Final Numerical Model Report: Update to the Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

Texas Water Development Board Contract 1948312321

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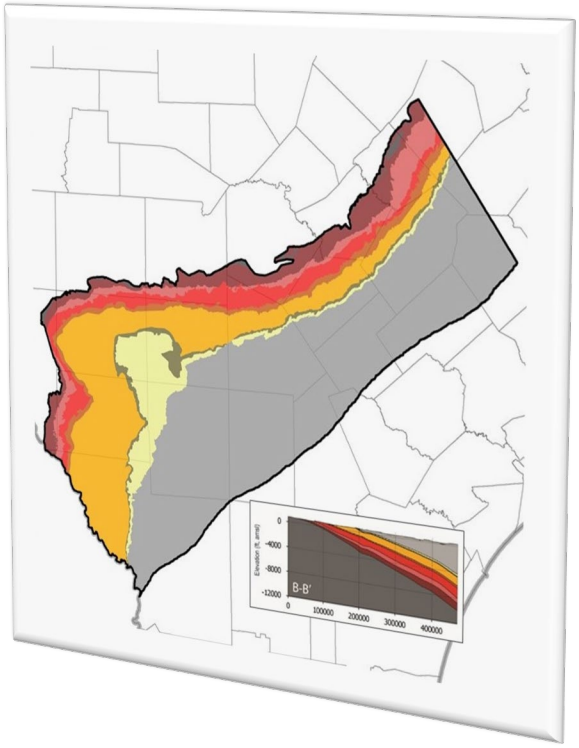

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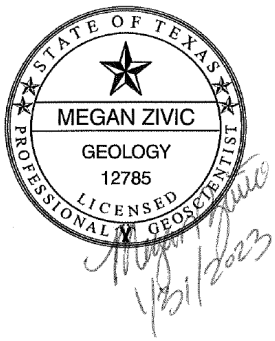

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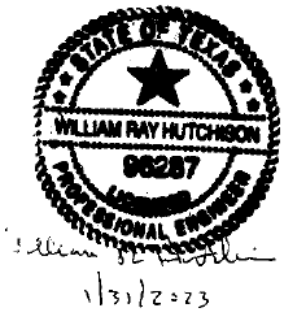

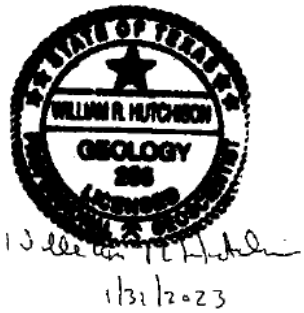

This document is released under the authority of William R. Hutchison, Ph.D., P.E., P.G. Dr. Hutchison was responsible for oversight of the numerical model described in this report and completed the predictive simulations described in this report.

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Executive Summary

The southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer system is an important groundwater resource in south central Texas. A groundwater availability model was developed in 2003 for this aquifer system in order to provide a tool for predicting groundwater availability into the future and assessing water management strategies developed by state water planners, Groundwater Conservation Districts, Regional Water Planning Groups, and other stakeholders. The groundwater availability model was updated in 2004 when the Queen City and Sparta aquifers were added to the initial Carrizo-Wilcox groundwater availability model. This study provides an additional update to the groundwater availability model, with particular focus on improving the hydrostratigraphic framework to improve consistency with the adjacent groundwater availability model for the central portions of the aquifer system. This report summarizes the conceptual and numerical hydrogeologic model for the aquifer system. This report does not reproduce documentation available on the construction of the previous groundwater availability models, except as necessary to describe the development of the updated groundwater availability model.

The conceptual model described herein provides the hydrogeologic framework and characterization of the aquifer of interest in the study area. This investigation involved evaluation of information regarding physiography, climate, hydrogeology, groundwater levels and groundwater movement, surface water features, recharge, hydraulic properties for the aquifer units, discharge (including well pumping), and groundwater quality.
The conceptual model relies on the results of previous groundwater availability model studies by Deeds and others (2003) and Kelley and others (2004). The conceptual model was updated with hydrogeologic information, such as water levels, pumping, and precipitation, collected after the previous studies were conducted. In addition to updating hydrogeologic datasets and interpretations, considerable effort was made toward verifying and updating the hydrostratigraphic framework of the aquifer system for input to the updated groundwater model.

The conceptual model for the updated southern portion of the Carrizo-Wilcox, Queen City, and Sparta groundwater availability model comprises eight hydrostratigraphic units, including (from top to bottom) river alluvium, Sparta aquifer, Weches aquitard, Queen City aquifer, Reklaw aquitard, Carrizo-upper Wilcox, and the middle and lower units of the Wilcox Group. All layers except the river alluvium are eastward-dipping sedimentary deposits. The river alluvium layer comprises narrow deposits along the major rivers and tributaries that overlay the outcrop areas of all layers. The top of the aquifer system of interest for this study is overlain by a wedge of younger sedimentary deposits, including the Gulf Coast Aquifer System.

The flow system is bounded by the Rio Grande to the south, by the boundary between the Guadalupe and Colorado river basins to the north, and by the updip extent of the Wilcox Group to the west. The eastern model boundary is the downdip extent of the Wilcox growth fault zone. Model boundary locations are the same as the previous groundwater availability model for this aquifer system.

The conceptual model includes two hydrogeologic conditions: initial conditions and transient conditions. The transient model period represents historical hydrogeologic conditions from 1980 through 2017. This time period was selected principally based on pumping data availability. Initial conditions for the transient model represent conditions prior to 1980.

Regional groundwater movement in the study area is generally from the upland areas in the west to the east toward the Gulf of Mexico. Groundwater withdrawals since the early 1980s have occurred predominantly for irrigation uses and, to a lesser degree, municipal and rural domestic supplies. Total annual groundwater withdrawals have generally remained larger than 240,000 acre-feet per year since 1980, with peak withdrawals of almost 320,000 acre-feet per year during 2014. Pumping in recent years has been on the order of 270,000 to 300,000 acre-feet per year. Groundwater levels in the aquifers have declined and rebounded in areas in response to local pumping and recharge. Groundwater levels have been relatively stable in outcrop areas, with some areas of decline; while groundwater levels in down-dip portions of the aquifers have generally declined since the 1980s. Aquifer recharge occurs from percolation of precipitation and infiltration of impounded water in reservoirs and lakes. Shallow groundwater levels contribute to streamflows and a few flowing springs along the major drainages in the area. The major rivers have gaining streamflow conditions along their lengths within the study area.

The Conceptual Model has been translated to a MODFLOW 6 numerical model using Groundwater Vistas. The groundwater model calibration consisted of evaluating pumping, general head boundary condition parameters and aquifer properties against the conceptual model and available water level elevation dataset. Calibrated results show that simulated water level elevations in the aquifer layers generally match the observed groundwater conditions in these units. Flow direction and head change over the simulated period are consistent with the conceptual model data. Calibration statistics for each layer and model-wide demonstrate a good calibration with a weighted scaled root mean square error of less than 10 percent in all modeled units. Water balance for the calibrated model shows that groundwater withdrawal has increased over the model time period with simultaneous impacts to groundwater storage and increased losing conditions in simulated rivers. This matches the observed conditions in the southern portion of the model domain where pumping is concentrated. Other water balance components such as recharge and inflows and outflows from general head boundaries were relatively constant throughout the model simulation.

Sensitivity analyses were conducted to evaluate the impact of parameter uncertainties and variations in boundary fluxes. Parameters evaluated quantitatively were hydraulic conductivity, recharge, evapotranspiration, and groundwater pumping. Substantive changes in calibration statistics were noted for changes in pumping values and for horizontal hydraulic conductivity within the Lower Wilcox, while medium sensitivity was observed for horizontal hydraulic conductivity associated with the Middle Wilcox. Parameters evaluated qualitatively included scenarios of no pumping, constant recharge, and increased storage. Increased storage results demonstrated that storage is not very significant to the model calibration although it dampens variability in simulated

groundwater elevations. Simulated groundwater elevations in unconfined portions of aquifers exhibited sensitivity where water level variability was partially attributable to modeled recharge rates. Simulation of no-pumping resulted in a general increase in water level elevation, especially within confined portions of aquifers, across the model domain. A better estimation of pumping changes through time will provide better transient calibration to water level elevations changes. As data collection continues and the conceptual model is improved, the uncertainties associated with the model can be reduced.

Predictive models, based on the calibrated model, were developed to evaluate the impact of future pumping and recharge on the aquifers. Five technical memoranda simulating various pumping rates through time are provided with this updated Groundwater Availability Model. The predictive simulations found that the groundwater model simulates realistic increases in water level elevations as the previous groundwater availability model had done.

Since the predictive pumping and recharge values were held constant across the model for all counties, local variabilities in pumping were not evaluated; nor was variability in other model parameters which were also held constant. Predictive modeling showed that drawdown in Groundwater Management Area 13 counties may be significantly affected by baseline pumping rates or average recharge conditions. Despite the constant parameters used, the predictive drawdown charts for counties by aquifer may still be useful in guiding the Joint Planning Process and development of desired future conditions.

1 Introduction

The Texas Water Development Board (TWDB) recognizes nine major aquifers and twenty-two minor aquifers in Texas. These aquifers are shown on Figure 1-1 and Figure 1-2. Major aquifers produce large quantities of groundwater over large areas, while minor aquifers produce small quantities of groundwater over large areas or large quantities of groundwater over small areas. Groundwater models developed in Texas through the Groundwater Availability Model program have been used in numerous ways to advance groundwater planning and management of the aquifers in the state. When the program began more than 20 years ago, one of the objectives was that the models were to be used as living tools that would be updated as data and modeling technology improved.

The Carrizo-Wilcox Aquifer is a classified as a major aquifer in Texas. The aquifer extends from the Rio Grande region in south Texas to northeast Texas and into Louisiana and Arkansas. For groundwater modeling purposes, the TWDB divided the aquifer into three areas: the southern portion, central portion, and northern portion. Each of these areas is modeled by separate groundwater availability models.

The Sparta and Queen City aquifers are classified as minor aquifers in Texas. These minor aquifers extend from the Frio River region in south Texas to east Texas. The Sparta Aquifer continues into Louisiana where it is mapped as Sparta Sand and in Arkansas where it is included with the Claiborne Group. The Queen City Aquifer continues into Arkansas and the northwest area of Louisiana as part of the Cane River Formation of the Claiborne Group. For groundwater modeling purposes, the TWDB divided the Sparta and Queen City aquifers into the same south, central, and north model areas as the Carrizo-Wilcox Aquifer.

The primary objective of this project is to update the existing groundwater availability model for the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers. The groundwater availability model is used to simulate impacts of groundwater pumping on groundwater resources in southern Texas, and is extensively used in the joint planning process in Groundwater Management Area 13. The study area is shown on Figure 1-3. This model will build from two primary sources of data and information: (1) the existing groundwater availability models for the Queen City and Sparta Aquifers (Kelley and others, 2004), and (2) the existing groundwater availability model for the southern Carrizo-Wilcox Aquifer (Deeds and others, 2003). The resulting numerical model developed for this project will provide the means to assess future impacts on groundwater conditions from current pumping and projected increases in pumping. Model results will be used for evaluating groundwater impacts, and surface water impacts. The groundwater availability model will also be used to assist the groundwater conservation districts in Groundwater Management Area 13 to develop and/or revise their desired future conditions as part of the joint planning process.

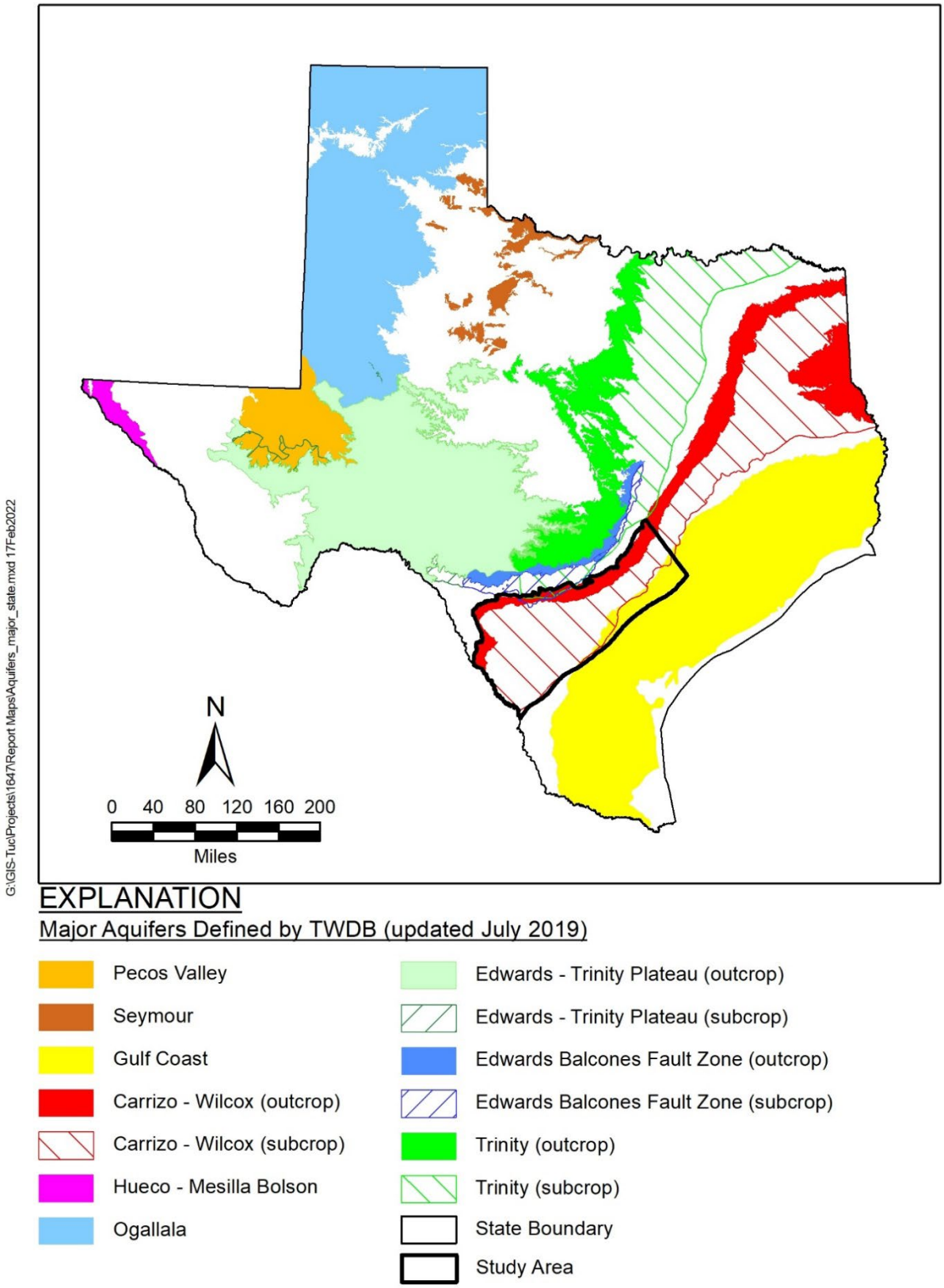


Figure 1-1. Major Aquifers in Texas

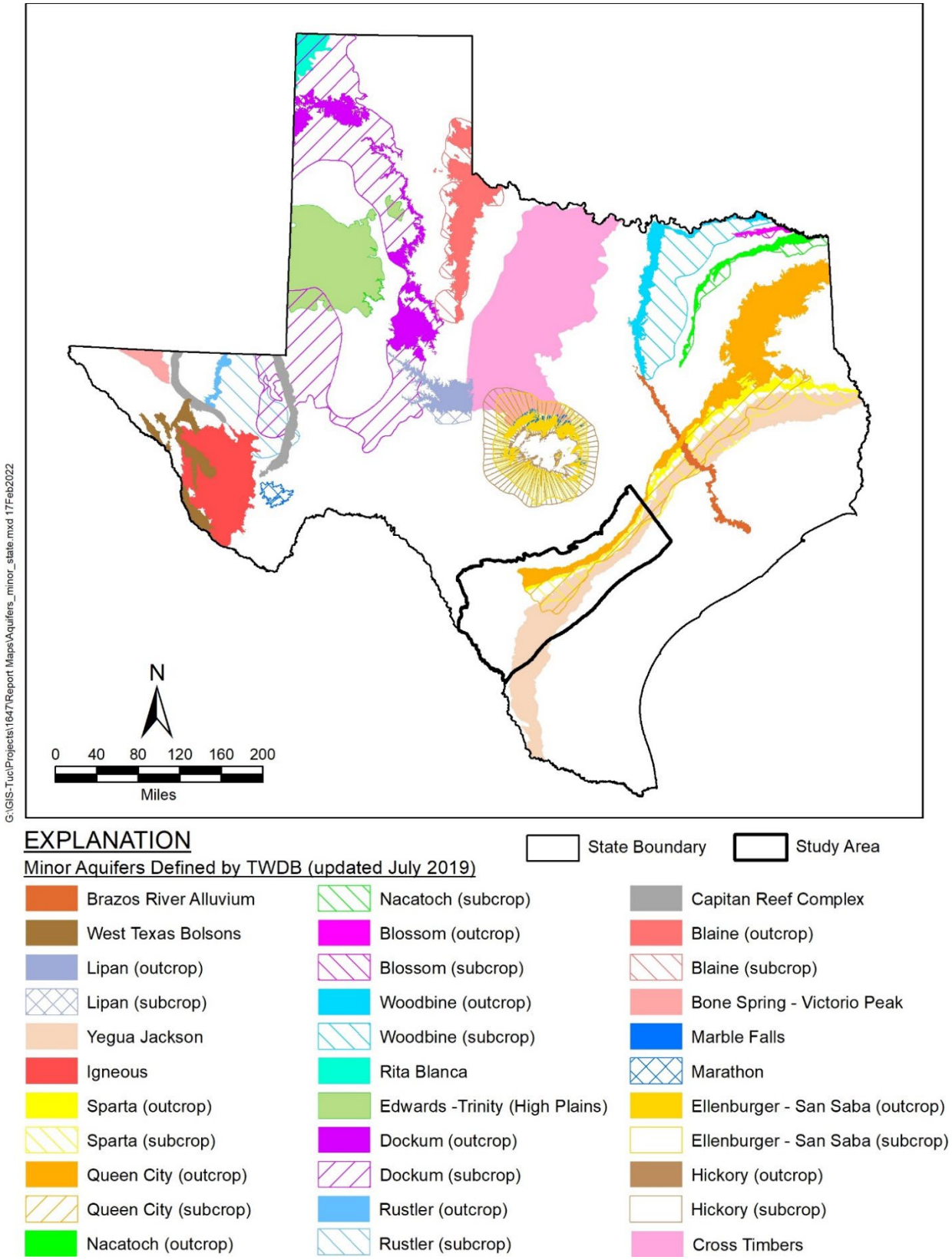


Figure 1-2. Minor Aquifers in Texas

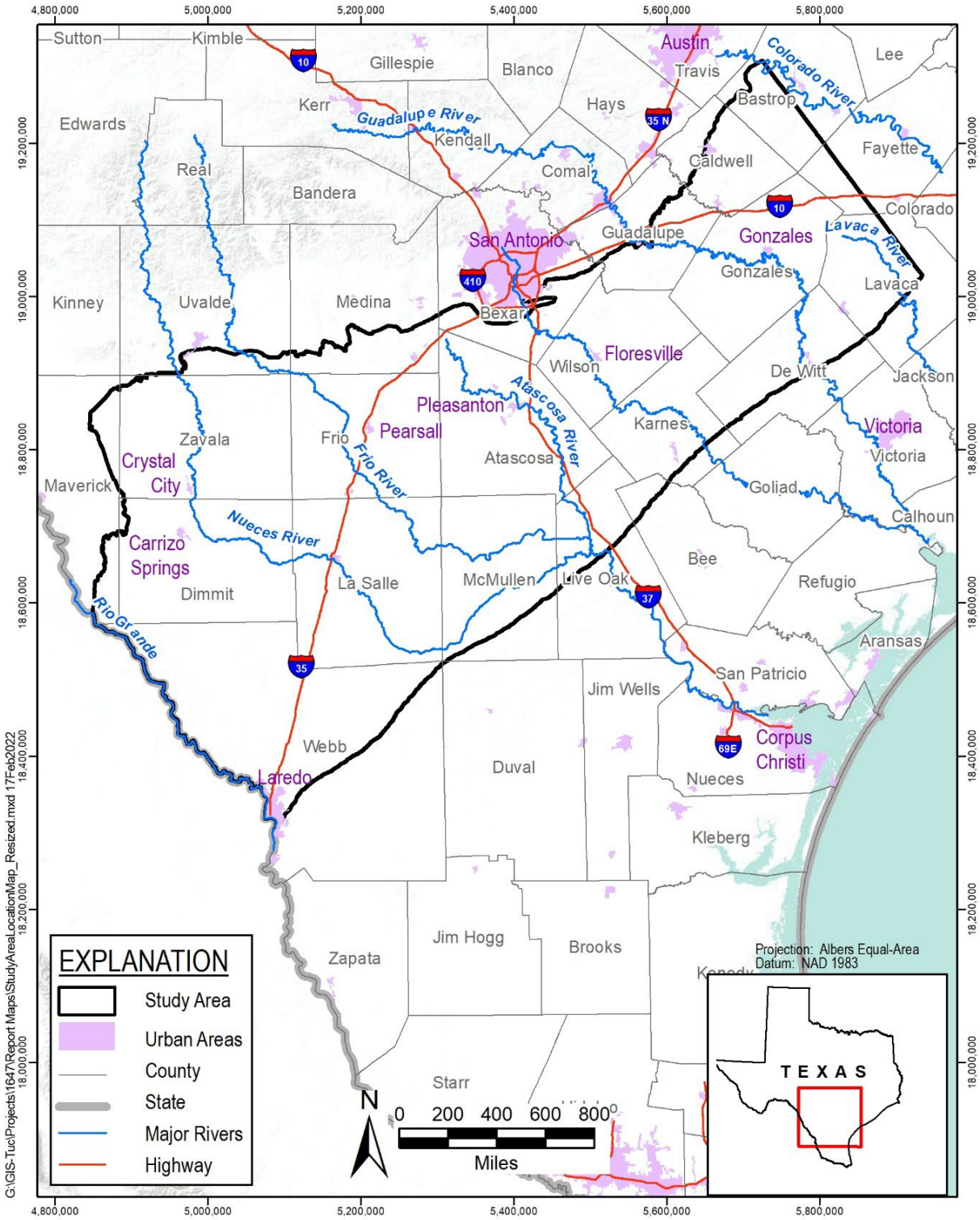


Figure 1-3. Location of Study Area

The model for this study will be developed specifically to address the objectives summarized above. The model domain extent and actively simulated aquifers were selected to encompass the water extractions of interest in the region. The model will be calibrated to observed annual conditions (groundwater levels and flows) from 1980 through 2017. The model will use annually averaged recharge and pumping stresses for all simulations because of the long-term nature of the objectives and the slow movement of groundwater in an aquifer. Details for the design and implementation of the calibrated model will be summarized in subsequent chapters of this report.

This project is conducted in two phases. Phase 1 is the update of the conceptual hydrogeologic model for the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers in support of the numerical model. Phase 2 is the development and calibration of a transient numerical groundwater flow model.

This conceptual hydrogeologic model provides the hydrogeologic framework and characterization of the groundwater system in the study area. This investigation involved evaluation of information regarding physiography, climate, hydrogeology, groundwater levels and groundwater movement, surface water features, recharge, hydraulic properties for the aquifer units, discharge (including well pumping), and groundwater quality.

This report summarizes the conceptual hydrogeologic model and the numerical groundwater model developed for the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers. An overview of the study area and summaries of previous studies are provided in Chapter 1. The hydrostratigraphy of the aquifer system, aquifer properties, groundwater recharge and discharge, surface water system, and water quality are described in detail in Chapter 2. The general conceptual model for development of the groundwater model is also summarized in Chapter 2. The information provided in this chapter was used to construct and calibrate the updated numerical groundwater model in Phase 2 of this project. Model construction, calibration, and sensitivity are described in detail in Chapters 4, 5, and 6, respectively.

1.1 Study Area

The study area for this investigation is located predominantly in south-central Texas (Figure 1-3). The study area is the same as the previous groundwater availability models by Deeds and others (2003) and Kelley and others (2004). The area includes all or portions of Atascosa, Bastrop, Bee, Bexar, Caldwell, De Witt, Dimmit, Fayette, Frio, Gonzales, Guadalupe, Karnes, La Salle, Lavaca, Live Oak, Maverick, McMullen, Medina, Uvalde, Webb, Wilson, and Zavala counties. Cities and major surface water drainages are shown on Figure 1-3. Major and minor aquifers that occur in the study area are shown on Figure 1-4 and Figure 1-5. The Yegua-Jackson Aquifer (minor) and Gulf Coast Aquifer System (major) overly the aquifers of interest for this study and are not explicitly included in this study.

Groundwater administrative areas located in Texas within the study area are shown on Figure 1-6, Figure 1-7, and Figure 1-8. The boundaries for these areas were obtained from TWDB (2019a). The study area extends across portions of five Regional Water Planning Areas (Figure 1-6): Region K (Lower Colorado), Region L (South Central Texas), Regional M

(Rio Grande), Region N (Coastal Bend), and Region P (Lavaca). Region L extends across the majority of the study area. Fifteen Groundwater Conservation Districts are located within the study area (Figure 1-7): Bee, Duval County, Edwards Aquifer, Evergreen Underground Water Conservation District, Fayette County, Lost Pines, McMullen, Medina, Pecan Valley, Plum Creek, Gonzales Under Ground Water District, Guadalupe County, Live Oak Under Ground Water District, Uvalde Under Ground Water District, and Wintergarden. In addition, the study area encompasses Groundwater Management Area 13, and also extends across portions of Groundwater Management Areas 10, 12, 15, and 16 (Figure 1-8).

Figure 1-9 shows the major rivers and associated drainage basins in the study area. Major rivers basins present in the study area include Rio Grande, Nueces, San Antonio, and Guadalupe basins, with small portions of the Colorado and Lavaca basins. Basin boundaries represent TWDB-designated major river basins (TWDB, 2019a). The Nueces River basin includes the Frio and Atascosa rivers, which are considered major rivers for this study.

The study area was delineated based on hydrologic boundaries, lateral extents of aquifers, and locations of pumping centers. The study area is bounded laterally by the Rio Grande in the south, and the approximate surface water basin divide between the Guadalupe and Colorado rivers in the northeast. The western boundary is the western extent of the Wilcox Aquifer outcrop. The eastern boundary is the same as defined for the previous groundwater availability models, which is the updip limit of the Wilcox growth fault zone as defined by Bebout and others (1982). The top or upper boundary of the model is defined as the land surface and the bottom boundary is defined as the bottom of the Wilcox Group (top of Midway Formation). This study area is the same as the boundaries in the previous groundwater availability models developed by Deeds and others (2003) and Kelley and others (2004).

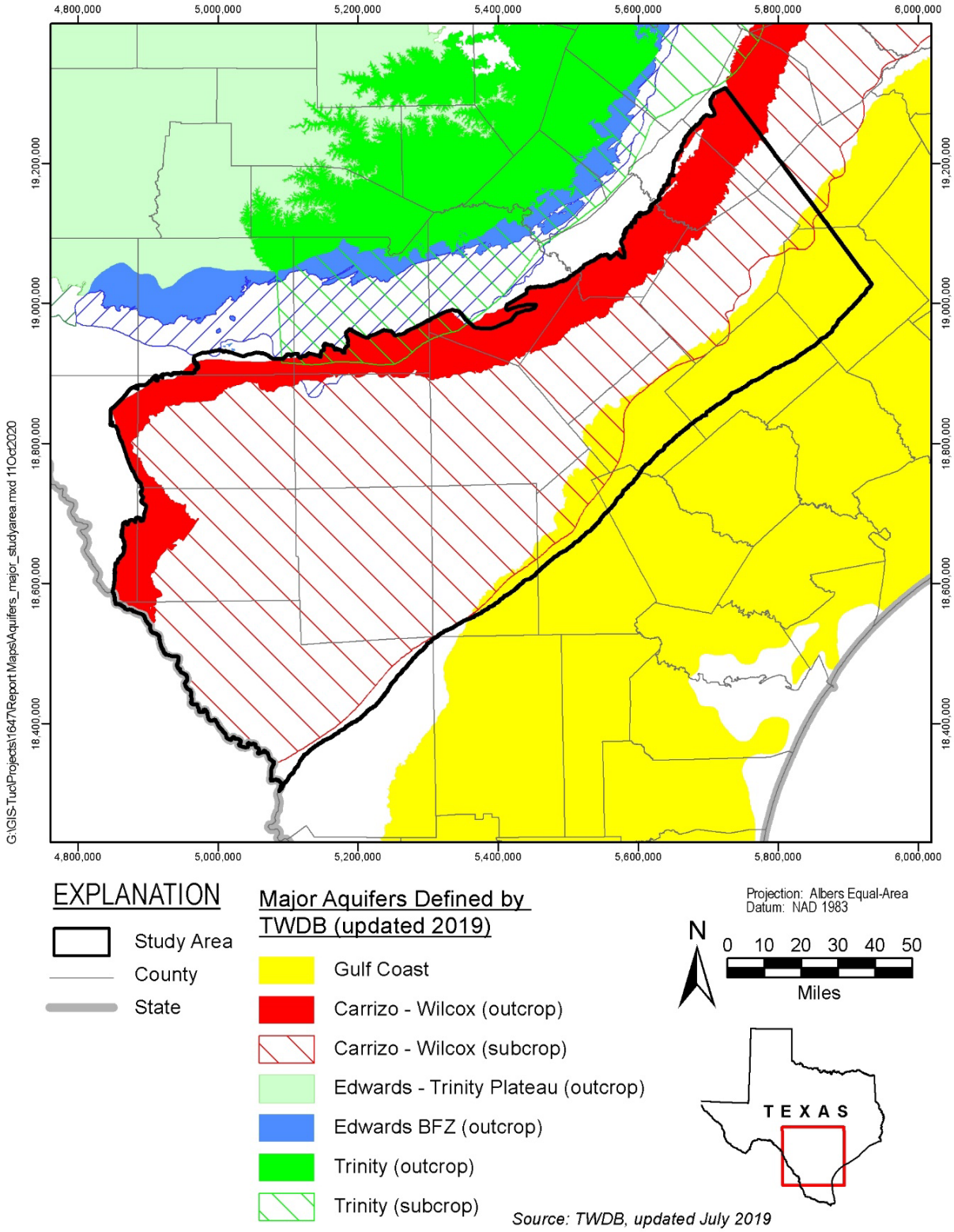


Figure 1-4. Major Aquifers in Study Area

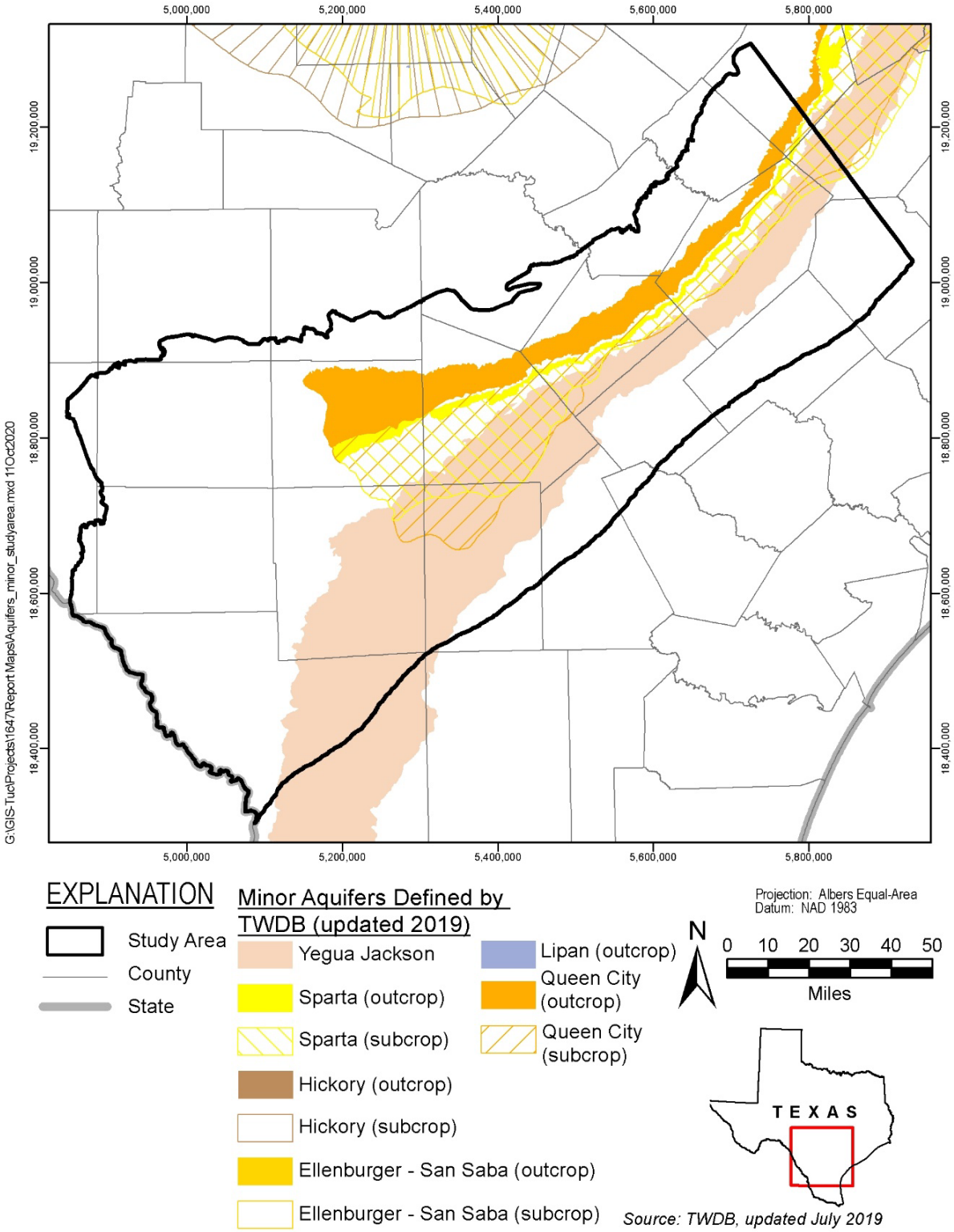


Figure 1-5. Minor Aquifers in Study Area

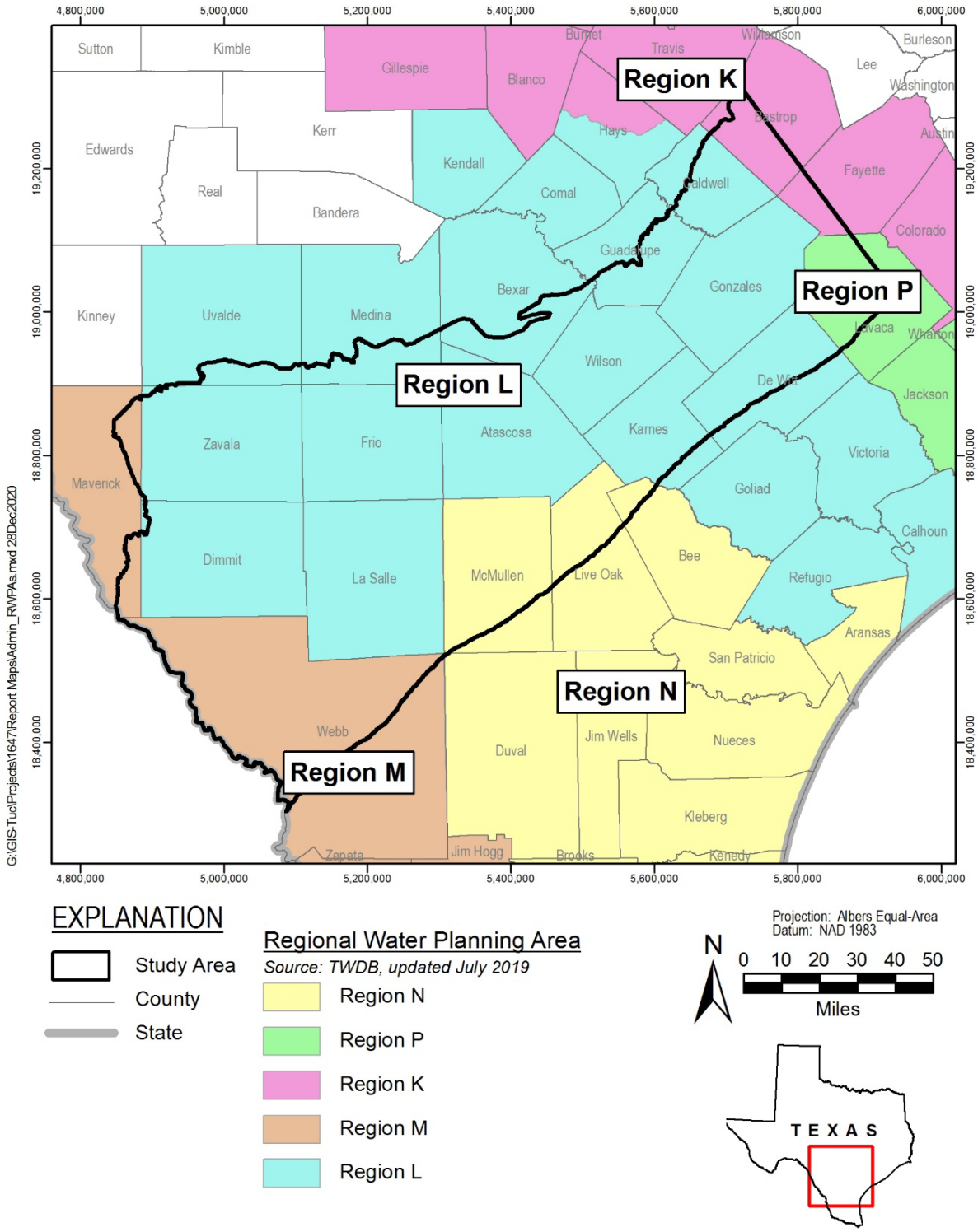


Figure 1-6. Regional Planning Areas in Study Area

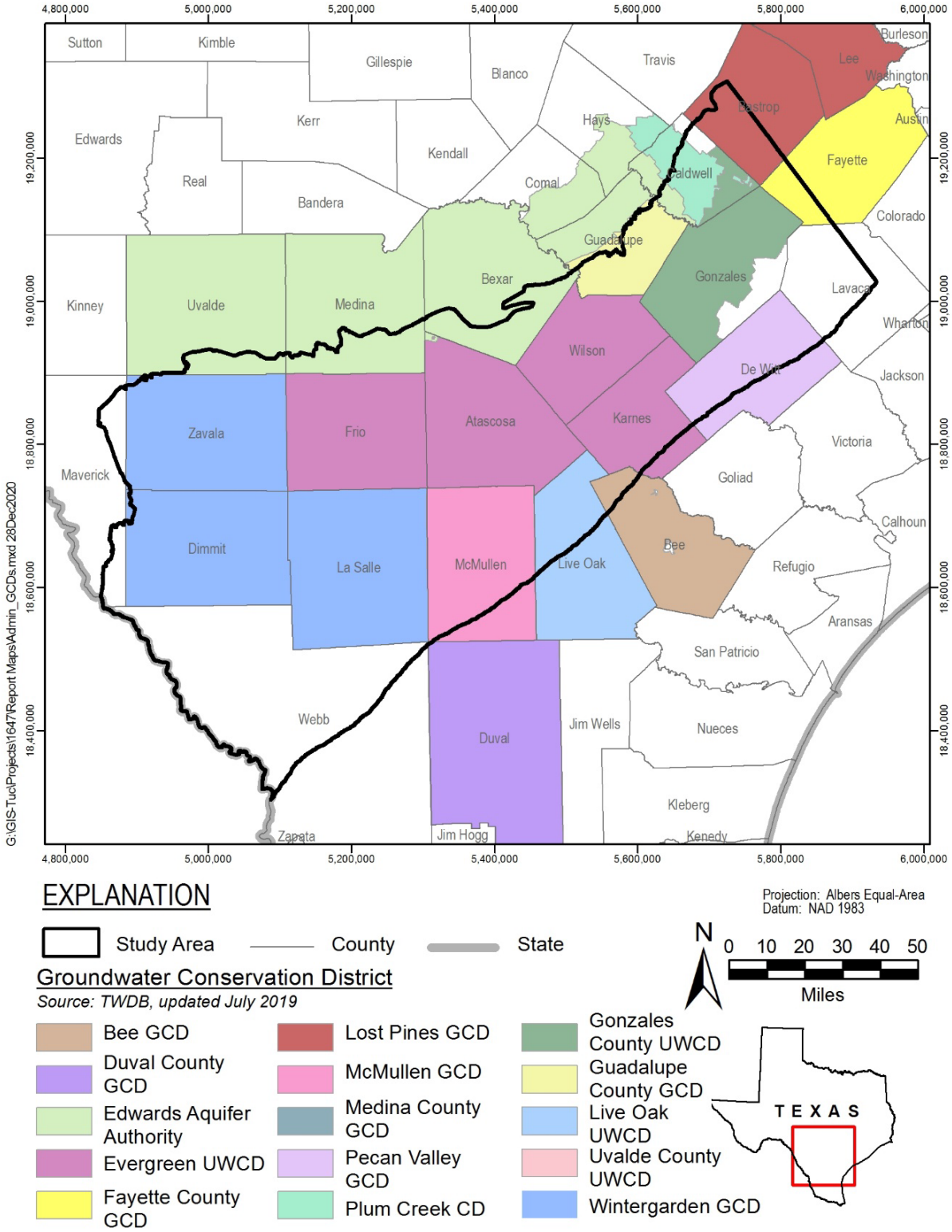


Figure 1-7. Groundwater Conservation Districts in Study Area

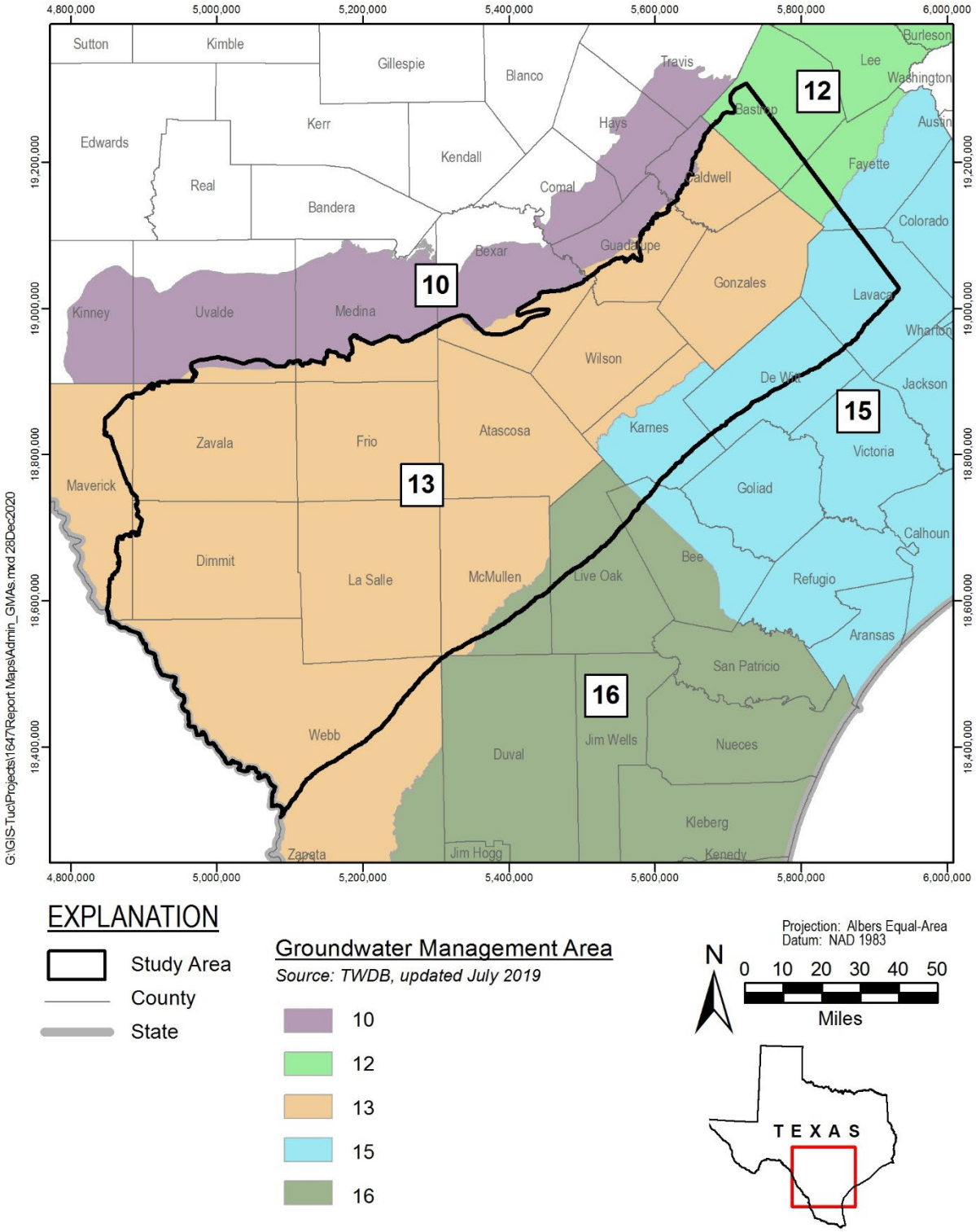


Figure 1-8. Groundwater Management Areas in Study Area

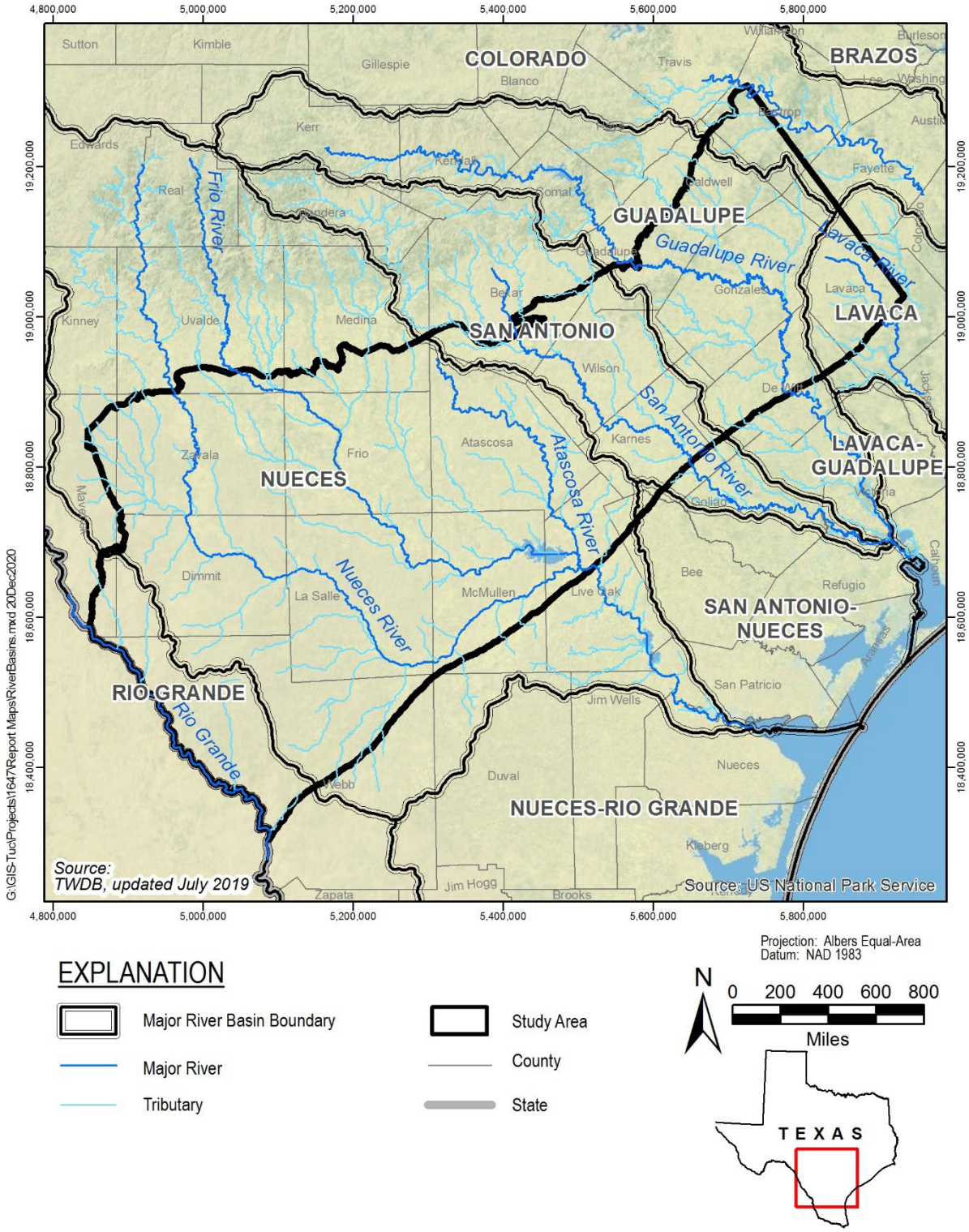


Figure 1-9. Major River Basins in Study Area

1.1.1 Physiography and Climate

Digital elevation model datasets (1 arc-second resolution, or 30 meters) were obtained for the study area from United States Geological Survey (USGS, 2019) National Elevation Datasets. Land surface elevation in the study area is shown on Figure 1-10. In general, land surface elevation in the study area decreases from the northwest to the southeast. Land surface elevations range from about 800 feet above mean sea level along the western boundary to about 200 feet above mean sea level along major river valleys along the eastern boundary. The land surface is substantially dissected by streams and drainages (Figure 1-10).

The study area is located within the Interior Coastal Plain physiographic province in Texas (Texas Bureau of Economic Geology, 1996). The province can be divided into different ecoregions based on topography and vegetation. Ecoregions in the study area include South Texas Brush County, Oak Woods and Prairies, and Blackland Prairie (Figure 1-11) (United States Environmental Protection Agency, 1998). South Texas Brush Country is the dominant ecoregion in the study area. According to the Texas Parks & Wildlife Department (2020) website for Texas Ecoregions, South Texas Brush Country is characterized by plains of thorny shrubs and trees (mostly mesquite, acacia, and prickly pear) mixed with grasslands, and scattered patches of palms and subtropical woodlands in the Rio Grande Valley. Vegetation types mapped by McMahan and others (1984) are shown on Figure 1-12.

The study area lies within the Southern and South-Central climate divisions delineated by the National Oceanic and Atmospheric Administration (2018), as shown on Figure 1-13. Thirty-year averages (1981 through 2010) for precipitation and temperature were computed using climate data obtained from the PRISM Climate Group (2020). The 30-year average annual temperatures range slightly over the study area from about 67°F in the northeast to about 74°F in the southwest, as shown on Figure 1-14.

The nearly 40-year average (1981-2019) annual precipitation in the study area increases from about 19 inches in the southwest to about 40 inches in the northeast, as shown on Figure 1-15. The spatial average annual precipitation between 1981 and 2019 for the entire study area is based on precipitation data from the PRISM Climate Group (2020) and is shown on Figure 1-16. Monthly precipitation data for individual weather stations in the study area were downloaded from the National Oceanic and Atmospheric Administration's (2020) National Centers for Environmental Information. Average monthly precipitation measured at selected rain stations in the study area is shown on Figure 1-17. A bimodal rainfall pattern is apparent with majority of rainfall occurring in late spring (May and June) and early fall (September and October).

Information on net lake evaporation was obtained from the TWDB (2020a) for 1-degree quadrangles in the study area. Average lake evaporation across the valley is shown on Figure 1-18. Average annual net lake evaporation ranges from less than 18 inches in the northeastern portions of the study area to more than 40 inches in the southwestern portions.

Hydrologic Soil Groups were classified from gridded Soil Survey Geographic Database soils datasets downloaded from the U.S. Department of Agriculture National Resources Conservation Service (Natural Resources Conservation Service, 2007) Web Soil Survey website (https://websoilsurvey.nrcs.usda.gov/app/). The National Resources Conservation Service defines the Hydrologic Soil Groups as:

> *Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows: Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission. Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission. Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.*

The dominant hydrologic soil groups in the study area are shown on Figure 1-19. Moderate to fine-grained soils with moderate to slow infiltration rates occur throughout the majority of the study area. Areas with sands and gravels with high infiltration rates are present in the northwest portions of the study area.

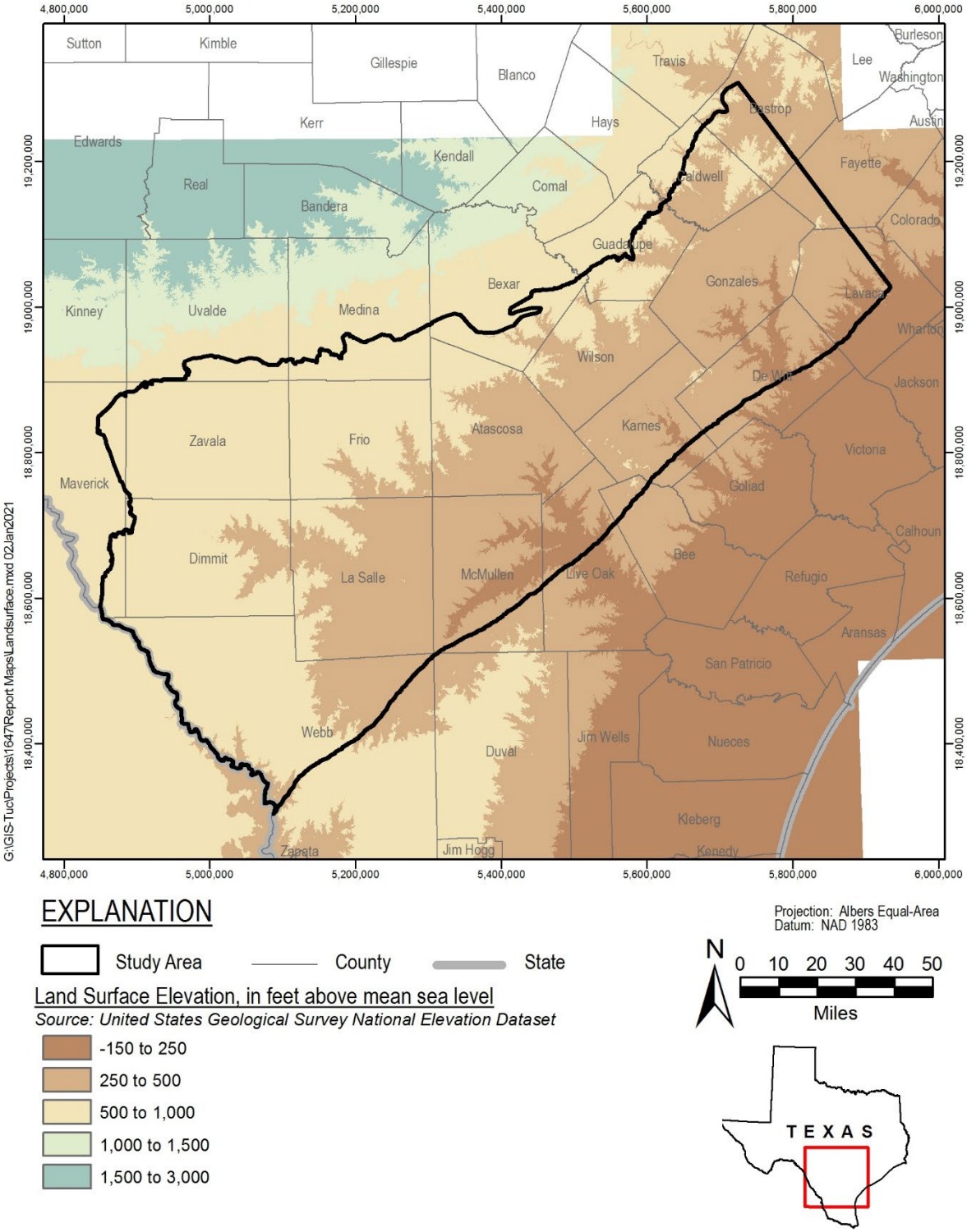


Figure 1-10. Land Surface Elevation in Study Area

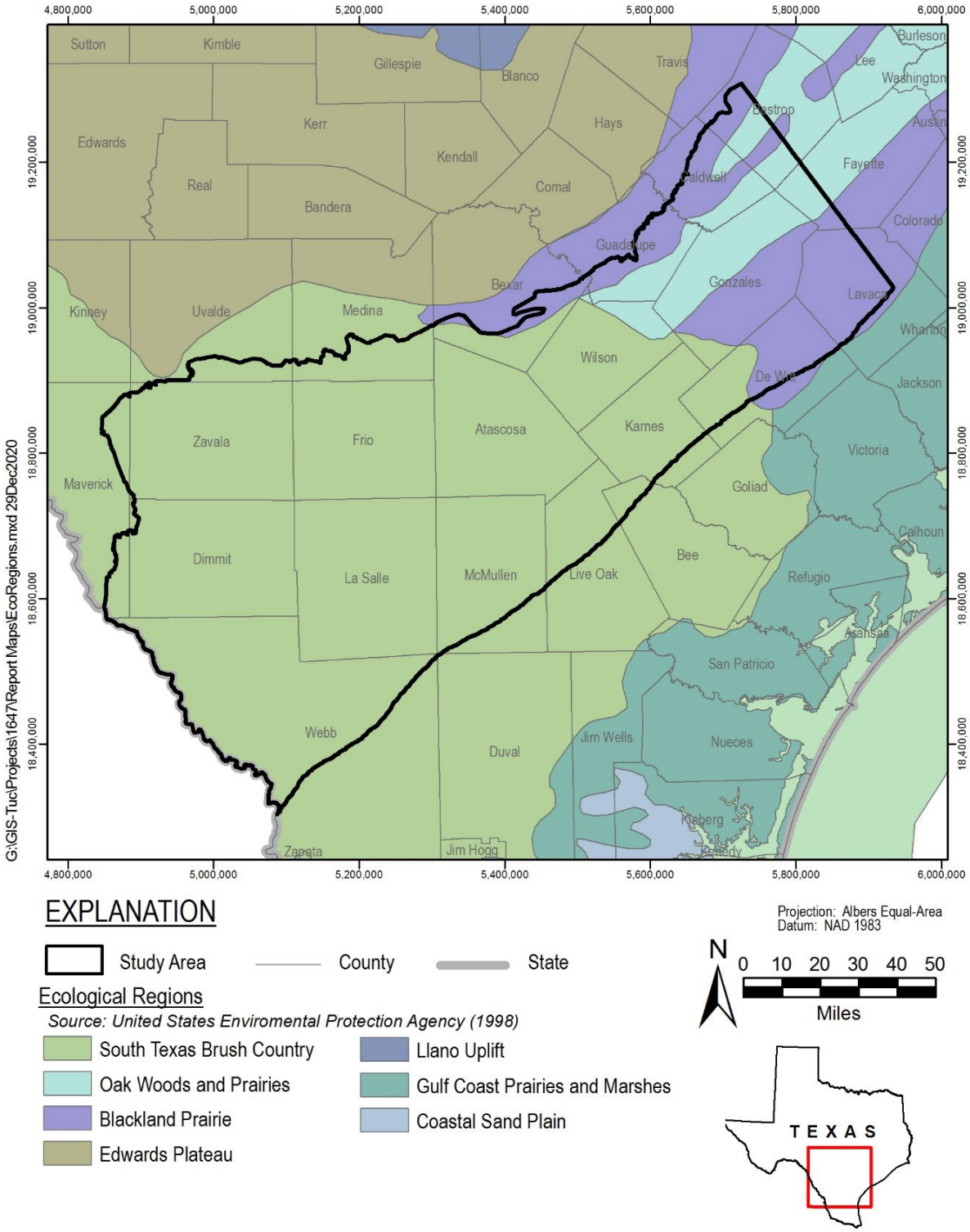


Figure 1-11. Ecological Regions in Study Area

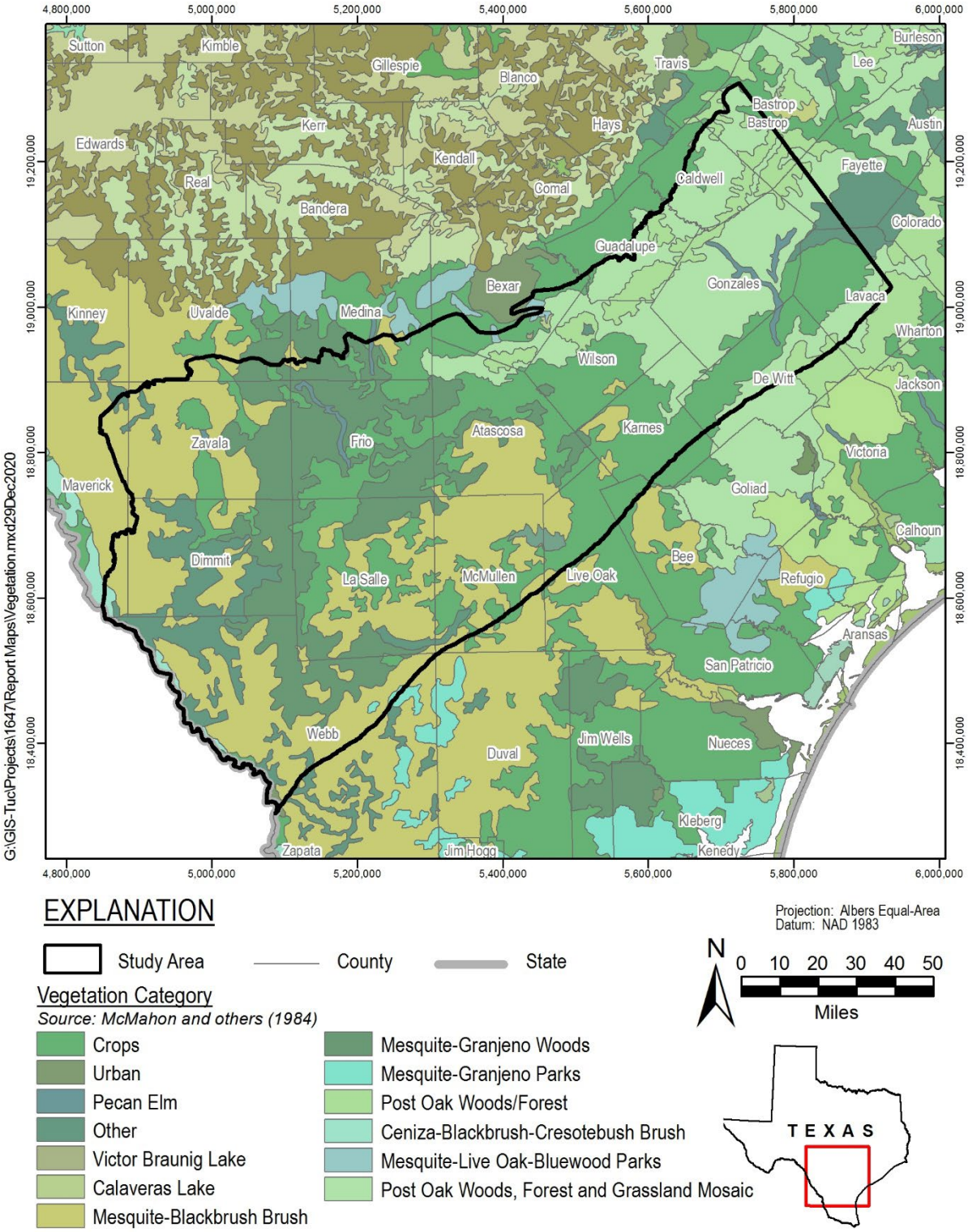


Figure 1-12. Vegetation Types in Study Area

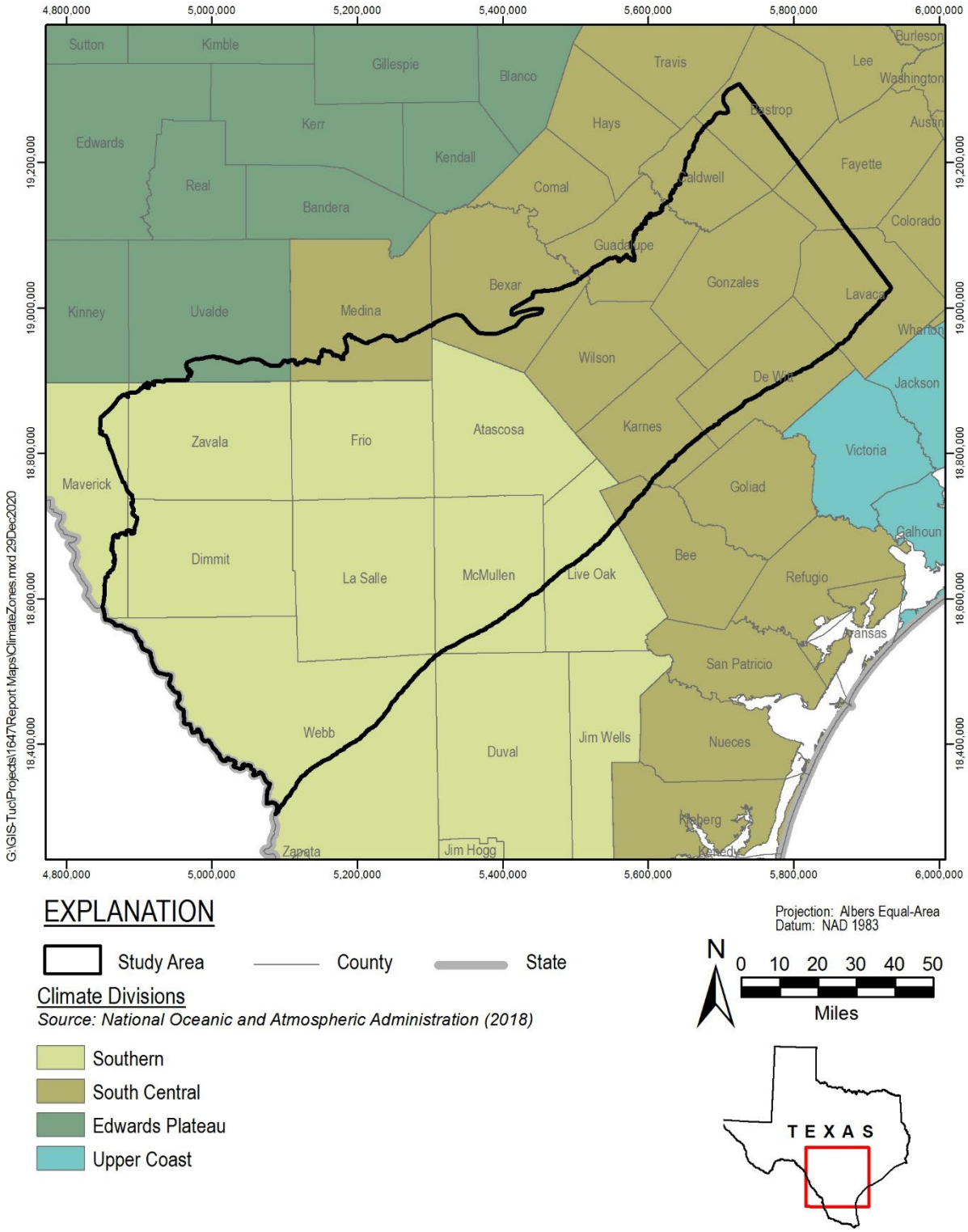


Figure 1-13. Climate Divisions in Study Area

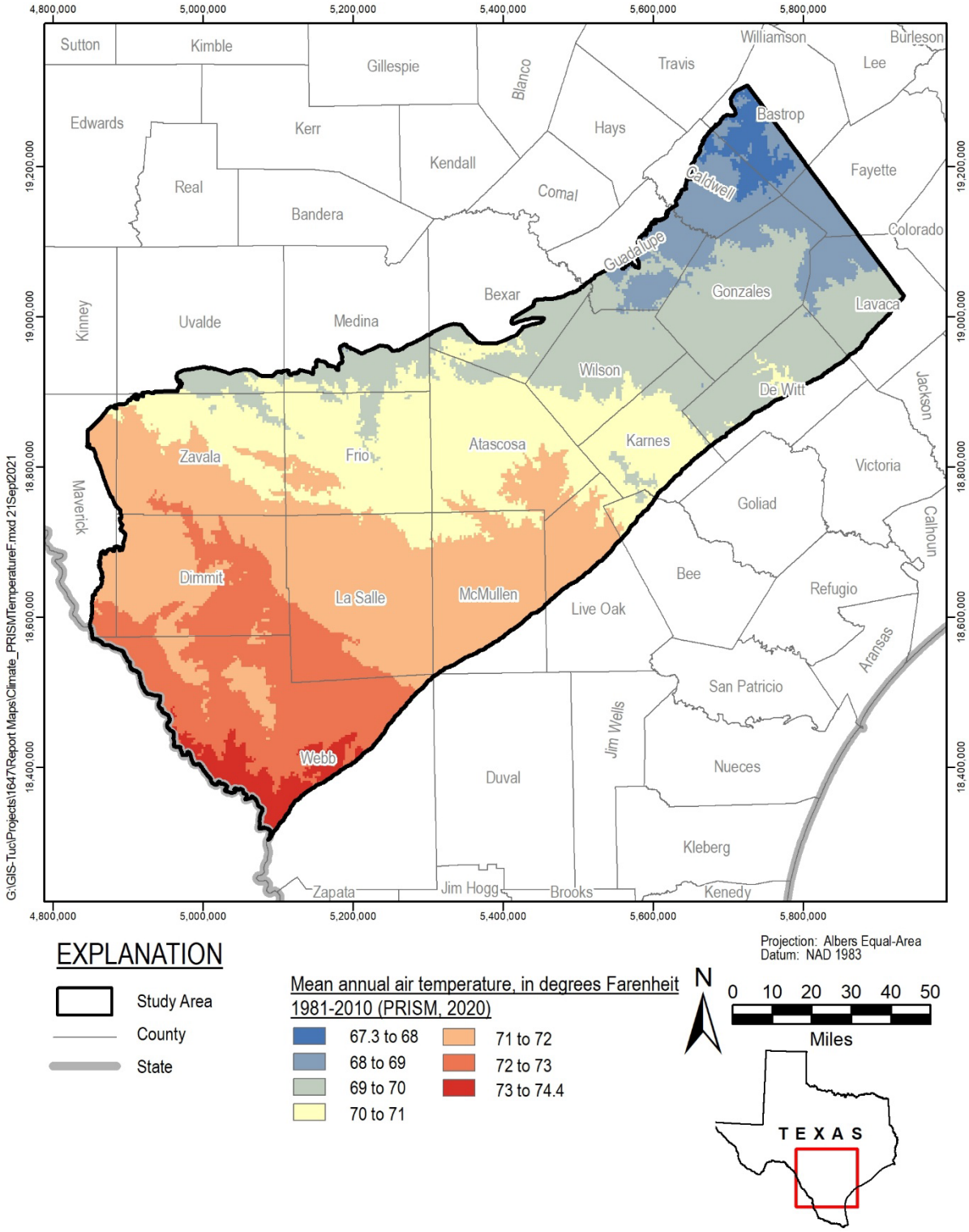


Figure 1-14. Average Annual Temperature in Study Area

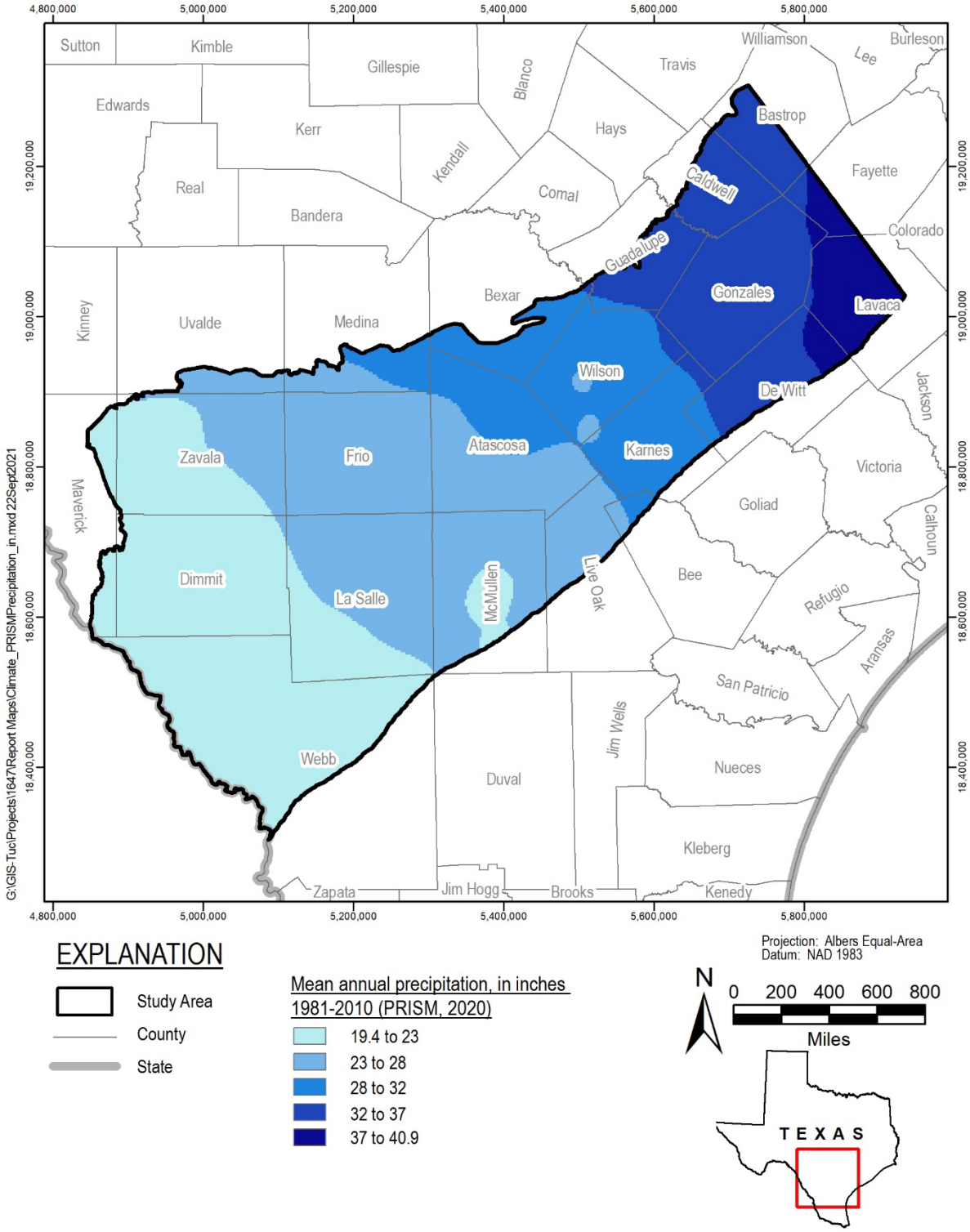


Figure 1-15. Average Annual Precipitation in Study Area

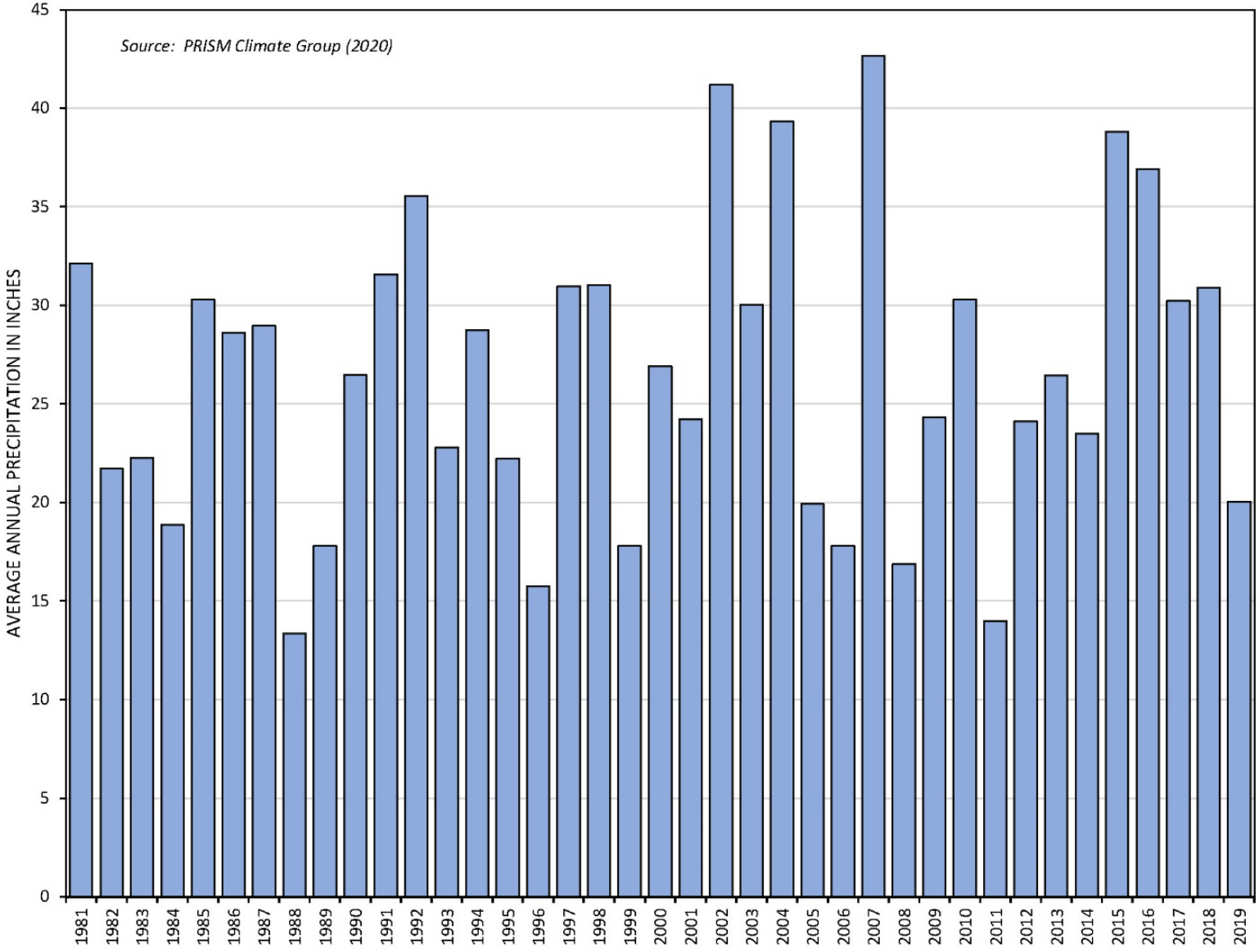


Figure 1-16. Annual Precipitation in Study Area

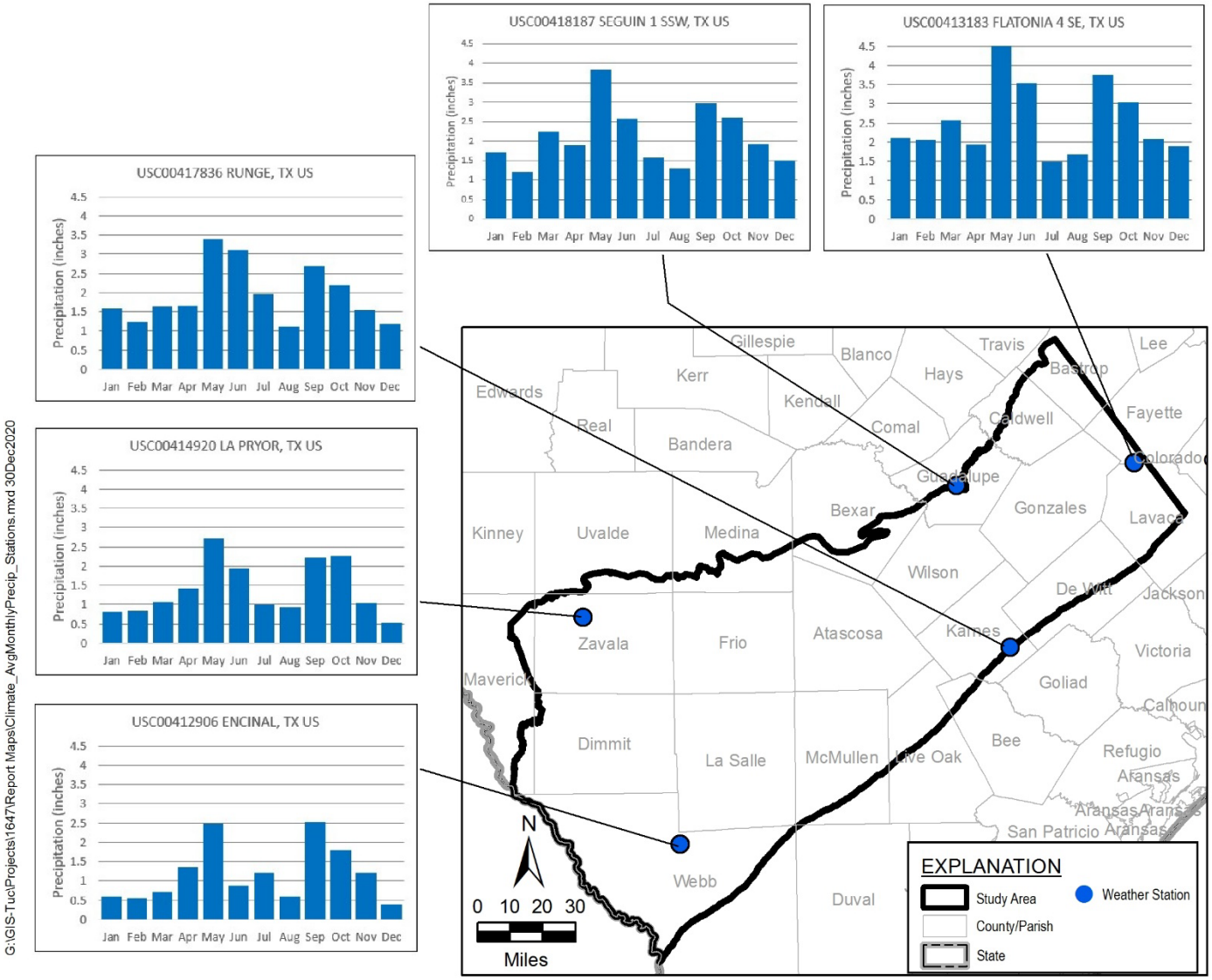
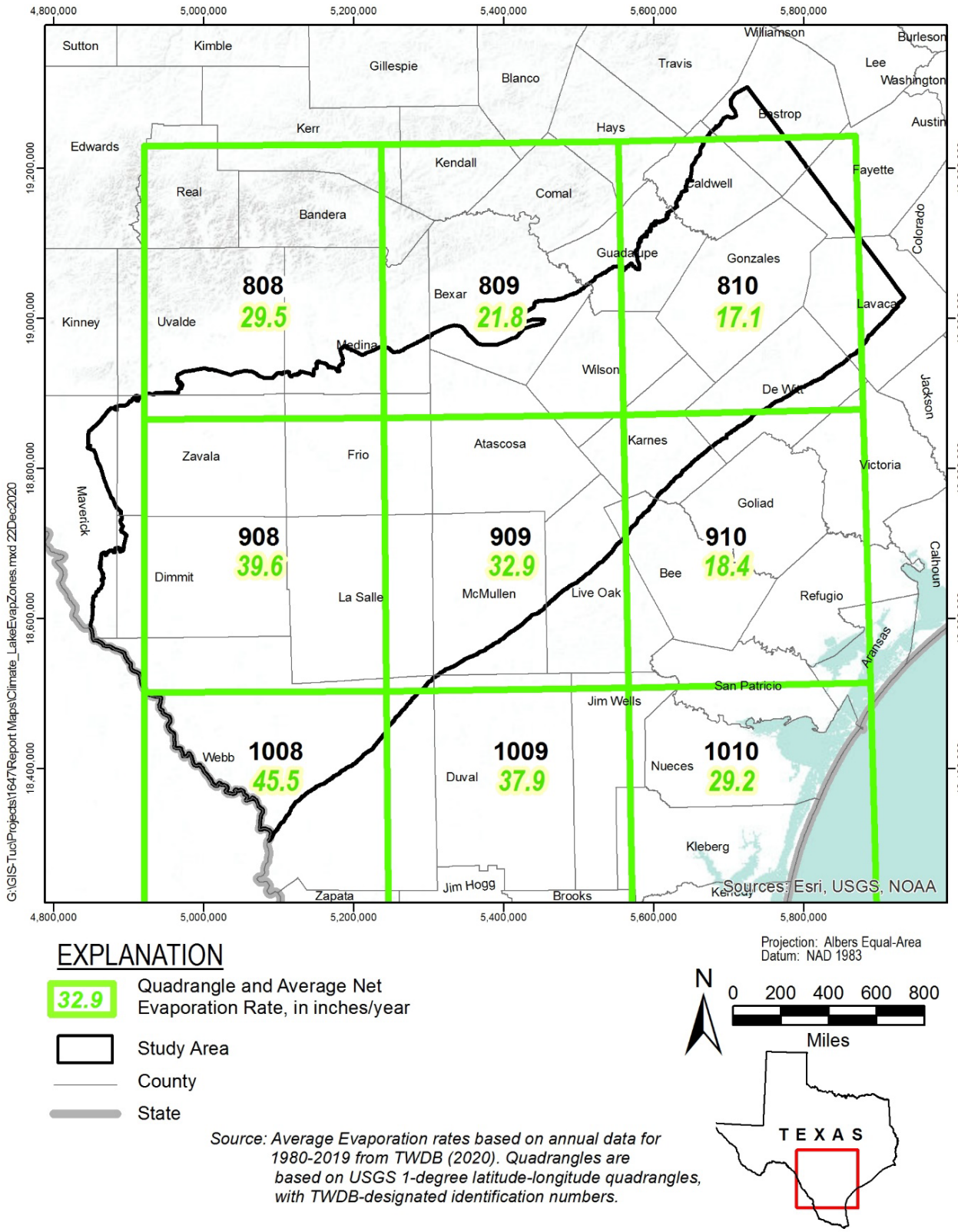


Figure 1-17. Average Monthly Precipitation at Selected Weather Stations



Source: Average Evaporation rates based on annual data for 1980-2019 from TWDB (2020). Quadrangles are based on USGS 1-degree latitude-longitude quadrangles, with TWDB-designated identification numbers.

Figure 1-18. Average Annual Net Lake Evaporation

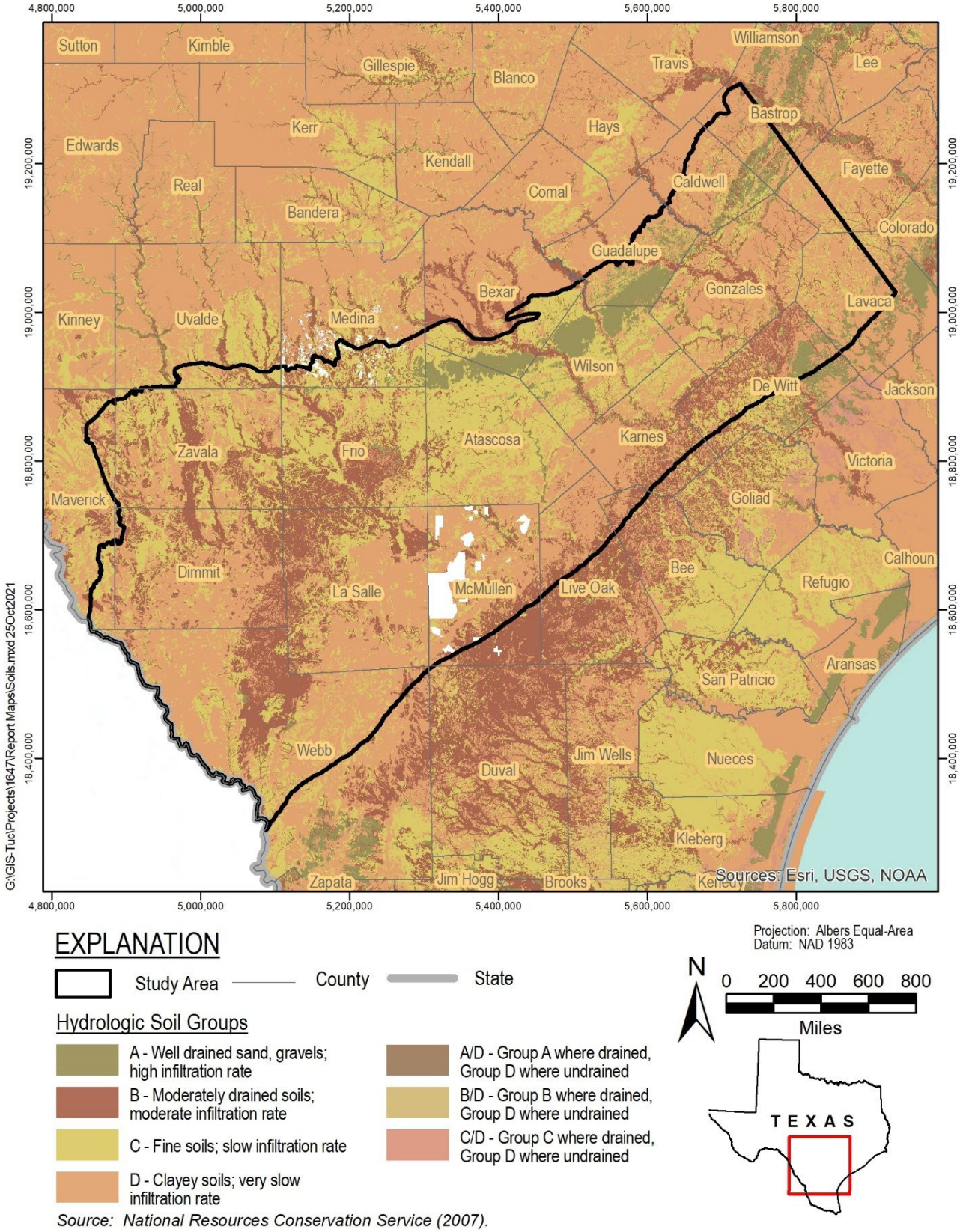


Figure 1-19. Hydrologic Soil Groups in Study Area

1.2 Geologic Setting

Deeds and others (2003) provide a comprehensive description of the general geologic setting of the study area. This section relies heavily on information presented in that report. Regional subsidence, episodes of sediment inflow from outside the Gulf Coast Plain, and eustatic sea level change have influenced the deposition of sediments in the study area (Grubb, 1997). According to Galloway and others (1994), deposition of Cenozoic sequences is characterized by an off-lapping progression of successive, gulfward thickening wedges. Deposition occurred principally along continental margin deltaic depocenters within the Rio Grande Embayment and to a lesser extent on the stable San Marcos Arch which separates the Rio Grande Embayment from the Houston Embayment outside the study area.

In ascending stratigraphic order, the principal depositional sequences are the Wilcox group, Carrizo Sand, Queen City Sand, Sparta Sand, Yegua-Cockfield, Jackson, and Vicksburg-Frio formations (Galloway and others, 1994). Southwest of the Frio River, the Bigford Formation is equivalent to the Reklaw Formation and base of the Queen City Sand, the El Pico Clay is equivalent to the Queen City Sand and Weches Formation, and the Laredo Formation is equivalent to the Sparta Sand and Cook Mountain Formation (Deeds and others, 2003). These depositional sequences are bounded by marine shales and finer-grained sediments deposited by marine transgressions. The sequences of interest for this study, shown on Figure 1-20, are the Wilcox Group, Carrizo Sand, Queen City Sand and Sparta Sand. The finer-grained bounding units of interest in the study area include the Reklaw and Weches formations, which overlay the Carrizo Sand and Queen City Sand, respectively.

Surficial geology in the study area, obtained from a United States Geological Survey integrated geologic database (Stoeser and others, 2007) available from the Texas Natural Resources Information System (2020), is shown on Figure 1-21. Major structural features are shown on Figure 1-22. Each unit outcrops along the northwestern extent of the study area and are generally oriented southwest to northeast. This outcrop orientation is coincident with depositional strike, the Balcones Fault Zone, and normal to basin subsidence (Deeds and others, 2003).

The dominant structural features in the model area include the Rio Grande Embayment in the southwest, San Marcos Arch to the northeast, and growth faults in the downdip area (Figure 1-22). The embayment focuses sediment input and is a central area of deposition. The axis of the Rio Grande Embayment coincides with the Frio River and a change in lithologic character of the aquifer units across the embayment axis (Deeds and others, 2003). The change in lithologic character is evidenced in borehole electrical logs and change in outcrop formations across this axis.

GIS-Tuc\1647\ReportMaps\Stratigrpahic_sections.ai\30Jan2020

Period	Epoch	Stratigraphic Units		Dominant Lithology	TWDB Aquifer/Aquitard	Hydostratigraphic Unit
		Northeast of Frio River	Southwest of Frio River			
Quaternary	Post-Eocene	Alluvium		sand	---	Quaternary Deposits
Tertiary		---		---	---	Younger Units
	Eocene	Sparta	Laredo	sand	Queen City-Sparta aquifer	Sparta aquifer
		Weches	El Pico Clay	mud		Weches aquitard
		Queen City		sand and mud		Queen City aquifer
		Reklaw	Bigford	mud	aquitard	Reklaw aquitard
		Carrizo	Carrizo	sand	Carrizo-Wilcox aquifer	Carrizo - Upper Wilcox interval
		Wilcox Group	Wilcox Group	mud		Middle Wilcox interval
	Paleocene			sand and mud		Lower Wilcox interval
	Post-Paleocene	---	---	---	---	Midway Group and Older Units

Figure 1-20. Generalized Stratigraphic Section of Hydrostratigraphic Units; Modified from Hamlin and others (2019)

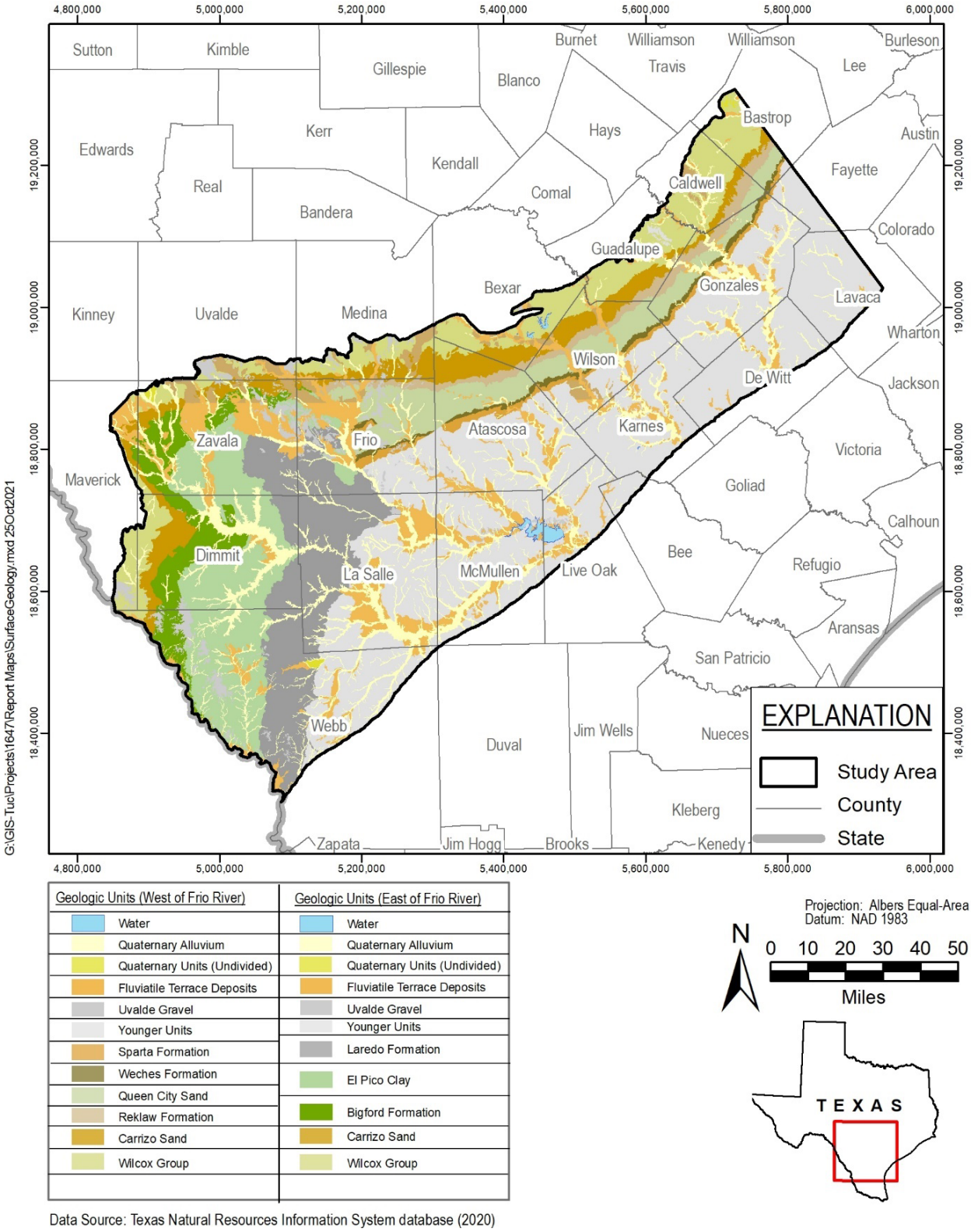


Figure 1-21. Surface Geology of the Northern Portion of the Carrizo-Wilcox, Queen City, and Sparta Aquifers

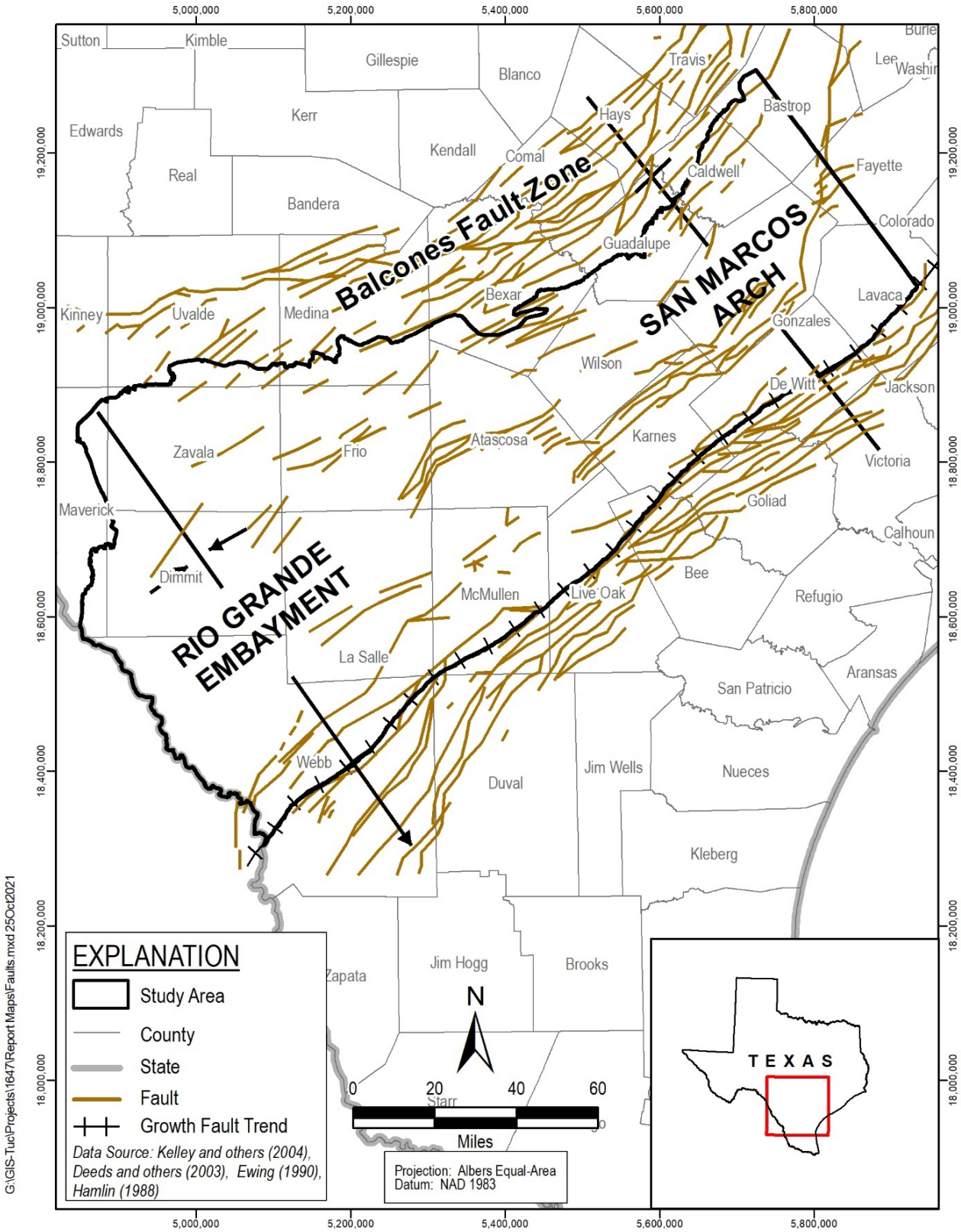


Figure 1-22. Major Fault and Structural Features in Study Area

1.3 Previous Studies

The southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer system has been studied by numerous investigations and groundwater modeling. This investigation relies heavily on the hydrogeologic interpretations and results of studies conducted by Deeds and others (2003) and Kelley and others (2004) for the previous groundwater availability models for these aquifers.

Deeds and others (2003) developed the groundwater availability model for the southern portion of the Carrizo-Wilcox Aquifer with the purpose of providing a tool for making predictions of groundwater availability through 2050. The study involved comprehensive literature reviews and analyses for developing the conceptual model for the aquifer system. The associated model report contains detailed information about the analysis that are not included in this report. The model is comprised of six layers, including, from top to bottom, Queen City, Reklaw, Carrizo, upper Wilcox, middle Wilcox, and lower Wilcox. Grid cells have uniform dimensions of 1-mile by 1-mile. The steady-state model was calibrated to predevelopment conditions. The transient model was calibrated to conditions from 1980 through 1989, with a subsequent model verification period from 1990 through 1999. The verified model was used to predict changes to groundwater conditions to the year 2050 based on future groundwater demands developed by Regional Water Planning Groups and Groundwater Conservation Districts.

The Carrizo-Wilcox groundwater availability model was updated in 2004 when the Queen City and Sparta aquifers were added to the model by Kelley and others (2004). The model included eight layers and was calibrated to the same period as the Carrizo-Wilcox groundwater availability model. The Sparta Sand and Weches Formation were added to the model as new layers. The Weches Formation layer is between the underlying Queen City Sand and the overlying Sparta Sand. The model grid, boundary conditions, and simulation periods of this groundwater availability model are the same as specified in the southern Carrizo-Wilcox groundwater availability model. The current study described herein relies on many aspects of the conceptual model developed by Kelley and others (2004).

2 Hydrogeologic Setting

The hydrogeologic setting summarizes the information required for the development of the conceptual groundwater model. This section provides information on the hydrostratigraphic layering framework, groundwater levels and flows, recharge, discharge, groundwater-surface water interactions, aquifer hydraulic properties, and groundwater quality principally in terms of salinity.

2.1 Hydrostratigraphy and Layering Framework

Hydrostratigraphic units are geologic units grouped by similar lithologies which influence the storage or movement of groundwater to determine aquifers or aquitards. Hydrostratigraphy refers to the layering of aquifers and associated confining units of a study area. The hydrostratigraphic chart for the Sparta, Queen City, and Carrizo-Wilcox aquifer system is presented on Figure 2-1. These units were deposited in altering progradation and transgressive sequences resulting in wedges of sand and shale, respectively, that dip and thicken toward the coast (Galloway and others, 2000). The thickest, most laterally extensive sand-rich wedges compose the major Carrizo-Wilcox aquifer system while the minor Sparta and Queen City aquifers are comparatively thinner, limited in lateral extent, and less sandy (George and others, 2011).

Across the Frio River, there is a change in formation names and contacts for units younger than the Carrizo Formation. Northeast of the Frio River, these formations are known as the following: Sparta Formation, Weches Formation, Queen City Formation, and Reklaw Formation. Southwest of the Frio River, in the Rio Grande Embayment area, the same stratigraphic interval is mapped and distinguished as the Laredo Formation, El Pico Clay, and Bigford Formation. Although the surface outcrops do not coincide across the Frio River, the aquifer units are continuous in the subsurface (Guevara and Garcia, 1972; Ricoy and Brown, 1977; Hamlin, 1988; Hamlin and others, 2019). The general relationship between the change in geologic formation across the Frio River is shown on Figure 1-20. The description for each unit's lithofacies is included in the hydrostratigraphic framework section (Section 2.1.4) of this report.

The Carrizo-Wilcox Aquifer is divided in southern Texas based on notable facies or system changes which influence the storage or movement of groundwater into the following intervals: the Carrizo-upper Wilcox, middle Wilcox, and lower Wilcox. The inclusion of the upper Wilcox with the Carrizo for this study is consistent with recent studies by Hamlin and others (2019) and Meyer and others (2020). These studies based their stratigraphic interpretations on both Bebout and others (1982) and Hargis (1985, 1986, 2009), who described the Carrizo Formation as the updip equivalent of the upper Wilcox, and Hamlin (1988) who related the fluvial systems of the Carrizo Formation to the deltaic systems of the upper Wilcox. The middle and lower Wilcox are generally less sandy due to their deposition in coastal plain and marine environments with the middle Wilcox being generally more shale-dominated (Hamlin and others, 2019). The inclusion of upper Wilcox with Carrizo is described in further detail in Section 2.1.4 of this report.

Therefore, the hydrostratigraphy evaluated for the groundwater model comprises the following distinct hydrostratigraphic units, from youngest to oldest: Sparta aquifer, Weches aquitard, Queen City aquifer, Reklaw aquitard, Carrizo-upper Wilcox interval, middle Wilcox interval, and lower Wilcox interval (Figure 2-1). Although not considered a substantial aquifer in the study area, Quaternary Deposits (river alluvium) are also incorporated into the aquifer framework for this study. The "Younger Units" are also included in the aquifer framework to better facilitate numerical modeling of the dipping groundwater system.

2.1.1 Overview of Stratigraphic Interpretation

The stratigraphic interpretations for this study relied heavily upon the methodology and available interpretations in the TWDB Brackish Resources Aquifer Characterization System Database (TWDB, 2019b) from Meyer and others (2020), Wise (2014), and Hamlin and others (2019). Figure 2-2 shows the spatial extent of stratigraphic interpretations for each of these studies compared to this report's study area. Notable differences in the data available between these studies are summarized as follows:

- Meyer and others (2020) distinguished Calvert Bluff (middle Wilcox) and Hooper and Simsboro Formations (lower Wilcox) in Bastrop and Lee counties, otherwise these intervals are grouped as the Wilcox Group.
- Hamlin and others (2019) distinguished contacts for the middle and lower Wilcox throughout the study area.
- Wise (2014) distinguished contacts for the top of Sparta Formation to the bottom of the Reklaw Formation in Atascosa and McMullen counties. The bottom of Reklaw Formation contacts were later revised by Meyer and others (2020) based on Reklaw interpretations from Bulling and Breyer (1989) and Sams (1991).

In June 2019, the Brackish Resources Aquifer Characterization System Group provided the stratigraphic interpretations available in their Database (TWDB, 2019b) from each of these studies, geophysical log images, and depth-calibrated geophysical logs, where available. The stratigraphic interpretations from these studies were first reviewed in Petra software (IHS, Inc.) to compare the distinguishing lithofacies for a given unit and correlation of lithofacies to adjacent logs.

The methodology used by Meyer and others (2020) to distinguish each unit contact using geophysical logs was thoroughly documented, the dataset was spatially dense, and all geological formations present on a log were represented in the interpretations as required of this study. After confirmation with the TWDB, the decision was made to use the methodology developed by the Brackish Resources Aquifer Characterization System Group for the hydrostratigraphic unit contacts and to ensure interpretations by Hamlin and other (2019) were consistent with this methodology or provide new interpretations to ensure consistency. This study reviewed geophysical logs to 1) provide new stratigraphic

interpretations from geophysical logs, as needed, to expand supporting structure control datasets, 2) revise other interpretations, if needed, to ensure they were consistent with the Brackish Resources Aquifer Characterization System Group methodology, and 3) subdivide the Wilcox Group into the middle and lower Wilcox for a subset of existing interpretations. Digital logs were analyzed from the Brackish Resources Aquifer Characterization System Group Database and logs provided by stakeholders, which were interpreted and submitted to the TWDB as part of this study.

Figure 2-3 shows the location of evaluated geophysical or water well logs used for this study. Stratigraphic interpretations for the hydrostratigraphic units are provided in detail in the hydrostratigraphic framework section (Section 2.4.1) of this report.

2.1.2 Outcrop Analysis

The studies conducted by Meyer and others (2020) and Wise (2014) provided over 100 individual well sites with stratigraphic interpretations in outcrop areas from water well logs by a geologist or driller. The counties in their study area included Atascosa, Bastrop, Bexar, Caldwell, Gonzales, Guadalupe, and Wilson. Additionally, geophysical logs for outcrop monitoring wells were provided by the Gonzales Groundwater Conservation District in Gonzales County. Due to the complexity of the lithofacies correlation across the Frio River in the geophysical logs and based on adequate sites with logs near the outcrops, water well log data was not added for Frio, Zavala, and Dimmit counties. The extent of the outcrop area for each hydrostratigraphic surface is based on the surface geology as mapped by the United States Geological Survey (Stoeser and others, 2007) (Figure 1-21). Furthermore, outcrop extents were compared to stratigraphic interpretations in nearby downdip wells to ensure consistency with subsurface data.

A comparison of the published official aquifer extent (Figure 1-4) to the outcrops of the Carrizo Sand mapped by the Bureau of Economic Geology (Figure 1-21) identified some minor discrepancies in extent in the uppermost outcrop areas, where saturated thickness, if any, of the aquifer is thin. Generally, the official aquifer extent encompasses the mapped outcrops; however, some slivers of Carrizo Sand outcrop are not included within the official aquifer boundary. The Groundwater Availability Model boundary includes these slivers of outcrop, consistent with the boundary previously delineated by Deeds and others (2003).

2.1.3 Major Updates from the Previous Groundwater Availability Model

2.1.3.1 Carrizo-upper Wilcox

As part of the update to the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers groundwater availability model, the aquifer framework was evaluated using two recent, independent studies within the Groundwater Management Area 13 area (Figure 2-2): Meyer and others (2020) and Hamlin and others (2019). Both studies interpreted formation contacts based on a review of borehole geophysical logs for the Sparta, Weches, Queen City, Reklaw, Carrizo, and Wilcox Group, which comprises the middle and lower Wilcox intervals. Importantly, both studies made the decisions to (1) group the upper Wilcox interval with the Carrizo Formation and therefore (2) classify the Wilcox Group as solely the equivalent of the middle and lower Wilcox intervals. This differs from the aquifer

framework developed for the previous groundwater availability model by Deeds and others (2003), which specified a separate model layer for the upper Wilcox interval primarily in the downdip area and southwest of the Frio River.

The Brackish Resources Aquifer Characterization System Group defined the Carrizo Formation as a massive sand complex with some areas including interbedded sand and shale units in the lowermost part of the unit (Meyer and others, 2020). The described interbedded sand and shale units are the equivalent of the upper Wilcox interval. They further note the contact is often difficult to distinguish between the Carrizo Formation from the interbedded upper Wilcox interval. Their method, which is the same as used by Hamlin and others (2019), opted to group the Carrizo Formation and upper Wilcox interval together with the base distinguished by the distinct, laterally extensive underlying shale marker of the middle Wilcox interval.

The Brackish Resources Aquifer Characterization System Group primarily provided stratigraphic interpretation entries for the Carrizo Formation and the Wilcox Group while Hamlin and others (2019) provided stratigraphic interpretation entries for the Carrizo-upper Wilcox, middle Wilcox, and lower Wilcox. A review of the stratigraphic interpretations from these studies shows that the Carrizo Formation, as it is distinguished by the Brackish Resources Aquifer Characterization System Group, has similar lithofacies as the Carrizo-upper Wilcox interval distinguished by Hamlin and others (2019).

This study reviewed stratigraphic interpretations from these recent studies to compare the respective lithofacies signatures used for the unit contacts. Particular attention was paid to understand the lithologic difference between the Carrizo Formation and the upper Wilcox interval. Overall, the upper Wilcox interval is composed of thick sand packages with relatively thin and variable shale beds, comprises considerably more sand than shale, and does not have a distinct marker to consistently distinguish it from the Carrizo Formation. The upper Wilcox interval as a whole is (1) comparatively thin, (2) not present in a large portion of the updip area, and (3) provides a more consistent overall unit thickness throughout the domain when grouped with the Carrizo Formation. Based on these observations, this study understands the merit of combining the upper Wilcox interval with the Carrizo Formation to be consistent with recent framework studies by both Meyer and others (2020) and Hamlin and others (2019).

Deeds and others (2003) did not provide a strong justification that the upper Wilcox interval was distinct from the Carrizo Formation. For the previous groundwater availability model, the upper Wilcox interval was determined by combining two different data sources with somewhat different interpretations of the Carrizo Formation. The upper Wilcox interval was determined by subtracting one study's Carrizo-upper Wilcox interpretation from another study's thickness of the Carrizo massive sand. Deeds and others (2003) note the updip limit of the upper Wilcox interval is somewhat artificial due to using two different interpretations. While reviewing geophysical logs located in the vicinity of the updip limit delineated by the previous groundwater availability model, this study noted that the presence of the upper Wilcox interval unit was not consistent and, therefore,

would also result in a somewhat artificial limit if implemented in the groundwater availability model update.

On September 19, 2019, the project team for this study met with the TWDB and Brackish Resources Aquifer Characterization System Group regarding this matter. During the meeting, both options were discussed and the TWDB opted to group the upper Wilcox interval with the Carrizo Formation for the groundwater availability model update. This grouping will be called the "Carrizo-upper Wilcox" interval for this study. This decision will allow the update to the groundwater availability model to be consistent with recent studies and stratigraphic interpretations.

2.1.3.2 Yoakum Canyon

The Yoakum canyon is a massive submarine channel which eroded into the lower Wilcox interval and filled with shale late in the Wilcox stratigraphic sequence in Bastrop, Caldwell, Gonzales, Lavaca, and Dewitt counties (Hoyt, 1959; Dingus and Galloway, 1990). The canyon trends northwest to southeast for approximately 67 miles from the shallow subsurface near outcrop to the early Eocene shelf edge with widths exceeding 10 miles and depths greater than 3,500 feet (Dingus and Galloway, 1990). Dingus and Galloway (1990) distinguish the Yoakum shale in this channel from the overlying fluvial-deltaic sand-rich deposits and the underlying middle Wilcox interval described as a dominantly aggradational shale sequence capped by a progradational (coarsening upwards sequence) sand sequence. The lower Wilcox interval predates the incision of the Yoakum canyon and is described as a thick sand-rich, progradational sequence (Dingus and Galloway, 1990).

The Yoakum shale was not previously distinguished by Deeds and others (2003) in the hydrostratigraphic framework, based on the thickness of the middle Wilcox interval in the previous groundwater availability model, but was captured in adjusted hydraulic conductivities for the lower Wilcox interval. During the stakeholder advisory forum held on August 2, 2019, the concern was brought up by a stakeholder that the Yoakum shale was not represented in the previous groundwater availability model hydrostratigraphic framework. Recent framework studies have confirmed the importance of the Yoakum shale. Although the Brackish Resources Aquifer Characterization System Group did not subdivide the Wilcox Group during their stratigraphic interpretation, the Yoakum shale thickness was provided as a remark in the database. Hamlin and others (2019) distinguished and included the Yoakum shale as part of the middle Wilcox interval which similarly resulted in a thicker middle Wilcox interval in the Yoakum canyon.

Due to its deposition late in the Wilcox stratigraphic sequence and dominant shale lithofacies, this study included the Yoakum shale as part of the middle Wilcox interval which is considered to be more fine-grained than the underlying lower Wilcox interval and overlying Carrizo-upper Wilcox interval. As a result, the middle Wilcox interval substantially thickens in the Yoakum canyon to better represent the shaley lithofacies, similar to the results of Hamlin and others (2019).

2.1.4 Hydrostratigraphic Framework

The hydrostratigraphic framework of an aquifer system is composed of the elevation surfaces of the hydrostratigraphic units in stratigraphic order. The hydrostratigraphic framework for the groundwater model is principally based on geophysical well logs, selected water well controls primarily along outcrop, and surficial geologic map information from the United States Geological Survey integrated geologic database (Stoeser and others, 2007) available from the Texas Natural Resources Information System (2020).

A continuous three-dimensional, volumetric representation of the hydrostratigraphic framework for the study area was prepared using the geologic modeling software Leapfrog® Geo, developed by Seequent. The Leapfrog geologic model was developed using contacts determined from the 1) review and analysis of geophysical logs from the Brackish Resources Aquifer Characterization System Group, Bureau of Economic Geology, and Montgomery & Associates, 2) review and analysis of driller's logs, and 3) outcrop extent polylines from the digital United States Geological Survey geology map dataset. Layer elevation surfaces were then exported from Leapfrog and slightly adjusted to better match surface geology contacts using ESRI's ArcGIS tools. After the development of the hydrostratigraphic framework elevation surfaces in Leapfrog Geo, these surfaces were exported to ESRI's ArcGIS for post-processing to incorporate the river alluvium model layer. The outcrop areas of the main hydrostratigraphic units in the study area are shown on Figure 2-4. The extents of the hydrostratigraphic units differ slightly from the TWDB-designated aquifer extents due to the incorporation of small, discontinuous outcrops.

Geologic cross sections of this detailed framework are presented on Figure 2-5. The sections were intentionally oriented in a manner to illustrate the stacking of the generally wedge-shaped aquifer units. The relatively thin river alluvium layer is too thin to be visible in regional-scale cross section view.

Each hydrostratigraphic unit and the Quaternary Deposits are described from youngest to oldest in the following sections. The geologic model also includes volumes for the units younger than the Sparta Formation ("younger unit") and units older than the Wilcox Group ("older unit"); these volumes define the upper and lower limits of the aquifer system in the groundwater availability model.

2.1.5 Quaternary Deposits (River Alluvium)

The Quaternary Deposits (river alluvium) were distinguished from other hydrostratigraphic units for the groundwater model. An extent (width) and a thickness were assigned to these deposits along three categories of rivers and streams in the study area: Rio Grande, all other major rivers, and tributaries. Extents and thicknesses of Quaternary Deposits represented in the hydrostratigraphic framework are shown on Figure 2-6.

The extent (width) of the Quaternary Deposits along the major river channels was simplified from the mapped Quaternary units. Major rivers in the study area include Rio Grande, Nueces River, Frio River, Atascosa River, San Antonio River, Guadalupe River, and

Lavaca River. For simplicity, the widths of Quaternary deposits along portions of major rivers with no mapped Quaternary units were defined by a buffered extent of 1,000 feet from the stream. The Rio Grande deposits were defined by a buffered extent of 2,000 feet from the river.

Only 28 available lithologic or geophysical log data for boreholes provided contacts for the Quaternary Deposits primarily in Bastrop and Caldwell counties, so a literature review was conducted to provide a basis for the unit thickness. According to the United States Geological Survey Groundwater Atlas of the United States (Ryder, 1996), Rio Grande River alluvium, located along the western boundary of the study area, may have a thickness of up to 200 feet. In a previous United States Geological Survey reconnaissance study with the Texas Water Commission, recent alluvium associated with the Guadalupe, San Antonio, and Nueces Rivers were estimated to have thicknesses of up to 30 feet (Alexander and others, 1964). Alluvial deposits of Frio River are estimated to be less than 100 feet thick (United States Department of Agriculture, 1992). Other Quaternary alluvium deposits associated with the Brazos River as well as other major streams in the state of Texas not in the study area are estimated to have a maximum thickness of about 100 feet (Ewing and others, 2016; Shah and others, 2007; Ryder, 1996). For the hydrostratigraphic framework, the Quaternary Deposits were assigned a thickness of 30 feet along all the major river channels, except Rio Grande. Rio Grande was assigned a thickness of 200 feet.

To aid with groundwater modeling, major tributary drainages were also included in the model framework as Quaternary Deposits. These areas had no subsurface contacts from borehole data and no specific documentation for unit thickness found in literature. Delineation of the stream network represented in the groundwater availability model is described in subsequent sections of this report. For simplicity, the width of Quaternary deposits along the tributaries with no mapped Quaternary units is defined by a buffered extent of 500 feet from the stream. A thickness of 15 feet was assigned to the deposits along the tributaries.

2.1.6 Younger Units

The wedge of geologic formations overlying the Sparta Formation are grouped into a single generalized aquifer unit called the "Younger Units" for this model update. This material is not described or characterized to the same degree as the aquifers of interest because it solely is used to facilitate groundwater flow modeling, as described in Section 3.8, and present a complete geologic model up to the surface. Top and bottom (base) elevation maps for the Younger Units are shown on Figure 2-7**.** The top elevation of the Younger Units is the land surface (or bottom of River Alluvium where present), and the bottom elevation is the top of the Sparta Aquifer described below. The thickness of the Younger Units (also shown on Figure 2-7) was prepared by subtracting the bottom elevation (top of Sparta) from the top elevation (land surface). The thickness ranges from 0 at the updip outcrop edge to 5,880 feet in downdip areas.

2.1.7 Sparta Aquifer

The Sparta Aquifer wholly comprises the Sparta Formation (George and others, 2011) which unconformably underlies the Cook Mountain Formation and conformably overlies the Weches Formation (Meyer and others, 2020). The Sparta Aquifer is a distinct sand rich unit identified as a high-destructive wave dominated deltaic facies in south Texas (Ricoy and Brown, 1977). Northeast of the Frio River, this hydrostratigraphic unit is easily distinguished from the younger Cook Mountain Formation and older Weches Formation, which are both marly marine transgressive units. Southwest of the Frio River, the mapped outcrops of the Sparta Formation and Cook Mountain Formation grade into the equivalent Laredo Formation; however, the lithofacies of the Sparta Aquifer are still distinct in the subsurface geophysical logs. Although the outcrop delineations change across the Frio River, several regional studies have shown the aquifers in the subsurface are continuous across the entire study area (Ricoy and Brown, 1977; Kelley and others, 2004; Hamlin and others, 2019).

2.1.7.1 Stratigraphic Analysis

Stratigraphic interpretations for the Sparta Aquifer were based on the methodology used by Meyer and others (2020). According to Meyer and others (2020), the top of the Sparta Aquifer is defined as the "top of the fining upwards sequence subjacent to the shale of the Cook Mountain Formation" while the bottom contact is the "base of the first significant progradational of the Sparta Formation". Meyer and others (2020) noted the bottom contact can be difficult to distinguish in areas where there is more than one upward coarsening sequence below the major Sparta Aquifer sand. West of the Frio River, the bottom contact is also difficult to ascertain due to significant thinning of the underlying Weches aquitard.

2.1.7.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom (base) elevation maps for the Sparta Aquifer are shown on Figure 2-8 and were prepared using 884 and 877 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the Sparta Aquifer ranges from about 858 feet from vertical datum in the northwest portion of the study area to -5,638 feet from vertical datum in the southeast portion. The vertical datum used for this framework and groundwater availability model is North American Vertical Datum 1988. The bottom elevation of the Sparta Aquifer ranges from about 854 feet from vertical datum in the northwest and decreases to about -5,818 feet from vertical datum in the southeast. The thickness of the Sparta Aquifer (also shown on Figure 2-8) was prepared by subtracting the bottom elevation from the top elevation. A total of 822 wells had both a top and bottom stratigraphic contact to provide thickness control. The Sparta Aquifer thickness ranges from 0 at the updip outcrop edge to 652 feet downdip in the Rio Grande River area.

2.1.8 Weches Aquitard

The Weches aquitard wholly comprises the Weches Formation (George and others, 2011) which conformably underlies the Sparta Formation and unconformably overlies the Queen

City Formation (Meyer and others, 2020). The Weches aquitard is composed of glauconitic muds and represents a marine transgression between the overlying Sparta Aquifer and underlying Queen City Aquifer (Ricoy and Brown, 1977).

This hydrostratigraphic unit is considered an aquitard to the Queen City Aquifer east of the Frio River. West of the Frio River, the Weches thins considerably and is difficult to discern from the underlying Queen City Aquifer; as a result, these units are traditionally known collectively as the El Pico Clay. Although the outcrop delineations change across the Frio River and the unit thins considerably in the outcrop area, several regional studies have shown the Weches aquitard as continuous in the subsurface across the entire study area (Ricoy and Brown, 1977; Guevara and Garcia, 1972; Kelley and others, 2004; Hamlin and others, 2019).

2.1.8.1 Stratigraphic Analysis

Stratigraphic interpretations for the Weches aquitard were based on the methodology used by Meyer and others (2020). According to Meyer and others (2020), the top of the Weches aquitard is defined as the "top of the shale subjacent to the base of the first significant progradational of the Sparta Formation" while the bottom contact is the "base of the shale marker above the uppermost sand signature of the Queen City Formation". Meyer and others (2020) noted the top contact can be difficult to distinguish in areas where there is more than one upward coarsening sequence below the major Sparta Aquifer sand. West of the Frio River, the Weches aquitard bottom is also difficult to ascertain due to significant thinning in the updip area combined with the top intervals of the underlying Queen City Aquifer becoming more shale dominated with thin sand intervals.

2.1.8.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom elevation maps for the Weches aquitard are shown on Figure 2-9 and were prepared using 910 and 908 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the Weches aquitard ranges from about 854 feet from vertical datum in the northwest portion of the study area to -5,818 feet from vertical datum in the southeast portion. The bottom elevation of the Weches aquitard ranges from about 822 feet from vertical datum in the northwest and decreases to about -5,899 feet from vertical datum in the southeast. The thickness of the Weches aquitard (also shown on Figure 2-9) was prepared by subtracting the bottom elevation surface from the top elevation surface. A total of 875 wells had both a top and bottom stratigraphic contact to provide thickness control. The Weches aquitard thickness ranges from 0 at the updip outcrop edge to 251 feet, with the vast majority of the unit being less than 200 feet thick.

2.1.9 Queen City Aquifer

The Queen City Aquifer is composed of sands deposited as a high-destructive, wave-dominated delta system (Guevara and Garcia, 1972). The Queen City Aquifer wholly comprises the Queen City Formation northeast of the Frio River which unconformably underlies the Weches Formation and conformably overlies the Reklaw Formation (Meyer and others, 2020). In this region, the Queen City Aquifer is easily distinguished from the

shales of the overlying Weches aquitard and underlying Reklaw aquitard. Southwest of the Frio River, the Queen City Aquifer is composed of the shale-dominated El Pico Clay and sandy intervals of the Bigford Formation (Klemt and others, 1976). Although the outcrop delineations change across the Frio River, several regional studies have shown the aquifers in the subsurface are continuous across the entire study area (Ricoy and Brown, 1977; Guevara and Garcia, 1972; Kelley and others, 2004; Hamlin and others, 2019).

2.1.9.1 Stratigraphic Analysis

Stratigraphic interpretations for the Queen City Aquifer were based on the methodology used by Meyer and others (2020). According to Meyer and others (2020), the top of the Queen City Aquifer is defined as the "top of the shallowest sand subjacent to the base of the shale of the Weches Formation" while the bottom contact is the "base of the upward coarsening sand package above the uppermost shale signature of the Reklaw Formation". Meyer and others (2020) noted the bottom contacts can be difficult to distinguish in areas where the Reklaw contains thin sand packages. Wise (2014) also notes the bottom contact can be difficult to ascertain due to the lower portions of the Queen City Aquifer containing more clay with thinner sand deposits which presents a more gradational contact. West of the Frio River and in the updip area, the shale of the overlying Weches aquitard and underlying Reklaw aquitard thin considerably, which makes the Queen City Aquifer contacts less distinct than in other regions of the study area. In these instances, the top of the shallowest sand below the Sparta coarsening upwards sequence was used and the deepest sand above the thin shale or reworked sand of the Reklaw aquitard. In the downdip area west of the Frio River, the shale of the overlying Weches aquitard and underlying Reklaw aquitard are thicker and the contact can be distinguished with the established methodology northeast of the Frio River.

2.1.9.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom elevation maps for the Queen City Aquifer are shown on Figure 2-10 and were prepared using 1,080 and 1,273 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the Queen City Aquifer ranges from about 889 feet from vertical datum in the northwest portion of the study area to -5,899 feet from vertical datum in the southeast portion. The bottom elevation of the Queen City Aquifer ranges from about 889 feet from vertical datum in the northwest and decreases to about -6,776 feet from vertical datum in the southeast. The thickness of the Queen City Aquifer (also shown on Figure 2-10) was prepared by subtracting the bottom elevation surface from the top elevation surface. A total of 1,010 wells had both a top and bottom stratigraphic contact to provide thickness control. The Queen City Aquifer thickness ranges from 0 at the updip outcrop edge to 1,968 feet.

2.1.10 Reklaw Aquitard

The Reklaw aquitard wholly comprises the Reklaw Formation (George and others, 2011), which conformably underlies the Queen City Formation and unconformably overlies the Carrizo Formation (Meyer and others, 2020). Southwest of the Frio River, the Reklaw aquitard is the equivalent of the lower interval of the Bigford Formation. The Reklaw

Formation consists of transgressive shales with the lower interval containing several sands representing re-worked or cannibalized sand during the transgression from the underlying Carrizo Formation (Bulling and Breyer, 1989; Sams, 1991; Meyer and others, 2020). Although there is a change in geologic formation across the Frio River, several regional studies have shown the Reklaw aquitard in the subsurface is continuous across study area in the downdip area with limited or missing shale in updip portions of Frio, Zavala, Dimmit, and Webb counties (Hargis, 2009; Hamlin and others, 2019). This study used the same methodology as Meyer and others (2020) for the stratigraphic interpretations of the Reklaw aquitard and thus results in a thin, limited Reklaw interval in these counties, which is considered to be more fine-grained than the upward coarsening sand at the base of the Queen City and the massive sand of the underlying Carrizo.

2.1.10.1 Stratigraphic Analysis

Stratigraphic interpretations for the Reklaw aquitard were based on the methodology used by Meyer and others (2020). According to Meyer and others (2020), the top of the Reklaw aquitard is defined as the "top of the shale subjacent to the base of the first progradational of the Queen City Formation" while the bottom contact is the "base of a shale or sand marker above the massive sand signature of the Carrizo Formation" Meyer and others (2020) noted the bottom contact can be difficult to distinguish where significant re-working of the underlying Carrizo Formation has occurred. West of the Frio River in the updip portion, the shale core and marker shale of the Reklaw is essentially non-existent. This study distinguished a thin transition zone equivalent to the fine-grained Reklaw with a lower overall deep resistivity signature between the overlying coarsening upward sequence of the Queen City Aquifer and the underlying massive sand of the Carrizo Aquifer.

2.1.10.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom elevation maps for the Reklaw aquitard are shown on Figure 2-11 and were prepared using 1,354 and 1,231 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the Reklaw aquitard ranges from about 9418 feet from vertical datum in the northwest portion of the study area to -6,776 feet from vertical datum in the southeast portion. The bottom elevation of the Reklaw aquitard ranges from about 882 feet from vertical datum in the northwest and decreases to about -7,081 feet from vertical datum in the southeast. The thickness of the Reklaw aquitard (also shown on Figure 2-11) was prepared by subtracting the bottom elevation surface from the top elevation surface. A total of 1,161 wells had both a top and bottom stratigraphic contact to provide thickness control. The Reklaw aquitard thickness ranges from 0 at the updip outcrop edge to 480 feet.

2.1.11 Carrizo-Upper Wilcox

The Carrizo-upper Wilcox interval wholly comprises the Carrizo Formation and the upper Wilcox interval of the Wilcox Group. Hargis (2009) described the upper Wilcox as the updip equivalent of the Carrizo Formation. Hamlin (1988) characterizes the fluvial facies of the Carrizo Formation in the updip region as contiguous with the deltaic facies in the downdip region. The Carrizo-upper Wilcox interval includes the bed-load fluvial channel-fill

sandstones with the lower interval consisting of a mixed alluvial system with fluvial-channel sandstones and minor shale (Hamlin, 1988). In the Rio Grande Embayment, the lower portion of the Carrizo-upper Wilcox transitions to include more sandstone (Bebout and others, 1982).

2.1.11.1 Stratigraphic Analysis

Stratigraphic interpretations for the Carrizo-upper Wilcox interval were based on the methodology used by Meyer and others (2020). According to Meyer and others (2020), the top of the Carrizo-upper Wilcox interval is defined as the "top of the massive Carrizo Formation sands" while the bottom contact is the "base of the first significant sharp-based sand superjacent to a regional marine shale marker equivalent to the top of the Middle Wilcox". Importantly, re-worked sands overlying the massive sand, which have a lower overall deep resistivity signature and limited areal extent, are included in the overlying Reklaw aquitard instead of the Carrizo.

2.1.11.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom elevation maps for the Carrizo-upper Wilcox interval are shown on Figure 2-12 and were prepared using 1,351 and 1,284 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the Carrizo-upper Wilcox interval ranges from about 907 feet from vertical datum in the northwest portion of the study area to -7,081 feet from vertical datum in the southeast portion. The bottom elevation of the Carrizo-upper Wilcox interval ranges from about 901 feet from vertical datum in the northwest and decreases to about -8,027 feet from vertical datum in the southeast. The thickness of the Carrizo-upper Wilcox interval (also shown on Figure 2-12) was prepared by subtracting the bottom elevation surface from the top elevation surface. A total of 1,181 wells had both a top and bottom stratigraphic contact to provide thickness control. The Carrizo-upper Wilcox interval thickness ranges from 0 at the updip outcrop edge to 1,685 feet.

2.1.12 Middle Wilcox

The middle Wilcox interval is part of the Wilcox Group which was deposited in a coastal plain and marine environment (Hamlin and others, 2019). The sequence of the middle Wilcox interval includes a brief depositional episode which is bounded by transgressive marine shales (Galloway and others, 2000). The middle Wilcox interval is shale-dominated with 20 to 40 percent sandstone and is defined by the maximum flooding surfaces of the Yoakum shale (Xue and Galloway, 1995). The deposition of the middle Wilcox is associated with the incision of submarine canyons which cut into the underlying lower Wilcox interval (Galloway and others, 2000). The incised channel was then later filled with the Yoakum shale during the following transgression (Galloway and others, 2000). In the Rio Grande Embayment area, a resurgence of progradation occurred toward the end of the middle Wilcox interval accumulation (Ayers and Lewis, 1985) resulting in an increase in sand lenses in the updip region. The middle Wilcox interval acts as a confining unit between the overlying Carrizo-upper Wilcox interval and underlying lower Wilcox interval (Hamlin and others, 2019).

2.1.12.1 Stratigraphic Analysis

Stratigraphic interpretations for the middle Wilcox interval were based on the methodology used by Meyer and others (2020) to determine the top of the Wilcox Group which is composed of the middle and lower Wilcox intervals. According to Meyer and others (2020), the top of the middle Wilcox interval is defined as the "top of a regional shale subjacent to the lowest significant sharp-based sand of the Carrizo Formation" which can either be the base of the massive sand complex or the base of the interbedded sand and shale units of the upper Wilcox. The bottom contact is interpreted as the bottom of a regional shale (known as the Tilden Shale) or above the uppermost sand signature in the lower Wilcox interval. This methodology is consistent with Hamlin and others (2019). Near the San Marcos Arch, this sand signature correlates to the Simsboro Formation. In the extreme downdip area, the lower Wilcox is dominated by thick shale-dominated deltaic successions (Olariu and Zeng, 2018) and the contact between the middle and lower Wilcox interval is less defined.

2.1.12.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom elevation maps for the middle Wilcox interval are shown on Figure 2-13 and were prepared using 1,455 and 723 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the middle Wilcox interval ranges from about 937 feet from vertical datum in the northwest portion of the study area to -8,028 feet from vertical datum in the southeast portion. The bottom elevation of the middle Wilcox interval ranges from about 931 feet from vertical datum in the northwest and decreases to about -9,556 feet from vertical datum in the southeast. The thickness of the middle Wilcox interval (also shown on Figure 2-13) was prepared by subtracting the bottom elevation surface from the top elevation surface. A total of 692 wells had both a top and bottom stratigraphic contact to provide thickness control. The middle Wilcox interval thickness ranges from 0 at the updip outcrop edge to 2,108 feet.

2.1.13 Lower Wilcox

The lower Wilcox interval is part of the Wilcox Group which was deposited in a coastal plain and marine environment (Hamlin and others, 2019). The lower Wilcox interval is conformable with the overlying middle Wilcox interval and the Midway Group (Galloway and others, 2000). The Midway Group is thought to be the prodelta marine deposit base of the lower Wilcox fluvial and deltaic system (Bebout and others, 1982).

2.1.13.1 Stratigraphic Analysis

Stratigraphic interpretations for the lower Wilcox interval were based on the methodology used by Hamlin and others (2019) and Meyer and others (2020) to determine the top and bottom, respectively, of the Wilcox Group which is composed of the middle and lower Wilcox intervals. The top contact of the lower Wilcox was selected to be the first sand adjacent to the Tilden Shale. According to Meyer and others (2020), the bottom of the lower Wilcox interval is defined as the "base of the first significant sand-based, upward coarsening, progradational sequence superjacent to a regional marine shale marker

equivalent to the Poth Shale core of Hargis (2009)". Meyer and others (2020) noted the extreme downdip contact was difficult to ascertain due to the basal Wilcox consisting of thick shale-dominated deltaic successions making the Poth Shale core difficult to discern (Olariu and Zeng, 2018).

2.1.13.2 Well Control and Formation Top, Bottom, Thickness

Top and bottom elevation maps for the lower Wilcox interval are shown on Figure 2-14 and were prepared using 902 and 1,486 stratigraphic contacts, respectively, from wells within the study area as well as some wells immediately outside of the study area to control surface edge effects. The top elevation of the lower Wilcox interval ranges from about 988 feet from vertical datum in the northwest portion of the study area to -9,556 feet from vertical datum in the southeast portion. The bottom elevation of the lower Wilcox interval ranges from about 970 feet from vertical datum in the northwest and decreases to about -11,144 feet from vertical datum in the southeast. The thickness of the lower Wilcox interval (also shown on Figure 2-14) was prepared by subtracting the bottom elevation surface from the top elevation surface. A total of 652 wells had both a top and bottom stratigraphic contact to provide thickness control. The lower Wilcox interval thickness ranges from 0 at the updip outcrop edge to 3,235 feet.

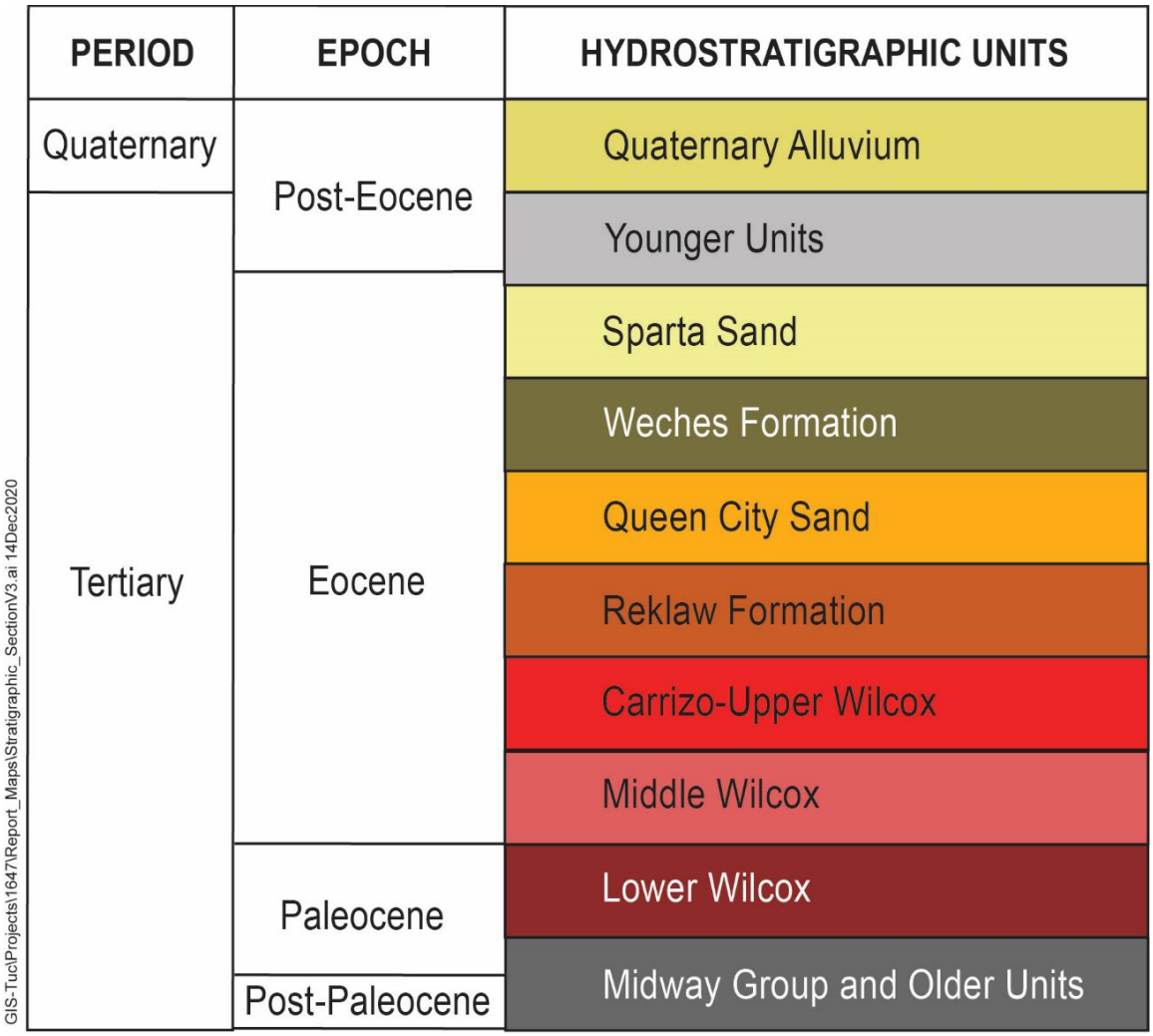


Figure 2-1. Hydrostratigraphic Units in the Updated Groundwater Availability Model

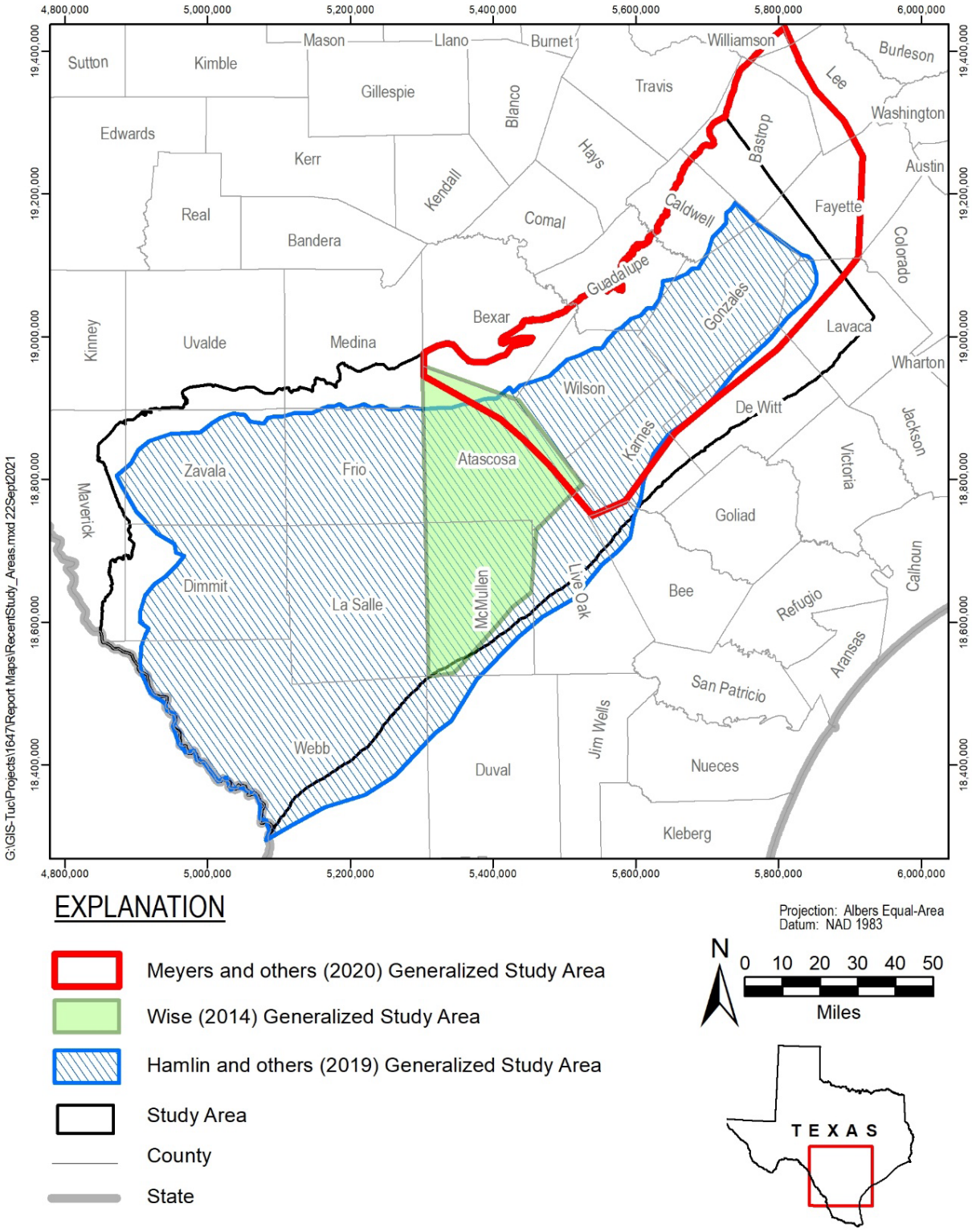


Figure 2-2. Recent Studies Map

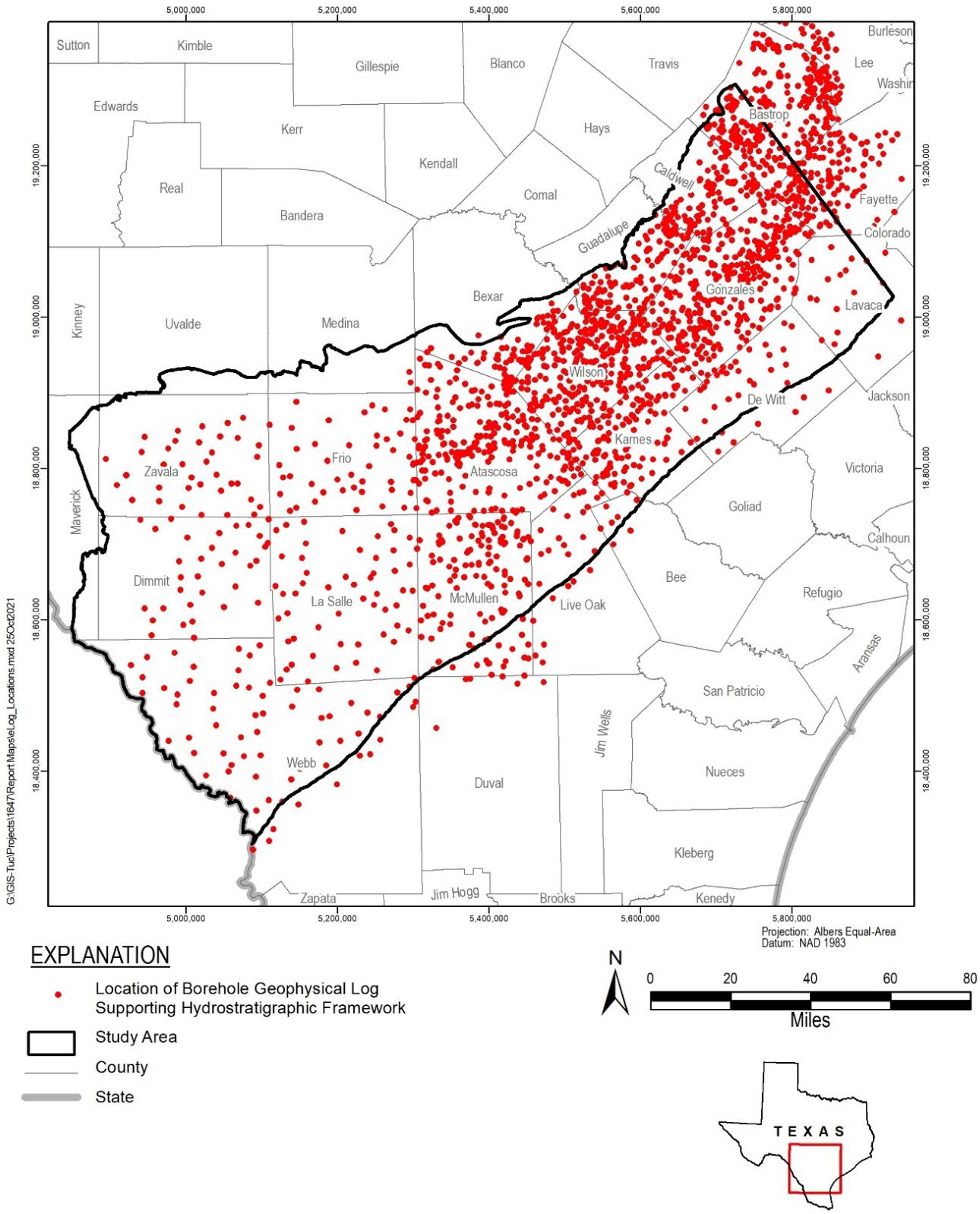


Figure 2-3. Locations of Borehole Geophysical Logs Supporting Framework Development

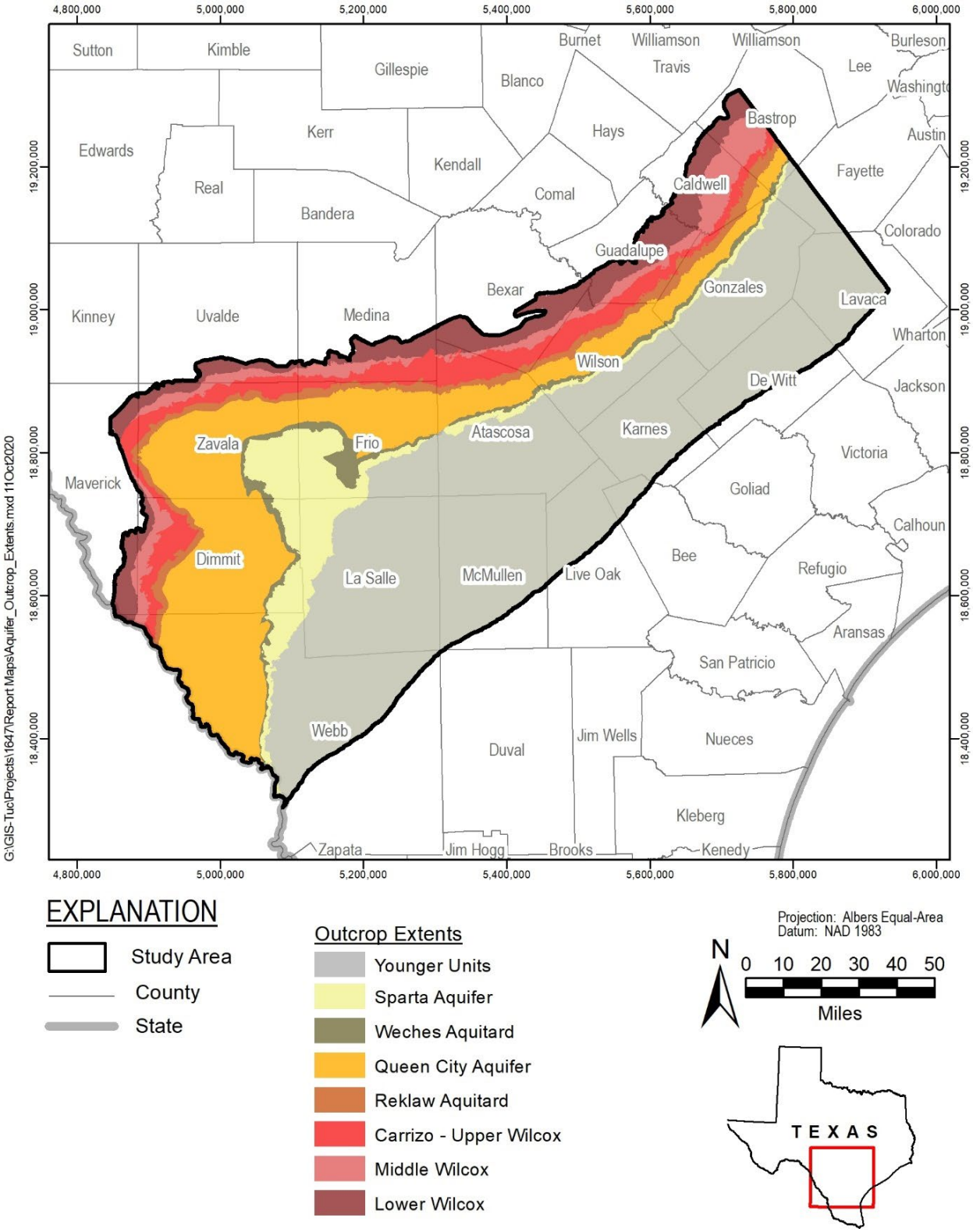


Figure 2-4. Aquifer Outcrops from Framework; Quaternary Deposits not Shown

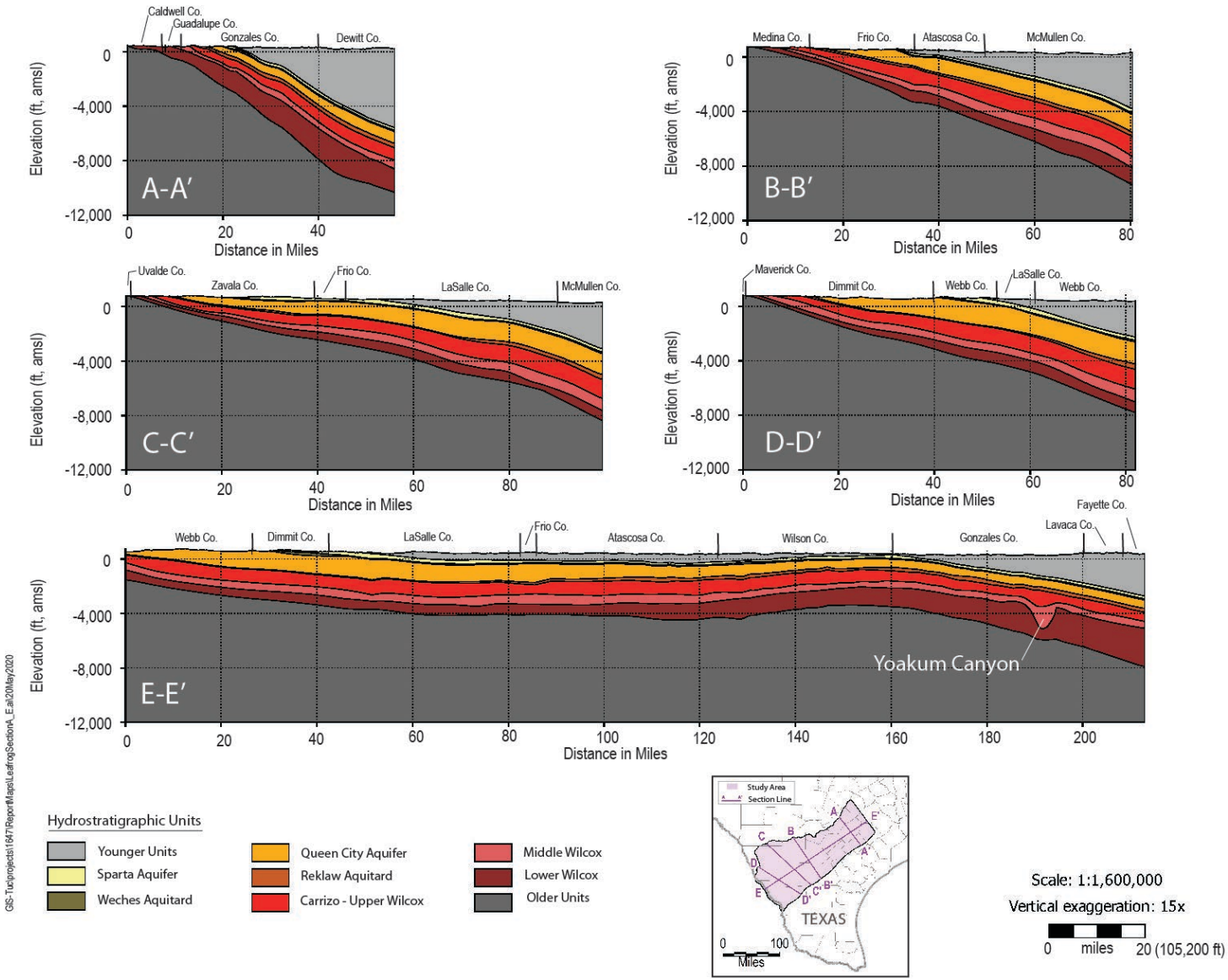


Figure 2-5. Hydrostratigraphic Sections

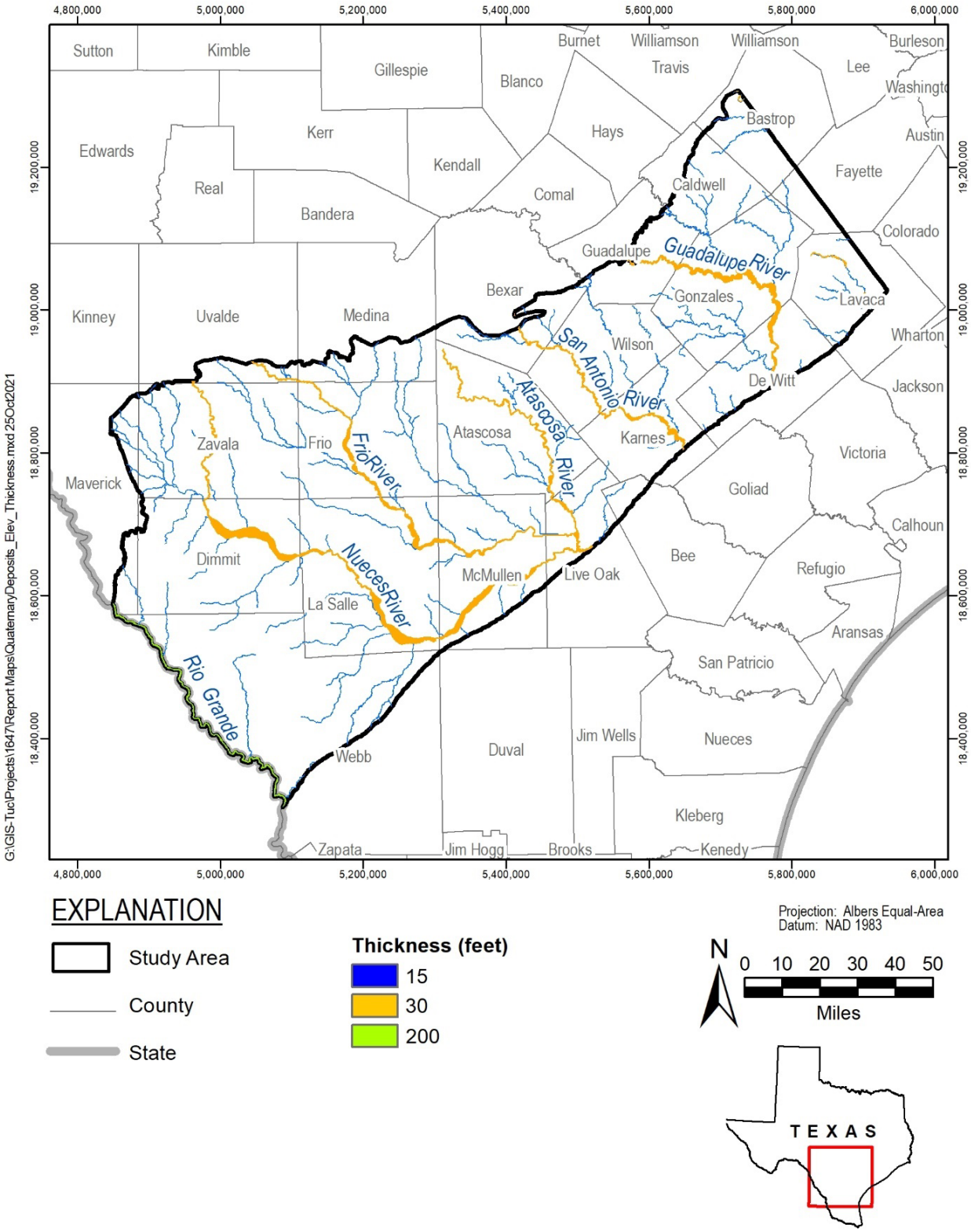


Figure 2-6. Thickness of Quaternary Deposits

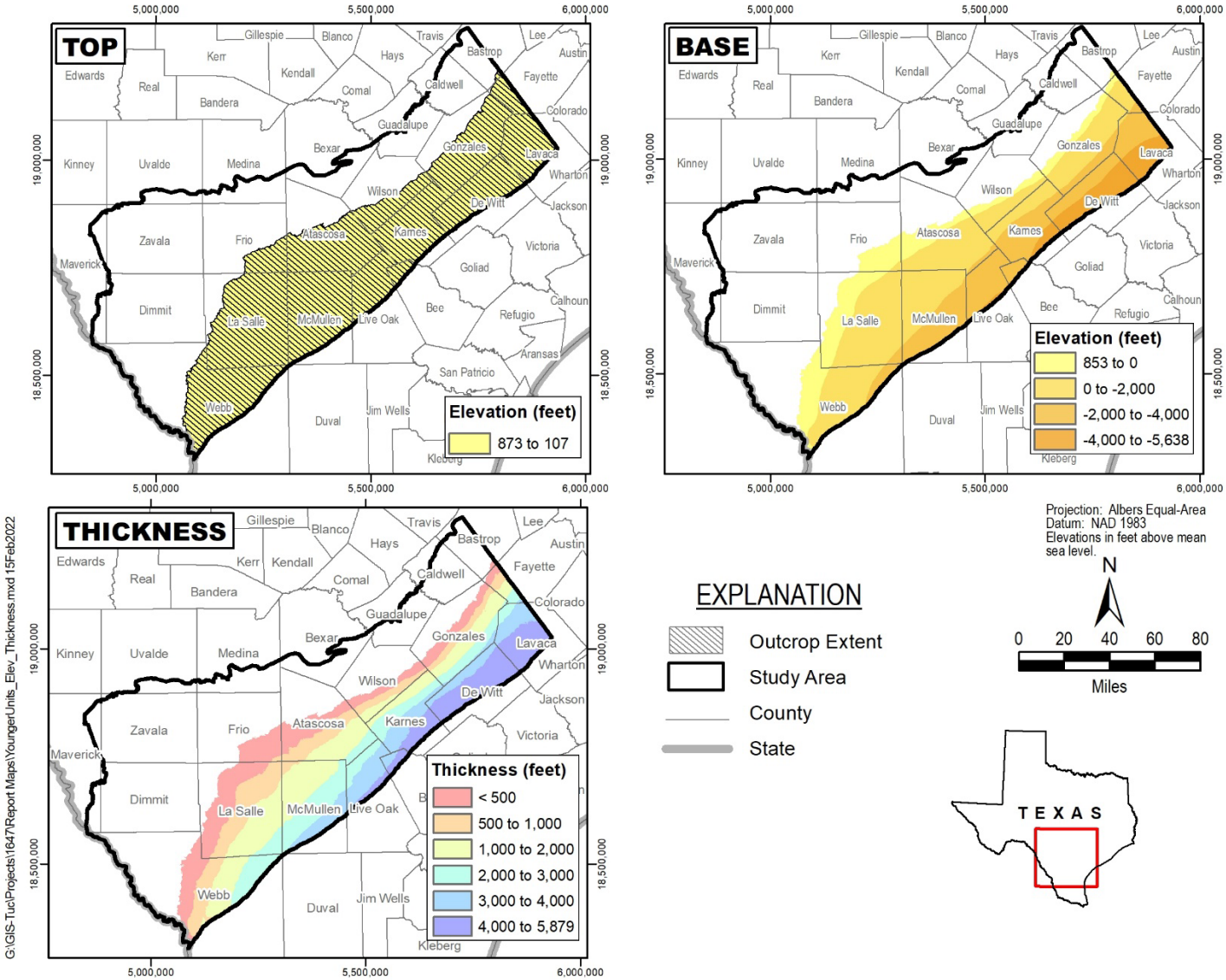


Figure 2-7. Surface Elevations and Thickness of Younger Units

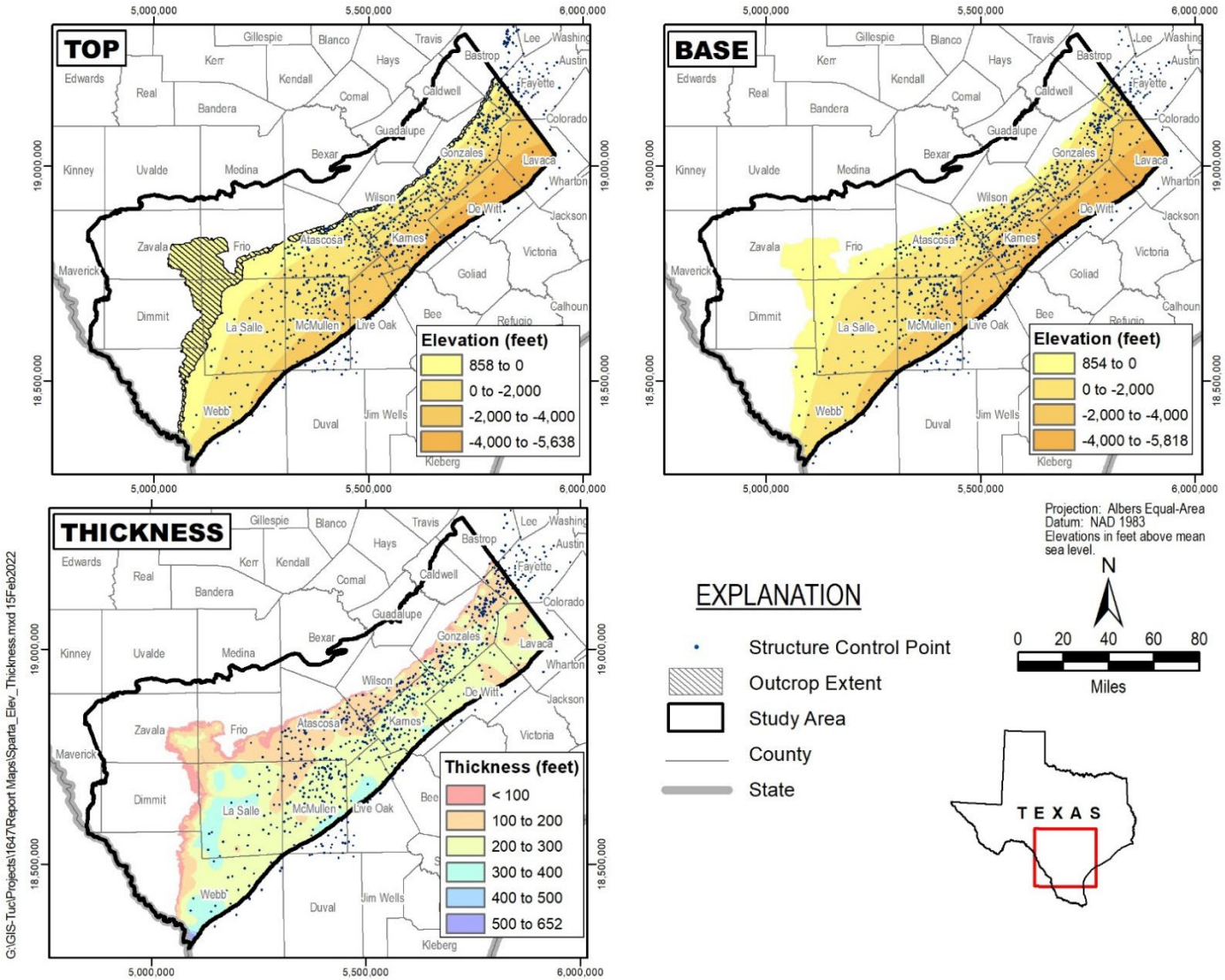


Figure 2-8. Surface Elevations and Thickness of Sparta Aquifer

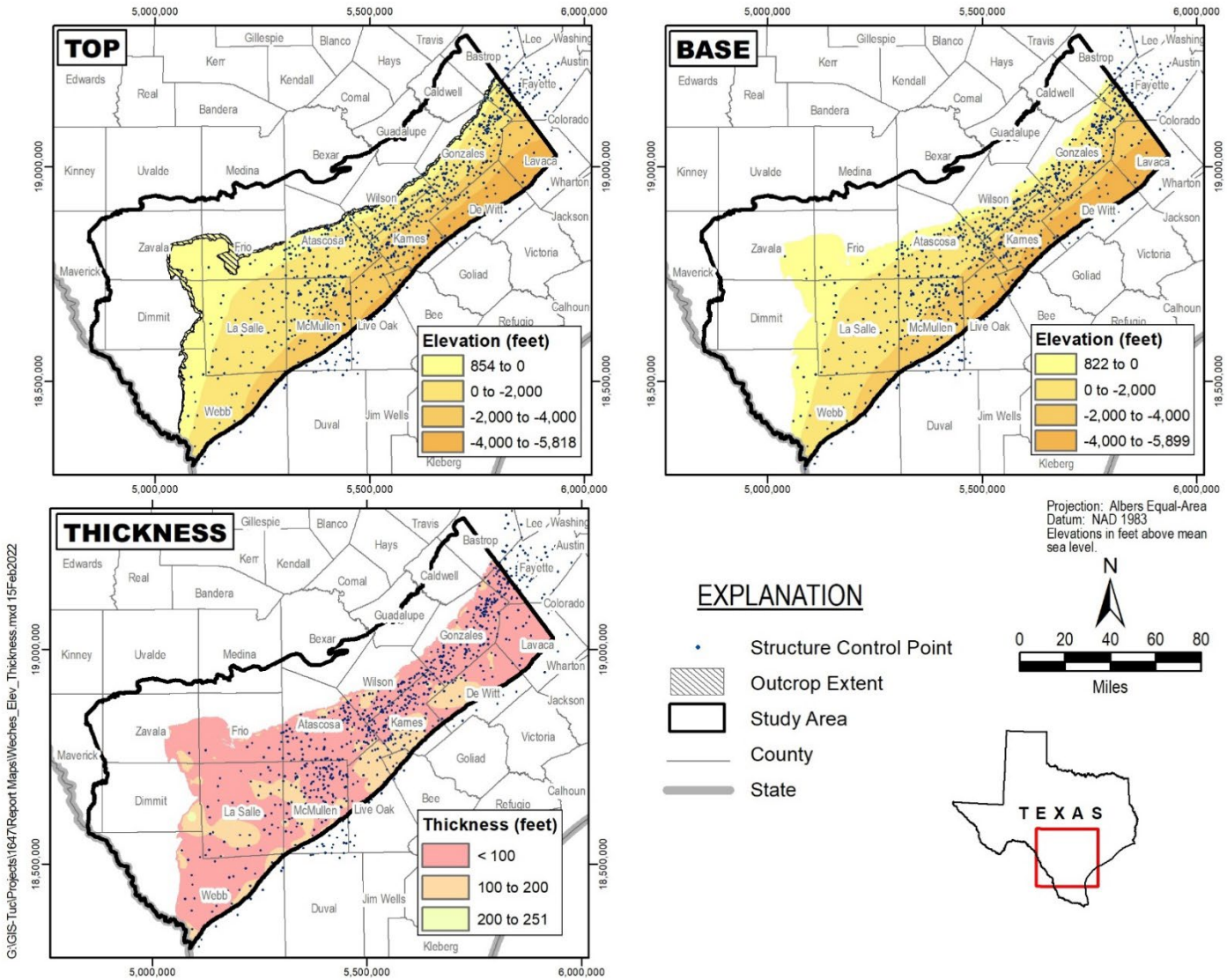


Figure 2-9. Surface Elevations and Thickness of Weches Aquitard

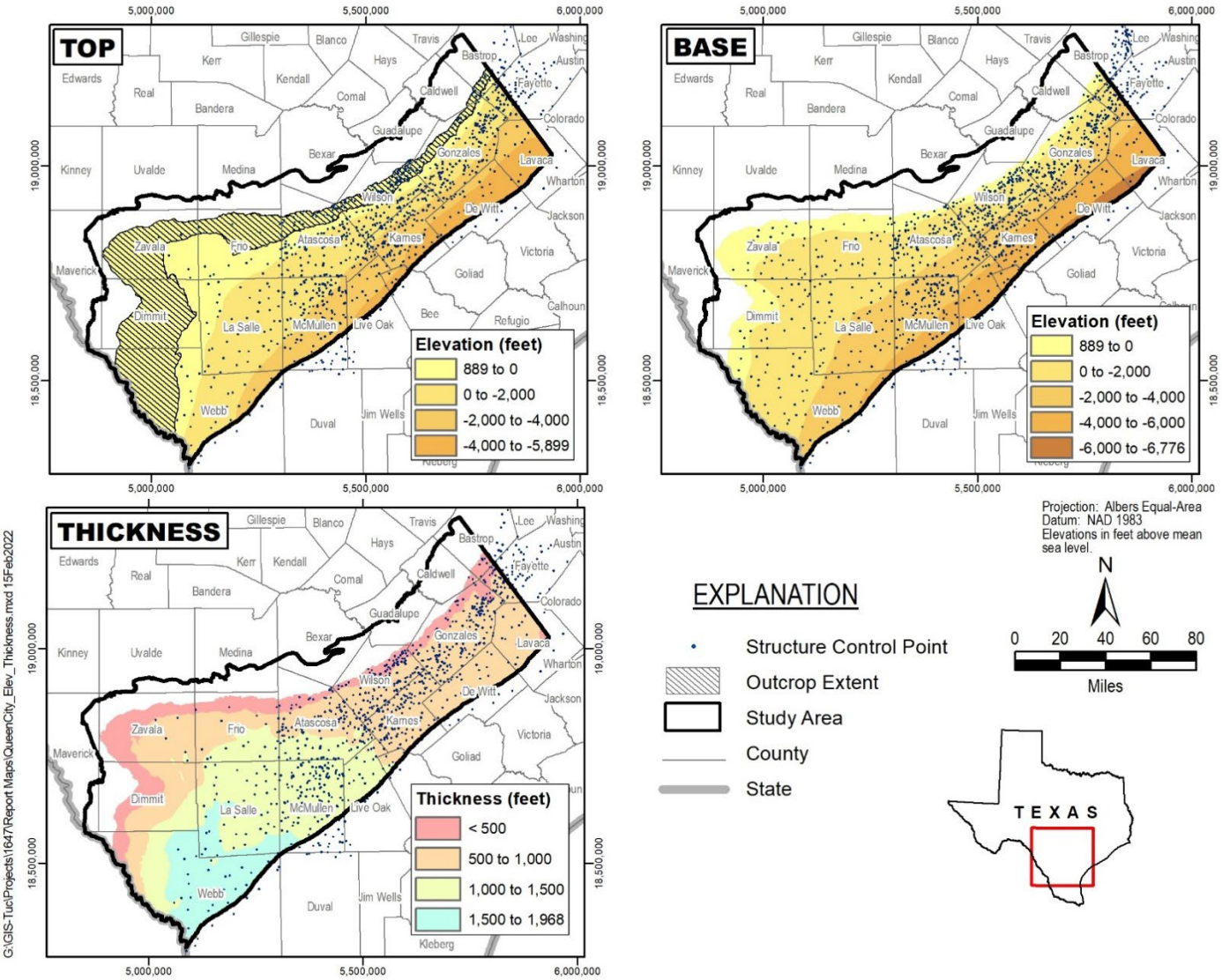


Figure 2-10. Surface Elevations and Thickness of Queen City Aquifer

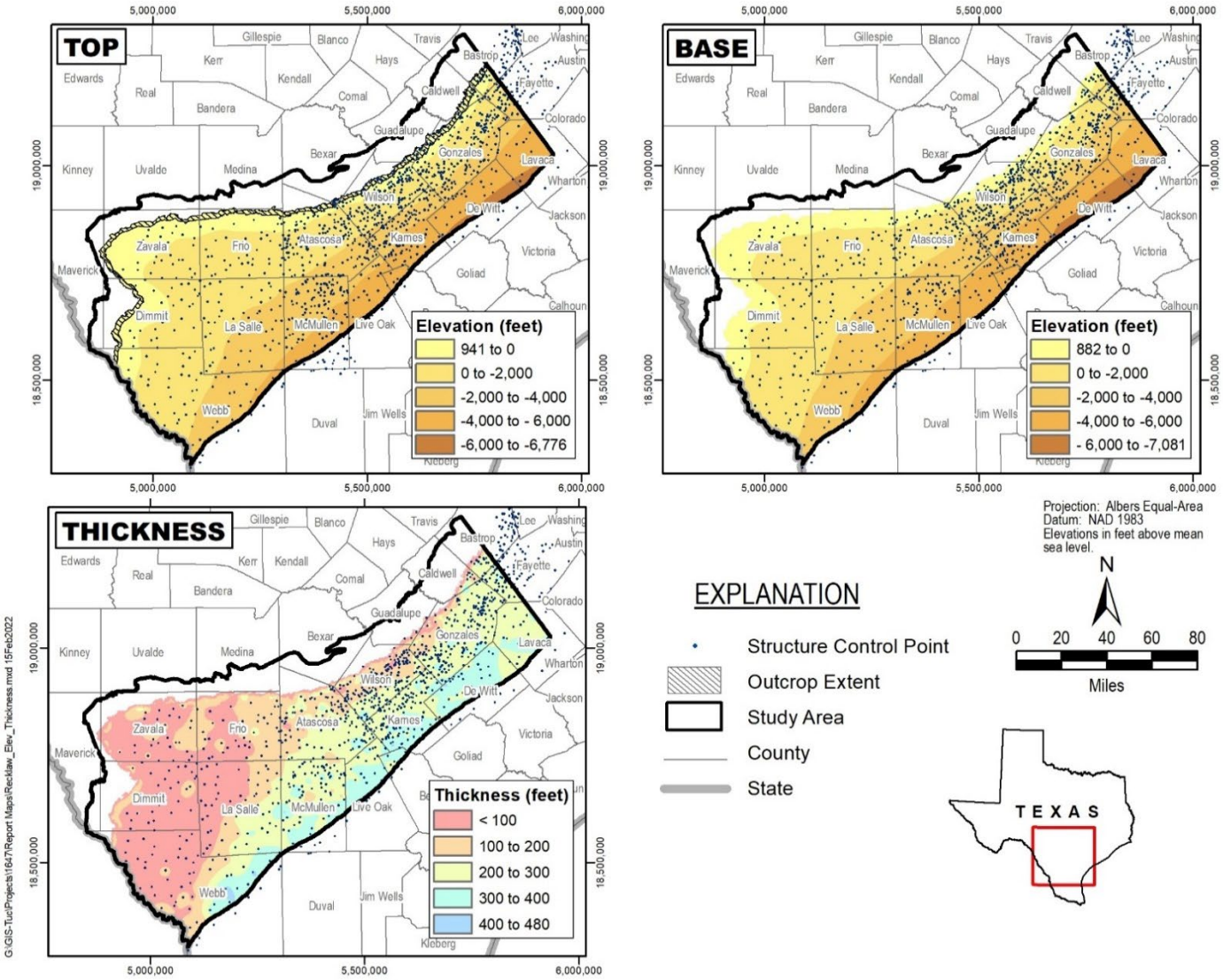


Figure 2-11. Surface Elevations and Thickness of Reklaw Aquitard

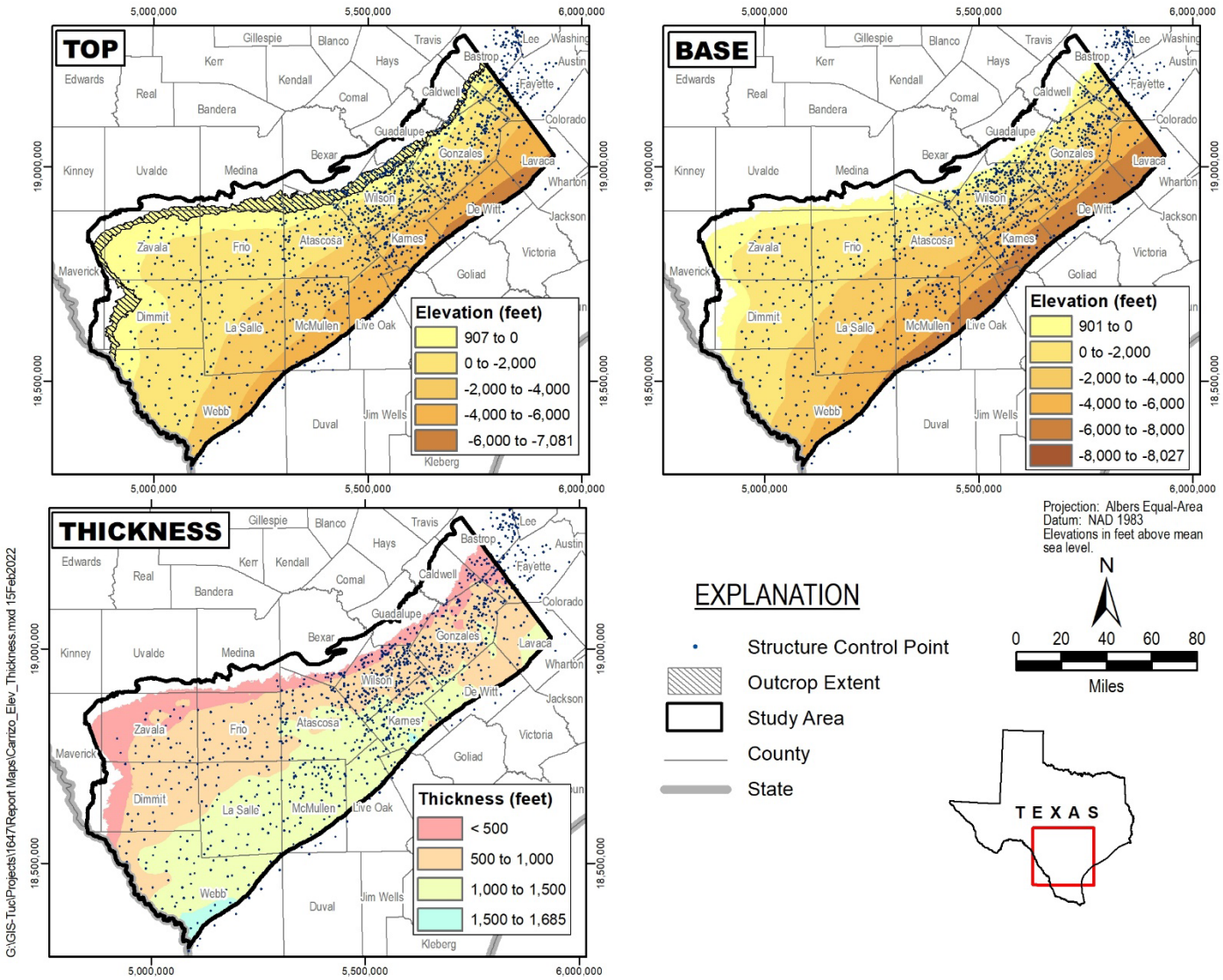


Figure 2-12. Surface Elevations and Thickness of Carrizo-Upper Wilcox interval

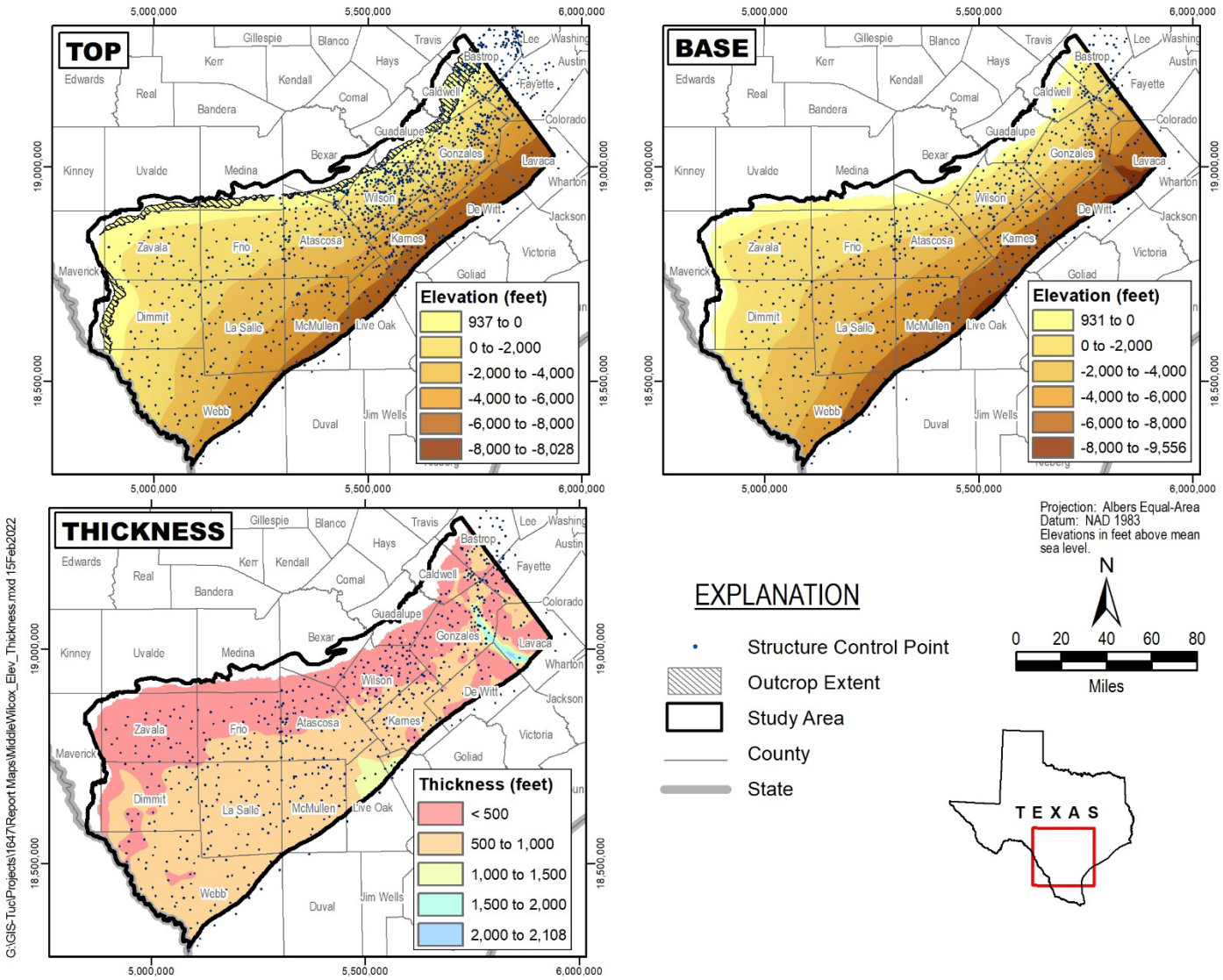


Figure 2-13. Surface Elevations and Thickness of Fiddle Wilcox interval

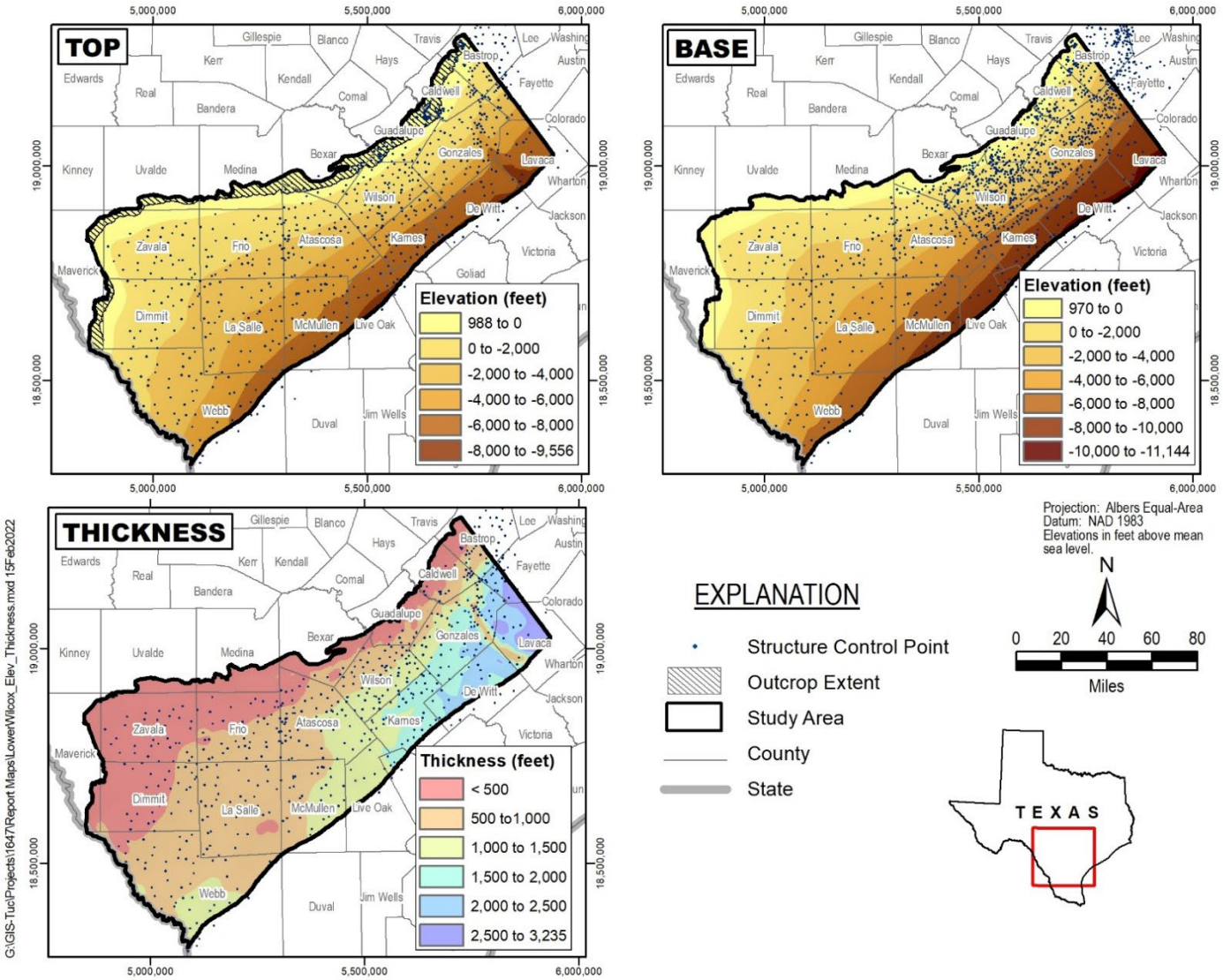


Figure 2-14. Surface Elevations and Thickness of Lower Wilcox Interval

2.2 Groundwater Levels and Flow

Groundwater in the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifer system occurs under unconfined (or water table) conditions in the outcrop areas and confined conditions in down-dip areas. Regional groundwater movement is generally from higher elevations in the northwest to lower elevations along drainages and to the southeast towards the Gulf of Mexico. As described by Deeds and others (2003), the relationship between the Carrizo Sand and the sand intervals of the Wilcox Group varies throughout the study area. The sands of the Wilcox and Carrizo units are generally hydraulically connected and behave as a single aquifer in the northeastern and southwestern-most margins of the study area. As described by Deeds and others (2003), the sands of the Wilcox Group are either not mentioned as an aquifer or not considered to be an aquifer due to salinity levels. An assessment of screened intervals compared to the hydrostratigraphic framework layers indicates distinct Carrizo and Wilcox wells in the outcrop area while the downdip area is more concentrated with Carrizo wells (Figure 2-15).

2.2.1 Previous Studies

An extensive literature search and analysis was conducted by Deeds and others (2003) and Kelley and others (2004) to understand the regional groundwater flow in the aquifer system and the history of groundwater use from the aquifers through 2000. The groundwater level information summarized herein relies heavily on the results of these two previous analyses. Groundwater level information was updated through 2019 for this study.

The investigations by Deeds and others (2003) and Kelley and others (2004) conducted a pressure versus groundwater level depth analysis, developed by Fogg and Kreitler (1982), using measurement data obtained from the TWDB website. The analysis used data from wells with both groundwater level and screened interval data. The goal of the analysis was to evaluate vertical hydraulic gradients between hydrostratigraphic units in the aquifer system. The analysis used the maximum groundwater level measured at each well. Results of the studies indicate that vertical pressure gradients are generally upward to near "hydrostatic" (no gradient) in the study area. A smaller than hydrostatic gradient indicates downward pressure gradients. Downward gradients generally occur where the underlying aquifer unit has been substantially developed. Furthermore, temporal changes to vertical gradient were assessed using data from post-1950 as data pre-1950 was not available for the study area.

2.2.2 Distribution of Groundwater Level Measurements

Information for well locations, well construction, and groundwater level measurements was obtained from the TWDB Groundwater Database (TWDB, 2019c), the Brackish Resources Aquifer Characterization System database (TWDB, 2019b), and data provided by stakeholders from Groundwater Conservation Districts. For many wells, the Brackish Resources Aquifer Characterization System database and well information from Groundwater Conservation Districts included the state identification number for linking to the TWDB Groundwater Database. This identification number was used to remove

duplicate wells from the water level dataset. If no state identification number was available, well location coordinates and completion information were used to identify duplicate wells for the dataset. Any remaining wells were assumed to be unique wells and were included in the evaluation for this investigation. A total of 55, 518 approved groundwater level measurement records are available from 4,175 wells located in the study area with aquifer designations beginning in the early 1900s. This data will be used as groundwater level targets for calibration of the historical transient groundwater model.

Available well screen information was compared to the hydrostratigraphic framework (base elevation surfaces) to determine the aquifer unit(s) that each well penetrates. These results were confirmed with studies from the Brackish Resources Aquifer Characterization System database to distinguish the representative aquifer for a well. If no information for the screened interval was available for a well, the well was assumed to represent the aquifer designated by the Brackish Resources Aquifers Characterization System group or the TWDB. A confidence level was assigned to each well to provide context on the information used to determine the aquifer designation and therefore the degree of confidence with this designation.

Locations of all wells with available groundwater measurements for the aquifers of interest in the study area are shown on Figure 2-15. The spatial distributions of selected groundwater level measurements for the Sparta Aquifer, Queen City Aquifer and the Carrizo-Wilcox Aquifer are shown on Figure 2-16, Figure 2-17, and Figure 2-18, respectively. Measurements at these locations were selected to either verify or evaluate and prepare the time-series groundwater level contours for 1980, 1999, and 2017, as discussed in the next section of this report. All available groundwater level measurements with aquifer designations will be used for calibration of the groundwater model. Many of the wells are located in the outcrop areas and many have just one or a few measurements available. Relatively few measurements are available for the deep, downdip portions of the aquifers of interest in the southeast (Figure 2-15).

2.2.3 Groundwater Levels and Flow through Time

The water table surface in the study area generally follows land surface topography, with higher groundwater level elevations occurring in the upland, outcrop areas in northwest and lower groundwater level elevations occurring to the southeast in the downdip areas.

Contours of regional groundwater level elevation were evaluated for the aquifer units for four time periods: (1) 1936 to represent predevelopment conditions; (2) 1980 to represent initial conditions for the groundwater model transient calibration period; (3) 1999 to represent conditions within the model calibration period; and (4) 2017 to represent conditions at the end of the groundwater model calibration period. Contours for predevelopment, 1980, and 1999 were prepared by Deeds and others (2003) and Kelley and others (2004) for the previous groundwater availability models for the aquifer system.

Predevelopment groundwater conditions are defined as the conditions of the groundwater system prior to the start of disturbances to natural groundwater flows as a result of groundwater development (pumping withdrawals). Predevelopment groundwater level

elevation contours maps were developed by Kelley and others (2004) for the Sparta Aquifer and Queen City Aquifer (Figure 2-19 and Figure 2-20) and by Deeds and others (2003) for the Carrizo-Wilcox Aquifer (Figure 2-21). The predevelopment groundwater levels contours could be used as a guide for calibration of a steady-state groundwater model.

The previously prepared contours for 1980 and 1999 were compared with control data associated with this study. The updated control data included water level measurement data and aquifer determinations based on the evaluation of the hydrostratigraphic framework model to screened intervals and water level points, where available, and with consideration to the aquifer designations determined by the Brackish Resources Aquifer Characterization System group (Meyer and others (2020); Wise (2014)). The water level measurements used for verification represented winter conditions as subsequently described in the contouring of the 2017 dataset. It was determined that the previous contours were representative of the available historic data and, thus, are sufficient for use in this study with minor modifications. These modifications were made due to some reclassified aquifer designations and the addition of compatible designations in the region southwest of the Frio River which is more traditionally not grouped as Sparta and Queen City aquifers based on the delineation of minor aquifers by the TWDB (Figure 1-5). Certain portions of the contours were reclassified as "approximate" in the deep, downdip portions of the aquifers where no measured data exist. These contour datasets will be used as guides during calibration of the historical transient groundwater model.

Contours for 2017 were prepared for this study using groundwater level measurements obtained from the TWDB Groundwater Database (TWDB, 2019c), the TWDB Brackish Resources Aquifer Characterization System database (TWDB, 2019b), and Groundwater Conservation District stakeholders. The spatial coverage of groundwater level measurement data for a given month of year is generally sparse because the data are not available at regular intervals in every well. The majority of measurements utilized were from winter months (November through February); therefore the 2017 contours generally represent winter conditions which may have less pumping interference. Since the amount of data specifically for the winter of 2016 to 2017 was insufficient for developing regional contours, data within the period of 2014 to 2019 were used based on the following criteria:

1. Highest priority was given to a measurement collected during the winter of 2016 to 2017. If a well had multiple measurements for a winter period, then the water levels were averaged;
2. If no data were available for the winter of 2016 to 2017, then winter measurements for adjacent years were used, first going back one year then forward one year;
3. If no winter measurements were available for the four-year window, then summer measurements were used.

4. Both the Sparta and Queen City Aquifer did not have sufficient data in the southwest portion of the study area for the four-year window, and therefore the period was extended to 2012 and 2013 to increase available control data in this region.

Groundwater level elevation contour maps for 1980, 1999, and 2017 for the Sparta, Queen City, Carrizo-Wilcox Aquifer are shown on Figure 2-22, Figure 2-23, and Figure 2-24 respectively. Contours were not drawn for the Weches and Reklaw confining units due to the lack of data for these units. Similar to the previous groundwater availability model, little water level data is available for the Wilcox unit downdip of the outcrop, therefore, groundwater level contours focused on the Carrizo (Deeds and others, 2003).

The groundwater elevation contour maps show that regional groundwater movement in the study area is generally to the southeast from the outcrop areas in the northwest. The highest groundwater level elevations in the study area occur in the northwest in Zavala and Frio counties. In general, relatively steep hydraulic gradients occur between outcrop and down-dip areas, and also at any cones of depression caused by groundwater pumping. Some of the changes in groundwater elevations presented on Figure 2-22, Figure 2-23, and Figure 2-24 are likely a result of limited availability of measurements at individual wells and inconsistent monitoring schedules. However, some of the changes could be a result of changes in groundwater pumping in a given area through time.

Inspection of groundwater level data and results of previous groundwater availability models suggest that regional hydraulic connections occur between the aquifer units in certain areas in the study area. The similarity of groundwater levels in adjacent aquifers suggests that the aquifers are hydraulically connected, particularly at or near outcrop areas.

In addition to time-series contour maps, changes in groundwater levels in the aquifer system were assessed using hydrographs of groundwater levels from 1980 through 2019. Wells with measurements for long periods of time were selected for evaluation and characterization of each aquifer unit. Selected groundwater level elevation hydrographs for the Sparta, Queen City, and Carrizo-Wilcox aquifers are shown on Figure 2-25 through Figure 2-31.

Groundwater levels have remained relatively stable in the Sparta Aquifer, with variations generally less than 10 feet at most wells (Figure 2-25). Hydrographs of the Sparta Aquifer are represented by wells in the outcrop region due to the availability of long periods of groundwater level measurements in this area. Measurements at a well in Fayette County indicate a gradual decline in groundwater levels of approximately 30 feet over a period of 10 years but show signs of stabilizing in recent years. Measurements at wells in Gonzales and La Salle counties suggest a gradual and slight recovery to the Sparta Aquifer from decades of stable conditions.

Similar to the Sparta Aquifer, hydrographs of the Queen City Aquifer are represented by wells in the outcrop region primarily in the central portion of the study area due to the

availability of groundwater level measurements through time in this area. Groundwater levels have remained relatively stable in the Queen City Aquifer, with variations generally less than 10 feet at wells in Atascosa and Wilson counties (Figure 2-26). However, during this period, groundwater level declines have occurred at a few wells in the aquifer including two wells in Frio County which have declined between 60 to 70 feet.

Groundwater levels in the Carrizo-Wilcox Aquifer have remained stable in the outcrop areas and have gradually declined through time at many hydrograph locations in the down-dip areas (Figure 2-27 and Figure 2-28). Hydrographs for Carrizo and Wilcox wells in the Carrizo-Wilcox outcrop area have remained mostly stable with fluctuations generally less than 20 feet. Hydrographs for wells in the down-dip area show substantial decline in groundwater levels (on the order of 150 to 200 feet) since the 1950s with many wells in the southern portion of the model in Dimmit and La Salle counties experiencing a more abrupt decline starting around the year 2010 (Figure 2-29 through Figure 2-31).

Analysis of seasonal groundwater fluctuations was attempted for this study. However, such an analysis could not be conducted because of insufficient available data. Frequent and regular measurements are needed at many individual locations for such an analysis to be conducted.

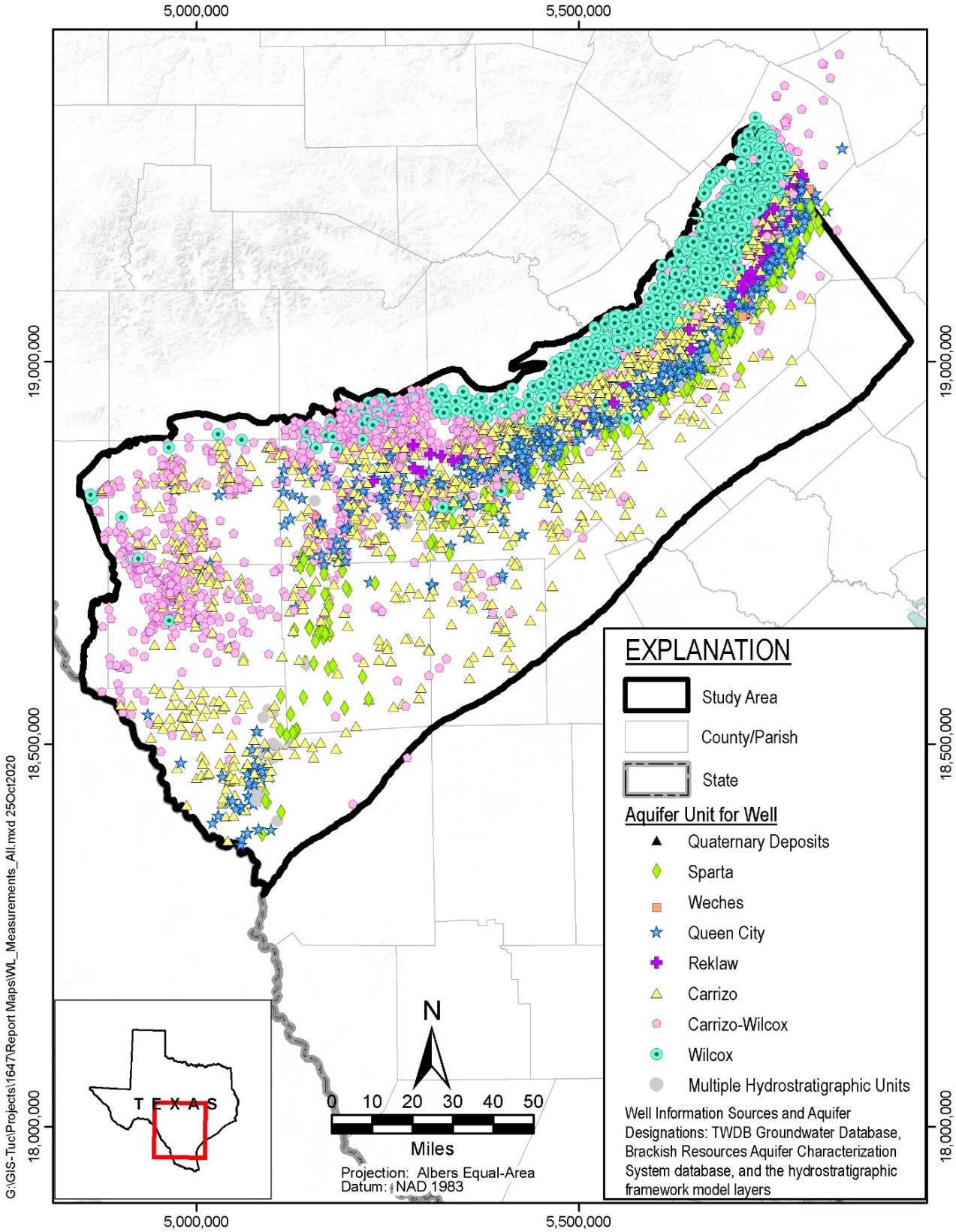


Figure 2-15. Locations of Wells with Groundwater Level Measurements

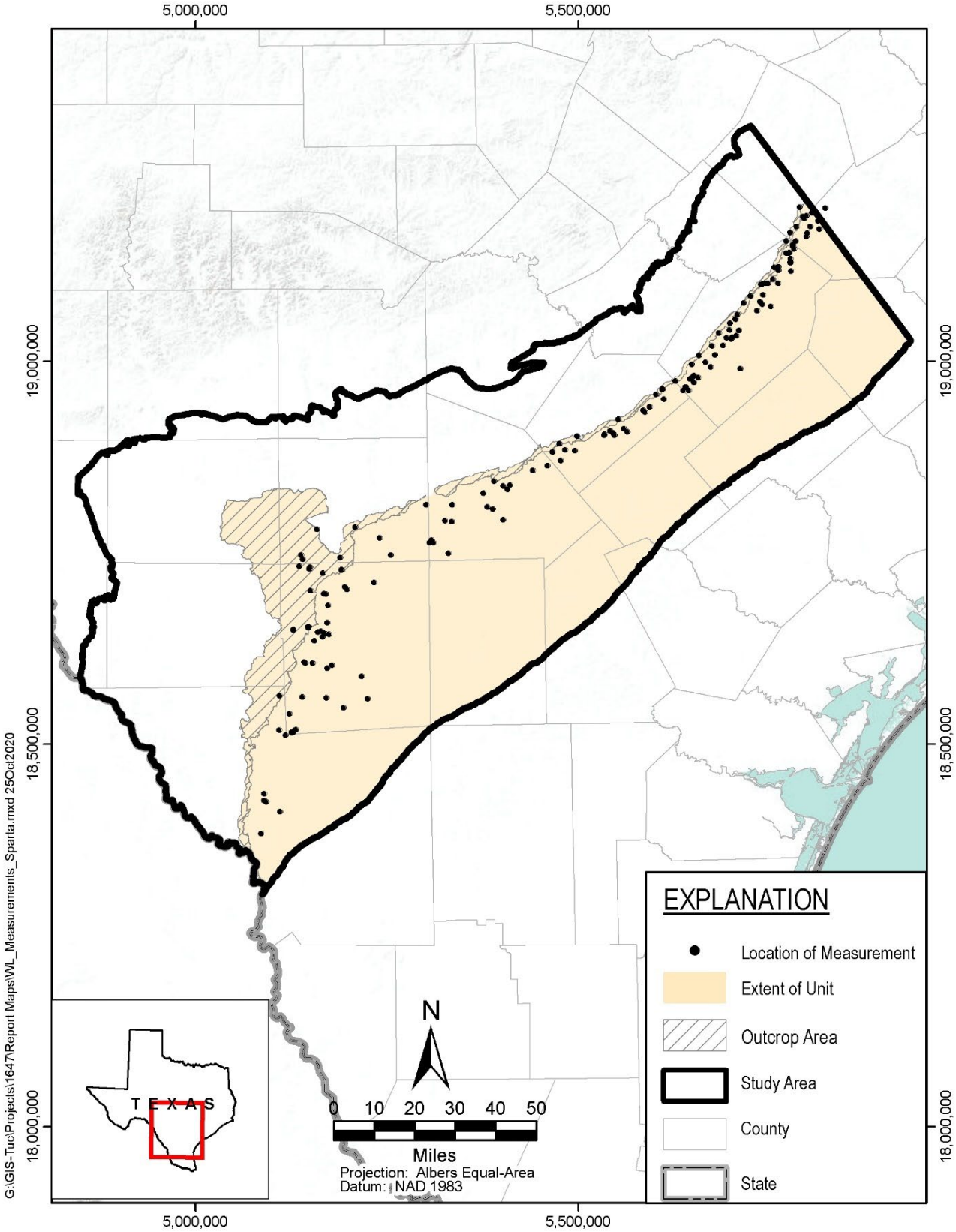


Figure 2-16. Locations of Selected Groundwater Level Measurements for Sparta Aquifer

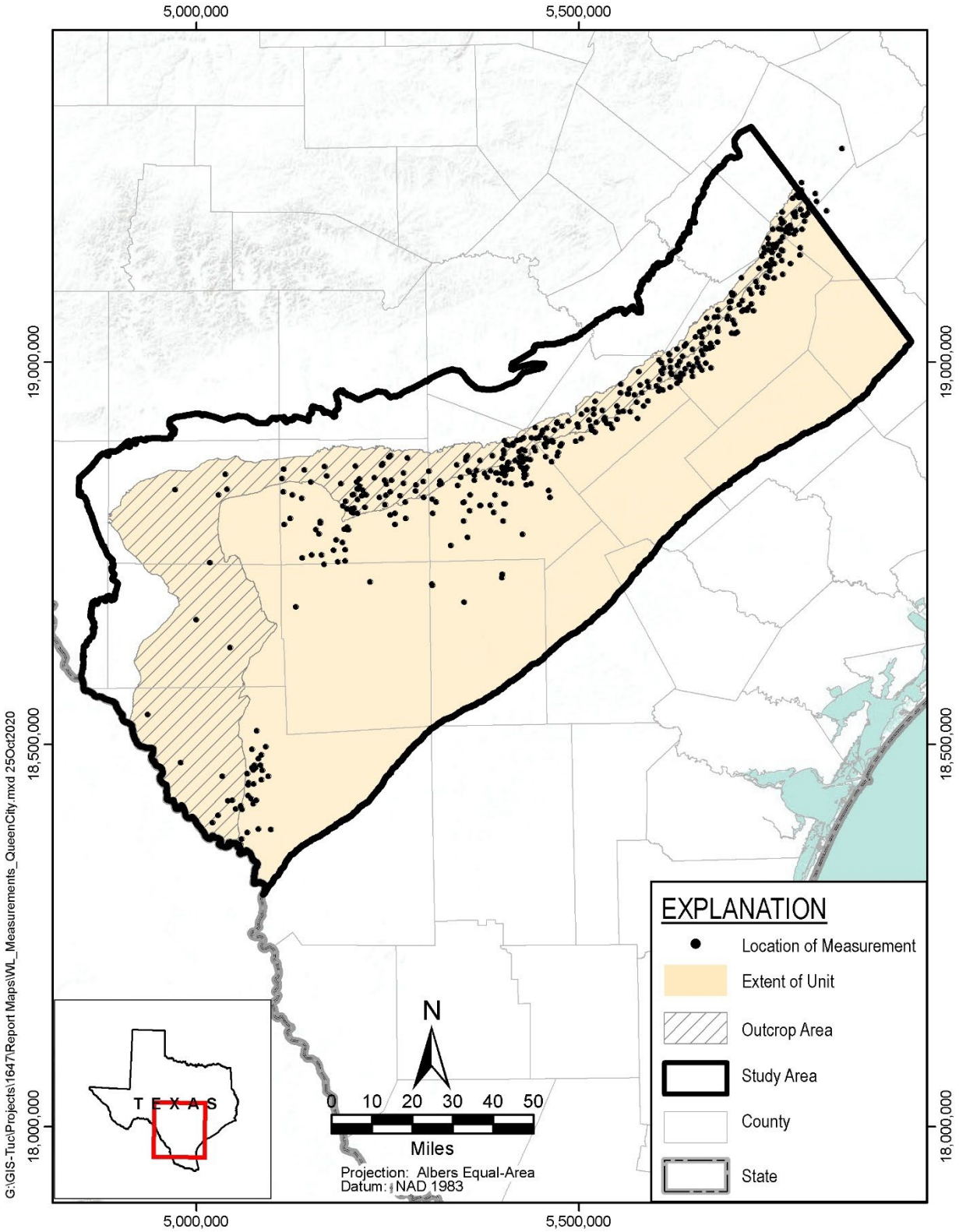


Figure 2-17. Locations of Selected Groundwater Level Measurements for Queen City Aquifer

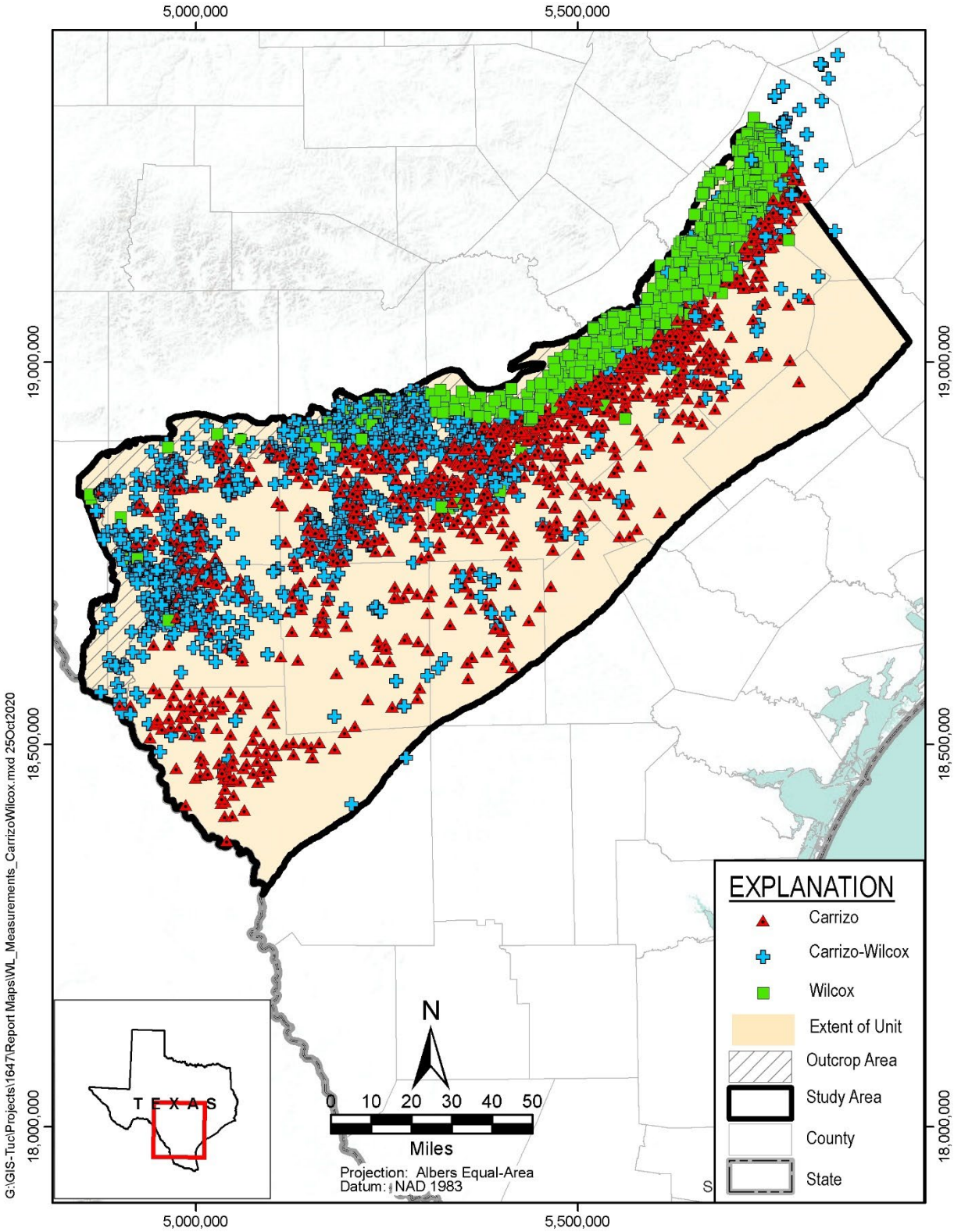
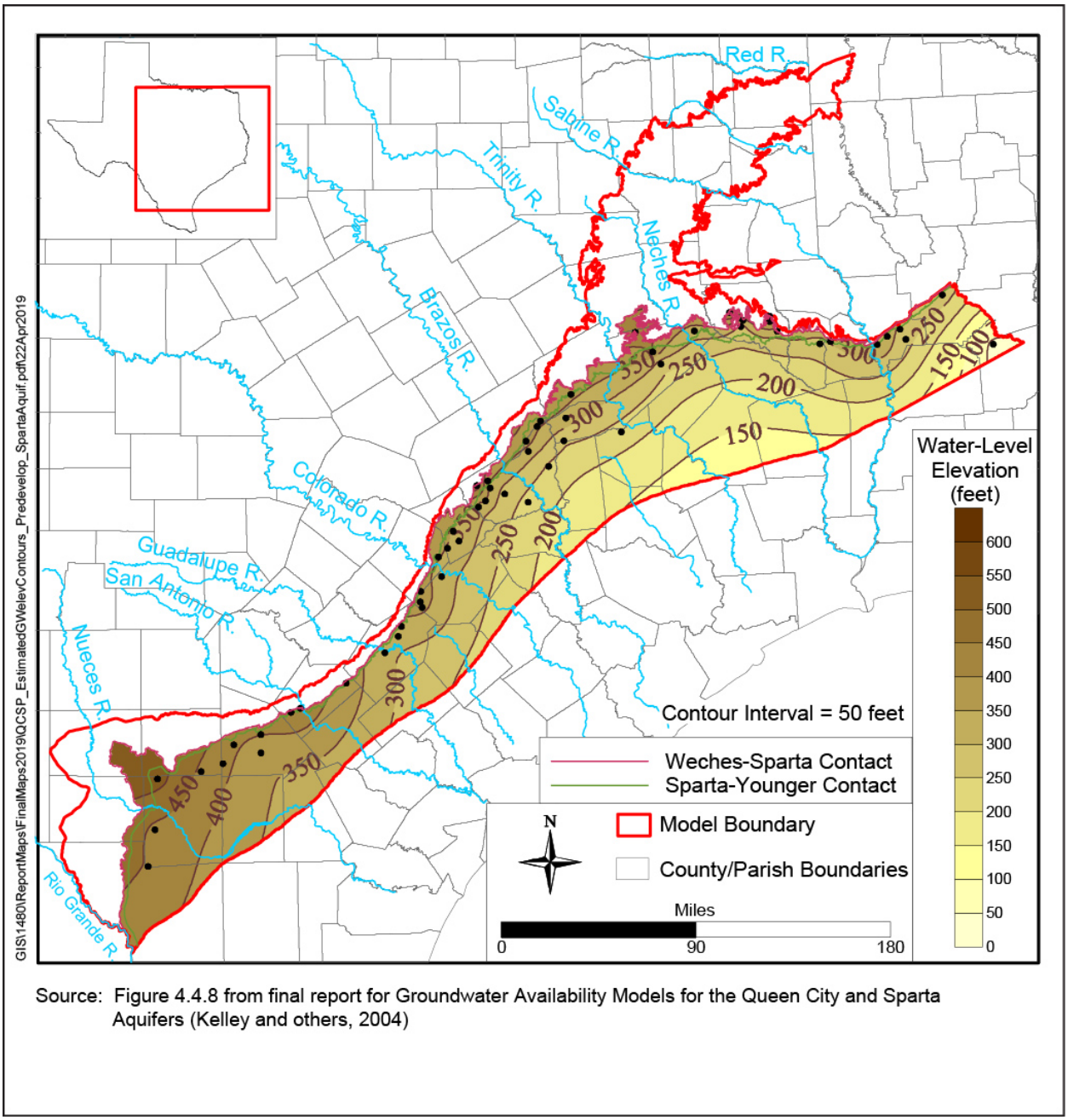


Figure 2-18. Locations Selected Groundwater Level Measurements for Carrizo-Wilcox Aquifer



Source: Figure 4.4.8 from final report for Groundwater Availability Models for the Queen City and Sparta Aquifers (Kelley and others, 2004)

Figure 2-19. Estimated Groundwater Level Elevation Contours for Predevelopment Conditions in Sparta Aquifer; from Kelley and others (2004)

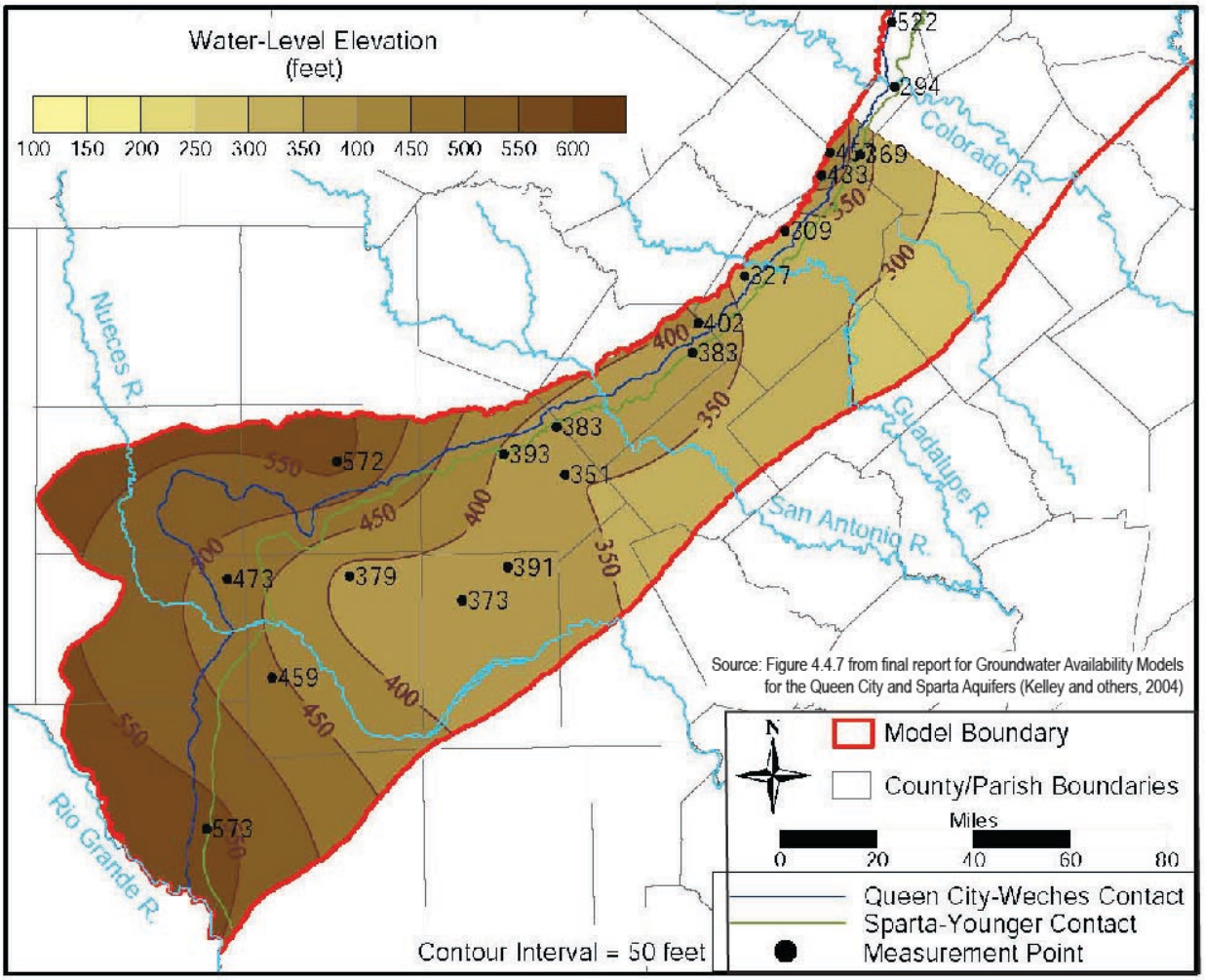


Figure 2-20. Estimated Groundwater Level Elevation Contours for Predevelopment Conditions in Queen City Aquifer; from Kelley and others (2004)

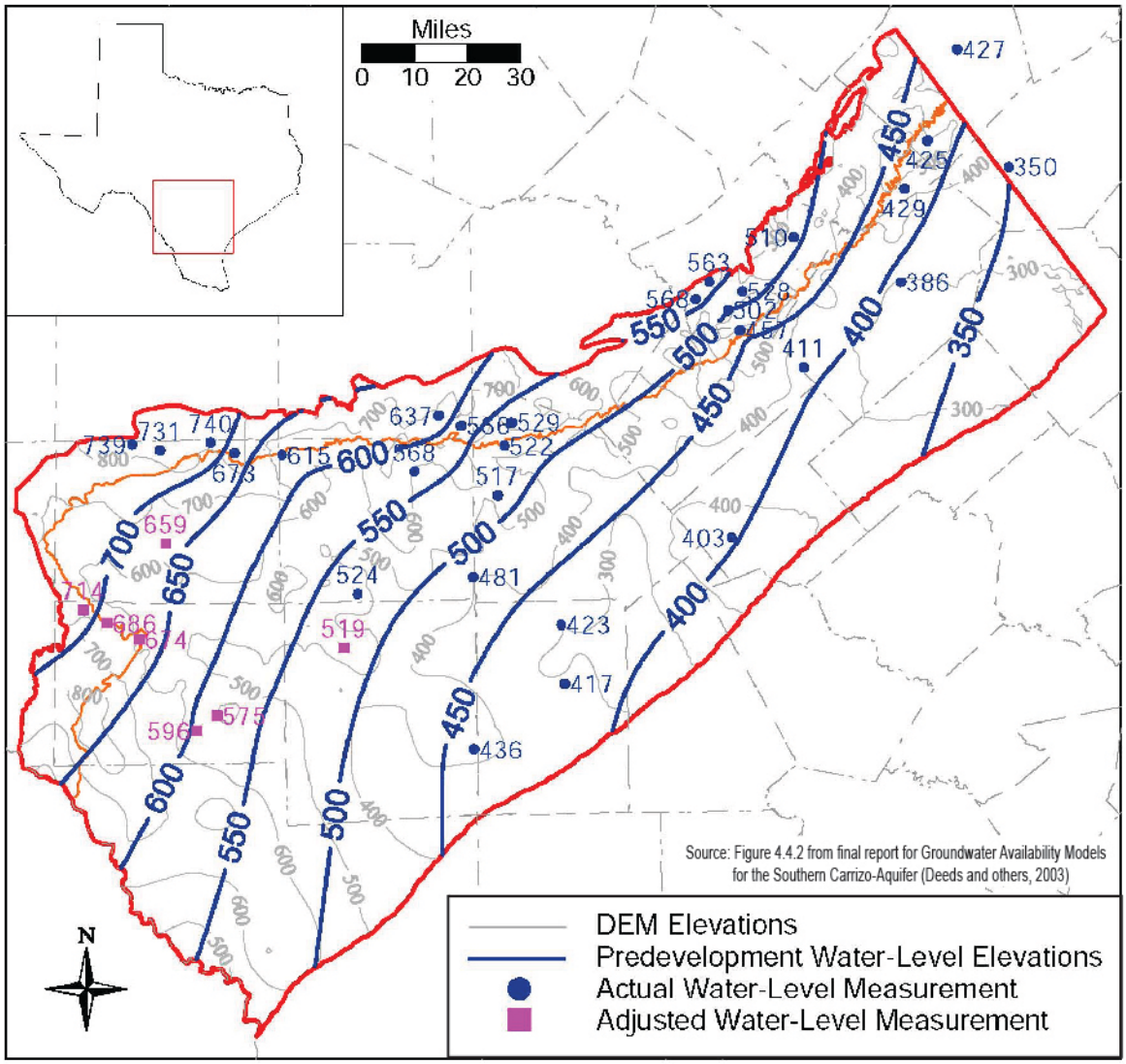


Figure 2-21. Estimated Groundwater Level Elevation Contours for Predevelopment Conditions in Carrizo-Wilcox Aquifer; from Deeds and others (2003)

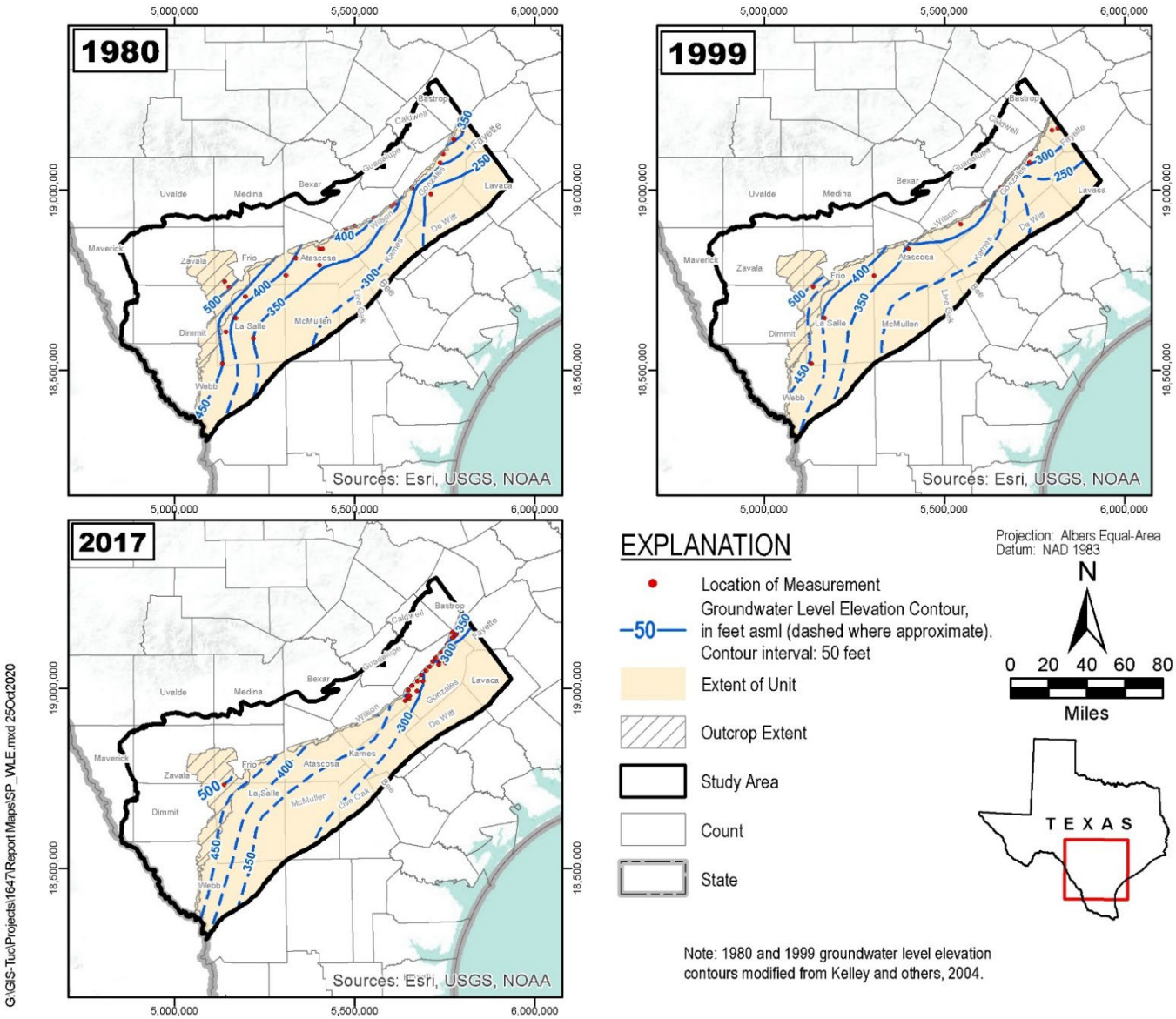


Figure 2-22. Groundwater Level Elevation Contours for Sparta Aquifer

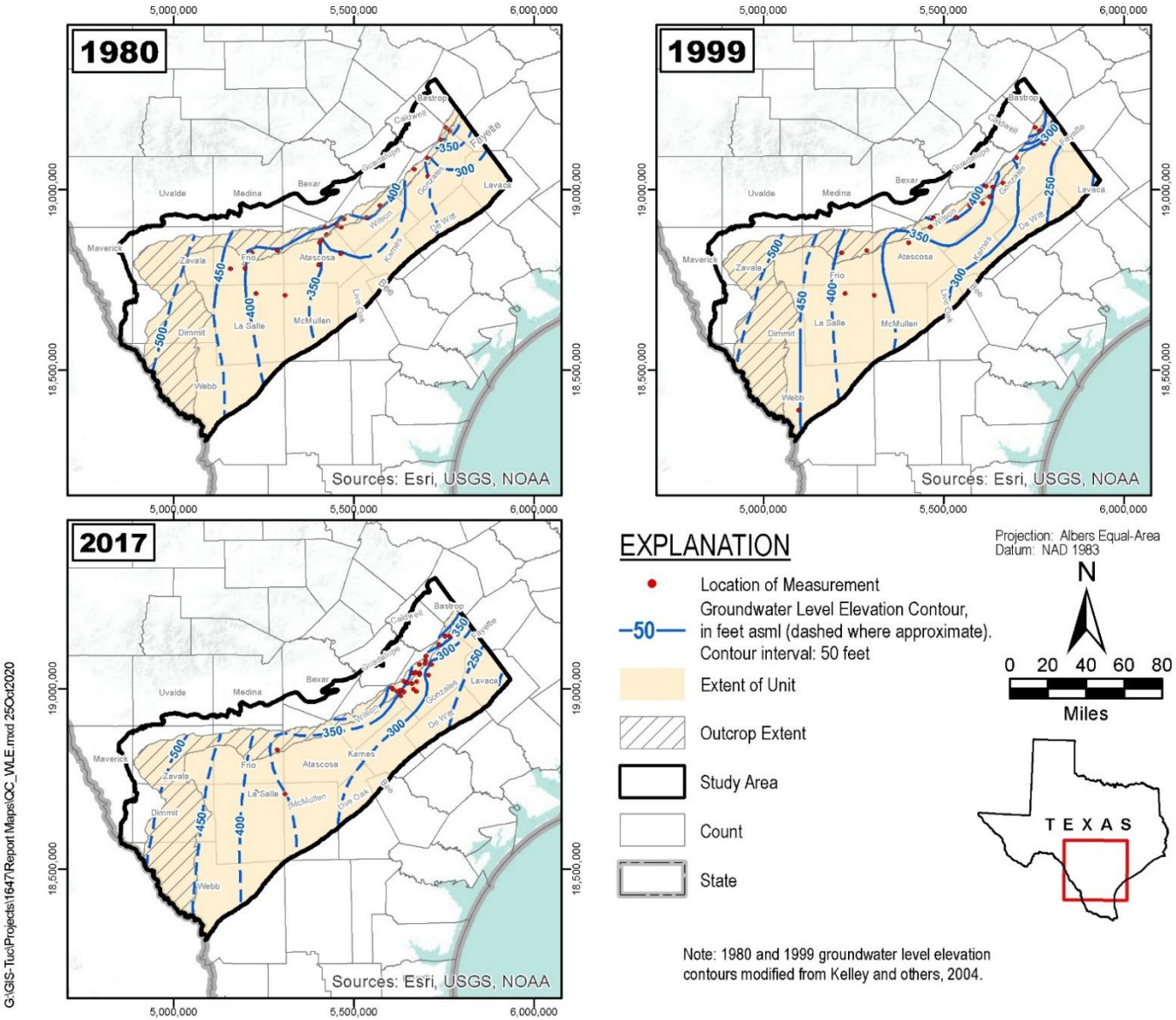


Figure 2-23. Groundwater Level Elevation Contours for Queen City Aquifer

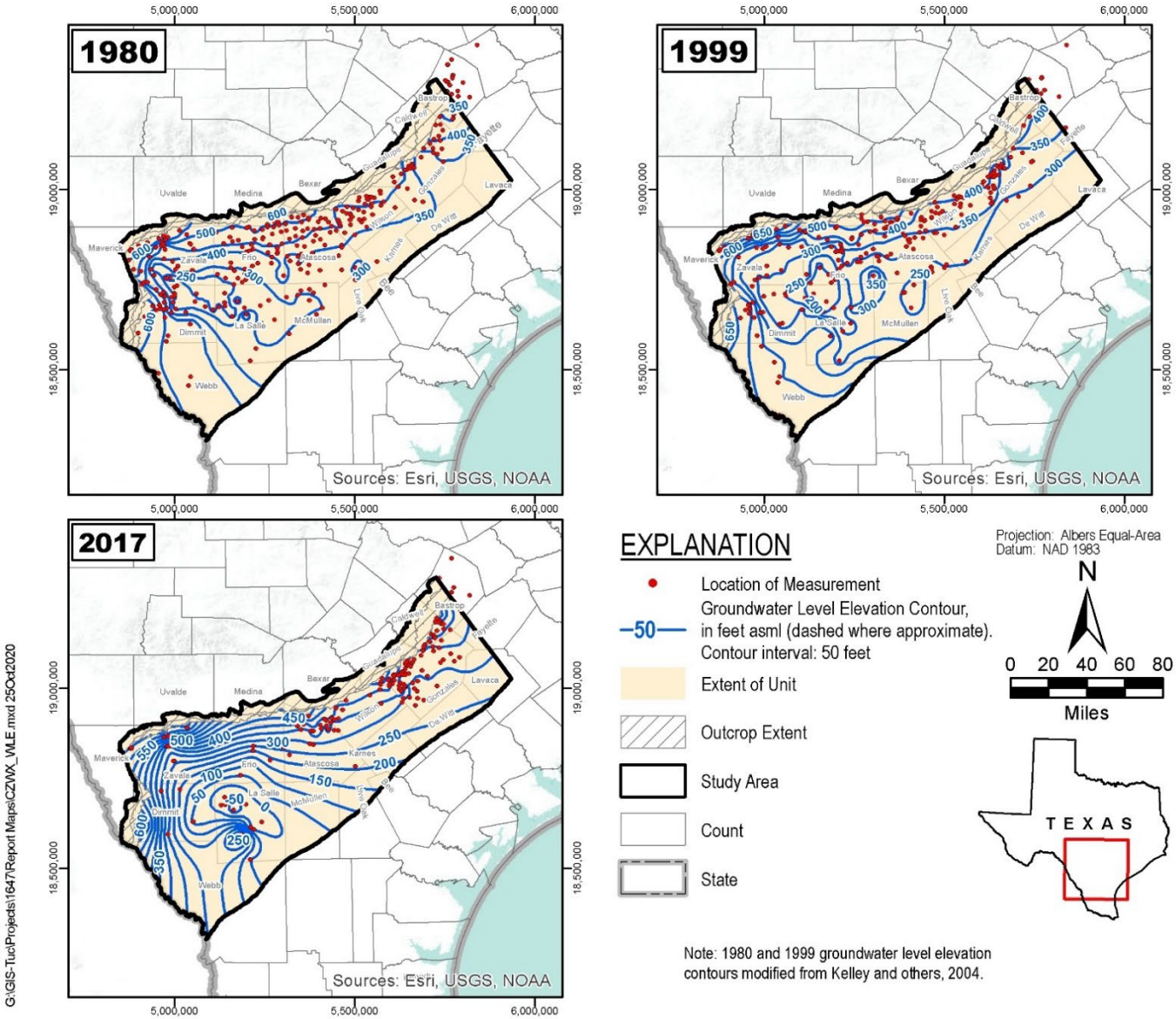


Figure 2-24. Groundwater Level Elevation Contours for Carrizo-Wilcox Aquifer

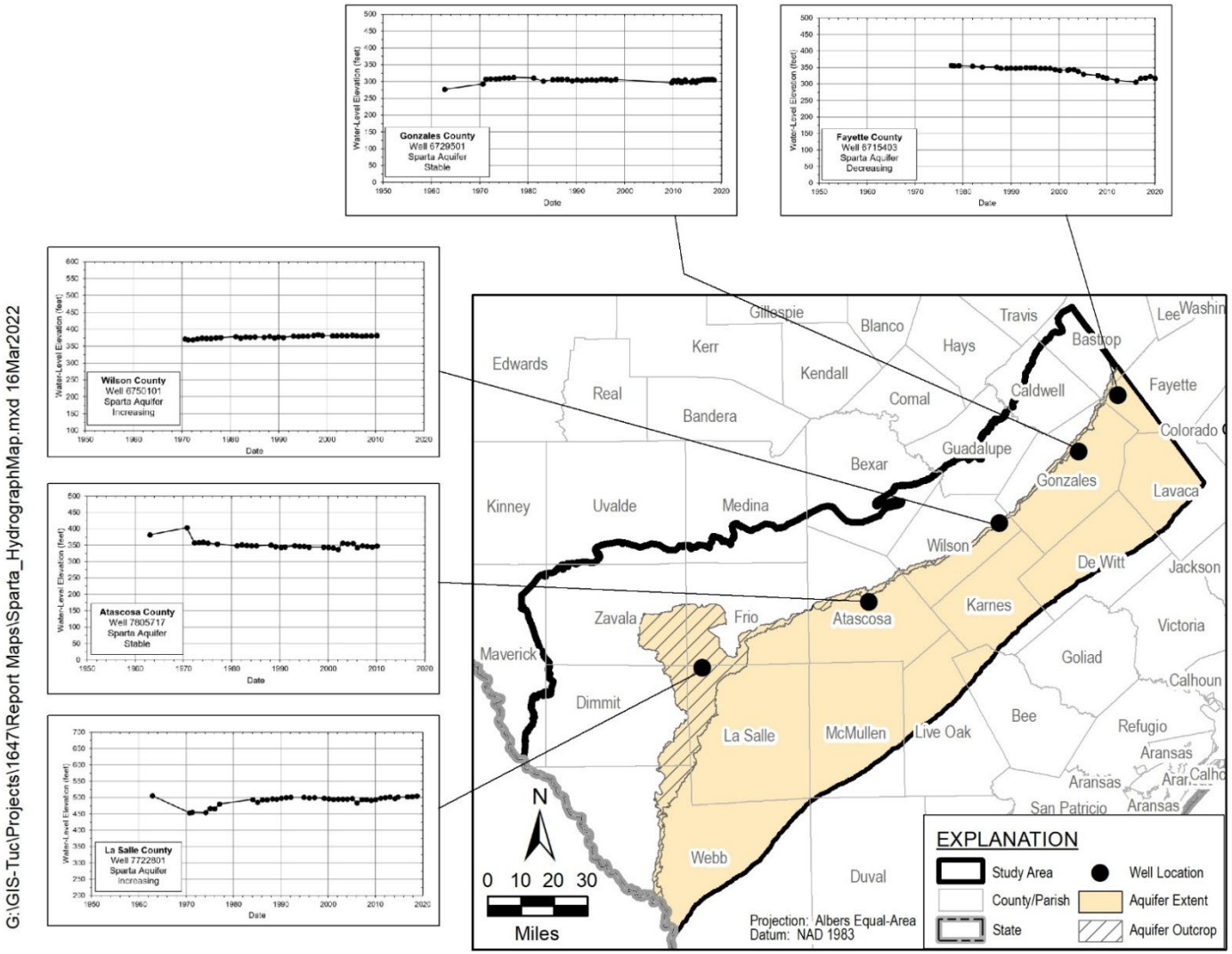


Figure 2-25. Selected Groundwater Level Elevation Hydrographs for Sparta Aquifer

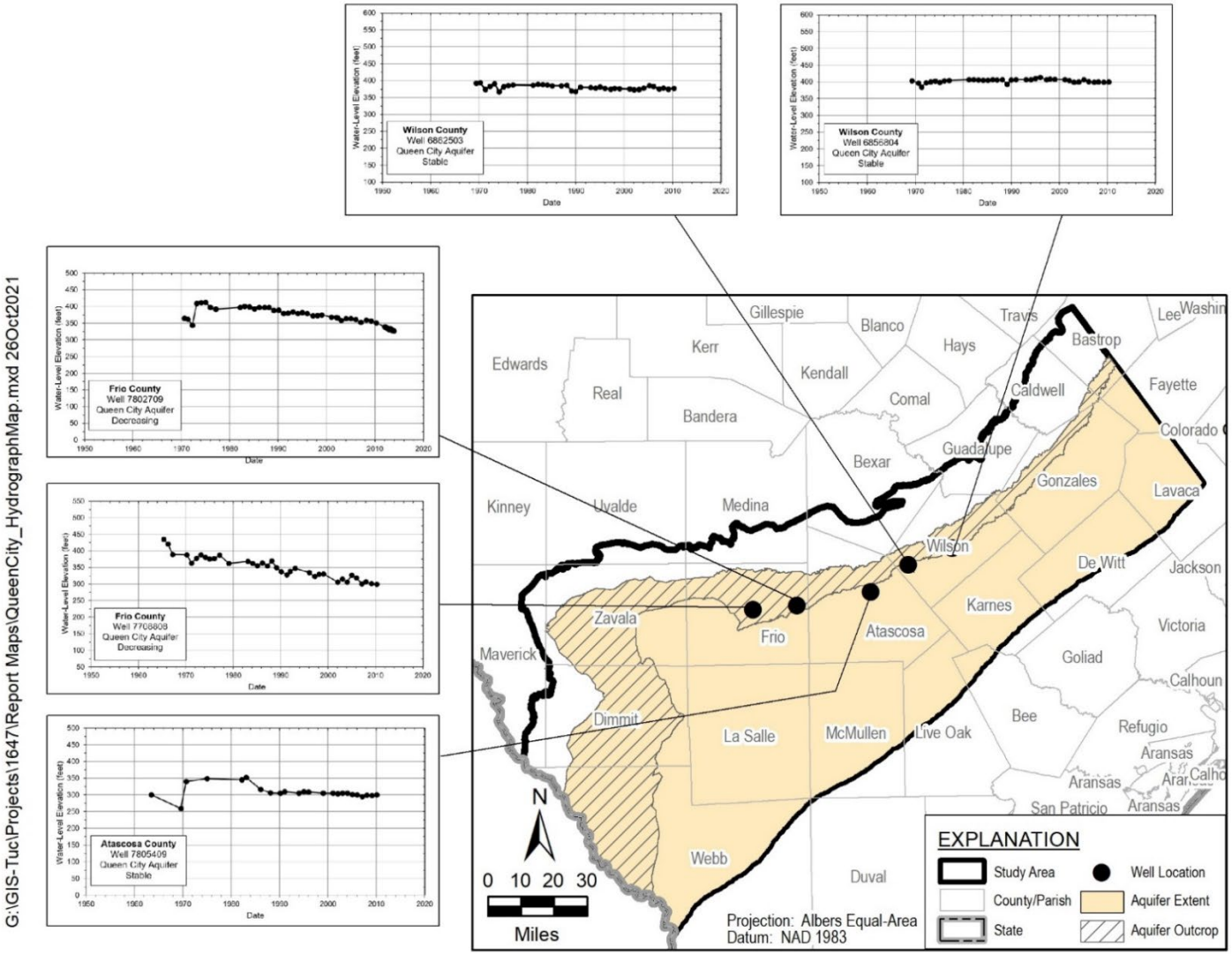


Figure 2-26. Selected Groundwater Level Elevation Hydrographs for Queen City Aquifer

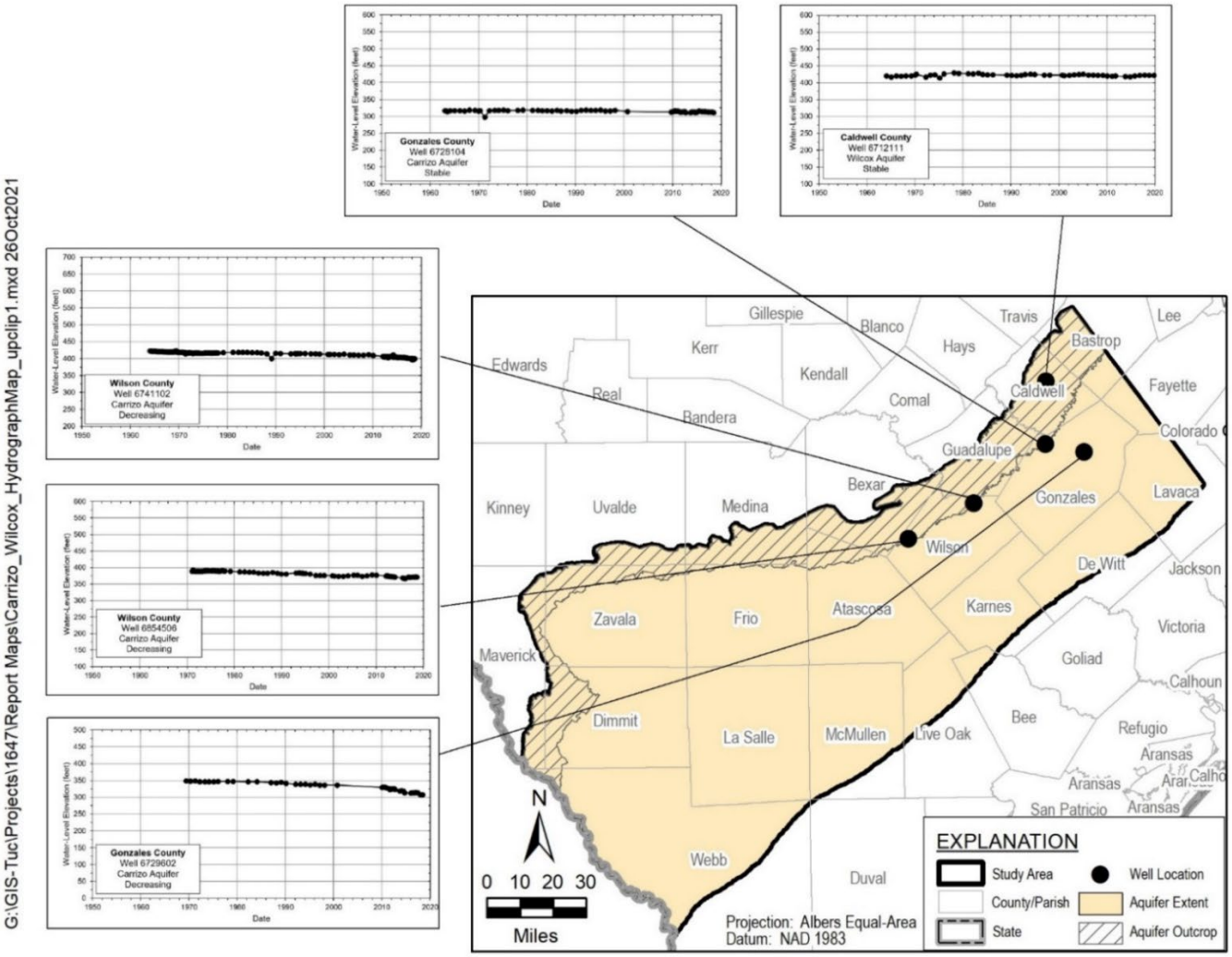


Figure 2-27. Selected Groundwater Level Elevation Hydrographs for Carrizo-Wilcox Aquifer in Northern Bastrop, Caldwell, Gonzales, and Wilson Counties

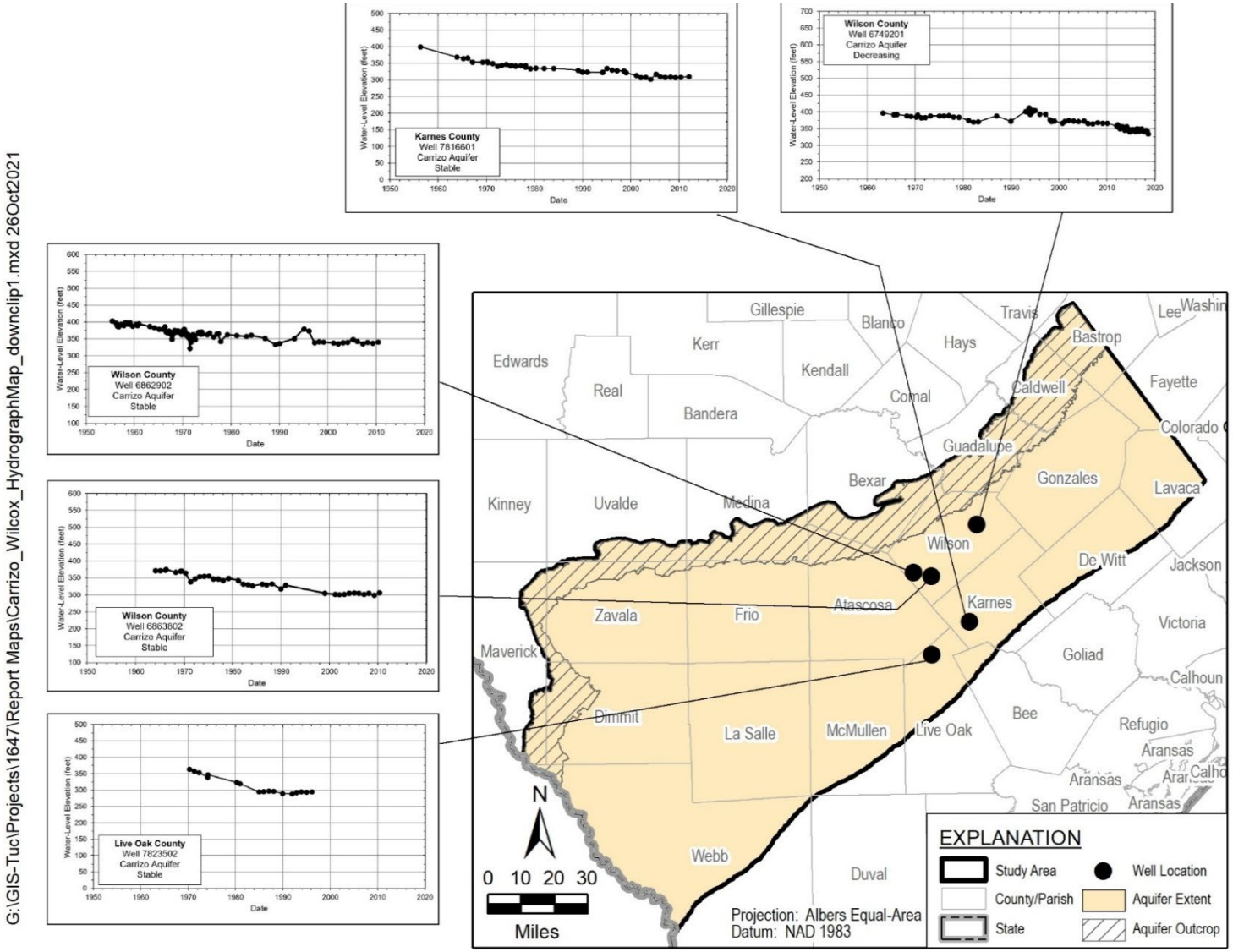


Figure 2-28. Selected Groundwater Level Elevation Hydrographs for Carrizo-Wilcox Aquifer in Southern Wilson County and Karnes and Live Oak Counties

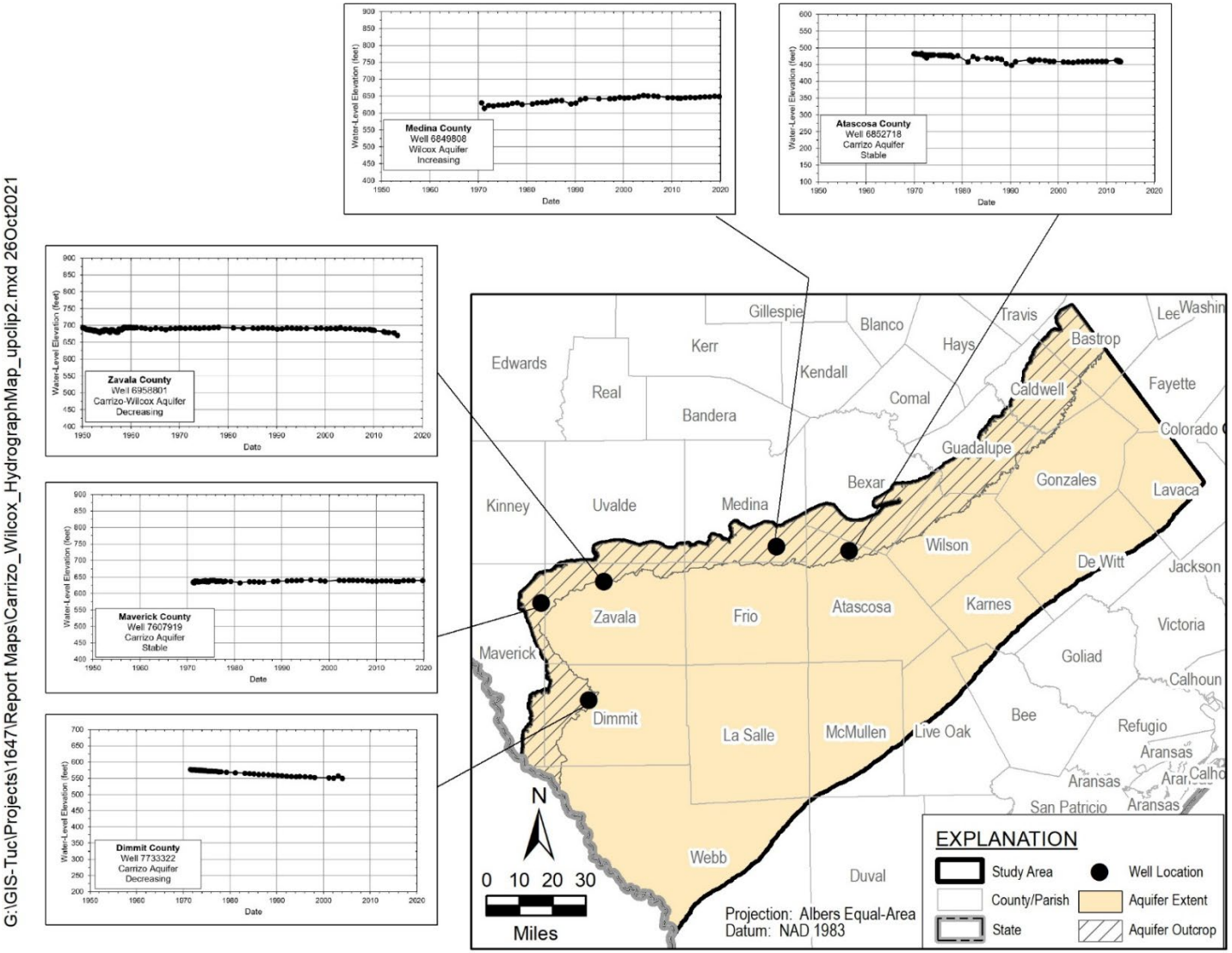


Figure 2-29. Selected Groundwater Level Elevation Hydrographs for Carrizo-Wilcox Aquifer in Outcrop Areas of Atascosa, Medina, Zavala, Maverick, and Dimmit Counties

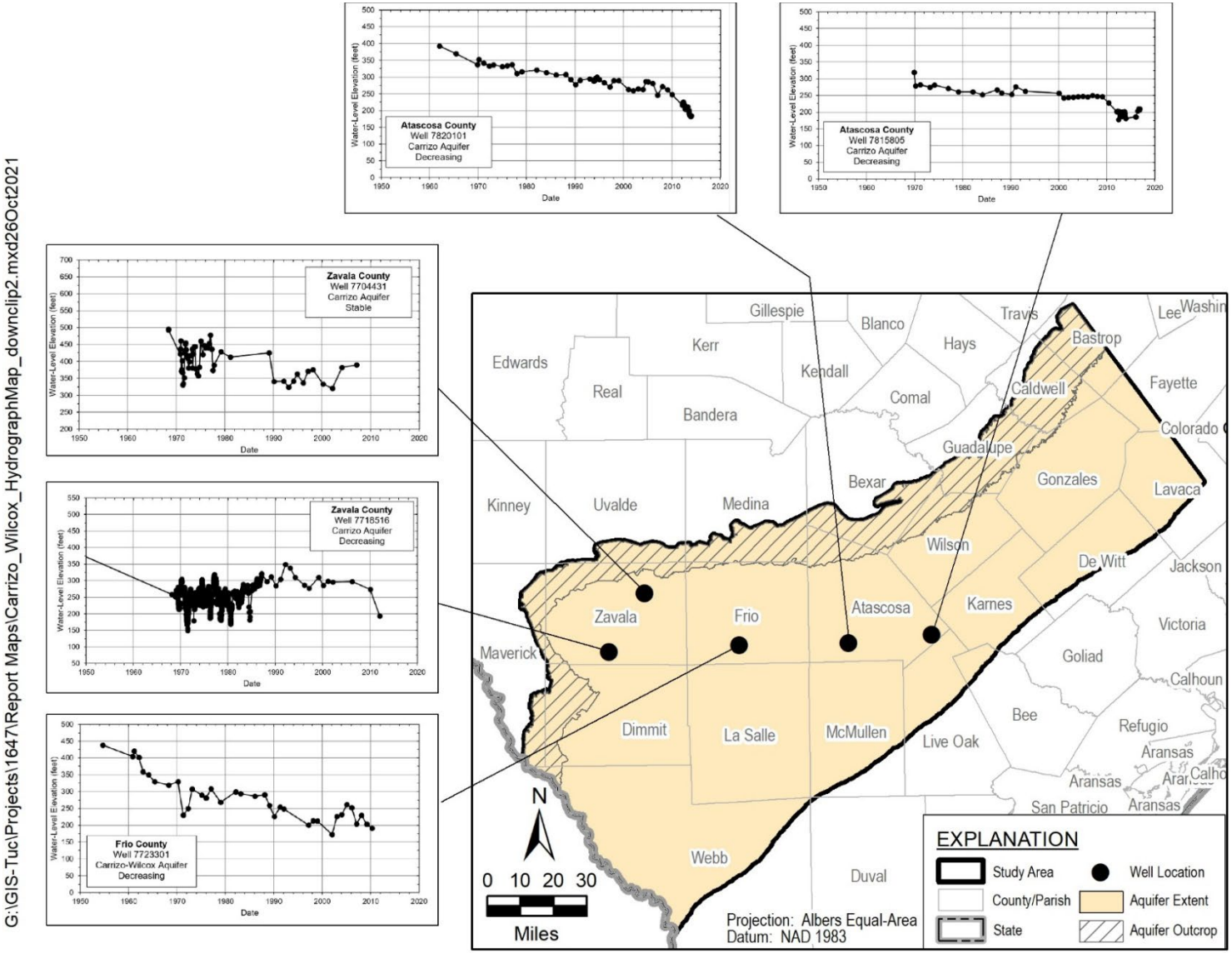


Figure 2-30. Selected Groundwater Level Elevation Hydrographs for Carrizo-Wilcox Aquifer in the Downdip Areas of Atascosa, Frio, and Zavala Counties

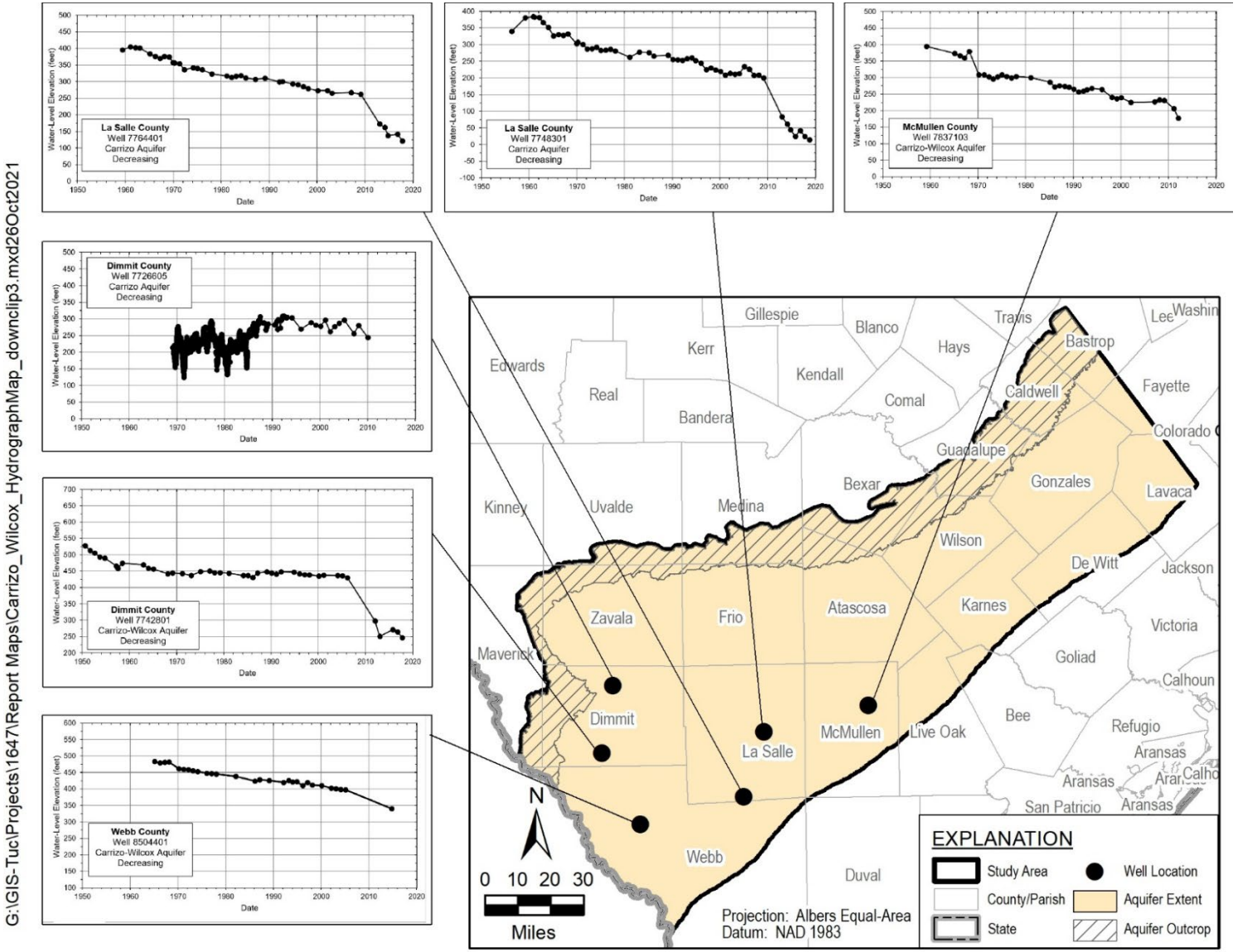


Figure 2-31. Selected Groundwater Level Elevation Hydrographs for Carrizo-Wilcox Aquifer for Wells in McMullen, La Salle, Webb, and the Downdip Area of Dimmit Counties

2.3 Recharge

Recharge to the Sparta, Queen City, and Carrizo-Wilcox aquifers in the study area occurs from (1) percolation of precipitation in the outcrop areas and (2) percolation of impounded water at reservoirs. Percolation of precipitation is the principal recharge mechanism in the study area. Recharge from infiltration along rivers and tributaries could occur in localized areas in the study area.

Aquifer recharge from Class II injection wells occurs below or in the deep, downdip portions of the aquifers of interest in the study area and is assumed to occur at relatively small rates. Any recharge from injection wells in the study area occurs below the base of useable quality water and would not impact groundwater conditions related to the groundwater availability model. For these reasons, injection wells are not included in the groundwater model for this study.

Springs often occur in topographically low areas along river valleys and in outcrop areas where hydrogeologic conditions generally preferentially reject recharge (Kelley and others, 2004).

2.3.1 Diffuse Recharge from Precipitation

Diffuse groundwater recharge from percolation of precipitation is difficult to estimate on a regional scale. Research has been conducted to improve these estimates for the study area. Previous estimates of recharge rates for the southern Queen City, Sparta, and Carrizo-Wilcox aquifers vary due to varied hydraulic conductivity, rainfall distribution, evapotranspiration rates, and groundwater-surface water interactions.

The distribution of average recharge rates specified in the previous groundwater availability model by Kelley and others (2004) are shown on Figure 2-32. Note that no values are shown for areas south of the interface between the Sparta and the Younger units because the Younger units are not explicitly simulated in the groundwater model. Recharge presumably still occurs over the Younger aquifer units; it is just not accounted for in this study. This distribution is based on extensive unsaturated zone simulations conducted by Scanlon and others (2003) using the widely used Unites States Department of Agriculture National Resources Conservation Service State Soil Geographic database and Soil Survey Geographic Database for soils information along with weather and vegetation data for the major aquifers in Texas in 14 study areas. Kelley and others (2004) then scaled recharge up in local topographic highs and down at local topographic lows to account for discharge to the stream channels. This was then scaled by geology depending on each layer's hydraulic properties. The previous southern model estimated an average recharge rate (before evapotranspiration) of 0.8 inches per year (Kelley and others, 2004). Annual recharge volumes specified in the previous southern groundwater availability model are summarized by aquifer layer in Table 2-1.

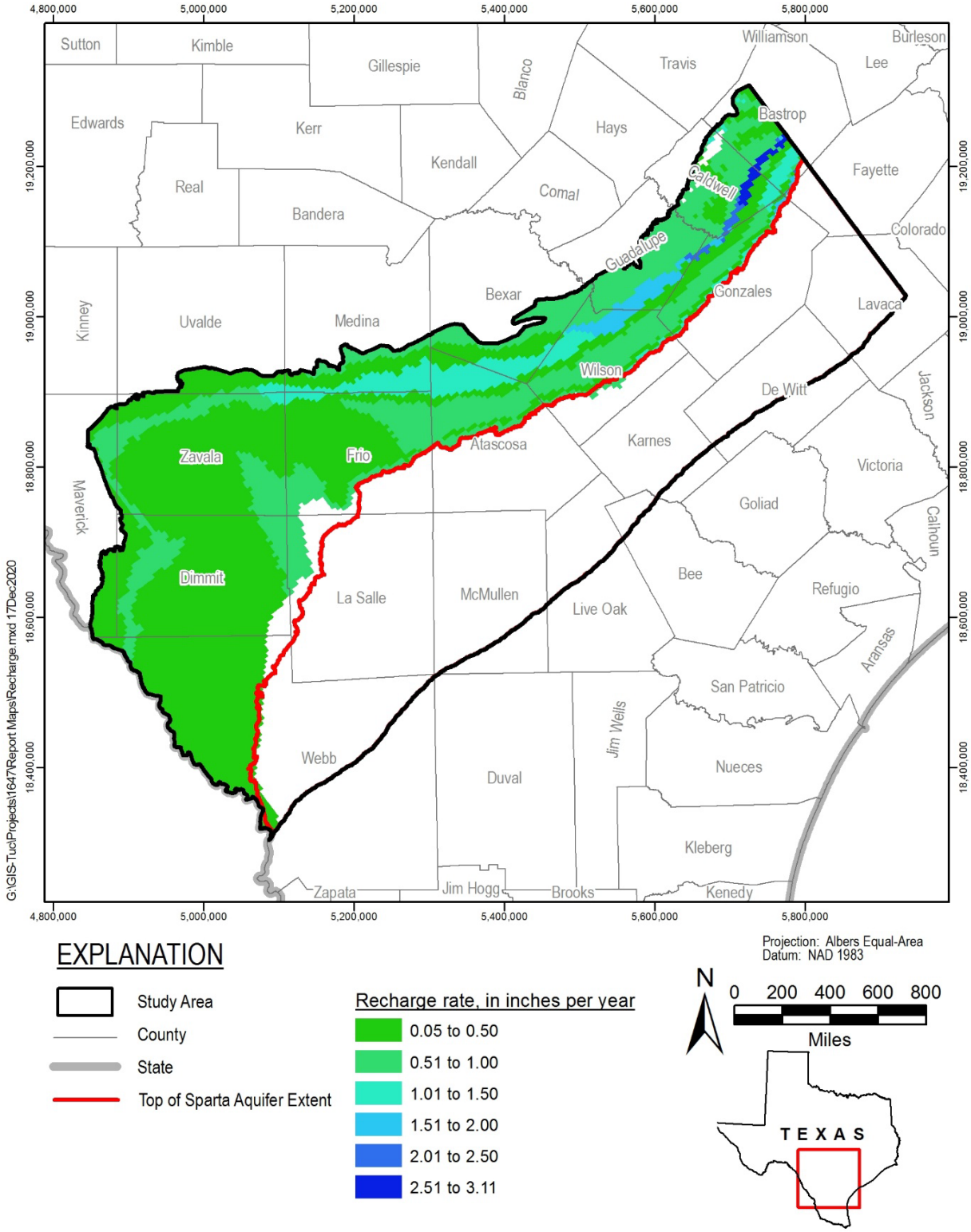


Figure 2-32. Distribution of Average Recharge Rates Simulated in Previous Groundwater Availability Model by Kelley and others (2004)

Table 2-1. Summary of Annual Recharge from Previous Groundwater Availability Model by Kelley and others (2004)

Aquifer Layer	Recharge
Sparta	24,486
Weches	4,714
Queen City	69,019
Reklaw	6,689
Carrizo + Upper Wilcox	66,504
Middle Wilcox	22,849
Lower Wilcox	24,249
TOTAL	*218,510*

Units in acre-feet per year

The recharge estimation approaches presented in this section are be used as a starting point for calibration of recharge. Annual scaling factors were applied to the distribution of average recharge from Kelley and others (2004), shown on Figure 2-32, during model calibration to match calibration targets, such as groundwater levels and streamflows. Adjustments made during model calibration are described in Section 3.10.

2.3.2 Recharge from Reservoirs

In total there are five reservoirs with surface areas greater than half a square mile in the study area (Figure 2-33). These reservoirs provide potential areas of focused recharge to the underlying aquifers of interest. Table 2-2 lists the names, owners, and year impounded for each reservoir. This information was sourced from the TWDB (2020a, b) and Deeds and others (2003). Figure 2-34 includes historic lake stage (water level) elevations obtained from the United States Geological Survey (2020a) and the previous groundwater availability model by Deeds and others (2003). The hydrographs show only minor variations in lake levels over the period of interest. Reservoir locations and stage measurements will be incorporated in the groundwater model.

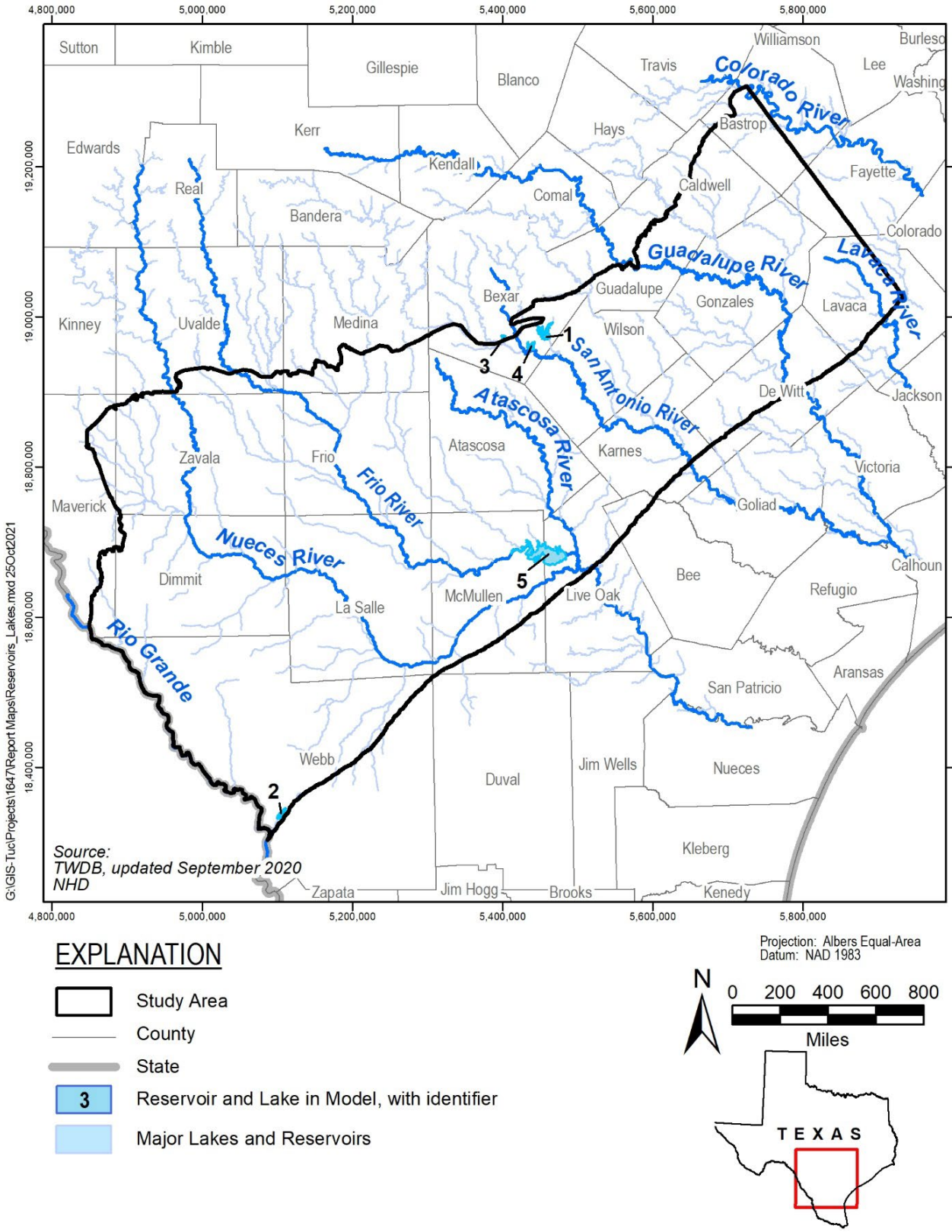


Figure 2-33. Locations of Major Reservoirs in Study Area

Table 2-2. Major Reservoirs in the Study Area

Reservoir	Reservoir Name	Owner	Date Impounded	Underlying Aquifer Unit
1	Calaveras Lake	City Public Service Energy of San Antonio	1969	Lower Wilcox
2	Lake Casa Blanca	Webb County	1949	Younger Units
3	Mitchell Lake	--	1967	Lower Wilcox
4	Victor Braunig Lake	City Public Service Energy of San Antonio	1962	Middle Wilcox
5	Yarbrough Lake (Choke Canyon Reservoir)	City of Corpus Christi and Nueces River Authority	1982	Younger Units

--- = Not available

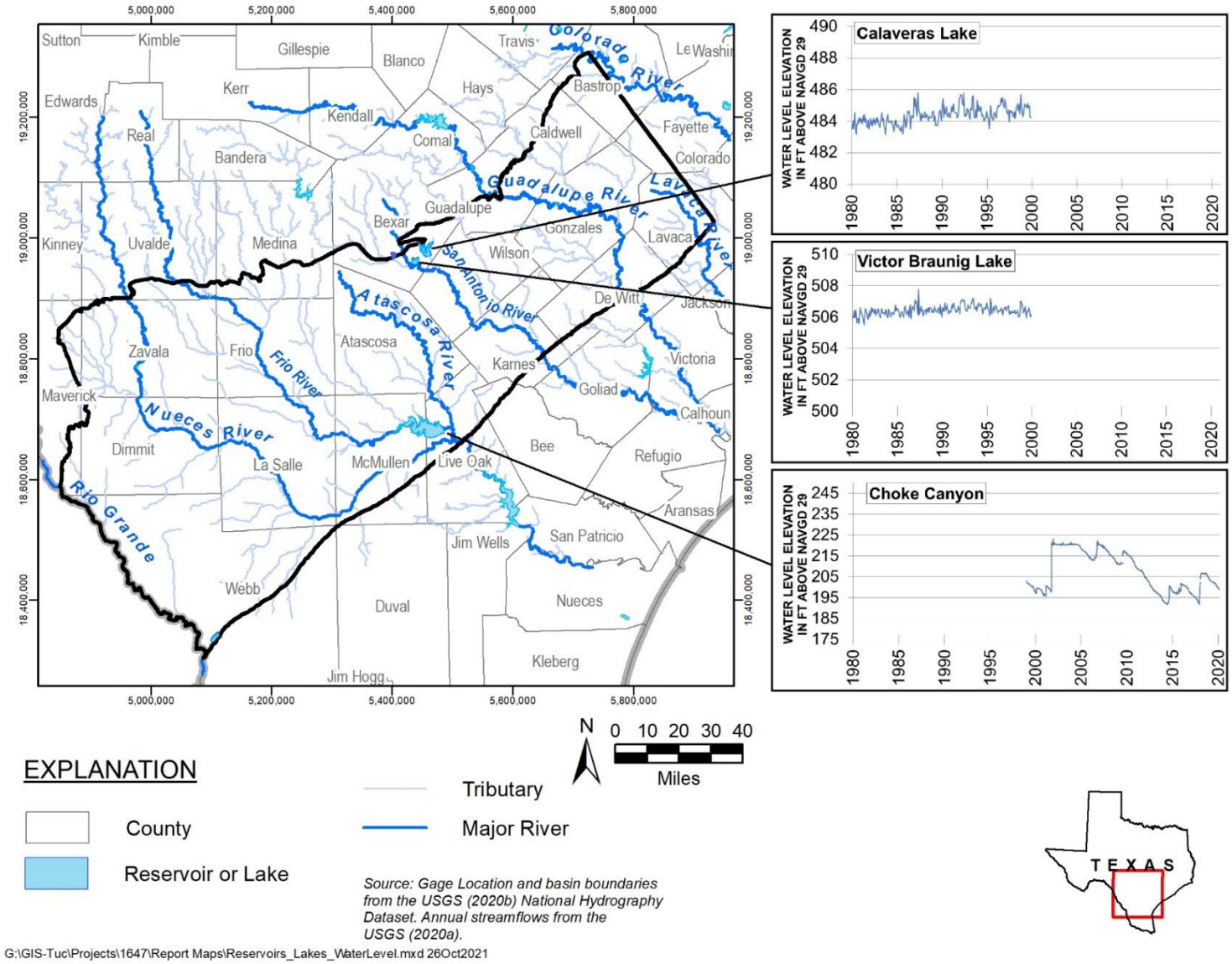


Figure 2-34. Water Level Hydrographs for Selected Reservoirs in Study Area

2.4 Surface Water Network

Important surface water features within the study area include several major rivers and tributaries, numerous lakes and reservoirs, and springs. The following sections describe the surface water network in the study area.

2.4.1 River Flows

The major rivers intersecting the study area include the Frio River, Atascosa River, Nueces River, Rio Grande, San Antonio River, Guadalupe River, and Lavaca River (Figure 2-35). The Frio River and Atascosa Rivers are tributaries to the Nueces River. Numerous other smaller river and streams are also included in the study area.

2.4.1.1 Previous Studies on Surface Water Gains and Losses

Gaining or losing streams is an indication of the contribution of groundwater to reaches along a stream. Several stream gain/loss studies have been conducted along rivers and tributaries in the study area. Deeds and others (2003) provide a comprehensive summary of these studies. Studies along the Cibolo Creek and Medina River in the Guadalupe River Basin, Lavaca River, Atascosa River, Frio River, Leona River and Nueces River in the Nueces River Basin, Cibolo Creek in the San Antonio River Basin, and the Rio Grande within the study area. The summary provided by Deeds and others (2003) indicate a spatial pattern that streams are gaining and perennial in the eastern portion of the study area and trend towards non-perennial and losing westward. Previous studies also show temporal variation as gaining streams were more prevalent at the onset of the 20th century and those reaches noted as losing stream reaches by the mid-century.

A literature survey was conducted to research updated studies on the status of discharge to rivers and springs in the study area. Only one relevant article was found along a limited segment of the Guadalupe River in the eastern portion of the study area (Figure 2-36). Ikard and others (2017) conducted a surface and groundwater exchange study along the Guadalupe River downstream from Seguin, Texas. The study integrated methods of electric resistivity tomography and floating gradient self-potential profiling in order to map subsurface geology and water flowing through those geologic materials (Ikard and others, 2017). Ikard and others (2017) concludes that the first segment of the Guadalupe River reach studied appears to be losing but transitions to a gaining stream before ending with a more neutral signal. This study does not quantify flow rates between the surface and groundwater. No other information was found on the rate of exchange between groundwater and surface water along streams.

2.4.1.2 Historical River Flows

Flows along the rivers are measured by the United States Geological Survey (2020a) at several streamflow gages along the major rivers in the study area, except for Rio Grande which is monitored by the International Boundary Water Commission (2020). Daily streamflow data are available from the United States Geological Survey for the period of 1905 through 2020. Annual streamflows are assessed for this study because annual stress periods will be simulated in the updated groundwater availability model. Measured river

flows will be used as a guide during calibration of the groundwater model. Annual streamflows at selected gaging stations along the major rivers in the study area are shown on Figure 2-37 through Figure 2-43. These hydrographs indicate that flow conditions vary between gaining and losing streams with generally losing flows observed more frequently during the 21st century.

Historical annual streamflows along the Rio Grande vary from year to year from about 660,000 to over 7,000,000 acre-feet per year. Streamflow measurements are limited along the Rio Grande and while gaging stations exist throughout the system, historic data are only available within the study area from the International Boundary Water Commission (2020) from 1903 to 2011 at a gaging station 8459000 near Laredo, Texas (Figure 2-37). Streamflow measurements are not available for gage station 8458800 at Palafax near Laredo for the study period.

Historical annual streamflows along the Nueces River vary substantially from around 200 acre-feet per year to over 2,250,000 acre-feet per year. Streamflow measurements indicate a general increase in flow along the length of the river (Figure 2-38). Annual flows are generally larger than 50,000 acre-feet per year in the upper reaches near Asherton, Texas and increase to mostly larger than 300,000 acre-feet per year in the lower reach near Three Rivers, Texas which is below the confluences of the Frio River and Atascosa River as well as downstream from the Choke Canyon Reservoir.

Historical annual streamflows along the Frio River vary substantially from year to year, ranging from about 460 to over 900,000 acre-feet per year. Streamflow measurements indicate a general increase in flow along its length (Figure 2-39), in some years there is a minor decline in flow. Annual flows are generally larger than 25,000 acre-feet per year in the upper reaches near Derby, Texas and increase to mostly larger than 40,000 acre-feet per year downstream at Tilden, Texas.

Historical annual streamflows along the Atascosa River vary substantially from year to year, ranging from less than 1,500 acre-feet per year to over 325,000 acre-feet per year. Streamflow measurements indicate a general increase in flow along its length except in 2007 where a decrease in streamflow along the reach was observed (Figure 2-40). Annual flows are generally larger than 2,500 acre-feet per year in the upper reaches near McCoy, Texas and increase to mostly over 10,000 acre-feet per year in the lower reach at Whitsett, Texas.

Historical annual streamflows along the San Antonio River vary from year to year, ranging from about 35,000 to over 1,500,000 acre-feet per year. Streamflow measurements indicate a general increase in flow along its length except between Floresville, Texas and Falls City, Texas where a decline in flow is observed on average. However, the record for this stream is shorter than others and data were only available at two of the gages for 2006 to 2020 (Figure 2-41). Over the entire span of the stream within the study area, annual flows are generally larger than 200,000 acre-feet per year in the upper reaches near Elemdorf, Texas and increase to larger than 300,000 acre-feet per year in the lower reach

near Runge, Texas. These trends between gages are not consistent and harder to generalize since the record of available data vary between gages.

Historical annual streamflows along the Guadalupe River vary from year to year, ranging from about 80,000 to over 4,500,000 acre-feet per year. Streamflow measurements indicate a general increase in flow along its length but that increase in flow decrease over the period of record and since 2008 there were two years where flow declined toward the lower reach (Figure 2-42). Annual flows are generally less than 500,000 acre-feet per year in the upper reaches near Seguin, Texas and increase to over 7,000,000 acre-feet per year in the lower reaches at Cuero, Texas. The oldest observed flow along the Guadalupe River within the study area is 1964.

Historical annual streamflows along the Lavaca River vary from year to year, ranging from less than 500 to over 100,000 acre-feet per year. Streamflow measurements within the study area were only available at one gaging station near Hallesttsville, Texas (Figure 2-43). Available measurements contain gaps in data and trends are hard to decipher along the reach within the study area.

Differences in measured annual streamflows were evaluated to note overall gains or losses along a specific river during the model simulation period from 1980 through 2019. Gages along unregulated reaches of the major rivers were selected for this evaluation. The annual differences between selected upstream and downstream gages along the major rivers are summarized in Table 2-3. Rio Grande and Lavaca River are not included in Table 2-3 because solely one streamflow measurement gage is located along these rivers in the study area. Gage locations are shown on Figure 2-37 through Figure 2-41. Gage data indicate that all major rivers generally have experienced gaining flow conditions during most years since 1980. It is important to note that these streamflow data do not represent baseflows; rather, the data are used as a generally guide for model calibration regarding general flow conditions along the rivers.

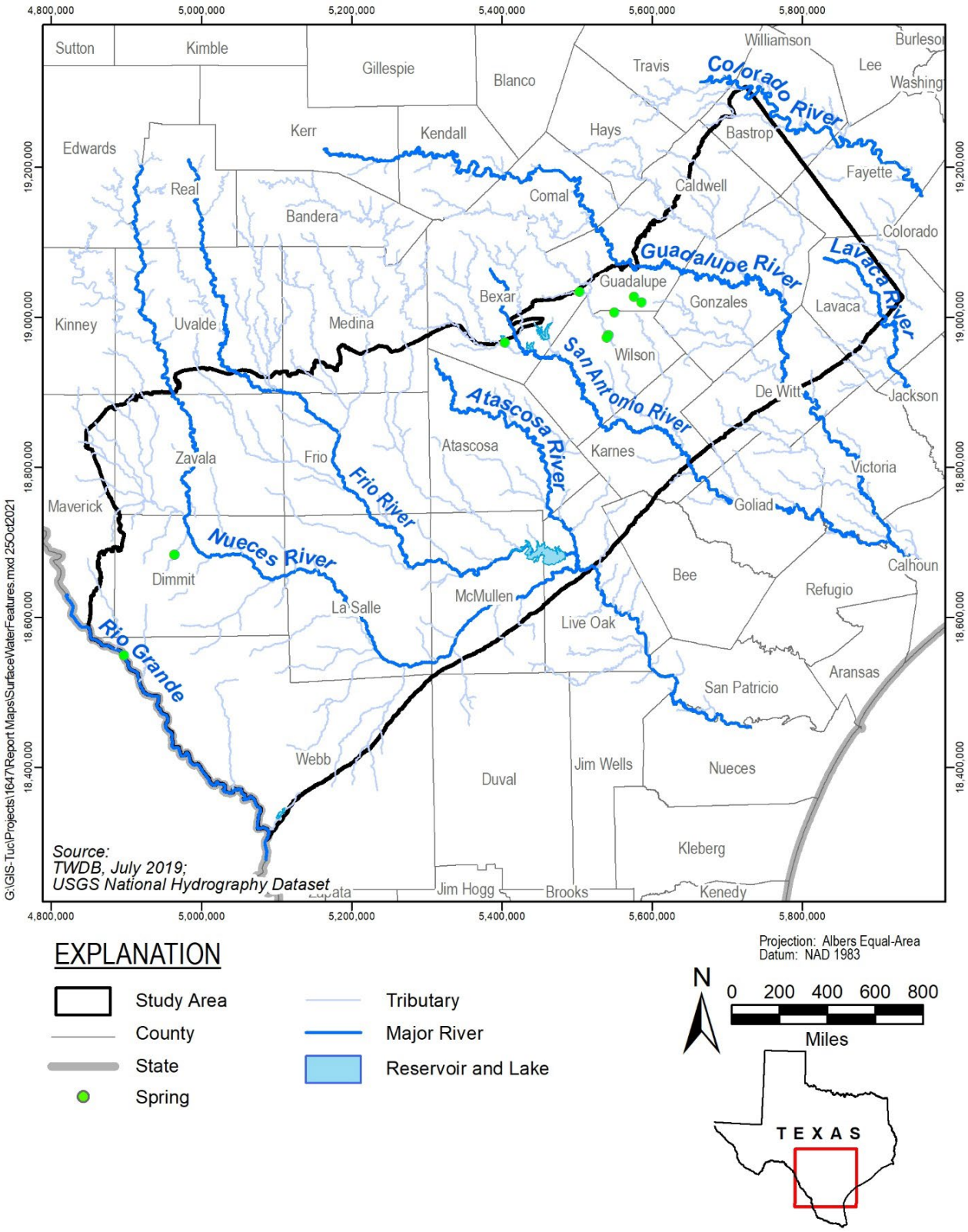


Figure 2-35. Surface Water Features in Study Area

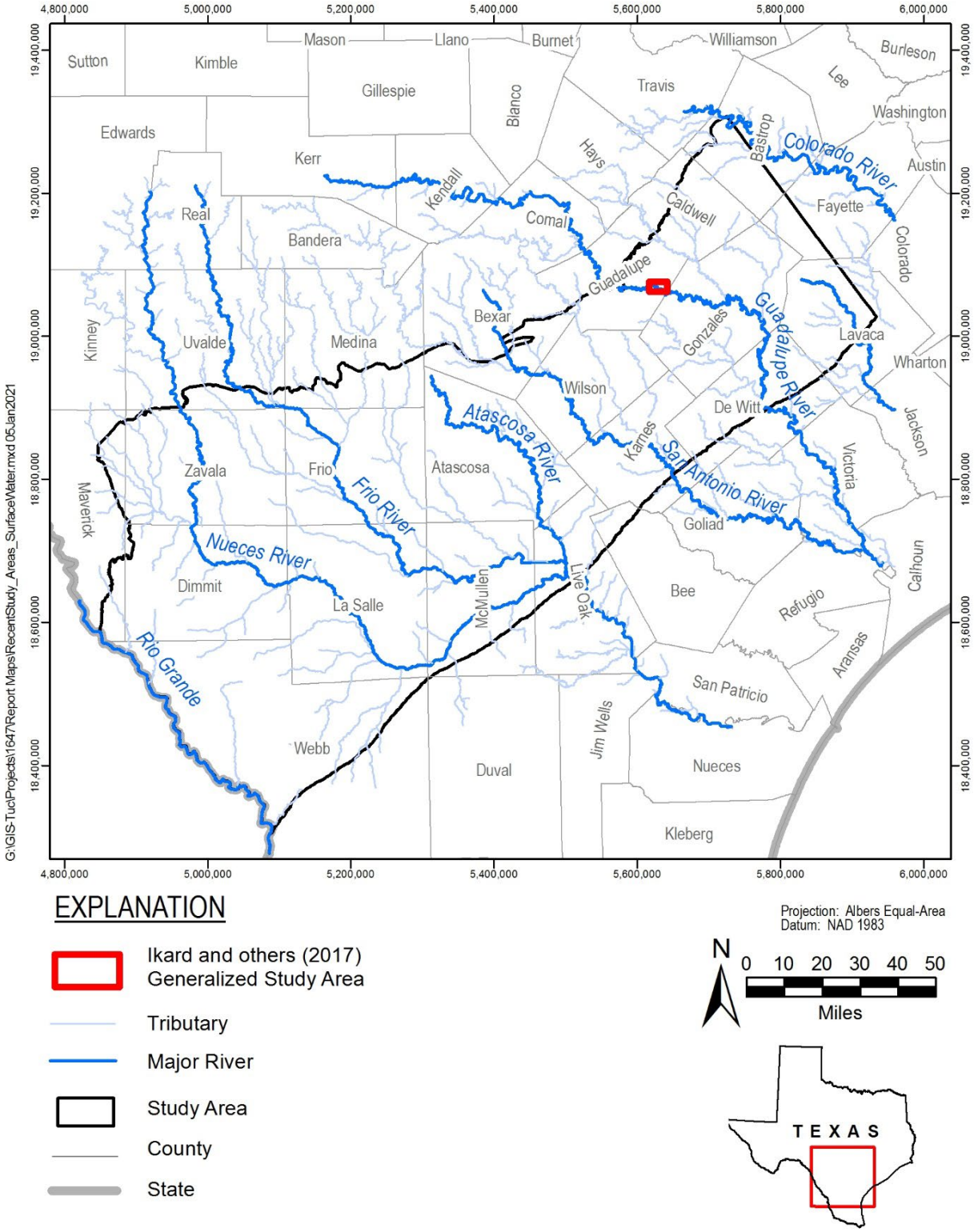


Figure 2-36. Location of Recent Surface Water Study Area

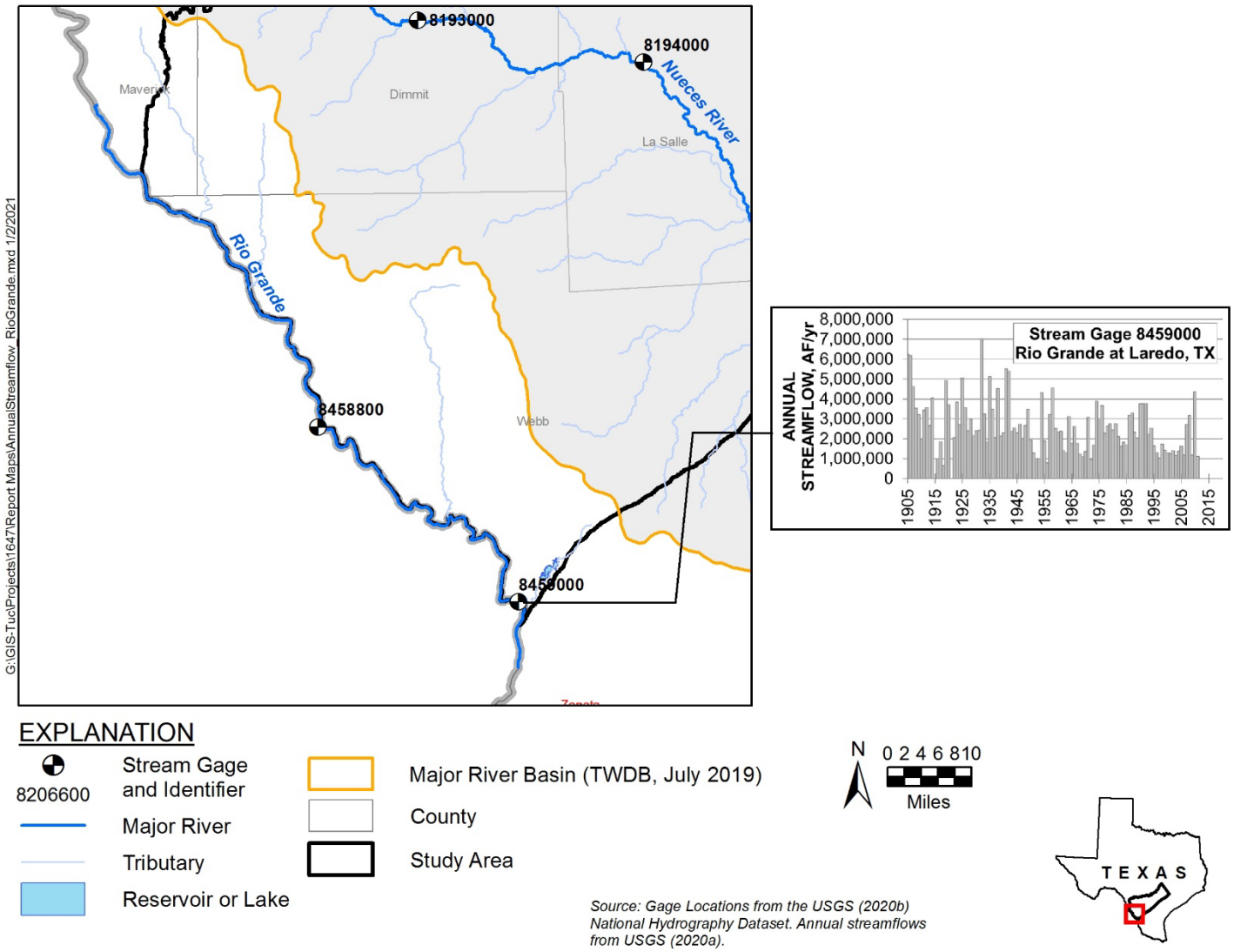


Figure 2-37. Annual Streamflows Along Rio Grande

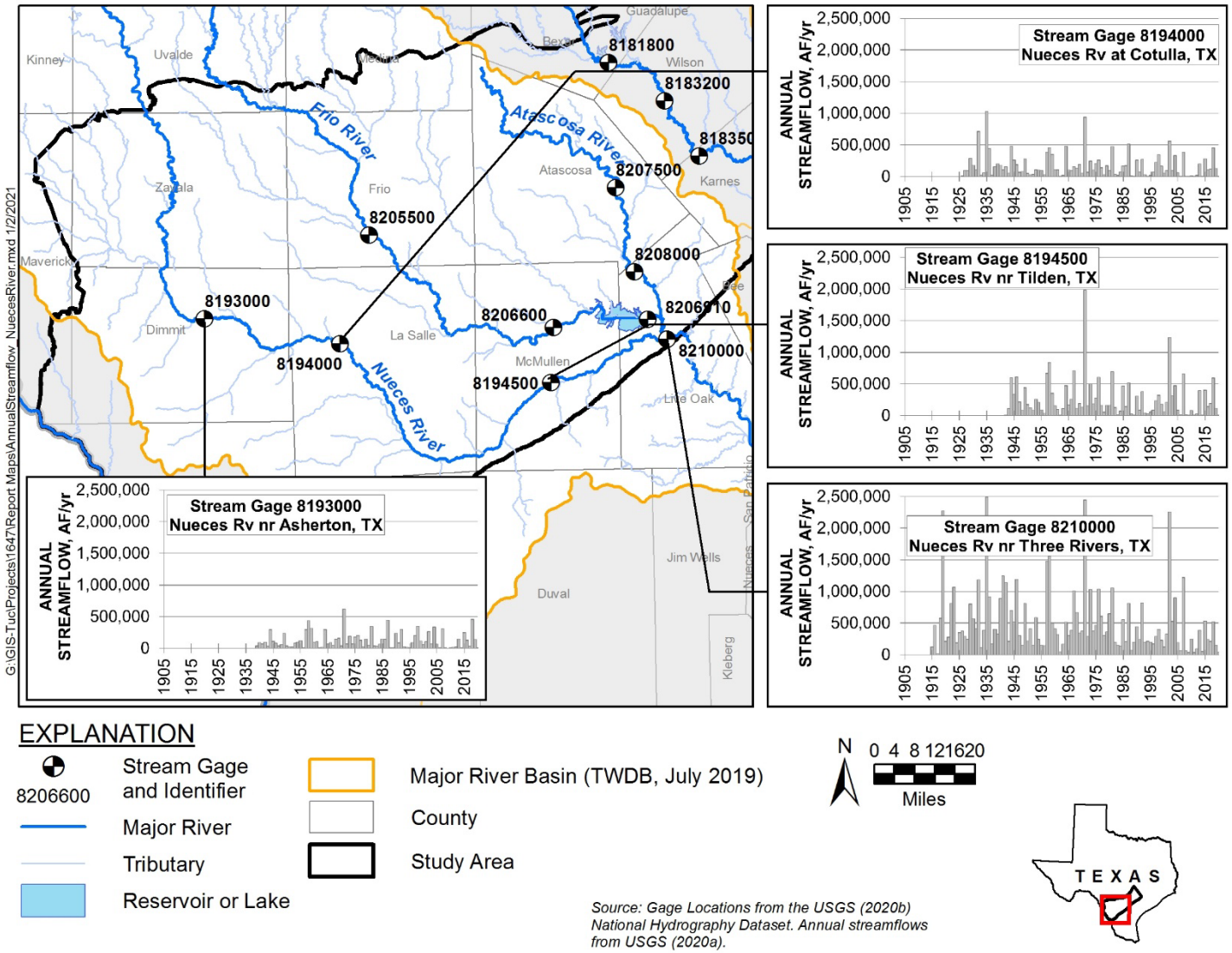


Figure 2-38. Annual Streamflows Along Nueces River

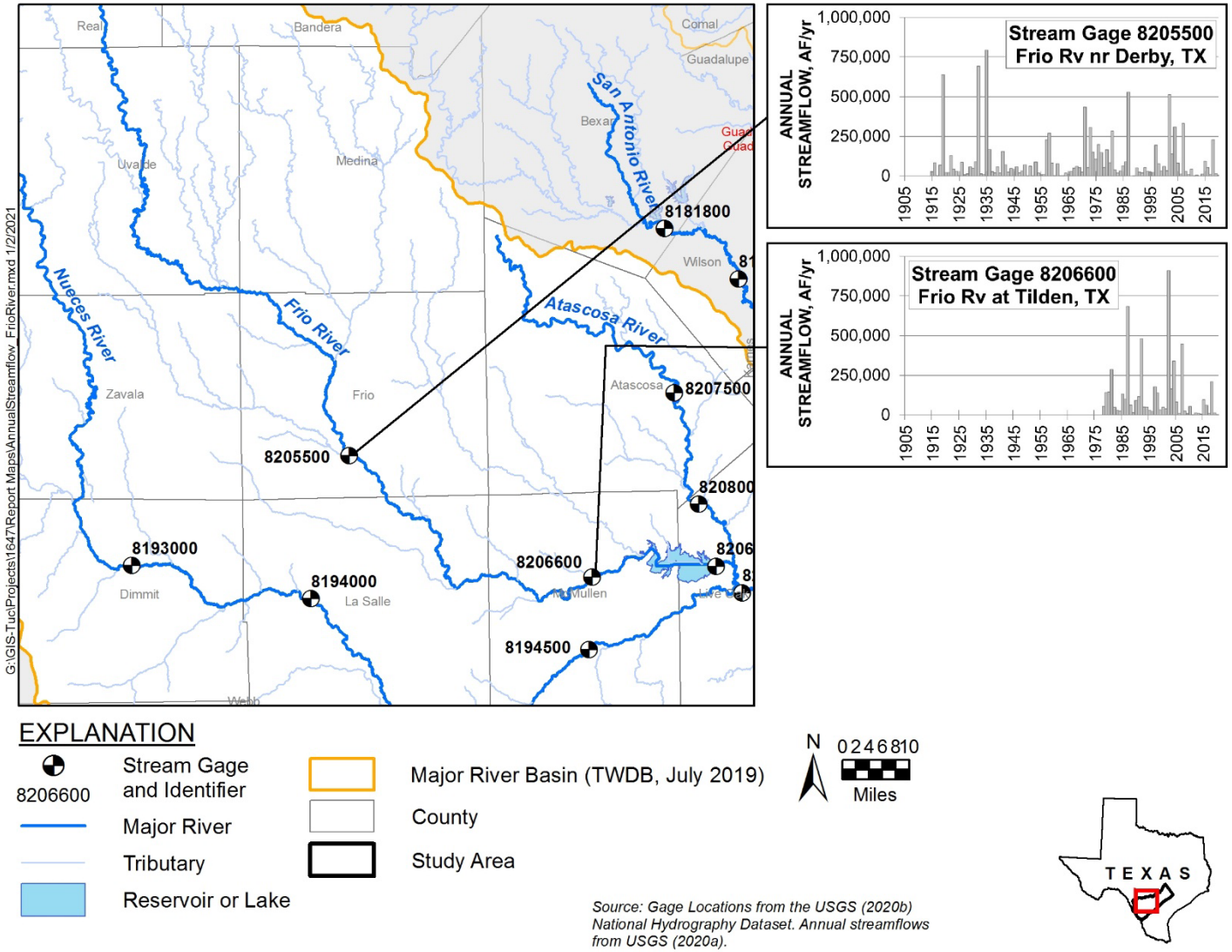


Figure 2-39. Annual Streamflows Along Frio River

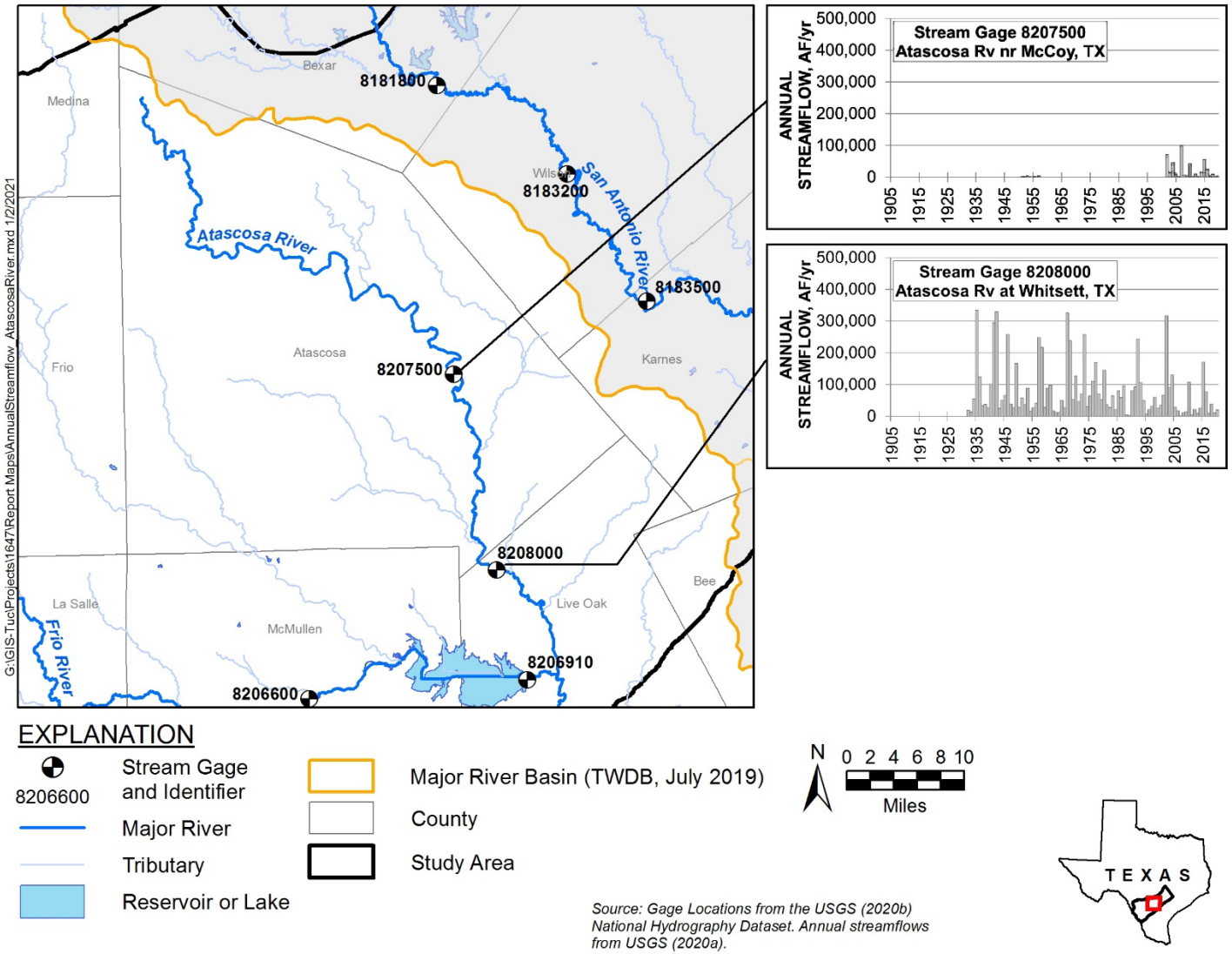


Figure 2-40. Annual Streamflows Along Atascosa River

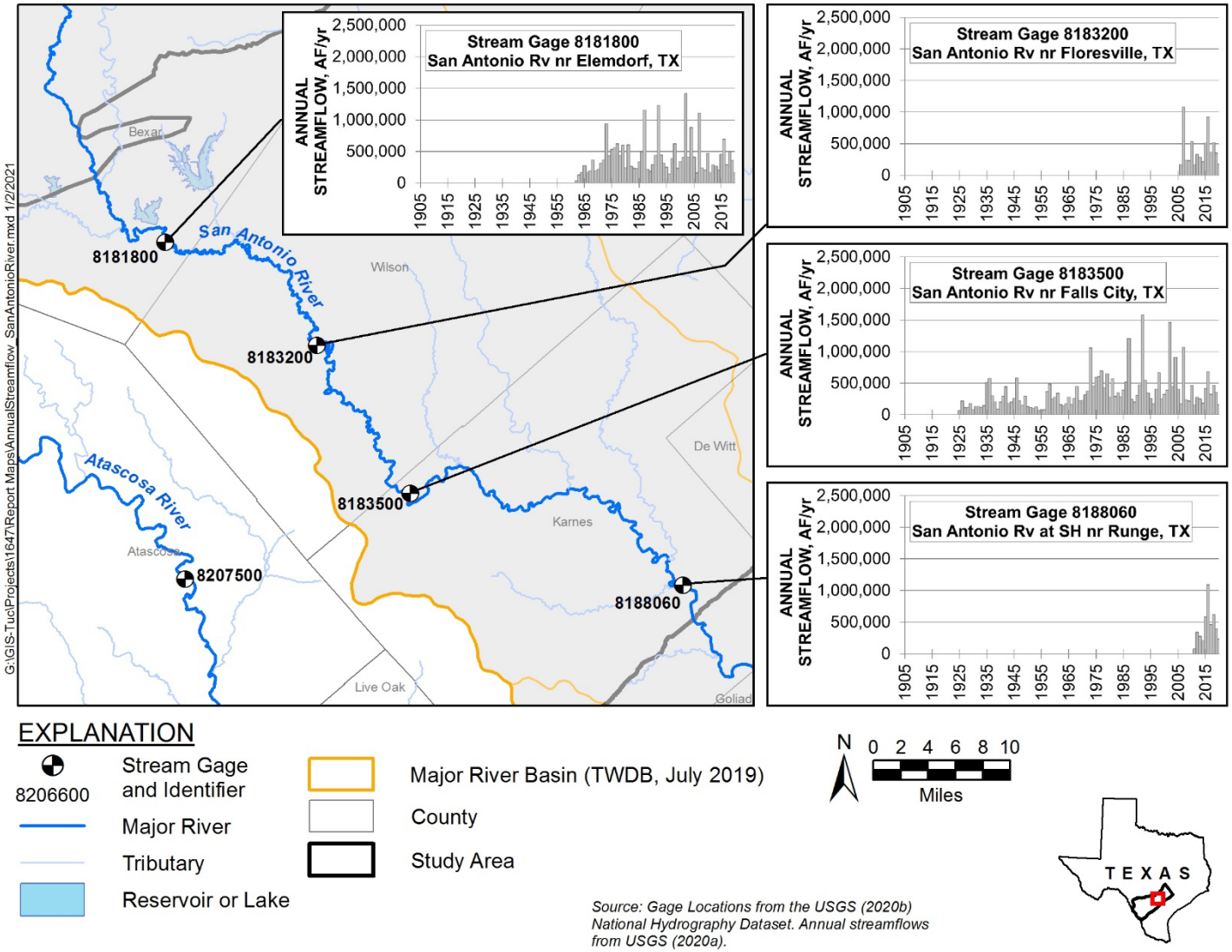


Figure 2-41. Annual Streamflows Along San Antonio River

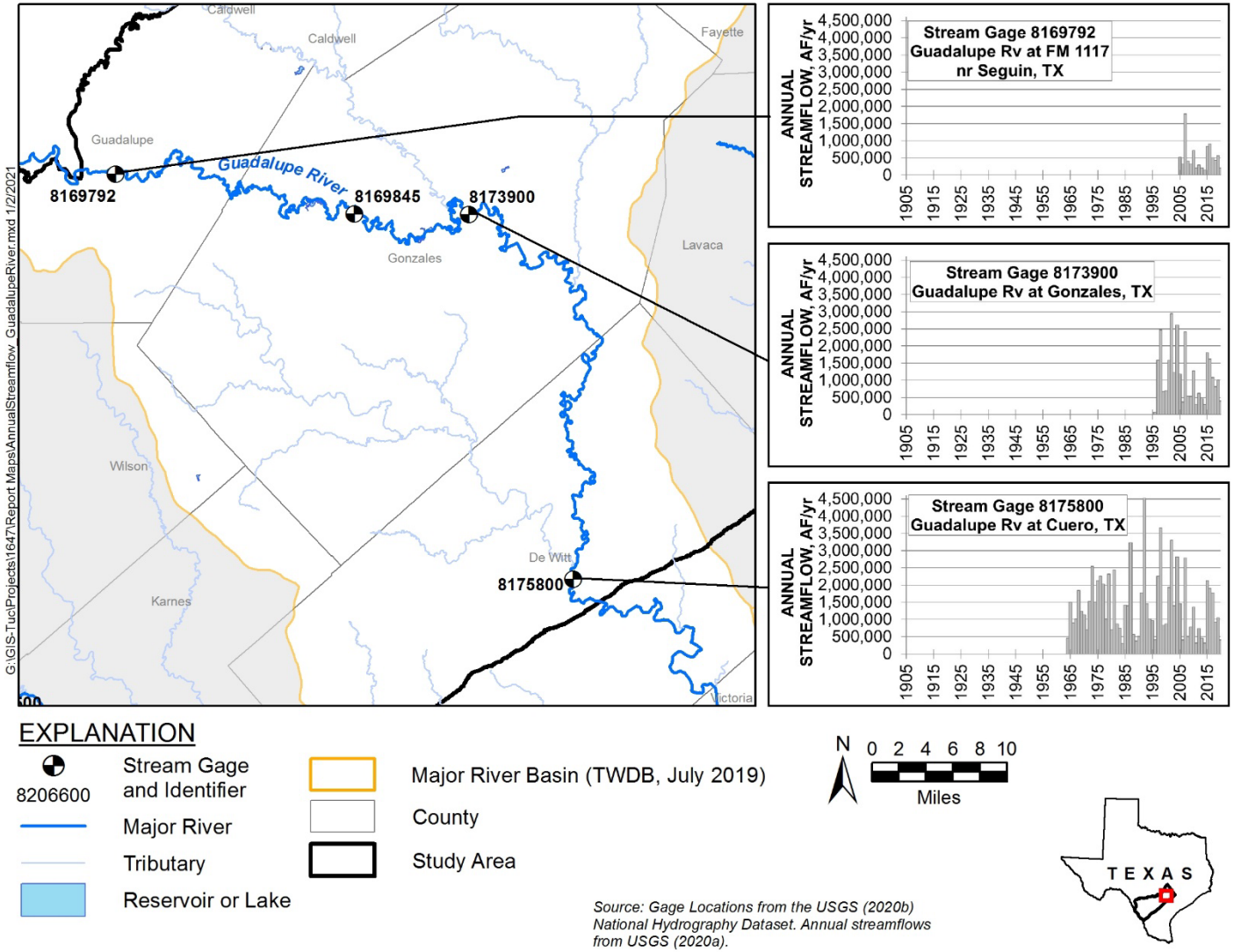


Figure 2-42. Annual Streamflows Along Guadalupe River

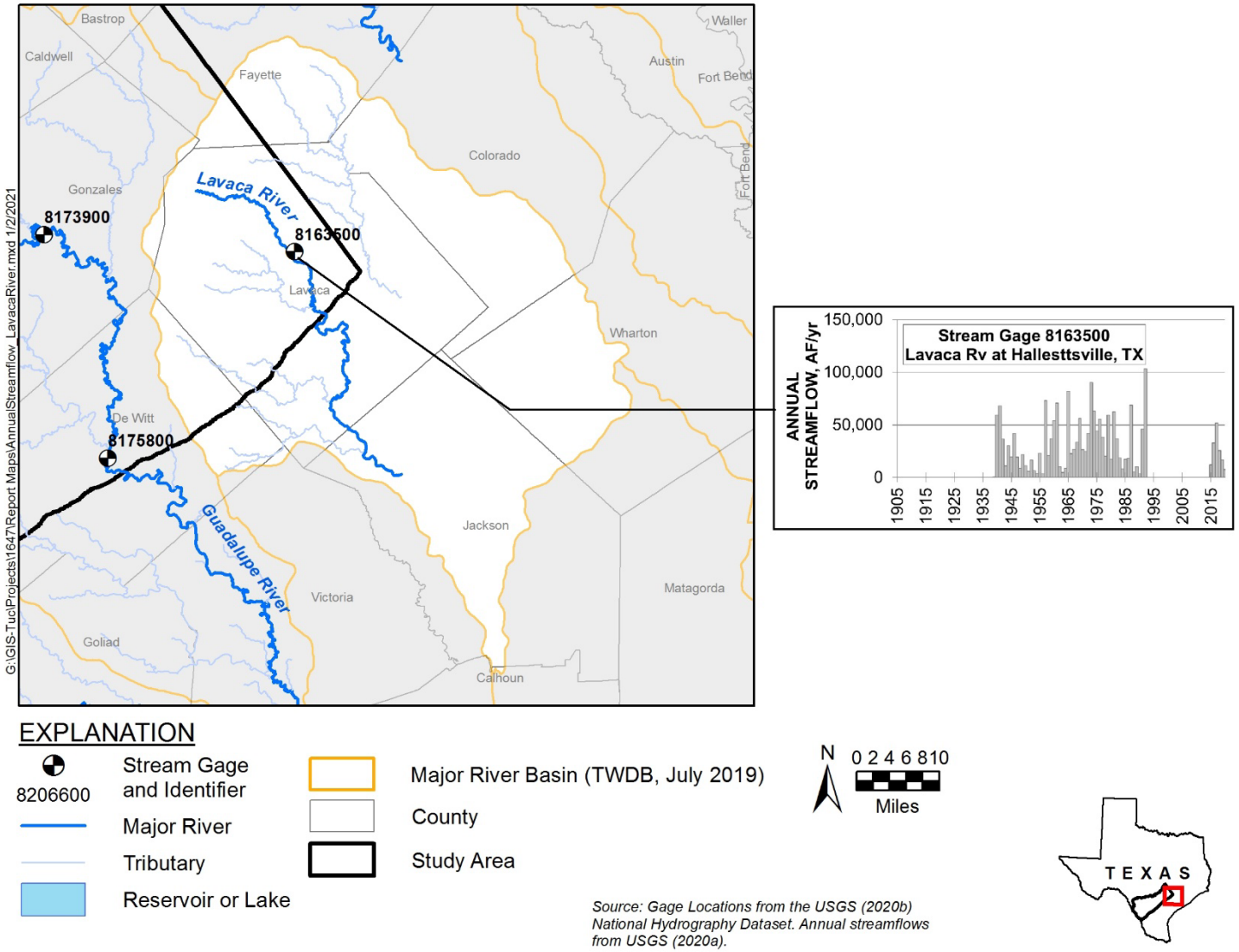


Figure 2-43. Annual Streamflows Along Lavaca River

Table 2-3. Difference in Annual Streamflows Along Major Rivers

River	Nueces River			Frio River	Atascosa River	San Antonio River		Guadalupe River	
Upstream Gage	8193000	8194000	8194500	8205500	8207500	8181800	8181800	8169792	8173900
Downstream Gage	8194000	8194500	8210000	8206600	8208000	8183200	8183500	8173900	8175800
Year	Acre-Feet								
1980	43,613	69,753	483,367	60,939	---	---	28,340	---	---
1981	128,626	214,998	360,231	4,315	---	---	-37,482	---	---
1982	4,259	87,795	70,492	8,793	---	---	26,273	---	---
1983	-10,196	-7,443	137,371	8,924	---	---	116,926	---	---
1984	6,409	-4,899	67,530	-6,380	---	---	59,839	---	---
1985	21,235	300,858	86,126	68,782	---	---	54,062	---	---
1986	28,545	-28,689	65,746	10,983	---	---	15,552	---	---
1987	62,343	6,782	293,180	156,996	---	---	59,292	---	---
1988	1,514	14,703	45,635	---	---	---	20,694	---	---
1989	2,790	2,520	194,774	14,134	---	---	17,851	---	---
1990	21,952	50,966	134,318	39,496	---	---	16,729	---	---
1991	-17,001	13,237	157,606	90,143	---	---	37,672	---	---
1992	-25,463	103,476	444,287	458,371	---	---	350,137	---	---
1993	-1,337	13,422	159,315	-4,126	---	---	103,010	---	---
1994	-4,973	17,201	188,326	19,862	---	---	26,991	---	---
1995	8,894	31,306	146,163	4,020	---	---	14,454	---	---
1996	-15,428	9,965	87,426	237	---	---	23,484	---	333,295
1997	14,053	17,191	49,972	-18,059	---	---	12,718	---	669,685
1998	-762	-22,352	78,320	62,402	---	---	40,330	---	1,193,277
1999	51,387	11,984	51,720	-439	---	---	20,652	---	149,300
2000	-3,417	2,111	65,511	-11,527	---	---	-24,700	---	158,624
2001	-10,270	114,011	117,294	4,033	---	---	-19,402	---	357,238
2002	296,159	673,404	1,026,709	396,872	246,812	---	48,633	---	365,386
2003	16,930	225,847	210,214	23,156	74,795	---	42,187	---	180,401
2004	-4,622	137,990	429,223	30,241	84,180	---	29,683	---	213,170
2005	-2,364	21,415	105,299	-158	20,110	---	-2,700	651,907	284,863
2006	-200	16,946	45,323	-2,227	14,804	14,215	15,312	61,222	32,301
2007	71,591	277,430	557,598	115,479	-96,527	-30,399	-46,766	626,929	384,927
2008	883	5,810	43,158	-5,211	6,064	634	-855	135,202	-38,991
2009	204	1,011	36,240	-2,659	9,817	21,853	9,327	213,729	246,600
2010	11,405	67,171	167,983	11,291	65,395	61,095	-9,386	558,795	79,502
2011	-8,485	-2,196	26,413	-1,647	3,980	-3,528	-11,821	85,228	21,213
2012	-3,811	10,344	64,499	7,297	11,716	42,393	-5,707	330,650	115,629
2013	50,085	199,964	-7,229	---	6,300	15,370	-21,509	258,637	-21,926
2014	1,350	-824	46,679	-5,743	8,612	5,007	-24,416	134,272	24,908
2015	36,731	114,943	135,256	2,535	116,082	54,136	-36,354	969,551	332,280
2016	-16,870	32,803	94,202	6,584	52,806	227,415	-19,964	697,243	285,622
2017	88,032	73,258	23,446	-183	5,940	73,817	32,755	581,928	689,879
2018	-1,712	137,379	-69,851	-17,585	30,036	15,066	-36,692	380,796	121,984
2019	-7,644	-12,827	34,003	-3,916	7,699	-3,779	3,027	430,539	43,664

--- = data not available for calculation

2.4.2 Reservoirs, Lakes, and Springs

Reservoirs, lakes, and springs can be found throughout the study area (Figure 2-35). Reservoirs overlying the aquifers of interest in the study area larger than one-half square mile in area are summarized in Section 2.3.2 of this report and shown on Figure 2-33. Discharge information is available from the United States Geological Survey (2020b) for solely one reservoir in the study area. Available daily discharge flows from the Choke Canyon reservoir are shown on Figure 2-44. Peak average daily discharges are generally on the order of 70 cubic feet per second or smaller from Choke Canyon Reservoir but vary up to 3,500 cubic feet per second. Discharges in the other reservoirs were not accessible through the public domain.

A handful of springs are documented within the study area (Figure 2-35). Springs are important to understanding the surface-groundwater interaction because they occur where groundwater intersects the land surface. Springs often occur in topographically low areas along river valleys and in outcrop areas where hydrogeologic conditions generally preferentially reject recharge (Deeds and others, 2003). Spring discharges are summarized in Section 2.7.2 of this report.

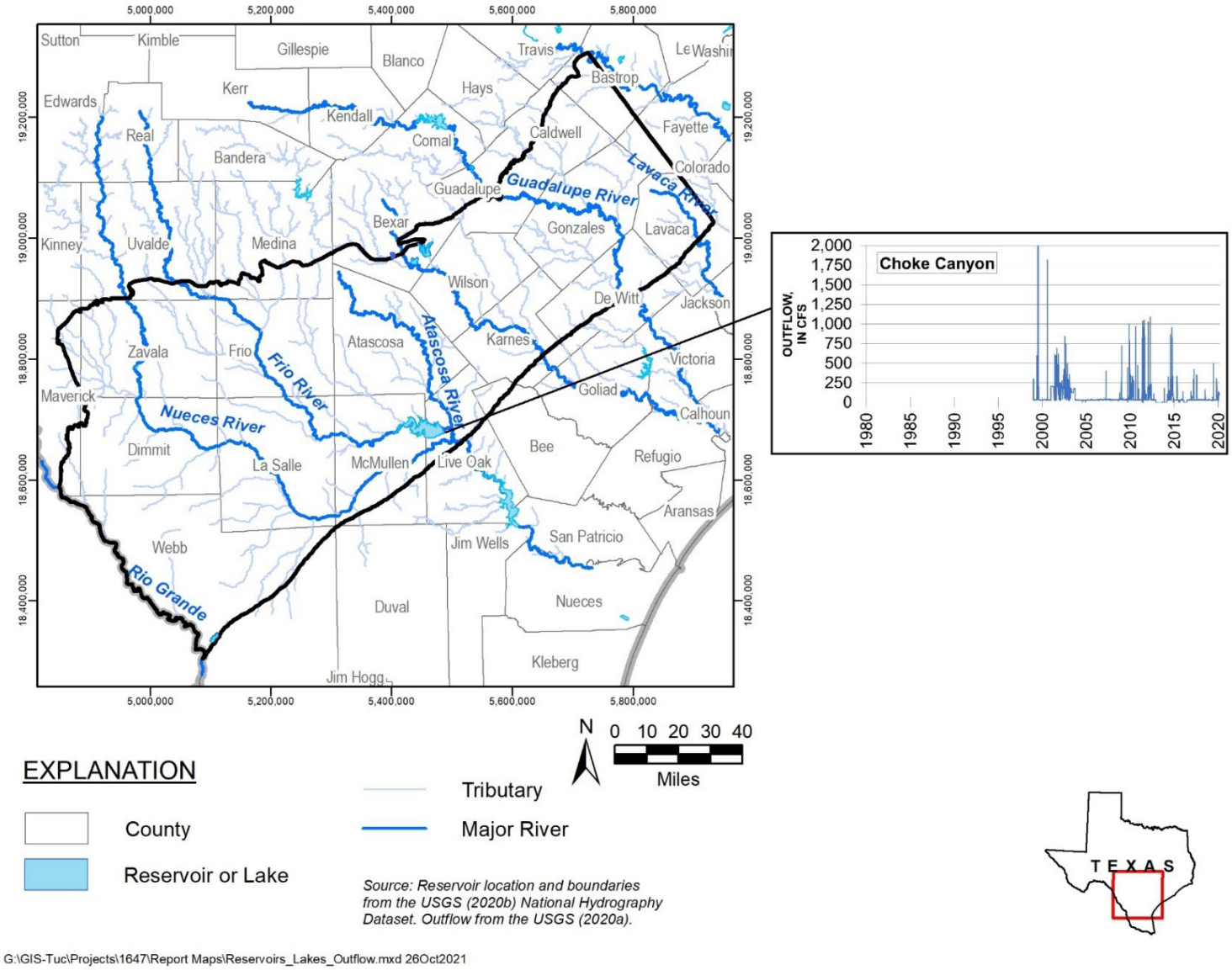


Figure 2-44. Daily Discharge Flows for Selected Reservoirs in Study Area

2.5 Hydraulic Properties

The movement and storage of groundwater through an aquifer is dependent on the structural and geological characteristics that are then described through hydraulic parameters. Important aquifer hydraulic parameters include transmissivity, hydraulic conductivity, specific yield, and specific storage. Transmissivity is the rate of groundwater movement under a 1:1 hydraulic gradient through a unit section of an aquifer 1 foot wide and extending the full saturated thickness of the aquifer (Theis, 1935). Transmissivity is a measure of the ability of an aquifer to transmit groundwater and is equal to the product of hydraulic conductivity and saturated aquifer thickness. Units for transmissivity are feet squared per day (feet^2/day). Hydraulic conductivity is the rate of groundwater movement, under a 1:1 hydraulic gradient, through a unit area of aquifer material (Heath, 1989). Units for hydraulic conductivity are feet per day (feet/day).

Specific yield is the ratio of the volume of water which a saturated porous medium will yield by gravity drainage to the volume of the porous medium (Lohman, 1972). Specific yield is generally applied to unconfined or "water table" aquifers. Specific storage is the volume of water released from or taken into storage per unit volume of the aquifer per unit change in head (units of 1/length) (Lohman, 1972).

For this study, the results from previous studies by Deeds and others (2003) and Kelley and others (2004) were updated with an additional analysis using recent well test data from the TWDB Groundwater Database (TWDB, 2019c). The previous studies utilized a large dataset developed by Mace and others (2002) to estimate aquifer transmissivity and hydraulic conductivity for the aquifer layers simulated in the previous groundwater availability models for the aquifer system. The measurements in the Mace and others (2002) database were compiled from the TWDB and the Texas Commission on Environmental Quality. The final datasets used for the previous modeling studies were obtained from the associated source databases for this model update. The data processing and analysis conducted for the previous studies are described in detail in reports by Deeds and others (2003) and Kelley and others (2004). Each measurement was assigned to an aquifer layer based on well screen or well depth information and elevations of the updated hydrostratigraphic framework described in Section 2.1 of this report, or the assigned layer in the previous model if screen information was not readily available. This process yielded more than 1,220 values of hydraulic conductivity. A total of 112 TWDB measurements from the TWDB (2019c) Groundwater Database were added to the previous dataset using data collected since 2004. TWDB well transmissivity was determined by using the estimation method developed by Driscoll (1986) for unconfined aquifers because yield and drawdown were the only available data. Using this method, transmissivity is equal to specific capacity divided by drawdown multiplied by a factor of 1,500. Transmissivity values were converted to hydraulic conductivity values by dividing by the screen length in the measurement well. Hydraulic conductivity is equal to transmissivity divided by the aquifer thickness at the well based on well screen information.

2.5.1 Hydraulic Conductivity

Hydraulic conductivity is specified in the groundwater model. Aquifer horizontal hydraulic conductivity values from previous studies and current analysis are summarized in Table 2-4. Histograms for estimated hydraulic conductivity values for each aquifer unit are shown on Figure 2-45. The hydraulic properties for each aquifer unit are summarized below. The aquifer properties reported herein are based on available aquifer testing results from datasets previously described, except for the river alluvium which is described using values reported in literature. The range and geometric mean values are representative of the aquifer testing data and might not represent actual properties throughout the entire aquifer layer. The testing data provide a range of possible values for constraining model calibration. Vertical conductance will be evaluated during model calibration. Distributions of aquifer property measurements in the upper aquifer units (Sparta, Weches, Queen City, and Reklaw) and the lower aquifer units (Carrizo and Wilcox Group) are shown on Figure 2-46 through Figure 2-50, respectively. The vast majority of data available for all aquifer units are from wells located at or very near outcrop areas. No hydraulic conductivity data are available for deep, downdip portions of the aquifer system.

Table 2-4. Summary of Estimated Aquifer Hydraulic Conductivity Measurements

	Hydraulic Conductivity (feet per day)			
Aquifer Layer	Count	Minimum	Maximum	Geometric mean
Sparta Aquifer	2	20	100	45.6
Weches Aquitard	--	--	--	--
Queen City Aquifer	279	0.01	750	31.5
Reklaw Aquitard	130	0.01	575	18.5
Carrizo-upper Wilcox	736	0.06	975	32.3
Middle Wilcox	215	0.08	487	8.4
Lower Wilcox	173	0.11	332	5.0
Wilcox (All)*	425	0.08	487	6.9

-- = Not available
*Wilcox (All) includes measurements reported for the upper, middle, and lower Wilcox layers plus measurements from the TWDB Groundwater Database assigned to "Carrizo-Wilcox" or "Wilcox" based on large well screen intervals at the tested wells.
Source: Deeds and others (2003), Kelley and others (2004), TWDB Groundwater Database (2019c).

Most available measurements for the Wilcox aquifer layers are within logarithmic values near 0 and up to 1 which represents a more constrained distribution of hydraulic conductivity. Hydraulic conductivity distribution is less constrained in the Queen City, Reklaw, and Carrizo aquifer layers. There is a degree of variation in hydraulic conductivity measurements that suggests levels of heterogeneity within the layers. There was abundant data for most layers, except for the Sparta Aquifer, Weches Aquitard, and upper Wilcox aquifer layer.

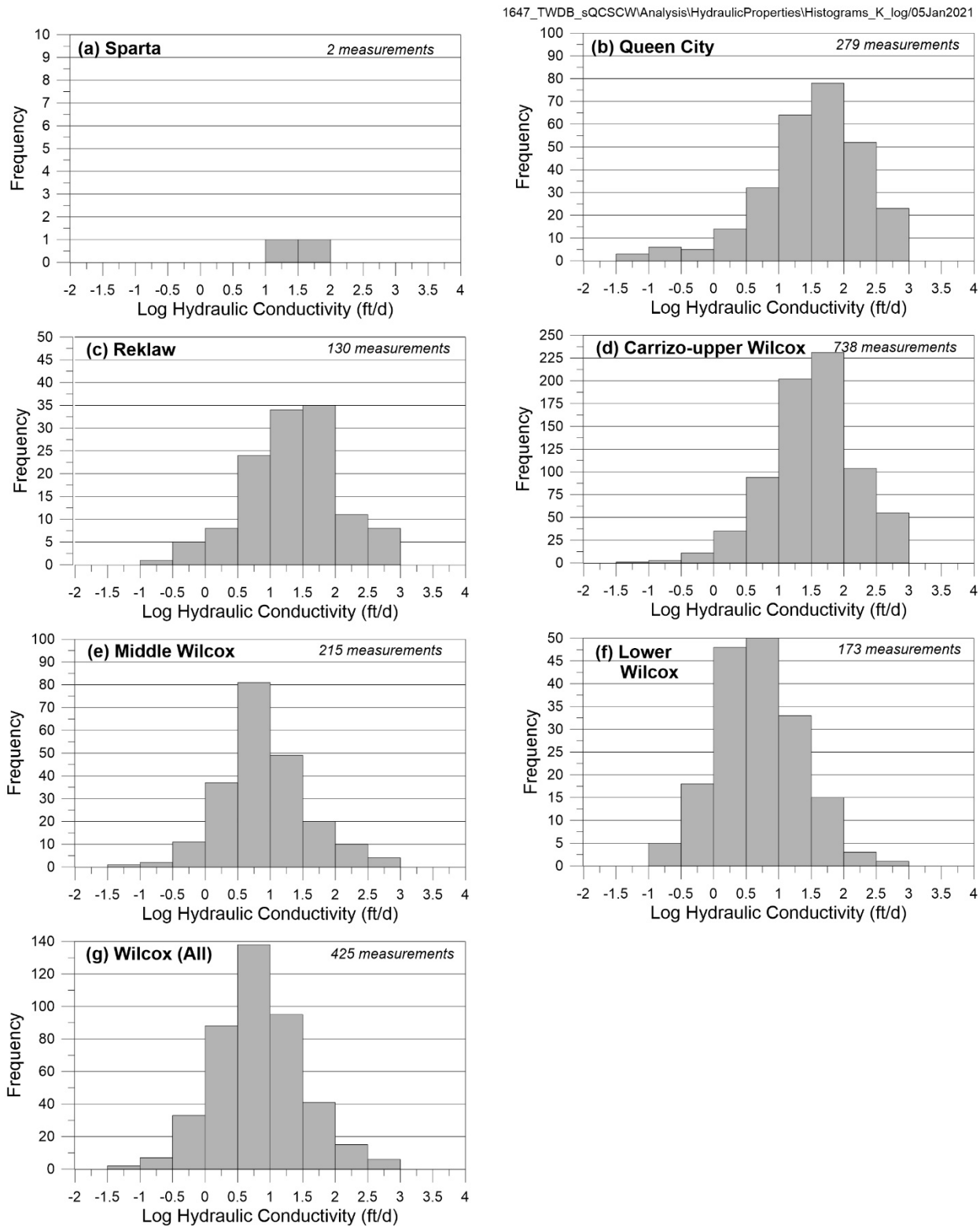


Figure 2-45. Histograms of Measured Hydraulic Conductivity

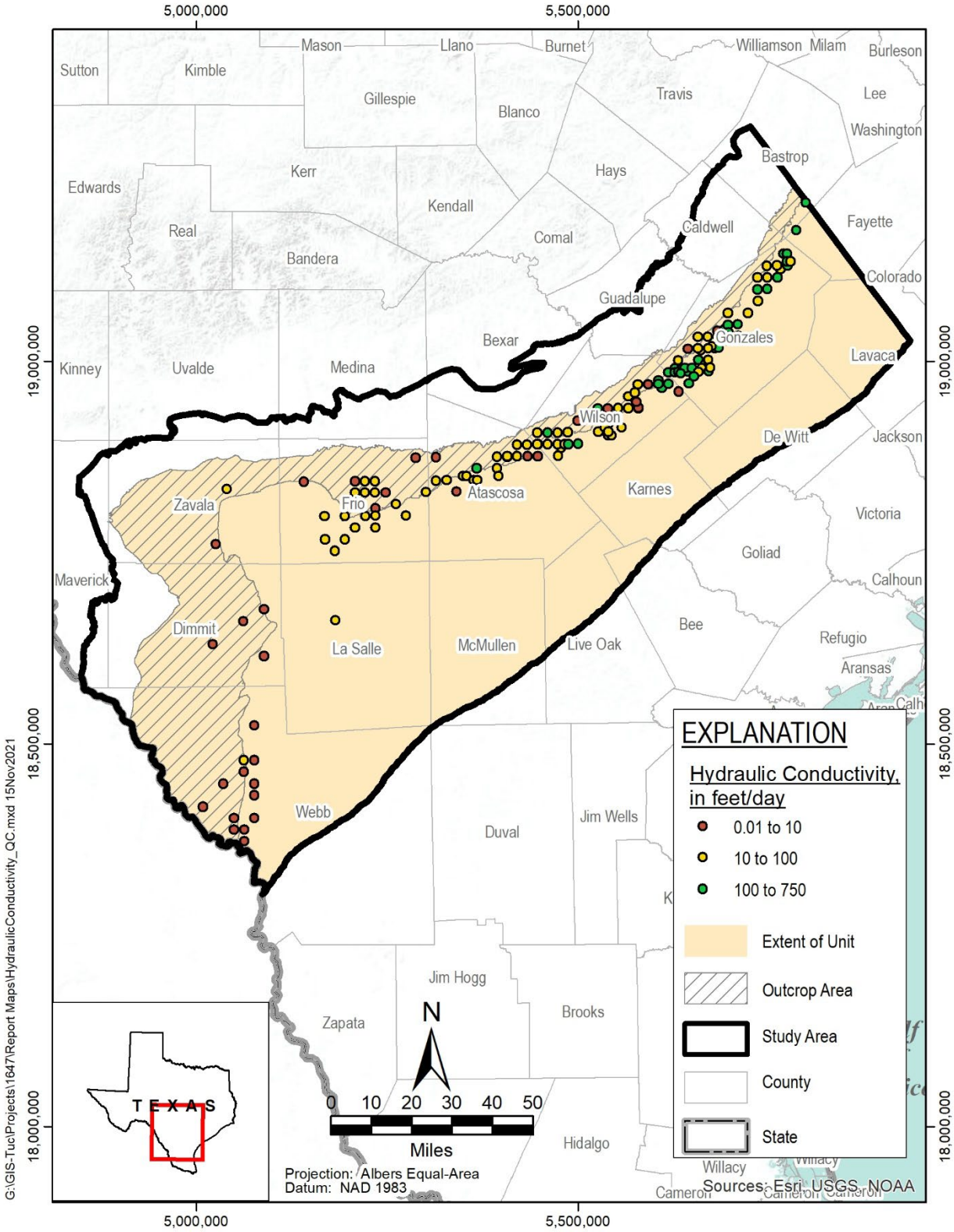


Figure 2-46. Hydraulic Conductivity Measurement Locations for Queen City Aquifer

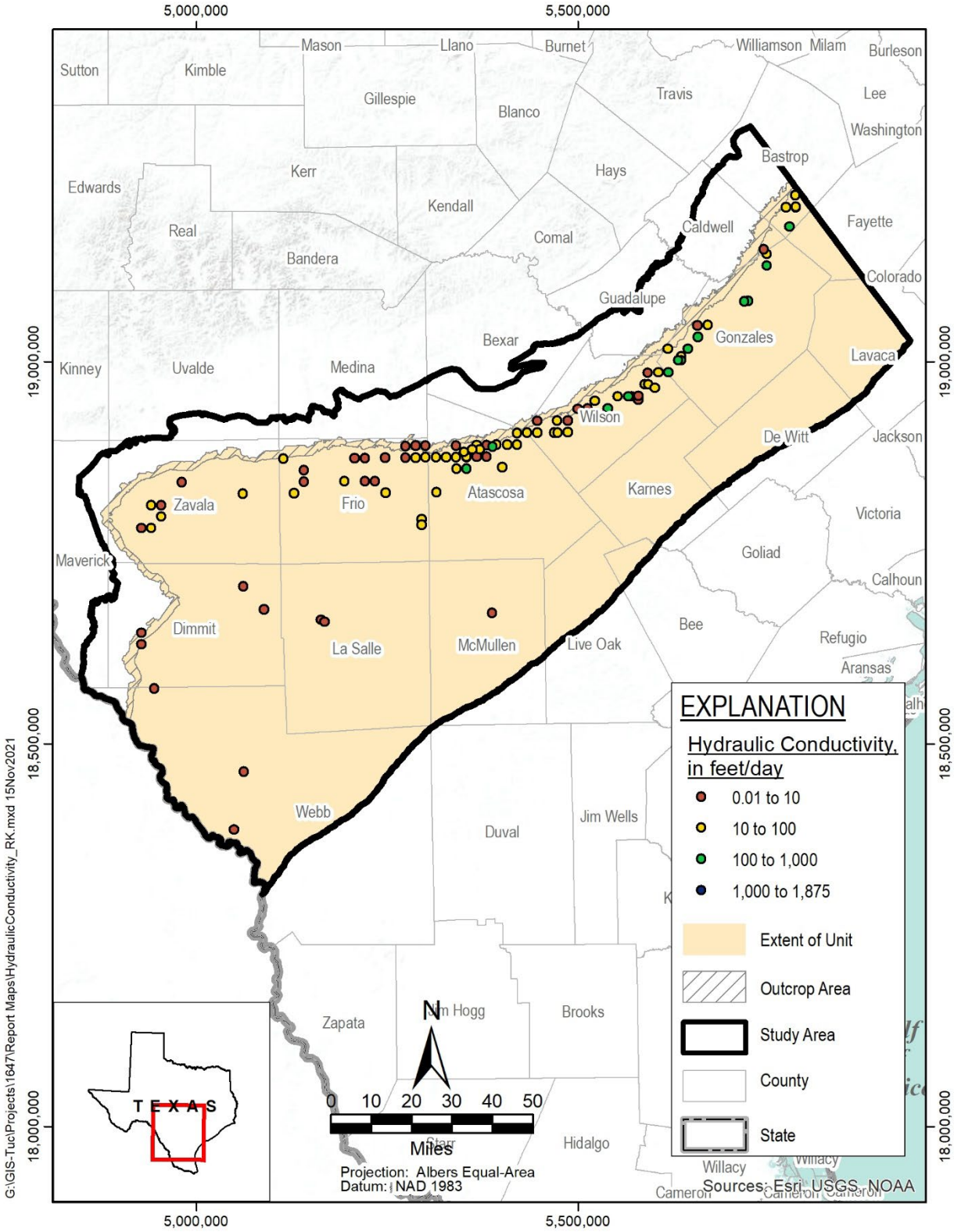


Figure 2-47. Hydraulic Conductivity Measurement Locations for Reklaw Aquitard

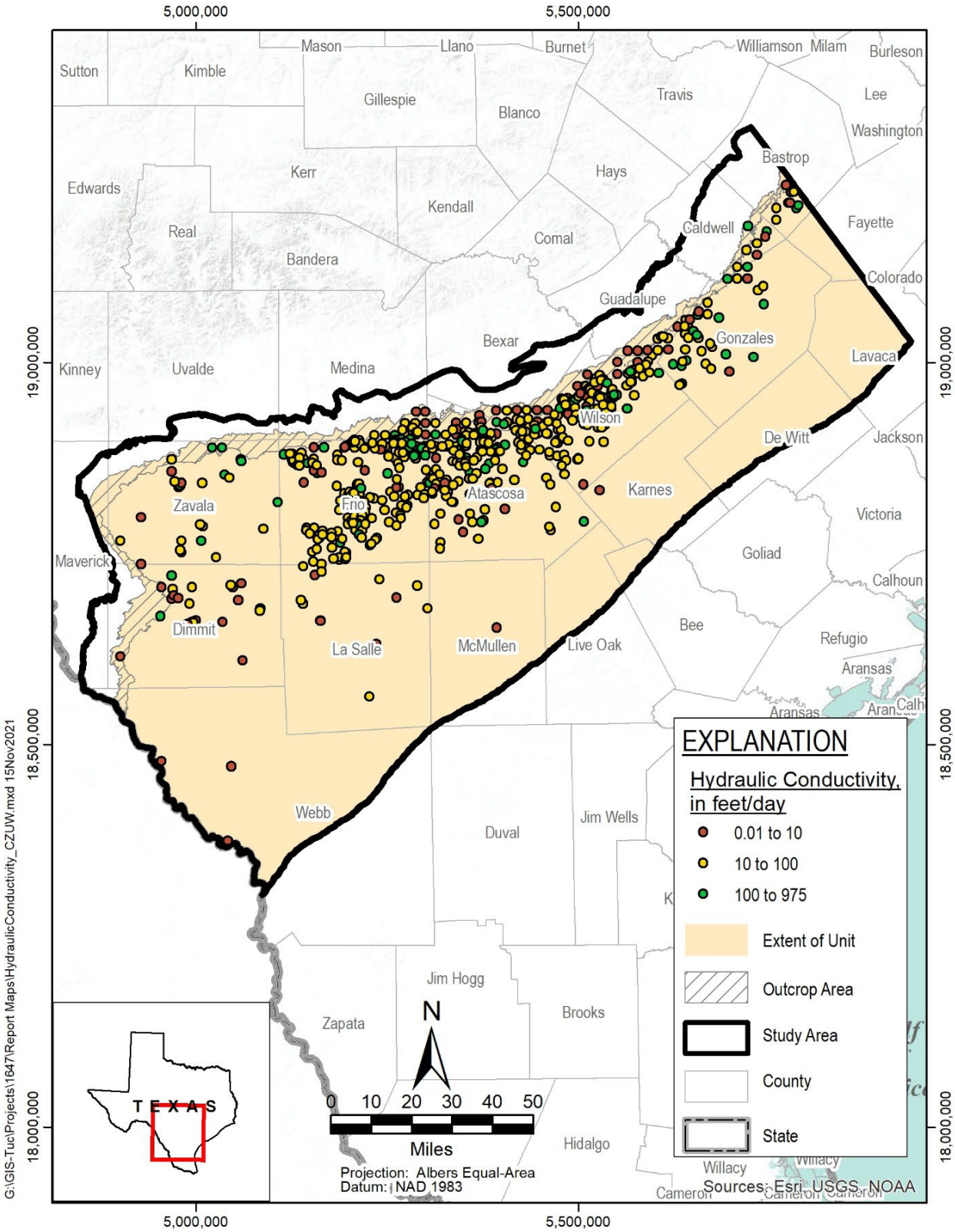


Figure 2-48. Hydraulic Conductivity Measurement Locations for Carrizo-Upper Wilcox Aquifer Interval

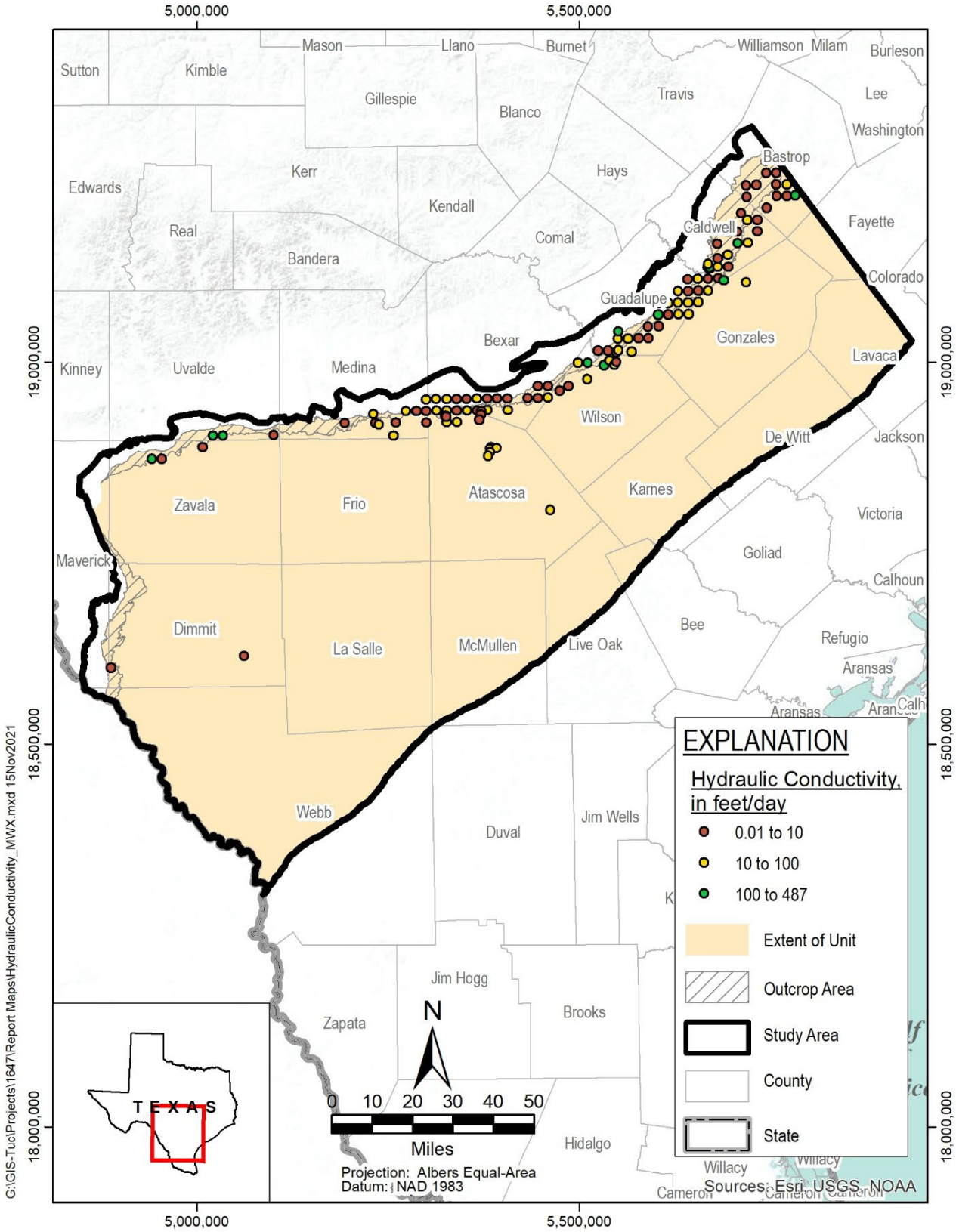


Figure 2-49. Hydraulic Conductivity Measurement Locations for Middle Wilcox Aquifer

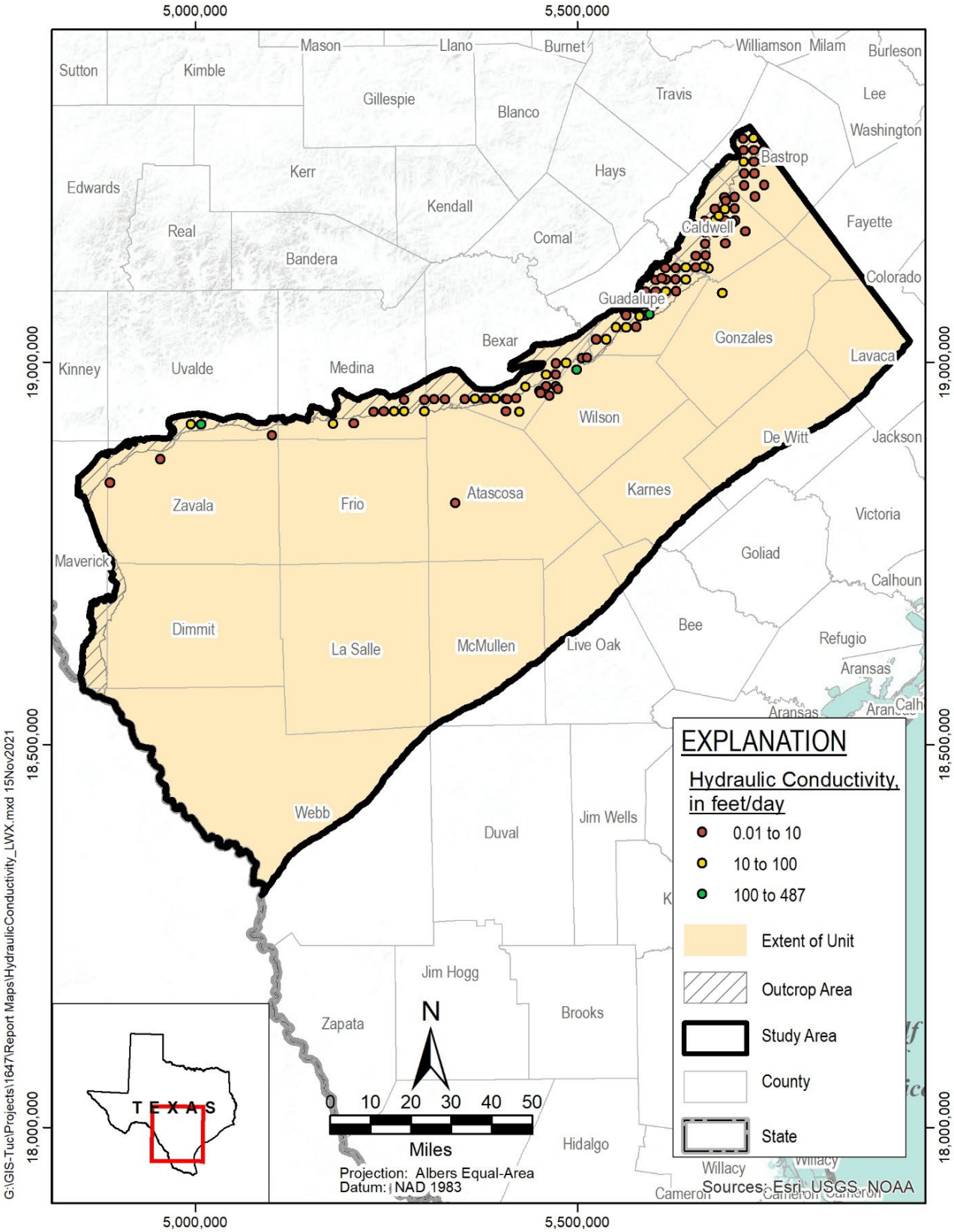


Figure 2-50. Hydraulic Conductivity Measurement Locations for Lower Wilcox Aquifer

2.5.1.1 River Alluvium

No measurements of hydraulic properties for river alluvium were available for the study area. Assuming a lithology of sandy gravel, hydraulic conductivity values for the river alluvium deposits range from approximately 10 feet/day to 1,000 feet/day (Freeze and Cherry, 1979).

2.5.1.2 Sparta Aquifer

Aquifer test data for the Sparta Aquifer are very limited (2 measurements) (Table 4-5). Based on these measurements, hydraulic conductivity values range from 20 feet/day to 100 feet/day, with a geometric mean of approximately 45.6 feet/day. Hydraulic conductivity values simulated in the previous groundwater availability model by Kelley and others (2004) for this area ranged from 3 to 5 feet/day in the outcrop to less than 0.1 feet/day in the deep, downdip portions of the layer.

2.5.1.3 Weches Aquitard

No aquifer test data are available from wells constructed in the Weches Aquitard. The previous groundwater availability model by Kelley and others (2004) specified a vertical hydraulic conductivity value equal to $1x10^{-4}$ feet/day.

2.5.1.4 Queen City Aquifer

Estimated hydraulic conductivity values for the Queen City Aquifer range from 0.01 feet/day to 750 feet/day, with a geometric mean of 31.5 feet/day. The measurement values are distributed principally in the outcrop areas in the eastern parts of the study area (Figure 2-46).

2.5.1.5 Reklaw Aquitard

Estimated hydraulic conductivity values range from 0.01 feet/day to 575 feet/day, with a geometric mean of 18.5 feet/day. The measurement values are distributed principally in the outcrop areas in the eastern parts of the study area (Figure 2-47). The previous groundwater availability model by Kelley and others (2004) specified a vertical hydraulic conductivity value equal to $1x10^{-4}$ feet/day. Data suggest that zones of higher conductivity could occur in local areas of this aquitard layer, which is consistent with observations of cross-formational flows from the Carrizo-Wilcox Aquifer to the Queen City Aquifer discussed in Section 2.8.4 of this report.

2.5.1.6 Carrizo-Upper Wilcox

Estimated hydraulic conductivity values for the Carrizo-upper Wilcox aquifer layer range from 0.06 feet/day to 975 feet/day, with a geometric mean of 32.3 feet/day. More measurement values are available for this aquifer layer than other layers, which indicates that this layer is the principal groundwater source in the study area. The measurement values are distributed principally in the outcrop areas; however, a relatively large number of measurement values are available for down-dip areas as well (Figure 2-48).

2.5.1.7 Middle Wilcox

Estimated hydraulic conductivity values for the middle Wilcox range from 0.08 feet/day to 487 feet/day, with a geometric mean of 8.4 feet/day. Locations of measured data for the middle Wilcox are principally in the outcrop area with less points in the downdip portions than upper Wilcox interval (Figure 2-49).

2.5.1.8 Lower Wilcox

Estimated hydraulic conductivity values for the lower Wilcox range from 0.11 feet/day to 332 feet/day, with a geometric mean of 5 feet/day. Similar to the upper Wilcox interval, locations of measured data for the lower Wilcox are limited to the outcrop areas with very few measurements in downdip portions of the aquifer layer (Figure 2-50).

Although numerous wells in the study area have measurements of hydraulic properties, there are large areas where data are not available which prevents a comprehensive understanding of hydraulic properties of the aquifer system as a whole. This is especially true for the deep, downdip portions of the aquifer units.

The previous groundwater availability model by Kelley and others (2004) scaled initial hydraulic conductivities as a function of sand fraction and representative conductivities for clay and sand. Values were generally unchanged during calibration. Vertical conductivity throughout the Reklaw aquitard was decreased to better represent a confining unit.

Calibrated hydraulic conductivity distributions from the previous groundwater availability model by Kelley and others (2004) were evaluated for this study. Simulated hydraulic conductivities in the study area for the Sparta Aquifer ranged from less than 0.1 to about 5 feet/day. Simulated hydraulic conductivities in the Queen City Aquifer are similar to the Sparta Aquifer, with a range from less than 0.1 to about 10 feet/day. The Carrizo Aquifer is specified with the largest hydraulic conductivities, ranging from less than 0.1 to about 100 feet/day. The upper and middle Wilcox both have minimum specified hydraulic conductivities of 1 feet/day, but with maximums of 7 and 10 feet/day, respectively. The lower Wilcox unit has the second highest specified hydraulic conductivities in the model area, ranging from 2 feet/day to 30 feet/day, with an average of 2.2 feet/day. The confining layers of Weches and Reklaw both were specified with a hydraulic conductivity of 1 feet/day.

Data for vertical hydraulic conductivity within the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer system are not available for this study. Groundwater models are often used to estimate vertical hydraulic conductivity at a regional scale. A typical ratio of horizontal to vertical hydraulic conductivity (vertical anisotropy) ranges from 1 to 1,000 for model applications. The previous groundwater availability model estimated vertical hydraulic conductivity based on sand and clay fractions. In that model, a vertical hydraulic conductivity value of $1x10^{-4}$ feet/day was specified for confining units, which is equivalent to the approximate conductivity for a clay material. This value was selected based on the expectation that vertical hydraulic conductivity is controlled by depositional environmental and lithofacies (Kelley and others, 2004). Model input datasets for the

previous groundwater availability model for the southern portion of the Queen City and Sparta aquifers indicate horizontal isotropic hydraulic conductivity properties, which means horizontal conductivity is equal in all directions.

2.5.2 Storage Properties

Few measurements of aquifer storage properties are available for the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer system. The TWDB (Meyers, 1969) compiled results of aquifer tests in Texas, available from the TWDB, United States Geological Survey, and other agencies, to provide reference to the hydraulic properties of the various aquifers in the state. Eighteen storage coefficient measurements reported by Myers (1969) for the Queen City, Carrizo, and Wilcox aquifers in the study area are shown on Figure 2-51. Most measurements were obtained at wells located in down-dip portions of the aquifers, representing confined aquifer conditions; however, some measurements were obtained at or near the outcrop area. Storage coefficient values range from $7x10^{-5}$ to $4x10^{-2}$ (dimensionless) in the Carrizo Aquifer, and $3x10^{-3}$ to $1x10^{-2}$ (dimensionless) in the Wilcox Aquifer. The single measurement for the Queen City Aquifer is $8x10^{-5}$ (dimensionless).

Deeds and others (2003) and Kelley and others (2004) specified values for specific yield and specific storage that allowed the model to reproduce measured changes in groundwater levels throughout the study area. Specific yield values for the Sparta, Queen City, Carrizo, and Wilcox aquifer layers were specified with a specific yield value of 0.15. A specific yield value of 0.10 is specified for the Weches and Reklaw confining layers. Typical specific yields for sedimentary materials range from 0.1 to 0.3 (Freeze and Cherry, 1979).

Storativity values from the previous groundwater availability model by Kelley and others (2004) were unchanged during calibration of that model. For the Weches, Queen City, Reklaw, and Carrizo aquifer layers, storativity was estimated for the model by calculating specific storage as a function of sand fraction, specific storage of sand and clay, and depth and then multiplying by layer thickness. Average storativity values specified for these layers are $1.1x10^{-3}$, $3.4x10^{-4}$, $3.8x10^{-3}$, $1.3x10^{-3}$, and $1.3x10^{-3}$ (dimensionless), respectively. Average specified specific storage values for these layers are $3.7x10^{-6}$, $5.3x10^{-6}$, $3.4x10^{-6}$, $4.5x10^{-6}$, and $2.8x10^{-6}$ 1/feet, respectively. Storativity values specified for the three Wilcox layers in a previous groundwater availability model by Deeds and others (2003) were also specified in the groundwater availability model by Kelley and others (2004). Storativity for the Wilcox layers is not explicitly reported by Kelley and others (2004); however, specific storage is reported to be $4.5x10^{-6}$ 1/feet for all Carrizo-Wilcox aquifer layers.

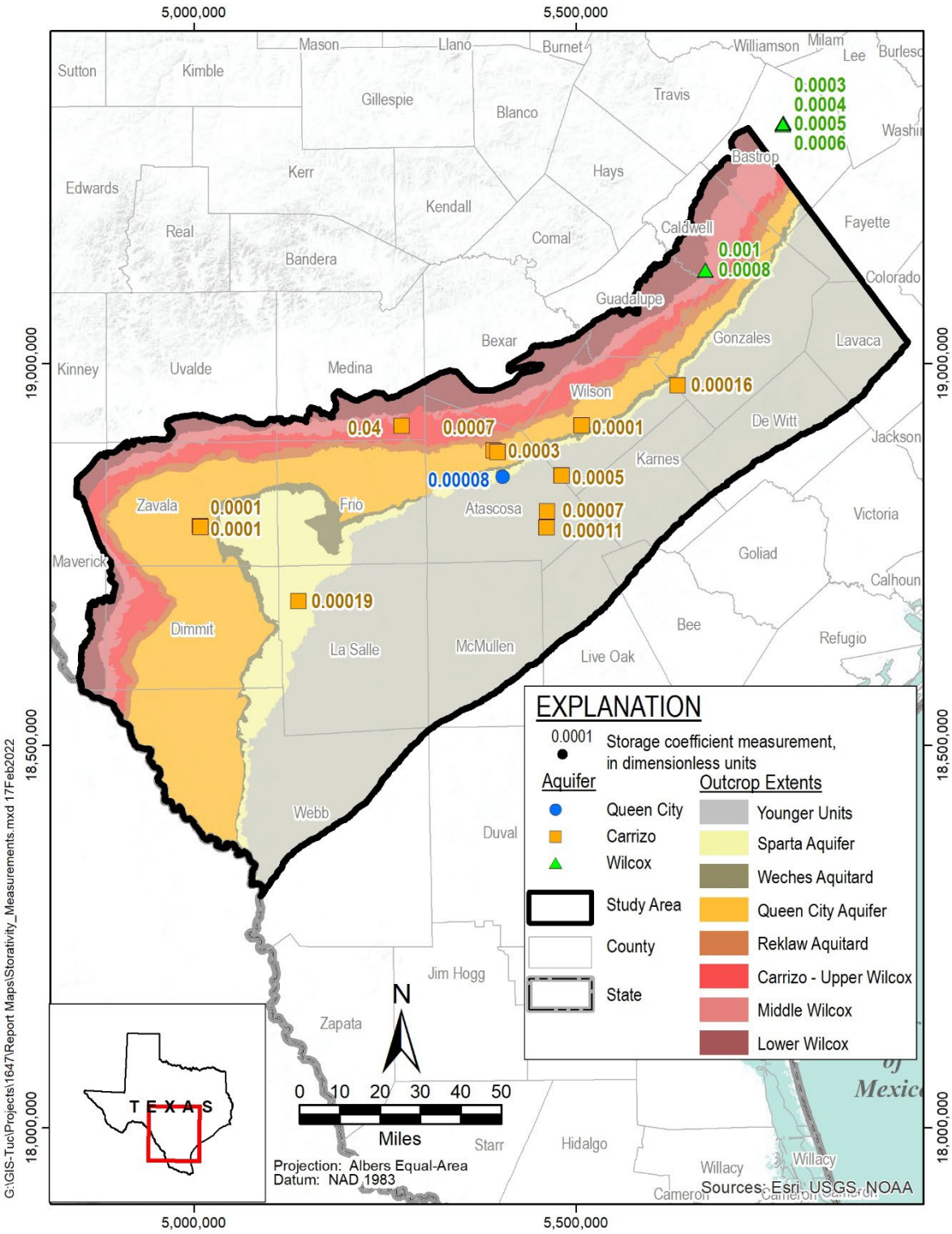


Figure 2-51. Storage Coefficient Measurement Locations for Aquifers in the Study Area from Meyers (1969)

2.5.3 Net Sand Thickness

The aquifer units in the study area comprise of thick, laterally continuous permeable fluvio-deltaic sands. Groundwater movement predominantly occurs within the sand intervals. Net sand fraction information could be used to scale aquifer hydraulic properties during model calibration. The model calibration report will summarize the use, if any, of this information in the model.

Sand distribution and thickness are important aquifer properties in quantifying groundwater volumes and estimating hydraulic properties of the hydrostratigraphic units of the study area. Geological formations within the study are generally comprised of interbedded layers of sand and clay. Those units which contain higher sand content or cumulative sand thickness are more capable of producing groundwater economically. Units which are chiefly comprised of clay act as aquitards, which may also contain smaller amounts of groundwater but restrict the movement of groundwater from one aquifer to another.

Net sand and percent sand thickness maps were prepared for each hydrostratigraphic unit using lithologic interval data from existing and updated interpretations of geophysical well logs and existing descriptions of lithology from driller's logs. The primary source of data was from the TWDB Brackish Resources Aquifer Characterization System Database which includes lithologic interpretations from Hamlin and others (2019), Meyer and others (2020), Wise (2014), and Kelley and others (2004). Source data for lithologic intervals from geophysical interpretations were classified using a two-tier system (100 percent sand or 100 percent clay per interpreted interval) or a four-tier system which provided varied sand percentages. Source data from driller's logs, which inherently vary widely in description, were simplified to a four-tier system by Meyer and others (2020). For this study, existing interval data with four-tier classification were modified to a two-tier system for consistency among sources.

In total, 3,469 wells had lithologic interpretations. The lithologic interpretations were grouped by hydrostratigraphic unit as determined by existing or updated hydrostratigraphic contact interpretations from borehole electrical logs in the Brackish Resources Aquifer Characterization System Database. Where hydrostratigraphic contact interpretations were not available, the updated model framework raster layers were evaluated to the wells to group the lithologic interpretations by the inferred hydrostratigraphic unit and were included in the net sand analysis where more spatial representation was needed such as outcrop areas.

For each hydrostratigraphic unit, the net sand analysis prioritized well locations where the lithologic interpretations represented the full hydrostratigraphic interval. These locations were determined by wells fully penetrating the unit based on hydrostratigraphic contacts from the borehole electrical log analysis. Where needed for adequate spatial distribution, select locations were included if the lithologic interpretation represented at least 80 percent of the hydrostratigraphic unit thickness. In a few instances, some locations were disregarded if they did not support the regional trend, particularly from driller's log source data.

Net sand thickness was calculated at each well as the sum of the sand intervals, as classified by the two-tier system, for each hydrostratigraphic model layer. Percent sand was calculated at each well by the ratio of the net sand to hydrostratigraphic model layer thickness. Table 2-5 provides the number of wells used for each hydrostratigraphic unit and the average percent sand for all wells.

Table 2-5. Summary of Percent Sand for Aquifer Units

Hydrostratigraphic Unit	Number of Well Locations Used	Average Percent Sand
Sparta	293	0.35
Weches	421	0.08
Queen City	460	0.39
Reklaw	465	0.15
Carrizo - Upper Wilcox	527	0.65
Middle Wilcox	571	0.27
Lower Wilcox	535	0.45

Percent sand raster files were prepared by interpolating the percent sand values at each well using the inverse distance weighted method in ArcGIS. These raster files were then converted into net sand raster files using GIS spatial analysis tools and the framework model layer thickness raster files. Percent sand was interpolated first to ensure the net sand thickness did not exceed the hydrostratigraphic unit thickness particularly for the thinning outcrop areas with limited data availability.

2.5.3.1 Sparta Aquifer

A total of 293 well locations were used to prepare the net sand thickness and percent sand maps of the Sparta Aquifer (Figure 2-52). Net sand thickness values ranged from 0 at the updip outcrop edge to over 350 feet in the southwestern portion of the study area in Webb County. A depocenter of maximum sand thickness is formed in the southwest portion of the study area and generally trends northeast-southwest.

2.5.3.2 Weches Aquitard

A total of 421 well locations were used to prepare the net sand and percent sand maps of the Weches aquitard (Figure 2-53). The Weches aquitard is relatively thin and generally greater than 80 percent shale/clay (less than 20 percent sand) across most of the study area.

2.5.3.3 Queen City Aquifer

A total of 460 well locations were used to prepare the net sand thickness and percent sand maps of the Queen City aquifer (Figure 2-54). Net sand thickness values ranged from 0 at the updip outcrop edge to over 1,100 feet in the large depocenter that trends southwest-northeast from Webb County to Atascosa County, similar to the net sand trend in the Sparta Aquifer.

2.5.3.4 Reklaw Aquitard

A total of 465 well locations were used to prepare the net sand thickness and percent sand maps of the Reklaw aquitard (Figure 2-55). The Reklaw aquitard, similar to the Weches, is relatively thin and generally greater than 80 percent shale/clay (less than 20 percent sand), although localized zones of increased sand exist.

2.5.3.5 Carrizo-Upper Wilcox

A total of 527 well locations were used to prepare the net sand thickness and percent sand maps of the Carrizo-upper Wilcox interval (Figure 2-56). Net sand thickness values ranged from 0 at the updip outcrop edge to over 1,000 feet in the depocenter formed in the central area of Atascosa, Karnes, and Wilson counties. This depocenter is chiefly composed of coarse-grained bed-load fluvial channel deposits (Hamlin, 1988). As the principal aquifer source, the Carrizo-upper Wilcox interval comprises the highest sand content of the model area. Sand percent ranges from greater than 90 percent in the eastern updip area to about 50 percent or less to the west and along the Rio Grande.

2.5.3.6 Middle Wilcox

A total of 571 well locations were used to prepare the net sand thickness and percent sand maps of the middle Wilcox interval (Figure 2-57). Net sand thickness ranged from 0 to over 600 feet in the northeastern corner but is generally less than 300 feet across the study area. The middle Wilcox interval varies significantly in some areas but is generally about 70 percent shale/clay (30 percent sand) and may act as an aquitard and flow barrier between the Carrizo-upper Wilcox and lower Wilcox intervals in certain areas. The middle Wilcox interval also includes the distinct Yoakum canyon which trends generally north-south in Gonzales, DeWitt, and Lavaca counties and results in a thick wedge of shale which is not discernable on the net sand thickness map but is apparent on the percent sand map and where sand content is less than 10 percent. The Yoakum canyon was a large submarine channel that was filled with shale deposits of the Middle Wilcox (Hargis, 2009).

2.5.3.7 Lower Wilcox

A total of 535 well locations were used to prepare the net sand thickness and percent sand maps of the Lower Wilcox interval (Figure 2-58). Net sand thickness values ranged from 0 at the updip outcrop edge to over 1,800 feet in the depocenter in the northeast, down-dip portion of the study area which then thins with a trend to the southwest. The elongated depocenter is generally about 60 percent sand and decreases in sand content both in the updip and downdip direction. In Gonzales, DeWitt, and Lavaca counties, the effect of the Yoakum canyon incision into the lower Wilcox interval which resulted in a thinner overall unit thickness along the canyon is apparent due to the generally north-south trend of decreased sand thickness.

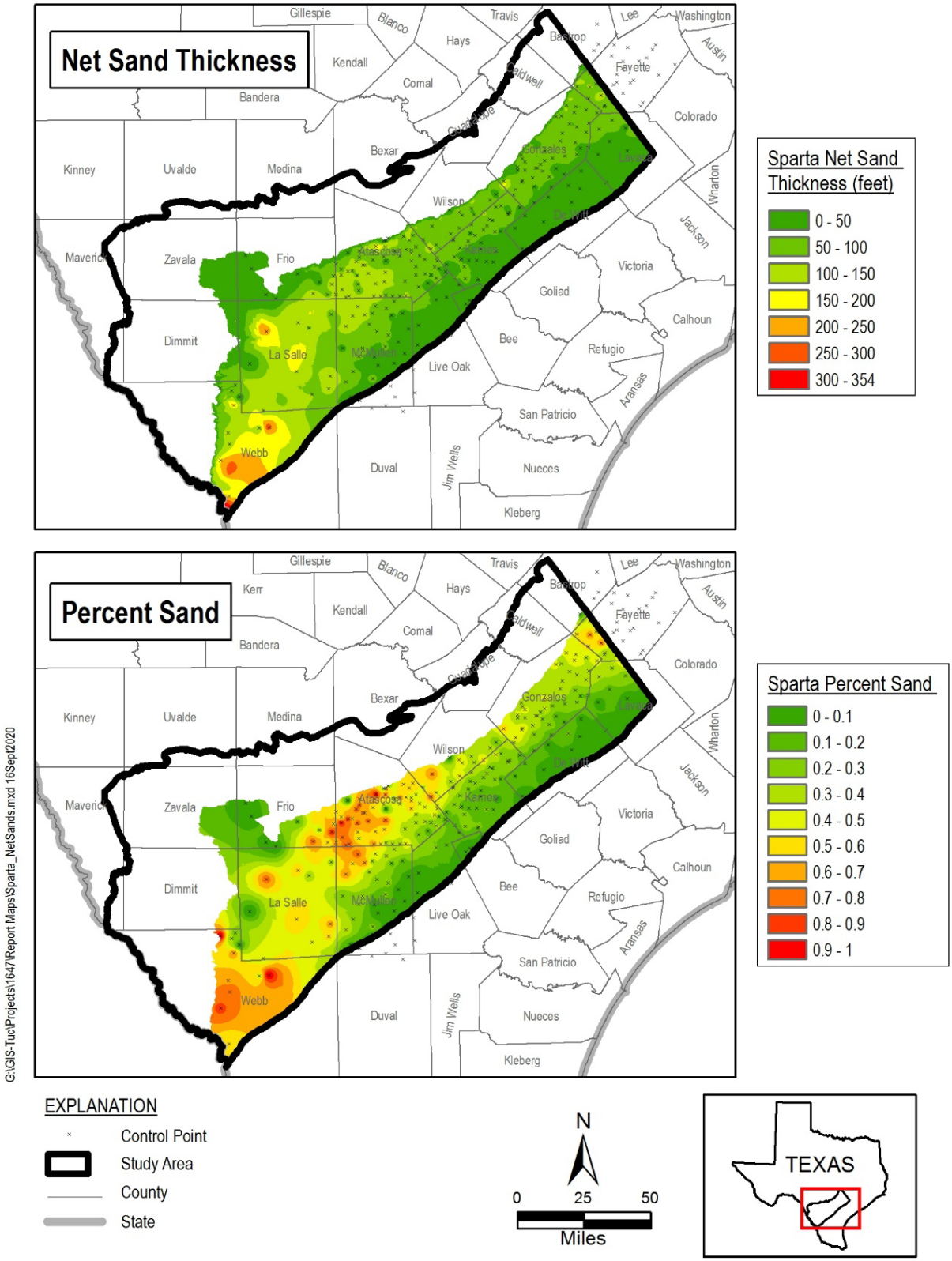


Figure 2-52. Net Sand Thickness and Percent Sand for Sparta Aquifer

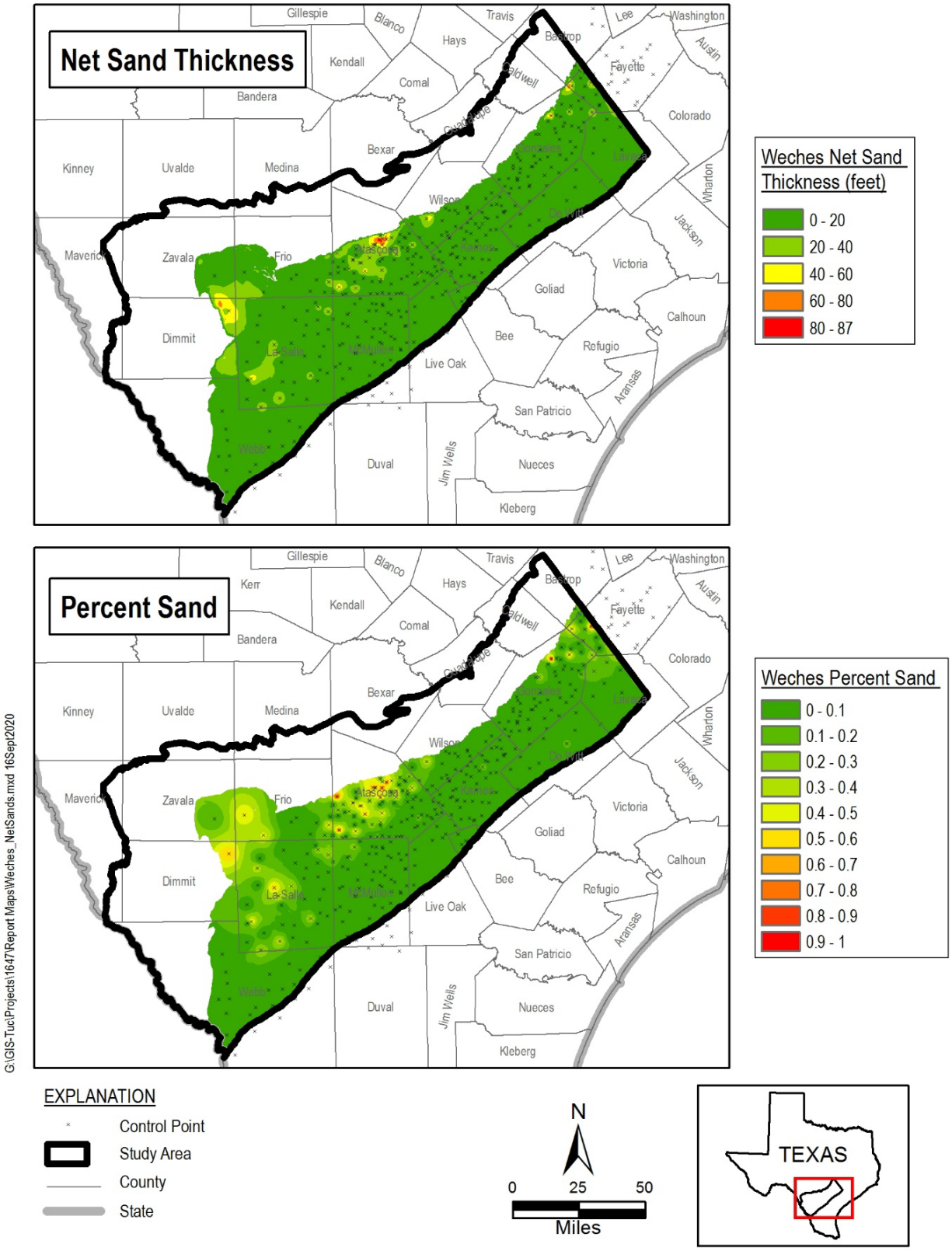


Figure 2-53. Net Sand Thickness and Percent Sand for Weches Aquitard

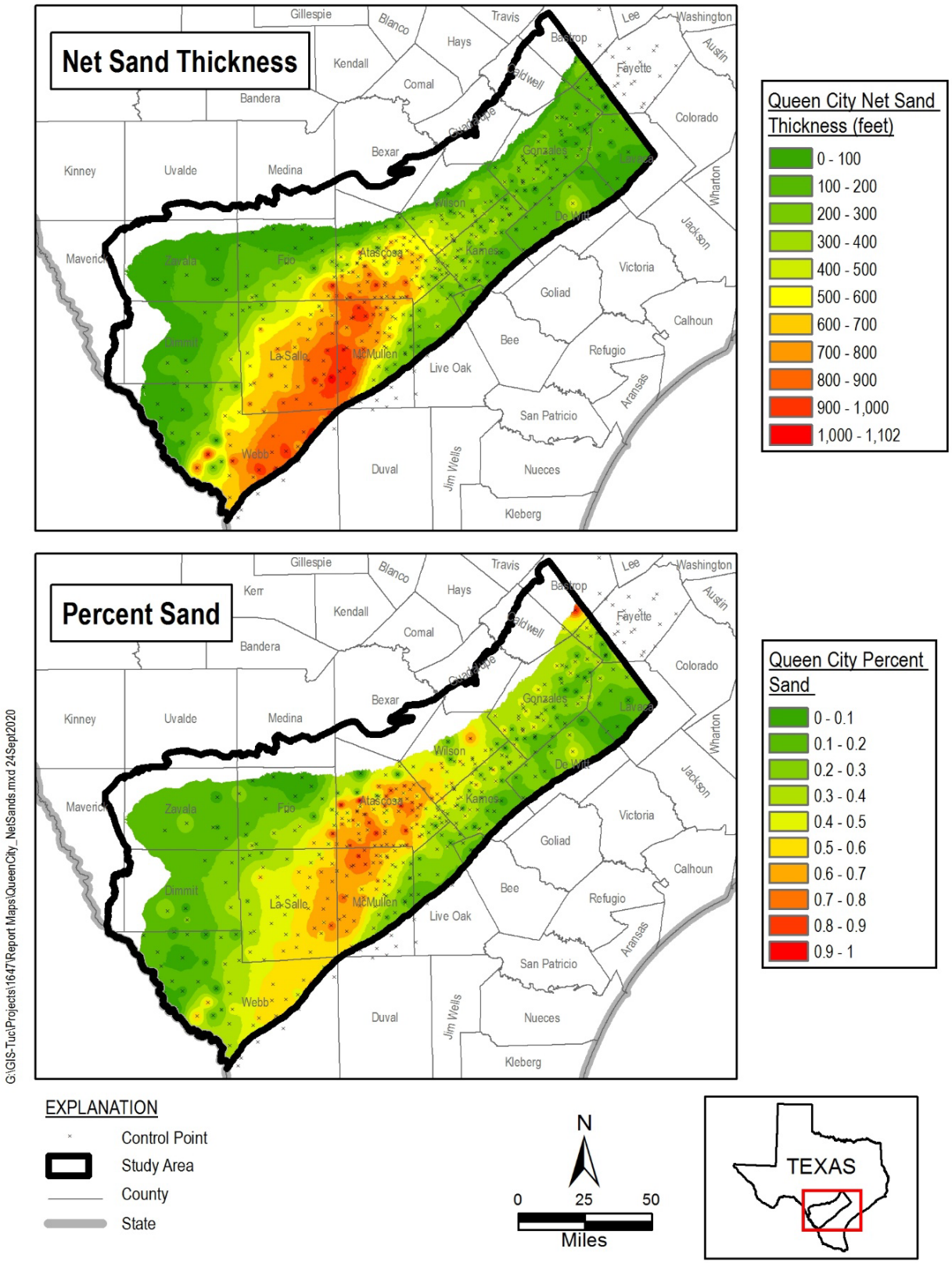


Figure 2-54. Net sand Thickness and Percent Sand for Queen City Aquifer

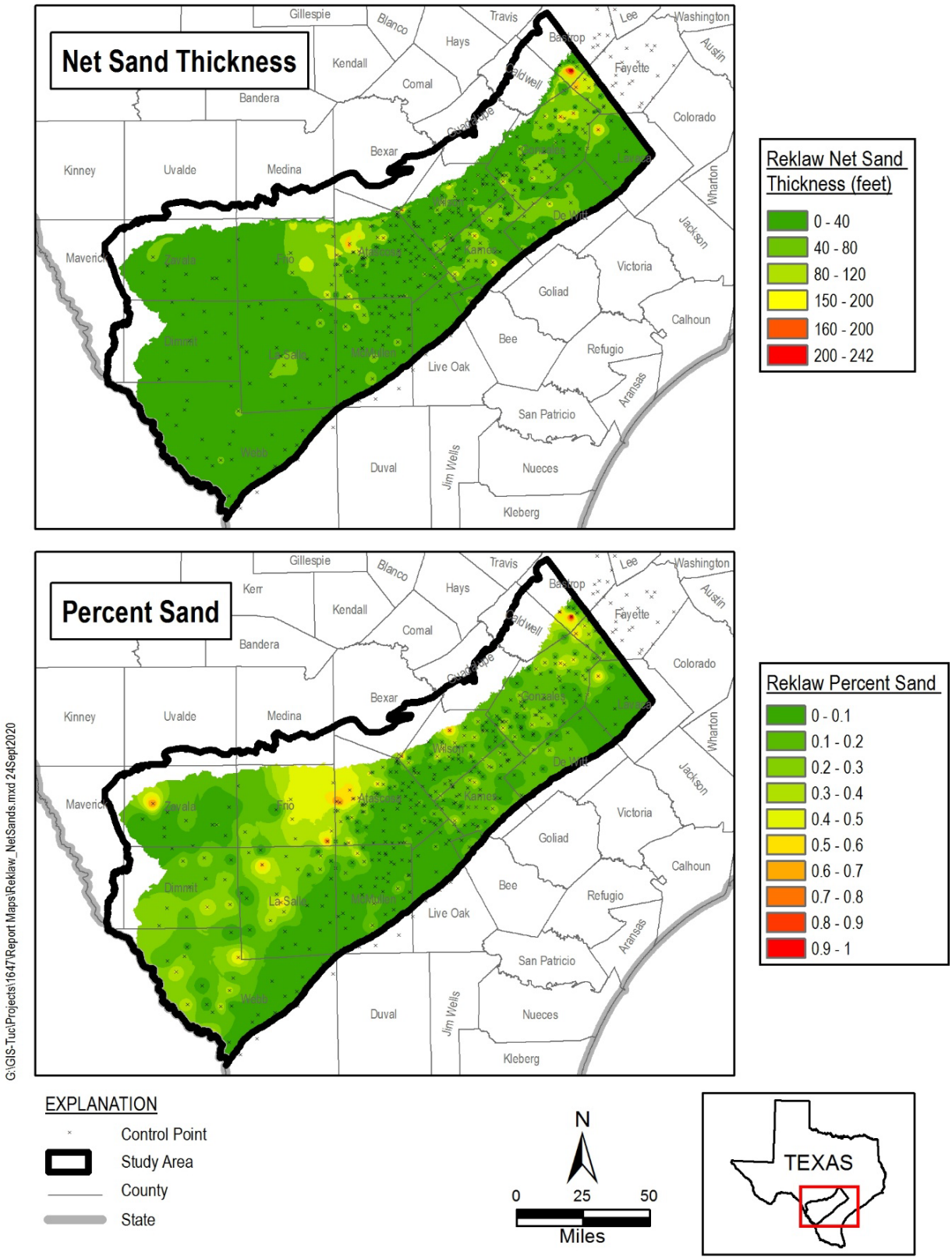


Figure 2-55. Net Sand Thickness and Percent Sand for Reklaw Aquitard

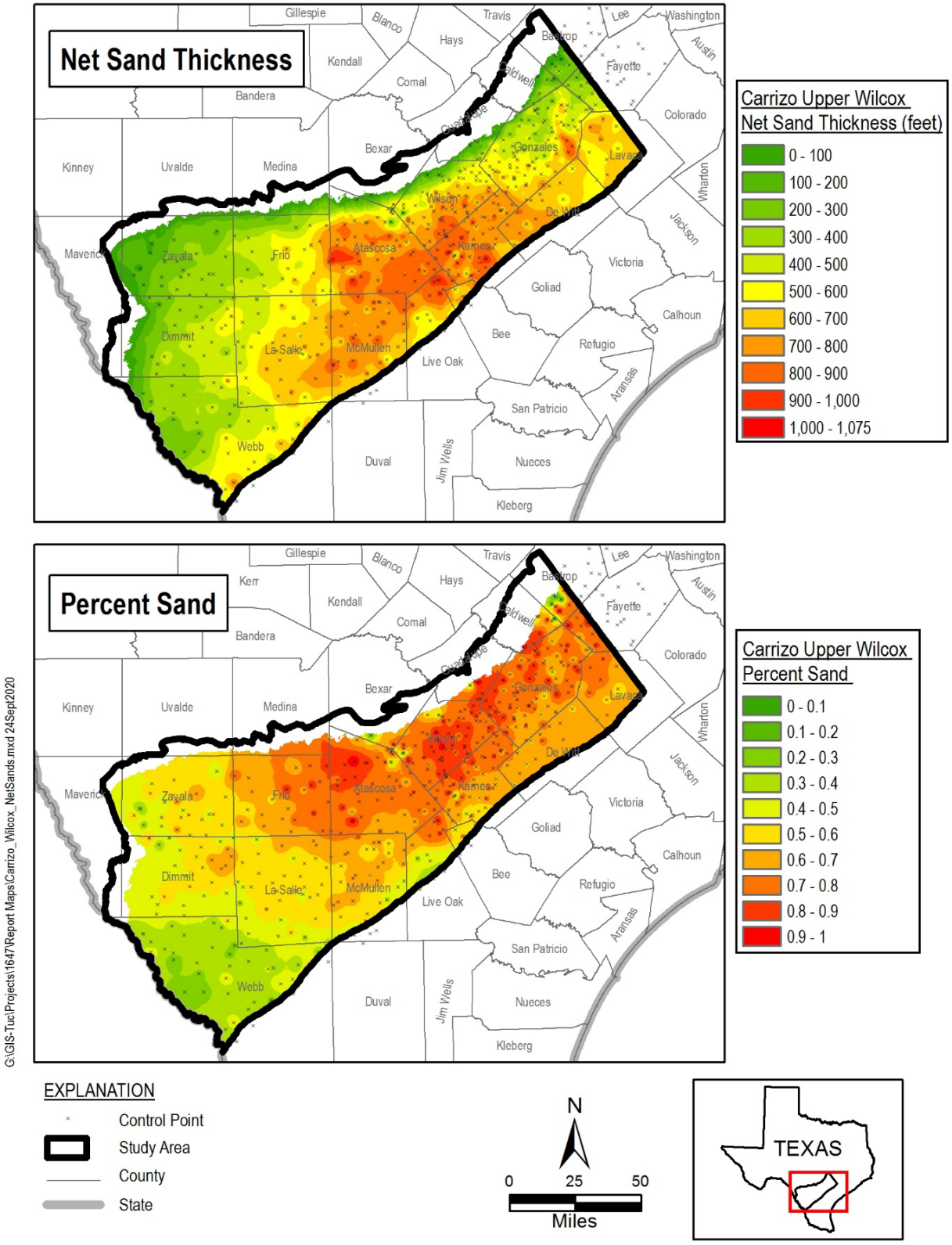


Figure 2-56. Net Sand Thickness and Percent Sand for Carrizo-Upper Wilcox Aquifer Interval

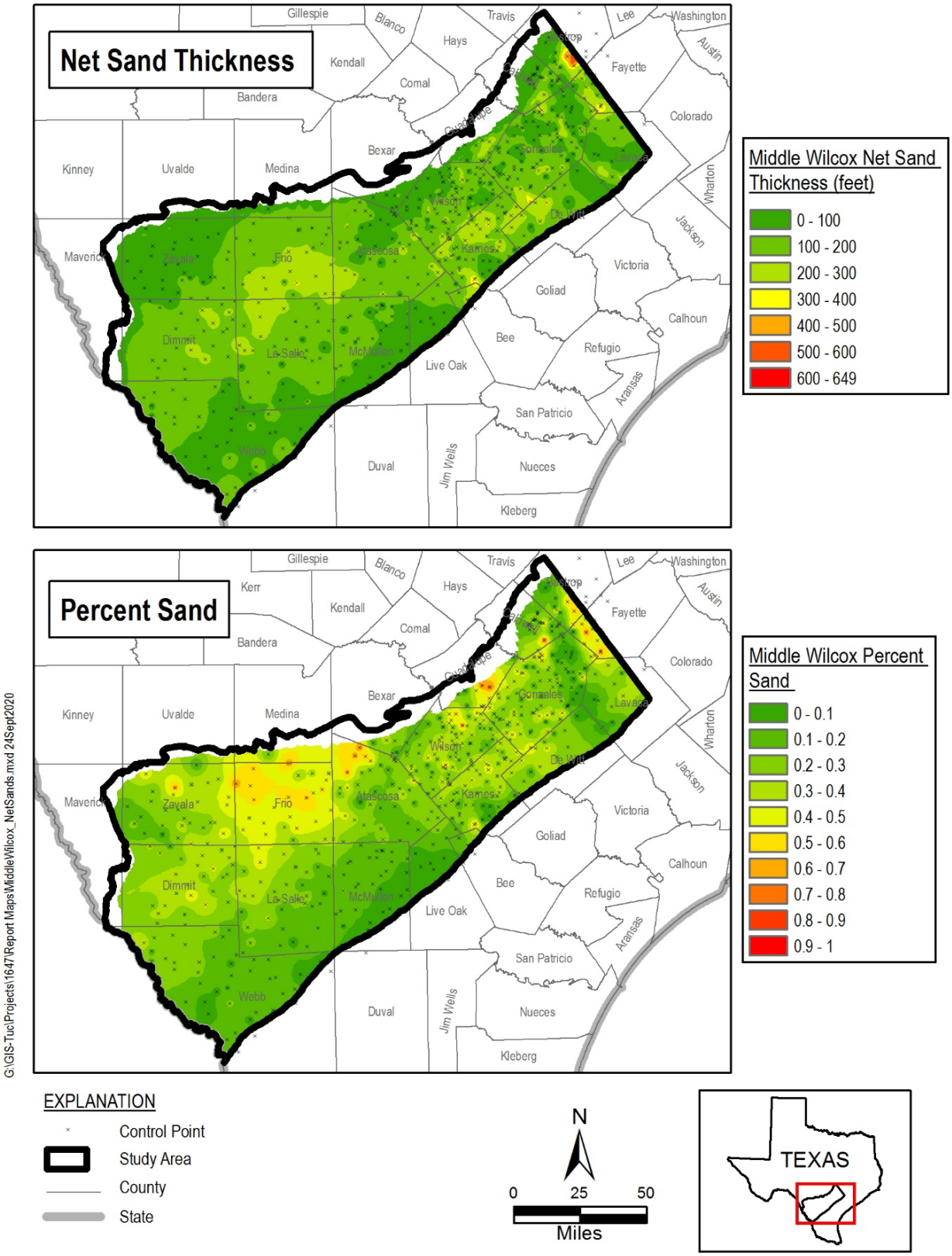


Figure 2-57. Net Sand Thickness and Percent Sand for Middle Wilcox Aquifer

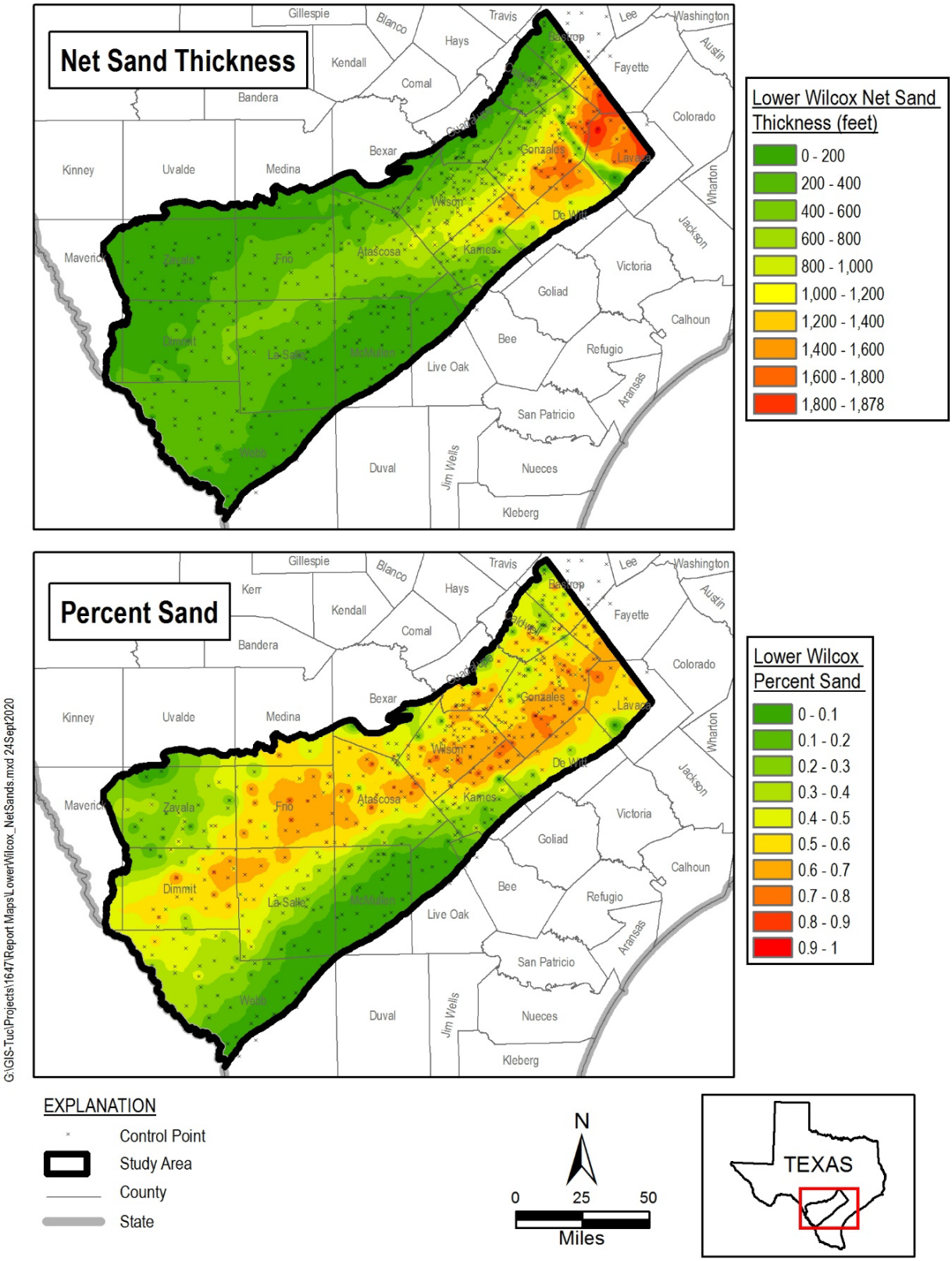


Figure 2-58. Net Sand Thickness and Percent Sand for Lower Wilcox Aquifer

2.6 Potential for Subsidence

Subsidence is the gradual lowering of land surface elevation and typically occurs when large amounts of groundwater have been extracted from unconsolidated aquifers where compressible lithofacies exist. The southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer system comprises hydrostratigraphic units containing interbedded, water-bearing sand and clay intervals. Land subsidence occurs when groundwater pumping results in substantial depressurization of the aquifer, thus causing compaction of clays. The compaction of aquifer layers could propagate to the surface causing land surface subsidence. Concerns with respect to land subsidence principally relates to potential damage to infrastructure, such as roadways, pipelines, and canals.

Land subsidence due to excessive groundwater pumping has not been documented in the study area. A Subsidence District is not present in the study area. Land subsidence will be evaluated during the numerical modeling process if model results indicate large groundwater level drawdown will occur from increased pumping in the region.

A study on variability of Texas aquifers to pumping-induced subsidence was recently conducted by Furnans and others (2017) for the TWDB. That study estimated the risk for subsidence for major and minor aquifers throughout Texas, including the Sparta, Queen City, and Carrizo-Wilcox aquifers. Subsidence risk was evaluated by developing a risk matrix that incorporated three factors: (1) distribution, thickness, and compressibility of clay layers, (2) amount and timing of water level changes, and (3) lowest historical water level. Subsidence risk value was assigned to individual wells with data. Subsidence risks at well locations throughout the Sparta Aquifer, the Queen City Aquifer, and the Carrizo-Wilcox Aquifer are shown on Figure 2-59**,** Figure 2-60, and Figure 2-61, respectively. Results of the Furnans and others (2017) study suggest that the southern portion of the Carrizo-Wilcox Aquifer has a medium to high risk for future subsidence due to pumping in the northeast portion of the study area and a generally low risk in the southwestern portion of the study area west of the Frio. The southern portion of the Queen City and Sparta aquifers have a generally medium risk of subsidence in the study area.

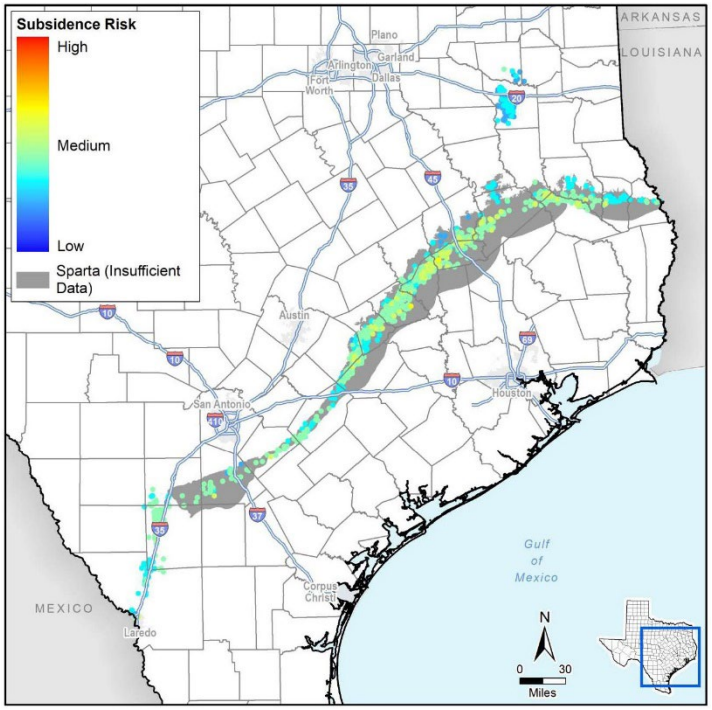


Figure 2-59. Sparta Aquifer Subsidence Risk Vulnerability at Well Locations; from Furnans and others (2017)

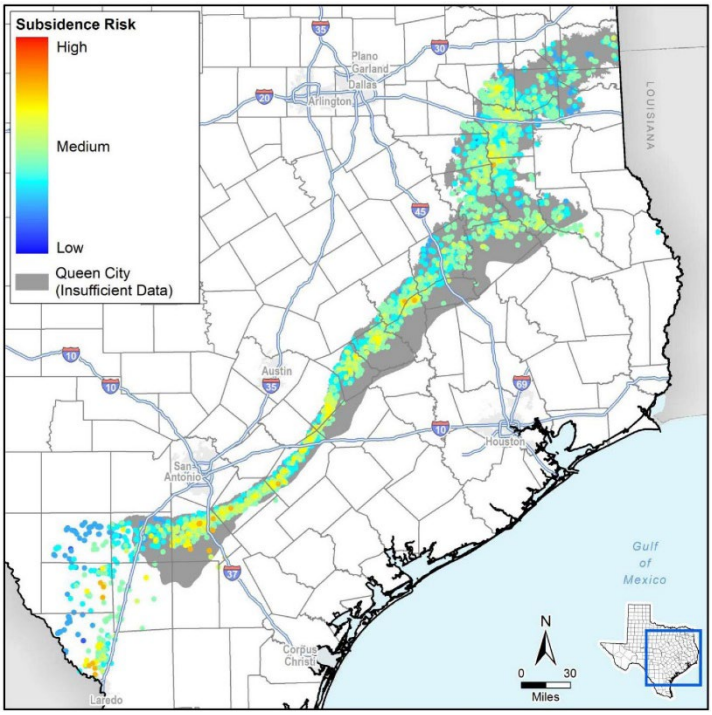


Figure 2-60. Queen City Aquifer Subsidence Risk Vulnerability at Well Locations; from Furnans and others (2017)

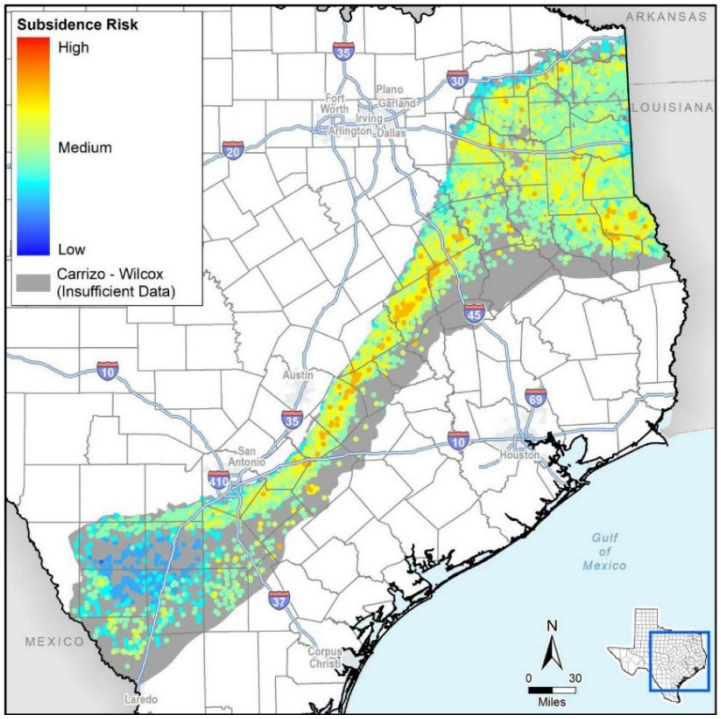


Figure 2-61. Carrizo-Wilcox Aquifer Subsidence Risk Vulnerability at Well Locations; from Furnans and others (2017)

2.7 Aquifer Discharge

Aquifer discharge refers to the groundwater exiting a groundwater system. Groundwater discharge mechanisms in the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers include groundwater pumping withdrawals, discharges to surface water features, evapotranspiration, and groundwater movement into adjacent aquifer units. Under predevelopment conditions, recharge to the aquifer is balanced by the same amount of discharge from the aquifer. Kelley and others (2004) estimate that groundwater evapotranspiration consumes about 9 percent of recharge in the study area and groundwater discharge to streams consumes about 84 percent of recharge; these discharges are components of rejected recharge. The following sections describe the components of groundwater discharge that occur in the study area.

2.7.1 Groundwater Withdrawals by Pumping

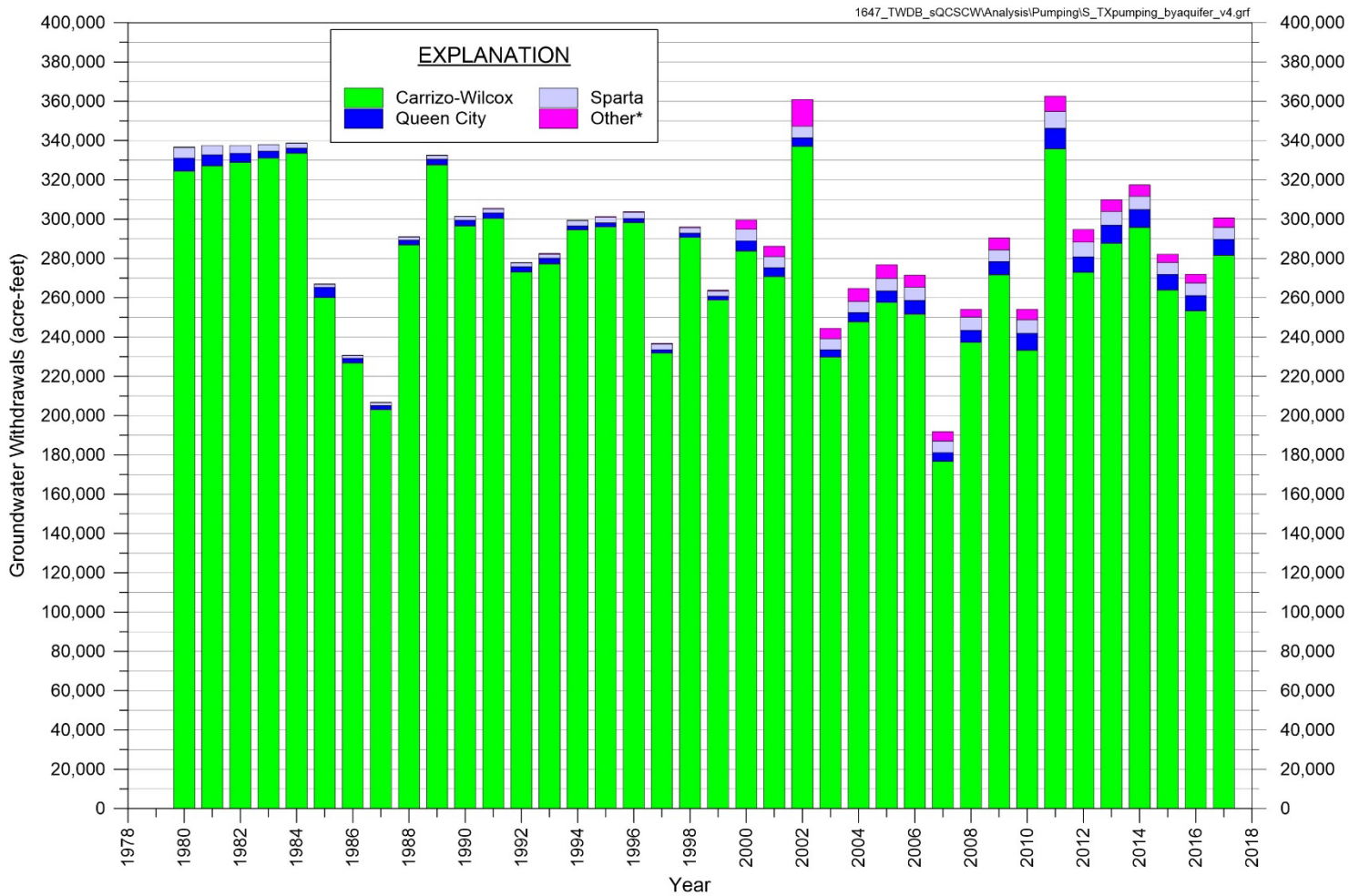
Groundwater pumping data were compiled for this study primarily from TWDB records of pumping estimates and are summarized herein. These data will be processed and spatially allocated or distributed for the groundwater flow model. Implementation of groundwater pumping in the groundwater model will be discussed in subsequent chapters of this report once model calibration is complete.

Groundwater pumping estimates from annual TWDB water use surveys were obtained for the years 1980 through 2017 for counties in Texas within the study area (TWDB, 2020c) except for the time period of 1981 through 1983 where data were not available. For

counties that are located partially outside the study area, annual pumping estimates for the entire county are reported. Data for the years 1981 through 1983 were estimated by linear interpolation of the available water use estimates. The water use surveys collect pumping estimates for six water use sectors: municipal, irrigation, manufacturing, steam-electric generation, livestock, and mining. Domestic pumping estimates are not included in the TWDB water use surveys. Data attributes of the annual TWDB datasets allow pumping estimates to be evaluated by aquifer source, county, and water use sector for this study.

Estimated annual pumping by primary aquifer source from 1980 to 2017 for the study area is shown on Figure 2-62. The primary aquifers summarized in these datasets include the Sparta, Queen City, Carrizo-Wilcox, and "Other" aquifers. "Other Aquifer" estimates included in this study comprises data from six counties in the study area that are located west of Frio River, where pumping estimates for the Queen City and Sparta aquifers are not classified by the historical TWDB dataset. In the area west of Frio River, the Sparta and Queen City aquifers have been historically recognized as their geological equivalents: the Laredo Formation and El Pico Clay, respectively. According to TWDB, pumping estimates categorized as "Other Aquifer" may include data from wells completed in alluvium and in any other units shallower than the Carrizo Formation but deeper than the Yegua-Jackson aquifer. At least a portion of the reported pumping from this aquifer designation is assumed to include pumping from the continuation of the Sparta and Queen City model layers in this region of the study area. The six counties include Dimmit, Frio, LaSalle, McMullen, Webb, and Zavala. Data for "Other Aquifer" were not included for Maverick and Uvalde counties since only a small portion of those counties intersect the model boundary and the areas are outside of the extents of the Queen City and Sparta aquifers.

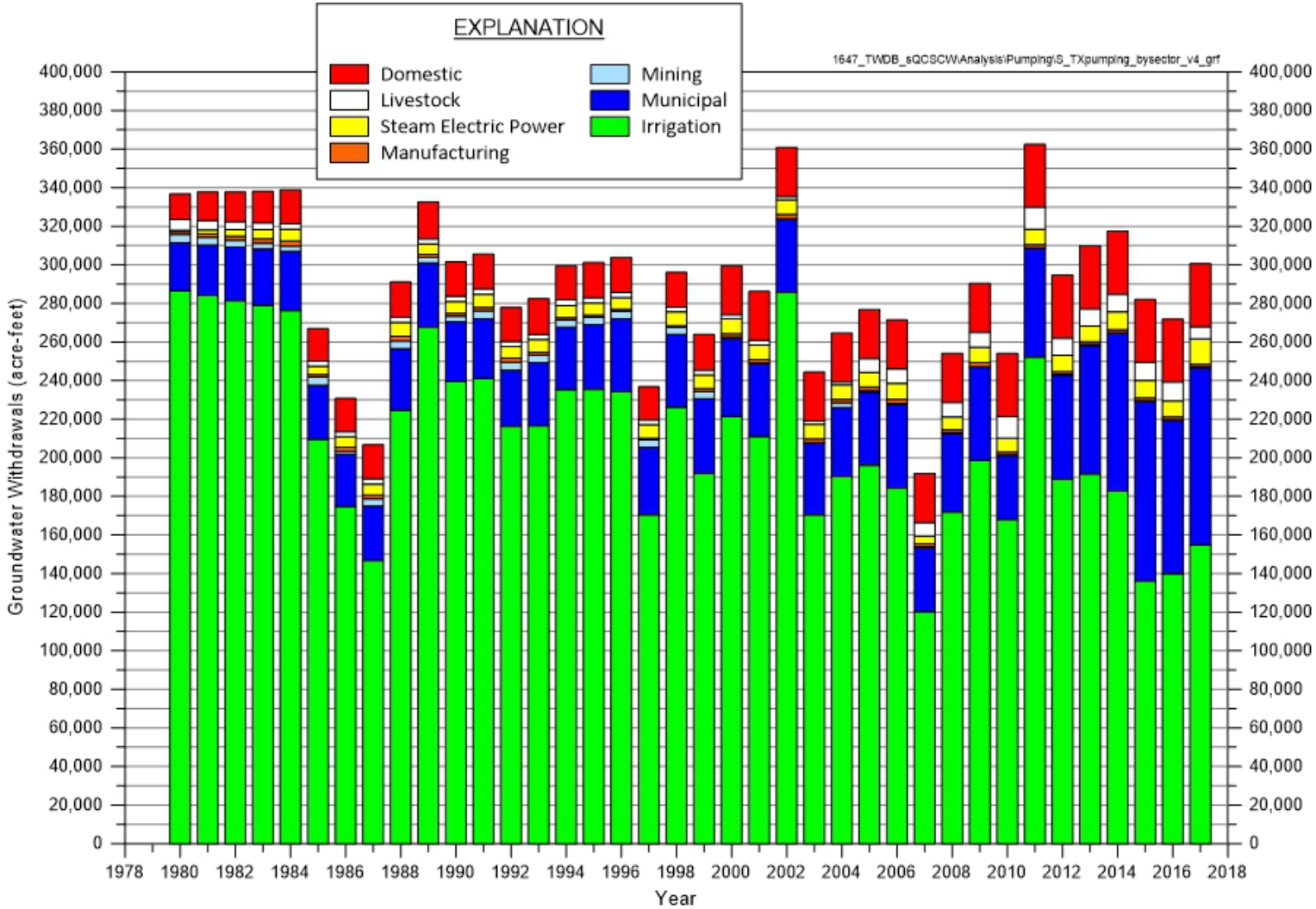
TWDB water use estimates indicate that total annual groundwater pumping from all included aquifers has varied in some years but has generally decreased slightly since 1980 (Figure 2-63). Total annual groundwater withdrawals average about 290,000 acre-feet and range from approximately 192,000 acre-feet in 2007 to approximately 362,000 acre-feet in 2011. The peak in 2011 directly correlated with a large increase in estimates for irrigation water use in Frio County as well as general increases in irrigation and municipal water use in the most actively pumped counties in the study area. A similar spike in 2002 directly correlated with an abnormally large increase in irrigation water use specifically in Zavala County. For the most recent year considered for this study, 2017, pumping is estimated to be approximately 300,000 acre-feet, which is an increase from the previous two years but follows a generally declining trend since 2011.



Source: TWDB (2020) annual water use surveys; estimates for domestic pumping.

Note:
TWDB water use estimates do not include domestic pumping estimates.
**"Other" aquifer data is compiled from counties west of Frio River where Queen City and Sparta are not classified. The "Other" category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than theYegua-Jackson aquifer.*

Figure 2-62. Estimated Annual Groundwater Pumping by Aquifer Source in Counties in Study Area: 1980 through 2017



Source: TWDB (2020) annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
Totals also include estimated pumpage from the "Other Aquifer" classification for counties west of the Frio River

Figure 2-63. Estimated Annual Groundwater Pumping by Water Use Sector in Counties in Study Area: 1980 through 2017

Average annual pumping is summarized by aquifer source, time period, and percent of total pumping in Table 2-6. The Carrizo-Wilcox Aquifer has been the principal source of groundwater supply in the study area over the period of record for pumping estimates (Figure 2-62). About 96 percent of pumping in the model domain from 1980 to 2017 has occurred from the Carrizo-Wilcox Aquifer, which includes the Carrizo-upper Wilcox, middle Wilcox, and lower Wilcox intervals. The Sparta and Queen City aquifers are relatively minor sources of total groundwater supply across the study area but are important sources of groundwater in some areas. Annual groundwater withdrawal estimates for the Sparta, Queen City, and "Other" aquifers have generally increased since the year 2000. Although "Other Aquifer" estimates account for a relatively small portion of total pumping, it is uncertain if this increase could be a result of changes in reporting by TWDB rather than actual pumping. There is an apparent shift in the estimated pumping values for "Other Aquifer" in Zavala County where there were no estimates prior to 2000 and an average of about 5,000 acre-feet per year reported from 2000 through 2017. About 85 percent of all pumping from the "Other Aquifer" category within the model domain was reported from Zavala County in the years 2000 to 2017. Annual pumping estimates for individual counties are summarized by aquifer source in charts in Appendix A.

Table 2-6. Summary of Annual Water use by Aquifer

	Estimated Annual Pumping in Acre Feet					
Aquifer Source	Average 1980-1999	Percent of Total 1980-1999	Average 2000-2017	Percent of Total 2000-2017	Average 1980-2017	Percent of Total 1980-2017
Sparta Aquifer	2,640	0.9%	6,444	2.3%	4,442	1.5%
Queen City Aquifer	3,084	1.0%	6,754	2.4%	4,822	1.7%
Carrizo-Wilcox Aquifer	288,321	98.0%	266,001	93.2%	277,748	95.8%
Other Aquifer	253	0.1%	6,004	2.1%	2,977	1.0%

Estimated annual pumping by water use sector from 1980 to 2017 for the study area is shown on Figure 2-63. Annual pumping is summarized by water use and aquifer source in Table 2-7. Groundwater withdrawals during this time period occurred largely for irrigation uses and, to a lesser degree, municipal and rural domestic water supply. With the exception of abnormally high years in 2002 and 2011, groundwater withdrawals for irrigation water use have generally decreased through time from approximately 287,000 acre-feet or 85 percent of total withdrawals in 1980 to approximately 154,000 acre-feet or about 52 percent of total withdrawals in 2017. Pumping for municipal use has increased from about 25,000 acre-feet or 7 percent of total pumping in 1980 to approximately 91,000 acre-feet or 30 percent of total pumping in 2017. Withdrawals for rural domestic use are estimated to have increased from about 4 percent of total pumping in 1980 to about 11 percent in 2017. Manufacturing withdrawals have been relatively stable accounting for a small portion of total withdrawals averaging less than 1 percent since 1980. Mining withdrawals also have historically accounted for a small portion of total withdrawals, but significantly decreased after 1999 according to TWDB estimates. Steam-electric generation and livestock withdrawals have slightly increased over time but still accounted for an average of less than 5 percent each of total withdrawals in the study area since 1980.

Estimated annual pumping is summarized by county and water use sector in Appendix B. Annual pumping is summarized by county and average percent of total pumping in Table 2-8. Based on the TWDB water use surveys, the majority of groundwater pumping from the Queen City, Sparta, and Carrizo-Wilcox aquifers has historically occurred in Atascosa, Frio, and Zavala counties. On average, those three counties have combined for over 70 percent of total withdrawals in the study area since 1980. In more recent years, Gonzales County has accounted for an increasing percentage of total pumping in the study area, while pumping has generally decreased in Atascosa, Frio, and Zavala counties. Groundwater use in Gonzales County has been predominantly for municipal growth beginning in 2011. Annual pumping estimates for individual counties are summarized by aquifer source in charts in Appendix A.

Domestic pumping estimates were not available from TWDB. Data were compiled from various sources to estimate rural domestic groundwater withdrawals from 1980 through 2017. For the period of 1980 through 1999, historical domestic pumping values for the Carrizo-Wilcox aquifer were extracted from the previous Southern Carrizo-Wilcox groundwater availability model dataset (Deeds and others, 2003). In that study, data from previously available TWDB rural domestic pumping that were not aquifer specific, were processed to include estimates for the years 1981 to 1983 and 1997 to 1999 using linear regression methods, then spatially and vertically distributed to individual model grid cells using census block data and interpolated well depths (Deeds and others, 2003). Historical domestic pumping values for the Queen City and Sparta aquifers for 1980 through 1999 were extracted from the previous Queen City and Sparta groundwater availability model update dataset (Kelley and others, 2004). In that study, data that were not aquifer specific were similarly processed to interpolate for missing years in the previously available TWDB records, then spatially and vertically distributed to individual model grid cells using census block data and aquifer allocation ratios based on the previous groundwater availability model and measured head levels in rural domestic wells in the TWDB database (Kelley and others, 2004). Groundwater withdrawals for the years 2000 through 2017, were estimated based on population density from 2000 and 2010 census block data and a water use assumption of 140 gallons per day (1.2 acre-feet per year) per capita. The per capita water use rate is based on reported domestic water use estimates from the 2016 South Central Texas Regional Water Plan for Region L (South Central Texas Regional Water Planning Group and others, 2015). Census blocks for 1980 and 1990, obtained from the United States Census Bureau (2020), are shown on Figure 2-64, overlain by extents of urban areas which were omitted from this analysis. Withdrawal estimates distributed by county and basin were then vertically assigned to an aquifer based on the vertical allocation factors defined by the previous groundwater availability model.

Table 2-7. Annual Estimated Groundwater Pumping by Water Use Sector and Aquifer Source

Aquifer Source	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Municipal																				
Carrizo-Wilcox Aquifer	23,980	25,433	26,894	28,354	29,807	24,141	26,386	27,696	31,164	32,576	30,214	29,843	28,120	31,507	31,481	32,298	36,483	33,949	36,535	37,556
Queen City Aquifer	296	308	319	331	343	3,443	170	200	182	207	350	384	365	340	334	304	296	228	237	240
Sparta Aquifer	431	414	396	380	363	404	347	395	416	453	474	447	430	464	457	515	530	507	640	541
Other Aquifer	37	35	32	30	28	45	40	21	9	43	60	183	78	304	23	325	256	296	375	275
Manufacturing																				
Carrizo-Wilcox Aquifer	1,354	1,638	1,923	2,207	2,491	1,361	1,921	1,773	2,474	1,516	1,540	1,755	2,053	1,208	1,033	1,088	943	860	837	1,455
Queen City Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
Sparta Aquifer	0	0	1	2	2	2	2	0	0	0	0	0	0	0	0	0	0	108	43	43
Other Aquifer	52	42	33	24	14	11	10	0	8	4	2	0	0	11	9	14	0	12	1	19
Mining																				
Carrizo-Wilcox Aquifer	4,309	3,902	3,497	3,091	2,684	4,148	1,680	3,751	3,875	2,718	2,802	4,028	4,011	4,034	3,831	3,903	3,904	3,748	3,476	3,700
Queen City Aquifer	0	1	2	4	5	5	0	6	6	6	6	14	8	8	8	8	8	8	8	7
Sparta Aquifer	0	1	2	4	5	4	0	4	5	5	5	7	7	7	7	7	7	7	7	6
Other Aquifer	85	75	65	55	45	20	0	30	41	44	44	53	46	46	26	31	31	25	17	25
Electric Power																				
Carrizo-Wilcox Aquifer	682	2,047	3,411	4,776	6,140	4,239	5,623	5,718	7,146	5,539	6,037	6,688	6,037	6,585	6,331	6,172	6,075	6,964	7,343	6,973
Queen City Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sparta Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation																				
Carrizo-Wilcox Aquifer	277,648	276,660	275,673	274,686	273,698	208,317	173,148	145,368	223,103	265,484	237,405	239,196	214,624	214,685	233,512	233,666	232,193	168,805	224,450	190,550
Queen City Aquifer	5,204	4,305	3,406	2,510	1,611	1,129	1,552	1,210	1,592	2,012	1,794	1,813	1,538	1,767	880	958	1,003	751	1,105	888
Sparta Aquifer	3,831	3,167	2,504	1,842	1,178	130	114	113	122	247	263	248	306	245	965	869	1,250	826	666	626
Other Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Livestock																				
Carrizo-Wilcox Aquifer	4,248	3,804	3,360	2,915	2,471	2,221	2,149	2,359	2,296	2,269	2,316	2,350	2,252	2,303	2,489	2,439	2,341	2,084	1,837	2,010
Queen City Aquifer	855	704	554	404	253	248	243	243	240	240	249	254	289	305	287	290	246	238	256	278
Sparta Aquifer	382	318	252	186	122	120	121	121	118	119	123	126	143	145	127	128	106	107	113	123
Other Aquifer	91	88	84	81	78	79	85	87	91	89	88	90	48	42	54	57	78	51	69	72
Domestic																				
Carrizo-Wilcox Aquifer	12,167	13,613	14,137	15,009	16,195	15,612	15,833	16,318	16,821	17,492	16,211	16,443	16,026	16,896	15,888	16,427	16,353	15,402	16,172	16,547
Queen City Aquifer	324	345	356	371	393	393	399	408	421	452	468	471	467	485	504	519	532	541	551	572
Sparta Aquifer	761	806	831	859	903	902	901	918	950	1,053	1,090	1,098	1,091	1,137	1,172	1,218	1,250	1,281	1,312	1,351
Other Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL																				
Carrizo-Wilcox Aquifer	324,388	327,097	328,895	331,038	333,486	260,039	226,740	202,983	286,879	327,594	296,525	300,303	273,123	277,218	294,565	295,993	298,292	231,812	290,650	258,791
Queen City Aquifer	6,679	5,663	4,637	3,620	2,605	5,218	2,364	2,067	2,441	2,917	2,867	2,936	2,667	2,905	2,013	2,079	2,089	1,766	2,157	1,985
Sparta Aquifer	5,405	4,706	3,986	3,273	2,573	1,562	1,485	1,551	1,611	1,877	1,955	1,926	1,977	1,998	2,728	2,737	3,143	2,836	2,781	2,690
Other Aquifer	265	240	214	190	165	155	135	138	149	180	194	326	172	403	112	427	365	384	462	391

Aquifer Source	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Municipal																		
Carrizo-Wilcox Aquifer	39,707	36,855	37,043	36,477	35,094	37,055	41,594	31,672	39,045	46,897	31,393	53,716	51,350	63,505	79,105	90,042	76,511	88,771
Queen City Aquifer	47	49	50	52	21	26	1,000	186	206	282	700	864	797	1,846	1,570	1,546	1,466	1,562
Sparta Aquifer	475	476	480	506	516	576	651	860	1,156	815	917	1,281	1,232	850	949	943	959	834
Other Aquifer	107	115	110	115	114	126	293	245	271	228	251	348	497	423	242	218	206	196
Manufacturing																		
Carrizo-Wilcox Aquifer	971	798	1,451	958	1,009	1,134	1,171	771	639	1,656	1,188	1,235	1,032	1,112	1,089	1,215	1,222	1,155
Queen City Aquifer	0	0	0	0	0	0	0	0	0	293	238	418	317	302	306	336	339	335
Sparta Aquifer	705	861	836	787	826	792	877	780	802	0	7	7	0	0	0	0	0	0
Other Aquifer	19	16	16	16	16	22	11	9	8	0	0	0	0	0	0	0	0	0
Mining																		
Carrizo-Wilcox Aquifer	660	515	407	425	2,330	737	360	584	538	514	322	332	431	415	391	410	547	679
Queen City Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sparta Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electric Power																		
Carrizo-Wilcox Aquifer	7,706	7,583	7,580	7,551	7,425	7,516	8,410	3,937	6,637	8,048	7,247	8,078	8,491	8,022	9,238	9,051	8,348	13,085
Queen City Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sparta Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation																		
Carrizo-Wilcox Aquifer	210,761	200,949	266,918	160,719	178,322	183,630	172,293	112,400	162,556	186,613	156,246	235,439	176,516	179,465	170,604	127,584	130,932	144,457
Queen City Aquifer	3,998	3,210	3,219	2,690	3,664	3,981	4,197	2,410	4,177	4,336	4,983	6,434	4,280	4,631	4,789	3,635	3,504	4,293
Sparta Aquifer	2,330	1,953	2,302	1,881	1,923	2,000	2,270	1,331	1,866	2,178	1,850	3,269	2,432	2,309	1,915	1,240	1,499	1,836
Other Aquifer	4,472	5,095	13,379	5,127	6,465	6,609	5,459	4,243	3,321	5,484	4,814	7,075	5,736	5,298	5,356	3,800	3,955	4,354
Livestock																		
Carrizo-Wilcox Aquifer	1,620	1,732	1,237	1,229	1,200	5,149	5,405	5,004	5,493	5,608	8,045	8,164	6,363	6,398	6,560	6,761	6,968	4,600
Queen City Aquifer	320	416	278	282	186	1,060	1,018	1,011	950	970	1,677	1,684	1,333	1,362	1,392	1,436	1,475	921
Sparta Aquifer	140	140	127	129	150	771	784	729	741	746	1,260	1,266	1,018	1,010	1,019	1,046	1,072	636
Other Aquifer	107	56	70	65	70	268	315	273	294	342	269	277	231	224	237	237	245	217
Domestic																		
Carrizo-Wilcox Aquifer	22,363	22,363	22,363	22,363	22,363	22,363	22,363	22,363	22,363	22,363	28,784	28,784	28,784	28,784	28,784	28,784	28,784	28,784
Queen City Aquifer	799	799	799	799	799	799	799	799	799	799	1,028	1,028	1,028	1,028	1,028	1,028	1,028	1,028
Sparta Aquifer	2,217	2,217	2,217	2,217	2,217	2,217	2,217	2,217	2,217	2,217	2,863	2,863	2,863	2,863	2,863	2,863	2,863	2,863
Other Aquifer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL																		
Carrizo-Wilcox Aquifer	283,788	270,795	336,999	229,722	247,743	257,584	251,596	176,731	237,271	271,699	233,225	335,748	272,967	287,701	295,771	263,847	253,312	281,531
Queen City Aquifer	5,164	4,474	4,346	3,823	4,670	5,866	7,014	4,406	6,132	6,680	8,626	10,428	7,755	9,169	9,085	7,981	7,812	8,139
Sparta Aquifer	5,867	5,647	5,962	5,520	5,632	6,356	6,799	5,917	6,782	5,956	6,897	8,686	7,545	7,032	6,746	6,092	6,393	6,169
Other Aquifer	4,705	5,282	13,575	5,323	6,665	7,025	6,078	4,770	3,894	6,054	5,334	7,700	6,464	5,945	5,835	4,255	4,406	4,767

Units in acre-feet
Source: Texas Water Development Board water use surveys (TWDB, 2020b).

Table 2-8. Summary of Groundwater Pumping by County

Estimated Groundwater Pumping, in acre-feet				
County	**Average 1980-2017**	**Average Percent of Total 1980-2017**	**Total in 2017**	**Percent of Total in 2017**
Atascosa	52,225	18.0%	41,876	13.9%
Bastrop	12,058	4.2%	25,488	8.5%
Bexar	9,739	3.4%	11,154	3.7%
Caldwell	3,812	1.3%	6,389	2.1%
Dimmit	10,875	3.8%	5,207	1.7%
Fayette	345	0.1%	847	0.3%
Frio	85,007	29.3%	68,448	22.8%
Gonzales	11,782	4.1%	50,021	16.6%
Guadalupe	3,741	1.3%	6,910	2.3%
Karnes	1,103	0.4%	1,721	0.6%
La Salle	7,195	2.5%	6,128	2.0%
Maverick	855	0.3%	340	0.1%
McMullen	602	0.2%	474	0.2%
Medina	8,290	2.9%	8,733	2.9%
Uvalde	479	0.2%	181	0.1%
Webb	1,134	0.4%	1,056	0.4%
Wilson	19,421	6.7%	25,985	8.6%
Zavala	61,328	21.1%	39,649	13.2%
Total	**289,990**	**100.0%**	**300,606**	**100.0%**

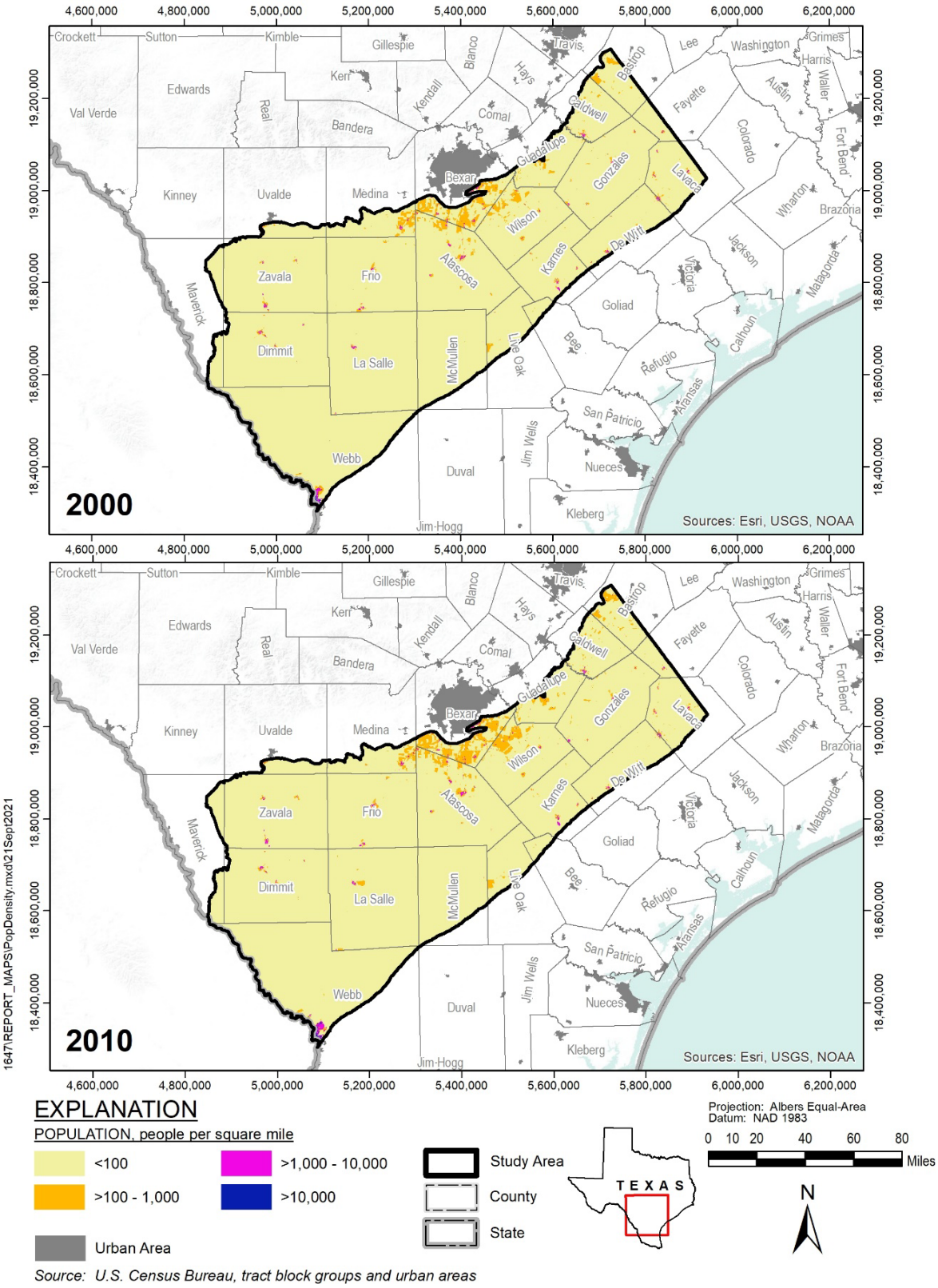


Figure 2-64. Census Blocks for 2000 and 2010

Distribution of groundwater use from each aquifer for each county are shown through time on Figure 2-65 through Figure 2-68. The time periods coincide with the water level contour maps shown on Figure 2-22 through Figure 2-24. The source for the majority of groundwater pumped from in the study area is the Carrizo-Wilcox Aquifer, particularly in Zavala, Frio, Atascosa, and Wilson counties. Estimated pumping for the Carrizo-Wilcox will be distributed vertically to the Carrizo-upper Wilcox, middle Wilcox, and lower Wilcox intervals based on the vertical allocations defined by the previous groundwater availability model. This pumping information provides an initial estimate for the groundwater model.

Pumping distributions were adjusted during model calibration for consistency with measured water level trends, as described in Section 4.1.1. Discrepancies between trends in pumping and water levels were noted, mainly in downdip areas in the Carrizo-Upper Wilcox model layer. The water level data is generally considered to be more accurate than the pumping information, therefore, the pumping rates were treated as calibration parameters, in the model. This was implemented on a county-by-county basis, with scaling factors applied to the pumping estimates of each year to account for the temporal variations in the errors. Compared to the initial pumping, the calibrated model has slightly less pumping per layer than the conceptual model. However, the total model-wide pumping remains similar to the conceptual pumping.

Data requests for groundwater pumping information were submitted to the Groundwater Conservation Districts in the study area. As of this report date, pumping data were obtained from one district (Plum Creek). Annual groundwater pumping for this district is summarized in Table 2-9.

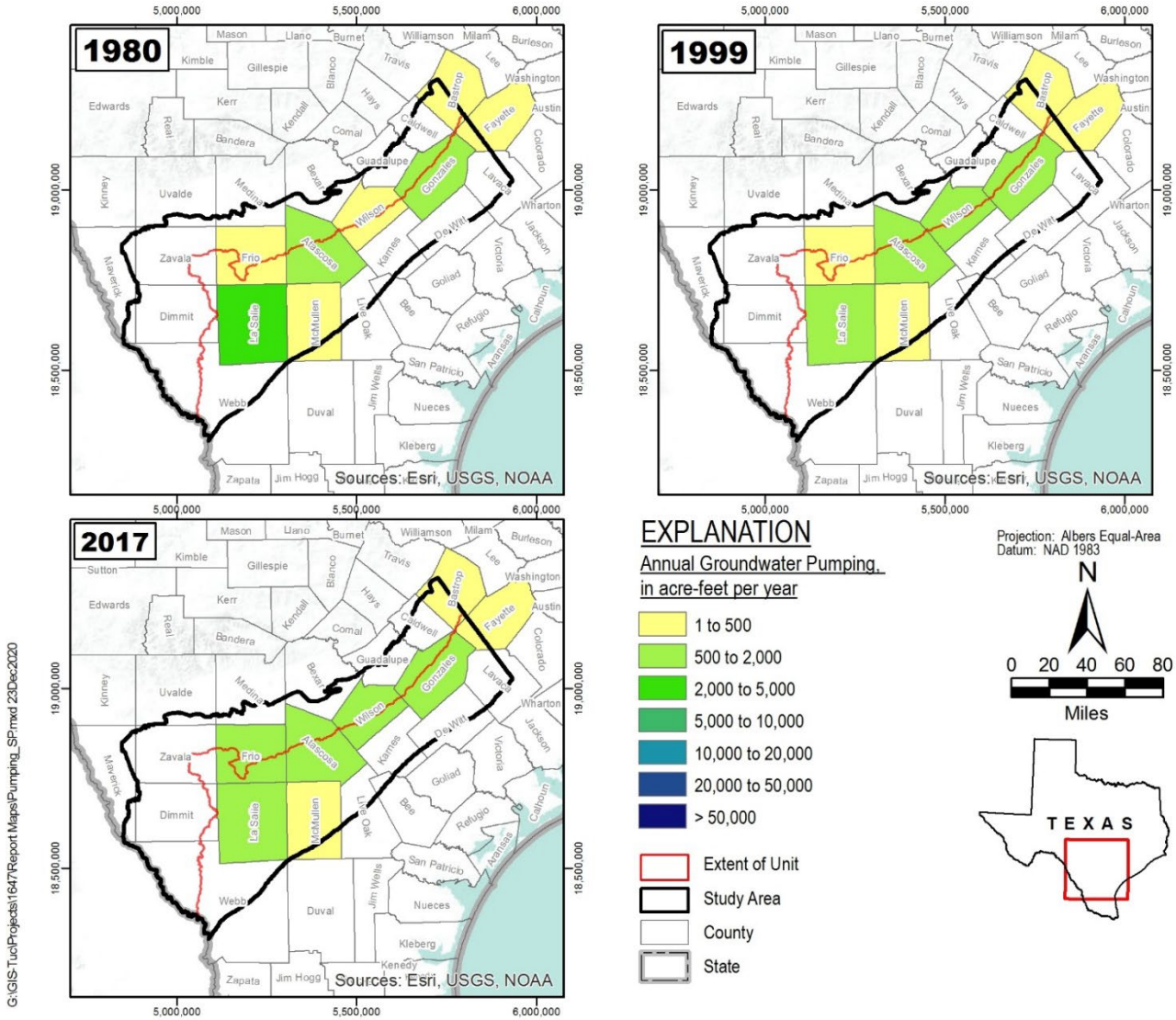


Figure 2-65. Distribution of Groundwater Pumping from the Sparta Aquifer

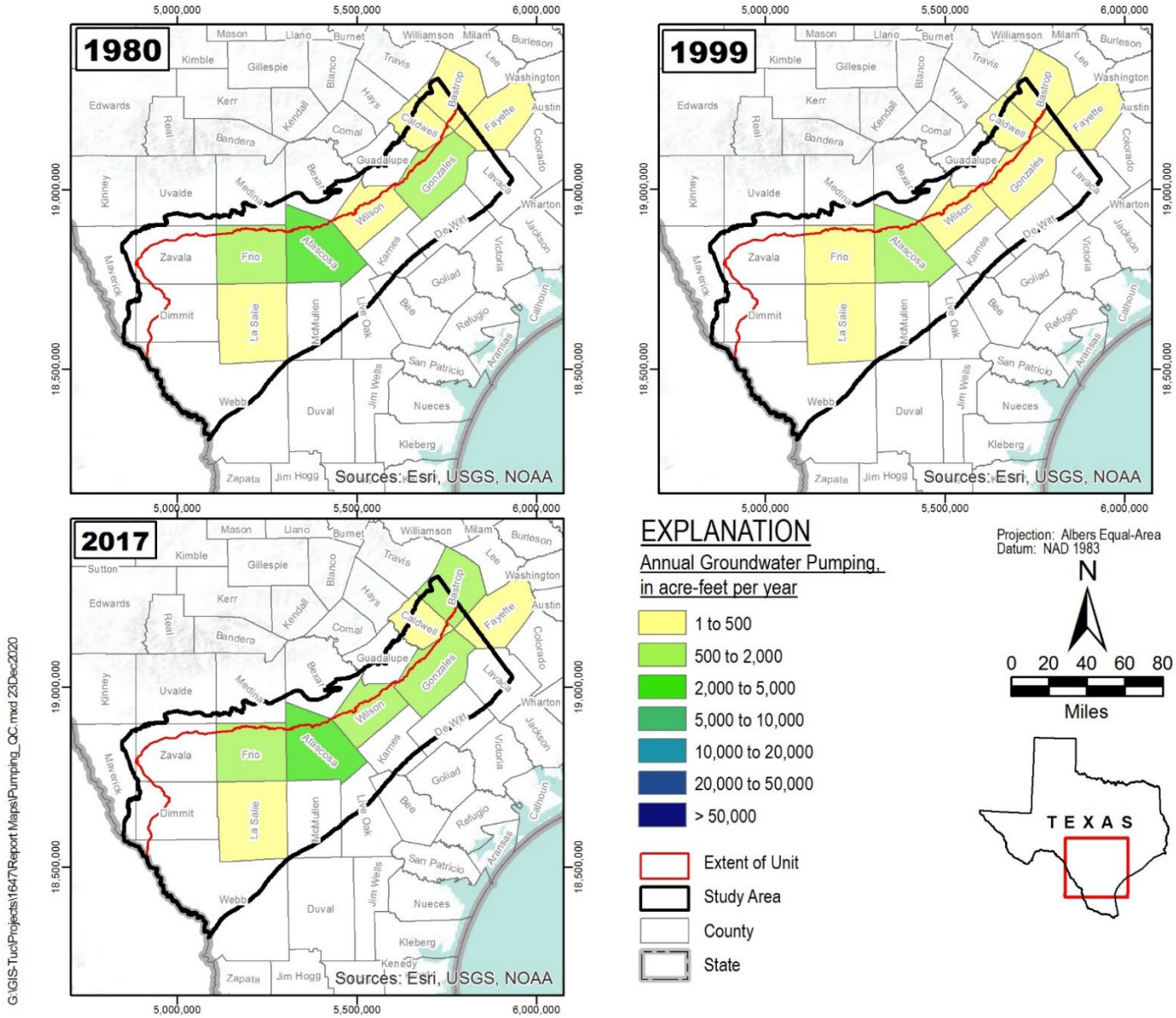


Figure 2-66. Distribution of Groundwater Pumping from the Queen City Aquifer

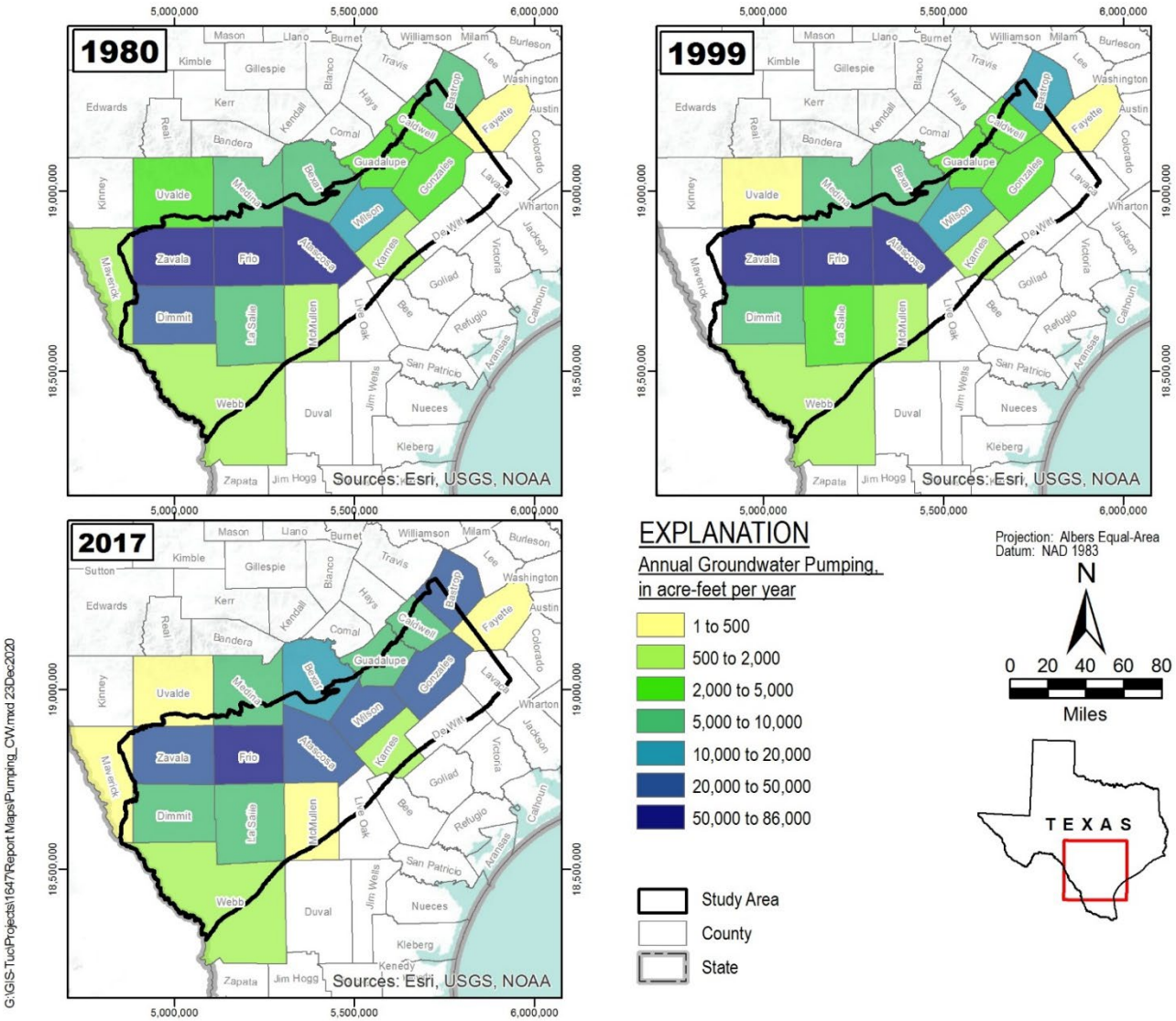


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Figure 2-67. Distribution of Groundwater Pumping from the Carrizo-Wilcox Aquifer

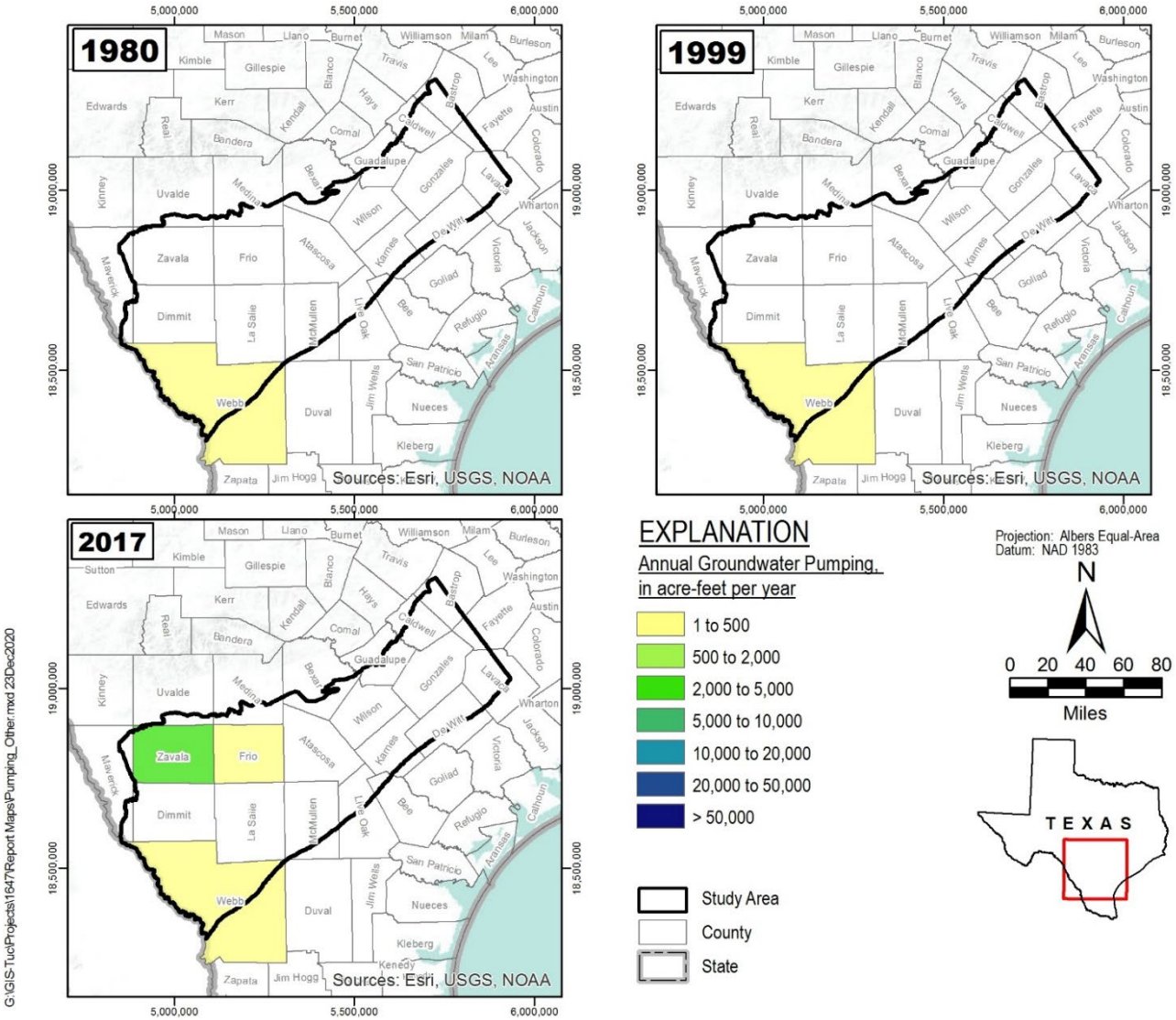


Figure 2-68. Distribution of Groundwater Pumping from the "Other" Aquifer

Table 2-9. Annual Reported Groundwater Pumping by Groundwater Conservation Districts in Study Area.

Groundwater Conservation District	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Plum Creek	566	601	549	913	1,169	682	1,185	1,717	1,524	1,705	1,684	1,495	1,563	1,707	1,416

Units in acre-feet
Source: Plum Creek Groundwater Conservation District; other districts either did not respond to requests for pumping data or did not have data to provide.

2.7.2 Discharge to Rivers and Springs

Base streamflow is the contribution of groundwater to gaining reaches along a stream. The differences in streamflows measured at gages along unregulated river reaches indicate that most major rivers in the study area have gaining streamflow conditions, as previously summarized in Section 2.4.1 of this report.

Groundwater discharge also occurs at springs and seeps where the water table intersects the land surface. Springs generally occur in low lying areas along river valleys and in outcrop areas where hydrogeologic conditions preferentially reject recharge (Deeds and others, 2003). Locations of springs in the area are shown on Figure 2-35. Deeds and others (2003) conducted a literature survey of springs in the study area. For this study, the springs dataset was updated with spring features listed in the United States Geological Survey (2020b) National Hydrography Dataset. Information from 13 springs was compiled from these sources. There are a limited number of springs in the study area because of drier climate and most wells that were previously flowing are only intermittent to date (Deeds and others, 2003). Declining spring flow in the area is attributed to pumping and free-flowing wells in the counties around these springs (Brune, 1975). Deeds and others (2003) summarized flow rates ranging from a low of 0.01 cubic feet per second (feet^3/second) (7 acre-feet per year) to a high of 1.6 feet^3/second (1,158 acre-feet per year) measured at Martinez Springs in Bexar County; a higher flow rate was observed at Mitchell Lake Springs but was attributed reservoir leakage and was discarded as unrepresentative of natural springs in the area. According to the prior literature survey, there are no significant springs flowing in the model area that are not coincident with stream reaches (Deeds and others, 2003).

2.7.3 Evapotranspiration

Evapotranspiration is the loss of water from a vegetated surface through the combined processes of soil evaporation and plants transpiration (University of Arizona Cooperative Extension, 2000). Evapotranspiration rates depend on plant density, plant age, depth to groundwater, and available soil moisture from infiltration of precipitation. This study is principally interested in the interaction of plants with groundwater. Inputs to the groundwater model include location of evapotranspiration, maximum evapotranspiration rate, and evapotranspiration extinction depth (or rooting depth). Evapotranspiration of groundwater occurs when groundwater levels are above the maximum rooting depth of the vegetation.

Limited information exists regarding groundwater use by native vegetation and crops within the study area. Vegetation present in the Texas portions of the study area includes mesquite and oak woodlands and grasslands (Figure 1-12). These tree types have deep root depths and might be sustained in part by groundwater consumption.

The Unites States Geological Survey's Gap Analysis Project (USGS, 2011) land cover dataset was obtained for a continuous and consistent coverage of vegetation and land cover. The Unites States Geological Survey's Gap Analysis Project land cover dataset for the study area

is shown on Figure 2-69. Although the United States Geological Survey dataset lacks the details vegetation species provided by the Texas vegetation dataset, it can be useful for understanding the complex distributions of vegetation across the entire study area.

Potential evapotranspiration was simulated in the previous Groundwater Availability Model developed by Kelley and others (2004) for the southern portion of the Queen City and Sparta aquifers. For that Groundwater Availability Model, the United States Department of Agriculture's Soil Water Assessment Tool was used to estimate groundwater evapotranspiration and evapotranspiration extinction depth. The United States Department of Agriculture's Soil Water Assessment Tool was used because it is a physically based method for estimating regional components of a groundwater system. Potential evapotranspiration is converted to actual evapotranspiration based on vegetation type and model-calculated soil water availability, using user-specified climate and vegetation information. For each stress period of the previous groundwater availability model, the United States Department of Agriculture's Soil Water Assessment Tool was used to calculate max evapotranspiration rate and evapotranspiration extinction depth for every model grid cell. The average maximum evapotranspiration rate for each evapotranspiration cell in the previous groundwater availability model is shown on Figure 2-70. Note that evapotranspiration was not simulated south of the interface between the Sparta Sand and overlying younger units which are not a part of this study. Maximum evapotranspiration rates specified in the model range from less than 0.5 inch per year to 20 inches per year. Evapotranspiration rates are generally small in the northern and southern portions of the study area. The largest evapotranspiration rates occur in the central portions of the study area. Evapotranspiration extinction depths were also estimated for each grid cell and remained constant through the simulation period. Extinction depths ranged from less than 1 foot to 7.2 feet. Canadell and others (1996) report a range for maximum rooting depths for temperate terrestrial biomes of up to 5 meters (16 feet) with an average of 2 to 3 meters (7 to 10 feet).

2.7.4 Cross-Formational Flows

Groundwater discharge also occurs as cross-formational groundwater flows from one aquifer unit to an adjacent unit and is a natural mechanism for aquifer discharge from the aquifers in this study. Previous studies have determined that the hydraulic head in the Carrizo-Wilcox Aquifer are higher than hydraulic heads in the overlying younger strata such as the Reklaw (Deeds and others, 2003; Harris, 1965; Kreitler, 1979). This is consistent with the findings of this analysis for the model update. Groundwater flow across the Reklaw Formation, which is a confining unit, is generally upward from the Carrizo-Wilcox Aquifer to the Queen City Aquifer (Deeds and others, 2003). A groundwater chemistry study by Hamlin (1988) also supports the upward flow from the Carrizo Sands to overlying sands. Deeds and others (2003) also determined that the upward gradient in groundwater movement continues between the Queen City aquifer and the regional water table in the confined, down-dip portions. Cross-formational groundwater flows are not directly measurable and are generally better estimated by groundwater modeling studies such as this groundwater availability model update.

The natural balance between aquifer recharge and cross-formational flow has changed over time due to the development of the aquifer system. In some areas with extensive groundwater pumping, hydraulic gradients have reversed between the Carrizo-Wilcox and overlying units. This reversal creates a potential for cross-formation flows from younger units into the underlying Carrizo aquifer interval (Deeds and others, 2003; Hamlin, 1988; Klemt and others, 1976; Mason, 1960).

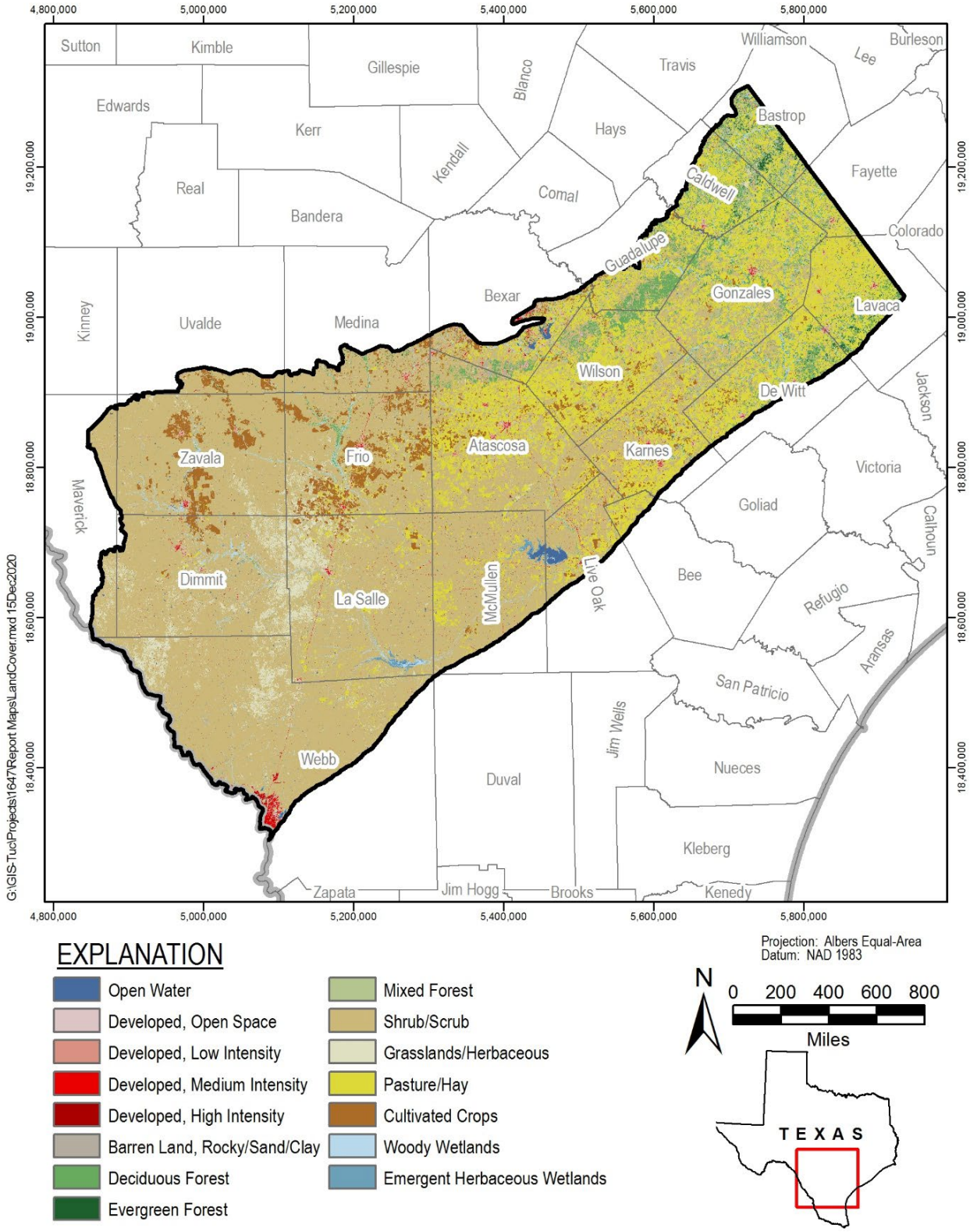


Figure 2-69. Land Cover Distribution in Study Area

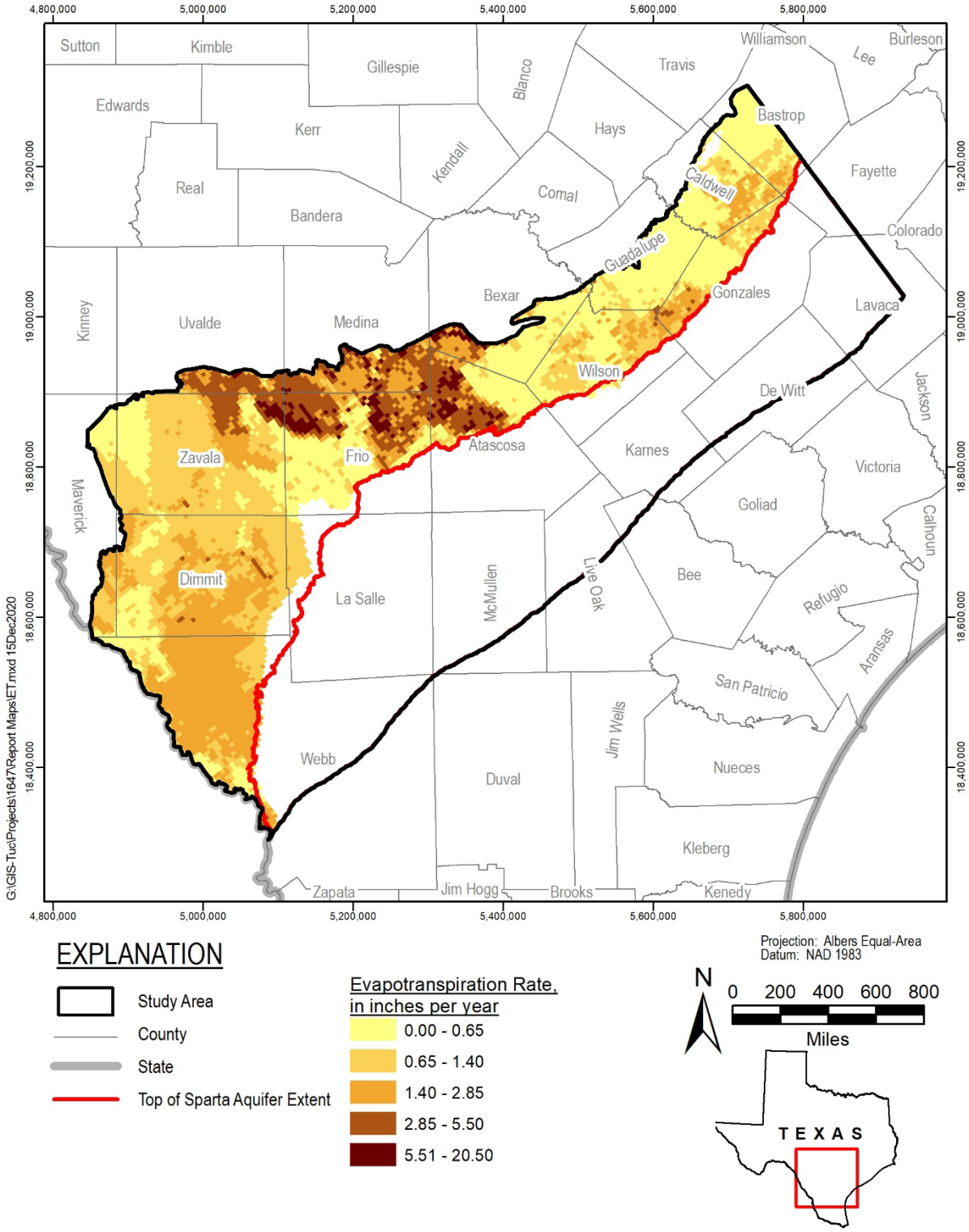


Figure 2-70. Average Maximum Evapotranspiration Rate Specified in the Previous Groundwater Availability Model by Kelley and others (2004)

2.8 Water Quality

Water quality of the aquifer system is considered herein for completeness and qualitative interpretations for the conceptual model. Changes in water quality in the study area will not be simulated in the groundwater availability model.

2.8.1 Data Sources

In this report, groundwater quality data was compiled for wells within the model boundary from the TWDB (2019c) Groundwater Database and the Brackish Resources Aquifer Characterization System database water quality. General water quality was evaluated in terms of drinking, irrigation, and industrial water quality based on screening levels developed by Deeds and others (2003), using only samples taken since 2010. A more detailed analysis of the spatial and temporal distribution of total dissolved solids was performed to evaluate salinity in the study area.

A detailed characterization of salinity (represented as total dissolved solids) is not required for the current groundwater flow model. Recent studies by both the Brackish Resources Aquifer Characterization System group (Meyer and others, 2020) and the Bureau of Economic Geology (Hamlin and others, 2019) conducted comprehensive analyses using geophysical well logs to calculate an interpreted total dissolved solids concentration across the entire depth range for each aquifer unit for their respective study areas. The study conducted by Hamlin and others (2019) covers a similar study area to the Groundwater Availability Model and the overall resulting net sand thickness distribution is relatively similar despite modest differences in the interpretation of the hydrostratigraphic framework contacts. Therefore, to provide some context to the changing salinity as evidenced by geophysical well logs, this report provides the salinity distribution maps from Hamlin and others (2019) for reference.

2.8.2 Water Quality Evaluation Based on Water Use

To evaluate drinking water quality, samples since 2010 were analyzed to find exceedances of any constituent with a United States Environmental Protection Agency designated primary or secondary maximum contaminant levels. Results for those constituents for which exceedances were found are summarized in Table 2-10. Since 2010, there have been primary maximum contaminant level exceedances in at least one well within the model boundary of arsenic, fluoride, selenium, and uranium, and secondary maximum contaminant level exceedances of aluminum, chloride, fluoride, iron, manganese, sulfate, and total dissolved solids. Constituents with the largest percentage of wells showing exceedances are iron (20 percent), manganese (16 percent), and total dissolved solids (26 percent).

For irrigation use, salinity hazard was evaluated based on specific conductance and sodium adsorption ratio. High or very high specific conductance was found in 33 percent of wells, and high or very high sodium adsorption ratio in 25 percent of wells. Boron, chloride, specific conductance, and total dissolved solids were found in groundwater at a relatively small number of wells in concentrations unsuitable for irrigation.

Constituents associated with scaling, corrosion, and sediment buildup were evaluated to assess the quality of groundwater for industrial purposes. Notable exceedances include high silica concentration in 4 percent of wells, and hardness in 27 percent of wells.

Table 2-10. Summary of Exceedances of Water Quality Standards for Selected Constituents at Wells in Study Area

Constituent	Screening Level[a]	Type of Exceedance	Number of Wells Sampled Since 2010	Number of Wells with Exceedance Since 2010	Percent of Wells with Exceedance Since 2010
Arsenic	10	Primary MCL[b]	297	1	0.3%
Fluoride	4	Primary MCL	318	3	0.9%
Selenium	50	Primary MCL	297	7	2.4%
Uranium	30	Primary MCL	297	1	0.3%
Aluminum	200	Secondary MCL	297	1	0.3%
Chloride	250	Secondary MCL	356	30	8.4%
Fluoride	2	Secondary MCL	318	8	2.5%
Iron	300	Secondary MCL	317	65	20.5%
Manganese	50	Secondary MCL	292	47	16.1%
Sulfate	250	Secondary MCL	335	17	5.1%
Total Dissolved Solids	500	Secondary MCL	355	91	25.6%
Hardness	180	Industrial	335	91	27.2%
Silica	40	Industrial	297	10	3.4%
Boron	2,000	Irrigation	334	9	2.7%
Chloride	1,000	Irrigation	356	4	1.1%
Sodium Adsorption Ratio (High)	18	Irrigation	334	45	13.5%
Sodium Adsorption Ratio (Very High)	26	Irrigation	334	38	11.4%
Specific Conductance (High)	750	Irrigation	332	88	26.5%
Specific Conductance (Very High)	2,250	Irrigation	332	21	6.3%
Total Dissolved Solids	2,100	Irrigation	355	7	2.0%

[a]Units in milligrams per liter
[b]MCL = Maximum contaminant level

2.8.3 Water Quality Evaluation Based on Total Dissolved Solids Distribution

Selected total dissolved solids hydrographs for each aquifer are also shown on Figure 2-71 through Figure 2-76**,** with wells selected based on data availability. Each well measurement was assigned to an aquifer using well construction information and the elevations of aquifers in the hydrostratigraphic framework. Due to lack of sampling frequency in many areas, temporal trends throughout several of the aquifer units could not be confidently established.

Figure 2-77 through Figure 2-81 provide the results from Hamlin and others (2019) of net sand thickness by salinity category for each aquifer unit. The analysis conducted by Hamlin and others (2019) used standard subsurface mapping techniques and groundwater salinity estimations based on the following two methods to construct separate net sand thickness maps for freshwater and brackish: 1) the empirical relationship between the resistivity of water-filled formation (R_0) and formation water salinity; and 2) calculation of formation water resistivity (R_w) (Hamlin and others, 2019). The review of electrical logs for this report's hydrostratigraphic framework resulted in minor changes to the hydrostratigraphic unit contacts compared to Hamlin and others (2019) to correlate to the Brackish Resources Aquifer Characterization System group hydrostratigraphic interpretations; however, these changes are relatively minor and therefore these salinity maps are sufficient for providing a general indication of salinity in the study area.

<u>Sparta Sand</u>

Available total dissolved solids measurements indicate that groundwater in the outcrop areas of the Sparta Sand can vary between freshwater to moderately saline, but data is limited (Figure 2-71). In the Sparta Aquifer, the greatest observed total dissolved solids concentration was classified as moderately saline (3,153 mg/L) from a well in La Salle County in 1986. Moderately saline concentrations occur in Atascosa, La Salle, Webb, and Wilson counties in sample dates ranging from 1971 through 2002. Slightly saline concentrations occur in Atascosa, Fayette, Frio, Gonzales, La Salle, Webb, and Wilson counties in sample dates ranging from 1932 through 2017. No salt domes are known to exist in these areas. A few of the selected hydrographs suggest that total dissolved solids concentrations have decreased slightly over time in some areas of the aquifer while other area experienced a spike in the early 2000s before returning to normal conditions (Figure 2-71). No data exist for the deep, down-dip portions of the aquifer unit.

<u>Queen City Sand</u>

Similar to the Sparta Sand, total dissolved solids measurements indicate that groundwater in the outcrop portions of the Queen City Sand varies between freshwater to moderately saline (Figure 2-72). The greatest observed total dissolved solids concentration was classified as moderately saline (8,378 mg/L) from a well in Atascosa County in 1975. There are instances of moderately saline concentrations in Atascosa, Dimmit, Frio, Gonzales, La Salle, McMullen, Webb, and Zavala counties in samples dates ranging from 1928 through 2014. Slightly saline concentrations occur in Atascosa, Caldwell, Frio, Gonzales, La Salle, McMullen, and Webb counties in sample dates ranging from 1940 through 2017. No salt

domes are known to exist in these areas. A few of the selected hydrographs suggest that total dissolved solids have remained relatively stable through time in some areas and has slightly increased in other areas (Figure 2-72). Data is limited in the deep, downdip portions of the aquifer unit.

Carrizo Sand

In the Carrizo Aquifer, groundwater is mostly freshwater in the outcrop area, with some areas with slightly saline concentrations (Figure 2-73 and Figure 2-74). The greatest observed total dissolved solids concentration was a single occurrence classified as brine (48,644 mg/L) from a well in De Witt County in 2013. A single occurrence of a total dissolved solids concentration classified as very saline was observed at a well in Karnes County in 2010. Moderately saline concentrations occur in Atascosa, Dimmit, Gonzales, La Salle, McMullen, and Zavala counties in sample dates ranging from 1959 through 2011. Slightly saline concentrations occur in Atascosa, Dimmit, Frio, Gonzales, Karnes, La Salle, McMullen, Medina, Webb, Wilson, and Zavala counties in sample dates ranging from 1913 through 2018. No salt domes are known to exist in these areas. A few of the selected hydrographs suggest that total dissolved solids have remained relatively stable through time in some areas and have slightly increased in other areas (Figure 2-73 and Figure 2-74).

Carrizo-Wilcox Undifferentiated and Wilcox Group

The water quality of the Carrizo-Wilcox undifferentiated wells and Wilcox outcrop wells are discussed separately in this report from the wells distinguished as solely Carrizo. Similar to the Carrizo Sand, groundwater is mostly freshwater in the outcrop area, with some areas with slightly saline concentrations (Figure 2-75 and Figure 2-76). The greatest observed total dissolved solids concentration was classified as moderately saline (6,681 mg/L) from a well in Dimmit County in 2006. Moderately saline concentrations occur in Dimmit, La Salle, Gonzales, Webb, and Zavala counties in sample dates ranging from 1960 through 2010. Slightly saline concentrations occur in Atascosa, Bastrop, Bexar, Caldwell, Dimmit, Frio, Gonzales, Guadalupe, La Salle, Maverick, McMullen, Medina, Webb, Wilson, and Zavala counties in sample dates ranging from 1930 through 2014. A few of the selected hydrographs suggest that total dissolved solids have remained relatively stable through time in some areas and have slightly increased in other areas (Figure 2-75 and Figure 2-76).

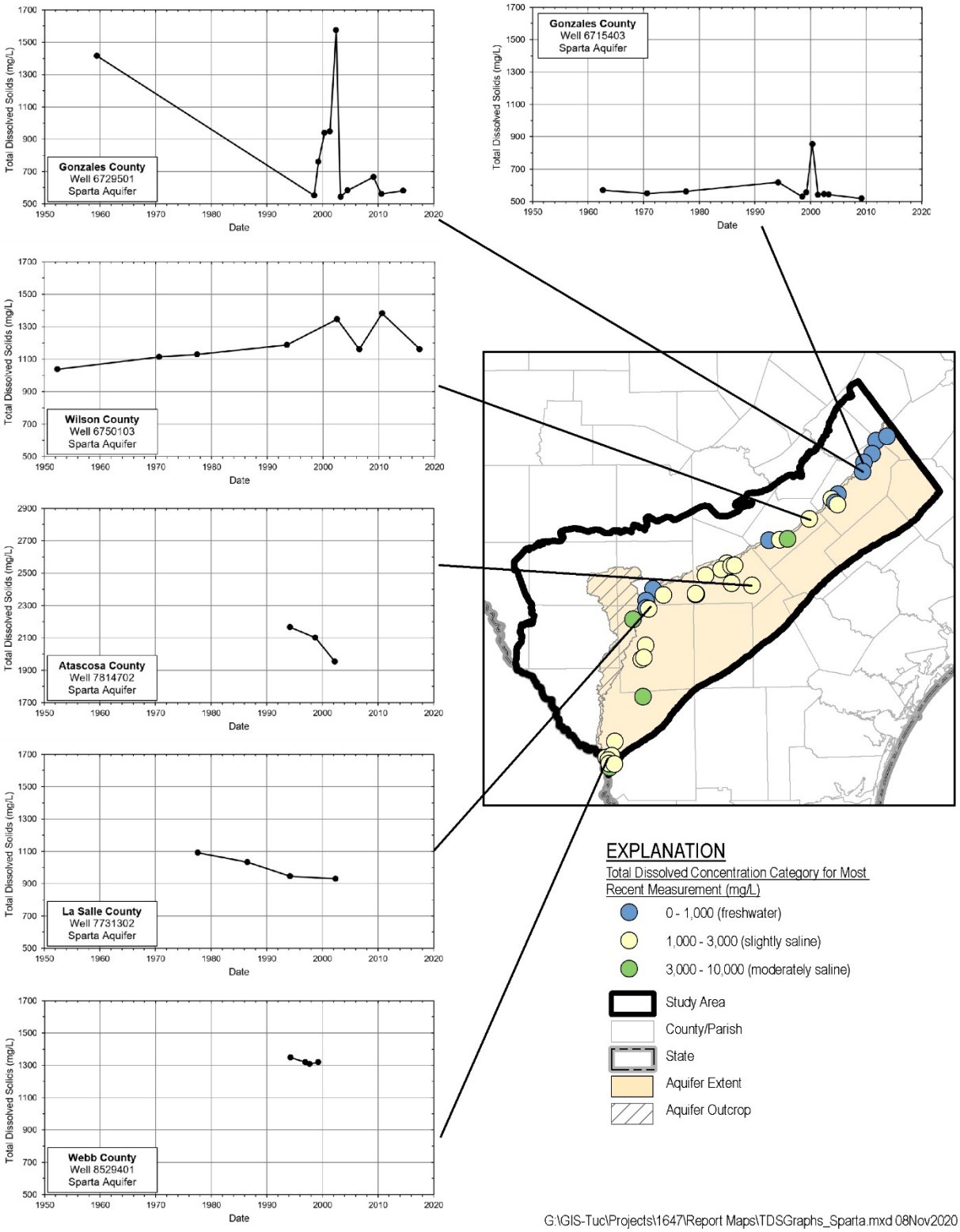


Figure 2-71. Total Dissolved Solids Distribution and Selected Historic Concentration for Sparta Aquifer Wells in Study Area

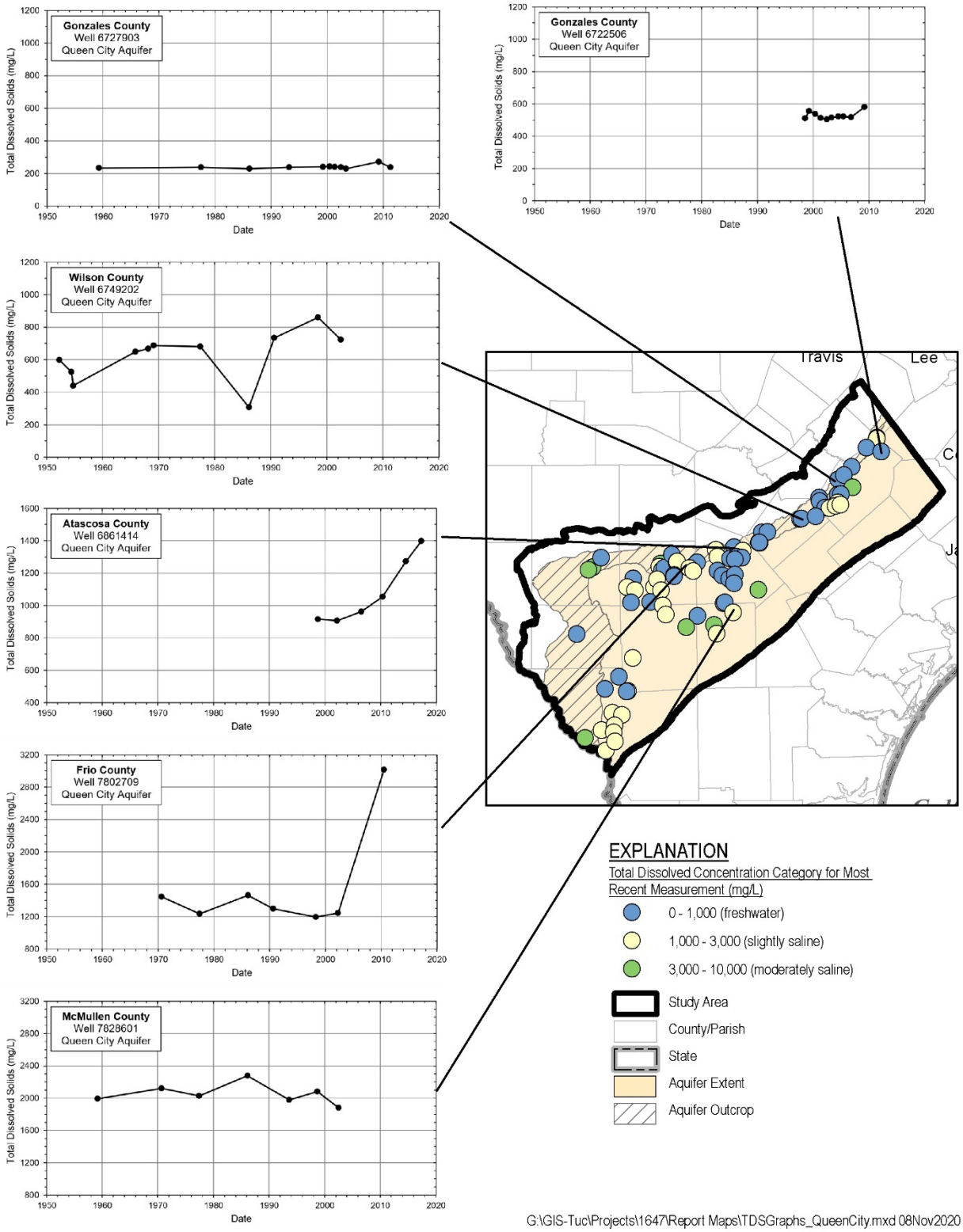


Figure 2-72. Total Dissolved Solids Distribution and Selected Historic Concentration for Queen City Aquifer Wells in Study Area

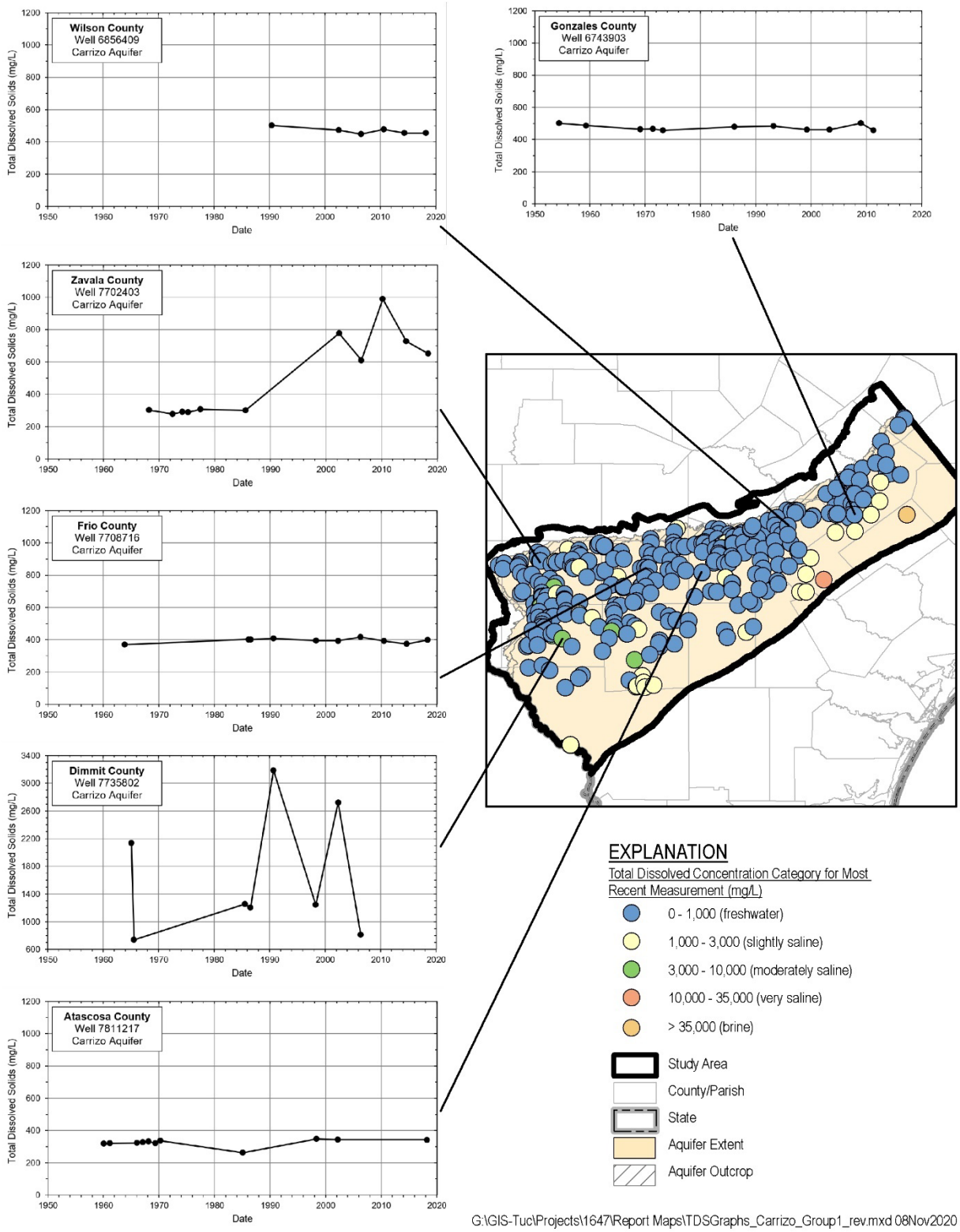


Figure 2-73. Total Dissolved Solids Distribution and Selected Historic Concentration for Carrizo Wells in Gonzales, Wilson, Atascosa, Frio, Zavala, and Dimmit Counties

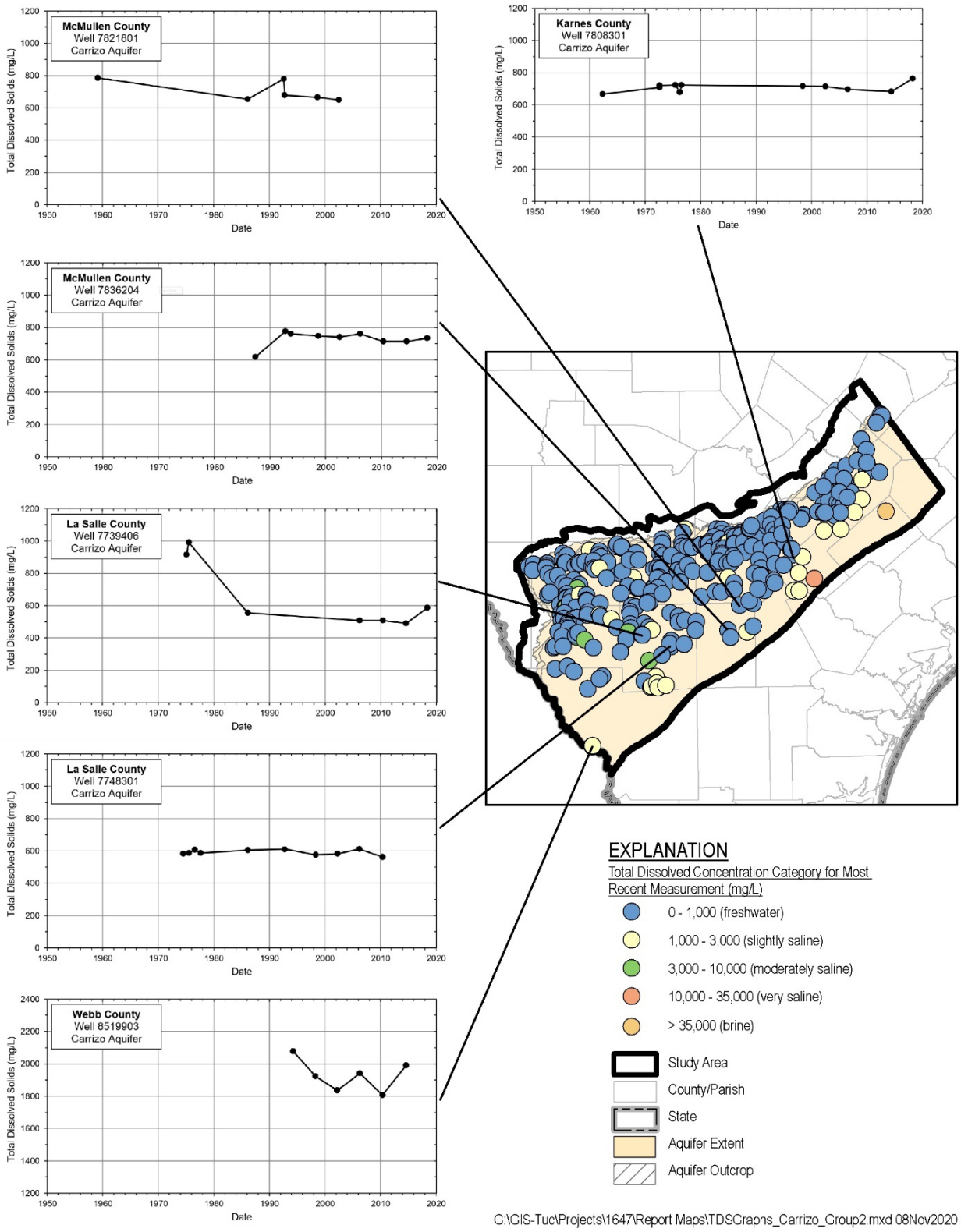


Figure 2-74. Total Dissolved Solids Distribution and Selected Historic Concentration for Carrizo wells in Karnes, McMullen, and La Salle Counties

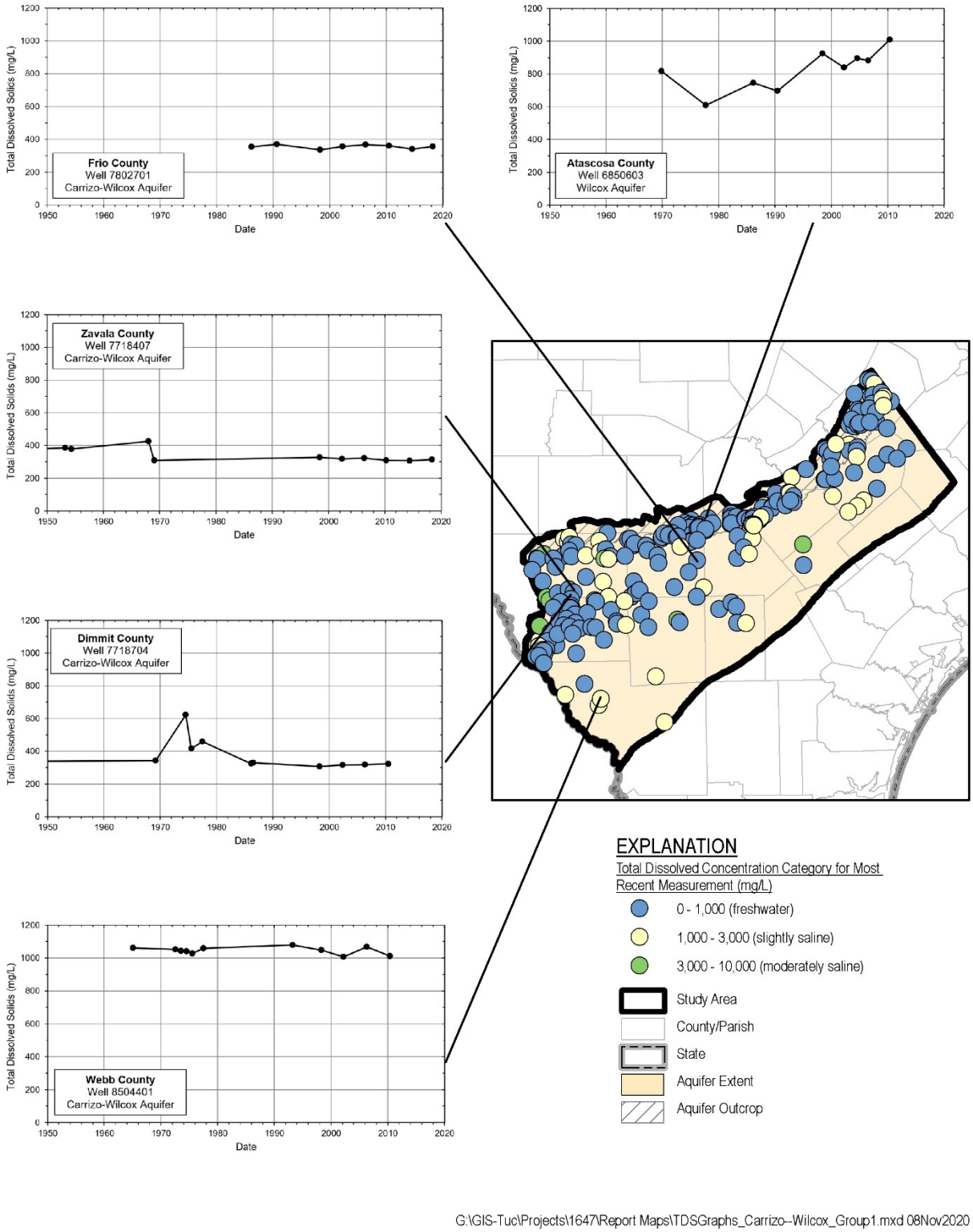


Figure 2-75. Total Dissolved Solids Distribution and Selected Historic Concentration for Carrizo-Wilcox Wells (undifferentiated) in Atascosa, Frio, Zavala, Dimmit, and Webb Counties

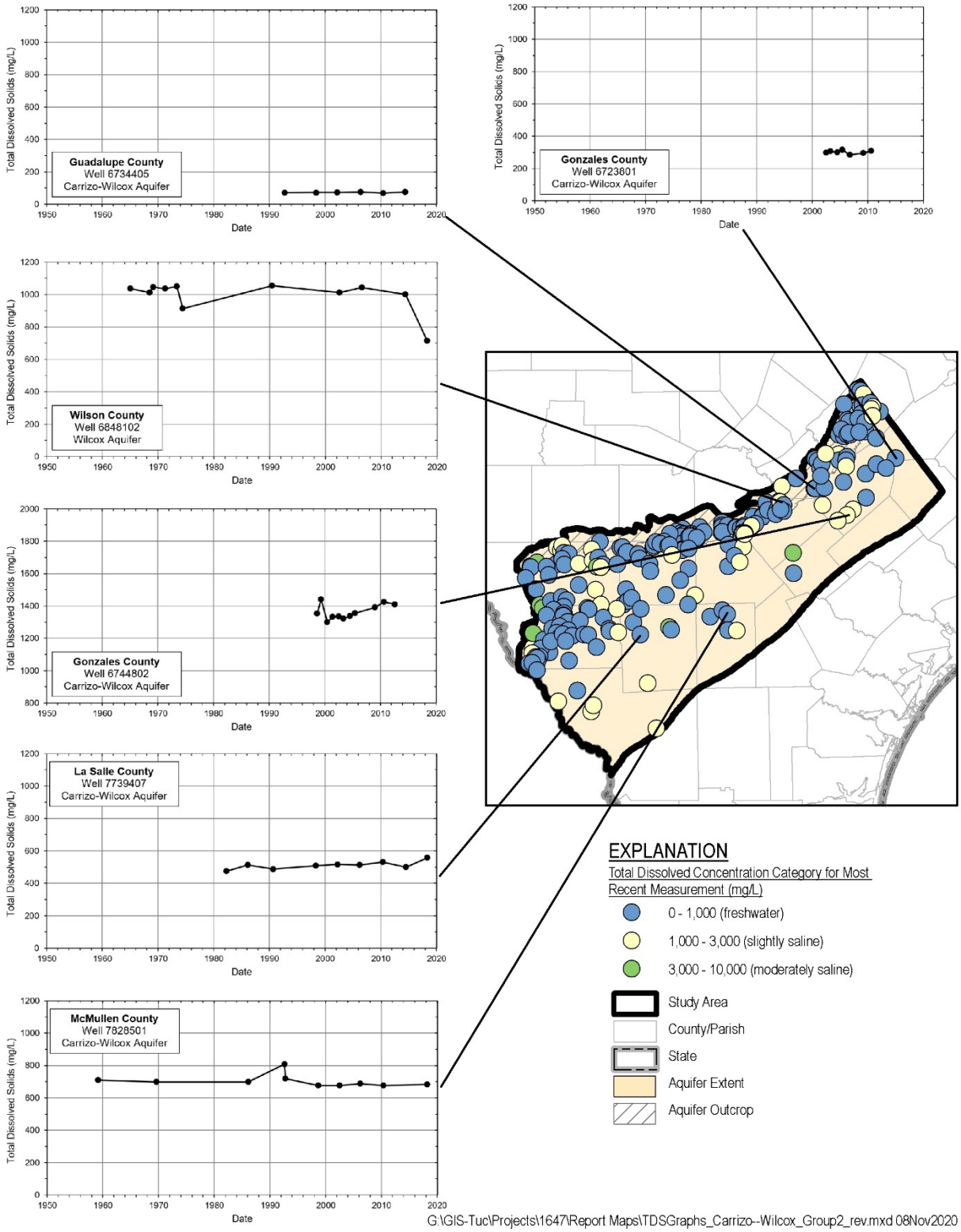


Figure 2-76. Total Dissolved Solids Distribution and Selected Historic Concentration for Carrizo-Wilcox Wells (Undifferentiated) in Gonzales, Guadalupe, Wilson, McMullen, and La Salle Counties

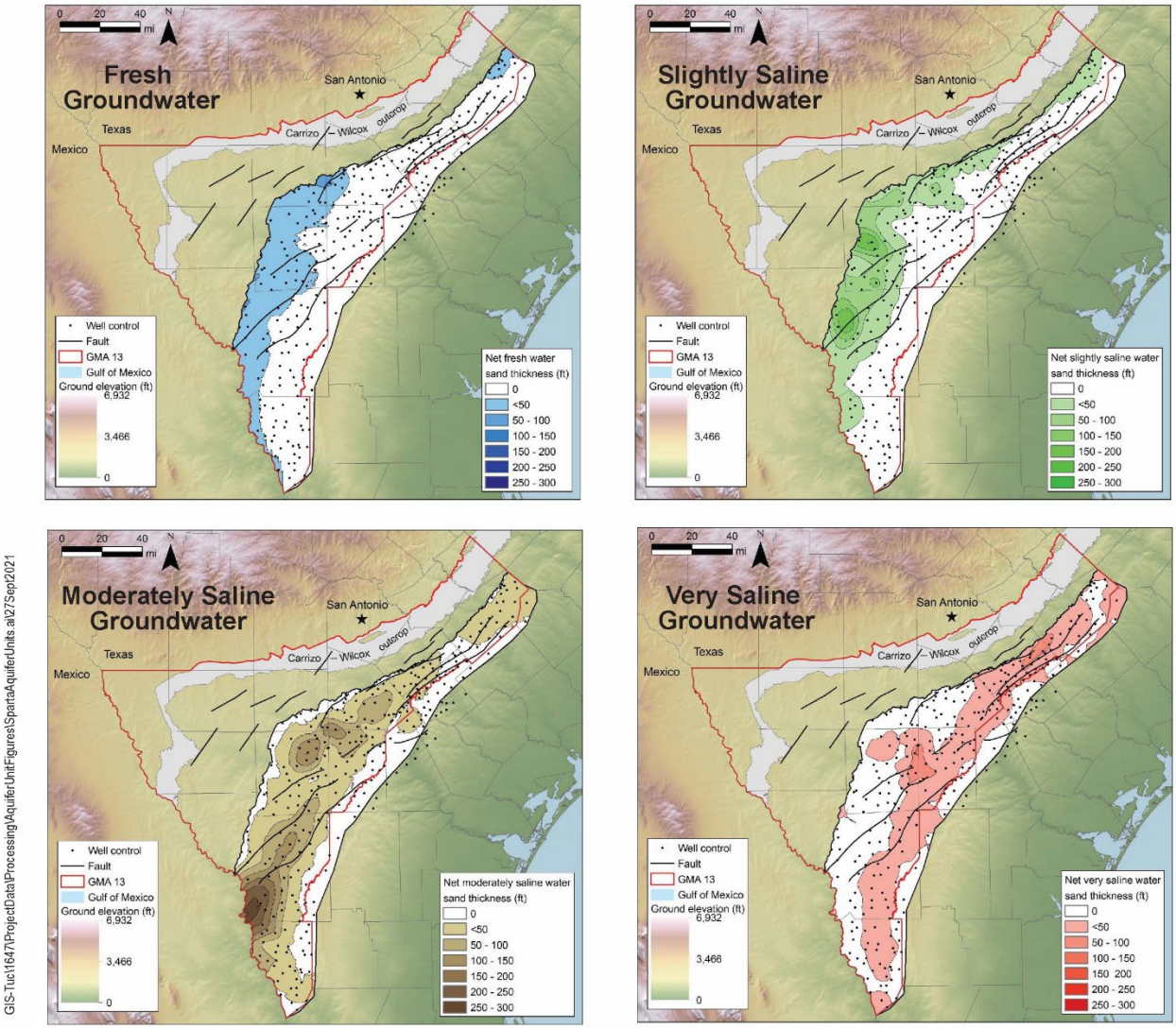


Figure 2-77. Net Thickness of Sand by Salinity Level for the Sparta Aquifer from Hamlin and others (2019)

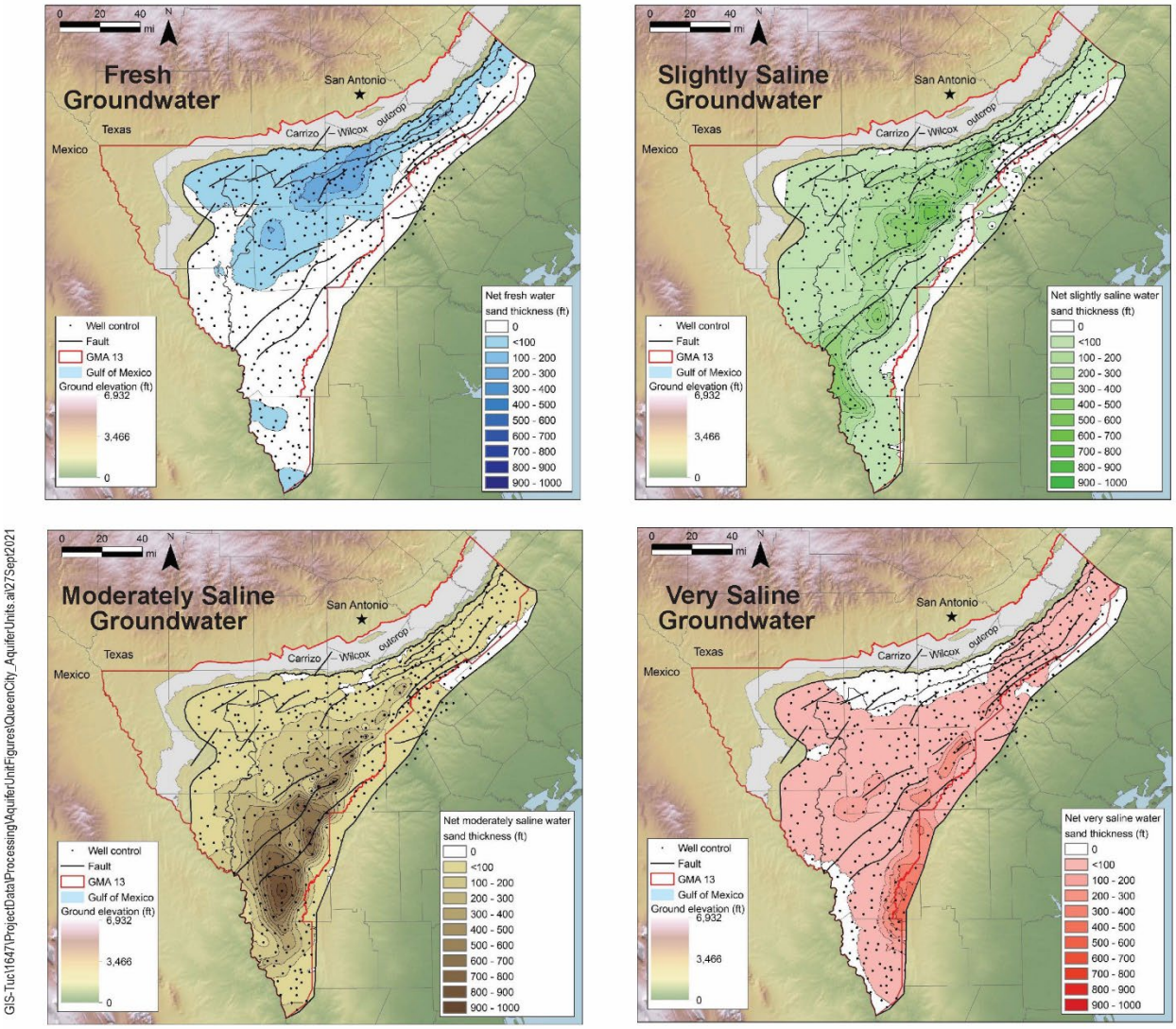


Figure 2-78. Net Thickness of Sand by Salinity Level for the Queen City Aquifer from Hamlin and others (2019)

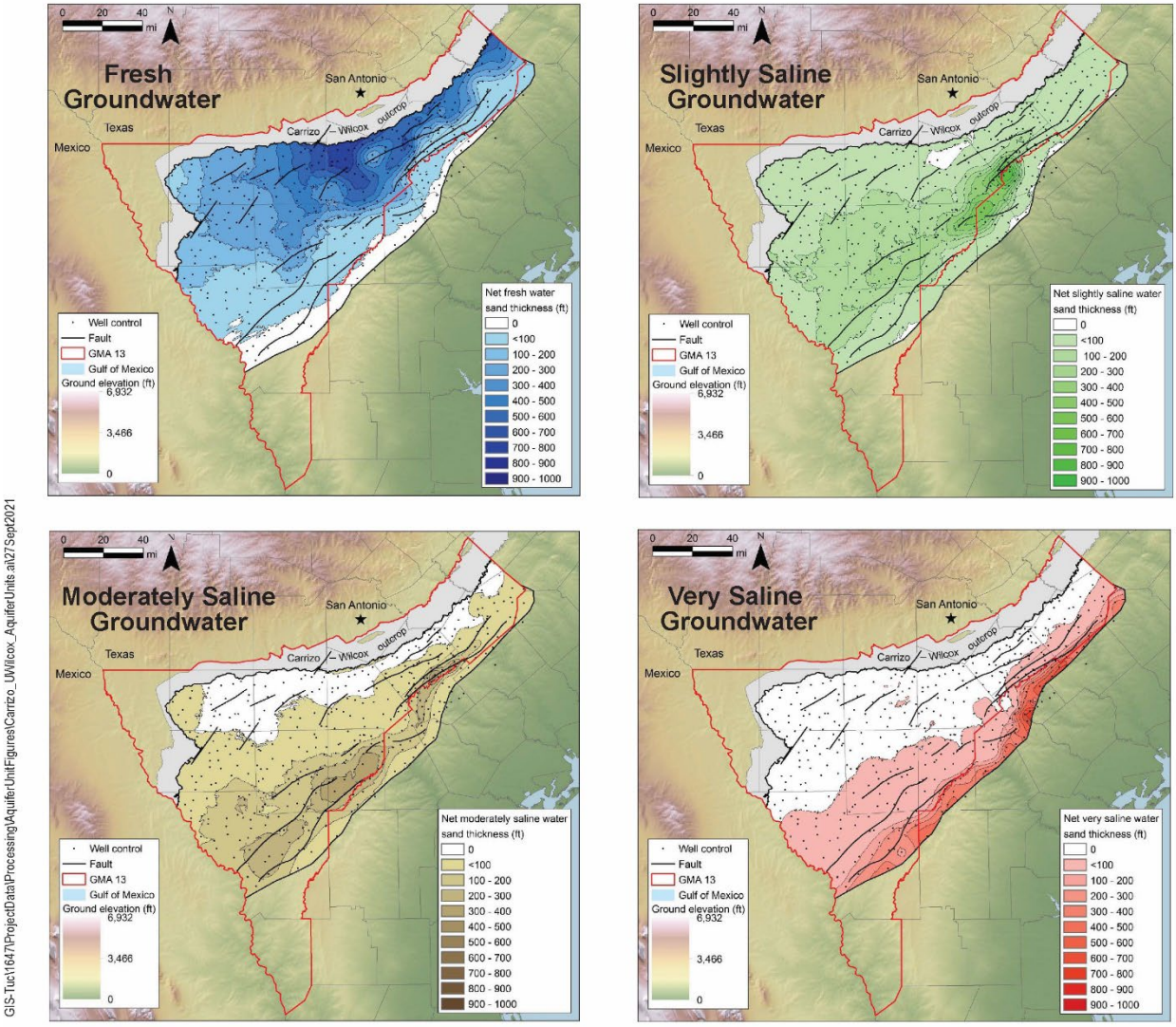


Figure 2-79. Net Thickness of Sand by Salinity Level for the Carrizo-Upper Wilcox Aquifer from Hamlin and others (2019)

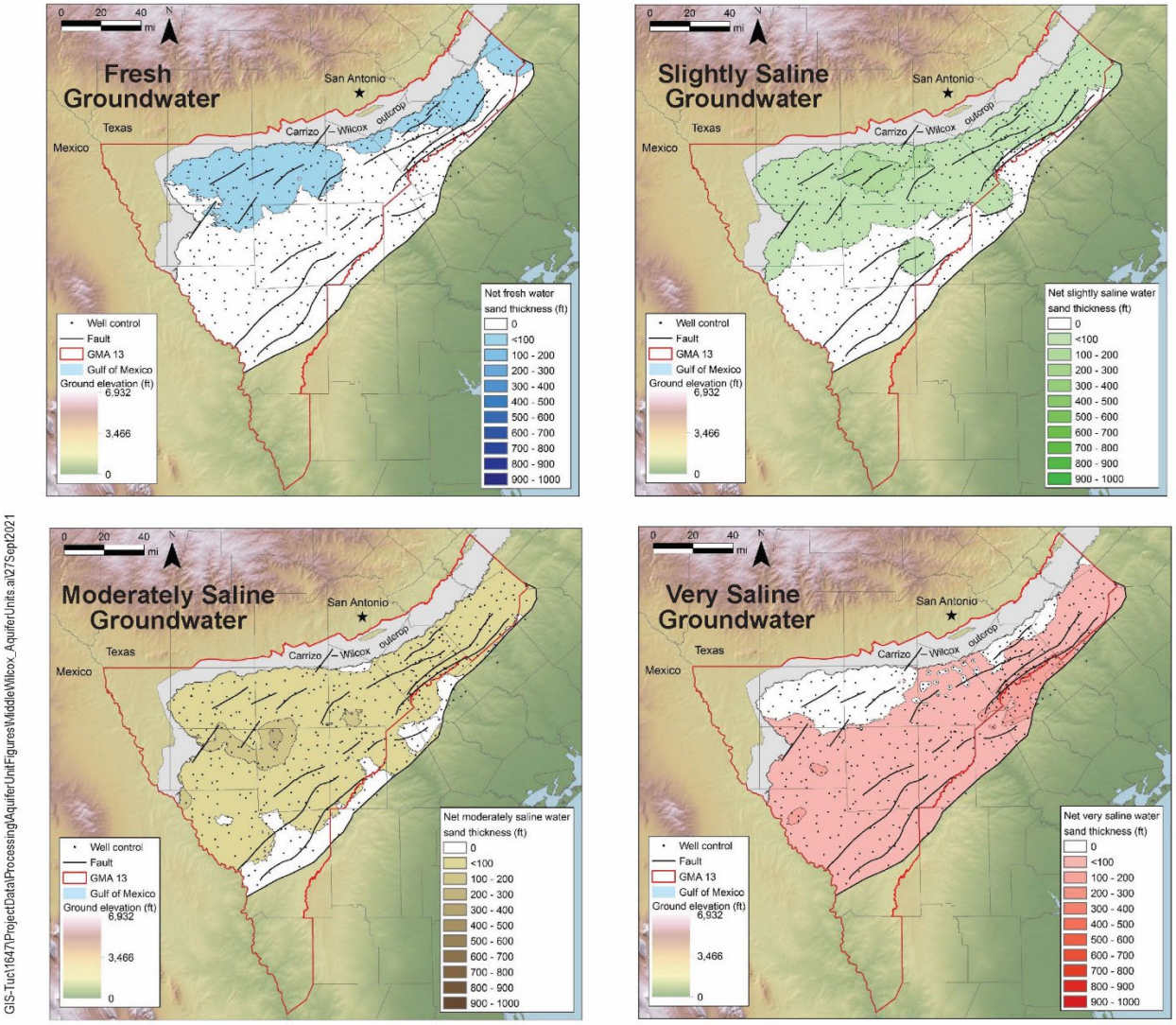


Figure 2-80. Net Thickness of Sand by Salinity Level for the Middle Wilcox from Hamlin and others (2019)

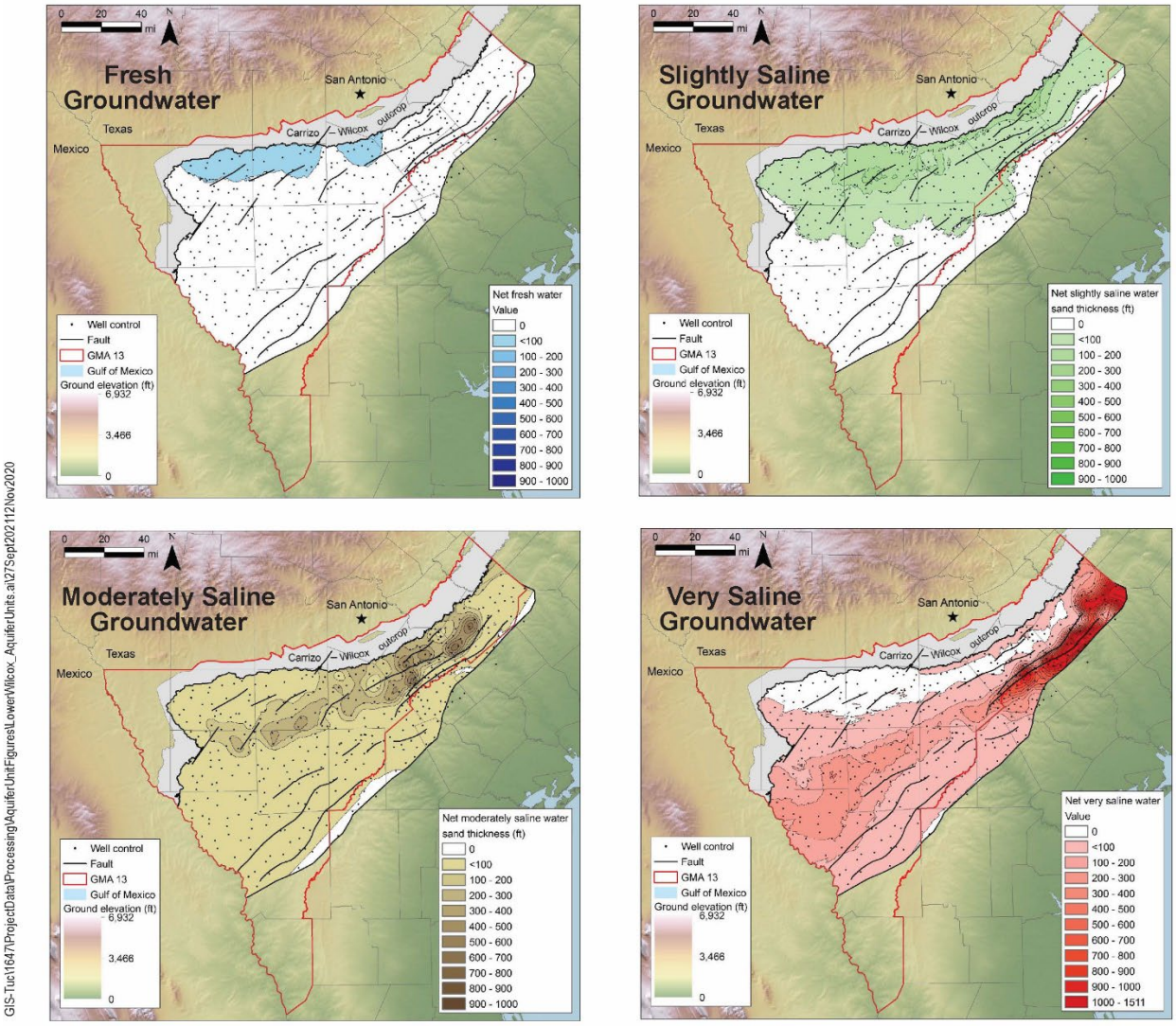


Figure 2-81. Net Thickness of Sand by Salinity Level for the Lower Wilcox from Hamlin and others (2019)

The geometric mean of the total dissolved solids concentration in each aquifer unit was calculated using the most recent concentration at each sampling location. The previously noted trend of down-dip increase in total dissolved solids concentration (Kelley and others, 2004) was verified, as seen in the concentrations in Table 2-11, with the exception of the Wilcox Aquifer where the mean concentrations are very similar.

Table 2-11. Geometric Mean of Total Dissolved Solids Concentrations Measured in Each Aquifer

Aquifer	Overall Mean (mg/L)	Outcrop (Unconfined) Mean (mg/L)	Downdip (Confined) Mean (mg/L)
Sparta	1,394.1	963.4	1,564.7
Queen City	1,062.7	947.7	1,384.4
Carrizo	455.7	288.4	473.4
Carrizo-Wilcox Undifferentiated and Wilcox Group	600.0	557.7	633.8

2.9 Summary of Conceptual Model

The conceptual hydrogeologic model for this study is based on the hydrogeologic setting described herein. A hydrogeologic conceptual model is a simplified representation of the important hydrogeologic features that govern groundwater movement in an aquifer system. Important hydrogeologic features include the hydrostratigraphic framework, hydraulic properties, aquifer recharge, natural and anthropogenic discharges from the aquifer, hydraulic boundaries, and groundwater occurrence and movement. The conceptual model provides the foundation for a numerical groundwater flow model. A simplified schematic of the conceptual hydrogeologic model for the southern portion of the Sparta, Queen City, and Carrizo-Wilcox aquifer system is shown on Figure 2-82.

The groundwater system in this conceptual model is a nine-layer system. Each model layer represents an individual hydrostratigraphic unit within the groundwater system. The nine layers represented in the model include the following, from top to bottom: river alluvium, Younger Units, Sparta Aquifer, Weches aquitard, Queen City Aquifer, Reklaw aquitard, Carrizo-upper Wilcox, and the middle and lower units of the Wilcox Group. The Sparta, Queen City, Carrizo, and the three Wilcox units are capable of producing adequate volumes of groundwater for use. These aquifer units are separated by two confining aquitards. The Weches Formation separates the Sparta Aquifer from the underlying Queen City Aquifer, and the Reklaw Formation separates the Queen City Aquifer from the Carrizo-Wilcox Aquifer. A representative hydrogeologic cross-section of the nine-layer groundwater system is shown on Figure 2-82. The aquifer units in this model dip eastward into the subsurface towards the Gulf Coast Basin and are overlain by a wedge of younger sediments (including the Gulf Coast Aquifer System and the Yegua-Jackson Aquifer).

Groundwater in the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer system occurs under unconfined (or water table) conditions in the outcrop areas and

confined conditions in down-dip areas. Regional groundwater movement is generally from the west-northwest in upland areas to the east towards the Gulf of Mexico, following the dip of the aquifer units. The sands of the Wilcox and Carrizo units are hydraulically connected and behave as a single aquifer in counties throughout the study area. Groundwater movement from one aquifer unit to another (cross-formational flow) occurs when groundwater level elevations are different in the adjacent aquifers. Cross-formational flow is observed to occur through the confining units in the study area.

Groundwater movement in the aquifers in controlled by topography, the hydro-stratigraphic framework, and variations in permeability within the aquifer layers. Groundwater movement in the confined, down-dip portions of the aquifer system are believed to be controlled by high-permeability sand intervals relative to lower permeability intervals.

The groundwater potentiometric surface in the deep, down-dip portions of the aquifer system are assumed to increase with depth, which produces upward cross-formational flows. Groundwater elevation contours developed for this study for each model layer will be used as initial conditions and guides for historical calibration. This conceptualization will be tested with the numerical model and a sensitivity analysis will be conducted to evaluate any impacts from uncertainty.

This conceptual model encompasses the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifer systems in south central Texas. The model boundaries are defined based on surface and groundwater features. The western boundary is the western-most extent of the lower Wilcox aquifer layer. The eastern boundary is the same as defined for the previous groundwater availability models, which is the up-dip limit of the Wilcox growth fault zone as defined by Bebout and others (1982). The southern boundary is the Rio Grande. The northern boundary is the approximate watershed drainage divide between the Guadalupe and Colorado river basins. The upper boundary is land surface in the outcrop area extending south to the extent of the Sparta outcrop. South of the Sparta outcrop, the upper model boundary is the contact between the Sparta and the overlying wedge of younger sediments. The bottom boundary of the model is defined as the bottom of the Wilcox Group (top of the older Midway Formation). The lateral extent of the model area is the same as the previous groundwater availability model for this aquifer system.

Hydraulic properties of the model layers will be evaluated and determined during model calibration. Measured hydraulic property data and the simulated properties specified in the previous groundwater availability models will be considered for model calibration. Additional adjustments may be required to vary properties within a layer, such as for outcrop and down-dip portions. Layer properties in the model will be described in detail upon model completion.

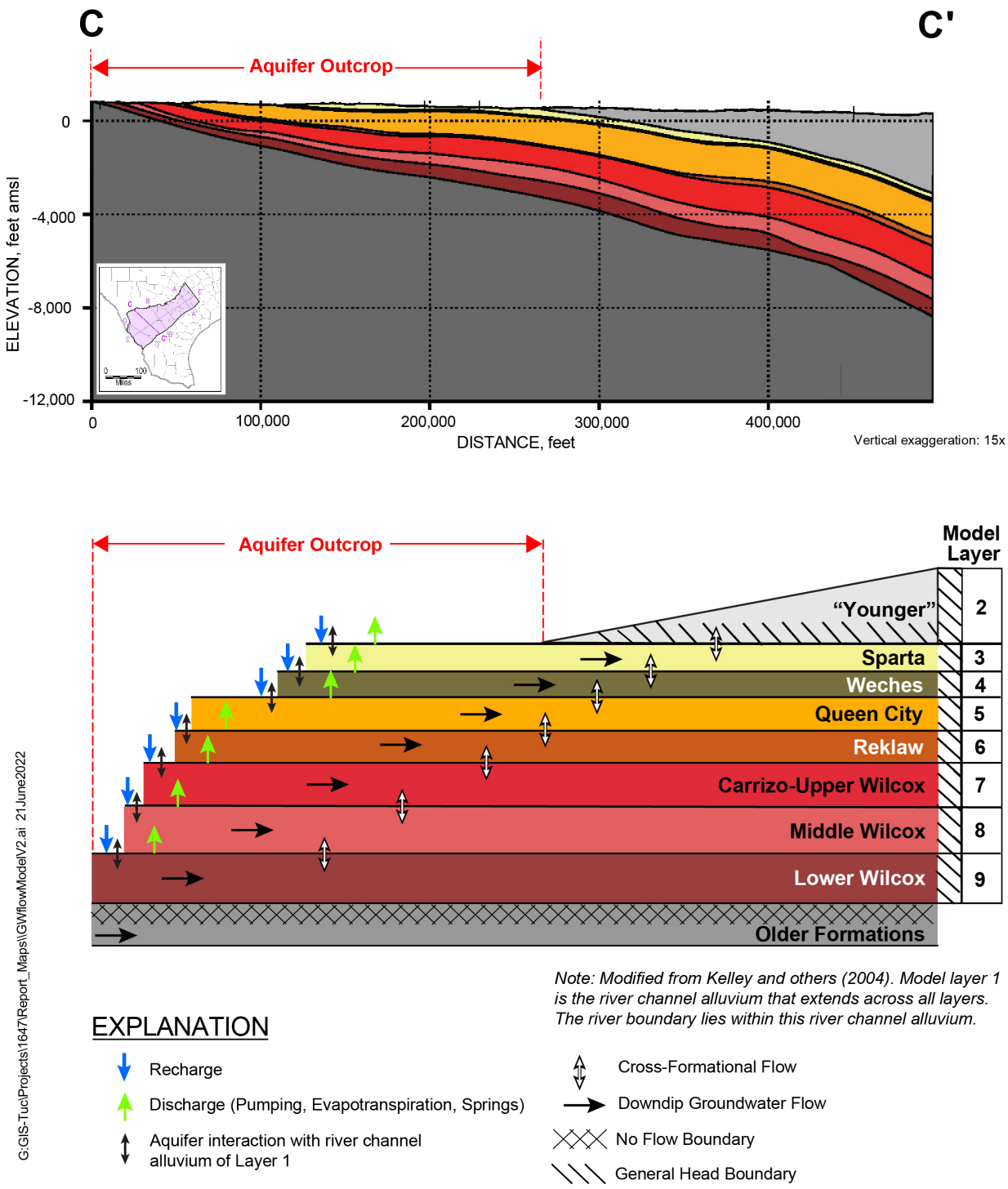


Figure 2-82. Conceptual Groundwater Flow Model Diagram for Southern Portion of Queen City, Sparta, and Carrizo-Wilcox Aquifers Groundwater Availability Model Update

2.10 Historical Transient Conditions

The transient model period represents historical hydrogeologic conditions from 1980 through 2017. This time period was selected principally based on pumping data availability. Initial conditions for the transient model will represent conditions prior to 1980. Hydrogeologic conditions in the study area varied during the transient model period due to changes in groundwater pumping and climate. The groundwater model will be calibrated to match measured groundwater levels, streamflows, and the conceptualized groundwater flow regime in the study area.

Groundwater inflow components to the groundwater flow model for the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers include: (1) recharge from infiltration of precipitation and (2) recharge from deep percolation of impounded reservoir water. Inputs for recharge from infiltration of precipitation will be initially developed by applying a recharge-precipitation relationship. As described in Section 2.3, annual scaling factors will be applied to the distribution of average recharge during model calibration if annual variation is required to match calibration targets for groundwater levels and streamflows. Recharge from reservoirs will be simulated using recorded reservoir water level data.

Groundwater outflow components to the groundwater flow model for the southern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers include: (1) groundwater withdrawals by pumping, (2) discharge to surface waters such as rivers, creeks, and springs, and (3) evapotranspiration. Pumping will be assigned to aquifer units based on the hydrostratigraphic framework and reported well construction information for each pumping well. The distribution of evapotranspiration will be initially based on average maximum evapotranspiration rate and evapotranspiration extinction depths. Components of evapotranspiration outputs could be scaled, if necessary, based on climatic factors and/or distributions of land cover.

Streamflows in major rivers that flow into the model domain will be specified at the model boundary. The water will be routed through the river system and infiltration will be dependent on the stage in the river, groundwater elevations in the model aquifer layers adjacent to the river channel, and channel conductance properties specified in the model. The initial flow rate for a river will be based on nearby streamflow measurements and could be adjusted during model calibration to match downstream measurements.

Changes in groundwater levels have varied through time and among the aquifer layers. Measurements at wells indicate rising, declining, or stable groundwater levels depending on location, with no overall regional trend. Groundwater levels have declined steadily in down-dip portions of the aquifers, and some local at or near the outcrop area. Declining groundwater levels are likely principally due to groundwater pumping.

3 Model Overview and Packages

The conceptual model update and the 2004 groundwater availability model for the Southern Carrizo-Wilcox Aquifer, Queen City, and Sparta Aquifers (Kelley and others, 2004) were the basis of the numerical model described in this report. The model will be used to assess future regional impacts from current pumping and projected future pumping. Model results will be used to evaluate long-term groundwater pumping impacts on surface water and groundwater. In addition, the model may be used to assist groundwater conservation districts in Groundwater Management Area 13 with groundwater planning and management, especially the evaluation and establishment of desired future conditions in the joint planning process.

The three-dimensional modular groundwater-flow model code MODFLOW 6 (Langevin and others, 2017) was used for the simulations with the Groundwater Vistas, Version 8 (Rumbaugh and Rumbaugh, 2020), graphic user interface. Construction of the numerical model generally required evaluating the area hydrostratigraphy, identifying flows in and out of the model domain, establishing the calibration period of the simulation, and designing the spatial resolution necessary to perform the simulation. The site location is shown on the map of Figure 1-3.

The numerical model honors the geologic conceptual model discussed in Section 2, including layering pinch-outs and outcrop of the geologic units, discussed further in Section 3.4. Pinch-outs are an important component of the conceptual model and occur where geologic units gradually thin to where they are no longer existent allowing direct contact and hydraulic communication with units that were previously located above and below the intervening unit that “pinched-out”. Figure 2-4 shows the model domain and the aquifer outcrops simulated in the groundwater model.

Flows in and out of the model domain were discussed as part of the hydrogeologic conceptual model sections related to recharge (Section 2.3), rivers (Section 2.4), pumping (Section 2.7.1), and evapotranspiration (Section 2.7.3). The conceptual block model, shown in Figure 2-82, illustrates the boundary flows and groundwater fluxes between hydrostratigraphic units. The boundary flows were translated into model boundary conditions using the boundary condition packages of MODFLOW 6. Boundary condition packages simulate interaction of the model with the “outside world” and allow water to flow into or out of the model domain. “Packages” in the MODFLOW framework numerically implement various conceptual flow processes and their interactions with groundwater.

The modeling objectives included extension of the calibration period relative to previous work performed Deeds and others (2003) and Kelley and others (2004). The calibration period of 1980 through 2017 was selected principally based on pumping and water level data availability. Annual stress periods were selected for these boundary flows to provide adequate temporal resolution to use the model for planning purposes as intended for all groundwater availability models developed by the TWDB. The numerical groundwater-flow model was constructed to simulate the conceptualized groundwater-flow system for a

steady-state predevelopment period, steady-state 1980 conditions, followed by transient conditions using annual stress periods from 1981 through 2017.

The spatial resolution of the model grid (model cell size) was based on the modeling objectives as well as the boundary conditions identified. The grid contained sufficient resolution to provide model-wide evaluations of water levels and flow budgets with further refinement near rivers/streams to better capture the surface-water / groundwater interactions. As discussed in detail in Section 3.4, grid cell size varies by layer. Once the grid was constructed, the hydrostratigraphic conceptual model that was developed in Leapfrog® Geo (software developed by Seequent) was imported into the model grid using Groundwater Vistas. Base-maps were also imported into Groundwater Vistas to identify county boundaries, rivers, and other features that generally orient the model.

Following model construction, preliminary model parameter estimates were generated (e.g., hydraulic conductivity parameterization) and boundary conditions (rivers, wells, recharge, evapotranspiration, hydraulic flow barriers, and general head boundaries) were developed for the predevelopment through 2017 simulation period. Calibration targets for water level elevations were developed for the steady-state 1980 and transient stress periods and imported into Groundwater Vistas (discussed in Section 4.0). Model calibration and sensitivity are discussed in Sections 4.0 and 5.0. Sub-sections in Section 3 below provide details of model construction.

3.1 MODFLOW 6 Overview

The MODFLOW 6 groundwater modeling software, version 6.2.2, was used to construct the model within the Groundwater Vistas (version 8) interface. MODFLOW 6 is the newest version of the MODFLOW code, released in 2017 by the United States Geological Survey (Langevin and others, 2017). The code is appropriate for this work as it can meet the simulation requirements and challenges for this project. Elements of the code and packages pertinent to the groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers flow simulations are discussed here.

The MODFLOW 6 groundwater model (Langevin and others, 2017) builds upon the functionality of previous MODFLOW codes, including MODFLOW-2005 (Harbaugh, 2005), MODFLOW-NWT (Niswonger and others, 2011), MODFLOW-USG (Panday and others, 2013), and MODFLOW-LGR (Mehl and Hill, 2005).

MODFLOW 6 solves for three-dimensional flow of water in the subsurface using the control-volume finite-difference approach. The control-volume finite-difference numerical method “discretizes” the modeled domain into model cells that may have different sizes and shapes. Each model cell represents a part of the domain that is encompassed by that model cell and model inputs and outputs are generated for this discretized system. The control-volume finite-difference methodology allows for flexible gridding of the subsurface domain including the ability to refine the computational grid locally using nested grids to provide spatial resolution where required and accurately represent pinch-outs, faults, displacements, and outcrops of geological layers.

As with the other MODFLOW codes, MODFLOW 6 consists of groups of "modules" or "packages" that perform various functions related to groundwater flow simulations. These packages compartmentalize the model into its various functional elements such as defining the model domain and its discretization, parameterizing the aquifer and flow processes, and implementing various pumping and boundary conditions to the modeled system. Table 3-1 shows the packages of MODFLOW 6 that were used for the groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers. Model input files were developed for each of the packages to represent the conceptual model of the system.

MODFLOW 6 is structured differently from older versions of MODFLOW in that the solution is separated from the model. With the MODFLOW code, the numerical solution represents a simulation consisting of one numerical model. In MODFLOW 6, a simulation can consist of multiple models, of different domains or different types, that are solved simultaneously and result in one numerical solution. Therefore, in addition to the model-related files shown on Table 3-1, MODFLOW 6 also includes files for the solution that contains the models; however, for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers, there is only one model. Implications of MODFLOW-6 structuring is discussed in more detail in Section 3.2.

MODFLOW 6 simulation outputs are contained in several files. The main output is written across three different files, the first of which is a run list file (LST) which includes mass balance information. Water level elevations output is provided in the heads file with the extension HDS. Modeled flows, storage flux, and boundary fluxes are output to the cell-by-cell flow file with extension CBB. Table 3-2 shows the relevant output files generated by MODFLOW 6.

Table 3-1. Summary of Model Input Packages

Package Type	Abbreviation	Description
Internal Packages		
Name file	NAM	Controls all other model files and names
Initial Conditions	IC	Reads the starting heads
Discretization	DISU	Discretizes groundwater domain
Hydraulic Flow Barrier	HFB	Represents flow barriers such as faults
Iterative Matrix Solver	IMS	Sets the solution methodologies and solvers
Node Property Flow	NPF	Calculates flow between cells
Storage	STO	Calculates the change in water volume
Temporal Discretization	TDIS	File containing model time discretization
Stress Packages		
Well	WEL	Implement sources/sinks
General Head Boundary	GHB	Implement head-dependent flux boundary
River	RIV	Implement river boundary
Recharge	RCH	Implement recharge
Evapotranspiration	EVT	Implement evapotranspiration

Table 3-2. Summary of Model Output Packages

Package Type	Abbreviation	Description
List file	LST	Lists model input, simulation summary, and mass balance
Groundwater Flow Head output	HDS	Contains head output for all GWF cells at all stress periods
Cell-by-cell flows	CBB	Contains CBB output for all cells at all stress periods
Output Control	OC	Control simulation output

3.2 NAME File

A MODFLOW 6 simulation includes two NAME files, one for the solution and another for the groundwater flow model.

For this updated model, the solution NAME file includes solution-related information such as solution options, time-stepping file name, and a NAME file for the model files, including the file name for the solver.

The groundwater model NAME file contains the model options, the abbreviations of MODFLOW 6 packages used, and a file name for the input (or output) files that are used in the model. Specified model options include the Newton Raphson option, which was selected for linearizing the model flow equations.

The Newton Raphson linearization approach was used with upstream weighting to run the model. With this approach, any dry cells are physically so because the water level is below their simulated bottom and not due to numerical reasons as is the case with the MODFLOW 2005 and prior "Wet/Dry" schemes.

3.3 Initial Conditions Package

The Initial Conditions (IC) package of MODFLOW 6 specifies initial water level elevations at all groundwater model cells in the domain. Since the first and second stress periods of the model are steady-state conditions, the starting head values do not affect the result but are required to begin the iterative process. During calibration, the computational burden of deriving a numerical solution is reduced by using a previous calibration simulation output for starting heads. The binary output file of a simulation is renamed "start.hds" such that the first stress period values (the steady-state result of the previous calibration simulation) are used as the starting condition for the next simulation.

3.4 Discretization Packages

A MODFLOW 6 simulation includes two discretization packages, one for time discretization of the solution and the other for defining the discretization of the unstructured grid for the model.

The Stress Period Setup (TDIS) package of MODFLOW 6 defines the time discretization. The Discretization (DISU) package of MODFLOW 6 was used and defines the model discretization information for the 3-dimensional groundwater cells.

3.4.1 Stress Period Setup

The Stress Period Setup (TDIS) package of MODFLOW 6 defines the time discretization. The groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers was discretized into 39 stress periods. The first stress period was simulated as steady-state representing predevelopment conditions. The second stress period was also simulated as steady-state representing 1980 as the initial conditions of the transient model. The remaining stress periods were simulated as yearly and represented

transient conditions from 1981 through 2017. The model was updated through 2017 based on pumping data availability. The annual stress period discretization was considered sufficient for the regional planning objectives of the modeling effort. Table 3-3 shows the stress period details.

Table 3-3. Stress Period Setup

Stress Period	Time Steps	Representative Year	Length (days)	Type
1	1	Predevelopment	365	Steady-State
2	1	1980	366	Steady State
3	1	1981	365	Transient
4	1	1982	365	Transient
5	1	1983	365	Transient
6	1	1984	366	Transient
7	1	1985	365	Transient
8	1	1986	365	Transient
9	1	1987	365	Transient
10	1	1988	366	Transient
11	1	1989	365	Transient
12	1	1990	365	Transient
13	1	1991	365	Transient
14	1	1992	366	Transient
15	1	1993	365	Transient
15	1	1994	365	Transient
17	1	1995	365	Transient
18	1	1996	366	Transient
19	1	1997	365	Transient
20	1	1998	365	Transient
21	1	1999	365	Transient
22	1	2000	366	Transient
23	1	2001	365	Transient
24	1	2002	365	Transient
25	1	2003	365	Transient
26	1	2004	366	Transient
27	1	2005	365	Transient
28	1	2006	365	Transient
29	1	2007	365	Transient
30	1	2008	366	Transient
31	1	2009	365	Transient
32	1	2010	365	Transient
33	1	2011	365	Transient
34	1	2012	366	Transient
35	1	2013	365	Transient
36	1	2014	365	Transient
37	1	2015	365	Transient
38	1	2016	366	Transient
39	1	2017	365	Transient

3.4.2 Model Domain Discretization

The Discretization (DISU) package of MODFLOW 6 defines the model discretization information for the 3-dimensional groundwater cells. The numerical model consists of nine geologic units in the model domain which were discretized into 9 numerical layers; layer stratigraphy is shown on Figure 2-1 and modeled layers are shown on Figure 2-82.

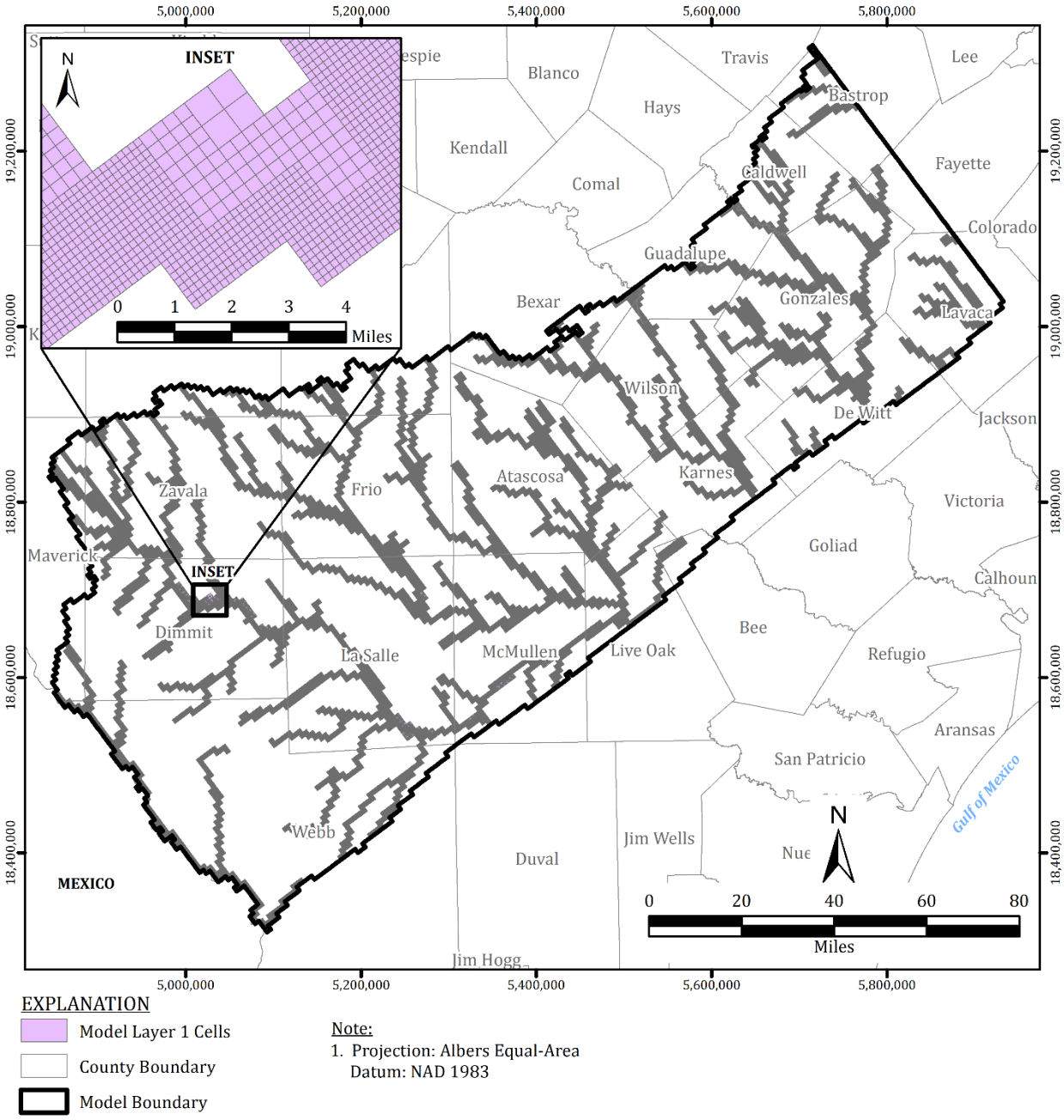
The domain and stratigraphy for the groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers were established during conceptual model development and spatial extents are shown on Figure 2-4. The major and minor aquifers are described in detail in Section 2. The model domain's northwestern and western boundary represent the northern extent of the Carrizo-Wilcox Aquifer as shown on Figures 1-4 and 2-4. The model domain includes the south-western portions of the Sparta and Queen City Aquifers as shown on Figures 1-5 and 2-4. The model layers include the Younger Units to complete the geological model up to the land surface; however, the Younger Units are not simulated in the model except as a general head boundary providing interaction between the Younger Units and underlying units, discussed in Section 3.9 below.

The domain was discretized using a parent grid-block size of one square mile (5,280 feet in length on each side) on a base grid containing 112 rows, 217 columns, and 9 layers. An oct-patch refinement procedure was implemented along the rivers to provide a finer spatial resolution along these features. The oct-patch feature is similar to the quad-patch refinement in Groundwater Vistas but further refines the grid in the horizontal and vertical directions. Table 3-4 summarizes the active cells within each layer and Figures 3-1 through 3-9 show the discretization of the groundwater domain. Model Layer 1, representing the Quaternary Alluvium hydrostratigraphic unit, has the greatest refinement level of 4, giving square cells measuring 660 feet for each side along the river (Figure 3-1 and Table 3-4). The model grid consists of 382,019 active cells.

The grid coarsens for deeper layers, with a coarsening of one level for every active layer found beneath the alluvium cells. Layer cells were eliminated where the geologic layer pinches out or where the geologic layer is absent and the underlying layer outcrops to the surface, as shown on Figures 3-1 through 3-9.

Table 3-4. Summary of Model Domain Discretization

Layer	Hydrostratigraphic Unit	Number of active cells	Smallest grid cell size (feet)	Largest grid cell size (feet)
1	Quaternary Alluvium	213,508	660	2,640
2	Younger Units	37,954	1,320	5,280
3	Sparta Aquifer	16,990	1,320	5,280
4	Weches Aquitard	11,024	1,320	5,280
5	Queen City Aquifer	26,790	1,320	5,280
6	Reklaw Aquitard	17,639	1,320	5,280
7	Carrizo-Upper Wilcox	17,993	1,320	5,280
8	Middle Wilcox	18,233	1,320	5,280
9	Lower Wilcox	21,888	1,320	5,280
	Model-Wide Active Cells:	**382,019**	**660**	**5,280**



EXPLANATION

- Model Layer 1 Cells
- County Boundary
- Model Boundary

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

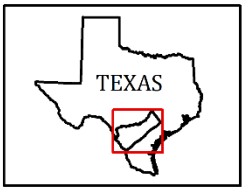
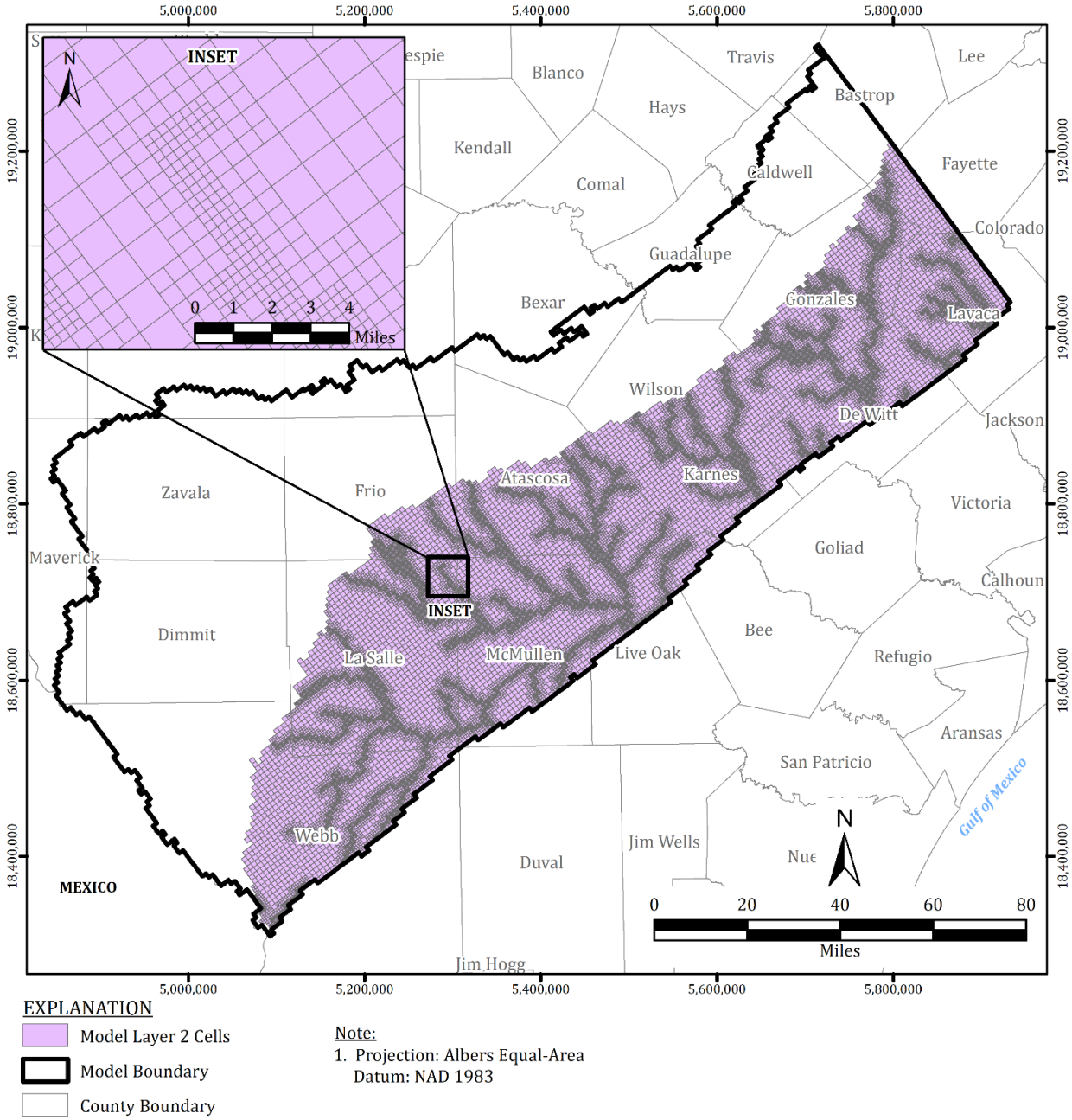


Figure 3-1. Groundwater Model Domain Discretization for Quaternary Alluvium (Model Layer 1)



EXPLANATION

- Model Layer 2 Cells
- Model Boundary
- County Boundary

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

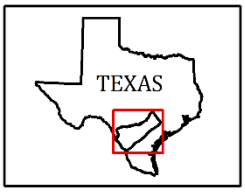


Figure 3-2. Groundwater Model Domain Discretization for Younger Units (Model Layer 2)

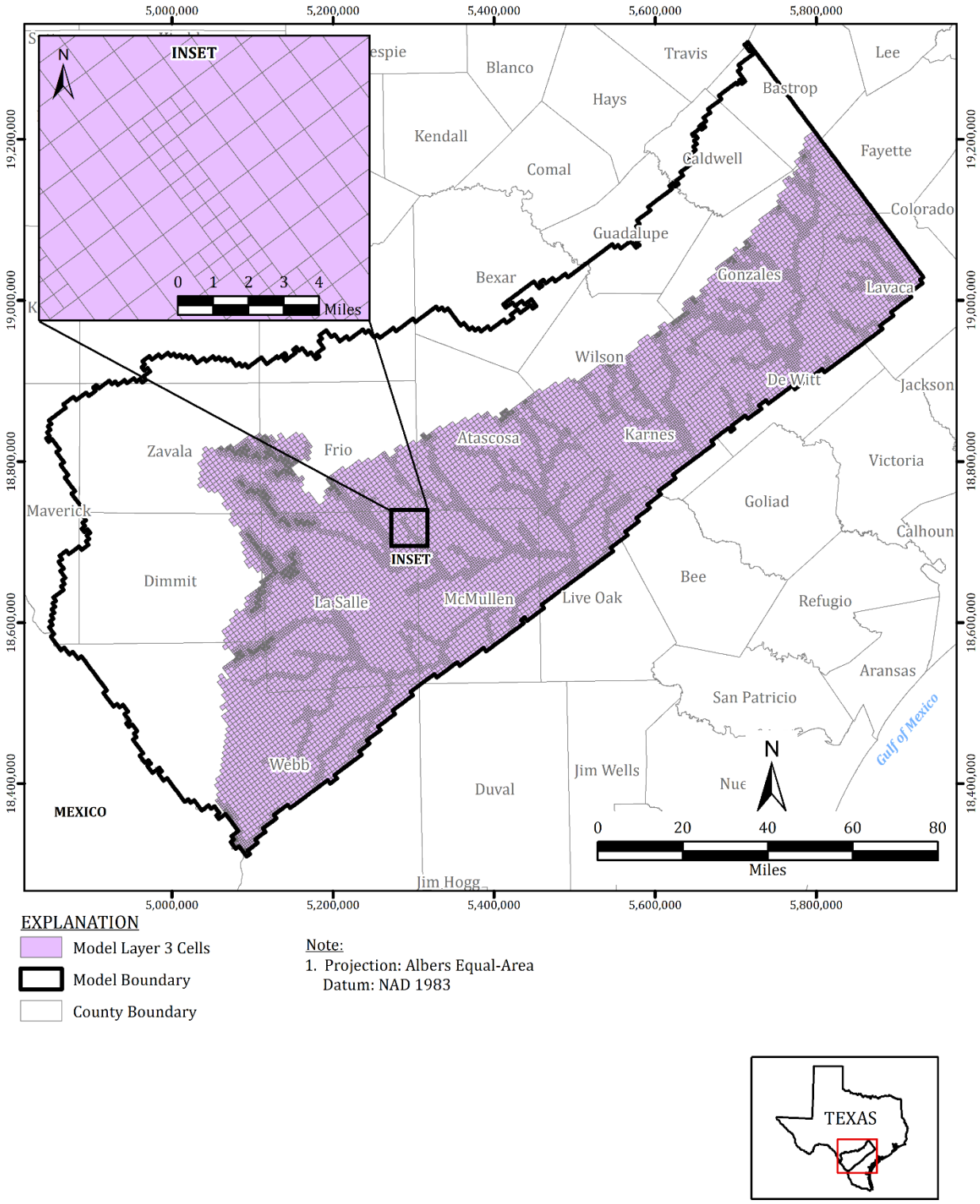


Figure 3-3. Groundwater Model Domain Discretization for Sparta Aquifer (Model Layer 3)

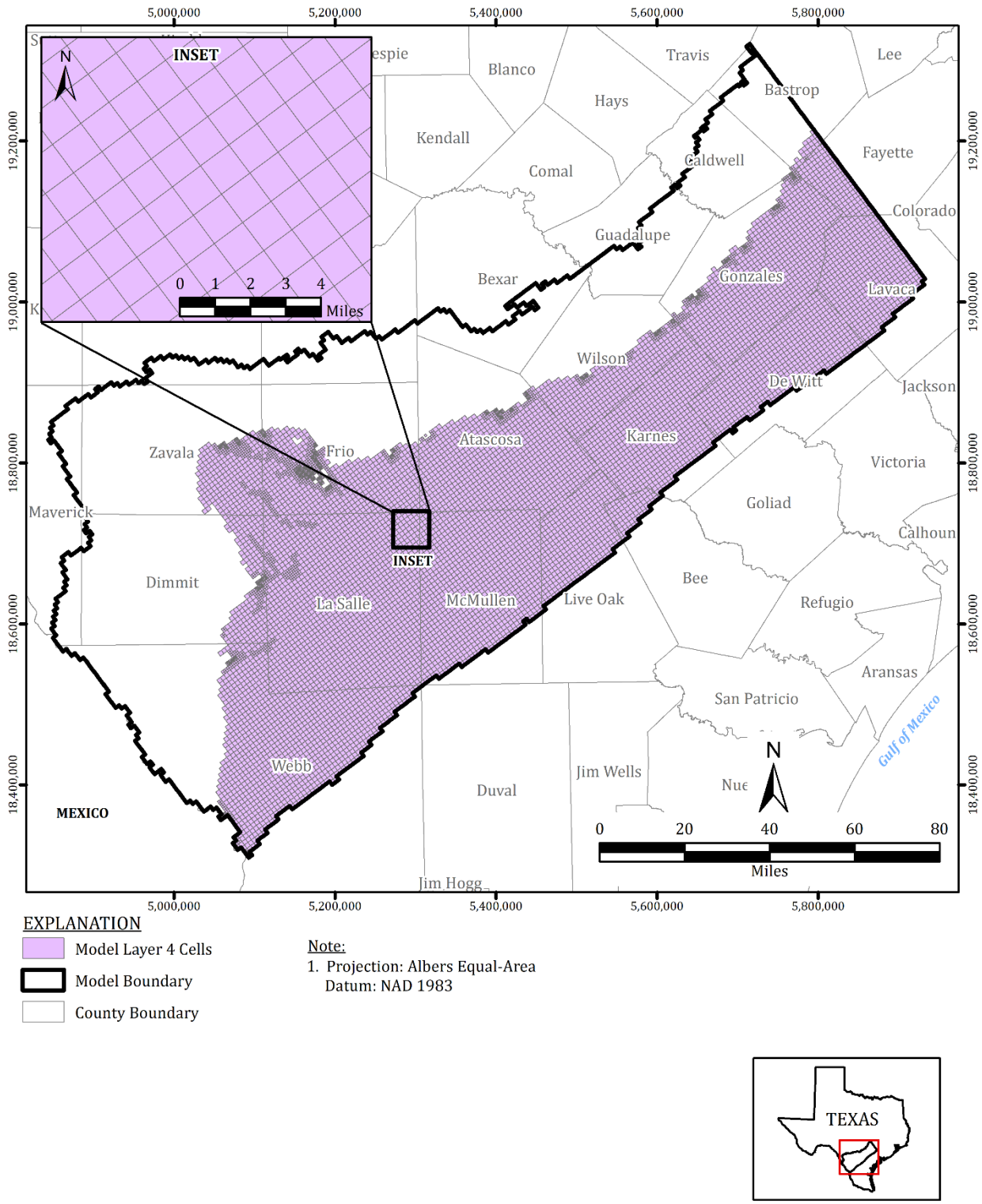


Figure 3-4. Groundwater Model Domain Discretization for Weches Aquitard (Model Layer 4)

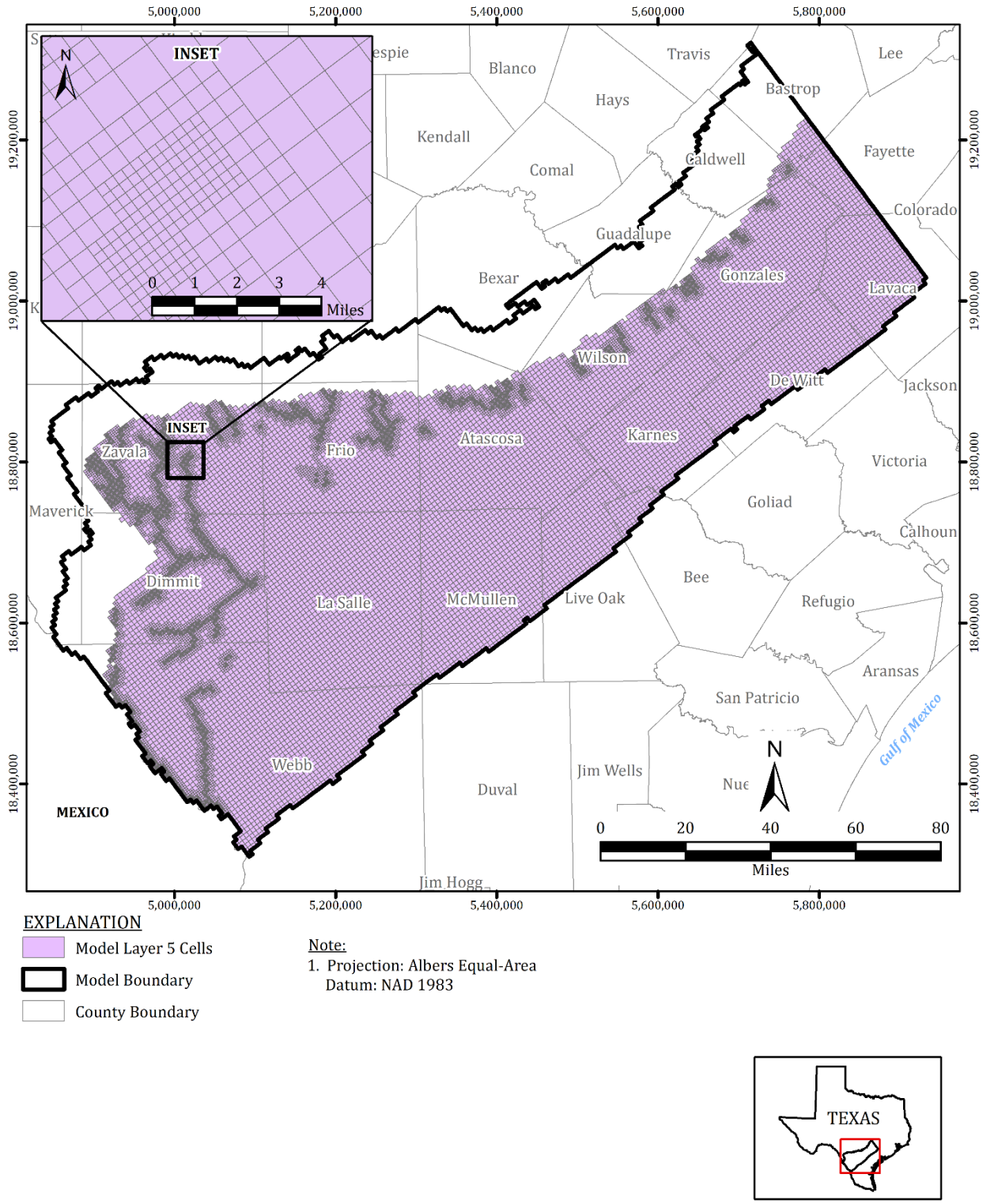
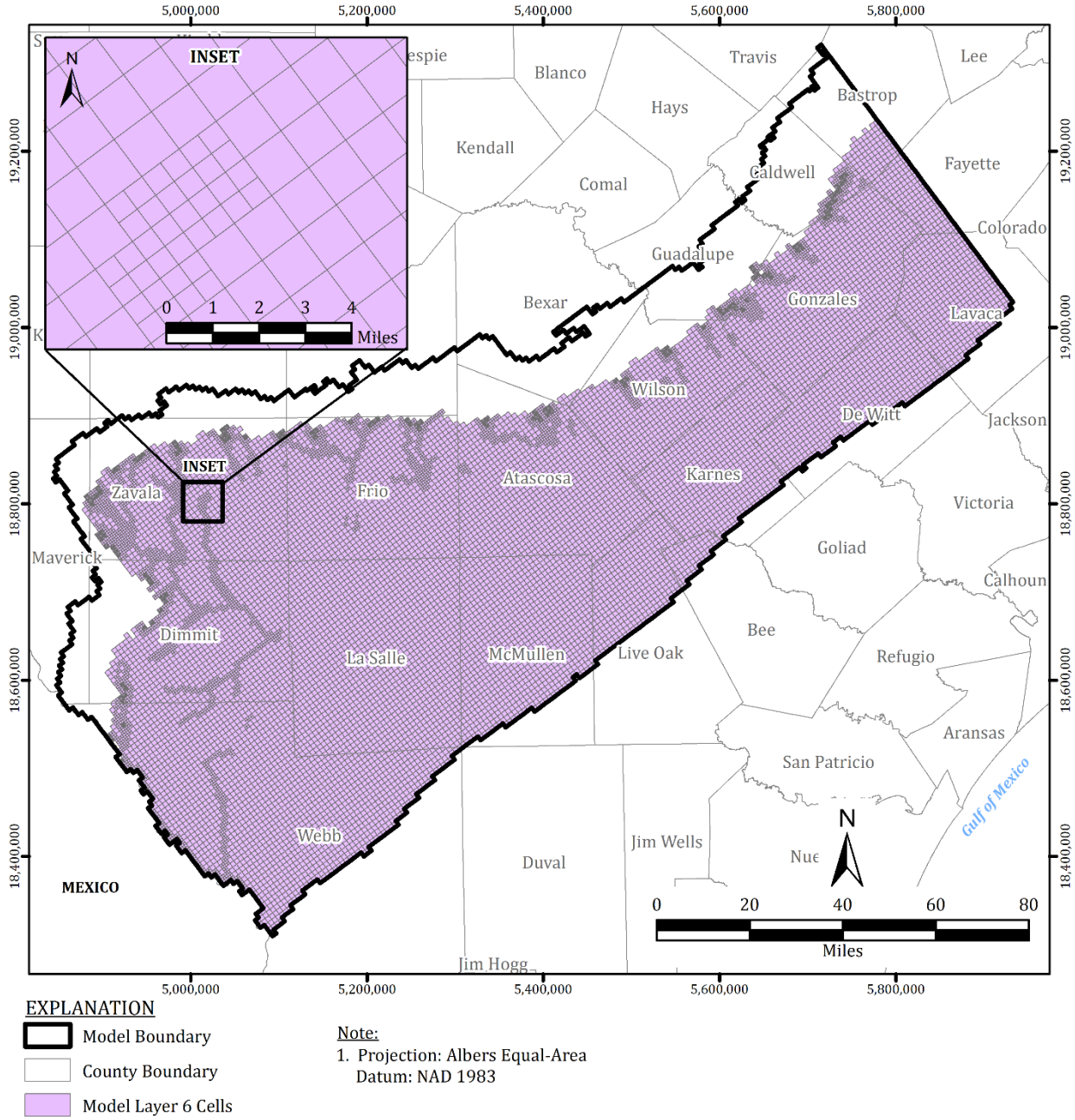


Figure 3-5. Groundwater Model Domain Discretization for Queen City Aquifer (Model Layer 5)



EXPLANATION

- Model Boundary
- County Boundary
- Model Layer 6 Cells

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

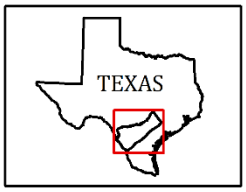


Figure 3-6. Groundwater Model Domain Discretization for Reklaw Aquitard (Model Layer 6)

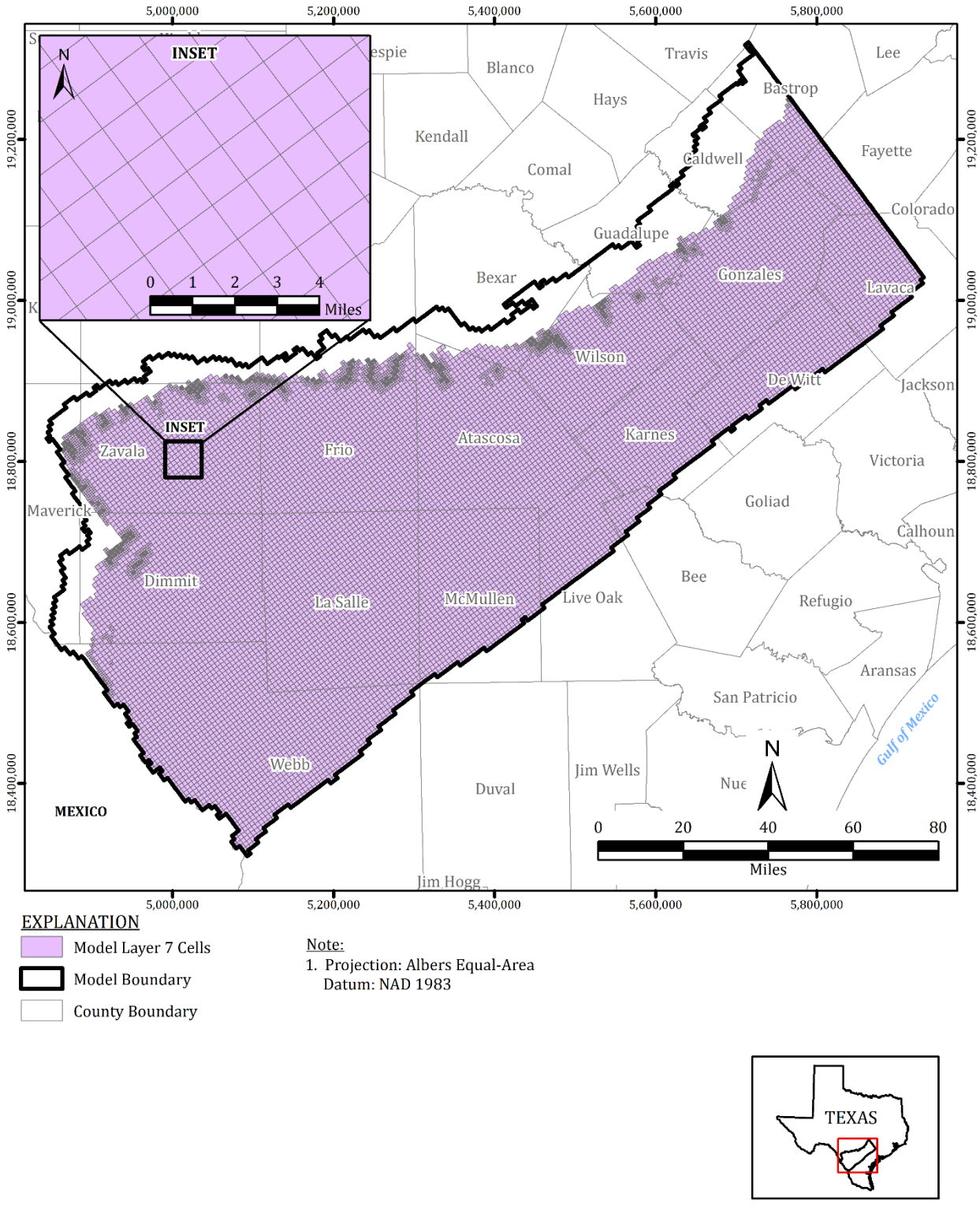


Figure 3-7. Groundwater Model Domain Discretization for Carrizo-Upper Wilcox (Model Layer 7)

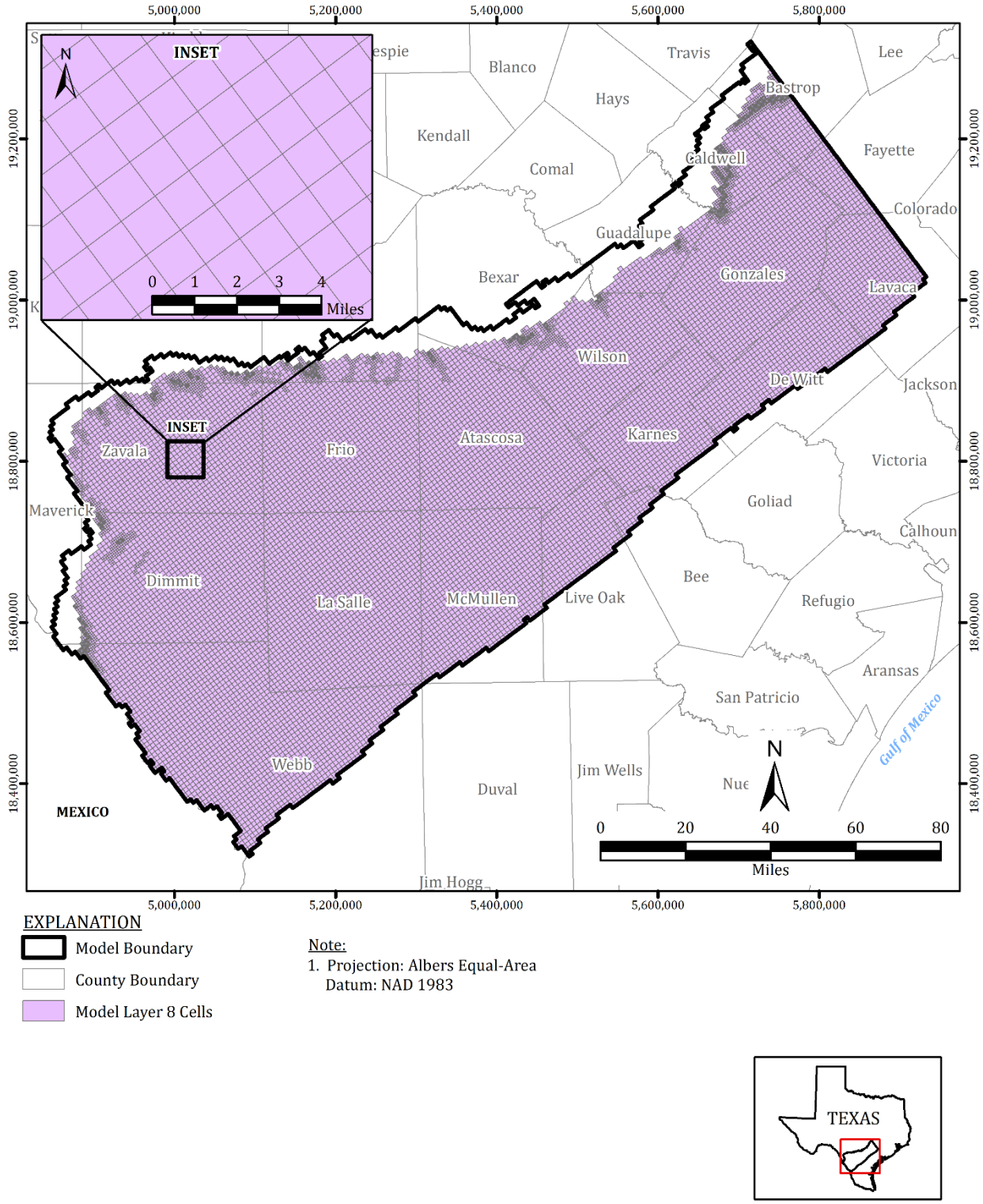
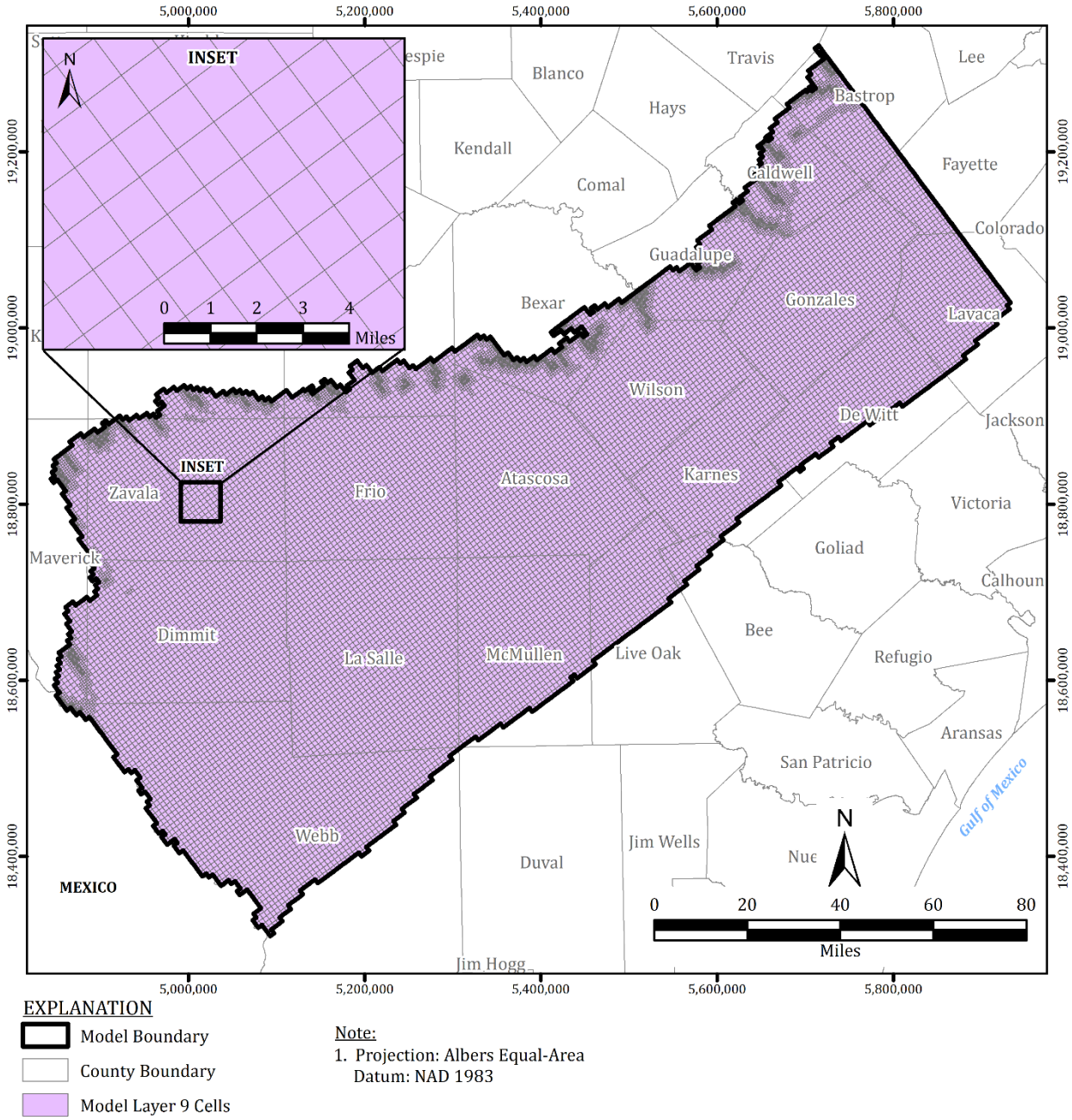


Figure 3-8. Groundwater Model Domain Discretization for Middle Wilcox (Model Layer 8)



EXPLANATION

- Model Boundary
- County Boundary
- Model Layer 9 Cells

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

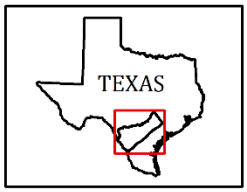


Figure 3-9. Groundwater Model Domain Discretization for Lower Wilcox (Model Layer 9)

Figures 3-10 through 3-36 show the stratigraphic elevations and thicknesses of the geologic units simulated by the model. It is noted that the top of a hydrostratigraphic unit is at the same elevation as the bottom of the hydrostratigraphic unit above it (if it exists at a location). The structural features in the model domain are described in Section 1.2 and include the Rio Grande Embayment, San Marcos Arch, and Balcones Fault Zone as shown on Figure 1-22. These structural features dictate the outcrop pattern of the geologic units. The Carrizo Aquifer and Wilcox hydrostratigraphic units outcrop along the northwestern extent of the model domain and also in the western portion of the model domain in the Rio Grande Embayment. The Sparta Aquifer and Queen City Aquifer hydrostratigraphic units outcrop in the central portion of the model domain. In the southeastern portion of the model domain, the hydrostratigraphic units in the subsurface dip to the southeast.

The hydrostratigraphic unit Younger Units was included in the active model domain. The Younger Units have a limited extent along the southeastern boundary of the model domain and, due to limited information about the unit, are treated as a general head boundary for the Sparta Aquifer, as described in Section 3.9.

MODFLOW 6 accommodates pinch-outs and Groundwater Vistas eliminates pinched-out model cells automatically, resulting in much more efficient and robust simulations. Pinch-outs were defined as any cell with a thickness less than 5 feet. MODFLOW 6 also accommodates conforming hydrostratigraphic layers and Groundwater Vistas creates the cross-layer connections between the hydrogeologic units. Figure 3-37 shows cross-sections of the numerical model with a northwest-southeast cross-section A-A' and southwest to northeast cross-section B-B'. The cross-sections show the model layering honors the conceptual model including the Yoakum Canyon shown in cross-section B-B' (Figure 3-37).

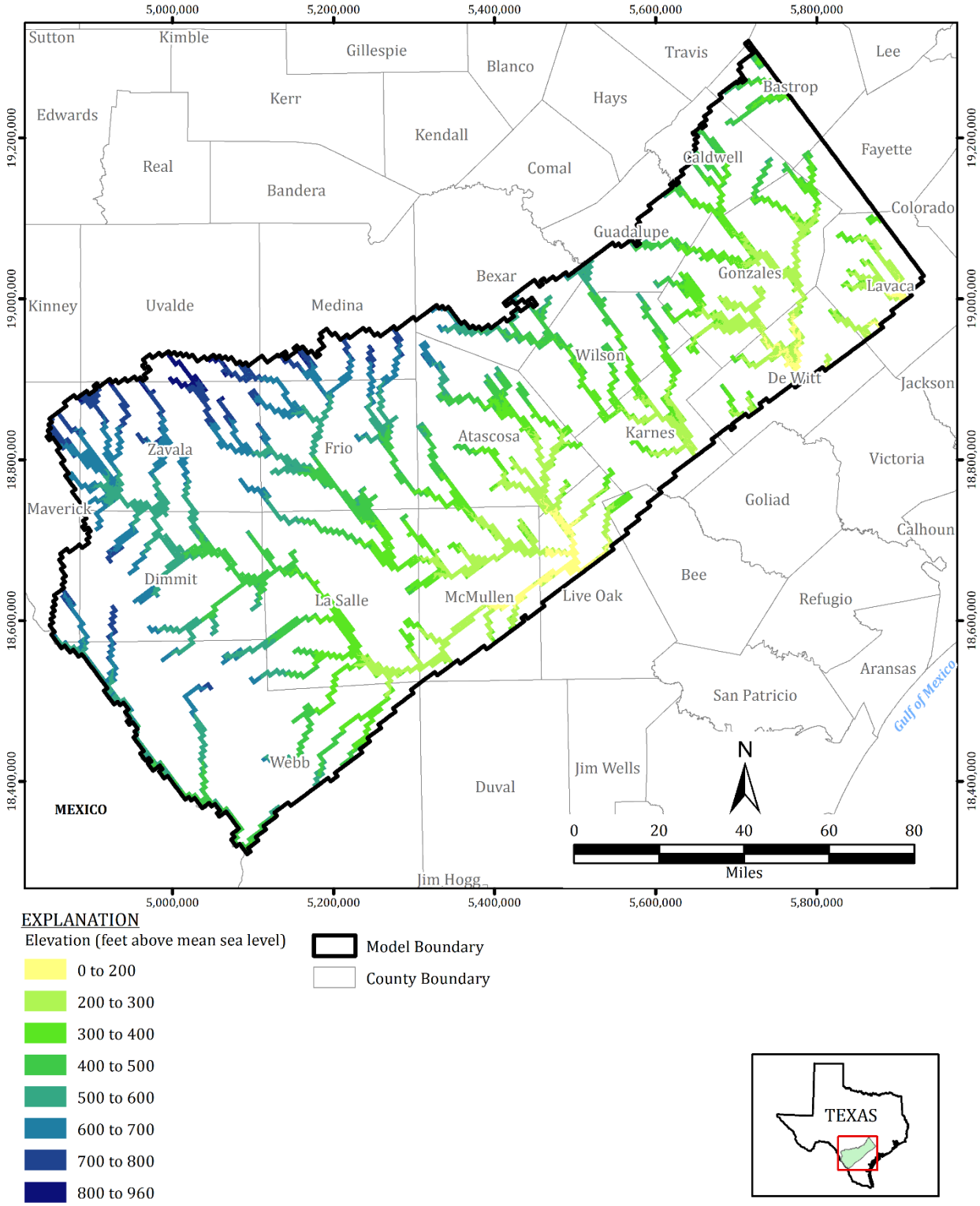


Figure 3-10. Modeled Top Elevation for Quaternary Alluvium (Model Layer 1)

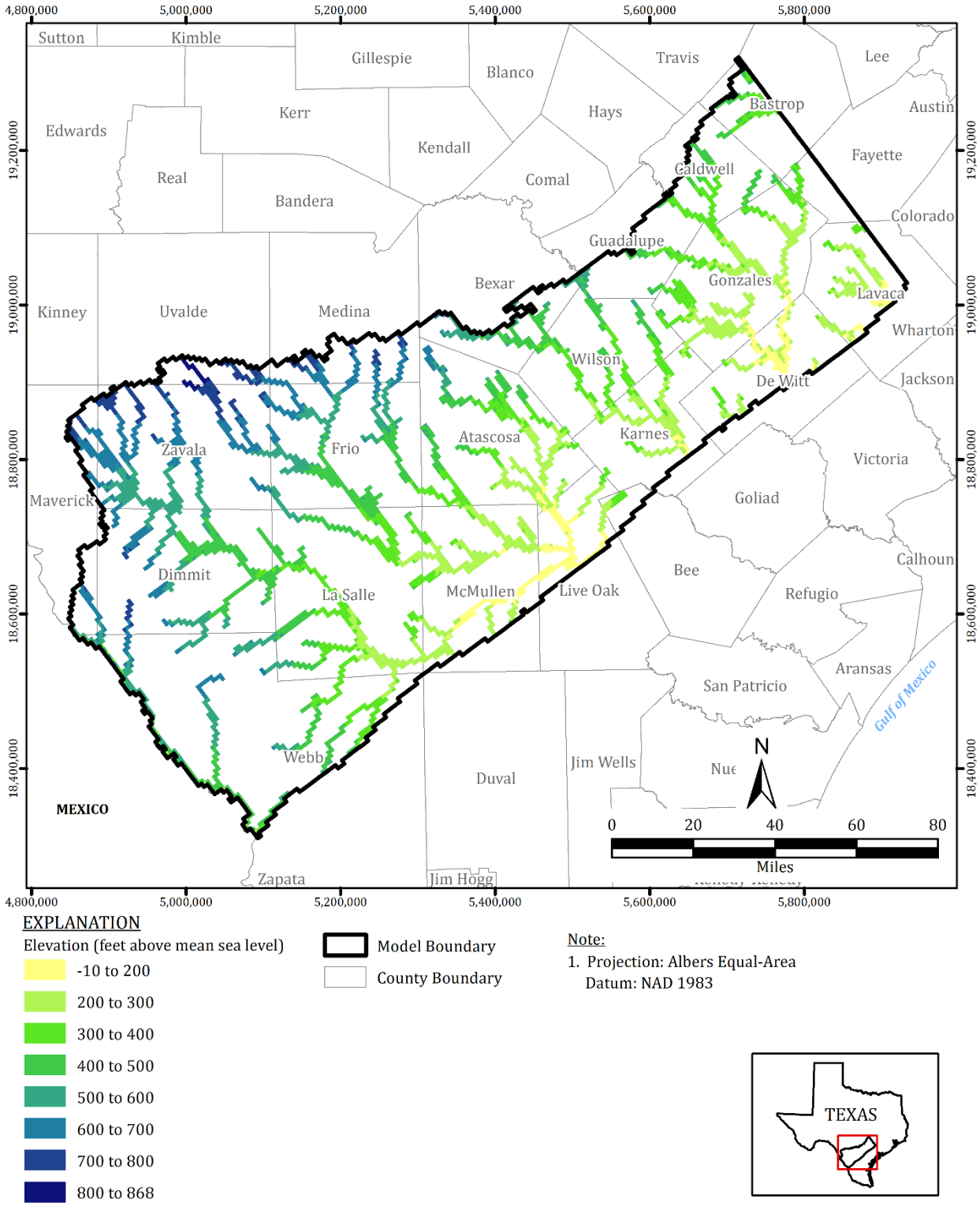


Figure 3-11. Modeled Bottom Elevation for Quaternary Alluvium (Model Layer 1)

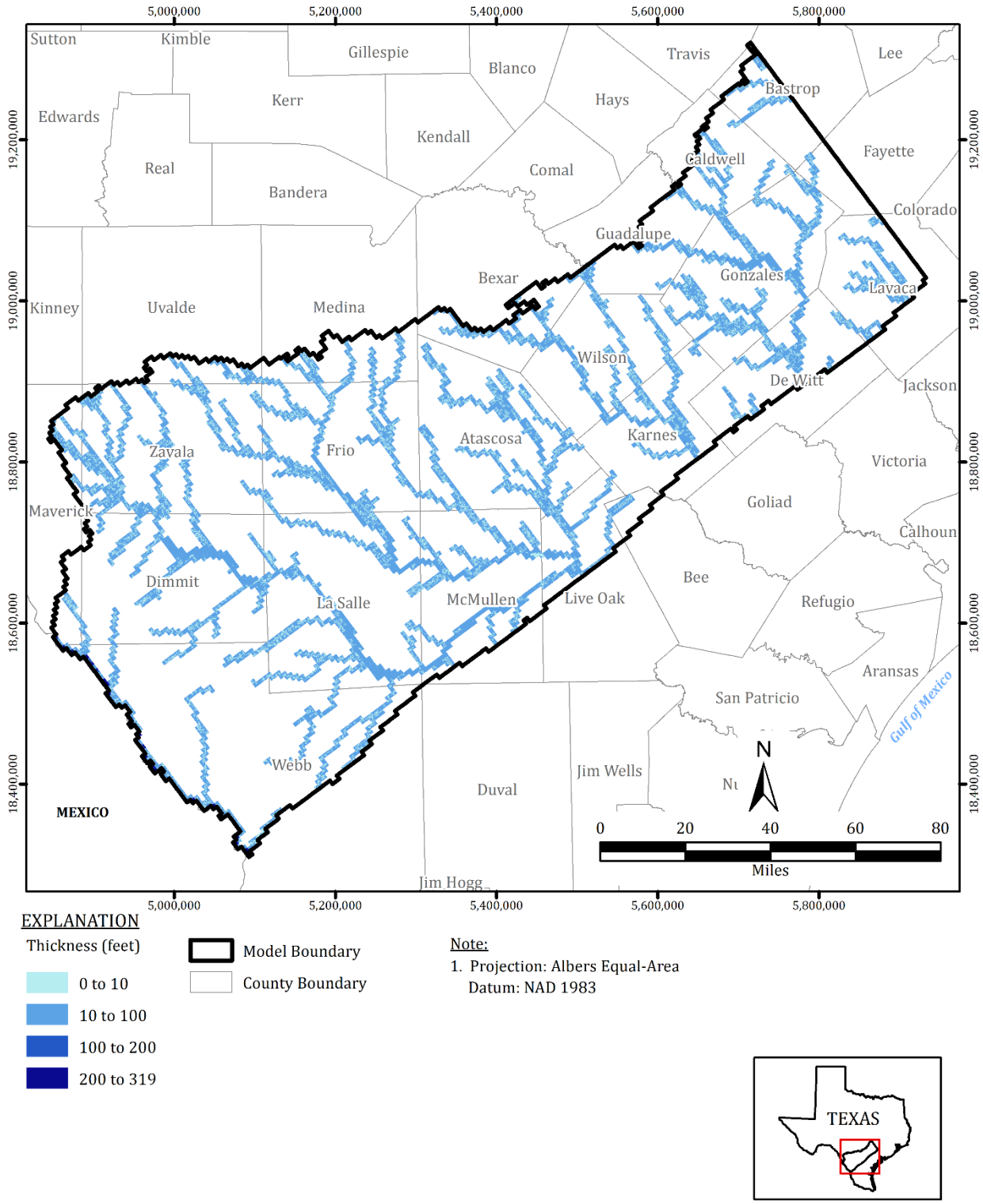


Figure 3-12. Modeled Thickness for Quaternary Alluvium (Model Layer 1)

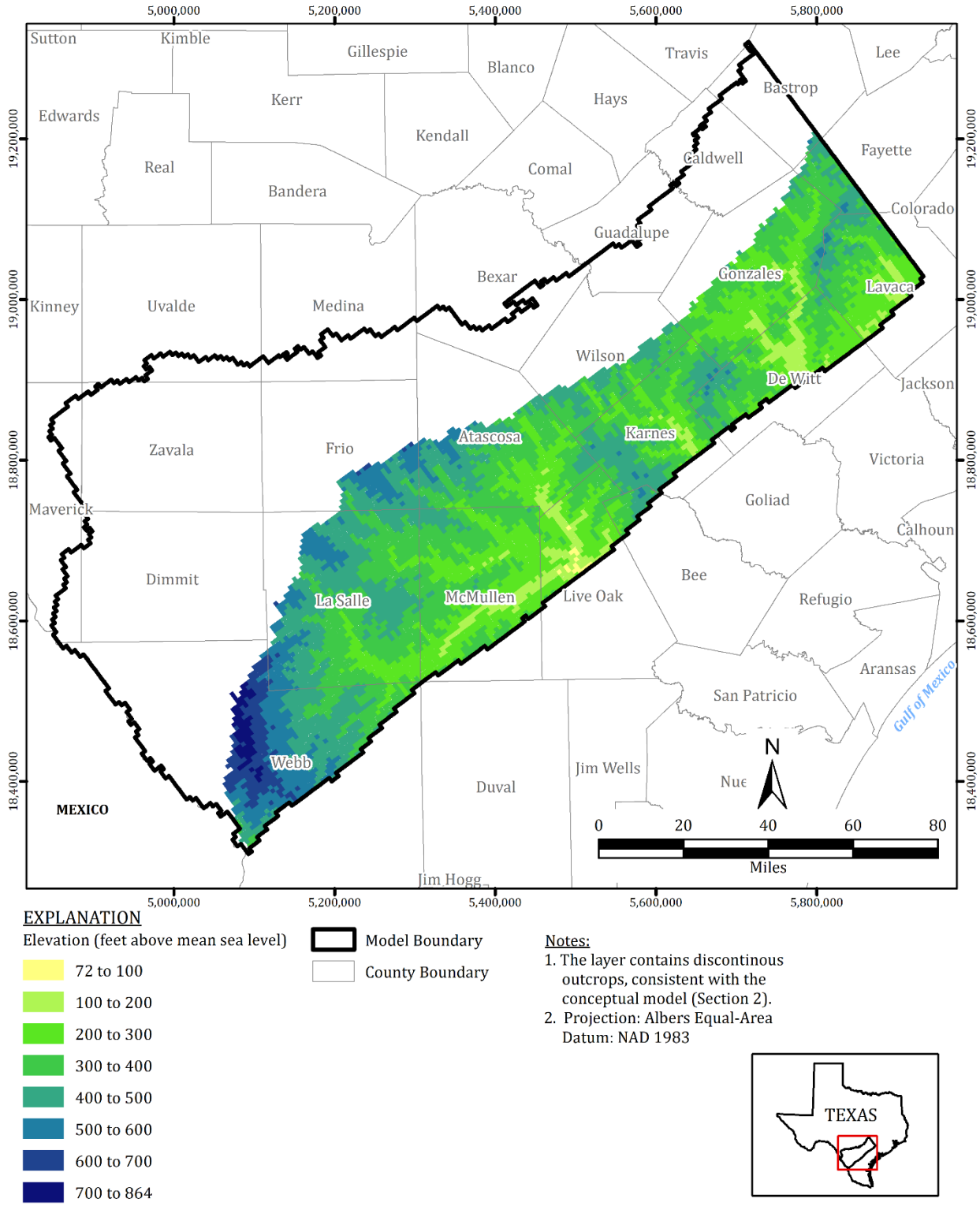


Figure 3-13. Modeled Top Elevation for Younger Units (Model Layer 2)

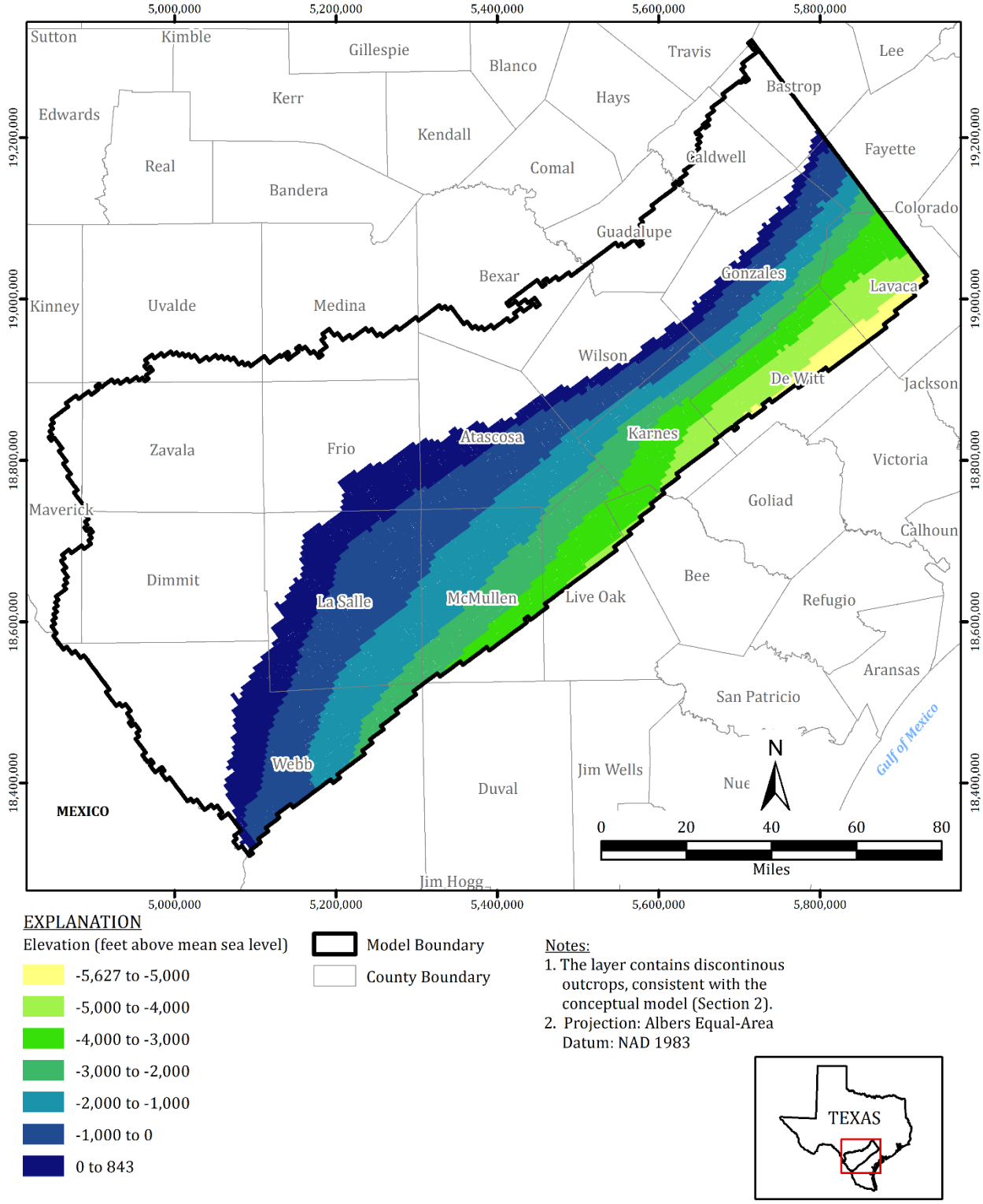


Figure 3-14. Modeled Bottom Elevation for Younger Units (Model Layer 2)

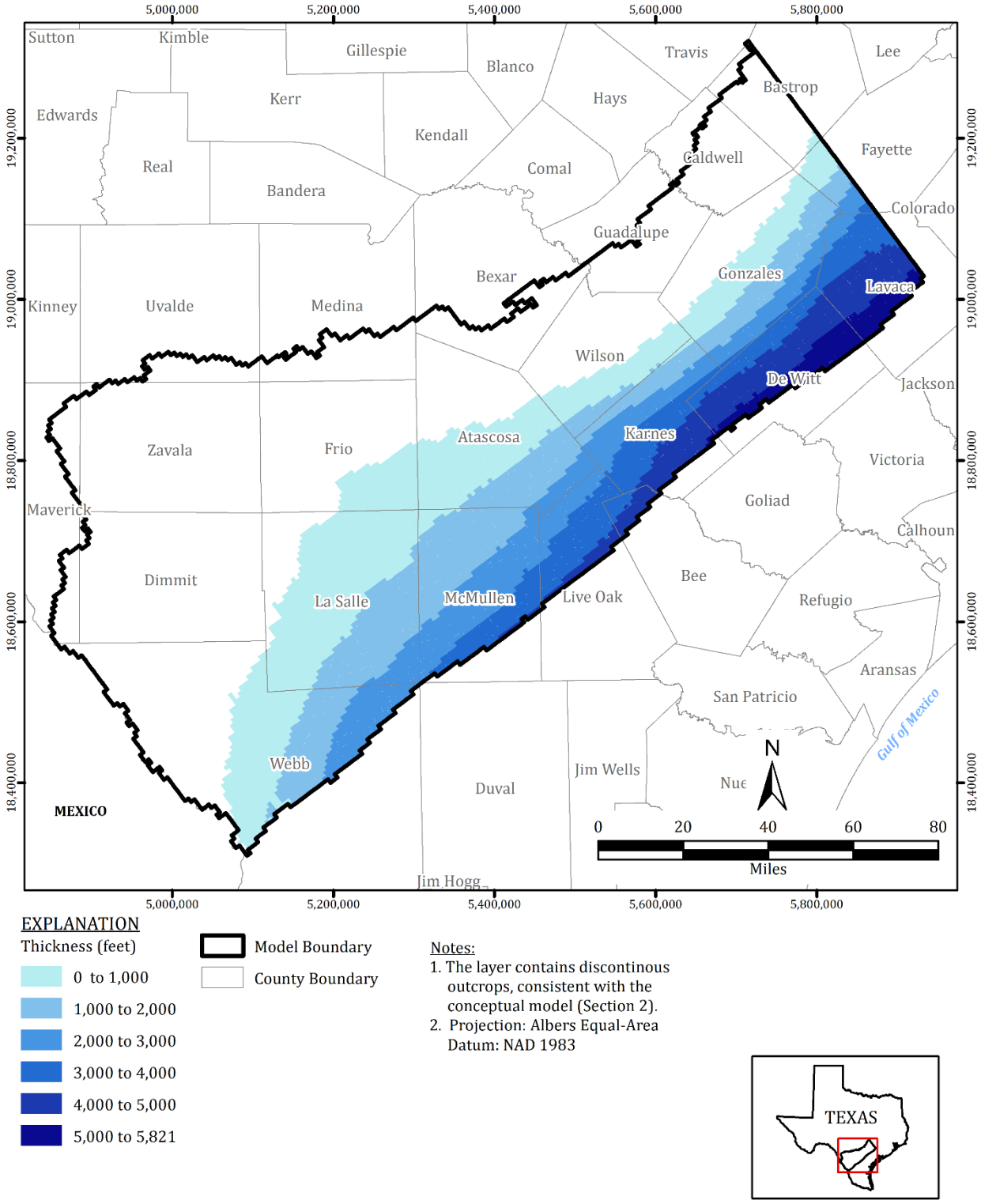


Figure 3-15. Modeled Thickness for Younger Units (Model Layer 2)

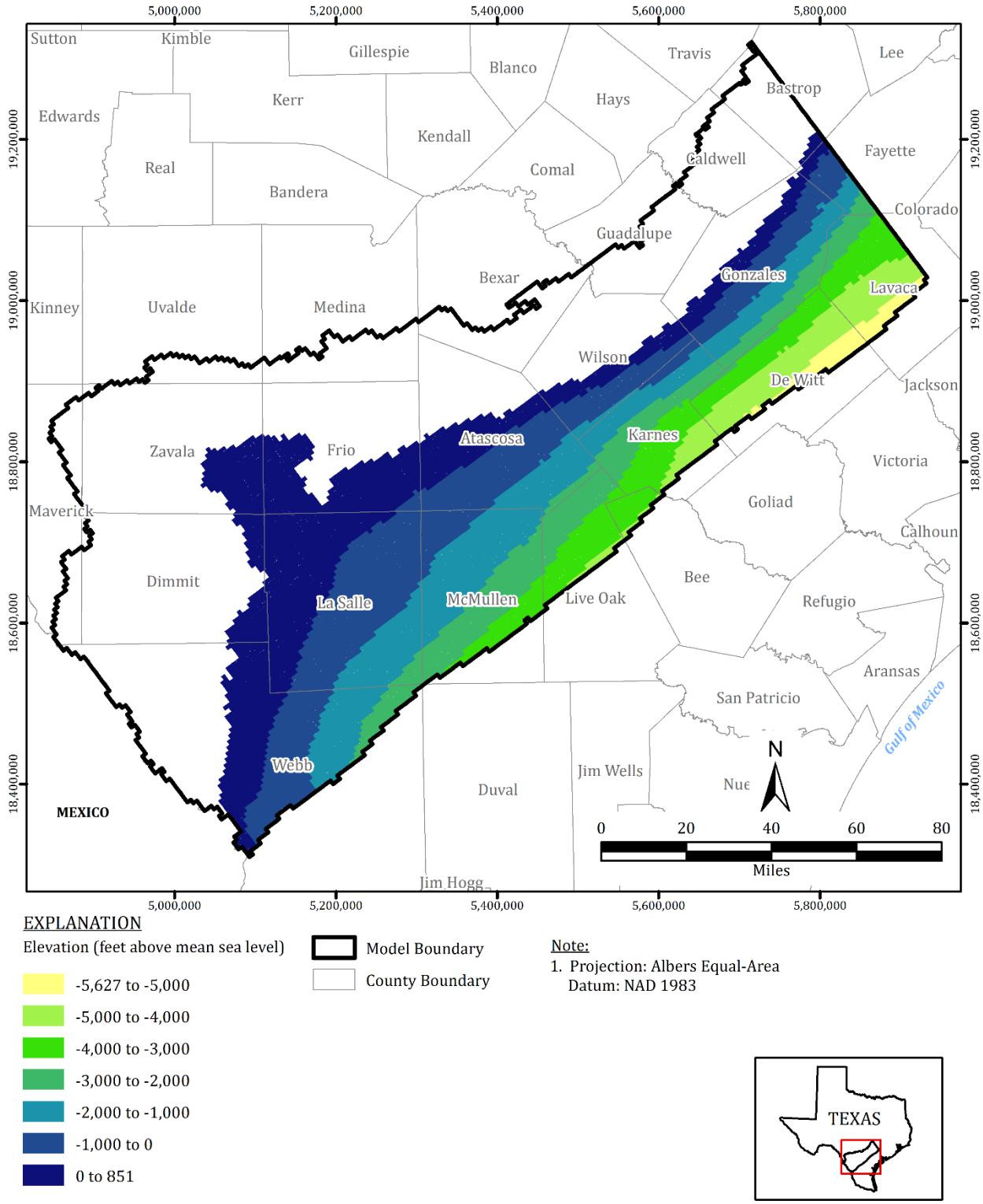


Figure 3-16. Modeled Top Elevation for Sparta Aquifer (Model Layer 3)

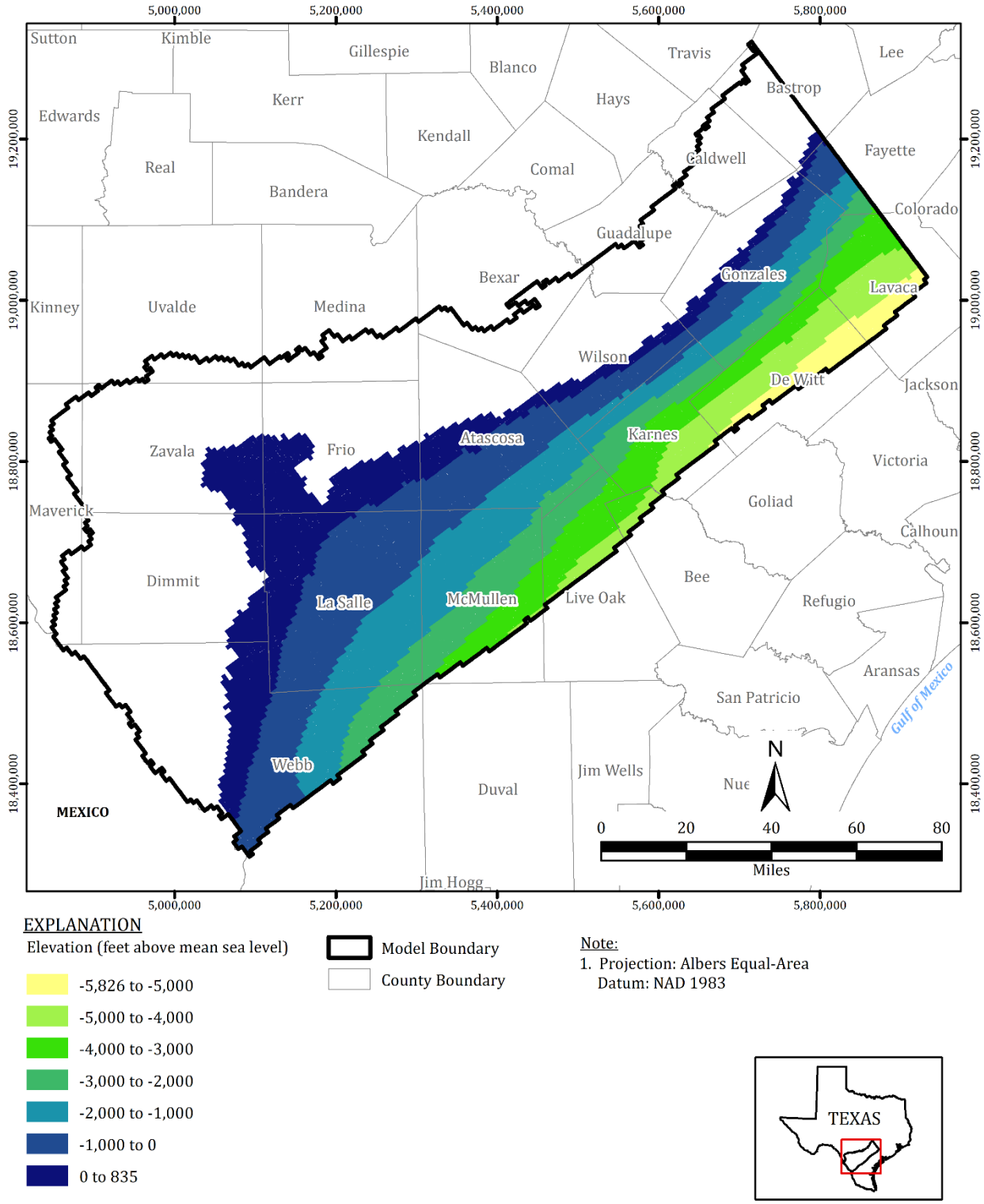


Figure 3-17. Modeled Bottom Elevation for Sparta Aquifer (Model Layer 3)

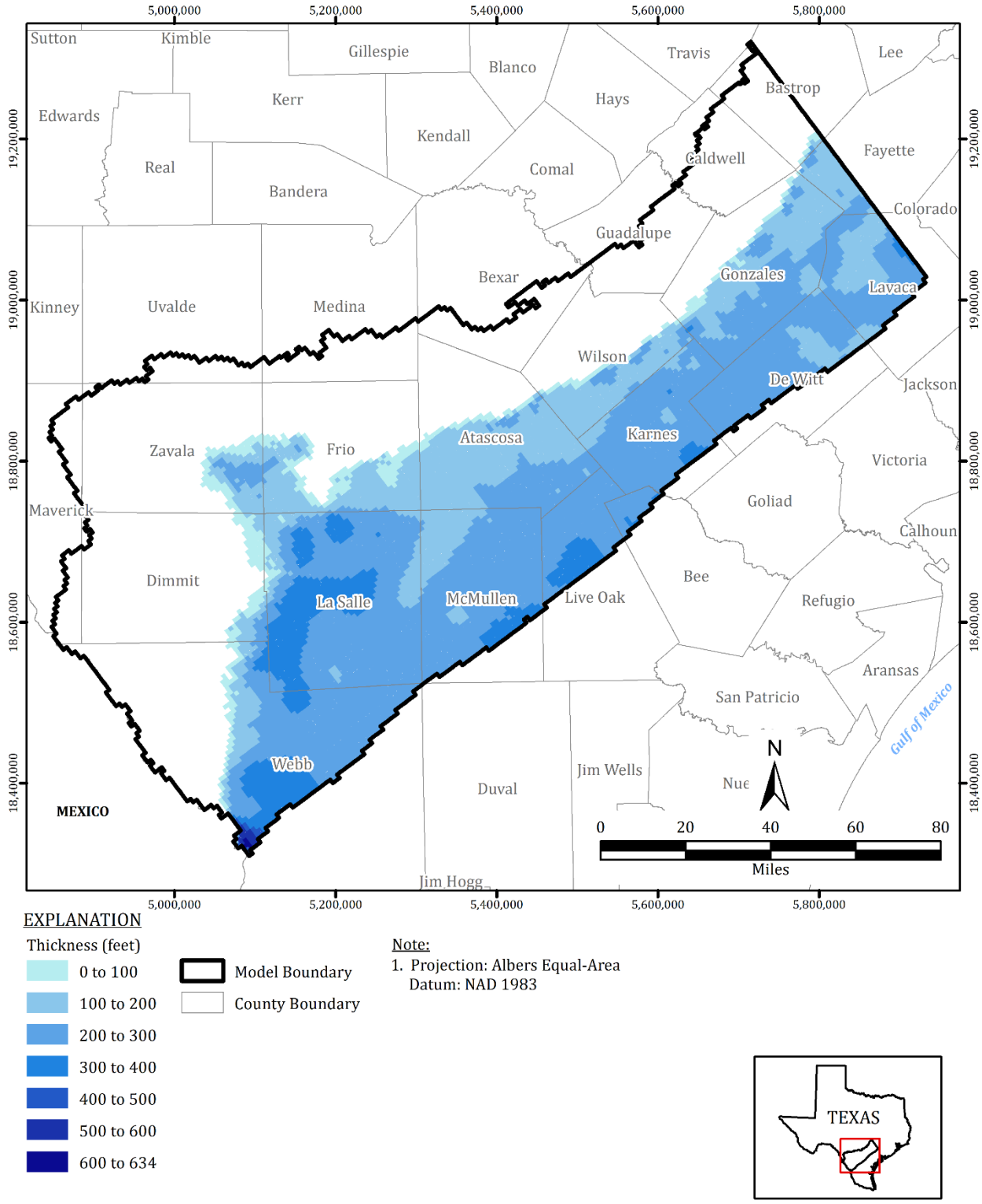


Figure 3-18. Modeled Thickness for Sparta Aquifer (Model Layer 3)

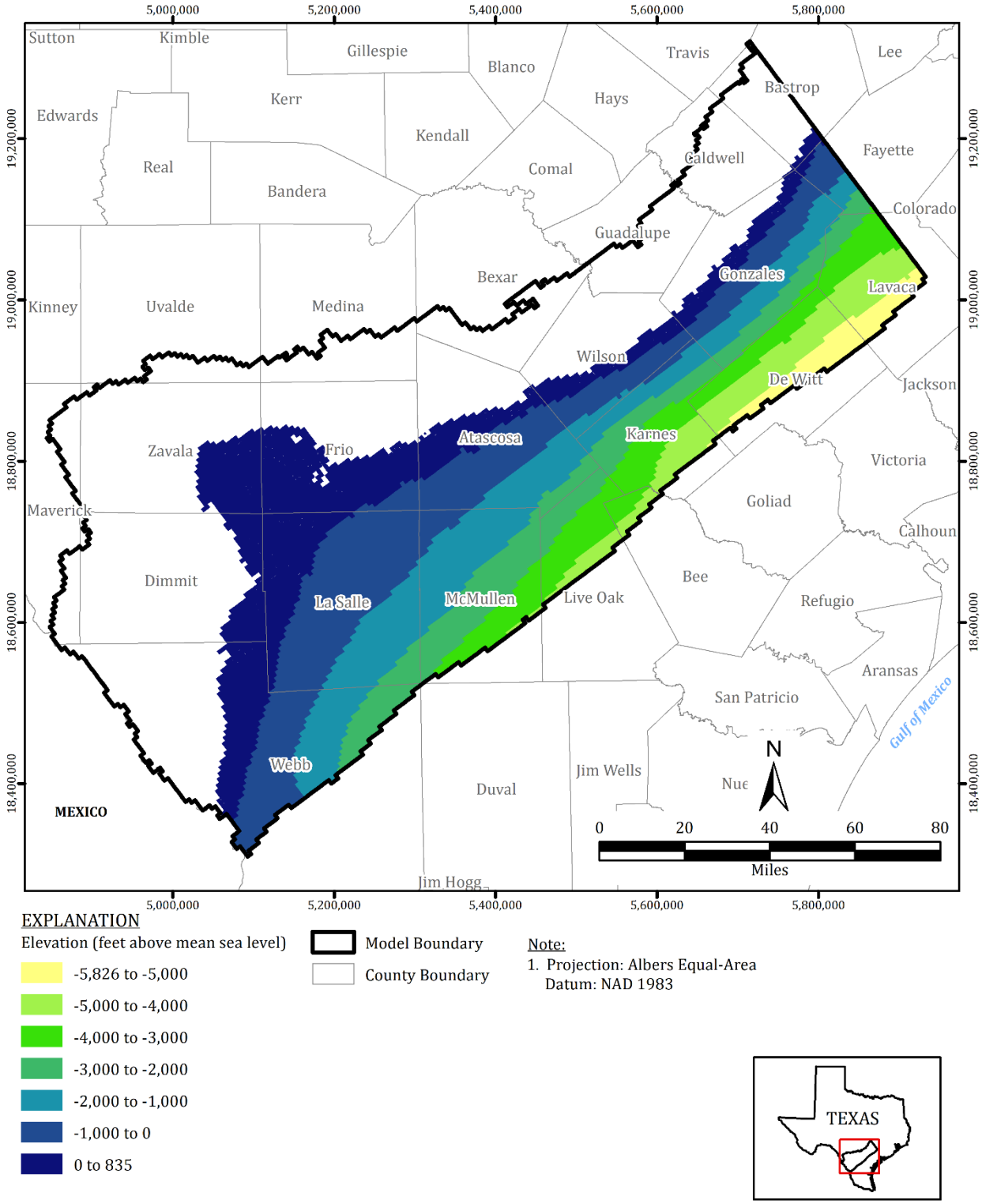


Figure 3-19. Modeled Top Elevation for Weches Aquitard (Model Layer 4)

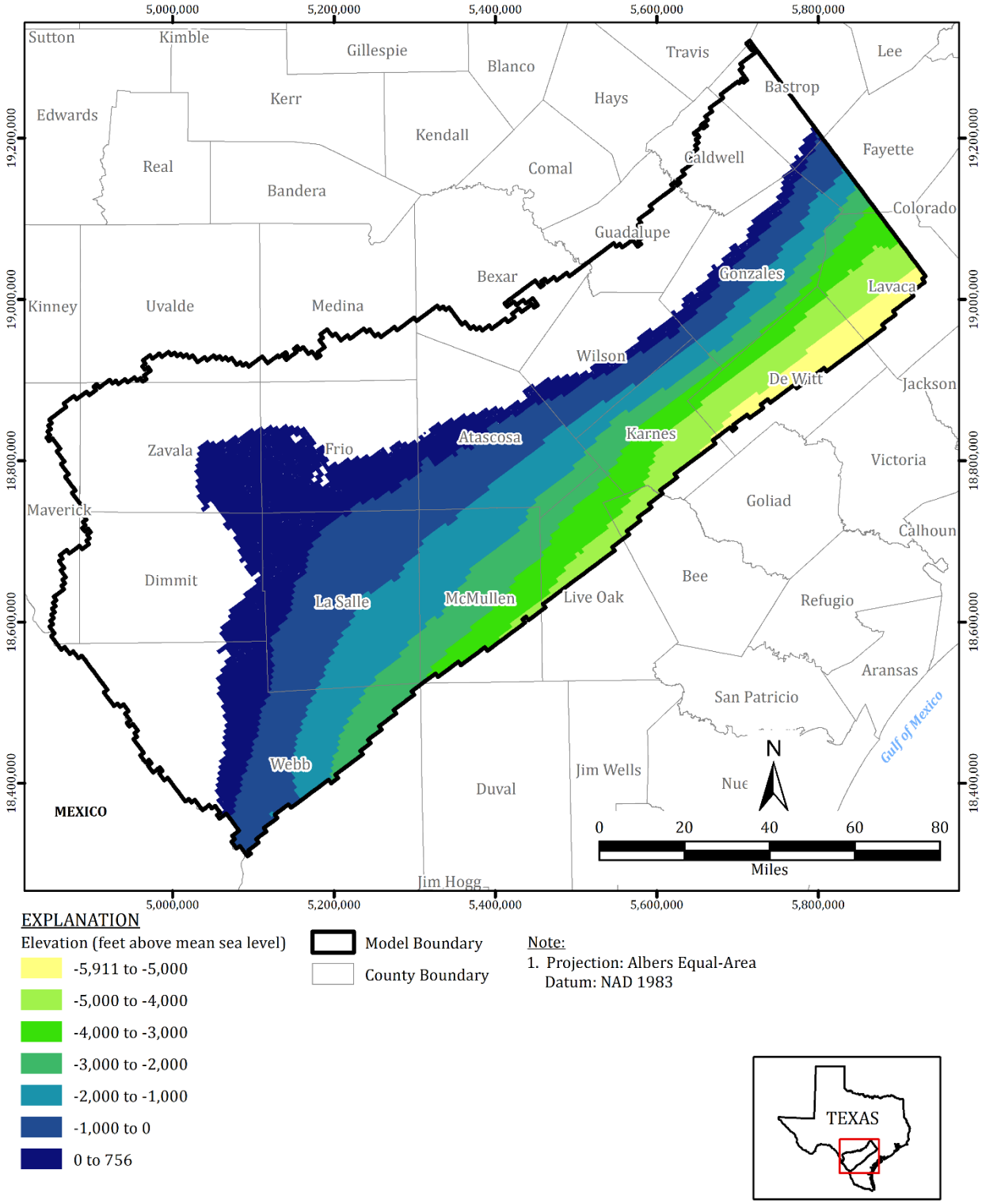


Figure 3-20. Modeled Bottom Elevation for Weches Aquitard (Model Layer 4)

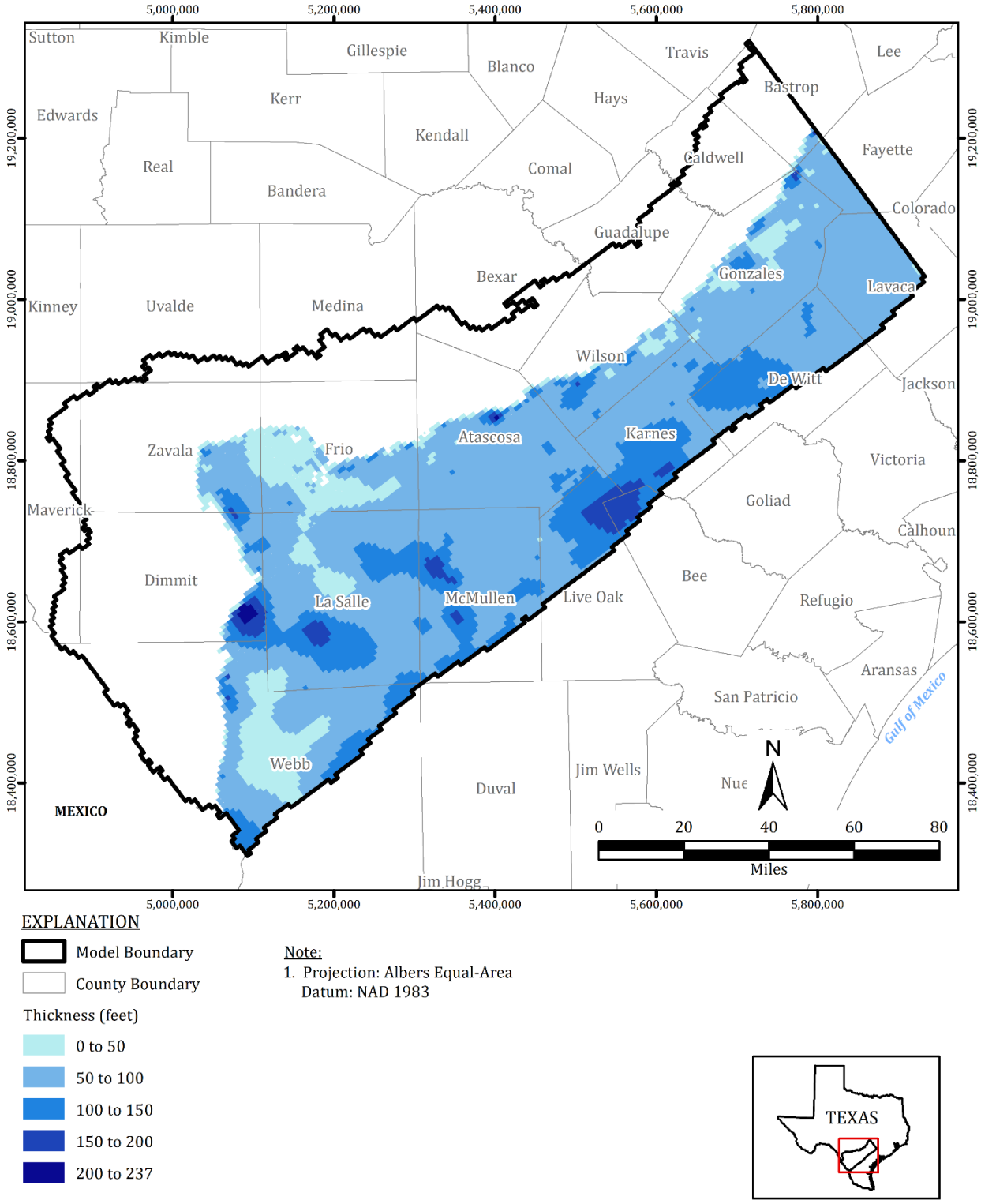


Figure 3-21. Modeled Thickness for Weches Aquitard (Model Layer 4)

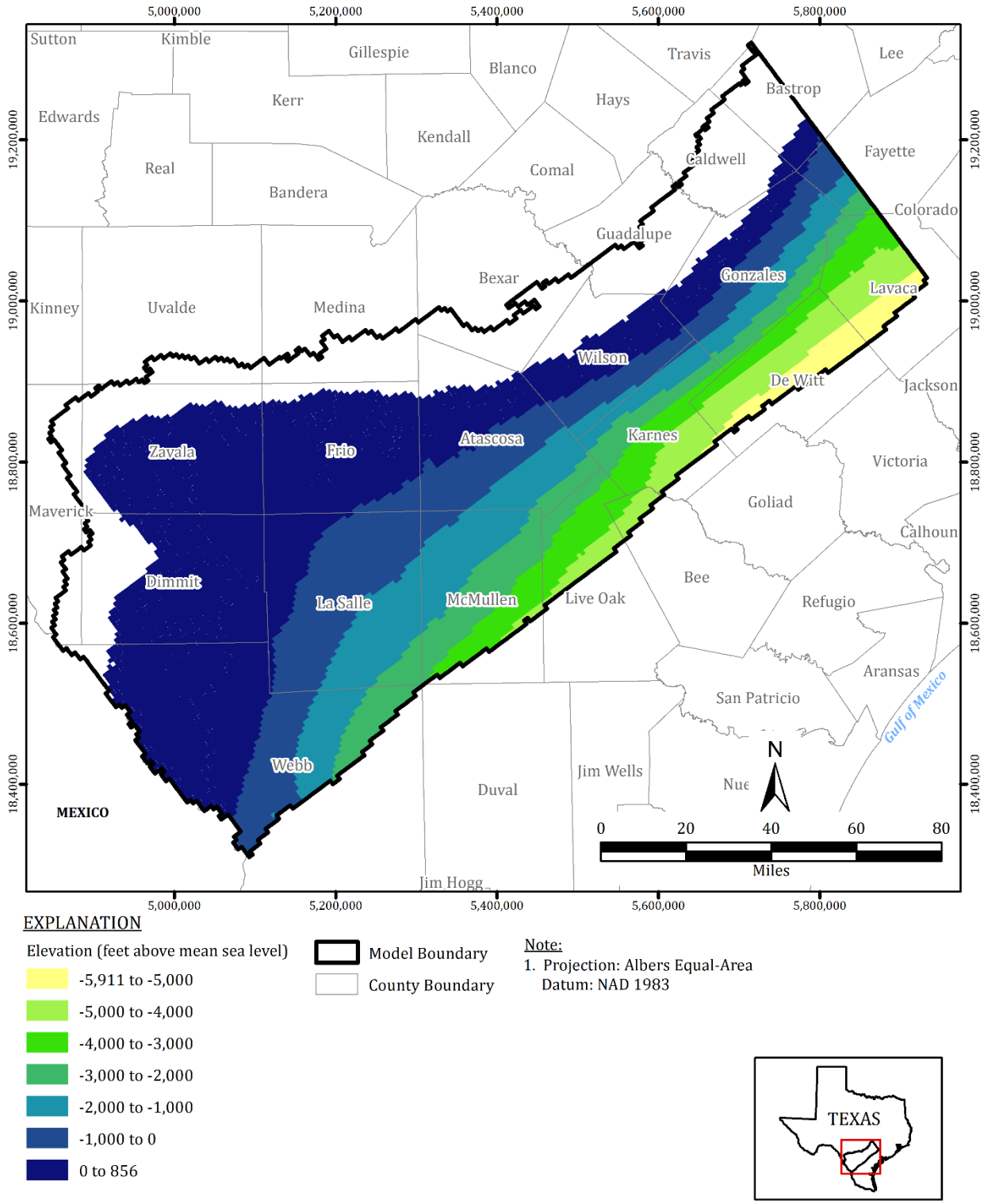


Figure 3-22. Modeled Top Elevation for Queen City Aquifer (Model Layer 5)

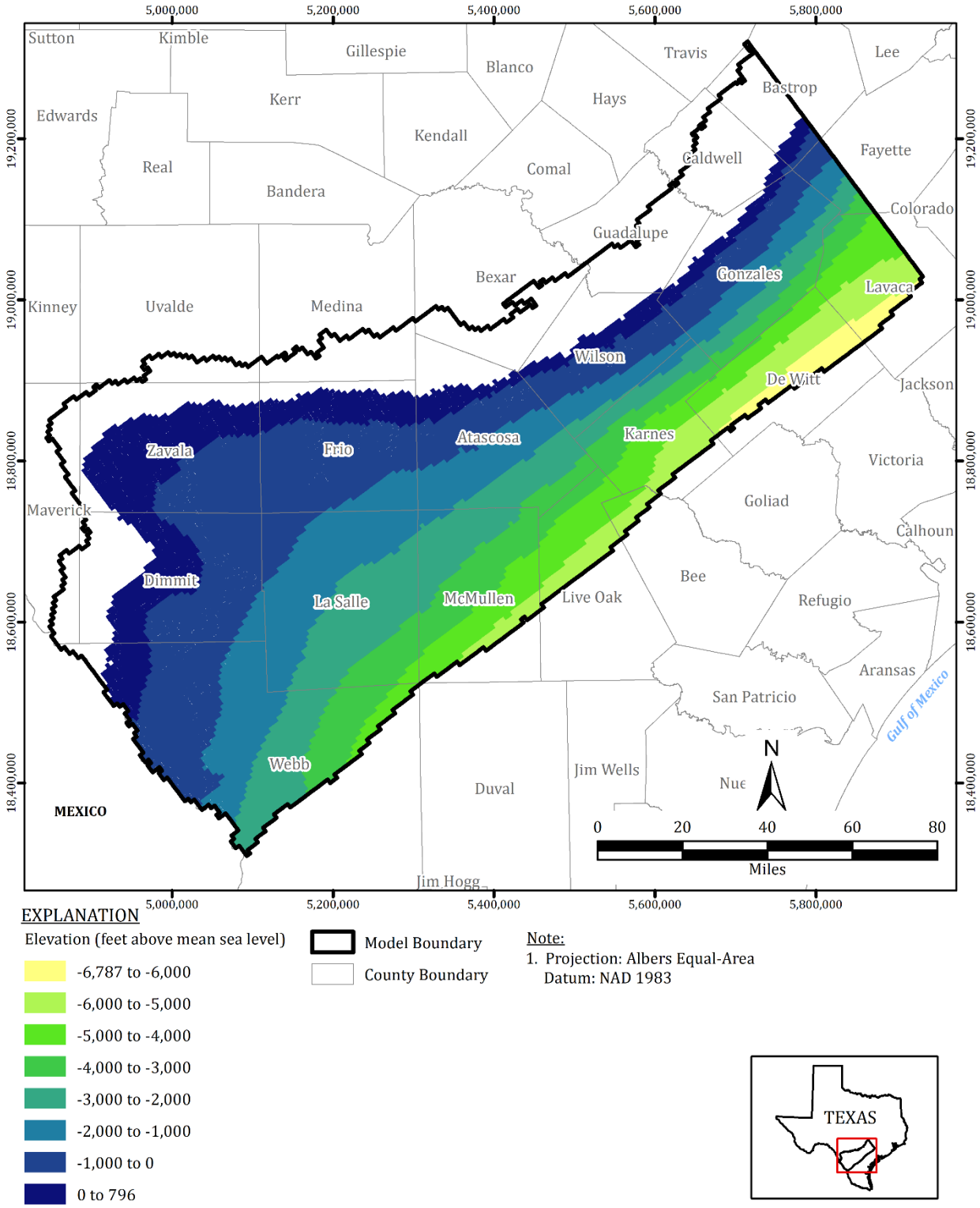


Figure 3-23. Modeled Bottom Elevation for Queen City Aquifer (Model Layer 5)

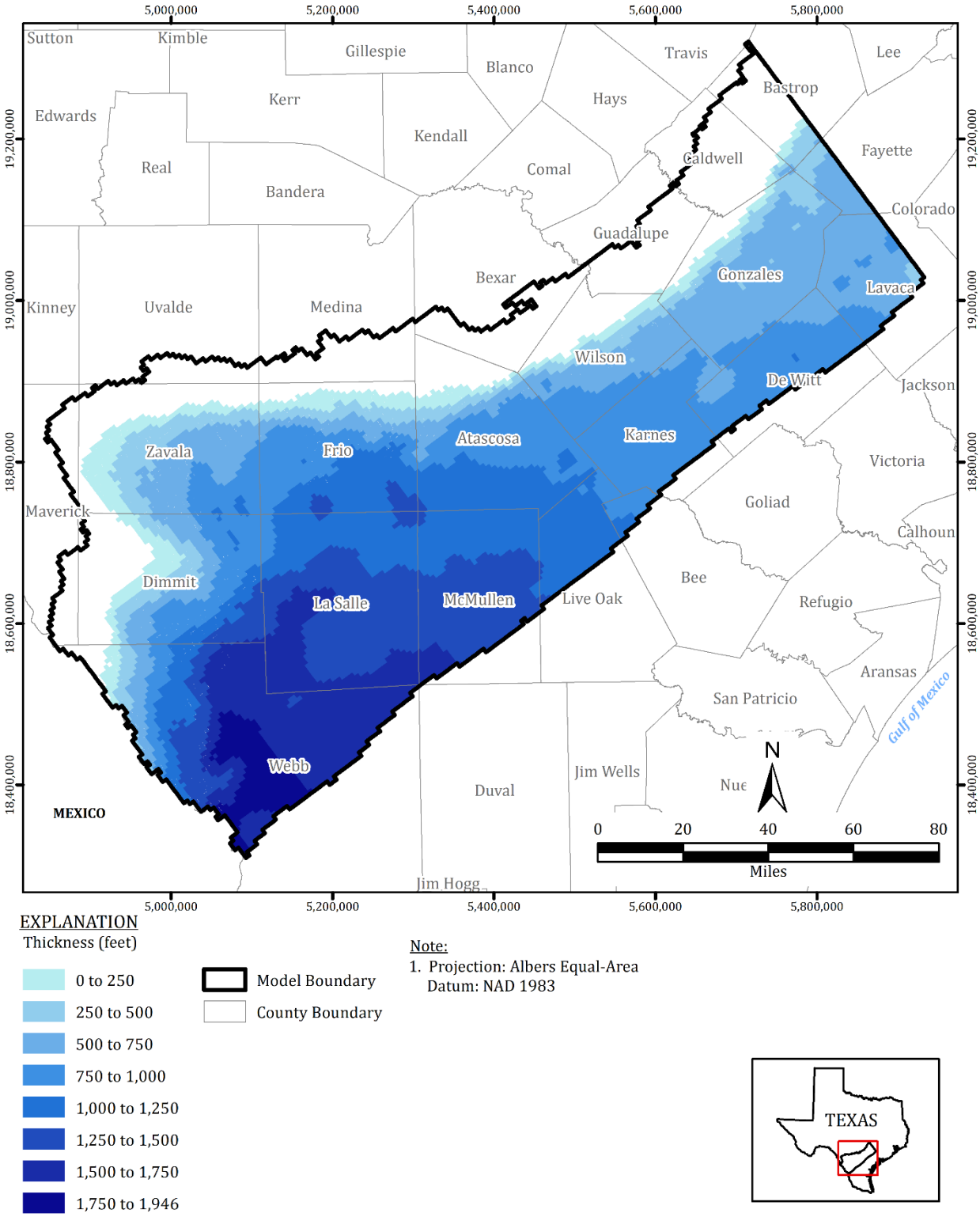


Figure 3-24. Modeled Thickness for Queen City Aquifer (Model Layer 5)

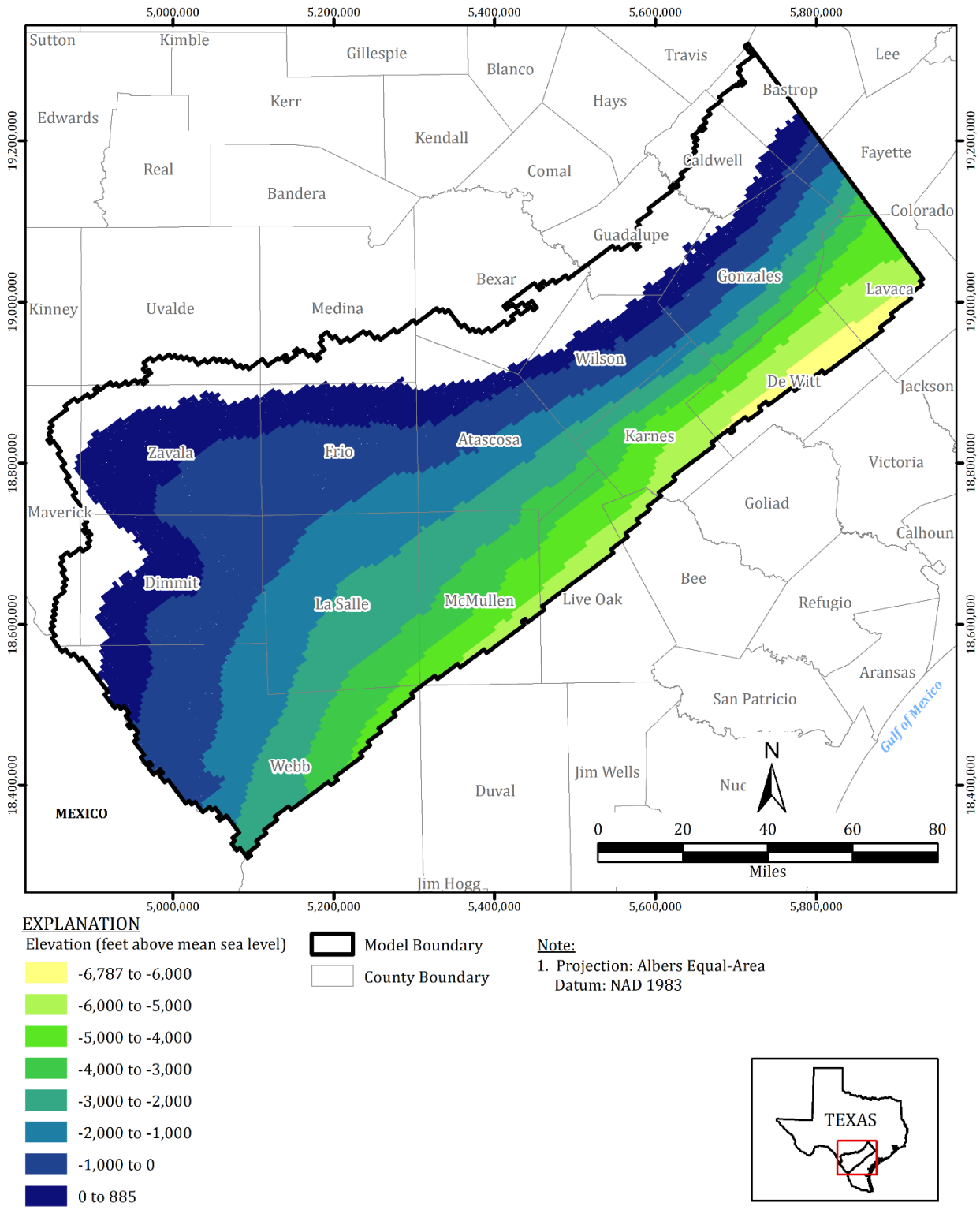


Figure 3-25. Modeled Top Elevation for Reklaw Aquitard (Model Layer 6)

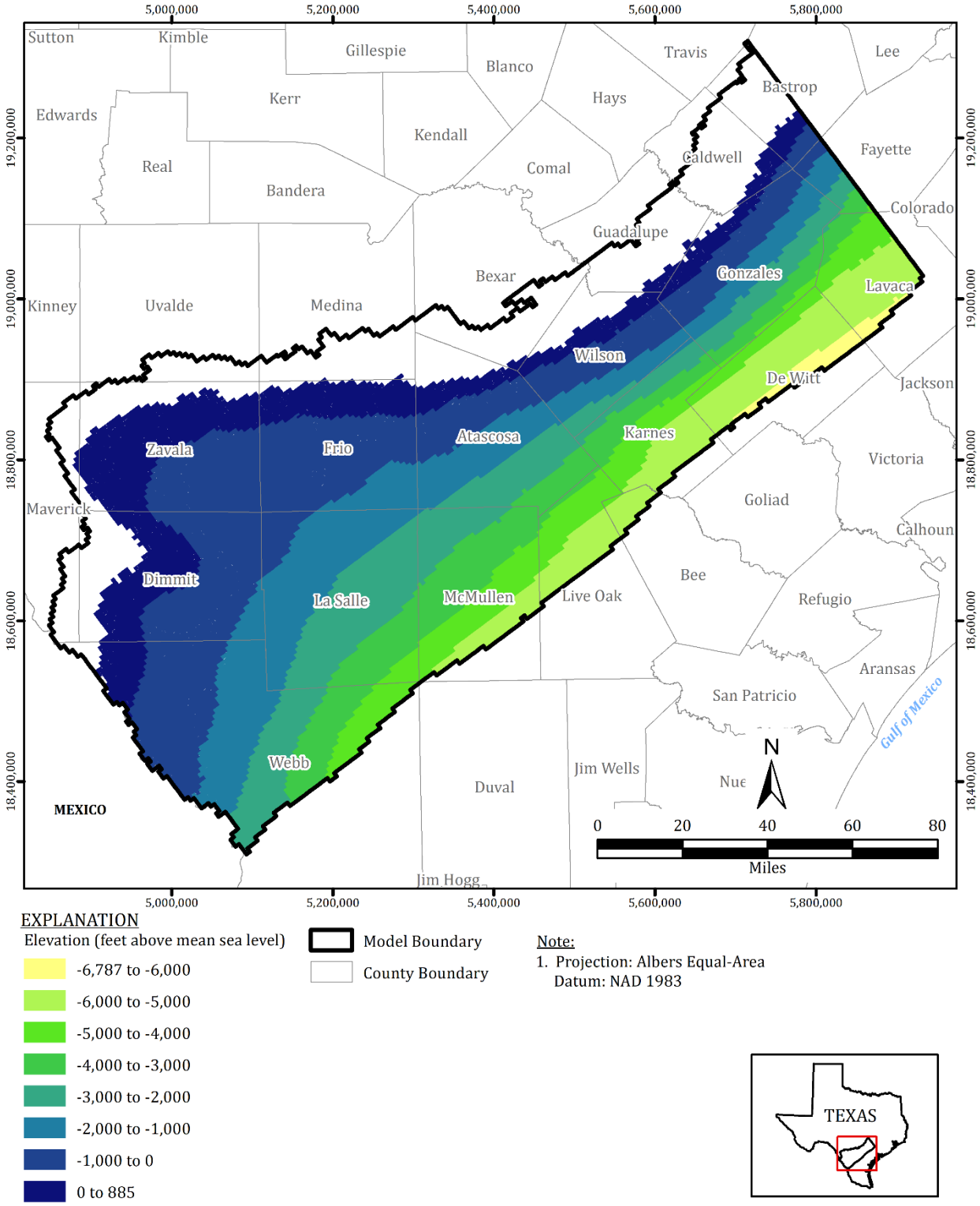


Figure 3-26. Modeled Bottom Elevation for Reklaw Aquitard (Model Layer 6)

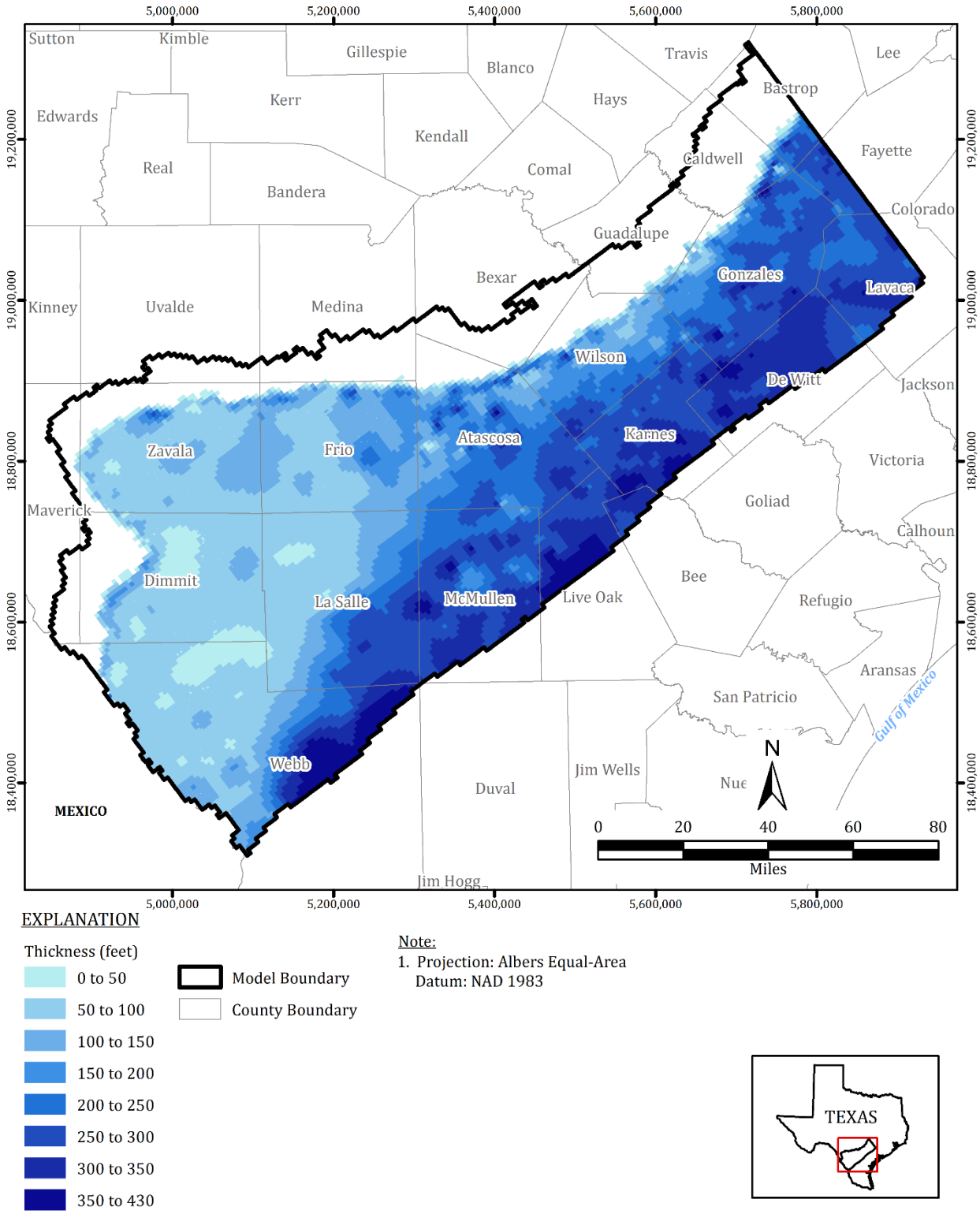


Figure 3-27. Modeled Thickness for Reklaw Aquitard (Model Layer 6)

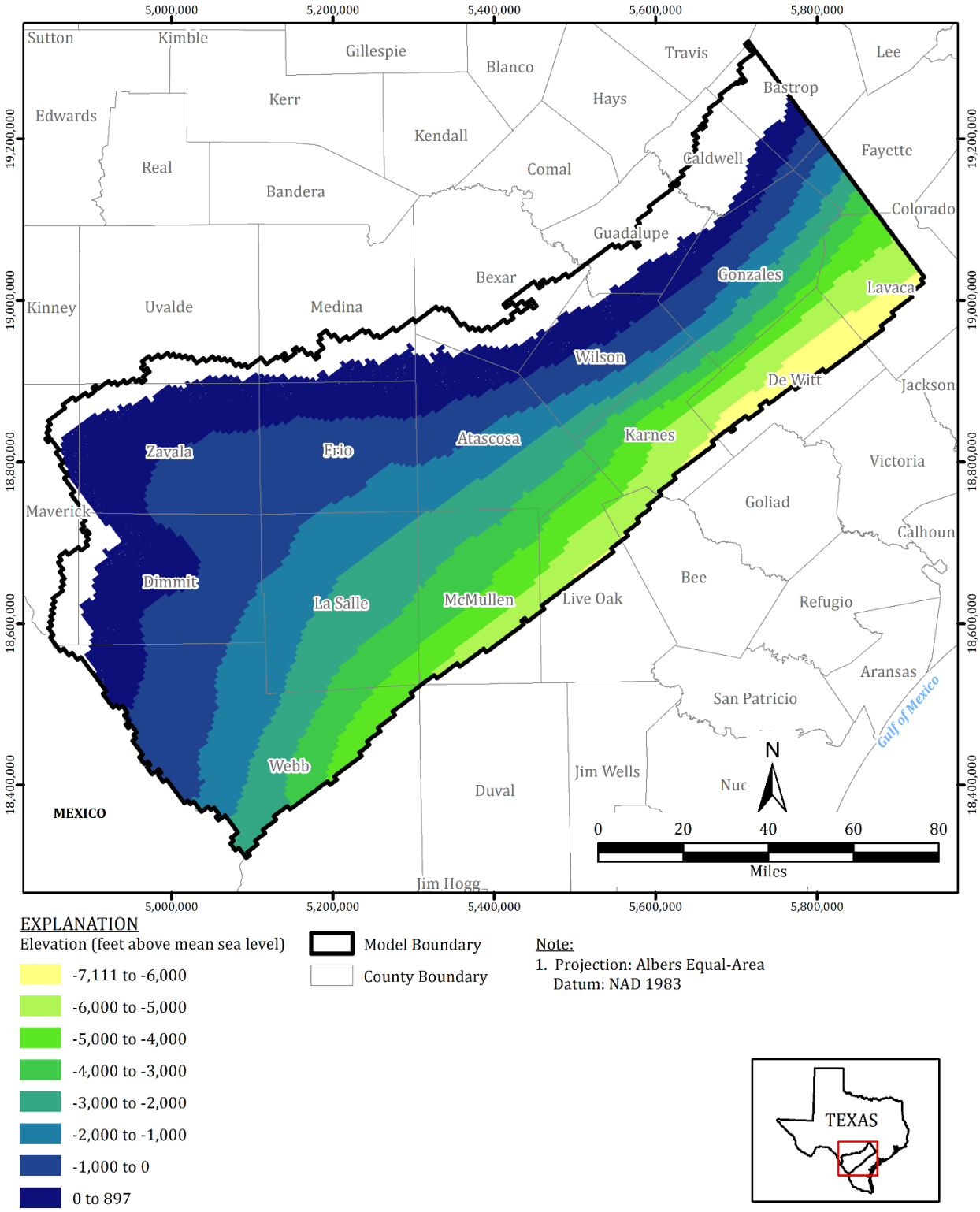


Figure 3-28. Modeled Top Elevation for Carrizo-Upper Wilcox (Model Layer 7)

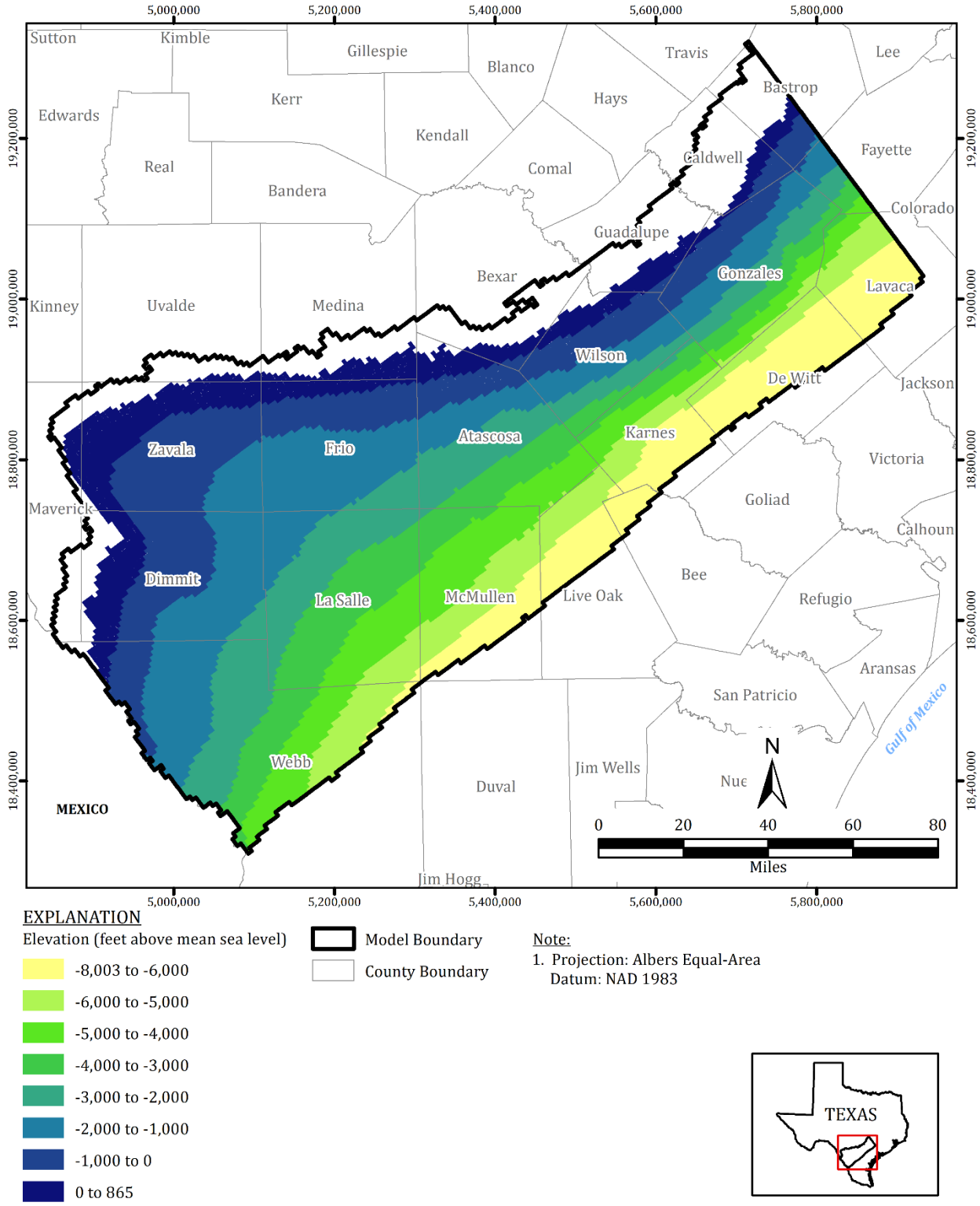


Figure 3-29. Modeled Bottom Elevation for Carrizo-Upper Wilcox (Model Layer 7)

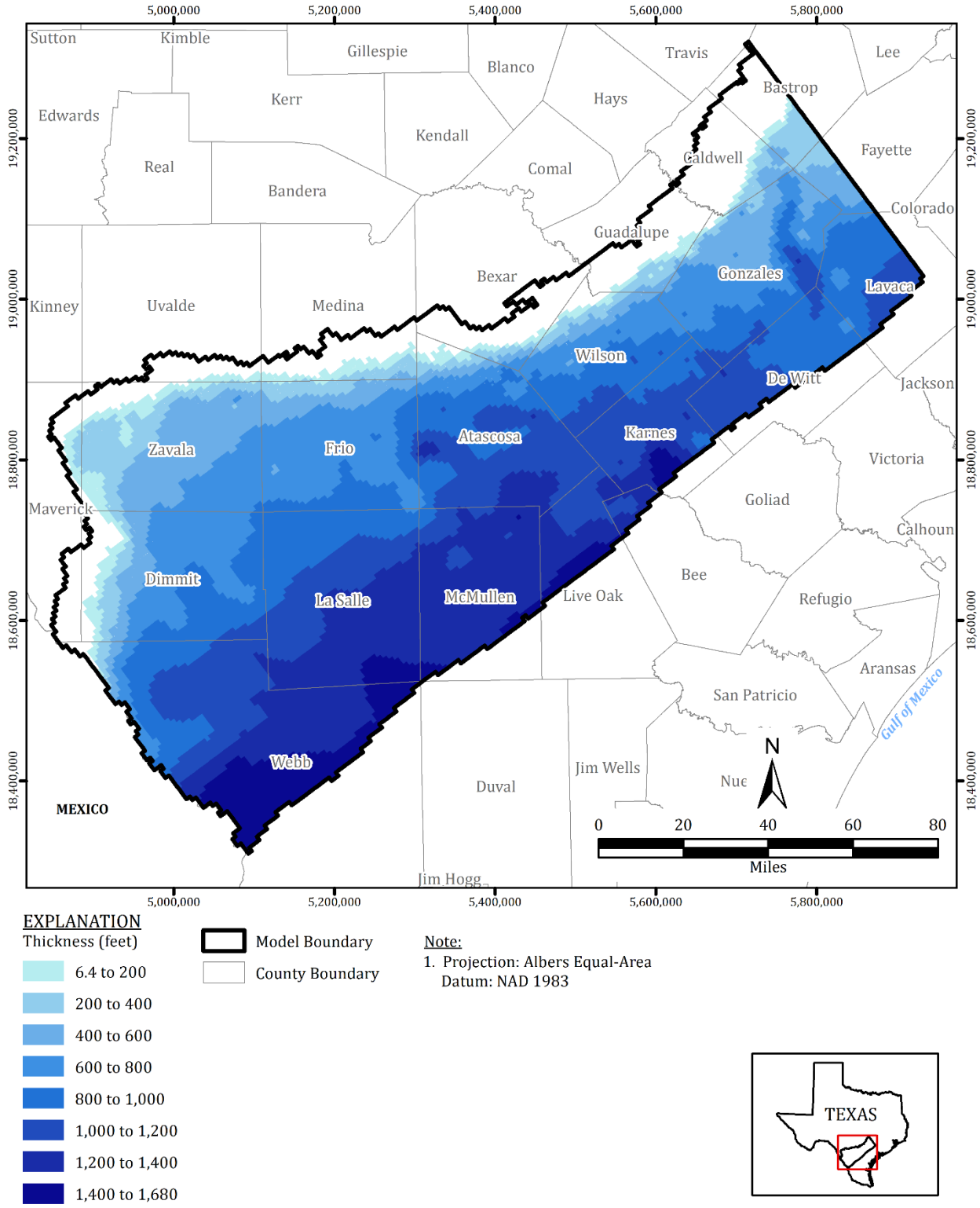


Figure 3-30. Modeled Thickness for Carrizo-Upper Wilcox (Model Layer 7)

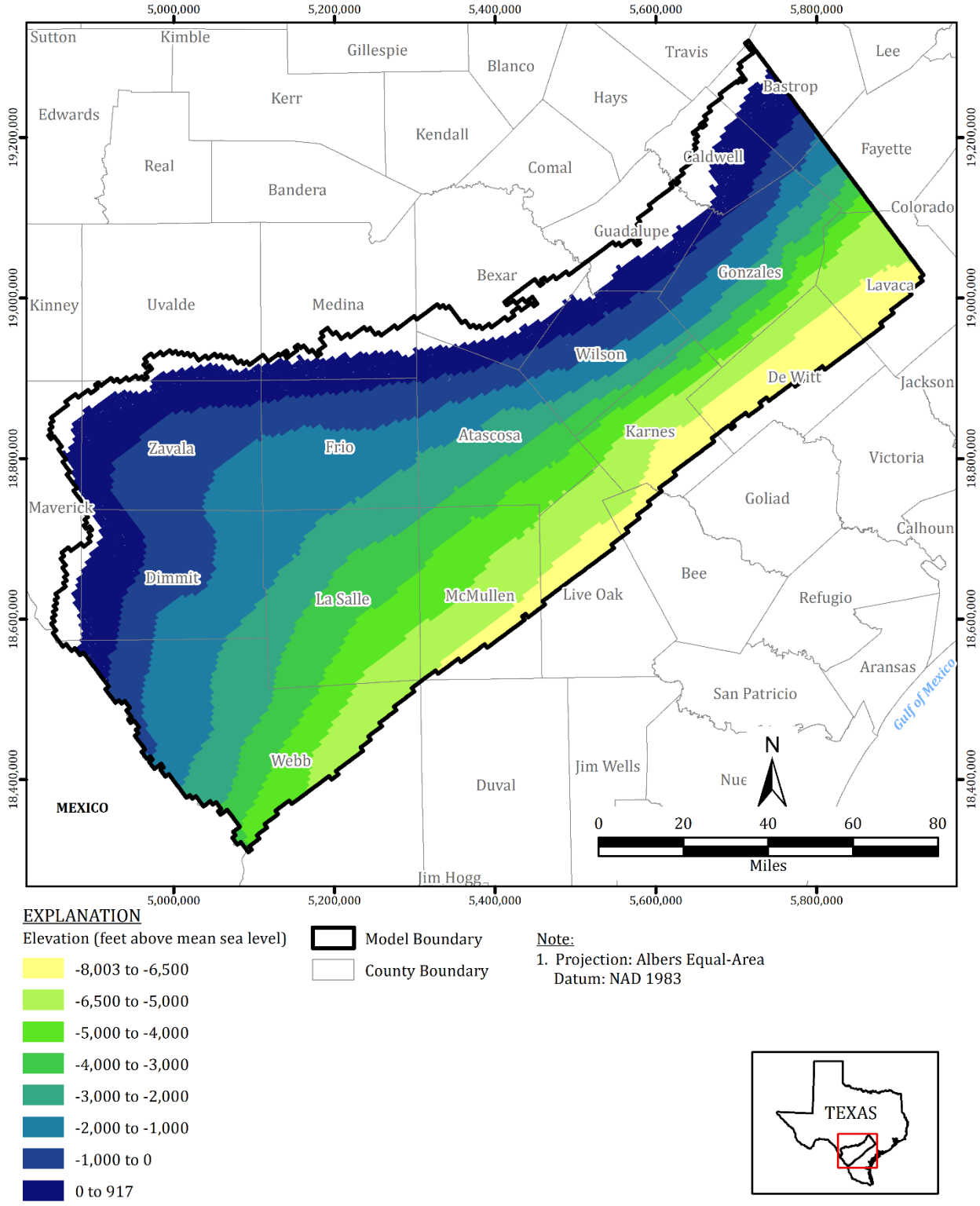


Figure 3-31. Modeled Top Elevation for Middle Wilcox (Model Layer 8)

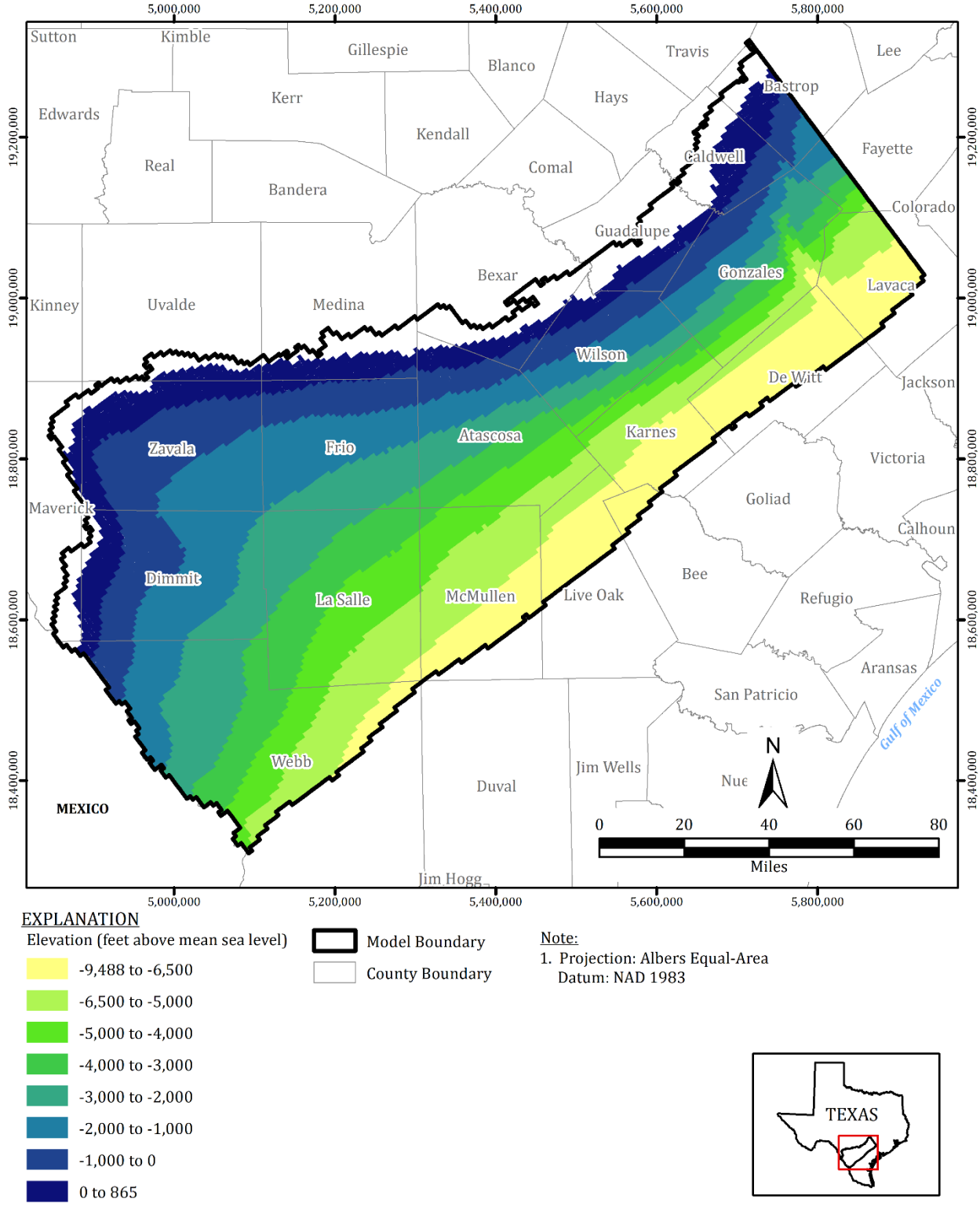


Figure 3-32. Modeled Bottom Elevation for Middle Wilcox (Model Layer 8)

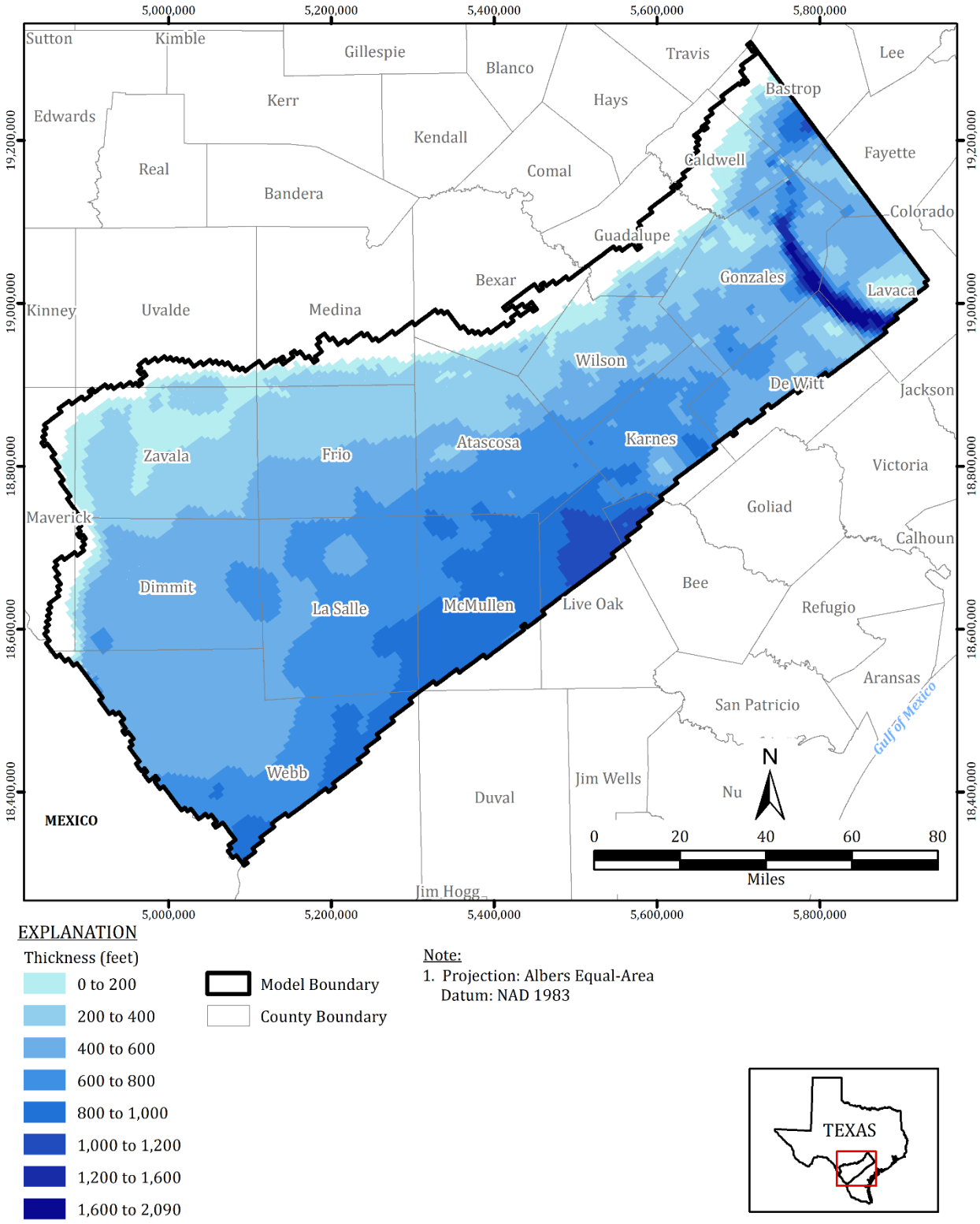


Figure 3-33. Modeled Thickness for Middle Wilcox (Model Layer 8)

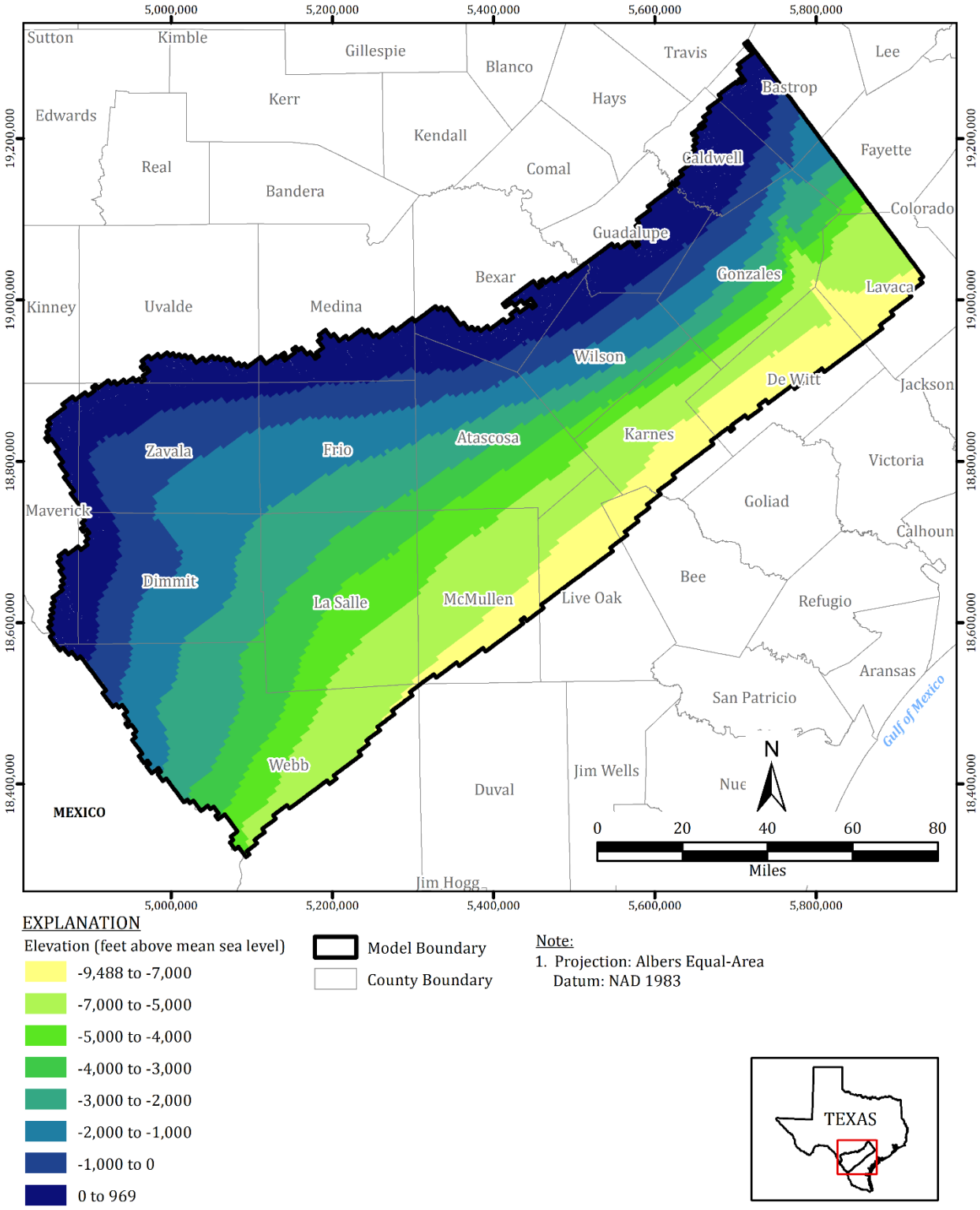


Figure 3-34. Modeled Top Elevation for Lower Wilcox (Model Layer 9)

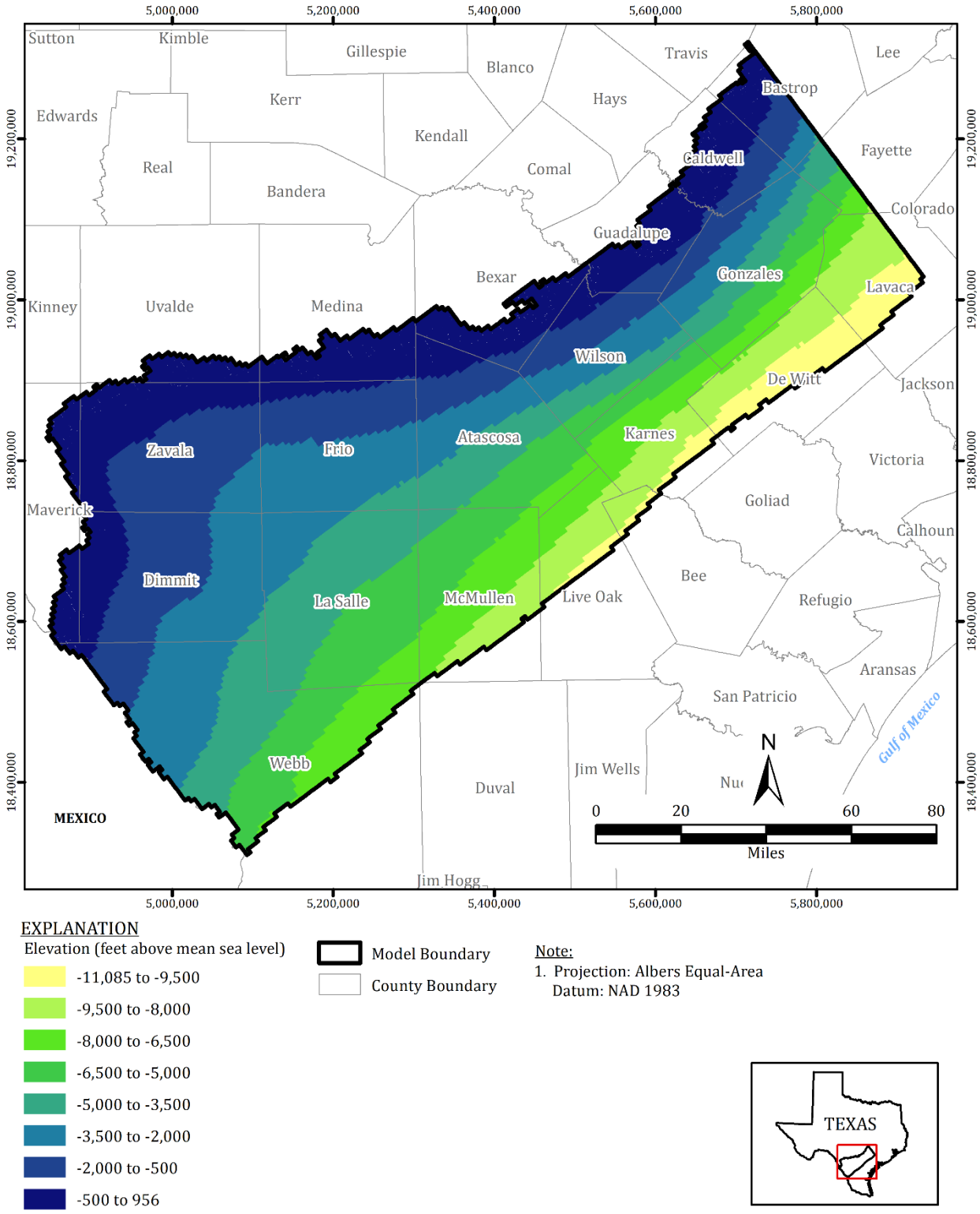


Figure 3-35. Modeled Bottom Elevation for Lower Wilcox (Model Layer 9)

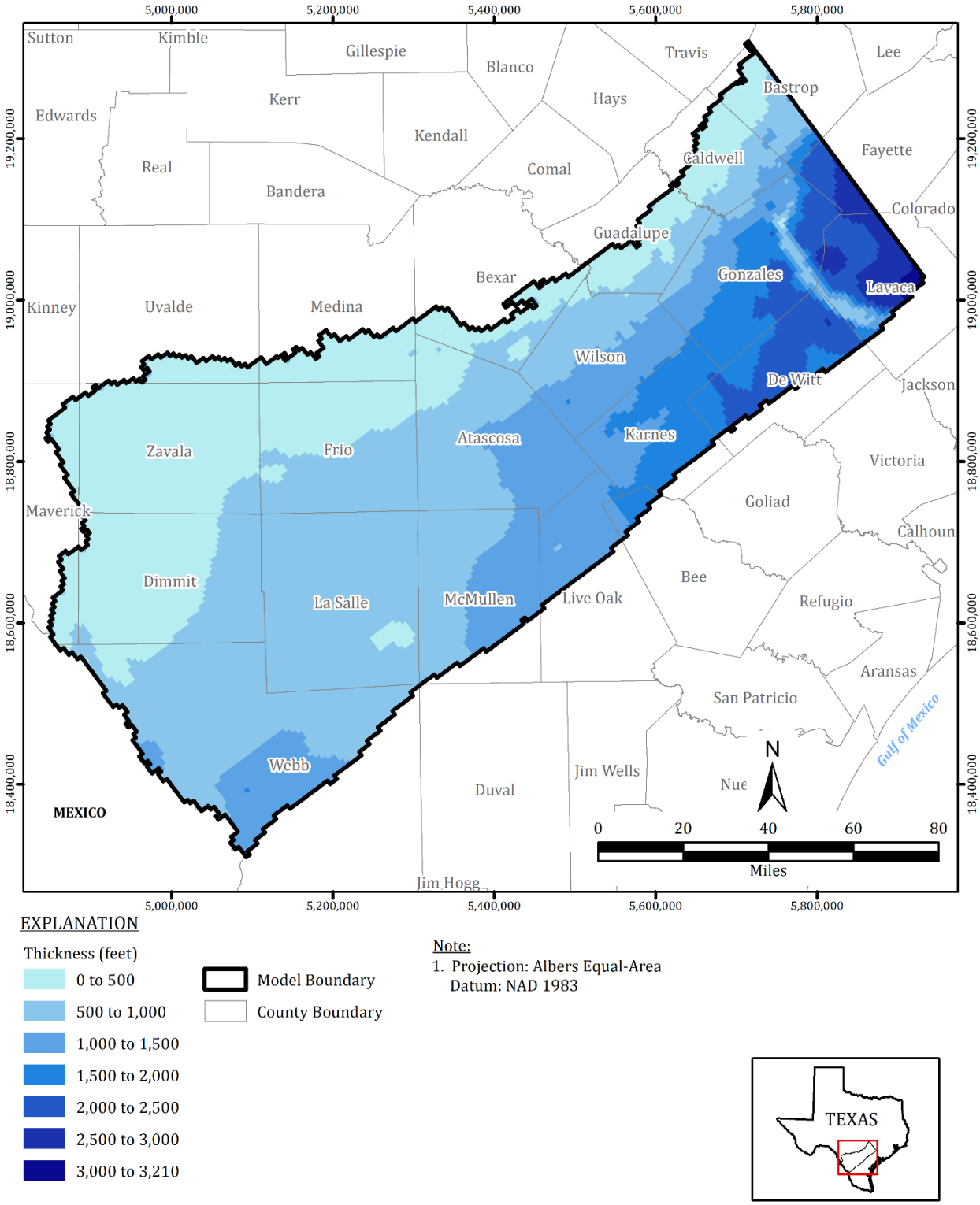
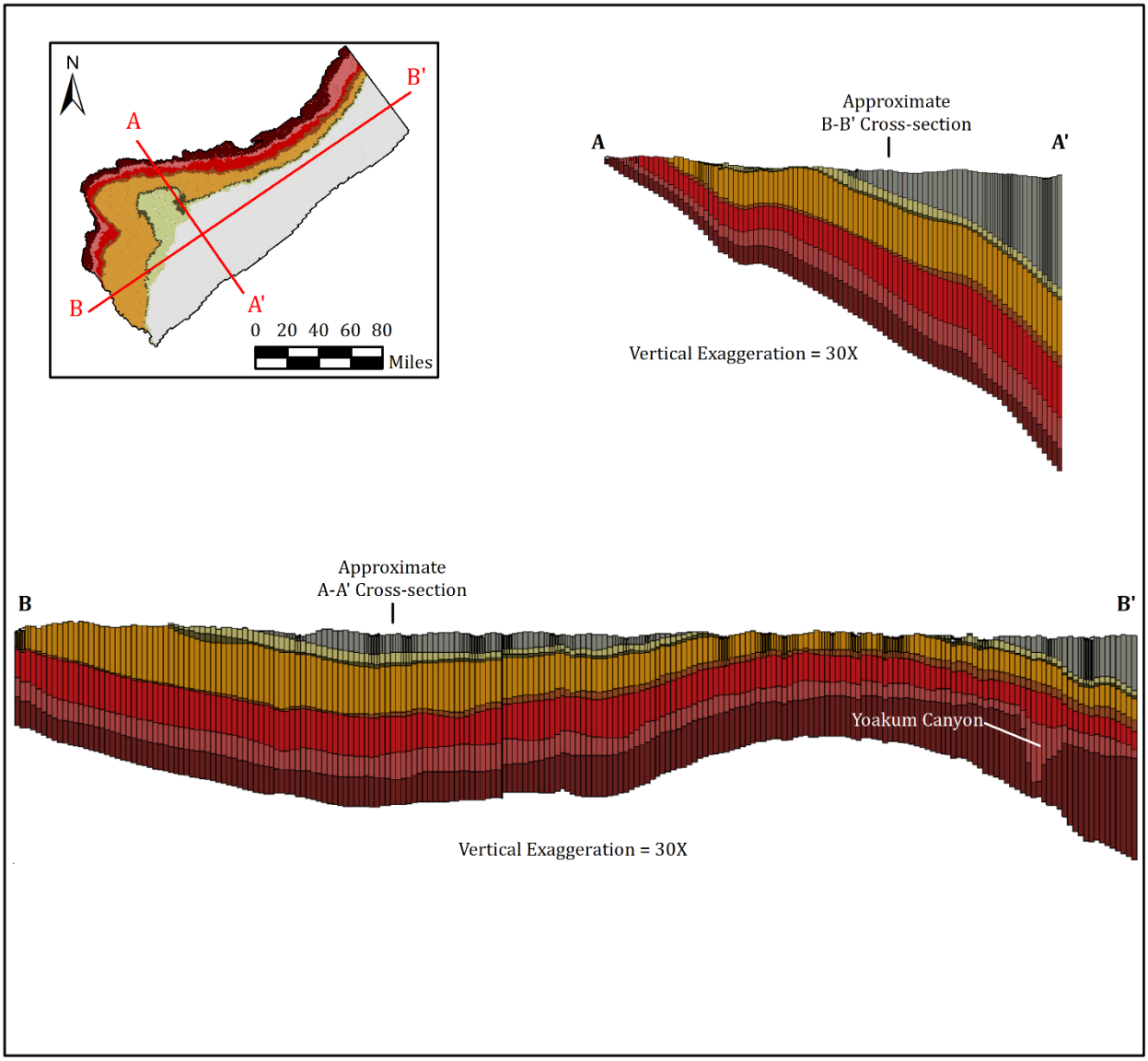


Figure 3-36. Modeled Thickness for Lower Wilcox (Model Layer 9)



EXPLANATION

- Layer 2 (Younger Units)
- Layer 3 (Sparta Aquifer)
- Layer 4 (Weches Aquitard)
- Layer 5 (Queen City Aquifer)
- Layer 6 (Reklaw Aquitard)
- Layer 7 (Carrizo-Upper Wilcox)
- Layer 8 (Middle Wilcox)
- Layer 9 (Lower Wilcox)

Note:
1. Groundwater Desktop was used to visualize the groundwater flow model cross-sections.

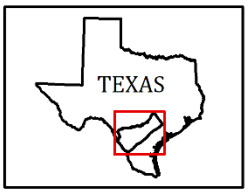


Figure 3-37. Cross Sections of Gridded Model Layers in the Groundwater Flow Model

3.5 Node Property Flow Package

The Node Property Flow (NPF) package and Storage (STO) package replace previous MODFLOW packages that characterize the aquifer properties including the Layer Property Flow (LPF), Block-Centered Flow (BCF), and Upstream Weighting (UPW) packages. The NPF Package was used to specify aquifer flow parameters (hydraulic properties) and define individual cells as confined or convertible for the groundwater domain. Aquifer flow parameters required by the NPF Package include horizontal and vertical hydraulic conductivities. The parameter values were established during calibration using the automated parameter estimation software, PEST (Doherty, 2010); this process is discussed further in the Calibration Section (Section 4.0). The initial parameterization approach for hydraulic conductivity using sand fraction information for modeled hydrostratigraphic units is discussed here. Deviation from this approach, which was required to achieve model calibration, is discussed in detail in Chapter 4.

Hydraulic conductivity values for the aquifers in the domain have previously been estimated at various locations as noted in Section 2.5; however, it is difficult to apply these values across a geologic unit. Therefore, hydraulic conductivity in each model layer was parameterized using the estimated distributions of sand fraction within each of the geologic units and across the model domain (Figures 2.52 through 2.58). Figures 3-38 through 3-44 show the sand fraction distributions for the Sparta Aquifer (model layer 3), Weches Aquitard (model layer 4), Queen City Aquifer (model layer 5), Reklaw Aquitard (model layer 6), Carrizo-Upper Wilcox (model layer 7), Middle Wilcox (model layer 8), and Lower Wilcox (model layer 9) units, respectively.

Uniform values were used for sand fraction within the Quaternary Alluvium (model layer 1), and the Younger Units (model layer 2). Sand fraction information was not available for the two transmissive units. The sand fraction value of 0.70 was used for the Quaternary Alluvium (model layer 1); the sand fraction value of 0.10 was used for the Younger Units (model layer 2). Sand fractions for all layers are summarized in Table 3-5.

Hydraulic conductivity parameterization was conducted as follows. A higher hydraulic conductivity value was associated with a sand fraction of unity, and a lower value was associated with a sand fraction of zero for each geologic layer (the assumption being that each geologic unit has its own type of soil or rock and that, within each unit, less sand implies higher clay or rock content with an associated lower effective hydraulic conductivity). The horizontal hydraulic conductivity for any computational cell in the domain is calculated as an arithmetic average, weighted by the sand fraction value of the cell, as shown in the equations below; this provides a linear relationship between the highest and lowest value within each geologic unit.

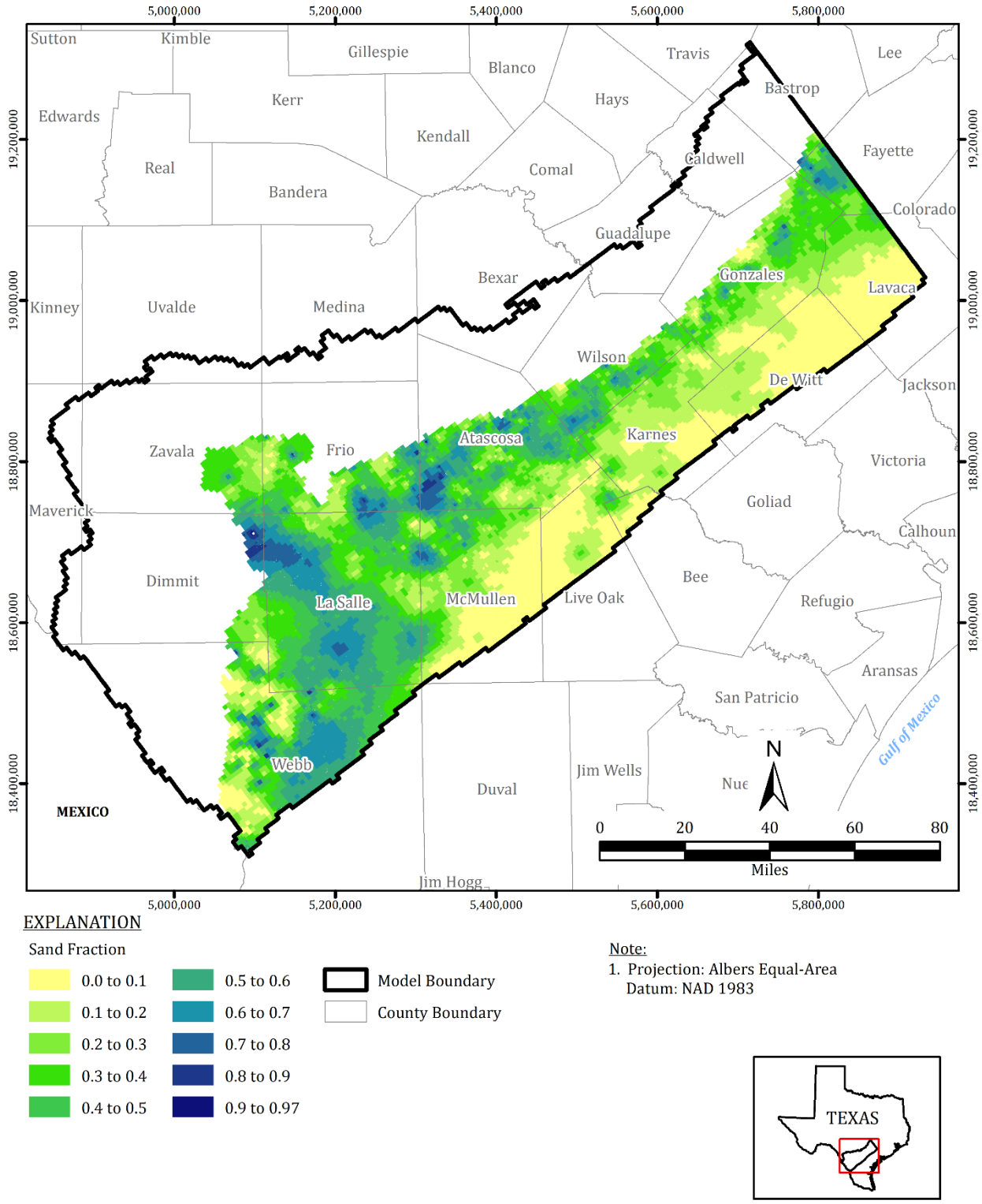


Figure 3-38. Estimated Sand Fraction Distribution for Sparta Aquifer (Model Layer 3)

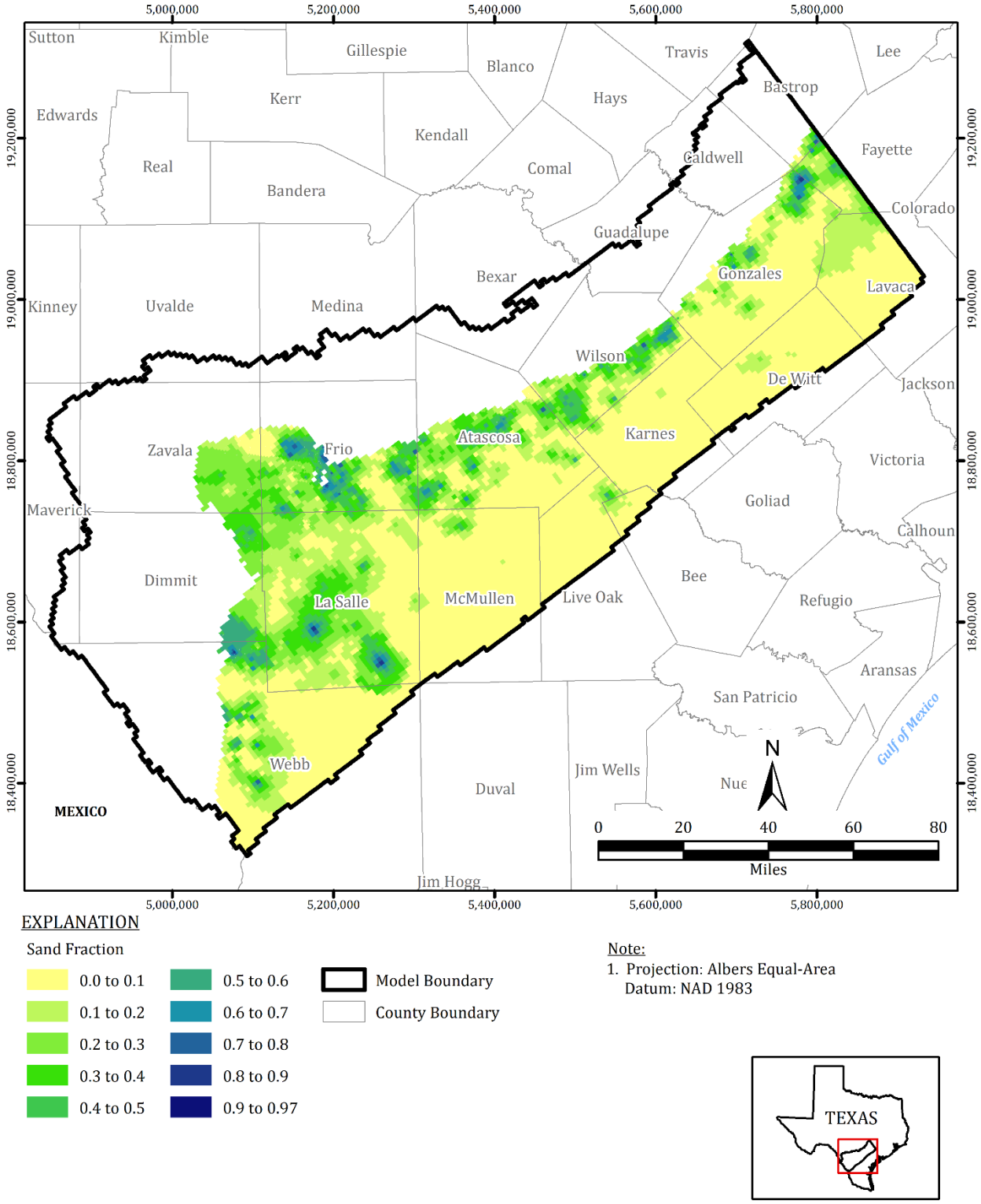


Figure 3-39. Estimated Sand Fraction Distribution for Weches Aquitard (Model Layer 4)

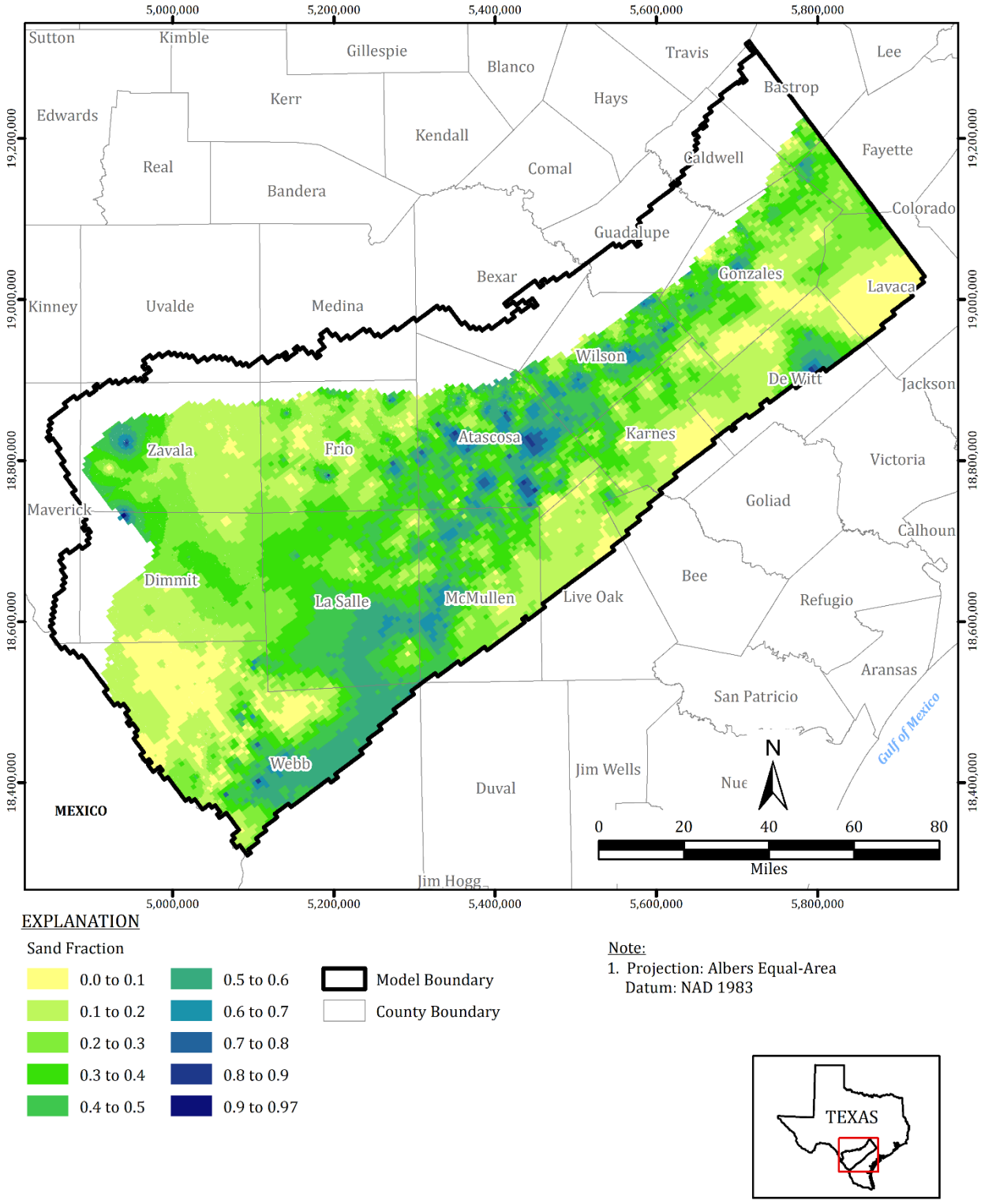


Figure 3-40. Estimated Sand Fraction Distribution for Queen City Aquifer (Model Layer 5)

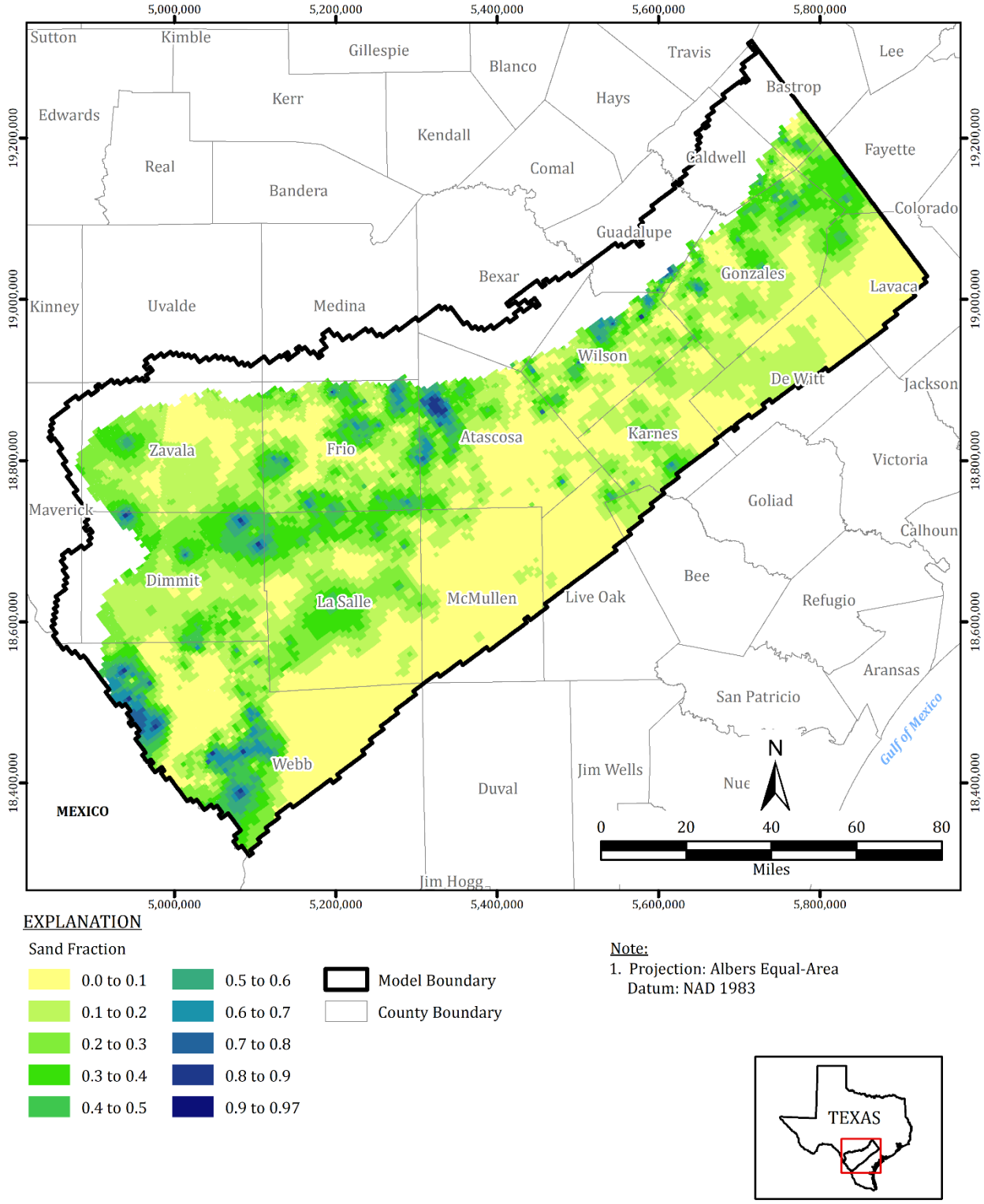


Figure 3-41. Estimated Sand Fraction Distribution for Reklaw Aquitard (Model Layer 6)

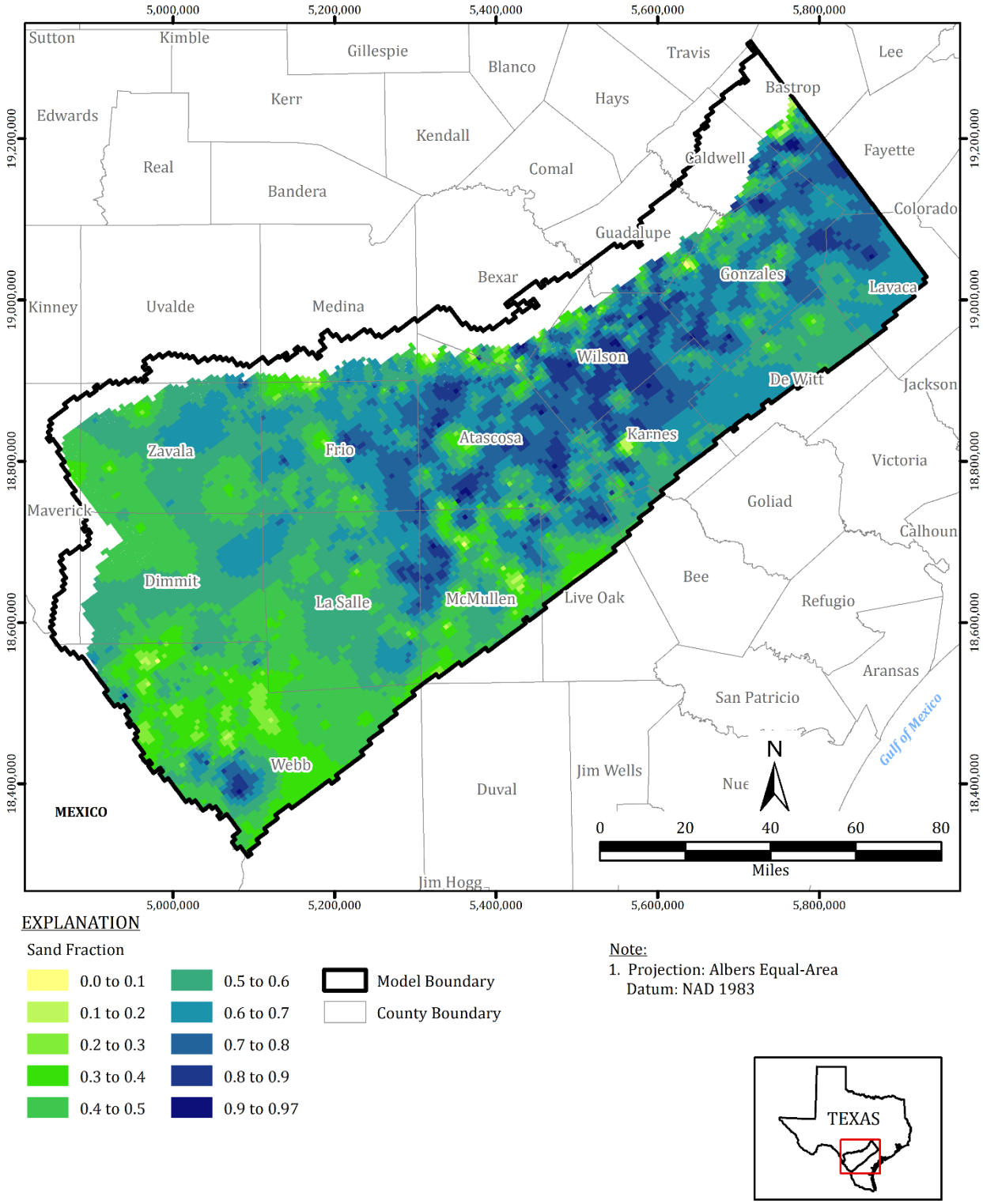


Figure 3-42. Estimated Sand Fraction Distribution for Carrizo-Upper Wilcox (Model Layer 7)

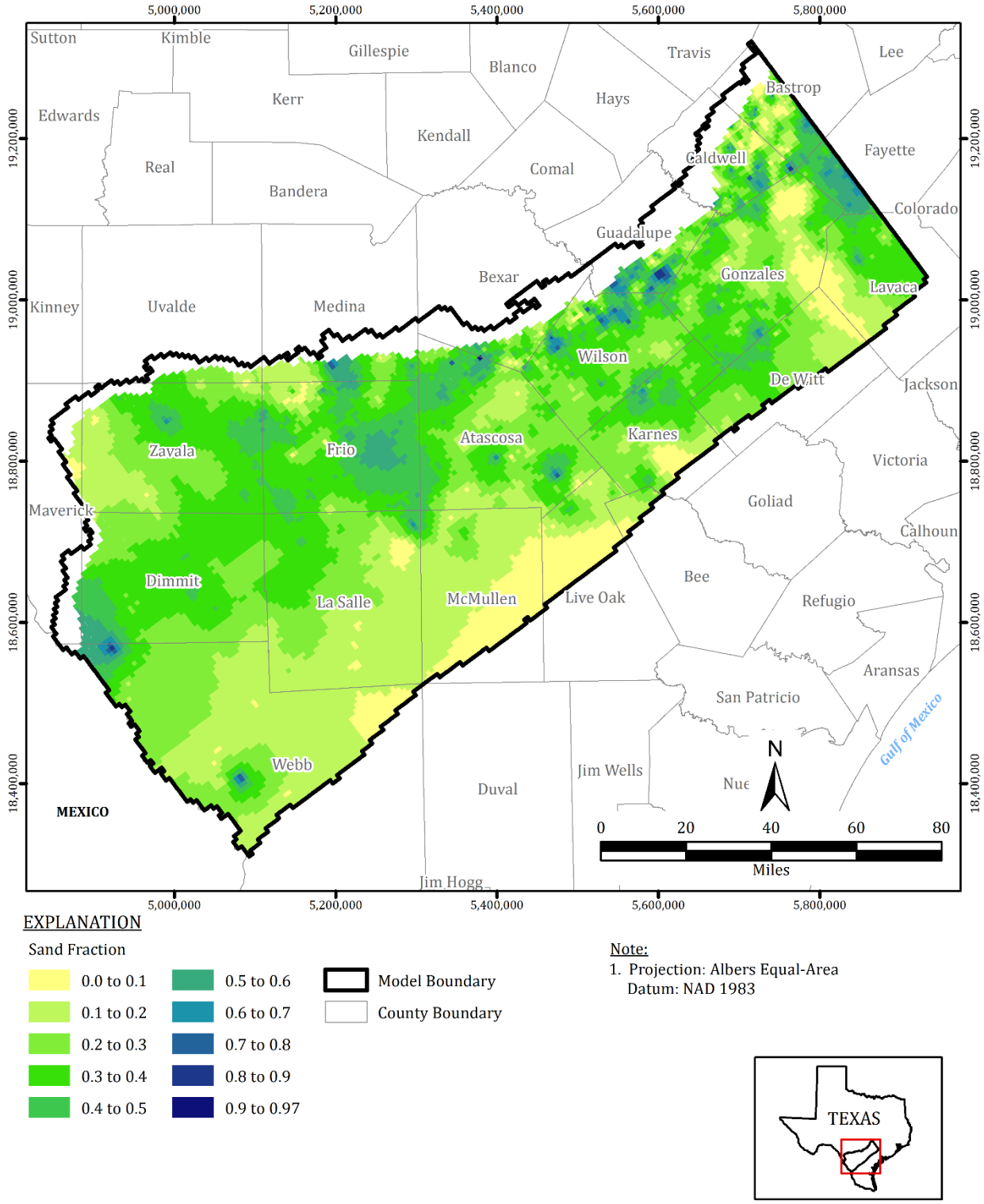


Figure 3-43. Estimated Sand Fraction Distribution for Middle Wilcox (Model Layer 8)

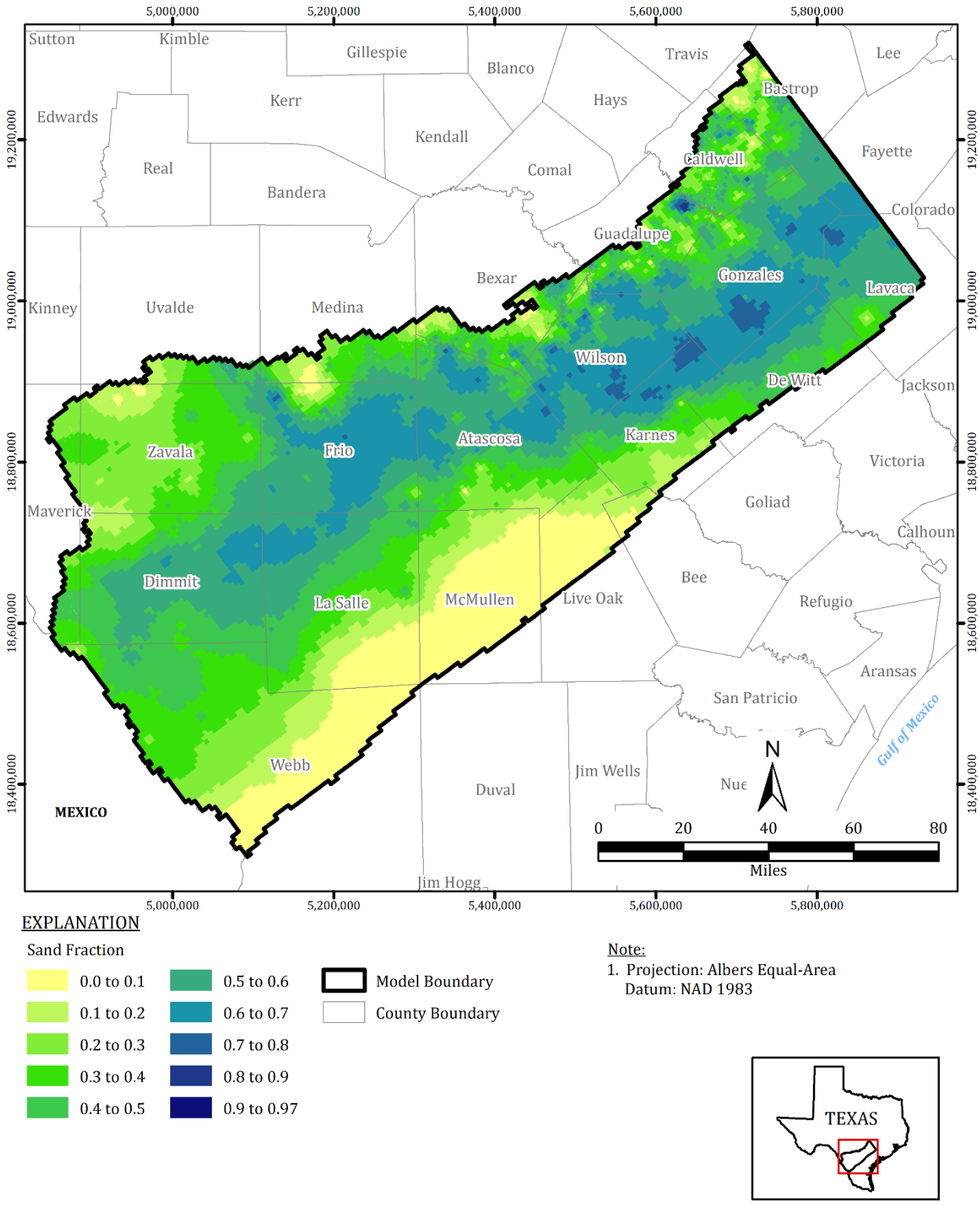


Figure 3-44. Estimated Sand Fraction Distribution for Lower Wilcox (Model Layer 9)

Table 3-5. Sand Fraction Range for Each Layer

Model Layer	Hydrostratigraphic Unit	Sand Fraction Range
1	Quaternary Alluvium	0.70
2	Younger Units	0.10
3	Sparta Aquifer	0 to 0.97
4	Weches Aquitard	0 to 0.86
5	Queen City Aquifer	0 to 0.90
6	Reklaw Aquitard	0 to 0.95
7	Carrizo-Upper Wilcox	0.04 to 0.97
8	Middle Wilcox	0.01 to 0.90
9	Lower Wilcox	0 to 0.87

The relationship between sand fraction, parameterized hydraulic conductivity values, and model hydraulic conductivity can be written as:

$$K_h = f_s K_s + (1 - f_s) K_c$$

Where K_h is the horizontal hydraulic conductivity of a cell; f_s is the sand fraction of a cell; K_s is the parameterization hydraulic conductivity value for sand for a geologic unit, and K_c is the parameterization hydraulic conductivity value for clay or rock for the geologic unit.

For vertical hydraulic conductivity, a weighted harmonic mean value was applied. Thus,

$$K_v = \frac{1}{[f_s / K_s + (1 - f_s) / K_c]}$$

Where K_v is the vertical hydraulic conductivity of a cell.

With this parameterization, sand hydraulic conductivity governs horizontal flow in the model since the arithmetic average tends towards the mid-point value for equal fractions of sand and clay. The clay hydraulic conductivity would generally govern vertical flow in the model since the harmonic average tends to be biased towards the lower (clay) conductivity value for equal fractions of sand and clay.

The sand fraction values are stored in the "Leakance" property within Groundwater Vistas. When the MODFLOW comment-line includes the phrase "Sand Fractions stored as Leakance", Groundwater Vistas creates a text file with the extension 'sand' representing the sand fraction for each cell. Groundwater Vistas then performs the computations for horizontal hydraulic conductivity, K_h, and vertical hydraulic conductivity, K_v, for each cell using the formulas above to create the NPF datasets. The horizontal and vertical hydraulic

conductivity values are saved in the text files with the extensions 'kx' and 'kz', respectively. Note that this computation can also be done during PEST simulations for calibration.

The specific storage and specific yield parameters were estimated as uniform for the model domain. There is less data available for these parameters and adding complexity to these model parameters was deemed unwarranted. The influence of these parameters on the system and model solution was tested with a sensitivity analysis, discussed in Section 5.0.

3.6 Hydraulic Flow Barrier Package

Representation of major faults and flow barriers followed the approach and spatial distribution of Deeds and others (2003) and Kelley and others (2004) using the Hydraulic Flow Barrier (HFB) package. The HFB hydraulic characteristic parameter, where lower values introduce a greater resistance to groundwater flow, was adjusted as part of model calibration. Simulated barriers to flow in the numerical model are shown on Figure 3-45.

3.7 Storage Package

The Storage (STO) package is used for transient conditions to provide both compressible storage and drainable and fillable porosity volumetric flow rate contributions. The STO package was used in the model to specify the aquifer storage parameters which include specific storage and specific yield. Input for the STO package are the specific storage and specific yield of each model cell. Specific storage values are stored in the text file with the extension 'ss' and the specific yield values are stored in the text file with the extension 'sy', both of which are created by Groundwater Vistas and called by the STO package. If the STO package is not included in the model NAME file, then a steady-state simulation is conducted. The mass balance output for the STO package provides information on the confined and unconfined components of the total storage. Thus,

$$Q_{STO} = Q_{SS} + Q_{Sy}$$

Where Q_{SS} is the volumetric flow rate from specific storage in units of length cubed over time (L^3/T) and Q_{Sy} is the volumetric flow rate from specific yield in similar units.

Specific storage and specific yield values within aquifer and aquitard units are discussed in detail in the Model Calibration Section below (Section 4.1).

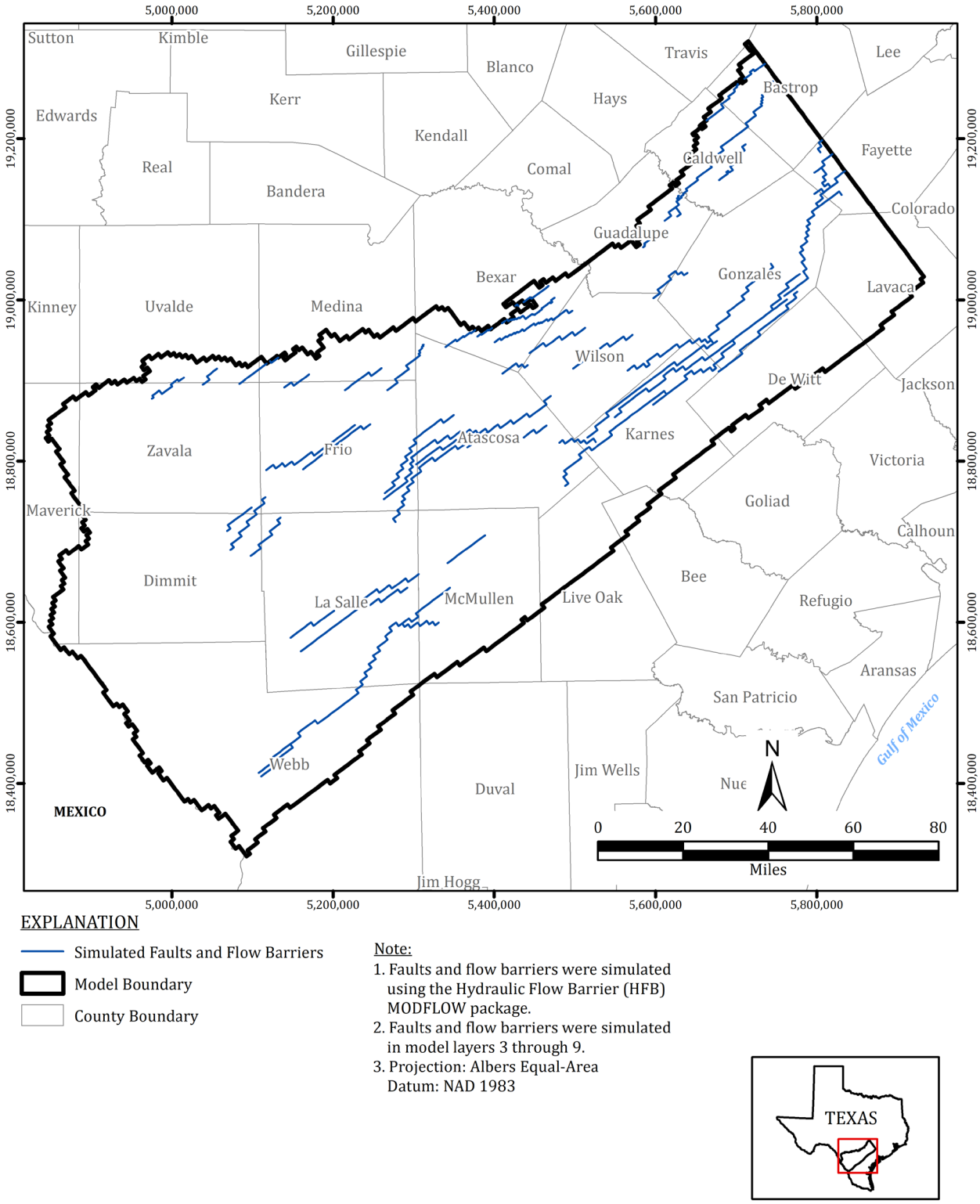


Figure 3-45. Simulated Faults and Flow Barriers in Model

3.8 Well Package

The Well (WEL) package was used in the model to simulate groundwater pumping wells. The initial input pumping data for the updated groundwater availability model consists of the following information:

- Predevelopment period – no pumping;
- 1980 to 1999 pumping from the 2004 groundwater availability model (Kelley and others, 2004); in the model, 1980 was simulated as a steady-state period;
- 2000 to 2011 pumping from the extension of the groundwater availability model calibration period for future conditions evaluation (Hutchison, 2017);
- 2012 to 2017 pumping was based on TWDB pumping data (TWDB, 2020c) and modified as follows;
    - Rates for counties straddling the model boundary were reduced according to land area inside versus outside the model domain;
    - Where no TWDB data was available for three counties which had historical model pumping (Bee, Dewitt, and Live Oak counties), the average of the previous five years of pumping, 2007 to 2011 from the extension of the groundwater availability model values (Hutchison, 2017), was used as the extrapolated pumping from 2012 through 2017. These values are initial estimates.

Details on pumping data availability and assimilation are provided in Section 2.7. The pumping data presented in the 2004 groundwater availability model (Kelley and others, 2004) consisted of pumping wells in 27,808 model cells and in single model layers.

Table 3-6 shows pumping volumes per layer from each data source and the estimated conceptual pumping used in this groundwater availability model update. Table 3-7 shows the average pumping rate for each dataset and the combined average conceptual pumping rate for the 2021 numerical model design. The pumping values were further evaluated during model calibration. Figure 3-46 shows the 2004 groundwater availability model data, the extended pumping values to 2011 (Hutchison, 2017), and estimates for later pumping data values prior to any rate adjustments made as part of model calibration (Section 4).

Table 3-6. Model Design Conceptual Pumping Dataset

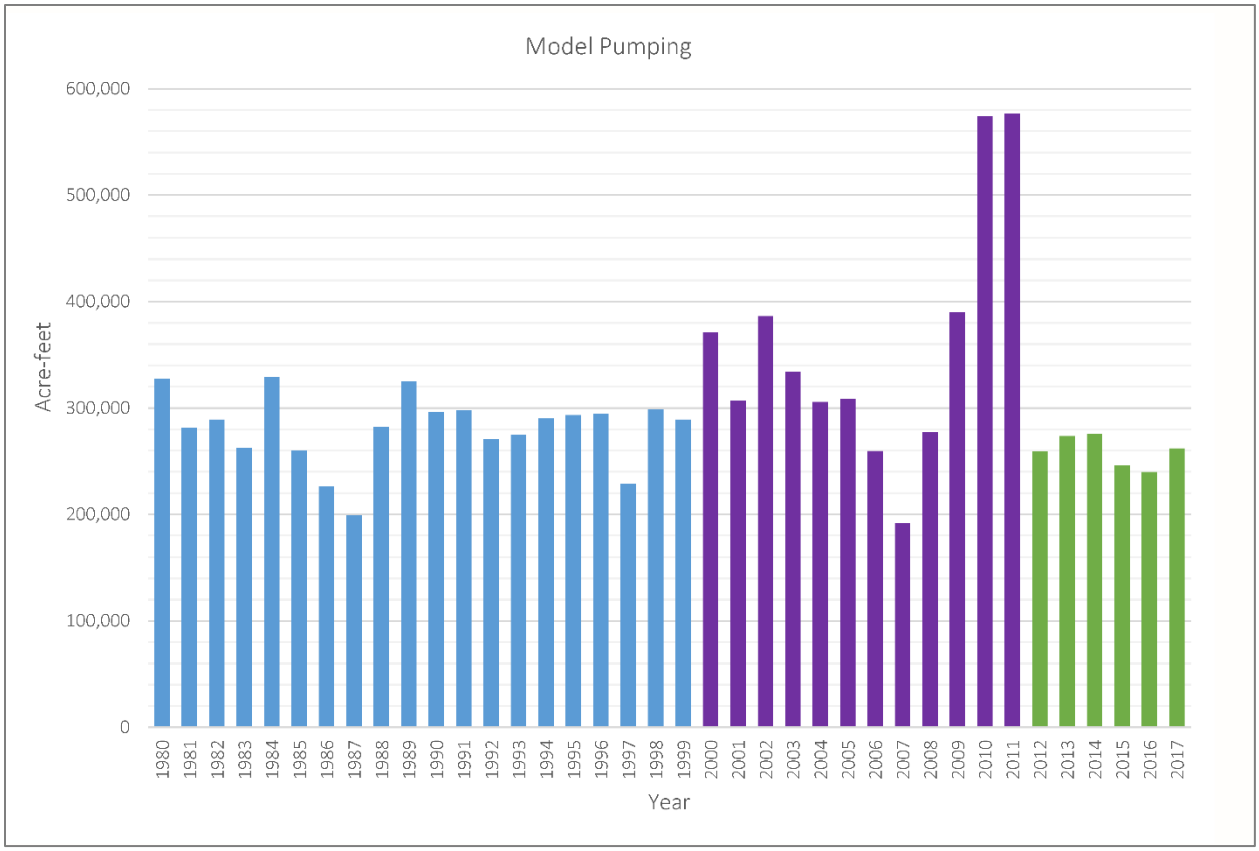
Hydrostratigraphic Unit	Model Layer	1980 to 1999 Model Pumping in 2004 GAM	2000 to 2011 Pumping	2012 to 2017 Pumping	Total 1980 to 2017 Model Design Conceptual Pumping in 2022 GAM
		(Acre-feet)			
Quaternary Alluvium	1	0	0	0	0
Younger Units	2	0	0	0	0
Sparta Aquifer	3	50,540	95,436	52,596	198,572
Weches Aquitard	4	0	0	0	0
Queen City Aquifer	5	51,802	100,800	61,357	213,960
Reklaw Aquitard	6	0	0	0	0
Carrizo-Upper Wilcox Aquifer	7	4,704,355	3,500,967	1,275,415	9,480,737
Middle Wilcox	8	466,764	340,553	102,844	910,160
Lower Wilcox	9	342,937	244,170	65,325	652,431
Pumping Total		**5,616,398**	**4,281,926**	**1,557,536**	**11,455,860**

Notes:
1.1980 to 1999 pumping from the 2004 groundwater availability model (Kelley and others, 2004).
2. 2000 to 2011 pumping from Hutchison, 2017.
3. 2012 to 2017 model pumping is based on TWDB pumping data (TWDB, 2020c) or Hutchison, 2017.
4. There is no pumping in the simulated predevelopment period (before 1980). 1980 was simulated as a steady-state period.
5. GAM = groundwater availability model

Table 3-7. Model Design Conceptual Pumping – Average Rates

Hydrostratigraphic Unit	Model Layer	1980 to 1999 Average Model Pumping Rate in 2004 GAM	2000 to 2011 Average Pumping Rate	2012 to 2017 Average Pumping Rate	Combined 1980 to 2017 Model Design Conceptual Average Pumping Rate in 2022 GAM
		(Acre-feet per year)			
Quaternary Alluvium	1	0	0	0	0
Younger Units	2	0	0	0	0
Sparta Aquifer	3	2,527	7,953	8,766	5,226
Weches Aquitard	4	0	0	0	0
Queen City Aquifer	5	2,590	8,400	10,226	5,631
Reklaw Aquitard	6	0	0	0	0
Carrizo-Upper Wilcox Aquifer	7	235,218	291,747	212,569	249,493
Middle Wilcox	8	23,338	28,379	17,141	23,952
Lower Wilcox	9	17,147	20,347	10,887	17,169
Pumping Rate Total		**280,820**	**356,827**	**259,589**	**301,470**

Notes:
1.1980 to 1999 pumping from the 2004 groundwater availability model (Kelley and others, 2004).
2. 2000 to 2011 pumping from Hutchison, 2017.
3. 2012 to 2017 model pumping is based on TWDB pumping data (TWDB, 2020c) or Hutchison, 2017.
4. There is no pumping in the simulated predevelopment period (before 1980). 1980 was simulated as a steady-state period.
5. GAM = groundwater availability model



Notes:
1.1980 to 1999 pumping from the 2004 groundwater availability model (Kelley and Others, 2004).
2. 2000 to 2011 pumping from Hutchison, 2017.
3. 2012 to 2017 model pumping is based on TWDB pumping data (TWDB, 2020c) or Hutchison, 2017.
4. There is no pumping in the simulated predevelopment period (before 1980). 1980 was simulated as a steady-state period.
5. GAM = groundwater availability model

Figure 3-46. Model Pumping 1980 to 2017

Since the 2004 model (Kelley and others, 2004) and extended model (Hutchison, 2017) do not have layers representing the alluvium or the Younger Units, this model update contains no pumping in model layers 1 and 2 (Table 3-6). As there is little pumping in these layers in the conceptual model (Section 2.7), the lack of pumping in layer 1 in the current modeling efforts is a minor omission from the overall water budget and the pumping in layer 2 is indirectly related to the general head boundary condition within the Younger Units (Section 3.9). Consistent with the conceptual model, the majority of the pumping in this model update is in the Carrizo-Upper Wilcox, Middle Wilcox, and Lower Wilcox.

Each pumping well in the current model is screened within a single model layer. Figures 3-47 through 3-51 show the total conceptual pumping volume of each well during the model time period (1980 to 2017) for each layer. There is no pumping from the Weches Aquitard (model layer 4) or the Reklaw Aquitard (model layer 6). Groundwater is pumped from the Queen City Aquifer, Sparta Aquifer, and Carrizo-Wilcox aquifers for municipal, irrigation, industrial, domestic, oil and gas, and stock uses.

Appendix E provides tables showing the total conceptual pumping for each county within the model domain for each stress period (each year) and each layer of the model simulation. Figures 3-52 through 3-56 display these values graphically as individual county charts showing total pumping. Pumping sums for counties that straddle the model boundary do not reflect total pumping from that county but only the pumping portion that overlaps the model. In general, most pumping is from the Carrizo-Upper Wilcox, Middle Wilcox, and Lower Wilcox stratigraphic units.

The WEL package of MODFLOW 6 was used to apply a sink within the cell for each pumping well. The well pumping was applied on an annual stress period for 38 stress periods representing 1980 to 2017 conditions. Zero pumping was simulated for the first stress period representing predevelopment conditions. Applying the pumping distributions of Figures 3-47 through 3-51directly onto the grid at a cell center produced irregularities in the nested grid portion of the domain. This is because pumping should be distributed uniformly over the area covered by a particular pumping rate; instead, smaller cells would get the same rate as larger ones thus concentrating the areal distribution into a smaller area. Therefore, the pumping rates from the conceptual model were transferred into the numerical model by first calculating the pumping rate per unit area, distributing that value onto the numerical grid blocks, and multiplying the result by the area of the grid-block to give the pumping rate for a cell. This was done for all stress periods. This issue was noticed after submitting a draft version of the model and was updated in the final calibration.

The WEL Package includes an “AUTOFLOWREDUCE” option that ensures that pumping demand does not draw water level elevations below the bottom elevation of the cell. This option is turned on for the simulation and any associated simulated reduction in pumping is reported in a “well flow-reduction” file. Therefore, actual model simulated pumping may be less than the conceptual pumping rates assigned as part of boundary condition parameterization due to the autoflow reduce option. Using this feature also avoids the “dry cell” issue that was present in the previous models using older versions of MODFLOW.

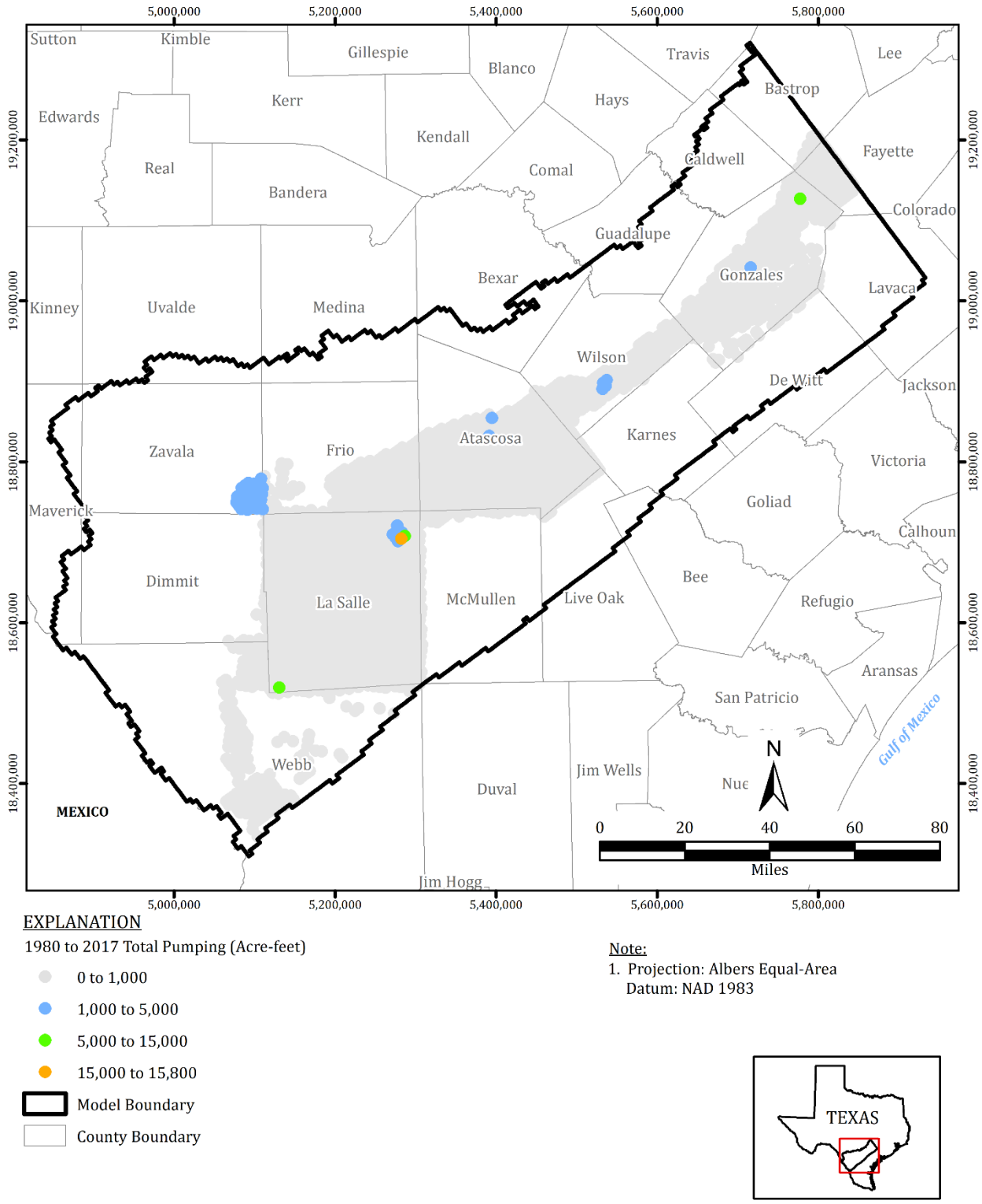


Figure 3-47. Pumping Well Total Pumping Volume in Sparta Aquifer (Model Layer 3)

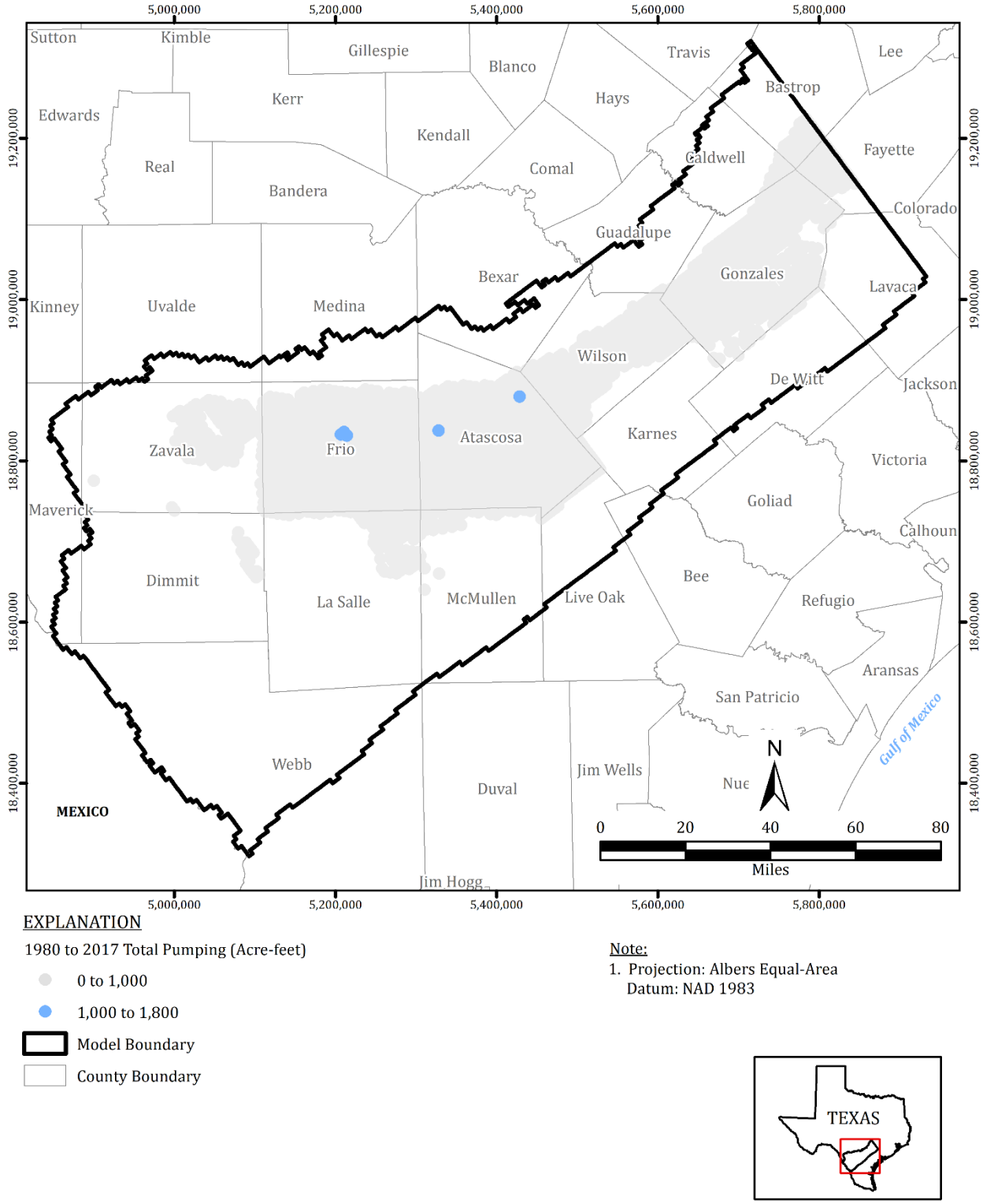


Figure 3-48. Pumping Well Total Pumping Volume in Queen City Aquifer (Model Layer 5)

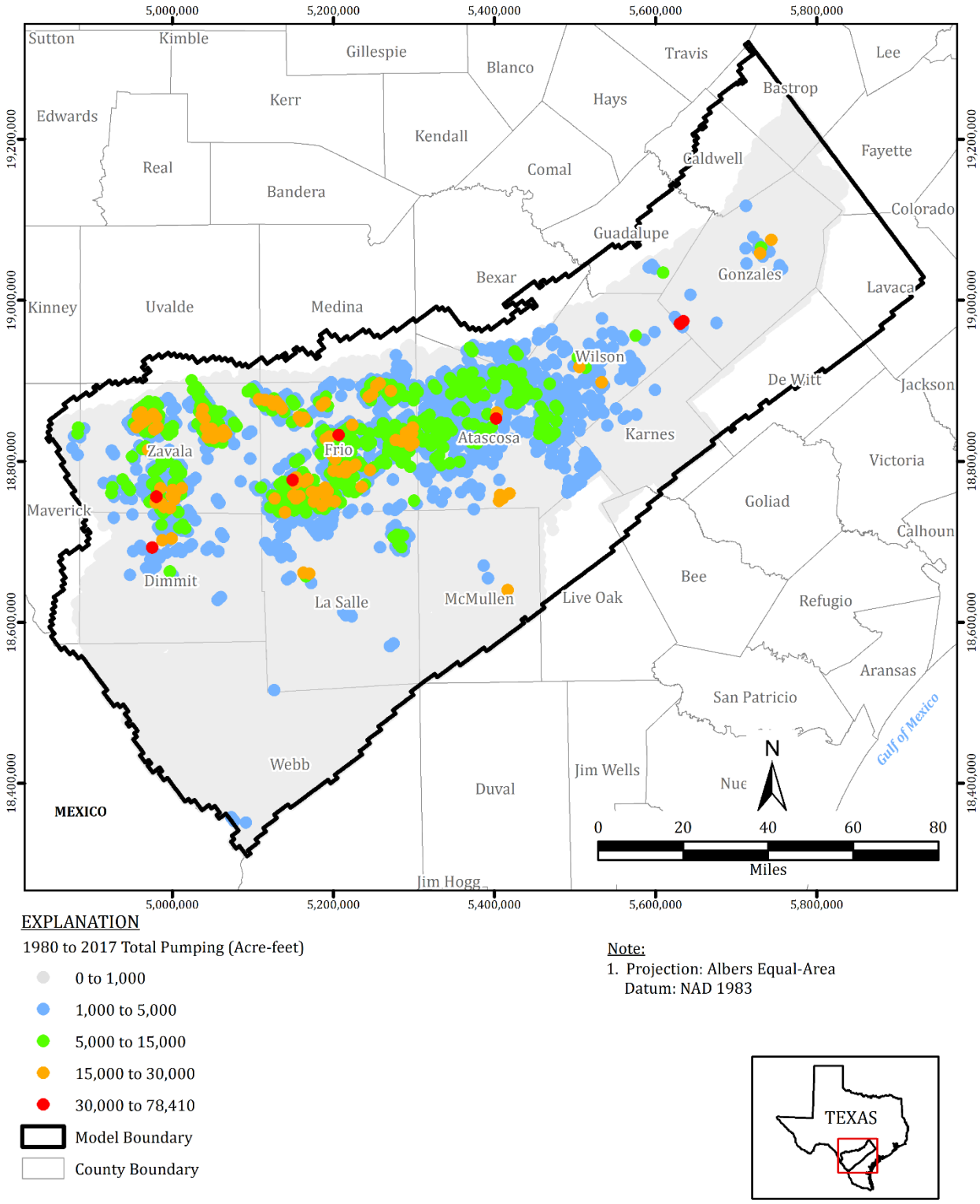
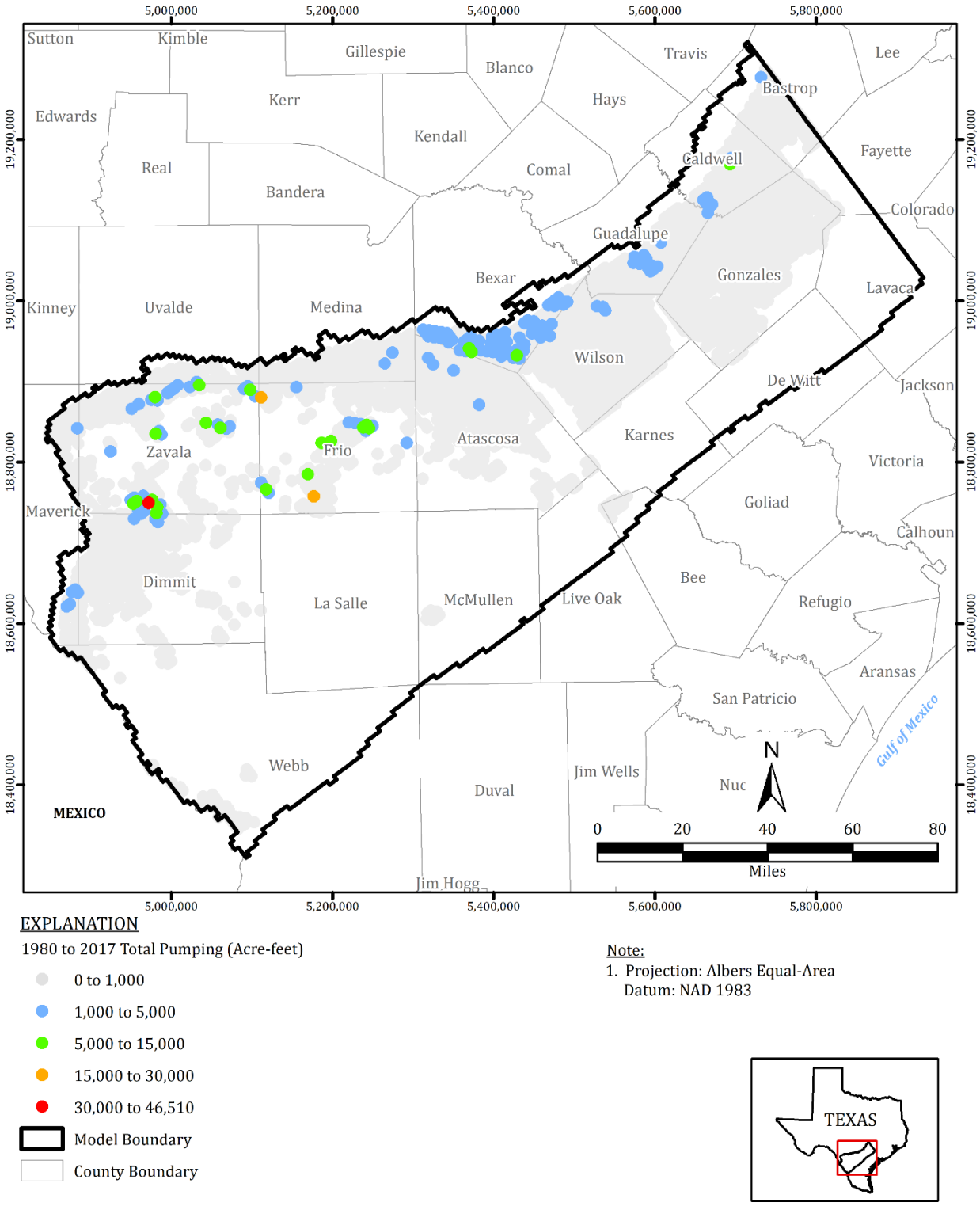


Figure 3-49. Pumping Well Total Pumping Volume in Carrizo-Upper Wilcox (Model Layer 7)



EXPLANATION

1980 to 2017 Total Pumping (Acre-feet)

- 0 to 1,000
- 1,000 to 5,000
- 5,000 to 15,000
- 15,000 to 30,000
- 30,000 to 46,510
- Model Boundary
- County Boundary

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

Figure 3-50. Pumping Well Total Pumping Volume in Middle Wilcox (Model Layer 8)

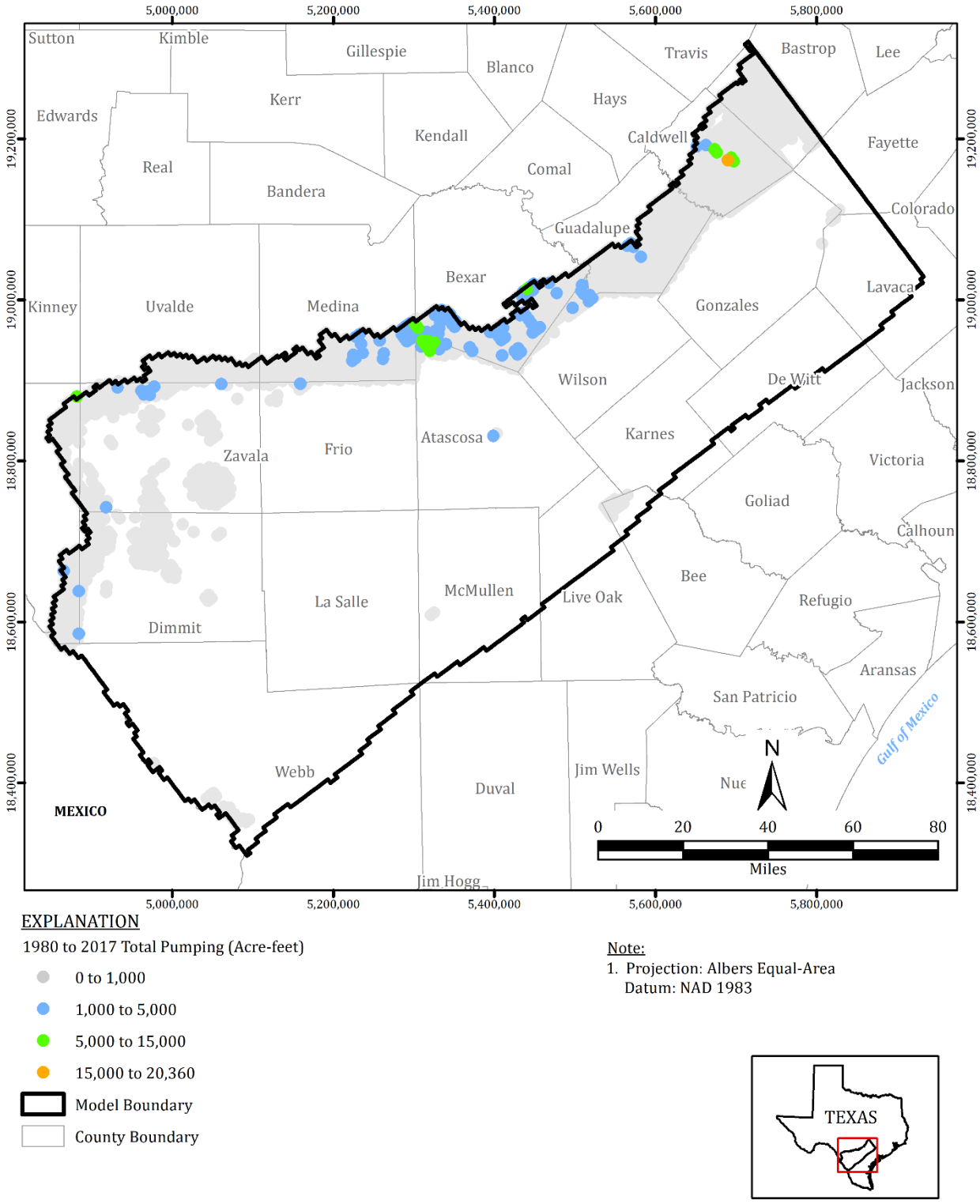


Figure 3-51. Pumping Well Total Pumping Volume in Lower Wilcox (Model Layer 9)

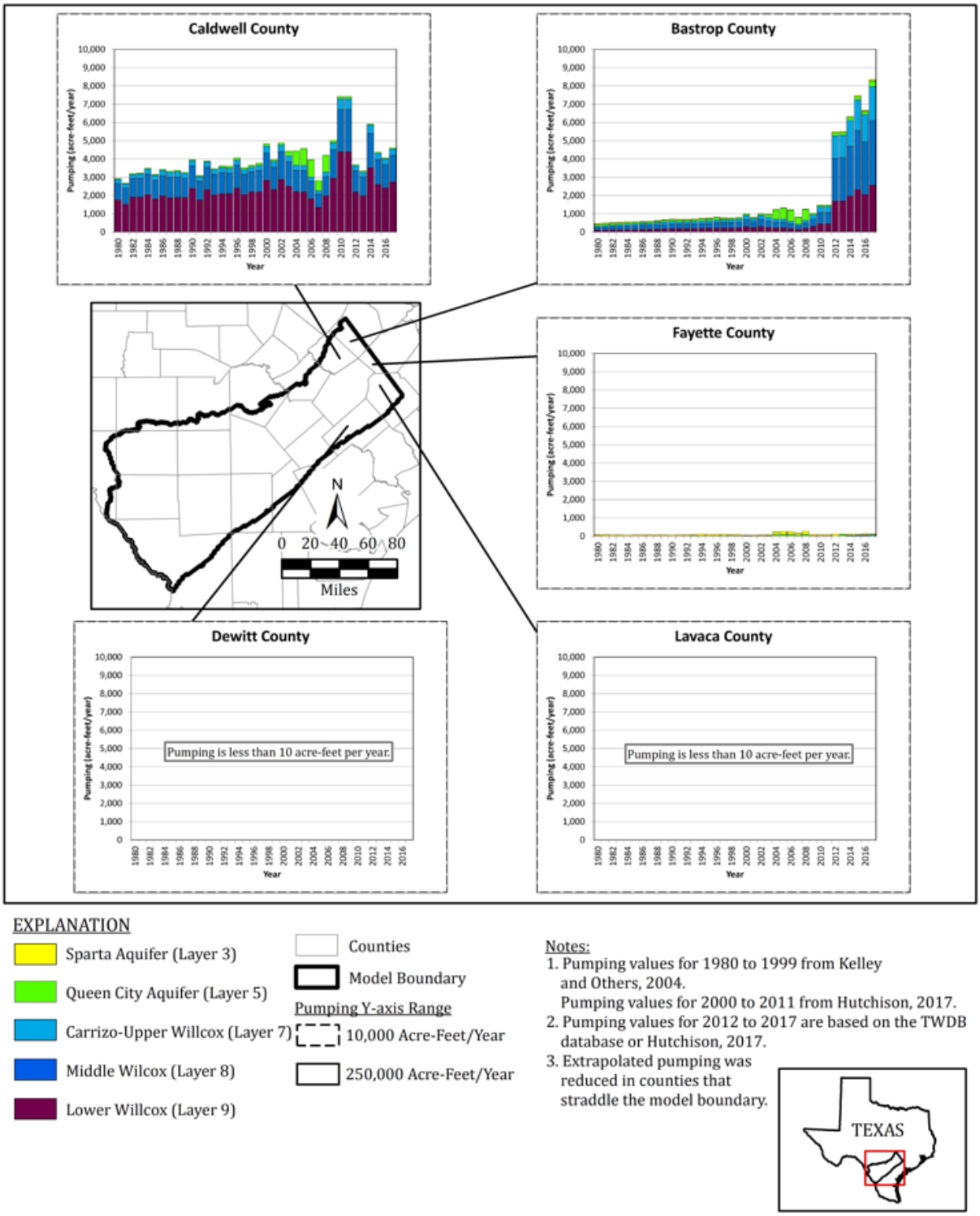


Figure 3-52. Pumping per County Set 1

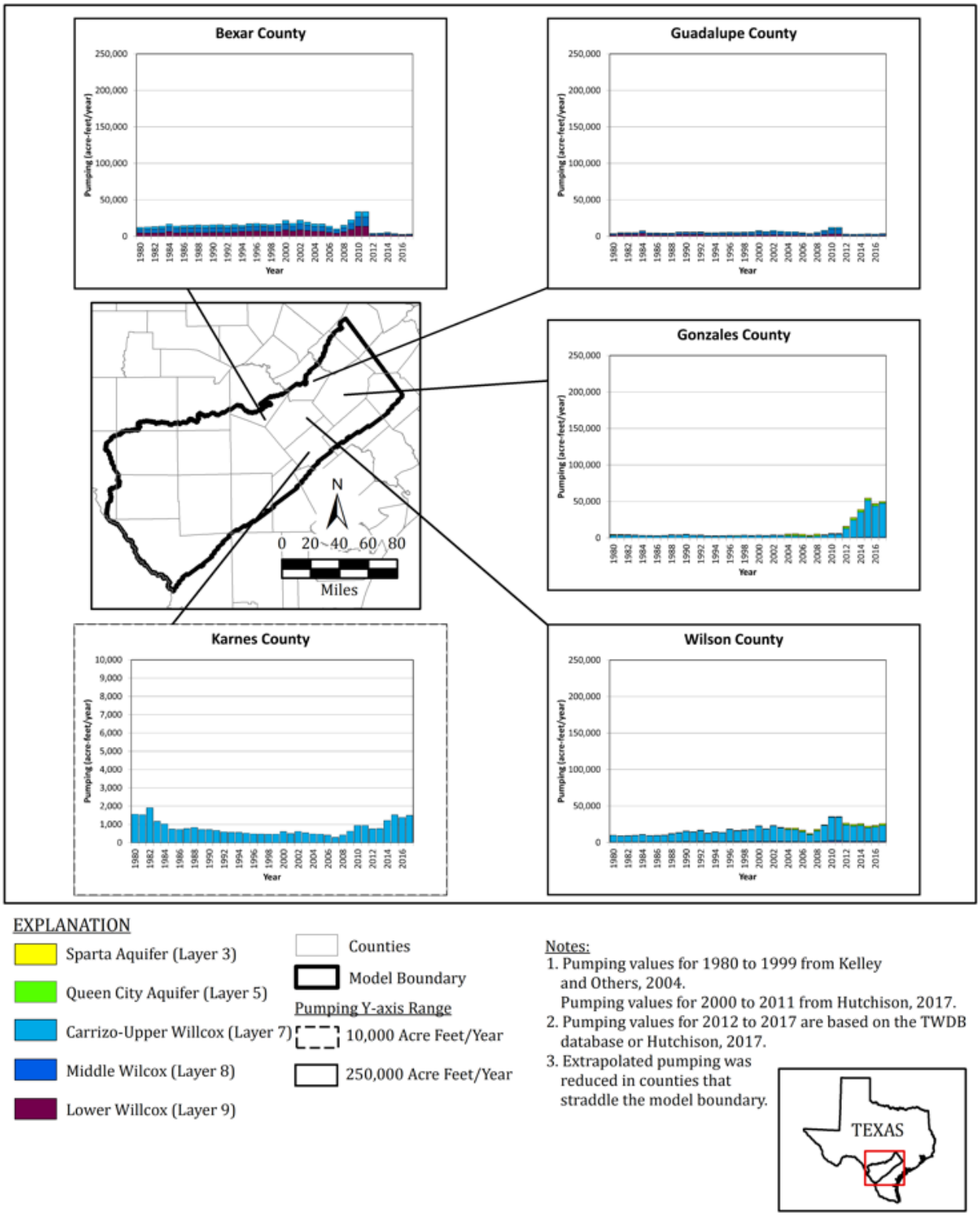


Figure 3-53. Pumping per County Set 2

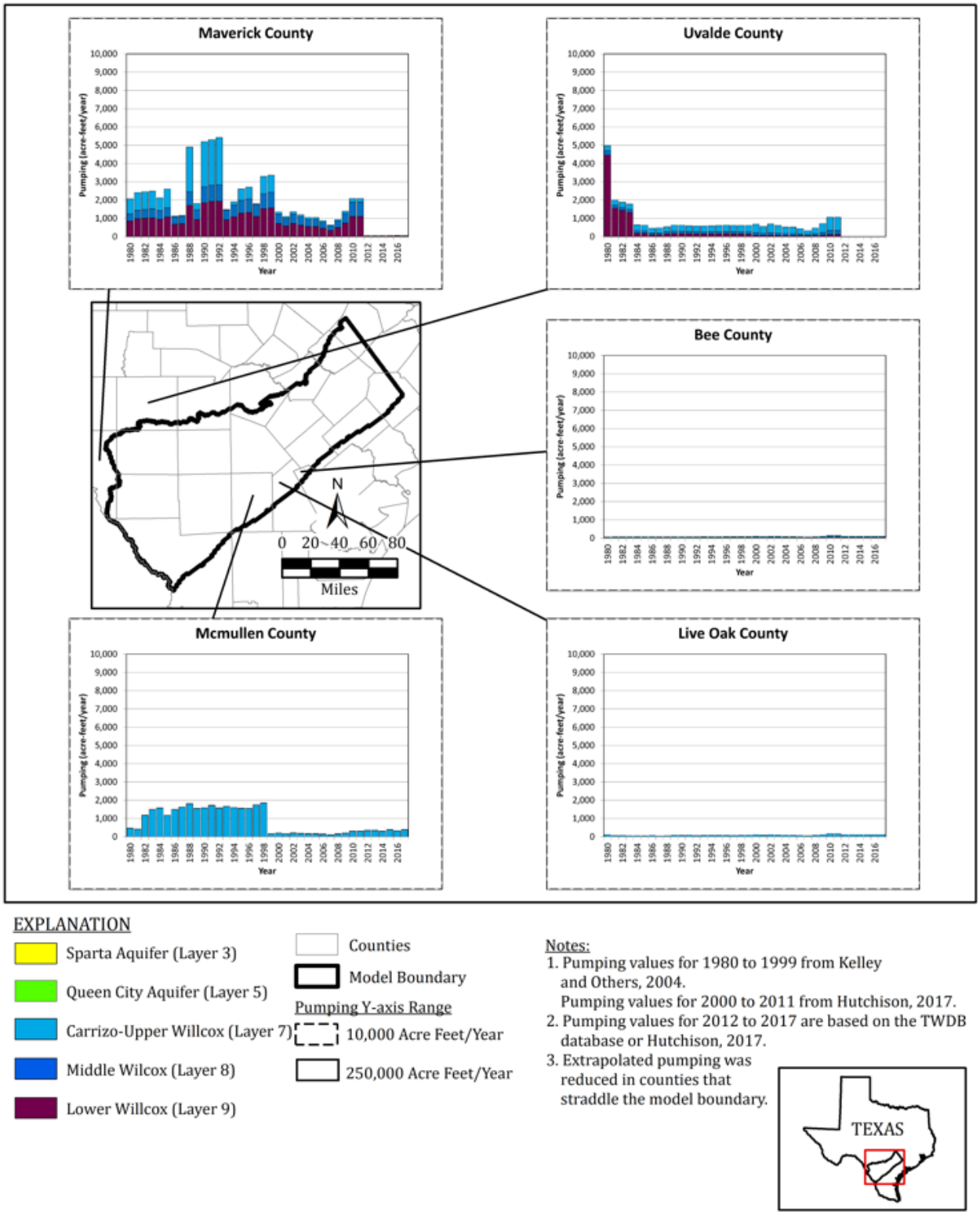


Figure 3-54. Pumping per County Set 3

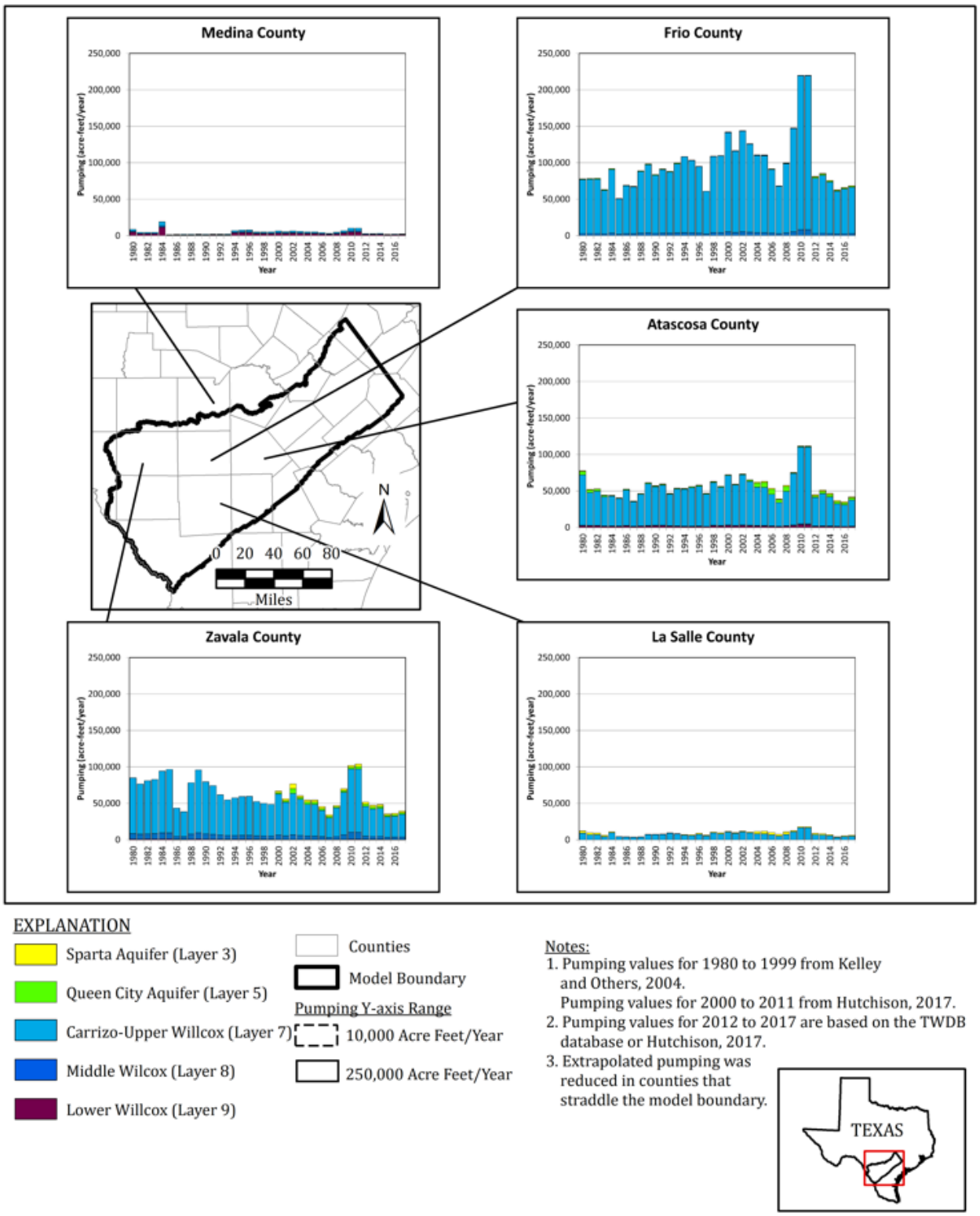
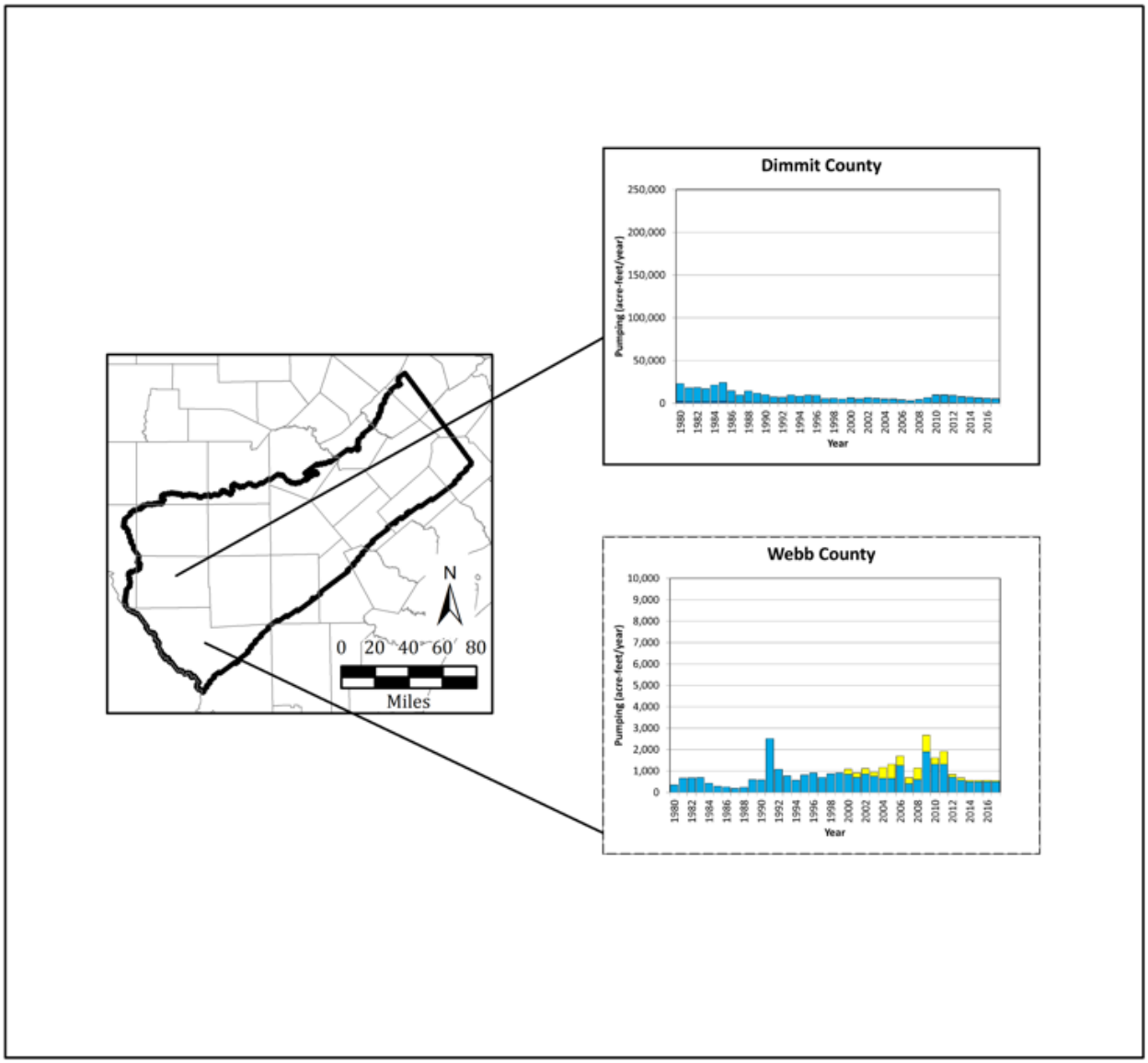


Figure 3-55. Pumping per County Set 4



EXPLANATION

- Sparta Aquifer (Layer 3)
- Queen City Aquifer (Layer 5)
- Carrizo-Upper Willcox (Layer 7)
- Middle Wilcox (Layer 8)
- Lower Willcox (Layer 9)

- Counties
- Model Boundary

Pumping Y-axis Range

- 10,000 Acre Feet/Year
- 250,000 Acre Feet/Year

Notes:
1. Pumping values for 1980 to 1999 from Kelley and Others, 2004.
   Pumping values for 2000 to 2011 from Hutchison, 2017.
2. Pumping values for 2012 to 2017 are based on the TWDB database or Hutchison, 2017.
3. Extrapolated pumping was reduced in counties that straddle the model boundary.

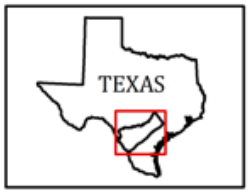


Figure 3-56. Pumping per County Set 5

3.9 General Head Boundary Package

Flow into or out of the model domain from the southern model boundary was simulated using the General Head Boundary (GHB) package, in accordance with the conceptual model shown on Figure 2-82. Figure 3-57 shows the modeled GHB conditions in the model.

The GHB in the Younger Units (model layer 2) represents flow from it into the Sparta Aquifer. The Younger Units are treated as active cells in the numerical model to provide a complete geological model up to the land surface; however, the GHB provided within it acts as a boundary to the Sparta Aquifer below while it disconnects the Quaternary Alluvium above it. Thus, the alluvium, when it lies above the Younger Units, has been made inactive. The Younger Units GHB was adjusted as part of calibration, as described in Section 4.

The lateral GHB condition in the Sparta Aquifer and lower aquifer layers (model layers 3, 5, 7, 8, and 9) along the southern and eastern model boundary allow flow of water into or out of the model domain and the respective aquifers. These GHB conditions account for the southern model boundary not being a natural aquifer boundary. The 2004 groundwater availability model (Kelley and others, 2004) did not use GHB conditions along the southern downdip boundary of the model.

The heads along the GHB boundaries approximate interpolated head contours. GHB heads are constant through the model simulation. Table 3-8 shows the GHB head range and conductance values for each layer.

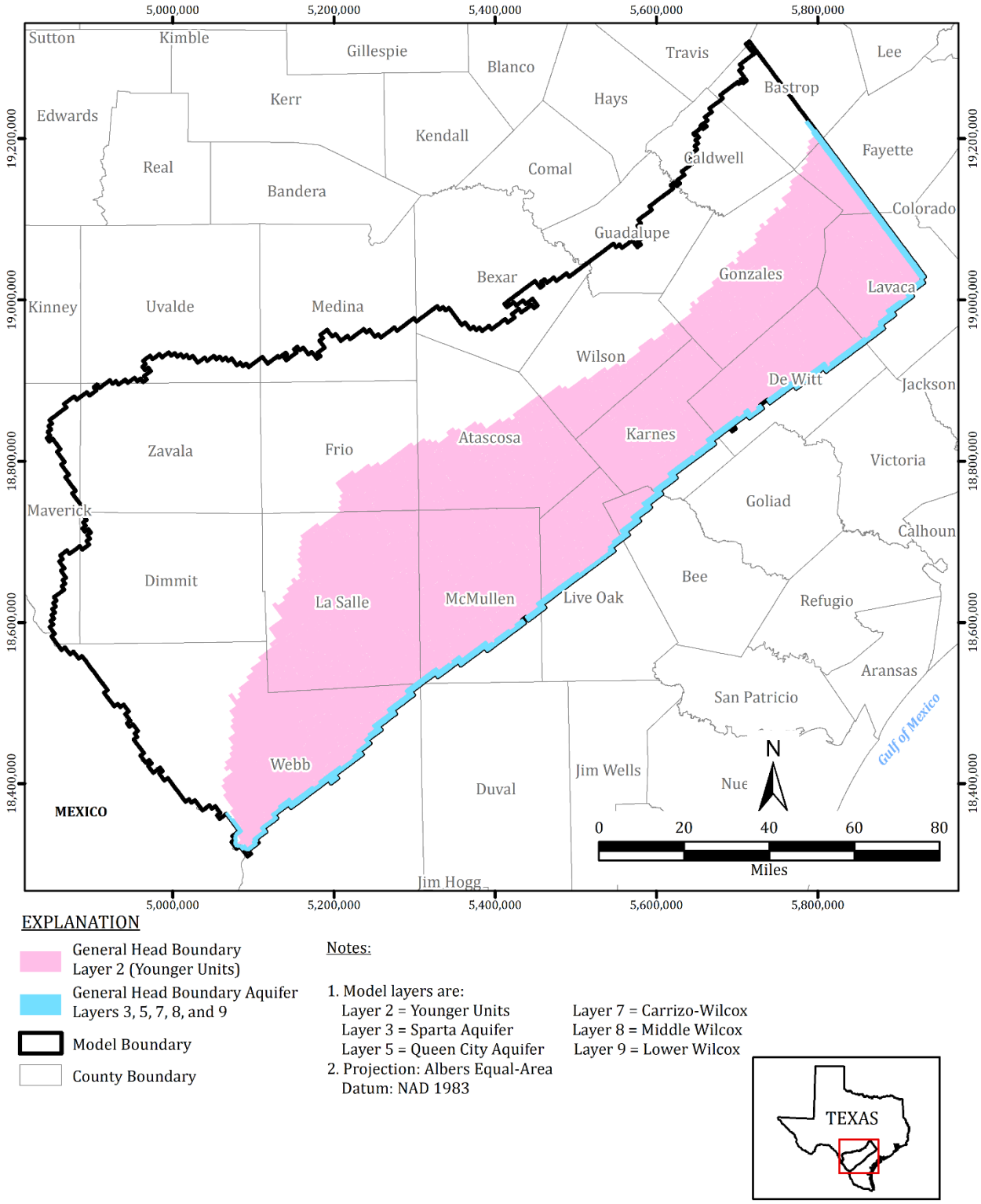


Figure 3-57. Modeled General Head Boundary Conditions

Table 3-8. General Head Boundary Conditions in Model Layers

Layer	Hydrostratigraphic Unit	Number of GHB Cells	GHB Head (feet)	GHB Conductance (feet/day)	Hydraulic Feature
Layer 2	Younger Units	37,954	min = 3.28	min = 2.74	Vertical flow into or out of Sparta Aquifer
			max = 702.90	max = 222.67	
Layer 3	Sparta Aquifer	380	min = 238	min = 0.17	Lateral boundary
			max = 449.8	max = 100	
Layer 5	Queen City Aquifer	279	min = 300.1	min = 2.3	Lateral boundary
			max = 459.4	max = 500	
Layer 7	Carrizo-Upper Wilcox	304	min = 320.1	min = 1.25	Lateral boundary
			max = 457.8	max = 2,430	
Layer 8	Middle Wilcox	354	min = 320.1	min = 2.1	Lateral boundary
			max = 457.8	max = 1,720	
Layer 9	Lower Wilcox	339	min = 320.1	min = 2.1	Lateral boundary
			max = 457.8	max = 5,260	

3.10 River Package

The River (RIV) package of MODFLOW 6 was used to simulate the interaction of groundwater with rivers in the model area. The RIV package simulates flow in or out of the aquifer to surface-water features such as canals, springs, reservoirs, rivers, and streams. Thus, flow within the surface-water features is not simulated but the groundwater-surface water interactions are calculated.

In the model, the RIV package simulates rivers and creeks. However, connection of rivers and creeks with the underlying Younger Units general head boundary condition is not included in the conceptual model. River cells above the Younger Unit GHB condition, are outside of the model domain but were maintained as active to accommodate possible future model expansion. To reflect that these cells are outside the model domain, rivers and creeks within the area of the Younger Units boundary condition were simulated with extremely low conductance values, thereby effectively turning off the river boundary in this area of overlap. Simulated rivers and creeks, and the area of effectively no river boundary, are shown on Figure 3-58.

Springs, or rejected recharge and subsequent runoff, occur in the model area in topographically low areas along river valleys. Springs that contribute to river flows are indirectly simulated using the RIV Package. Those that do not contribute and are isolated have low flows with negligible impact on groundwater and are not directly simulated in this model.

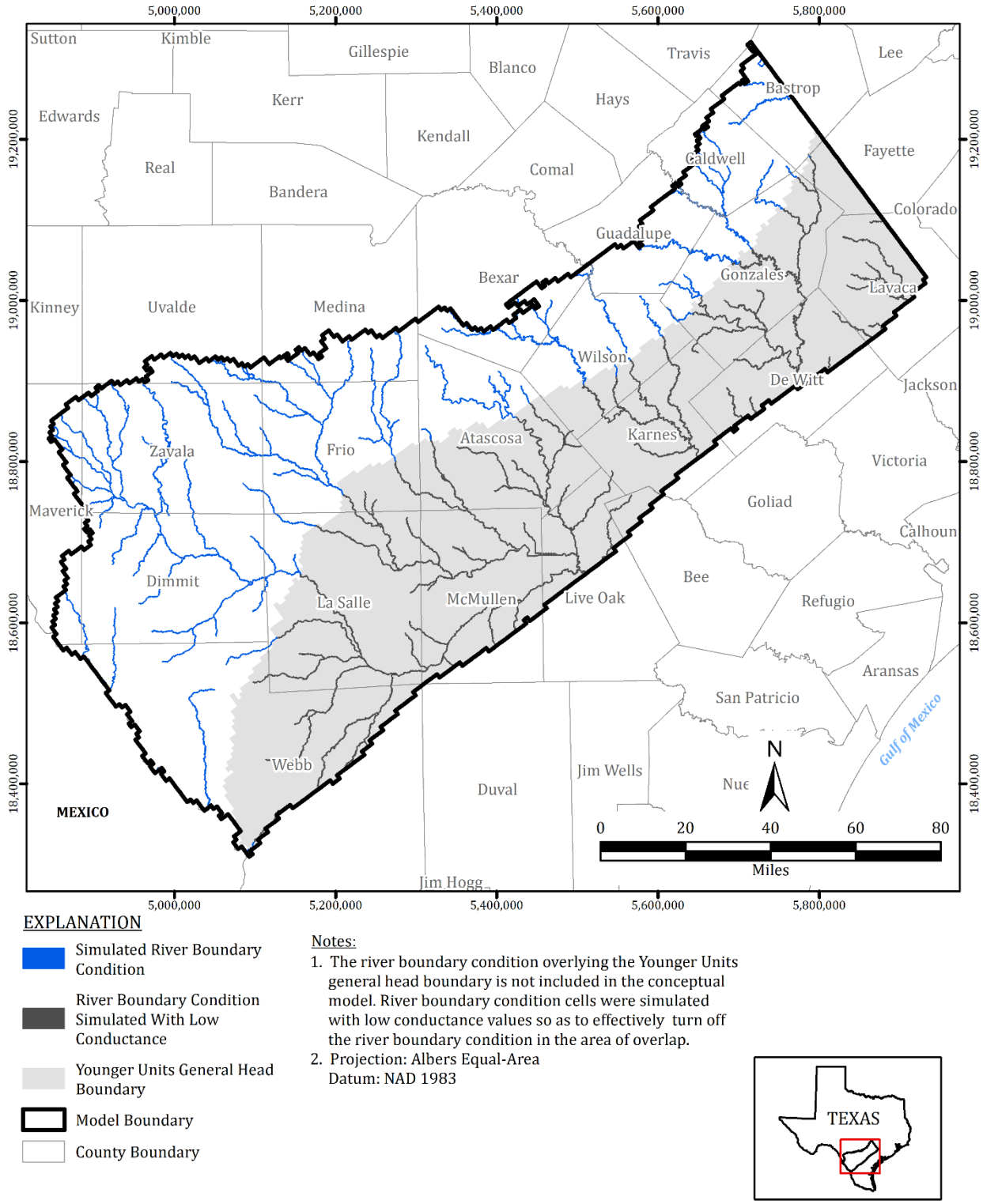
Reservoirs within the model domain are located along rivers and reservoir-groundwater interaction is simulated using the RIV package. Small lakes not connected to the rivers have negligible contribution to groundwater and are not directly simulated in this model.

Other packages are supported by MODFLOW-6 and can be used to simulate streamflow routing between cells representing surface water features in addition to groundwater-surface water exchanges (for example, Stream (STR) and the Stream Flow Routing (SFR) packages). The SFR package, however, does not provide any more accuracy on an annual stress period considering that flow measurements and baseflow computations are also highly approximate. Since the SFR package further slowed down computations, the RIV package was used in the simulations.

Figures 2-37 through 2-43 show the annual stream flows at stream gages located on the major rivers in the model domain, the Rio Grande, Nueces River, Frio River, Atascosa River, San Antonio River, Guadalupe River, and Lavaca River. Rivers generally flow from northwest to southeast. A positive difference between downstream and upstream gages means the river is gaining along the reach, and a negative difference means the river is losing along the reach. The rivers simulated in the model are historically gaining streams.

Figure 3-58 shows the simulated river boundary condition within the model domain. River width, bed thickness, and bed conductivity were taken as 20 feet, 1 foot, and 1 foot per day, respectively, and the river segment length intersecting each groundwater cell was calculated by Groundwater Vistas for computation of the conductance coefficient. The river

stage was estimated from the topography. The riverbed elevation was taken as a foot below the stage and does not vary during the transient simulation. Hydraulic conductivity of the bed material was adjusted as part of calibration, as described in Section 4.



EXPLANATION

- Simulated River Boundary Condition
- River Boundary Condition Simulated With Low Conductance
- Younger Units General Head Boundary
- Model Boundary
- County Boundary

Notes:

1. The river boundary condition overlying the Younger Units general head boundary is not included in the conceptual model. River boundary condition cells were simulated with low conductance values so as to effectively turn off the river boundary condition in the area of overlap.
2. Projection: Albers Equal-Area
   Datum: NAD 1983

Figure 3-58. Simulated River Boundary Conditions

3.11 Recharge Package

The Recharge (RCH) package was used to simulate areal groundwater recharge. Annual average recharge rates were estimated to be up to 0.8 inches per year over the model area with recharge being proportional to the hydraulic conductivity of the outcrop material, as described in Section 2.3.1.

Figure 3-59 shows an average of the 2004 groundwater availability model (Kelley and others, 2004) recharge rate. This rate represents an average estimate of recharge within the domain and across the various aquifers that crop out at the surface. Since recharge is related to hydraulic conductivity of the material, the recharge spatial distribution was noted to be generally similar between years, with locations of higher hydraulic conductivity having higher recharge throughout the simulation period. Therefore, the average 2004 groundwater availability model recharge distribution shown on Figure 3-59 was used as the basis for model recharge and was scaled each year based on yearly precipitation rates compared to the precipitation average over the model period (1980 to 2017).

The recharge scaling factors developed for 1980 through 2017 were used as initial recharge in the model (Table 3-9). Initial recharge scaling factors are also charted on Figure 3-60. The predevelopment period was estimated with a recharge scaling factor of 1. Groundwater Vistas allows import of these as “multiplication factors” applied to the average recharge conditions and this produces the recharge values for the predevelopment period and the years 1980 through 2017 in the model. The recharge values were implemented in MODFLOW 6 via the RCH package, with recharge applied to the topmost active cell as computed by Groundwater Vistas. However, in MODFLOW 6, the FIXED CELL option is selected to ensure that recharge is applied to the appropriate cell in the cell-by-cell flux computations, even if the cell is dry.

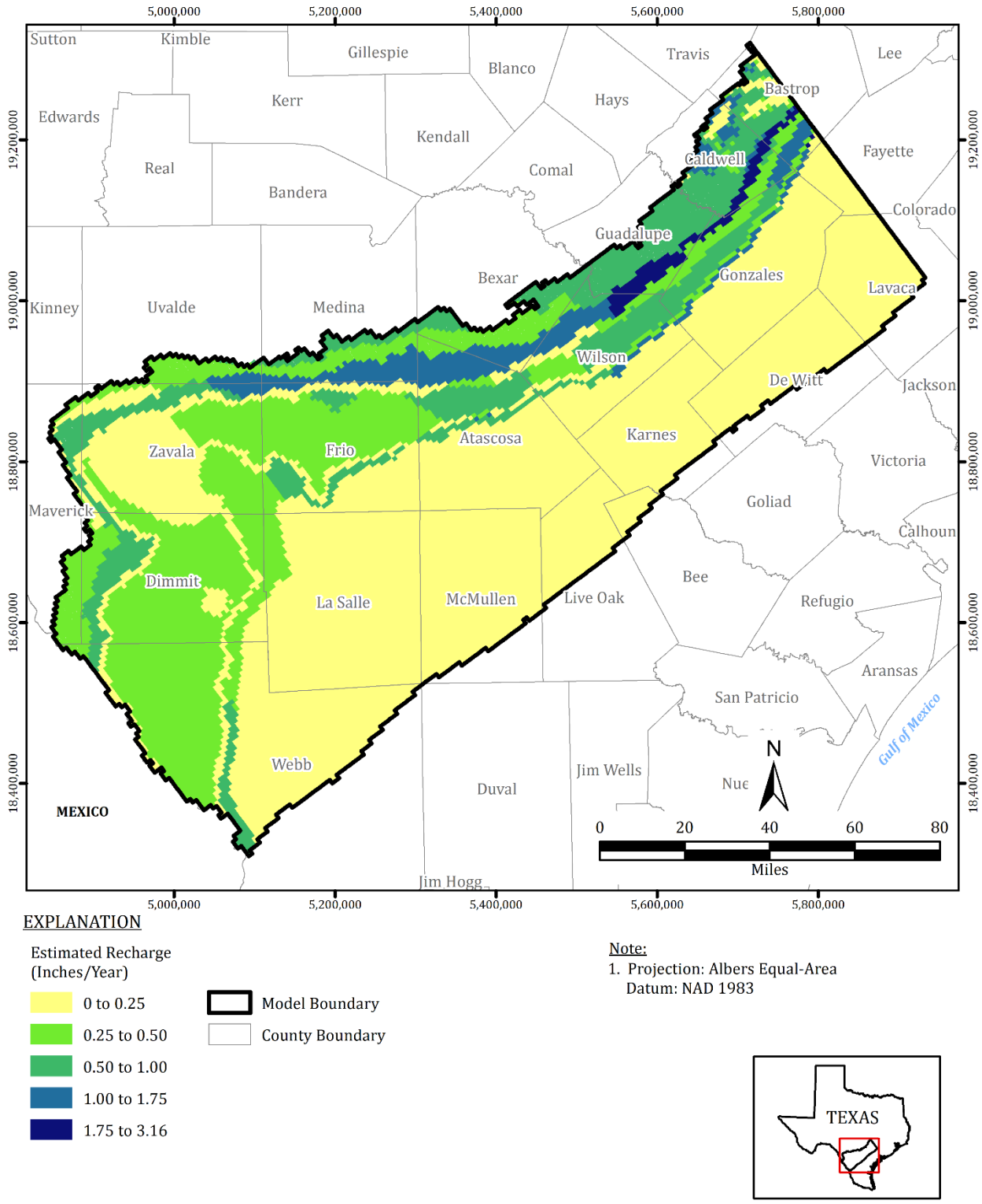
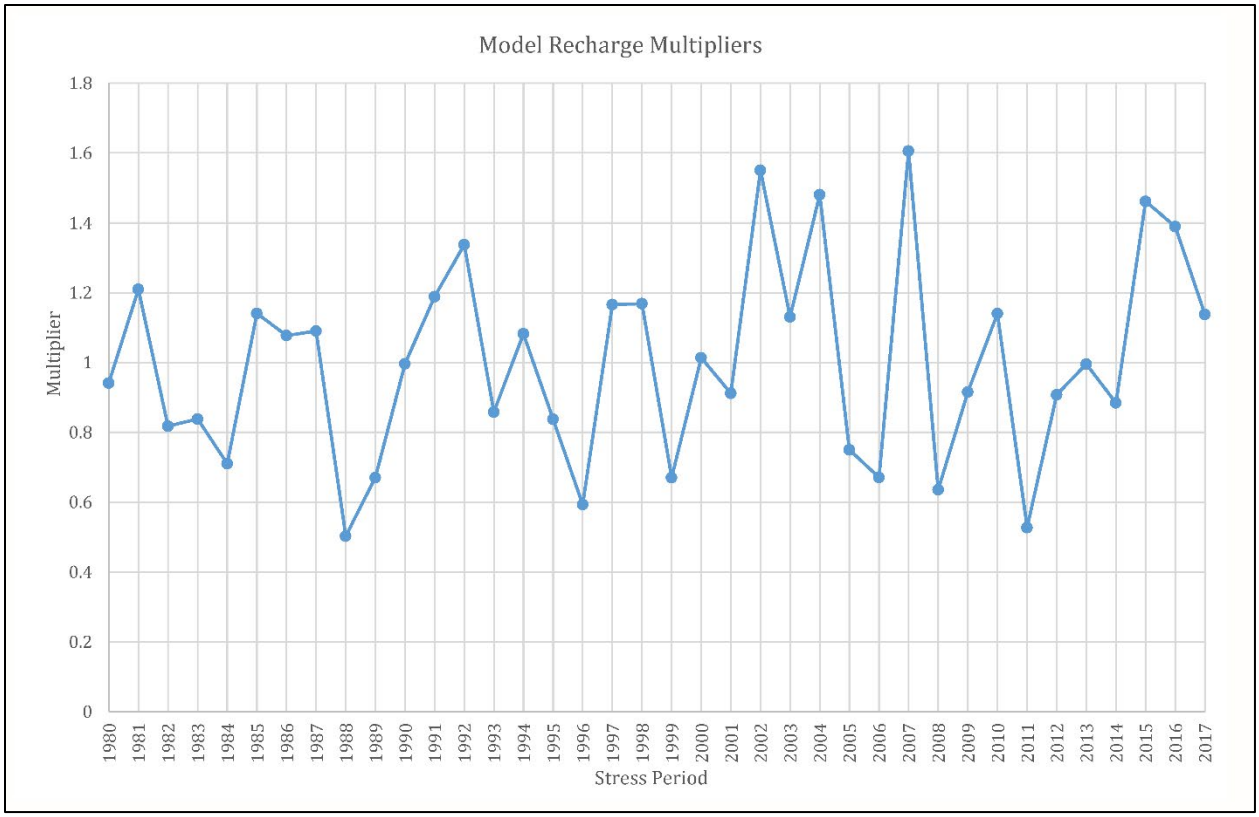


Figure 3-59. Distribution of Average Estimated Annual Recharge Rates from 2004 Groundwater Availability Model

Table 3-9. Recharge Multiplication Factors

Stress Period	Representative Year	Recharge Multiplier
1	Predevelopment	1
2	1980	0.941233
3	1981	1.20989
4	1982	0.817489
5	1983	0.837982
6	1984	0.709876
7	1985	1.140727
8	1986	1.077201
9	1987	1.090083
10	1988	0.50285
11	1989	0.669938
12	1990	0.996226
13	1991	1.188665
14	1992	1.337696
15	1993	0.857914
16	1994	1.082128
17	1995	0.837184
18	1996	0.592762
19	1997	1.165936
20	1998	1.168464
21	1999	0.669863
22	2000	1.013551
23	2001	0.911784
24	2002	1.550166
25	2003	1.130597
26	2004	1.480479
27	2005	0.749747
28	2006	0.670442
29	2007	1.60549
30	2008	0.635113
31	2009	0.915405
32	2010	1.140376
33	2011	0.527319
34	2012	0.907342
35	2013	0.995529
36	2014	0.884123
37	2015	1.461126
38	2016	1.389508
39	2017	1.137795

Note:
Recharge multipliers represent ratio of yearly precipitation to average precipitation over the model period. Recharge multipliers were applied to average recharge from the 2004 groundwater availability model (Kelley and others, 2004).



Notes:
1. Recharge multipliers represent ratio of yearly precipitation to average precipitation over the model period. Recharge multipliers were applied to average recharge from the 2004 groundwater availability model (Kelley and others, 2004).
2. Recharge for the predevelopment period, pre-1980, was simulated with a factor of 1.

Figure 3-60. Model Recharge Multipliers 1980 to 2017

3.12 Evapotranspiration Package

The Evapotranspiration (EVT) package of MODFLOW 6 was used to apply evapotranspiration to the model. The EVT package applies a potential evapotranspiration flux (in units of length per time) to each associated model cell in the domain. The actual evapotranspiration flux depends on a user-defined potential evapotranspiration flux that is applied to each cell when the water table is at or above the "evapotranspiration surface" of that cell (taken equal to the land surface elevation). The actual potential evapotranspiration flux declines linearly to zero as the water table depth drops down to an "extinction depth". Estimation of extinction depth in the 2004 groundwater availability model (Kelley and others, 2004) ranged from less than 1 foot to 7.2 feet (Section 2.7.3). The distribution of maximum evapotranspiration rates in the model is shown on Figure 3-61. Evapotranspiration was applied to the topmost active cell as computed by Groundwater Vistas. However, in MODFLOW 6, the FIXED CELL option is selected to ensure that evapotranspiration is applied to the appropriate cell in the cell-by-cell flux computations, even if the cell is dry.

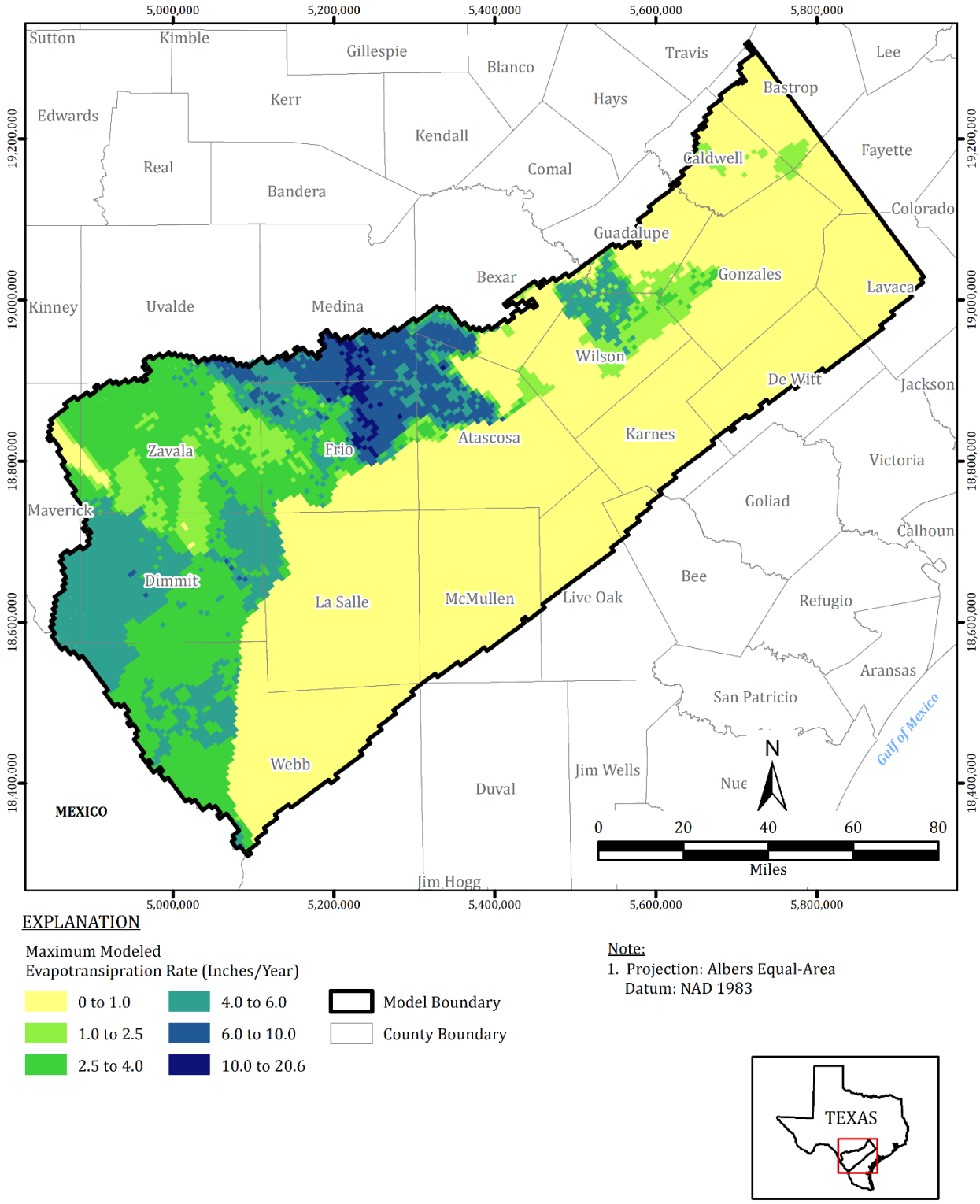


Figure 3-61. Distribution of Modeled Maximum Evapotranspiration Rates

3.13 Output Control Package

The Output Control (OC) package of MODFLOW 6 controls how water levels, fluxes, and water budget information are saved during a simulation. The Output Control file was set up to save these results at the end of each stress period. Thus, output was provided for the predevelopment steady-state, the steady-state 1980 stress-period, and at the end of each year of the 1980 to 2017 transient simulation period.

3.14 Iterative Matrix Solver Package

The Iterative Matrix Solver (IMS) package of MODFLOW 6 sets up the solution methodologies and linear solver selection for a simulation.

Nonlinear iterations using the Newton-Raphson linearization scheme were controlled using residual reduction and under-relaxation. The under-relaxation parameters that are a default for MODFLOW 6 (the default parameters in Groundwater Vistas interface reflect these parameter values) are not very sensitive and were not changed for the simulations. The residual reduction parameters are generally tightened when nonlinear convergence is difficult.

Difficulties were encountered but are relaxed when convergence eases. Specifically, the residual change tolerance term (BACKTRACKING_TOLERANCE) was varied between 10,000 and 1.1 at various stages of simulation. The final optimal value selected was 1.1.

The BiCGSTAB scheme was selected to solve the asymmetric system of linear equations. Linear solver parameters that were significant to the simulation included the matrix ordering scheme (REORDERING_METHOD), the level of fill (PRECONDITIONER_LEVELS), and number of orthogonal directions (NUMBER_ORTHOGONALIZATIONS). These parameters were varied depending on convergence behavior during calibration. Final calibrated simulation values were: PRECONDITIONER_LEVELS = 3; the RCM Ordering scheme; and NUMBER_ORTHOGONALIZATIONS = 14. The “drop tolerance” scheme was used with a drop-tolerance factor (PRECONDITIONER_DROP_TOLERANCE) equal to 1.0×10^{-3}.

Solver parameters were tuned throughout model development and calibration. This was done to make sure that the simulations progressed as quickly as possible at each stage of the project.

4 Model Calibration

The model was constructed as discussed above in Section 3. At the beginning of the calibration process, the model contained initial estimates for hydraulic conductivity, recharge rates, pumping, specific storage, specific yield, and general head boundary conditions, as outlined in the conceptual model. Calibration targets for water levels and streamflow differences between gages were also compiled to evaluate goodness of fit of the model with field datasets. Preliminary simulations confirmed the model was appropriately assembled and showed the model could be executed successfully. Solver parameters were adjusted for robustness and efficiency and were tuned throughout the calibration process.

Preliminary calibration simulations were also conducted to evaluate the hydrogeologic datasets being used for calibration and to evaluate model behavior and sensitivity. These simulations helped to understand the data in a hydrogeologic framework using the model, by evaluating the water level targets and noting how changes in stresses (pumping and recharge) impact changes in the strains (water levels and baseflows). Significant factors that were noted from initial model calibration efforts include:

<u>Pumping data errors and uncertainty:</u>

Early calibration simulations indicated that the largest errors occurred in the downdip areas of the Carrizo–Upper Wilcox layer (model layer 7) in La Salle, Dimmitt, Zavala, and Frio Counties. Further examination of the pumping and water level data in the region indicated that there was a discrepancy between pumping and water levels in the area. Specifically, during the 1980s, water levels in these counties were at 200 to 400 feet above mean sea level and remained so through the early 2000s with slow and steady declines (Figure 2-30). However, between about 2007 and 2012, the water levels began declining rapidly, being below 100 feet mean sea level in these counties with many wells having water levels below 0 feet mean sea level. However, an examination of pumping data in these counties (Figure 3-55) indicated that pumping in the early 1980s was about the same (or slightly higher than) as pumping since 2012. The largest pumping in the model domain occurs in these counties, specifically in model layer 7 (the Carrizo-Upper Wilcox unit) throughout the simulation period. Therefore, it was noted that the pumping rates through time would need to be adjusted as part of the calibration process.

<u>Water level target errors and uncertainty</u>:

There are a total of 2,024 monitoring wells within the model domain that had groundwater measurements between 1980 and 2017. Of these, 1,433 wells have only 1 datapoint. Several of these wells do not indicate an aquifer type or have a multiple aquifer type designation. Early calibration simulations indicated inconsistency within the dataset including large water level differences between nearby wells, water levels below the simulated aquifer unit bottom, and wells better matching results from aquifer units other than originally designated. Therefore, further evaluation and quality control of the water level data was conducted as part of the calibration process.

Sand fraction distributions:

Use of sand fraction distributions for calibration of modeled horizontal and vertical hydraulic conductivities turned out to be limiting. Further analyses were conducted on the limitations of using sand fractions and a more flexible parameterizing approach was used to calibrate the model.

Bed elevations and water levels of River Boundary Condition Package (RIV) boundaries:

The modeled river boundary conditions used bed elevations derived from the available digital elevation models with assumed river water levels being 1 foot above the bed. This has significant control on the surface-water to groundwater interactions and resulted in highly variable baseflow fluctuations through space along the river length. Therefore, these were also evaluated for calibration along with the RIV leakance term when evaluating baseflow. It is again noted that the model computes baseflow, while observed differences between upstream and downstream gages include effects of diversions and tributaries, and other riparian processes in between.

During model calibration, the hydraulic conductivity values for the aquifers and aquitards (layers 1 and layers 3 through 9) as well as the General Head Boundary Package (GHB) conductances of layers 2, 3, 5, and 7 through 9 were adjusted within reasonable parameter value bounds to provide appropriate water level and flow conditions in the model domain; the layer 7 (Carrizo-Upper Wilcox) pumping rates in LaSalle, Dimmit, Zavala, and Frio Counties were adjusted within reasonable ranges through time to provide appropriate changes in water levels; and the specific storage and specific yield values of the units were adjusted within reasonable parameter value bounds to provide appropriate magnitude of fluctuations of water levels. RIV boundary parameters were also adjusted to provide appropriate ranges for surface-water to groundwater interactions.

The model was calibrated using an interactive expert approach (manual calibration evaluations) in conjunction with automatic model calibration using the parameter estimation code PEST (Doherty, 2010). Consistency with the conceptual model was also evaluated and adjustments were made to model aquifer parameters or conceptual elements until the model was considered calibrated. The Hydraulic Flow Barrier Package (HFBs) along faults in the region was also evaluated as barriers to flow, with HFB conductance being a calibration parameter. It was noted that HFBs may cause a partial barrier to flow but may not explain the general water level responses simulated at the annual time scale. Transient changes in water levels could be simulated just as well without a resistance across the faults.

The model calibration procedure and results are described in sections below and in calibration figures and tables included in this report. Appendices provide detailed modeling results. Appendix F contains the calibrated groundwater model pumping by county, layer, and year, and pumping charts by county. Appendix G contains the calibration target list with metadata. Appendix H contains the calibration target list showing calibration residuals. Appendix I contains water level hydrographs for all model

groundwater targets. Appendix J presents detailed water budgets for Texas Groundwater Conservation Districts or Texas counties in the model domain.

4.1 Calibration Procedures

This section discusses the methods used to calibrate the model and the calibration parameters which include pumping, RIV boundary condition, GHB boundary condition, and aquifer parameters. Measured groundwater level elevations and estimated baseflows were used to constrain the simulation results and make calibration parameter adjustments.

The model was run for 39 stress periods. The first stress period was run as a steady-state condition for predevelopment conditions (no pumping). The second stress period was also run as a steady-state condition for 1980 estimates of recharge and pumping. It is recognized that the aquifer is not at steady-state conditions in 1980; however, this approach provides a numerically consistent starting condition for the transient stress periods that follow. The values of annual average pumping and recharge for 1980 conditions may be treated as surrogates that include the transient storage processes that may be occurring through the year.

4.1.1 Calibration of Pumping

Pumping rates for each stress period were based on annual TWDB water use surveys for the years 1980 through 2017 for counties in Texas within the study area (TWDB, 2020c). Data were not available for the period of 1981 through 1983 and were derived by linear interpolation of the available water use estimates. The estimates of pumping are prone to errors and uncertainties as was noted earlier.

The modeled input pumping rates and modeled simulated rates from 1980 through 2017 are summarized in Table 4-1. The simulated rates are shown on Figure 4-1 along with the original conceptual estimates using TWDB water use surveys. It is noted that the model input pumping values corresponded to the conceptual pumping except in the Middle and Lower Wilcox Aquifers; in the Middle Wilcox, a significant percentage of pumping, 187,838 acre-feet, was initially assigned to areas of the aquifer which are thin and subsequently pinched out in the numerical model – as a result, this pumping was removed from the Middle Wilcox and added to the Lower Wilcox. Table 4-1 shows how the input pumping values for the Middle and Lower Wilcox differ from the conceptual pumping values.

Compared to the conceptual and input pumping, the calibrated model has slightly less simulated pumping per layer than the input values. Simulated discrepancies with the input values are due to the autoflow reduce option that occurs as part of the simulation discussed in Section 3.8 and due to a small amount of pumping within layers 3, 5, and 9 occurring within pinch out areas. Simulated discrepancies with the conceptual values are due to the Middle Wilcox pumping adjustment, described above, and manual adjustment to pumping within the Carrizo-Upper Wilcox (layer 7), described below. However, Figure 4-1 shows that the simulated model-wide pumping remains similar to the conceptual pumping.

Discrepancies between pumping and water levels were noted mainly in downdip areas in the Carrizo-Upper Wilcox model layer in the four-corner area defined by the intersection of Zavala, Frio, La Salle, and Dimmit Counties during preliminary calibration simulations. Specifically, water levels in the area declined sharply (by 150 to 250 feet) after about 2007 to 2012 and continued to decline through 2017; however, the pumping rates were about the same or even slightly lower in these later years. The water level data are generally considered to be more accurate than the pumping information; therefore, the pumping rates were also treated as calibration parameters in the model. This was implemented on a county-by-county basis, with scaling factors applied to the pumping estimates of each year to account for the temporal variations in the errors.

PEST simulations were set up to evaluate these scaling factors for pumping through time. These simulations were not successful, and PEST could not capture the pumping stresses required to provide the appropriate water level changes. This approach was successful to some extent in previous applications (Hutchison, 2017) because water level changes were not as significant in the model extension period (2000 through 2011) of that study and because the previous model storage term was unreasonably large causing a very different flow regime. It is noted that the large storage term of the previous model caused unreasonable future conditions with storage dominating the water level impacts for decades.

Manual adjustments were made to the pumping regime to better accommodate the water level signature. Specifically, the final adjustments included changing pumping in the Carrizo–Upper Wilcox (model layer 7) in Zavala, Frio, La Salle, and Dimmit Counties. In these counties, the pumping rates were reduced by 50 percent for the 1980 through 1990 period and increased by 50 percent for 2007 through 2009, not scaled in years 2010 and 2011, and then increased by 50 percent for the 2012 through 2017 period. Adjustments during calibration were driven by observation wells in downdip areas of layer 7 (confined wells) as these were sensitive to pumping values. Ultimately, however, regions of the Carrizo-Upper Wilcox aquifer that exhibit the largest drawdown do not have pumping such that scaling of a pumping value can only have limited impact from locations further away. Better local pumping data in these regions would help improve model calibration and reliability.

The calibrated pumping per county showing a tabulation of pumping by model layer is presented in Appendix F.

Table 4-1. Estimated and Simulated Model-Wide Pumping from 1980 to 2017

Hydrostratigraphic Unit	Model Layer	Conceptual Model Pumping		Model Input Pumping		Model Simulated Pumping	
		Total Pumping (acre-feet)	Pumping Rate (acre-feet per year)	Total Pumping (acre-feet)	Pumping Rate (acre-feet per year)	Total Pumping (acre-feet)	Pumping Rate (acre-feet per year)
Quaternary Alluvium	1	0	0	0	0	0	0
Younger Units	2	0	0	0	0	0	0
Sparta Aquifer	3	198,572	5,226	198,572	5,226	189,150	4,978
Weches Aquitard	4	0	0	0	0	0	0
Queen City Aquifer	5	213,960	5,631	213,960	5,631	202,957	5,341
Reklaw Aquitard	6	0	0	0	0	0	0
Carrizo-Upper Wilcox	7	9,480,737	249,493	9,480,737	249,493	8,938,876	235,234
Middle Wilcox	8	910,160	23,952	722,322	19,008	678,185	17,847
Lower Wilcox	9	652,431	17,169	840,269	22,112	786,035	20,685
Total Model Pumping		11,455,860	301,470	11,455,860	301,470	10,795,203	284,084

Notes:
1. Conceptual model pumping is described in Section 3.0 and in Table 3-6.
2. As discussed, the input pumping for the Middle Wilcox was adjusted for pumping assigned to areas of the aquifer that are thin and pinched out (inactive) in the numerical model. This pumping, totaling 187,838 acre-feet, was added to the Lower Wilcox Aquifer.

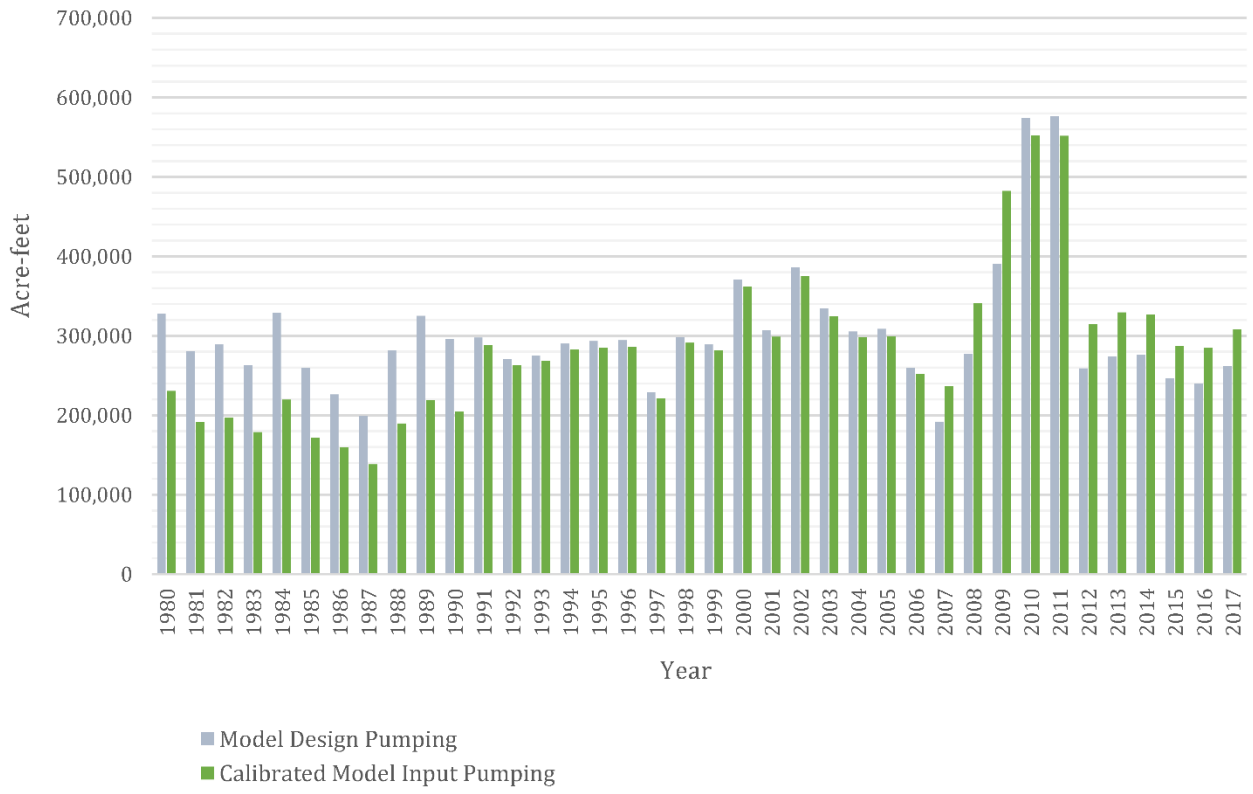


Figure 4-1. Model Design and Calibrated Model Input Pumping from 1980 to 2017

4.1.2 Calibration of Aquifer Parameters

There was a significant amount of information in the TWDB Brackish Resources Aquifer Characterization System Database including lithologic interpretations from Kelley and others (2004), Wise (2014), Hamlin and others (2019), and Meyer and others (2020), which was used to delineate sand thicknesses and sand percentages (or fractions). This information was used during preliminary model calibration as conceptualized in Section 3.5 in the Node Property Flow (NPF) Package discussion. This approach was used in the Groundwater Management Area 11 model (Panday and others, 2020) calibration process. The sand fractions were also used in the Southern Carrizo-Wilcox Aquifer model (Deeds and others, 2003), and the Queen City and Sparta Aquifer model (Kelley and others, 2004).

Simulations using this approach caused issues with the range of hydraulic conductivities that may exist horizontally and vertically within the Groundwater Management Area 13 aquifer system. This is because the sand fractions did not span a sufficient range to give a sufficiently wide range of hydraulic conductivity values in any aquifer or aquitard unit, while actual hydraulic conductivities could vary by orders of magnitude within the same aquifer on the regional scale. Table 4-2 shows the sand fraction distributions for the nine numerical model layers, showing the 10th percentile and 90th percentile values for the sand fraction of each layer. The 10th and 90th percentiles are the same for layers 1 and 2 because they are simulated with a uniform sand distribution. The hydraulic conductivity distribution in the various layers is also shown on the table, for typical values that were generated in the preliminary calibration efforts. The minimum to maximum ratio for simulated horizontal hydraulic conductivity is less than 5 in layers 7, 8, and 9. This is a very mild heterogeneity considering that data show ranges of heterogeneity of 1,000 or more. The minimum to maximum ratio for simulated vertical hydraulic conductivity is less than 3 in all model units. This is not sufficiently heterogeneous for a regional model to provide the variations in leakances that may be occurring between the modeled aquifers.

A pilot point approach was then implemented to calibrate the model. The parameter estimation software PEST was used to calibrate the hydraulic conductivity values for the model. Horizontal and vertical hydraulic conductivity pilot points were initially assigned their locations in a spatially even pattern using Groundwater Vistas' quick pilot point tool. Pilot point minimum and maximum values, as well as their initial values, were assigned to maintain consistency with respective aquifer and aquitard data that are presented as part of the conceptual groundwater model. Greater pilot point density was assigned in layers 5 through 9 since the aquifers in these units contain the majority of the groundwater elevation targets and the parameterization of the intervening aquitard (layer 6) was found to be important to calibration. Pilot points were used in Layer 1 and Layers 3 through 9. After the first complete PEST simulation, the calibration was reviewed, and pilot points were manually relocated to achieve greater density in areas where calibration proved more difficult. This process was iterative until the final calibration was achieved.

The resulting calibrated model hydraulic conductivities are shown on Table 4-3. Model layer 2 was treated with uniform hydraulic conductivity values. Model layer 2 represents Younger Units where a GHB condition is applied to represent associated water levels.

Table 4-2. Ranges of Hydraulic Conductivity Values for Given Sand Fraction Value Ranges

Model Layer	Hydro-stratigraphic Unit	Sand Fraction (Percent)		Hydraulic Conductivity (feet per day)		Resulting Horizontal Hydraulic Conductivity (feet per day)		Resulting Vertical Hydraulic Conductivity (feet per day)		Horizontal Hydraulic Conductivity - Ratio of Maximum to Minimum	Vertical Hydraulic Conductivity - Ratio of Maximum to Minimum
		10th Percentile	90th Percentile	Sand	Clay	Minimum	Maximum	Minimum	Maximum		
1	Quaternary Alluvium	0.7	0.7	200	0.2	140.1	140.1	0.7	0.7	1	1
2	Younger Units	0.1	0.1	1	0.04	0.1	0.1	0.05	0.05	1	1
3	Sparta Aquifer	0.01	0.5	40	8.0E-04	0.4	21.8	8.1E-04	1.8E-03	54.4	2.2
4	Weches Formation	0	0.3	3.2	6.9E-04	6.9E-04	1.1	6.9E-04	1.0E-03	1,528.6	1.5
5	Queen City Aquifer	0.01	0.5	300	3.0E-07	3.0	151.0	3.0E-07	6.0E-07	50.3	2.0
6	Reklaw Formation	0.01	0.4	0.19	0.0045	6.4E-03	0.07	4.5E-03	7.0E-03	11.3	1.5
7	Carrizo-Upper Wilcox	0.4	0.8	100	0.001	35.9	75.8	1.6E-03	4.1E-03	2.1	2.6
8	Middle Wilcox	0.1	0.4	5	0.1	0.5	2.1	0.1	0.1	4.3	1.6
9	Lower Wilcox	0.0	0.6	7.7	0.9	1.1	5.1	0.9	1.9	4.8	2.2

Note:
Sand fractions discussed in Section 2.0.

Table 4-3. Calibrated Hydraulic Conductivity for Modeled Geologic Units

Model Layer	Hydrostratigraphic Unit	Calibrated Model Hydraulic Conductivity (feet per day)						Conceptual Model Estimated Hydraulic Conductivity (feet per day)	
		Horizontal			Vertical			Range	Geometric Mean
1	Quaternary Alluvium	0.74	to	115.5	3.90E-03	to	88.2	none	none
2	Younger Units	1.0E-07			0.045			none	none
3	Sparta Aquifer	0.10	to	4.56	1.7E-03	to	0.16	20 to 100	45.6
4	Weches Formation	3.9E-03	to	6.02E-02	4.0E-06	to	1.3E-02	none	none
5	Queen City Aquifer	0.12	to	1,139	5.4E-02	to	1,014	0.01 to 750	31.5
6	Reklaw Formation	2.5E-05	to	0.71	4.5E-10	to	0.11	0.01 to 575	18.5
7	Carrizo-Upper Wilcox	9.8E-02	to	1,064	2.0E-06	to	699	0.06 to 975	32.3
8	Middle Wilcox	9.5E-02	to	606	2.3E-05	to	1.51	0.08 to 487	8.4
9	Lower Wilcox	8.9E-02	to	570	2.4E-03	to	86.5	0.08 to 332	5.0

Note:
Conceptual model estimated hydraulic conductivity described in Section 2.0.

The horizontal and vertical hydraulic conductivity of model layer 2 were 1 x 10^{-7} foot per day and 0.045 feet per day, respectively, for the Younger Units. Since the entire surface of the Younger Units was a GHB condition, the GHB conductances, in combination with the vertical conductivity of layer 2, transmit flow between the GHB heads of the Younger Units and the underlying Sparta Aquifer. The low value of horizontal hydraulic conductivity is to prevent the GHB impact at a node from applying horizontally to adjacent nodes.

The remaining model layers were treated as heterogeneous. Figures 4-2 through 4-9 show the locations of horizontal hydraulic conductivity pilot points and the calibrated horizontal hydraulic conductivity field for model layers 1, and layers 3 through 9. There are no conceptual estimates for hydraulic conductivity within the alluvium; model layer 1 was simulated with a calibrated horizontal hydraulic conductivity ranging from 0.74 to 115.5 feet per day.

The calibrated horizontal hydraulic conductivity of the Sparta Aquifer, layer 3, ranges from 0.10 to 4.56 feet per day. The conceptual model indicates a higher range; however, there are only two data points that could be estimating local conditions and are likely not representative of the aquifer. Nevertheless, the low calibrated hydraulic conductivity values across the Sparta Aquifer warrant additional study. The calibrated horizontal hydraulic conductivity of the Queen City Aquifer, layer 5, ranges from 0.12 to 1,139 feet per day, approximating the range of conceptual estimates.

The calibrated horizontal hydraulic conductivity of the Carrizo-Upper Wilcox, layer 7, ranges from 9.8 x 10^{-2} to 1,064 feet per day. The minimum simulated horizontal hydraulic conductivity values are similar to the lowest conceptual estimates. The highest simulated horizontal hydraulic conductivity values in layer 7 in La Salle County (Figure 4-7) is slightly higher than the conceptual estimate. Pumping in central La Salle County in layer 7 is small and consistent throughout the simulation period (Figures 3-49 and 3-55) yet drawdowns are significant (Figure 2-31), especially after 2010. The high conductivity in layer 7 in this area may be a result of connecting the more distant pumping increases between 2007 and 2012 in Northern La Salle and Frio Countries to these drawdown locations.

The calibrated horizontal hydraulic conductivity of the Middle Wilcox, layer 8, ranges from 9.5 x 10^{-2} to 606 feet per day. The calibrated horizontal hydraulic conductivity of the Lower Wilcox, layer 9, ranges from 8.9 x 10^{-2} to 570 feet per day. The minimum and maximum simulated horizontal hydraulic conductivity values for layers 8 and 9 are similar to the lowest conceptual estimates. The maximum values are slightly higher than indicated along the northern edges of the Middle and Lower Wilcox Aquifers in Zavala and Bexar Counties, where pumping is fairly high and the units pinch out.

Figures 4-10 through 4-17 show the locations of vertical hydraulic conductivity pilot points and the calibrated vertical hydraulic conductivity field for model layer 1, and model layers 3 through 9. The calibrated vertical hydraulic conductivity of the Quaternary Alluvium, layer 1, ranges from 3.9 x 10^{-3} to 88.2 feet per day. The calibrated vertical hydraulic conductivity of the Sparta Aquifer, layer 3, ranges from 1.7 x 10^{-3} to 0.16 feet per day.

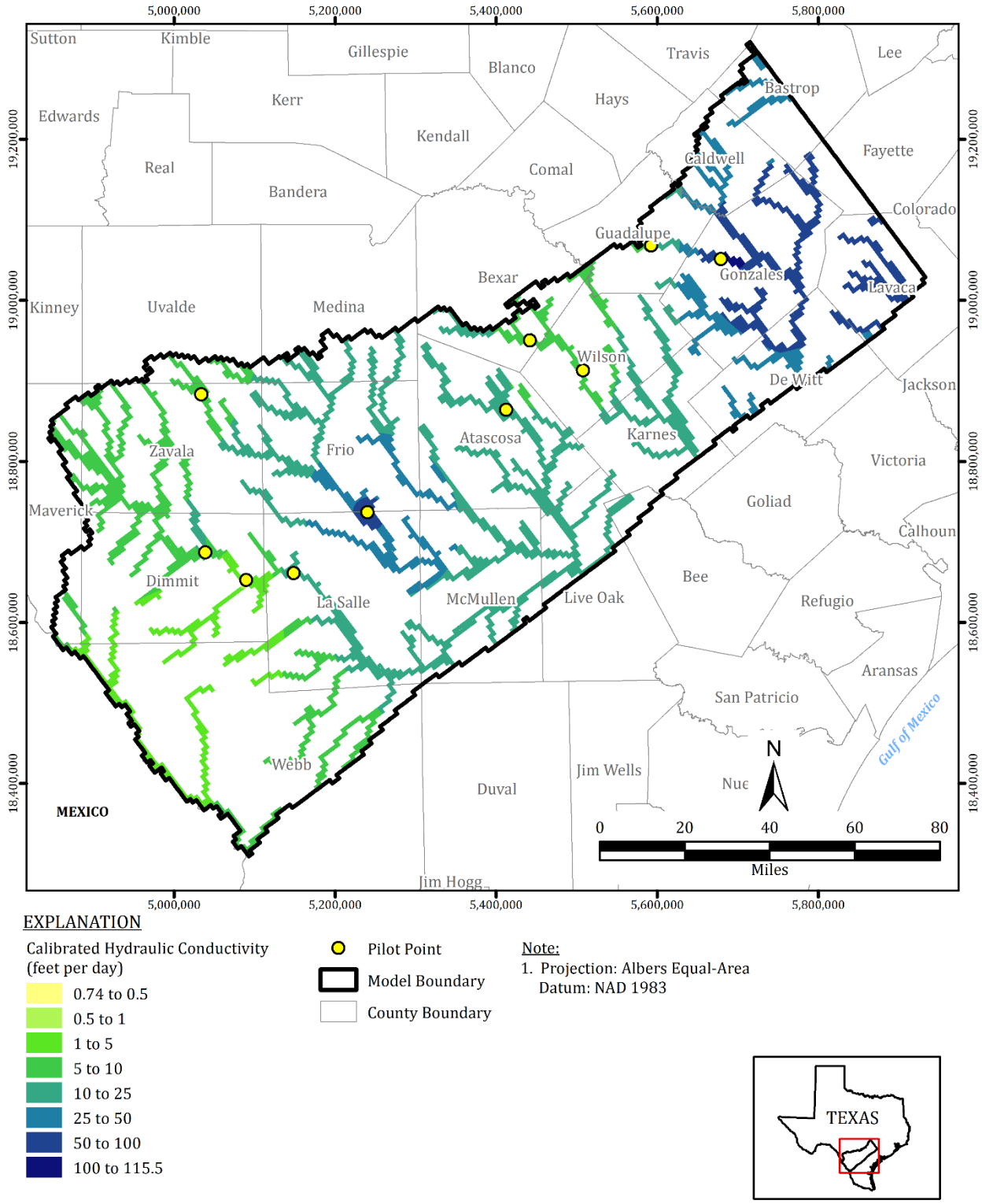


Figure 4-2. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Quaternary Alluvium (Model Layer 1)

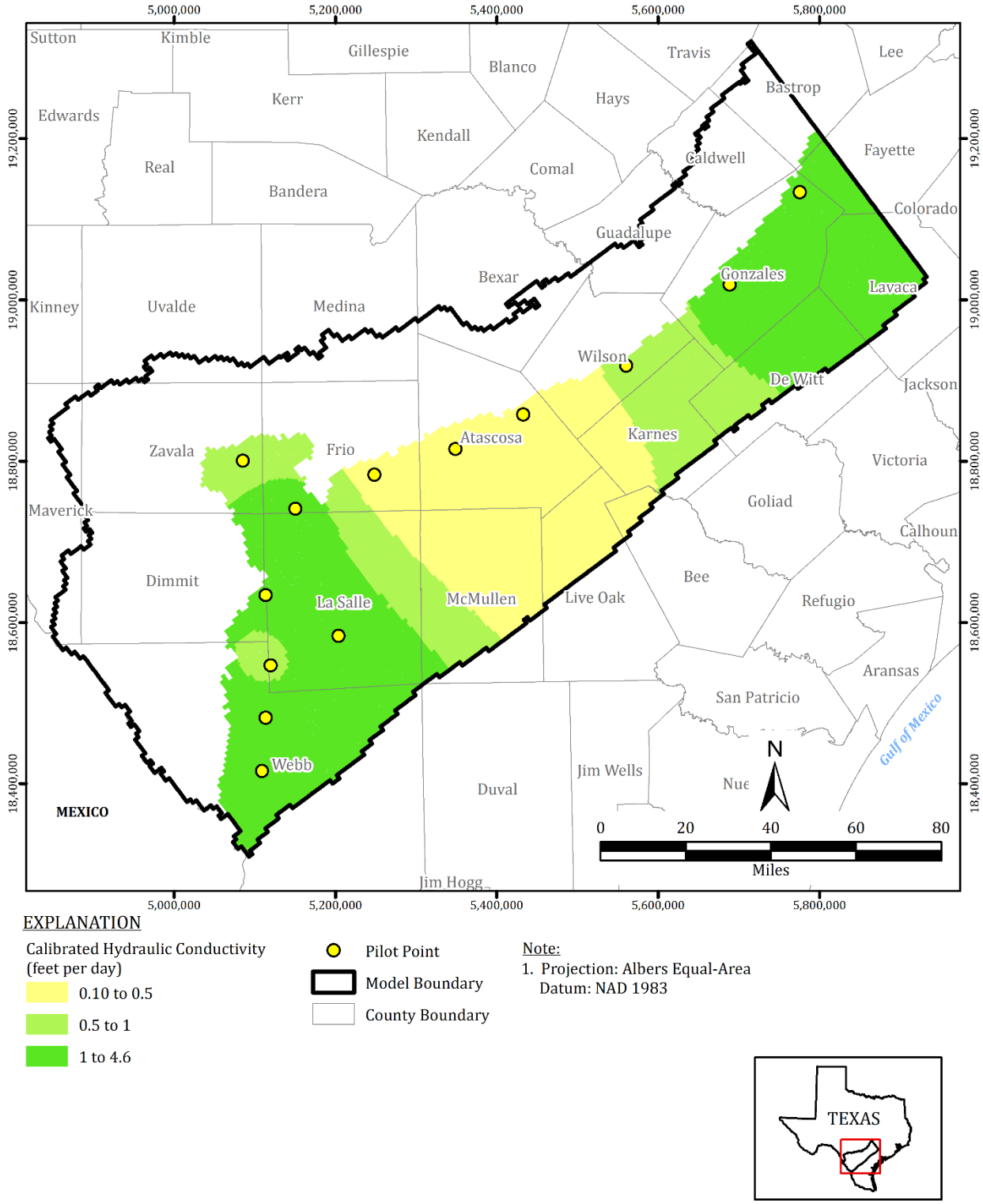


Figure 4-3. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Sparta Aquifer (Model Layer 3)

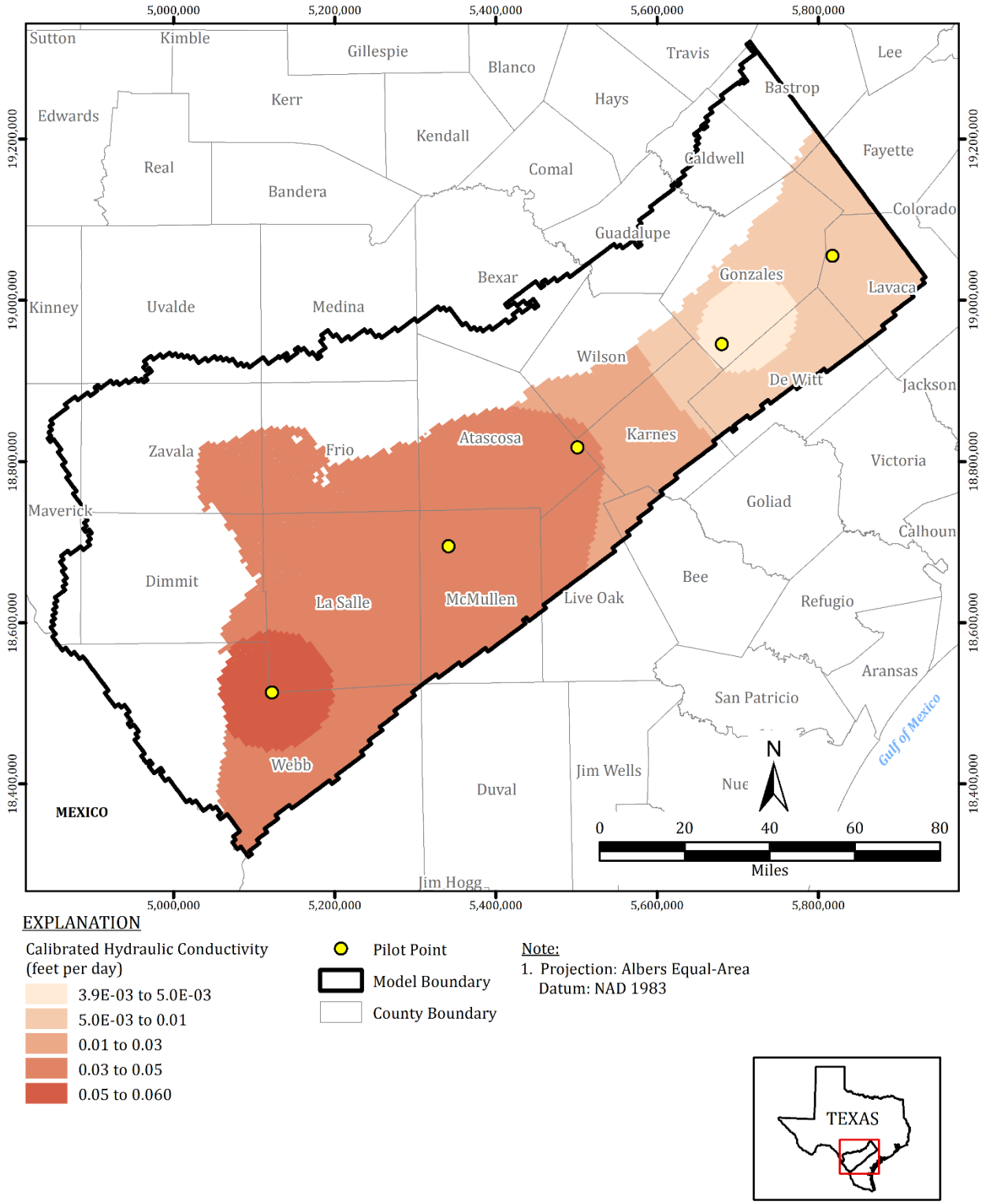


Figure 4-4. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Weches Aquitard (Model Layer 4)

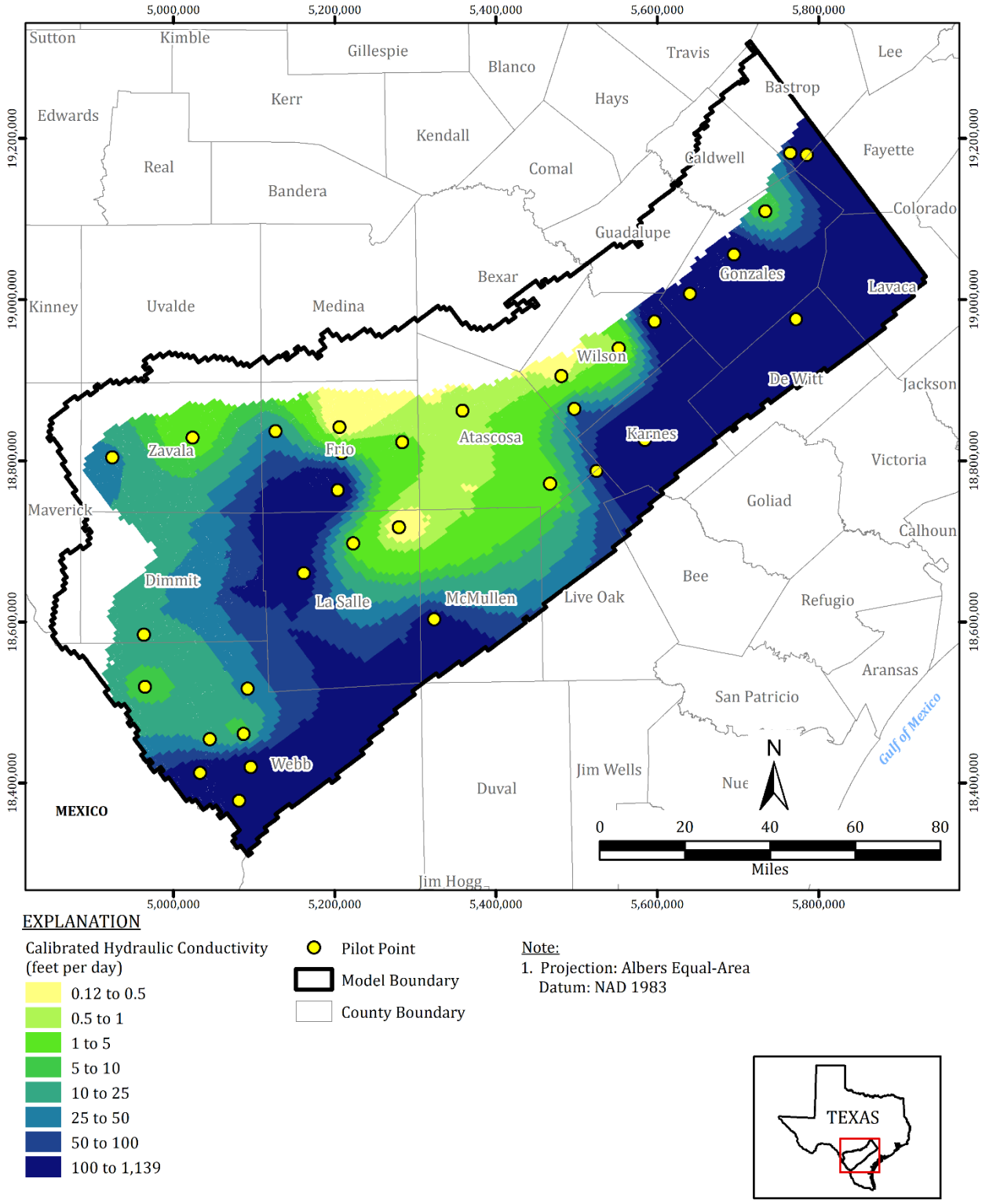


Figure 4-5. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Queen City Aquifer (Model Layer 5)

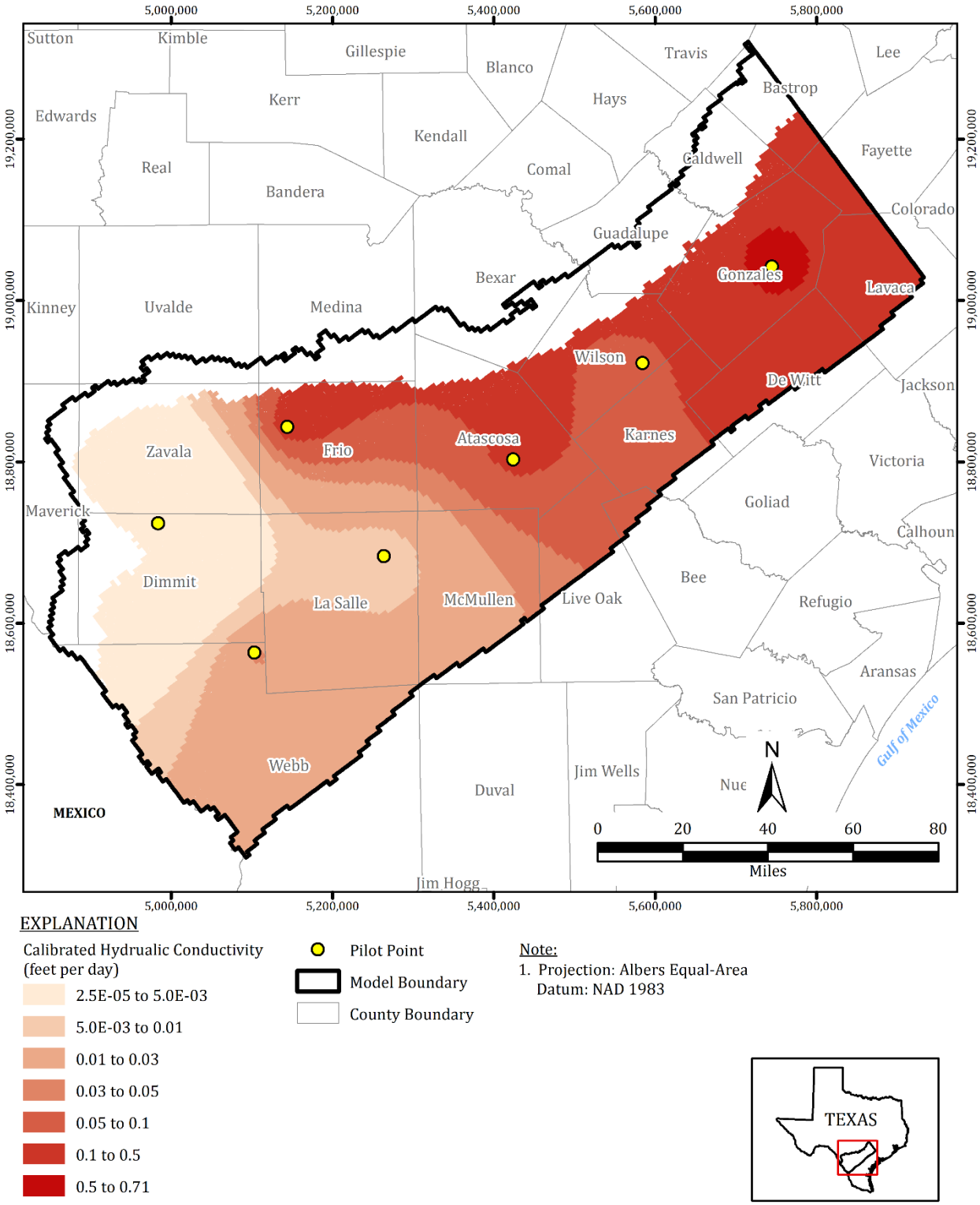


Figure 4-6. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Reklaw Aquitard (Model Layer 6)

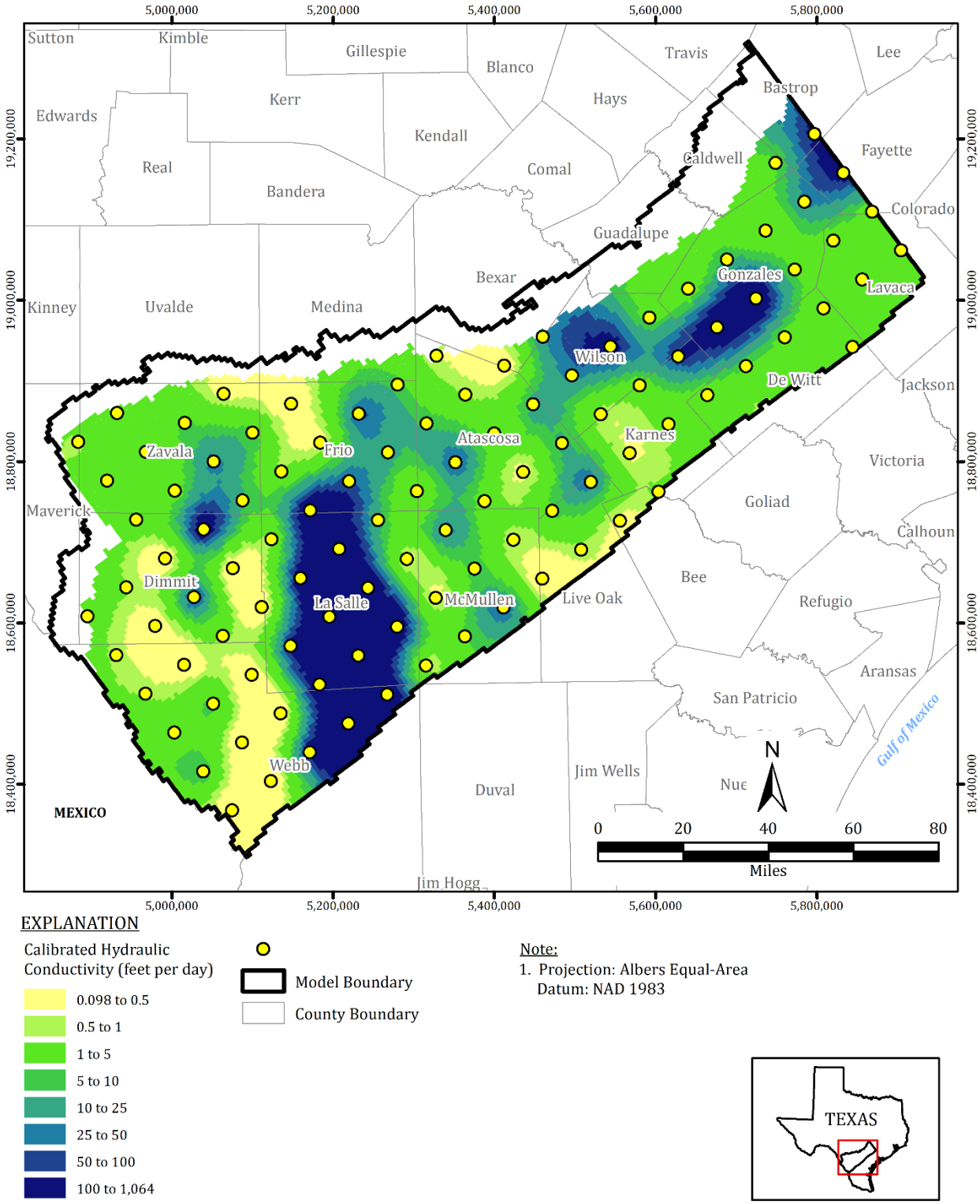


Figure 4-7. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Carrizo-Upper Wilcox (Model Layer 7)

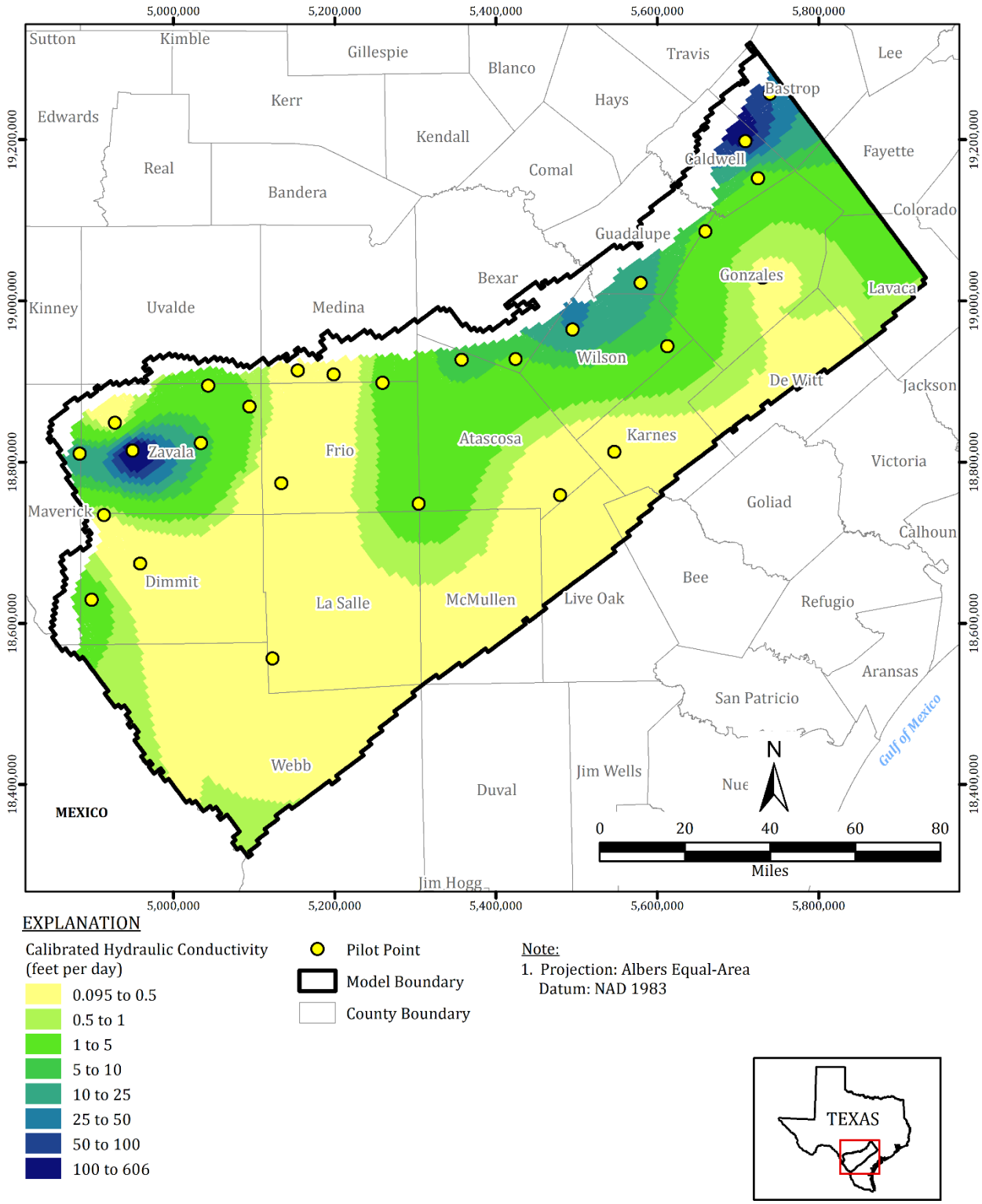


Figure 4-8. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Middle Wilcox (Model Layer 8)

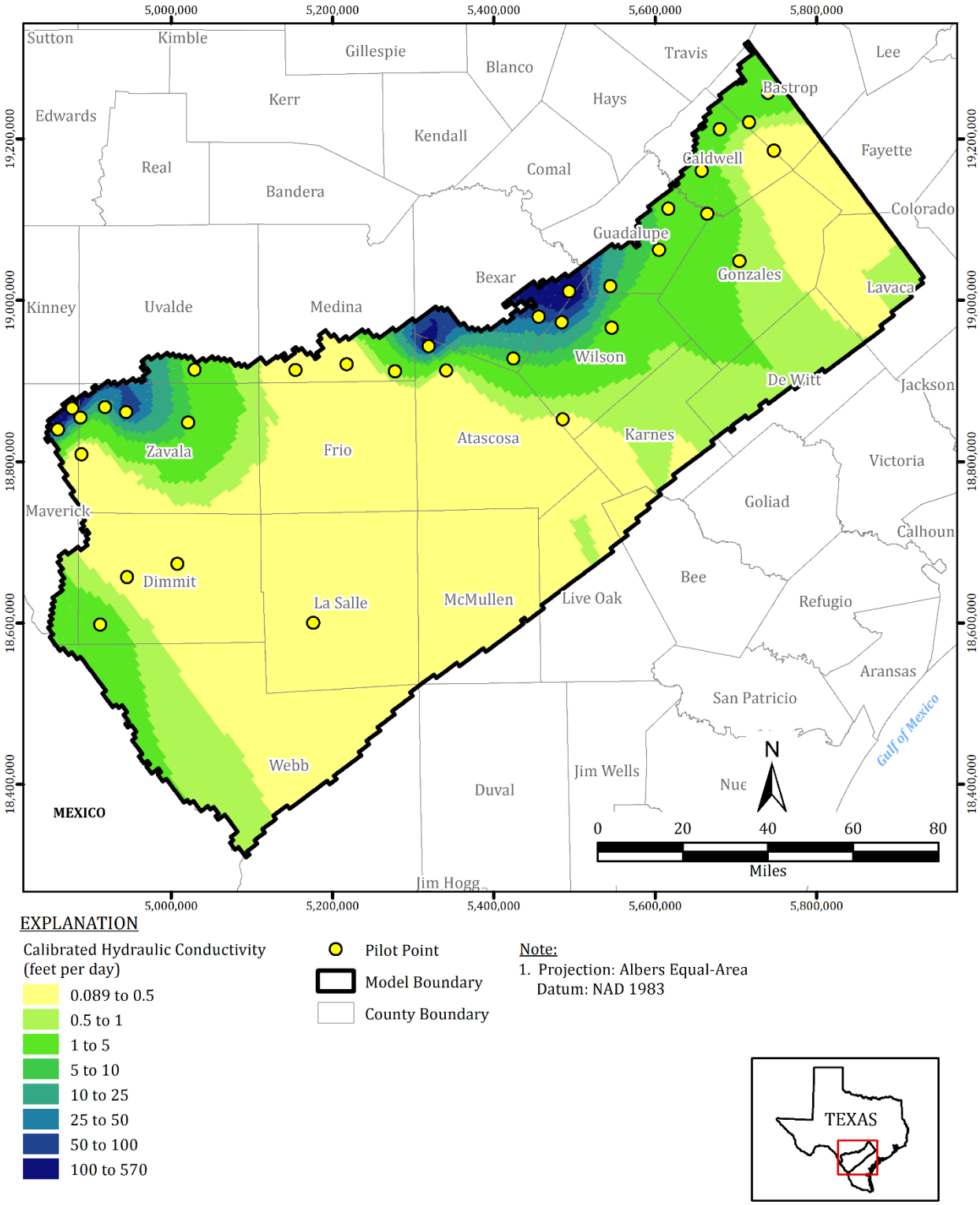


Figure 4-9. Pilot Point Locations and Calibrated Horizontal Hydraulic Conductivity for Lower Wilcox (Model Layer 9)

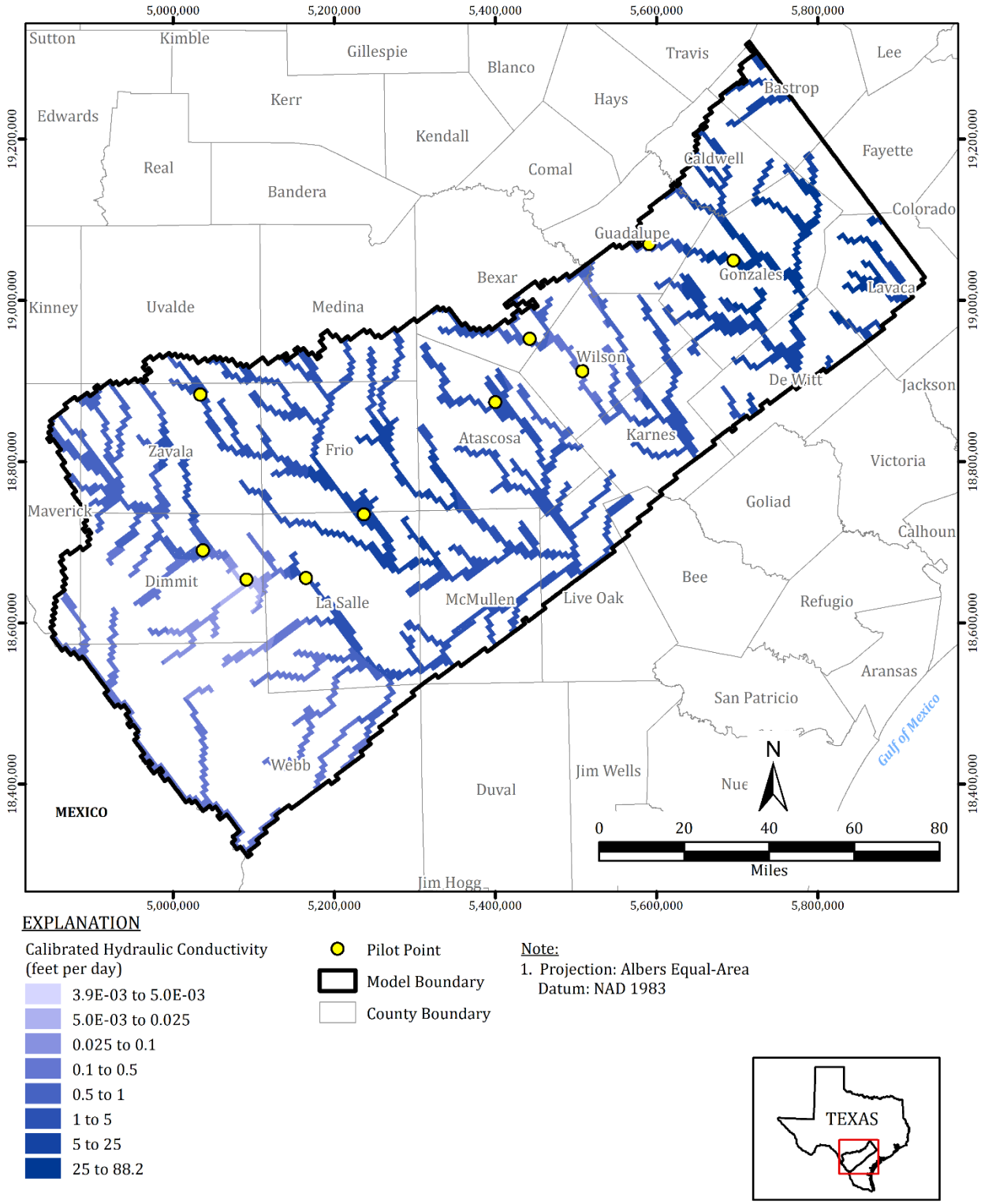


Figure 4-10. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Quaternary Alluvium (Model Layer 1)

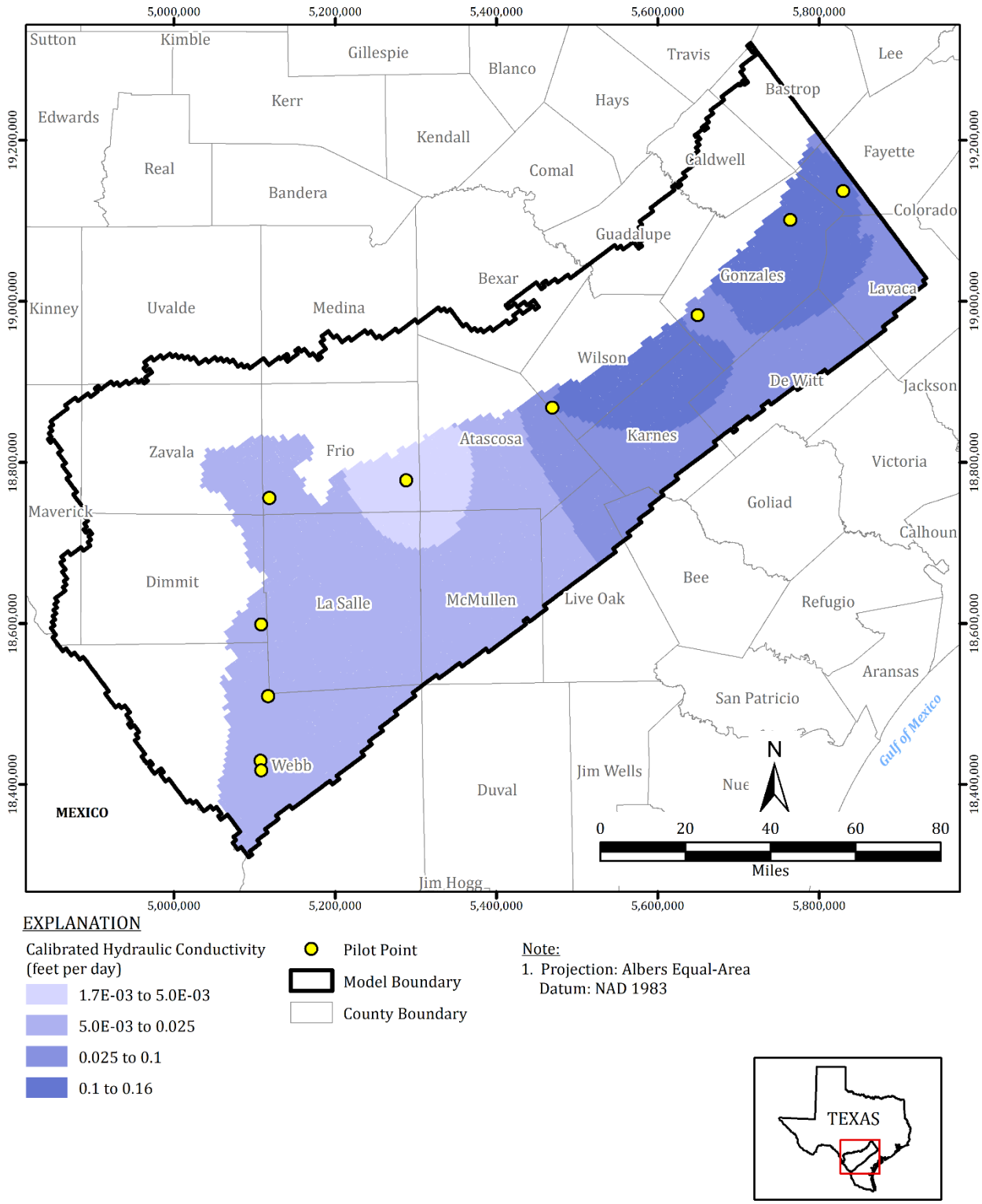


Figure 4-11. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Sparta Aquifer (Model Layer 3)

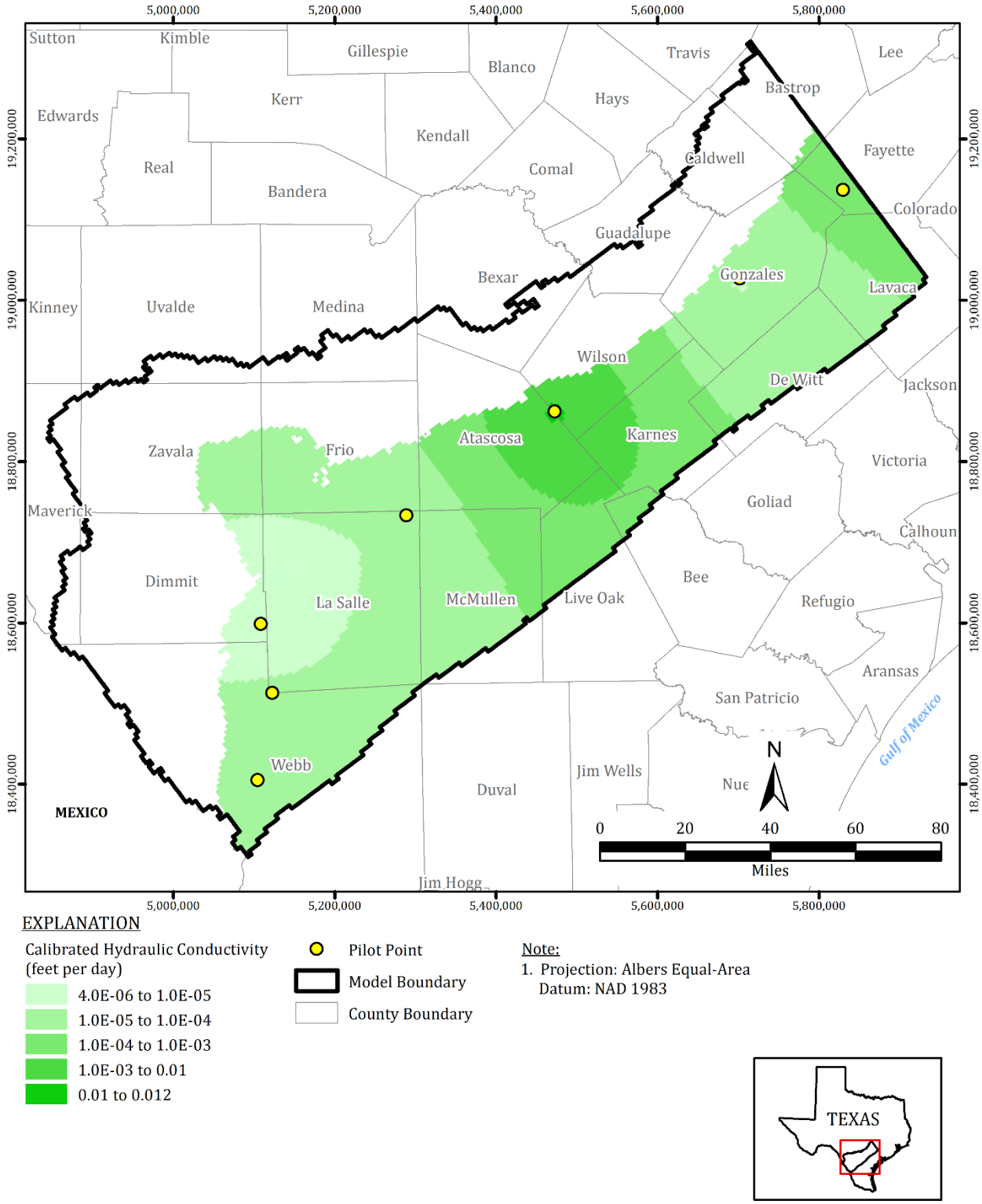


Figure 4-12. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Weches Aquitard (Model Layer 4)

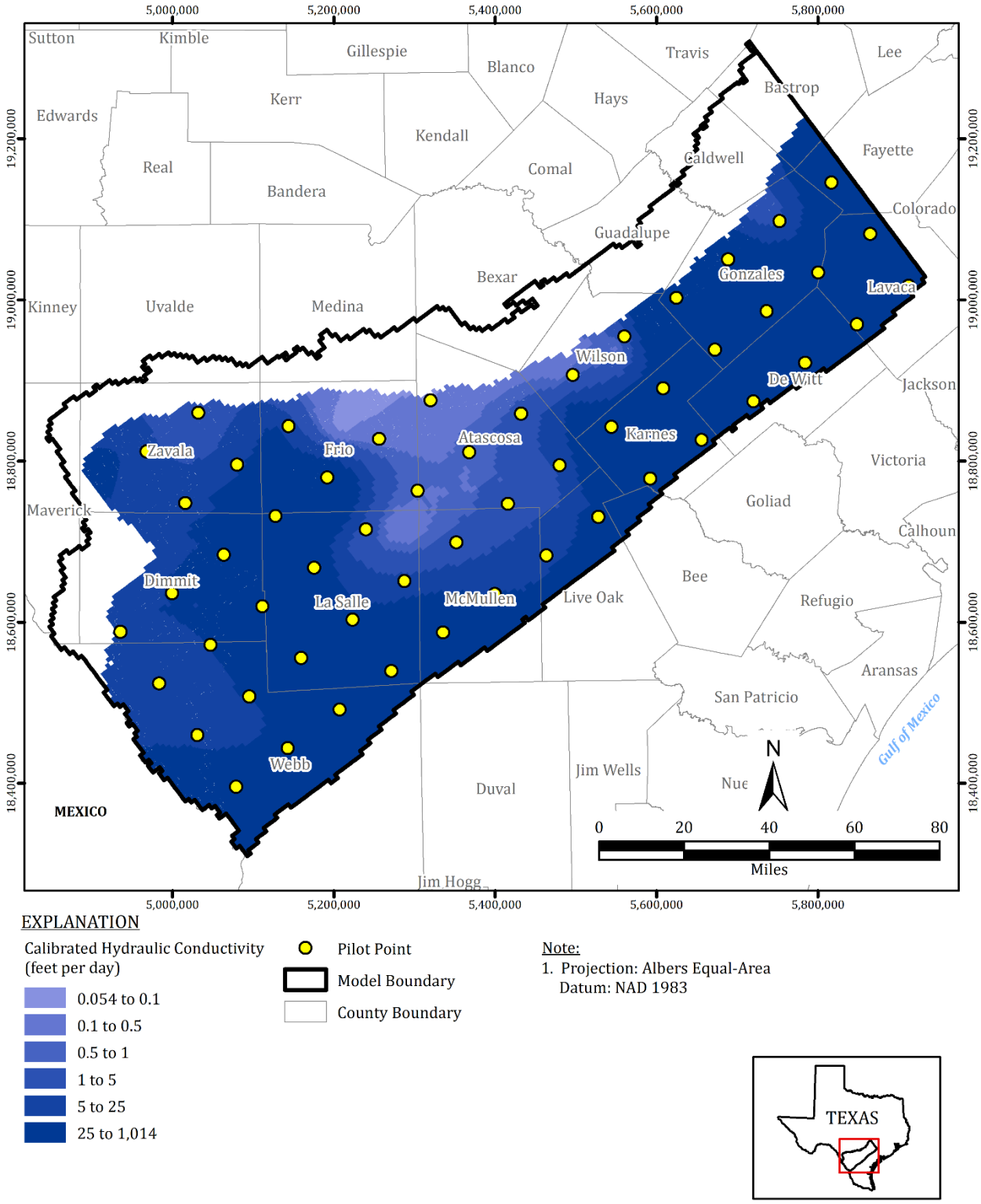


Figure 4-13. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Queen City Aquifer (Model Layer 5)

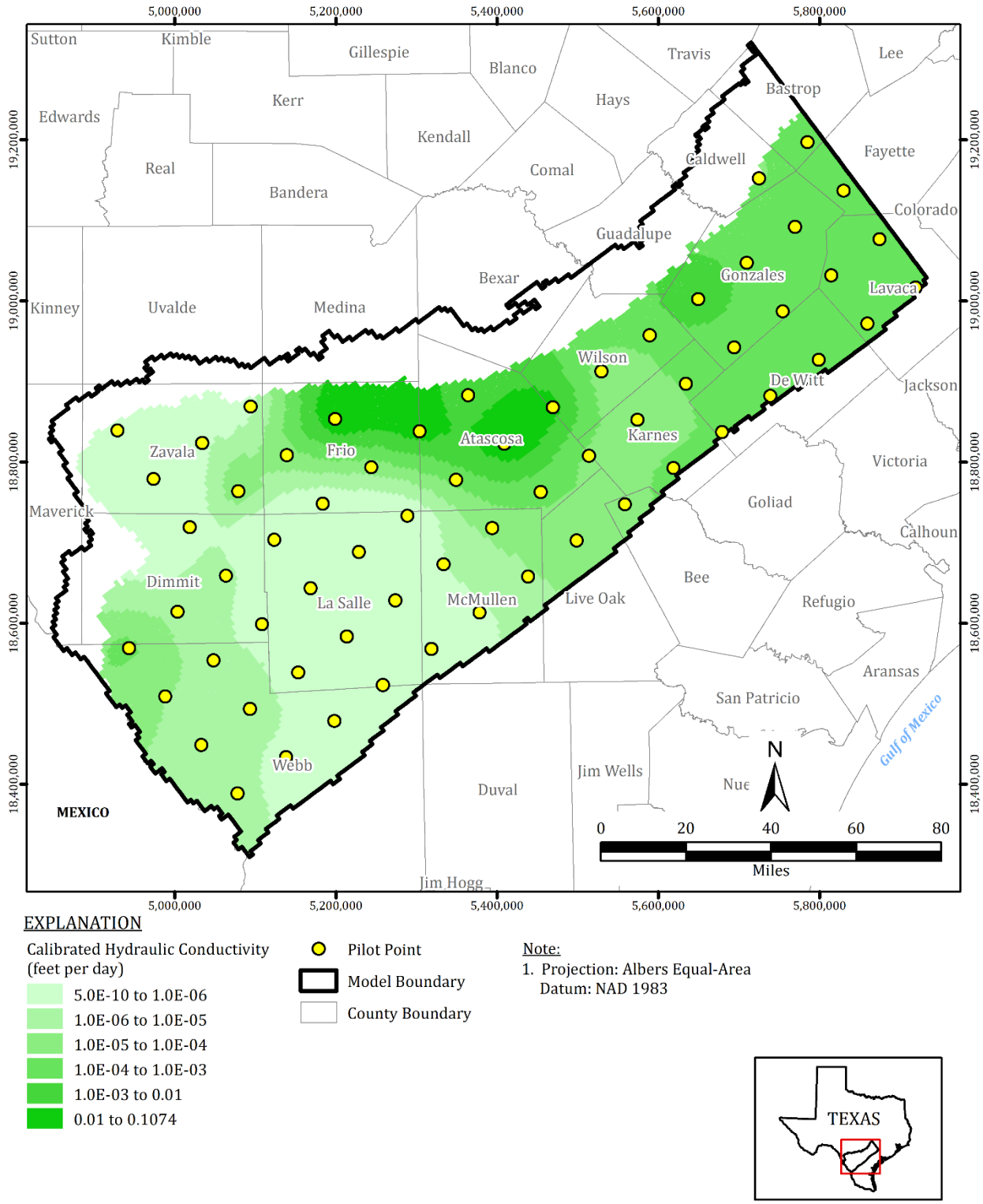


Figure 4-14. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Reklaw Aquitard (Model Layer 6)

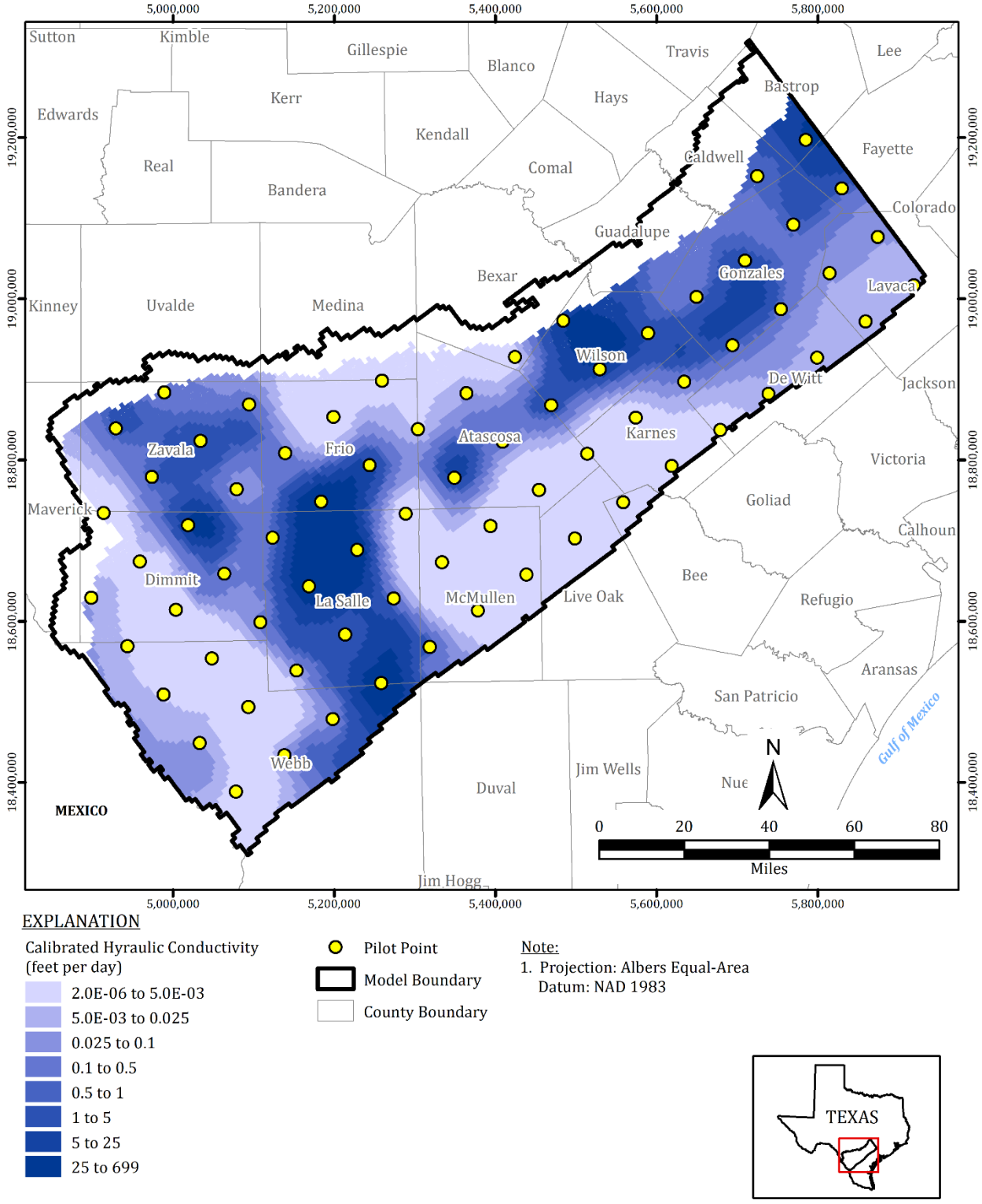


Figure 4-15. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Carrizo-Upper Wilcox (Model Layer 7)

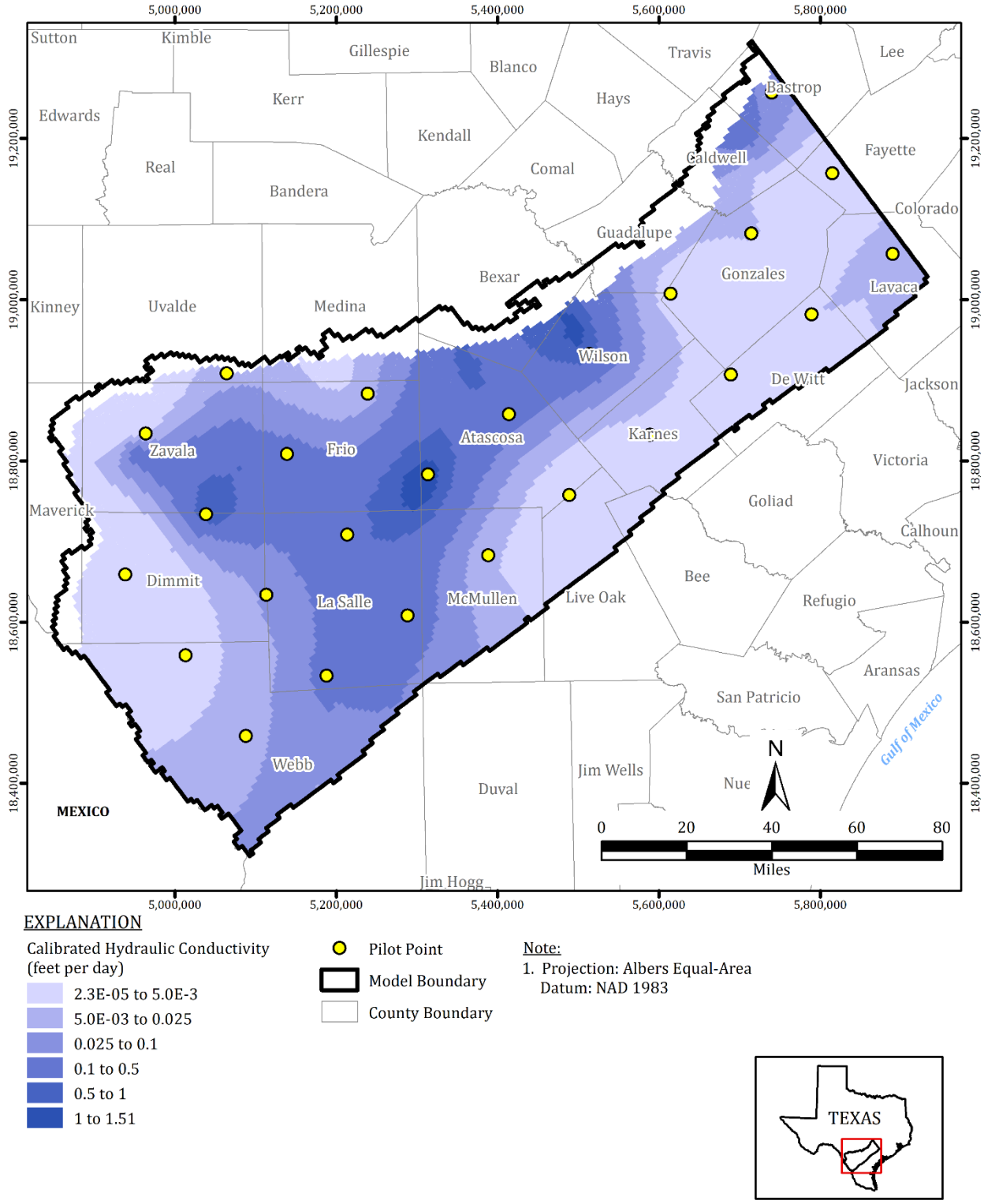


Figure 4-16. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Middle Wilcox (Model Layer 8)

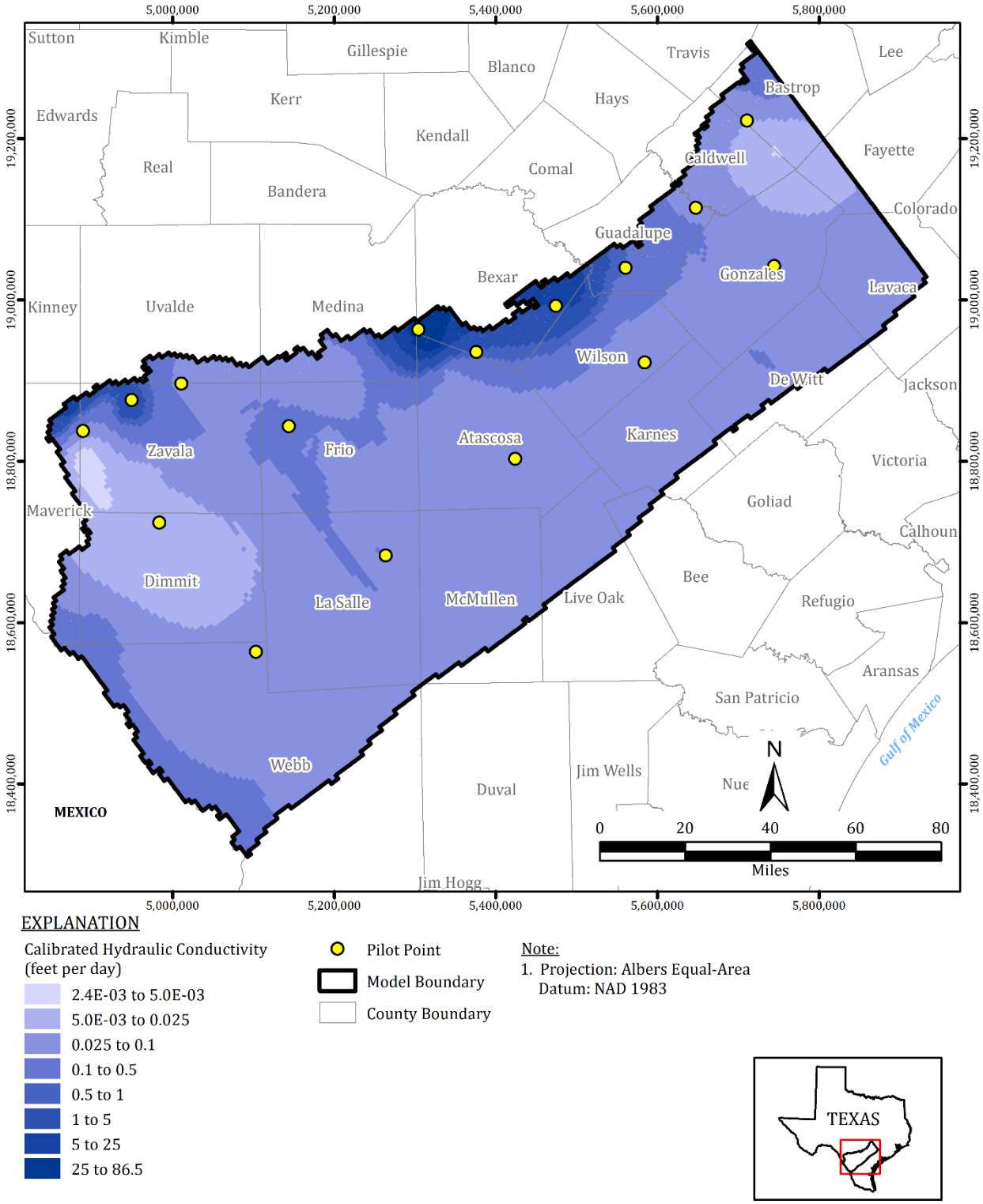


Figure 4-17. Pilot Point Locations and Calibrated Vertical Hydraulic Conductivity for Lower Wilcox (Model Layer 9)

The calibrated vertical hydraulic conductivity of the Weches Aquitard, layer 4, ranges from 4.0×10^{-6} to 1.3×10^{-2} feet per day. The calibrated vertical hydraulic conductivity of the Queen City Aquifer, layer 5, ranges from 5.4×10^{-2} to 1,014 feet per day. The calibrated vertical hydraulic conductivity of the Reklaw Aquitard, layer 6, ranges from 4.5×10^{-10} to 0.11 feet per day. The calibrated vertical hydraulic conductivity of the Carrizo-Upper Wilcox, layer 7, ranges from 2.0×10^{-6} to 699 feet per day. The calibrated vertical hydraulic conductivity of the Middle Wilcox, layer 8, ranges from 2.3×10^{-5} to 1.51 feet per day. The calibrated vertical hydraulic conductivity of the Lower Wilcox, layer 9, ranges from 2.4×10^{-3} to 86.5 feet per day. Vertical hydraulic conductivity values are generally significantly smaller than the horizontal hydraulic conductivity values, providing the model with a high horizontal to vertical anisotropy as is conceptualized for the model and applied in other Groundwater Management Area 13 modeling efforts (Deeds and others, 2003; Kelley and others, 2004). The low vertical hydraulic conductivity values represent heterogeneous layered systems that are present within each of the major hydrostratigraphic aquifer and aquitard units.

The HFB conductance was also implemented in PEST as a parameter and PEST simulations adjusted the conductance from the initial values; however, the HFBs do not explain the water levels or water level responses in the domain at the scale of the simulation using annual stress periods. The PEST calibrated values were, however, retained for the HFB conductances.

The specific storage and specific yield values were maintained uniform throughout each model layer with values shown on Table 4-4. The specific storage value for the alluvium beneath the rivers (model layer 1) was 5×10^{-5}, and the specific yield was 0.1. The specific storage value for all aquifer units was 5×10^{-7} and the specific yield was 0.001. The specific storage value for all aquitard units was 1×10^{-7} and the specific yield was 0.005.

Although the model specific yield values are lower than those used in the previous groundwater availability models (0.15 and 0.1) (Kelley and others, 2004), studies for the Queen City, Sparta, and Carrizo-Wilcox Aquifers in Groundwater Management Area 11 indicate simulated water levels are not overly sensitive to storage properties (Panday and others, 2020) and that specific yield can vary widely with minimal change in contribution to pumping (Hutchison, 2021). In addition, specific storage values are consistent with published values for aquifer and aquitard materials (Freeze and Cherry, 1979) and the specific yield value for the alluvium was taken as a representative value (Freeze and Cherry, 1979). Specific yield values of the aquifer materials were in the range of values presented above in Section 2.5.2 and obtained from aquifer tests in the domain (Myers, 1969). Low storativity values in the outcrop (unconfined) regions may be representative of partial confinement of the aquifer system. The effect of storage parameters and the storage terms on the nature and magnitude of water level elevation fluctuations was small.

Table 4-4. Specific Storage and Specific Yield

Layer	Hydrostratigraphic Unit	Specific Storage	Specific Yield
Layer 1	Quaternary Alluvium	5.0E-05	0.1
Layer 2	Younger Units	1.0E-07	0.001
Layer 3	Sparta Aquifer	5.0E-07	0.005
Layer 4	Weches Aquitard	1.0E-07	0.001
Layer 5	Queen City Aquifer	5.0E-07	0.005
Layer 6	Reklaw Aquitard	1.0E-07	0.001
Layer 7	Carrizo-Upper Wilcox	5.0E-07	0.005
Layer 8	Middle Wilcox	5.0E-07	0.005
Layer 9	Lower Wilcox	5.0E-07	0.005

4.1.3 Calibration of GHB

The GHB condition was applied along the surface of layer 2 for depicting flow between the Younger Units and the underlying Sparta Aquifer, and along the southeastern and northeastern boundaries of the domain in aquifer units, layers 3, 5, 7, 8 and 9, to represent interaction with deeper portions of those modeled units beyond the boundary and to account for the model boundary not being a natural aquifer boundary.

The GHB condition was applied on all active portions of layer 2 to represent a boundary condition applied on the Younger Units for flow of water between the Younger Units and the underlying Sparta Aquifer. The boundary heads were obtained from the 2004 groundwater availability model (Kelley and others, 2004) (Figure 4-18). These heads were interpolated using the triangular irregular networks approach and compared to water level elevation data for the Younger Units. The water level measurements and the interpolated triangular irregular network surface were not used in the model but confirmed consistent values between the 2004 model heads and available data. Figure 4-19 shows the triangular irregular network based on the 2004 model heads and the location of the water level measurements used to compare to the 2004 model heads. The GHB head patterns in the Younger Units indicate generally lower water levels beneath the river channels.

Figure 4-20 shows the GHB conductance values of the layer 2 GHB condition. The conductance values for the layer 2 GHBs were also obtained from the 2004 groundwater availability model (Kelley and others, 2004) and are noted to decrease from the pinch-out locations towards the southeast boundary. This represents the thickening of the Younger Units from the outcrop areas towards the southeast and downdip regions. It is noted that the conceptual model currently provides the GHB through an active model layer 2 and therefore the GHB conductances along with the vertical hydraulic conductivity of layer 2 conduct flow between the GHB heads of the Younger Units and the Sparta Aquifer. The vertical hydraulic conductivity of model layer 2 was included as a calibration parameter but the GHB conductance was not.

GHB conditions along the southeastern and northeastern boundaries of the domain in aquifer layers 3, 5, 7, 8 and 9 represent interaction with deeper portions of those modeled units beyond the boundary (Figure 3-57). The boundary heads were approximated from interpolated head contours and not changed during calibration. The boundary conductances were variable parameters during the calibration process, though they were generally uniform along the boundary within each layer with variations accounting for changes in cell width. These GHB conditions were significant in setting the predevelopment water levels appropriately, as was noted during preliminary calibration simulations. Table 4-5 shows the GHB calibrated range in heads and conductance for each layer.

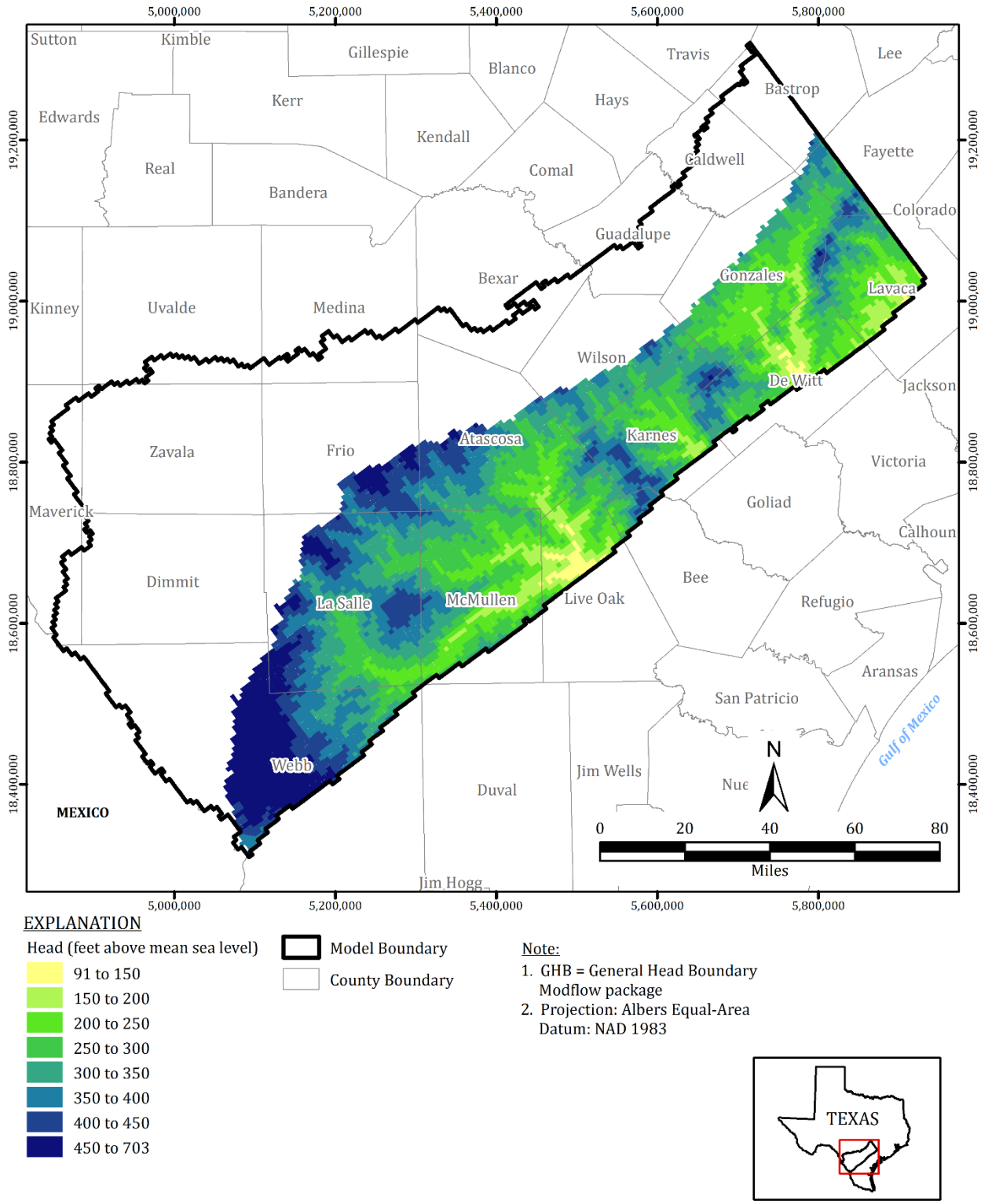


Figure 4-18. Boundary Head Values for GHB Conditions Applied to the Younger Units (Model Layer 2)

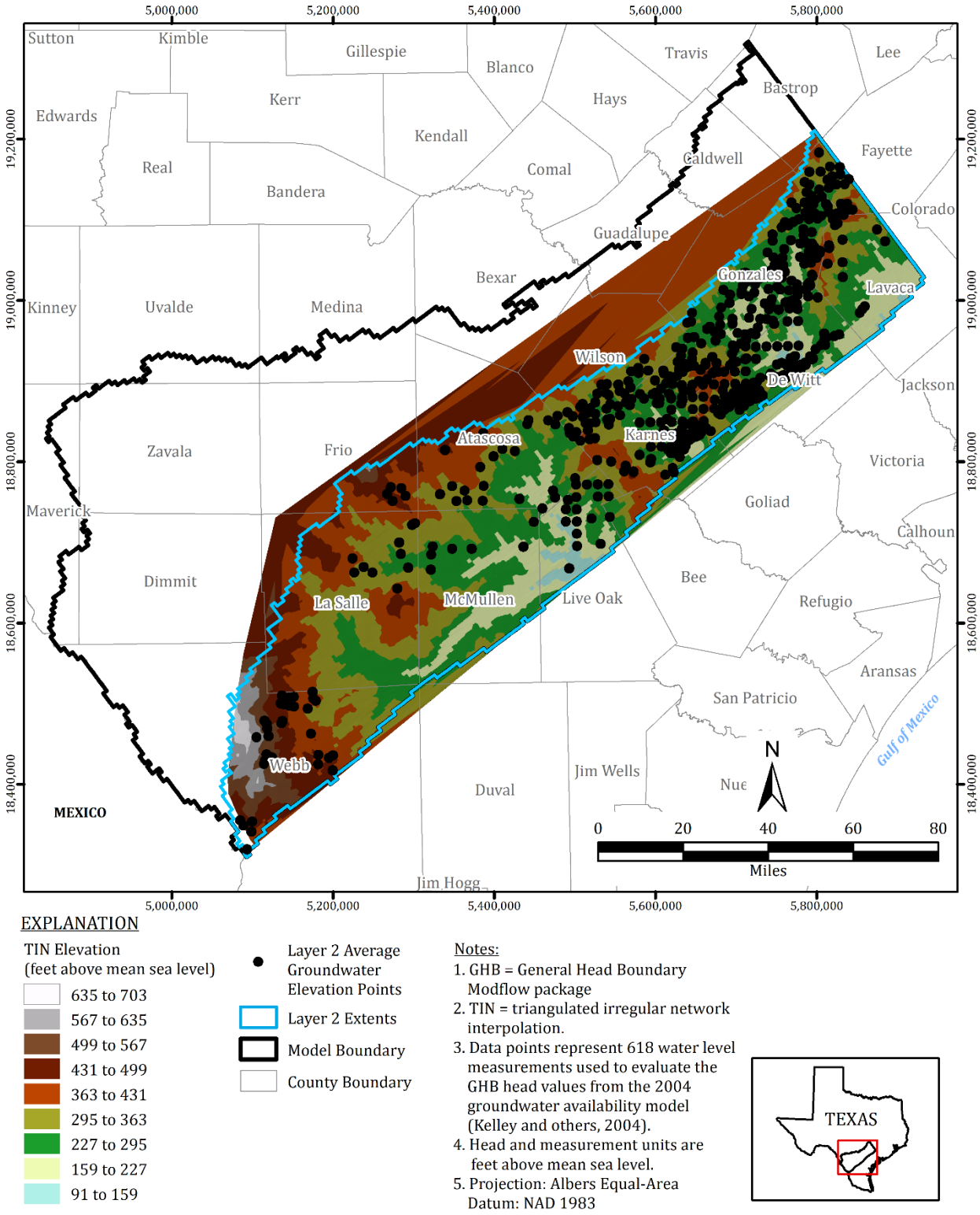


Figure 4-19. Data Points for Evaluation of GHB Heads Applied to Younger Units (Model Layer 2)

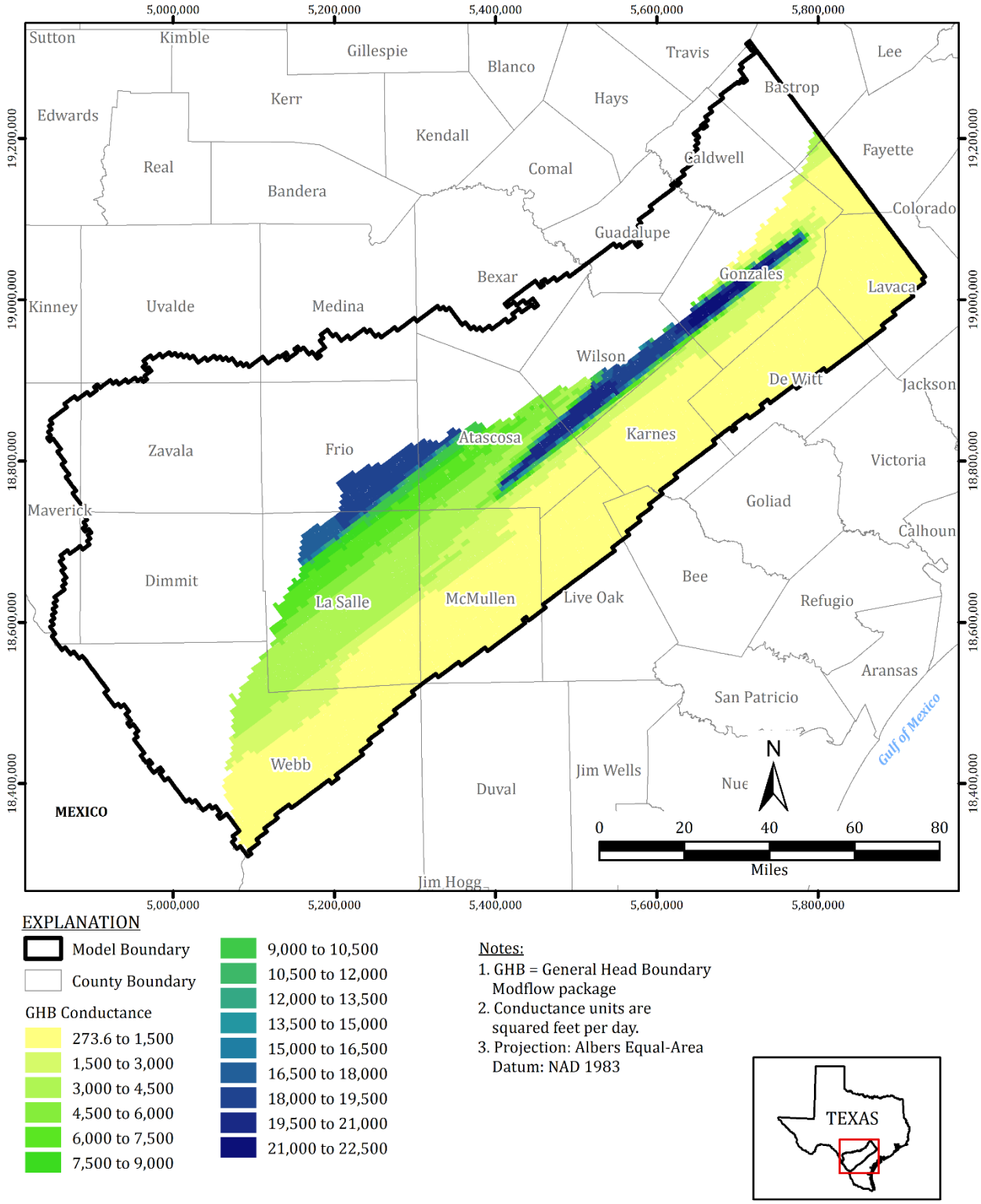


Figure 4-20. Boundary Conductance Values for GHB Conditions Applied to the Younger Units (Model Layer 2)

Table 4-5. Calibrated General Head Boundary Conditions

Layer	Hydrostratigraphic Unit	Number of GHB Cells	GHB Head (feet)	GHB Conductance (feet per day)	Hydraulic Feature
Layer 2	Younger Units	37,954	min = 90.7	min = 273.6	Vertical flow into or out of Sparta Aquifer
			max = 702.9	max = 22,266.5	
Layer 3	Sparta Aquifer	380	min = 238.0	min = 17.4	Lateral boundary
			max = 449.8	max = 10,000	
Layer 5	Queen City Aquifer	279	min = 300.1	min = 231.8	Lateral boundary
			max = 459.4	max = 50,000	
Layer 7	Carrizo-Upper Wilcox	304	min = 320.1	min = 5.8	Lateral boundary
			max = 457.8	max = 243,000	
Layer 8	Middle Wilcox	354	min = 320.1	min = 5.8	Lateral boundary
			max = 457.8	max = 172,000	
Layer 9	Lower Wilcox	339	min = 320.1	min = 5.8	Lateral boundary
			max = 457.8	max = 526,000	

4.2 Model Simulated Versus Measured Heads

Groundwater level elevations were used to constrain the model to observed conditions during the simulation period. This section discusses the development of the water level elevation target data set and the various qualitative as well as quantitative measures that were used to evaluate the simulated water level elevations.

4.2.1 Water Level Elevation Targets

Section 2.2.2 on Distribution of Groundwater Level Measurements provides details on data sources and compilation for available water level information. A total of 23,815 water level elevation records from 2,024 wells are within the model domain in the simulated model layers and during the simulated model timeframe (1980 through 2017). Layer 2, Younger Units, is active but is conceptualized as a boundary condition to the underlying Sparta Aquifer; therefore 760 data records from 591 wells in the Younger Units were excluded from the model water level target set. A total of 671 water level elevation records from 318 wells was also removed due to following questionable data flags:

- pumping-level measurement;
- presence of oil and grease in well;
- possible incorrect well identification;
- flooding/runoff into the well casing;
- air leak in the sampling line; and
- well water level elevations previously flagged as questionable and marked for exclusion.

Using well construction and geologic information, target wells were assigned to corresponding model layers and this layering was checked against respective water level elevations. Early simulations also indicated locations where a target well may have been placed in the wrong layer by evaluating large residuals adjacent to well-calibrated targets.

Targets were assigned for the 1980 dataset by averaging the available data for the year if multiple data points were available at a well. Targets for the transient simulation years of 1981 through 2017 were maintained at the date when the measurement was taken. The target locations were placed in all model layers except the alluvium (layer 1), the Younger Units (layer 2), and the two layers representing aquitards (Weches and Reklaw Aquitards, model layers 4 and 6). The distributions of monitoring locations in each layer are shown on Figures 4-21 through 4-25. The number of observed water level measurements at each well location is also shown. The largest density of data throughout the model domain as well as the longest records of measurement are in the Carrizo-Upper Wilcox Aquifer (layer 7). The deeper units (layers 8 and 9) have observation wells only where the shallower units tend to pinch out, with the largest density of wells in layer 9 being in in Atascosa, Wilson, Gonzalez, Caldwell, and Bastrop Counties.

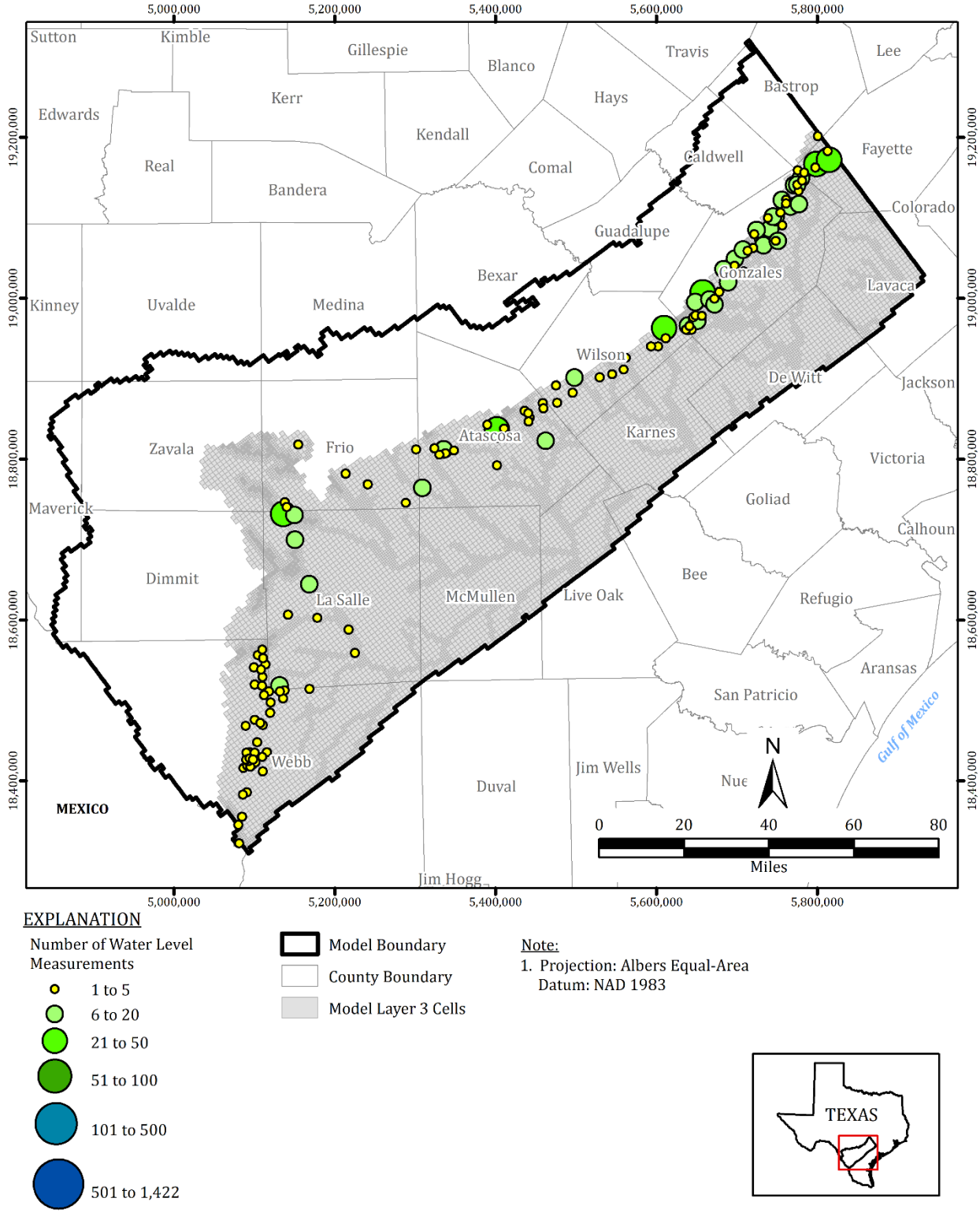


Figure 4-21. Location of Groundwater Observation Wells and Available Water Level Elevation Data, Sparta Aquifer (Layer 3)

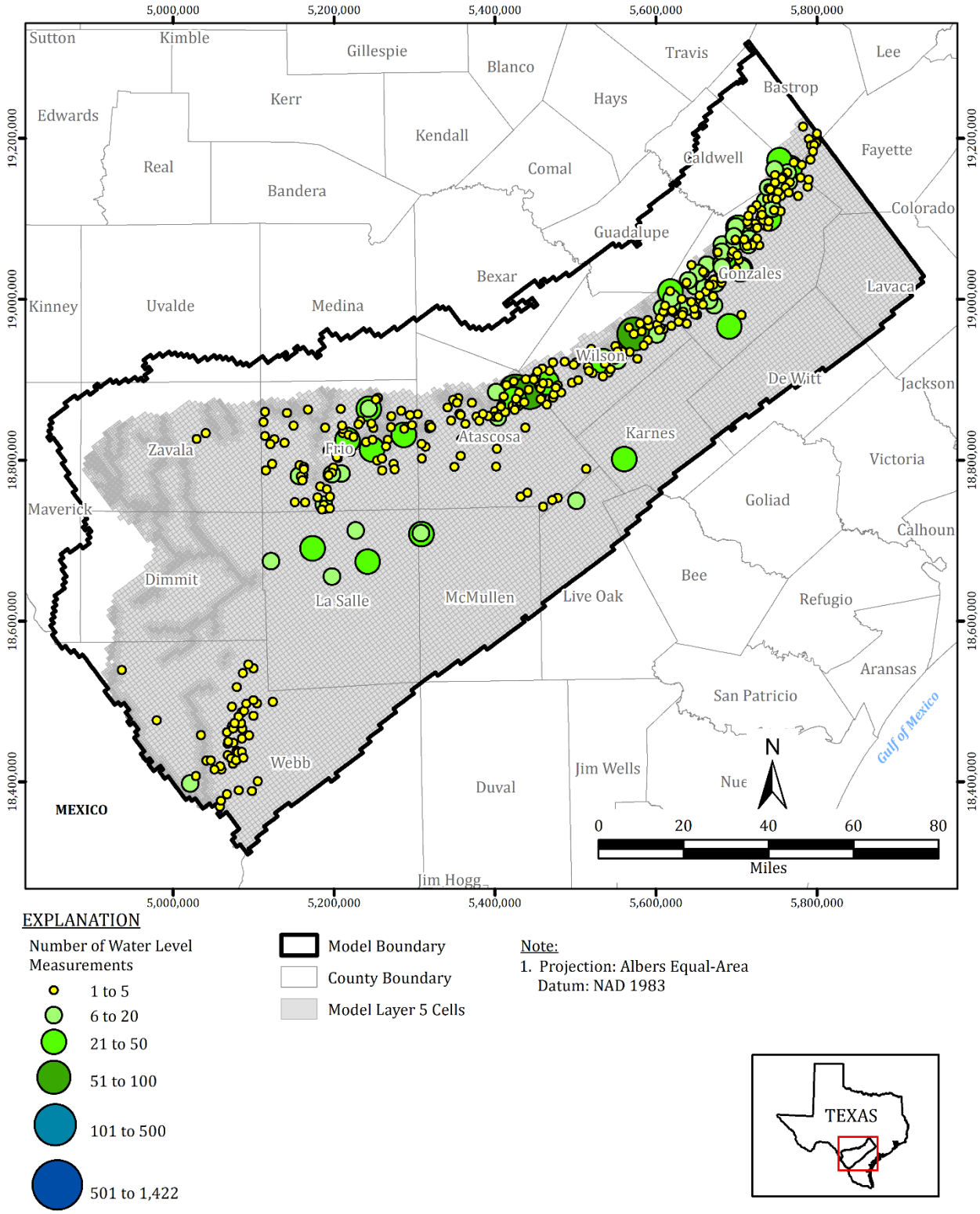


Figure 4-22. Location of Groundwater Observation Wells and Available Water Level Elevation Data, Queen City Aquifer (Layer 5)

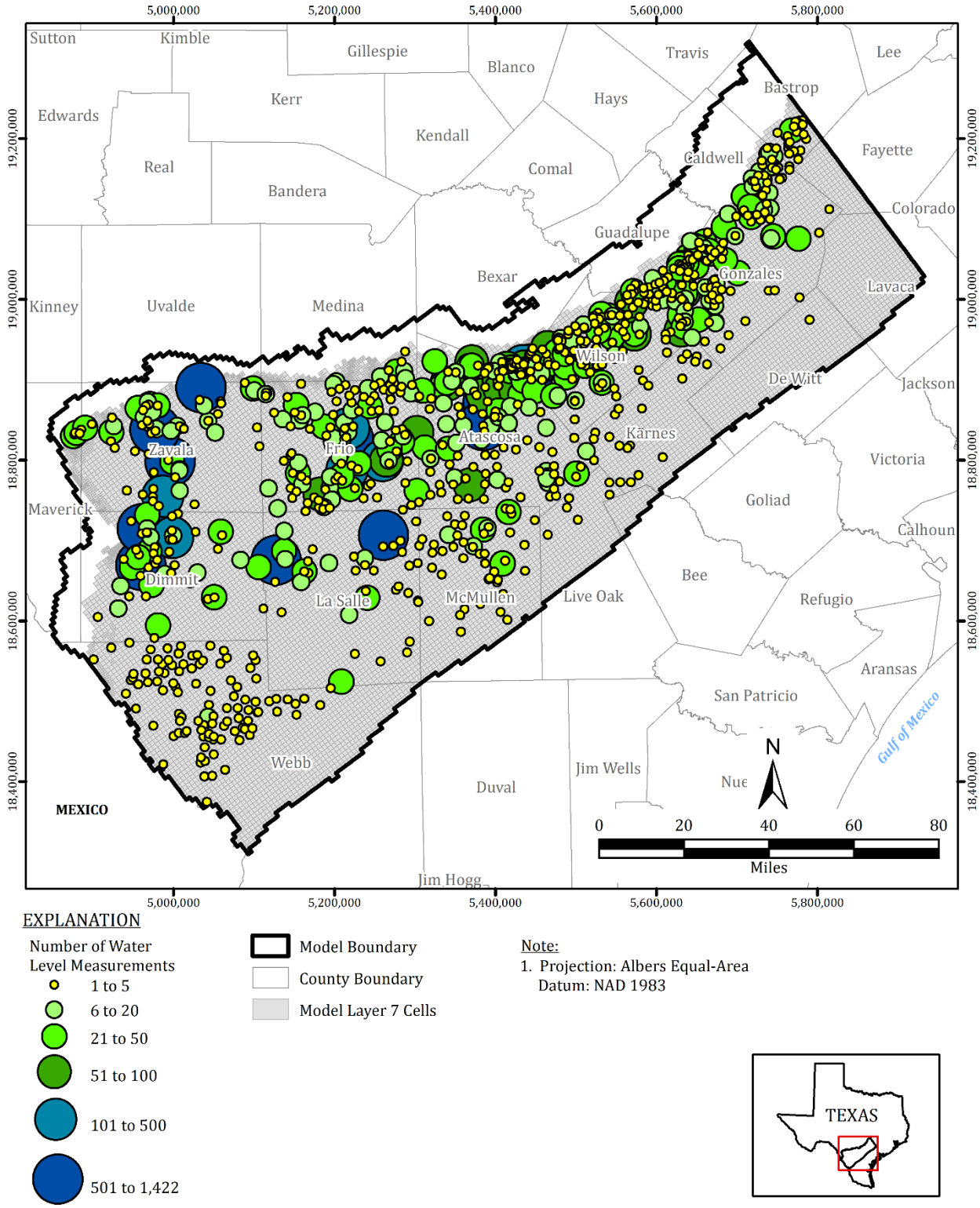


Figure 4-23. Location of Groundwater Observation Wells and Available Water Level Elevation Data, Carrizo-Upper Wilcox (Layer 7)

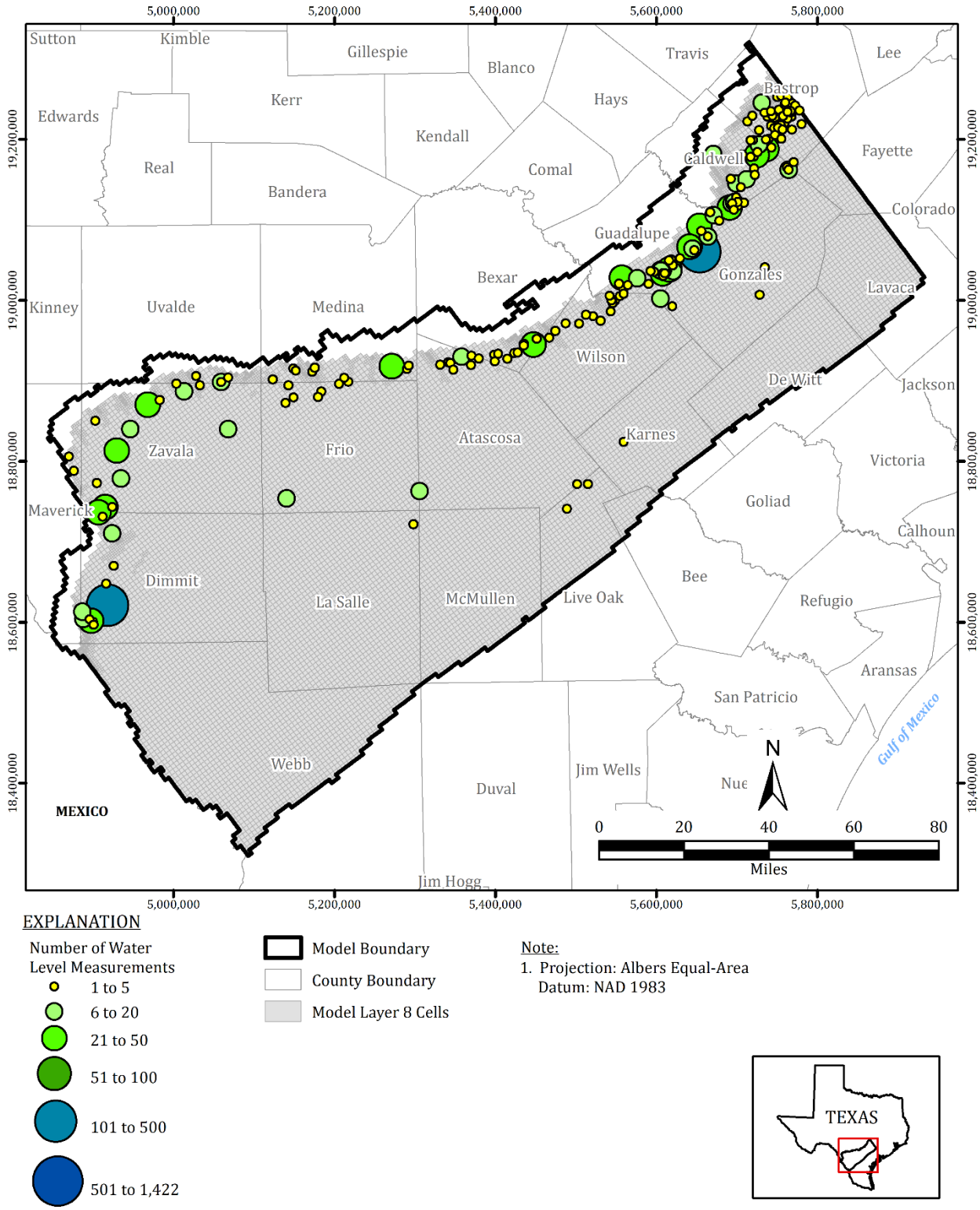


Figure 4-24. Location of Groundwater Observation Wells and Available Water Level Elevation Data, Middle Wilcox (Layer 8)

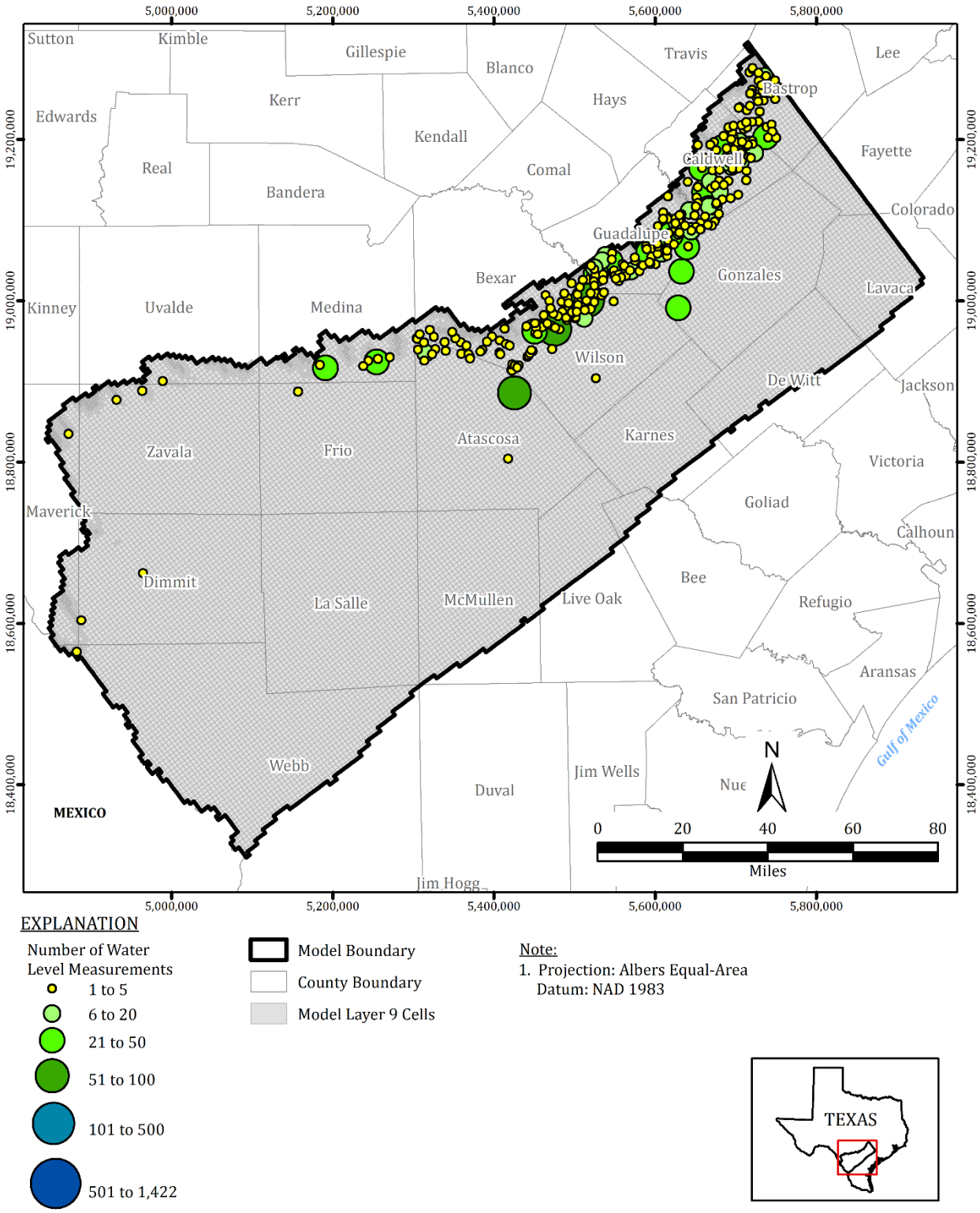


Figure 4-25. Location of Groundwater Observation Wells and Available Water Level Elevation Data, Lower Wilcox (Layer 9)

The target dataset was evaluated for additional quality control issues that would warrant applying a weight to the water level elevation records. A weight factor applied to a water level measurement represents a measure of uncertainty in the data. Weight factors were applied for the following conditions.

- Low confidence in layering;
- Discrepancy between well completion and water level elevations;
- Well possibly screened in aquitard units and moved to adjacent overlying aquifer; and
- Well screened across multiple model layers.

A weight factor of 0.5 was applied to target wells and their water level elevation records with a low confidence in layering. The remaining wells with quality control issues were assigned a weight of 0.1. Since weights were assigned by well and problematic water levels were excluded from the dataset, water level records at each well in the model (for different times) have uniform weights.

In spite of weighting, most water level records used in the model have a weight of 1. Within the target dataset, 15,274 records from 1,170 wells have a weight of 1 while 3,515 records from 384 wells have a weight of 0.5; 5,026 records from 470 wells have a weight of 0.1. The water level elevation records with target weights and aquifer type designation are provided in Appendix G.

Besides the available water level dataset from 1980 through 2017, the predevelopment estimated water levels were also used for calibration to a steady-state predevelopment stress period where there was no pumping in the domain (Deeds and others, 2003; Kelley and others, 2004). The estimated predevelopment water level contours for the Sparta Aquifer, Queen City Aquifer, and the Carrizo-Wilcox Aquifer shown on Figures 2-19 through 2-21 of Section 2.2 were used to provide dummy predevelopment targets within these aquifers. The dummy predevelopment targets were provided a lower weighting of 0.5 since they were evaluated from estimated predevelopment contours that may be honored to a lesser degree by the model than the measured 1980 through 2017 target dataset.

4.2.2 Simulated Versus Observed Heads

Calibration simulations were conducted with a first steady-state stress period representing predevelopment conditions, followed by a second steady-state stress period representing average 1980 conditions to be used as a starting condition for the remaining annual transient stress periods up to 2017. The predevelopment stress period was evaluated qualitatively against contours of predevelopment conditions in the Sparta Aquifer, Queen City Aquifer, and Carrizo-Upper Wilcox, while the remaining stress periods were evaluated more thoroughly and quantitively.

The simulated predevelopment water level contours for the Sparta Aquifer (model layer 3), Queen City (model layer 5), and Carrizo-Upper Wilcox Aquifer (model layer 7) are shown on Figures 4-26 through 4-28, respectively. Predevelopment estimated contours are also

shown on these figures. Simulated predevelopment heads have similarities and differences from estimated contours. Simulated water levels in model layer 3 are similar to the GHB heads applied on the Younger Units, while estimated predevelopment patterns are uniform with water flowing from outcrop areas in the northwest towards the downdip areas in the southeast. However, both simulated and observed water level elevations range from 600 feet above mean sea level in outcrop areas to about 250 feet above mean sea level in down dip areas. Simulated water levels in model layers 5 and 7 both show that flow generally occurs from the outcrop areas in the northwest towards the downdip areas in the southeast with water level elevations ranging from 700 to 350 feet above mean sea level. Even though contour patterns are not congruent, the simulated flow regime is similar to the conceptualized predevelopment conditions.

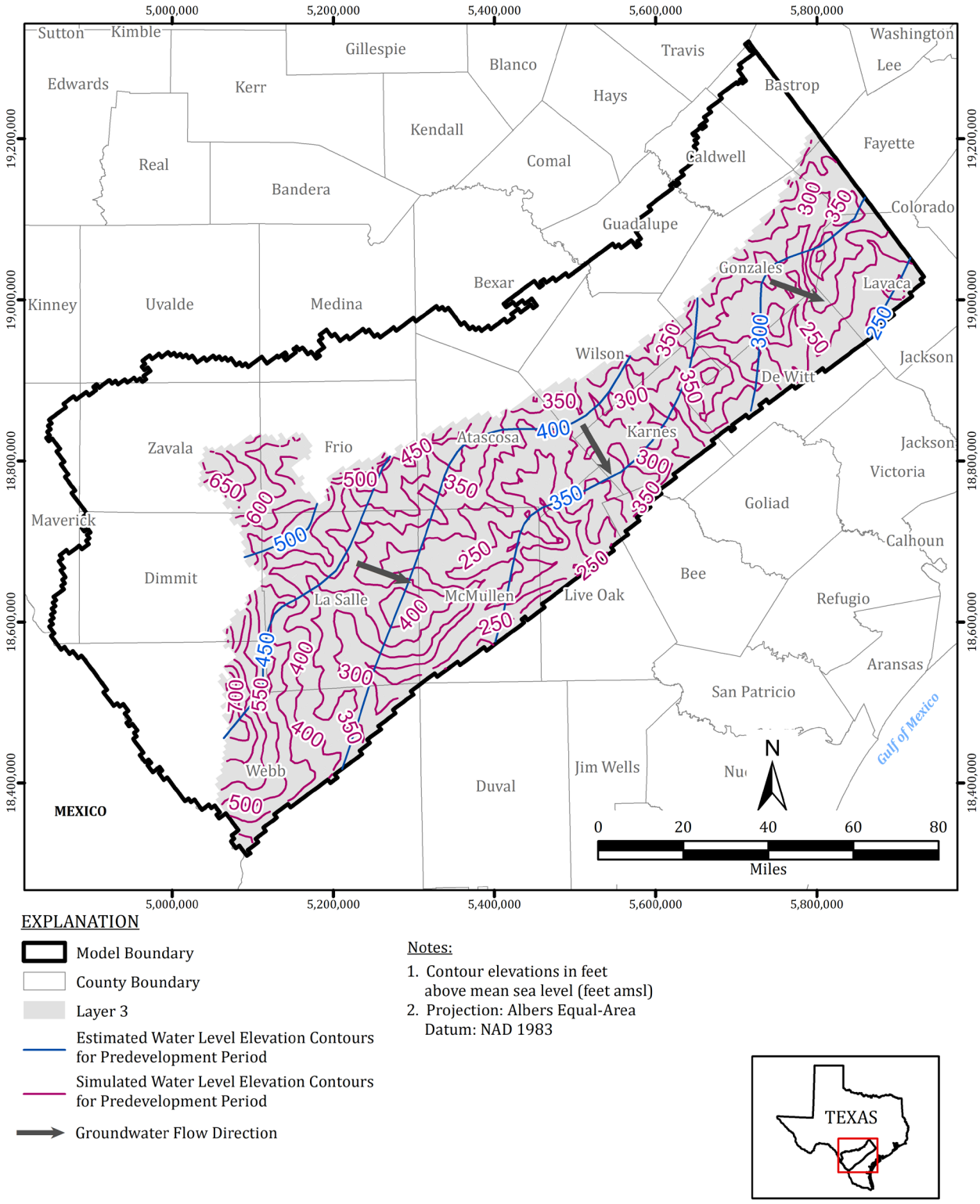
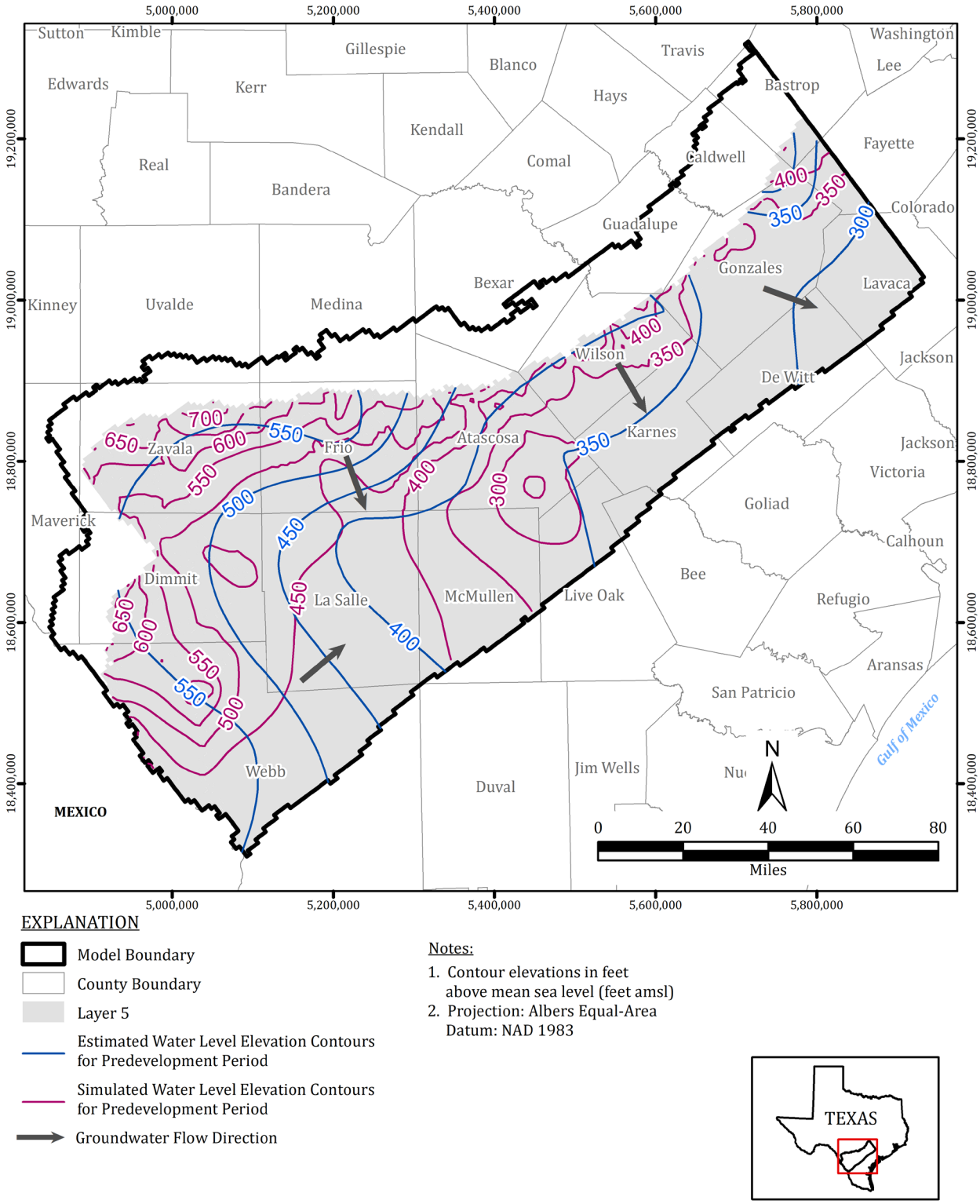


Figure 4-26. Simulated and Estimated Predevelopment Water Level Elevation Contours for the Sparta Aquifer (Layer 3)



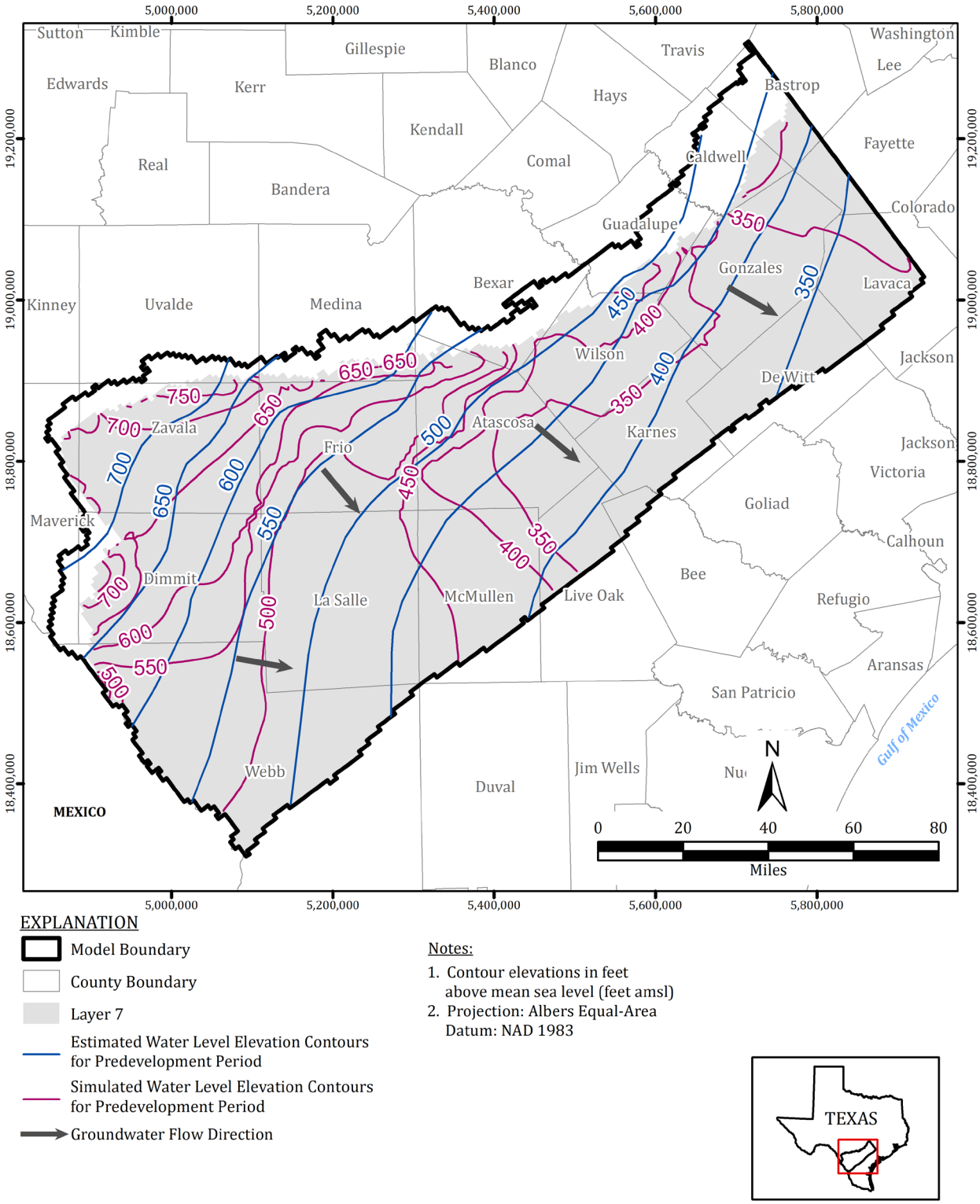
EXPLANATION

- Model Boundary
- County Boundary
- Layer 5
- Estimated Water Level Elevation Contours for Predevelopment Period
- Simulated Water Level Elevation Contours for Predevelopment Period
- Groundwater Flow Direction

Notes:

1. Contour elevations in feet above mean sea level (feet amsl)
2. Projection: Albers Equal-Area Datum: NAD 1983

Figure 4-27. Simulated and Estimated Predevelopment Water Level Elevation Contours for the Queen City Aquifer (Layer 5)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 7
- Estimated Water Level Elevation Contours for Predevelopment Period
- Simulated Water Level Elevation Contours for Predevelopment Period
- Groundwater Flow Direction

Notes:

1. Contour elevations in feet above mean sea level (feet amsl)
2. Projection: Albers Equal-Area Datum: NAD 1983

Figure 4-28. Simulated and Estimated Predevelopment Water Level Elevation Contours for the Carrizo-Upper Wilcox Aquifer (Layer 7)

Table 4-6 shows the summary for weighted head calibration statistics for the remaining stress periods representing 1980 and 2017 conditions. All residuals are computed as observed minus simulated metrics. Thus, positive residuals indicate that simulated water level elevations are lower than observed while negative residuals indicate that simulated water level elevations are higher than observed. The residual mean of 0.67 is relatively close to zero, indicating a good calibration with simulated water levels only slightly lower than observed. The absolute residual mean was 18.3 feet and the root mean squared error was 29.4 feet with a scaled root mean square error of 3.1 percent. Given the range of water level elevation measurements of 942.5 feet, the residual mean being relatively close to zero and the scaled root mean square error being less than 10 percent indicate a good calibration. Calibration statistics were not computed separately for the steady-state 1980 stress period because 1980 conditions were simulated to provide initial conditions to the transient stress periods and do not reflect 1980 conditions. Specifically, the pumping and recharge values applied would act as surrogates to include storage changes that are not simulated in a steady-state run.

The weighted head calibration statistics are also presented separately for the unconfined (outcrop) and the confined (downdip) targets in Table 4-7. The residual mean for the unconfined targets was 2.19 and for the confined targets was 0.39, indicating simulated water level elevations are slightly lower than observed in both the unconfined and confined areas. The percent errors in the outcrop and downdip areas were 3.5 and 3.3 percent, respectively. The weighted head calibration statistics show the model is well calibrated in both the unconfined and confined areas.

Table 4-8 shows the summary for the weighted head calibration statistics for the 1980 through 2017 simulation period for each model layer. All model layer statistics meet the calibration criteria set forth by TWDB that requires the mean absolute error or root mean square error to be less than 10 percent of the measured hydraulic-head drop across the model area for each model layer. The scaled absolute residual mean is less than 10 percent for all model layers; the scaled root mean square error is less than 10 percent for all layers.

The error statistics are less than 10 percent of the range of observations which is generally considered a reasonably good calibration. This number could not be improved further in a reliable manner, considering all the uncertainties in pumping and water level measurement locations discussed in Sections 3.8, 4.1.1, and 4.2.1, respectively.

Table 4-6. Weighted Calibration Statistics for 1980 to 2017 Simulation

Statistic	Value
Number of targets	2,024
Number of observations	23,815
Range in observed values	942.5
Minimum residual	-373.3
Maximum residual	342.0
Sum of squared residuals	2.1E+07
RMS error	29.4
Residual mean	0.67
Absolute residual mean	18.3
Standard deviation	29.4
Scaled absolute residual mean	1.9%
Scaled standard deviation	3.1%
Scaled RMS error	3.1%

Table 4-7. Weighted Calibration Statistics for 1980 to 2017 Simulation for Unconfined and Confined Wells

Statistic	Unconfined Targets	Confined Targets
Number of targets	404	1,620
Number of observations	3,688	20,127
Range in observed values	571.05	942.5
Minimum residual	-193.5	-373.3
Maximum residual	189.8	342.0
Sum of squared residuals	1.5E+06	1.9E+07
RMS error	19.9	30.9
Residual mean	2.19	0.39
Absolute residual mean	11.8	19.4
Standard deviation	19.8	30.9
Scaled absolute residual mean	2.1%	2.1%
Scaled standard deviation	3.5%	3.3%
Scaled RMS error	3.5%	3.3%

Table 4-8. Weighted Calibration Statistics by Layer for Transient 1980 to 2017 Simulation

Statistic	Layer 3 (Sparta Aquifer)	Layer 5 (Queen City Aquifer)	Layer 7 (Carrizo-Upper Wilcox)	Layer 8 (Middle Wilcox)	Layer 9 (Lower Wilcox)
Number of observations	678	1,605	18,549	1,714	1,269
Range in observed values	401.2	475.4	870.2	826.8	690.1
Residual mean	-4.8	-0.74	0.46	2.39	6.05
Absolute residual mean	11.7	16.7	19.4	10.3	18.2
Standard deviation	23.6	29	30.3	22.3	27.3
RMS error	24.1	29	30.3	22.4	28
Scaled absolute residual mean	2.90%	3.50%	2.20%	1.20%	2.60%
Scaled standard deviation	5.90%	6.10%	3.50%	2.70%	4.00%
Scaled RMS error	6.00%	6.10%	3.50%	2.70%	4.10%

Note:
Layers 1, 3, and 5 (Quaternary Alluvium, Weches Aquitard, and Reklaw Aquitard) do not contain targets.

Figure 4-29 shows the observed versus simulated water level elevation regression plots for the 1980 through 2017 simulation for the entire domain, and Figures 4-30 and 4-31 show these values based on whether the aquifer is confined or unconfined. The results tightly surround the best-fit line with no noticeable bias across the range of observations except for confined water levels in Layer 7 that drop below 100 feet above mean sea level which are not simulated well by the model. These are observations in La Salle County with deep drawdown after 2007 but with little pumping nearby. The unconfined water level elevations generally fall along the 1:1 line, indicating a good match between observed and simulated water level elevations model-wide.

Figures 4-32 through 4-36 show the observed versus simulated water level elevation regression plots for the 1980 through 2017 simulation period for each aquifer layer. These plots cluster closely around the 1:1 line, indicating a good match between observed and simulated values in all layers.

Appendix H tabulates the calibrated simulated water level elevation for each observed data point for all targets and includes the calculated weighted residual value along with additional target data.

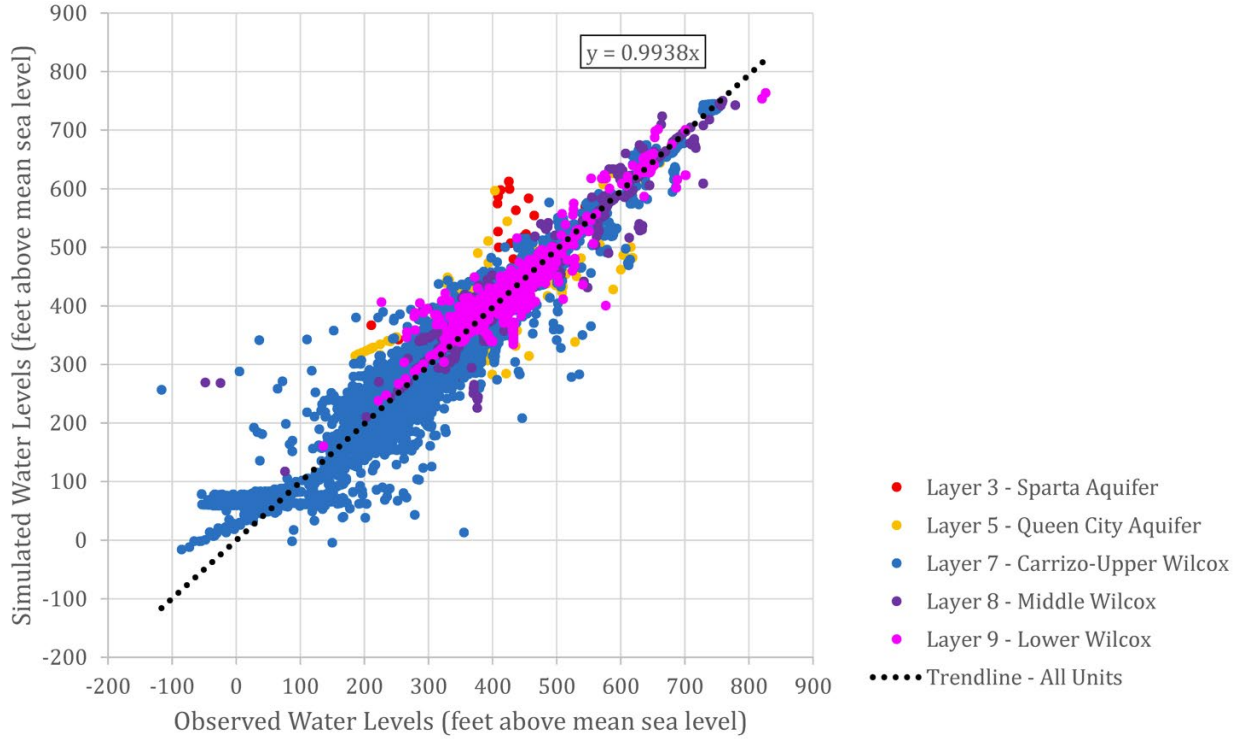


Figure 4-29. Observed versus Simulated Water Level Elevations for Calibrated 1980 to 2017 Simulation

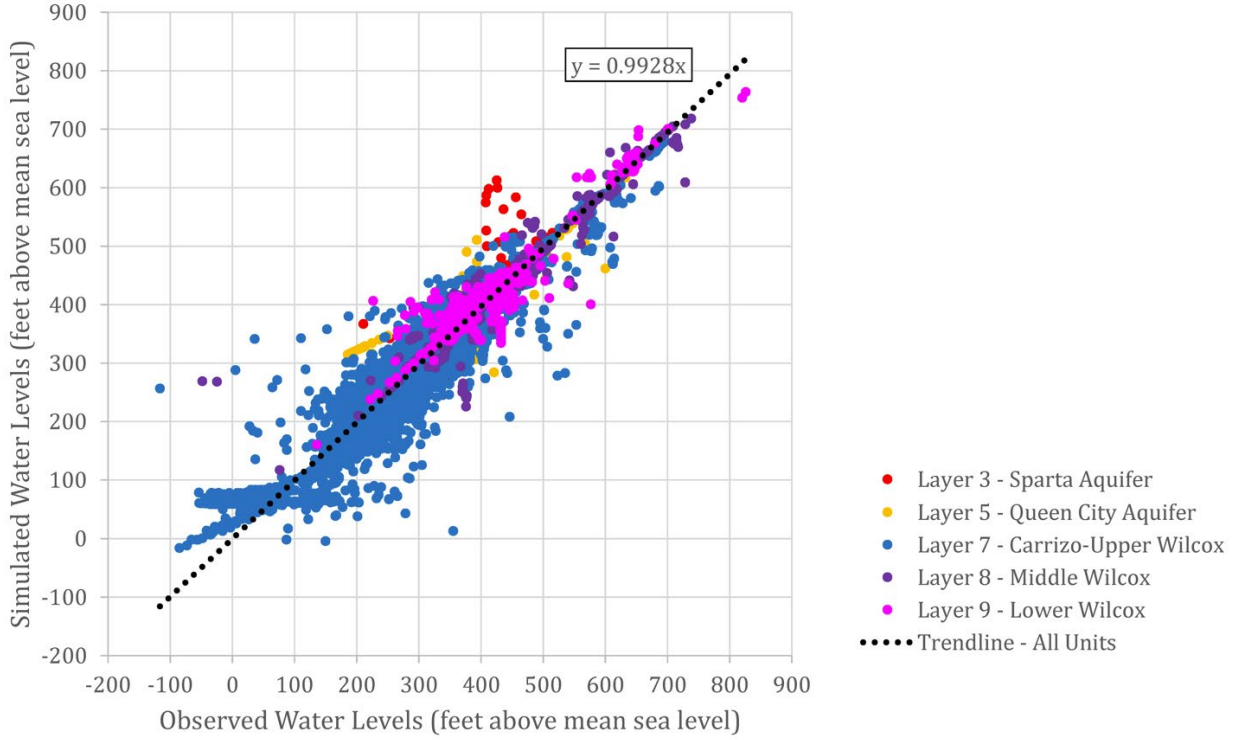


Figure 4-30. Observed versus Simulated Confined Water Level Elevations for Calibrated 1980 to 2017 Simulation

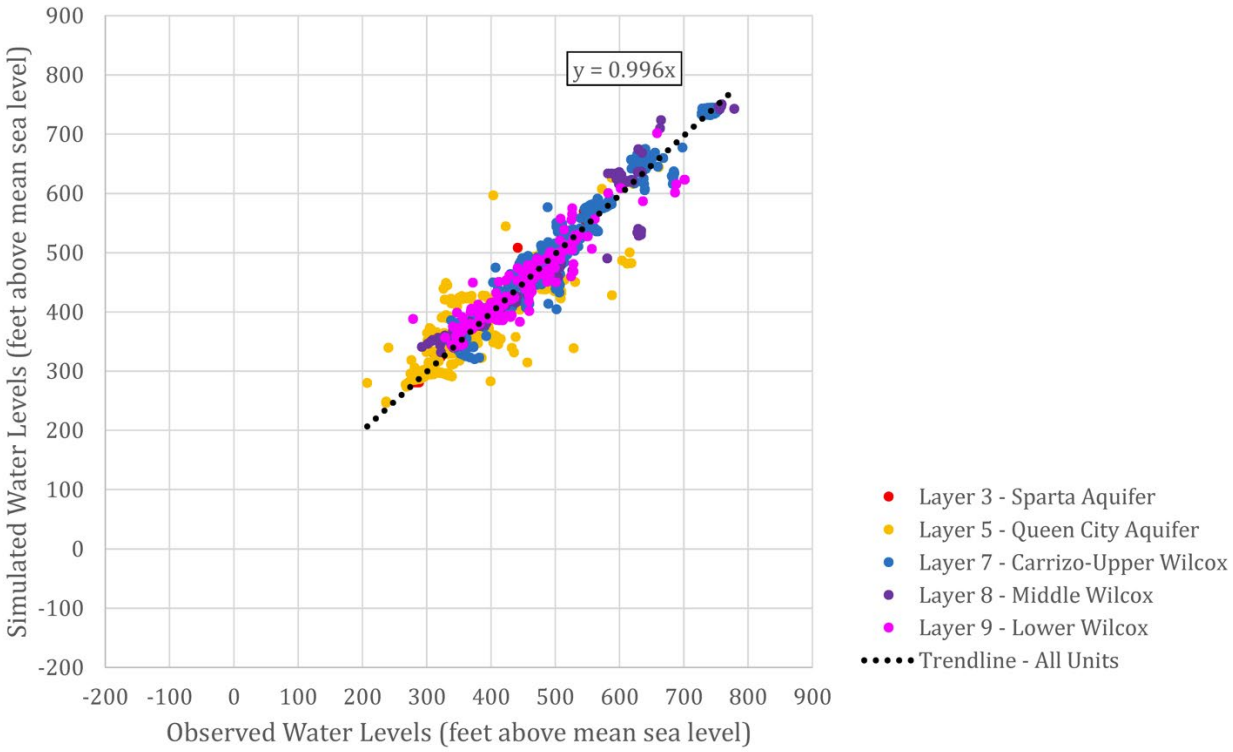


Figure 4-31. Observed versus Simulated Unconfined Water Level Elevations for Calibrated 1980 to 2017 Simulation

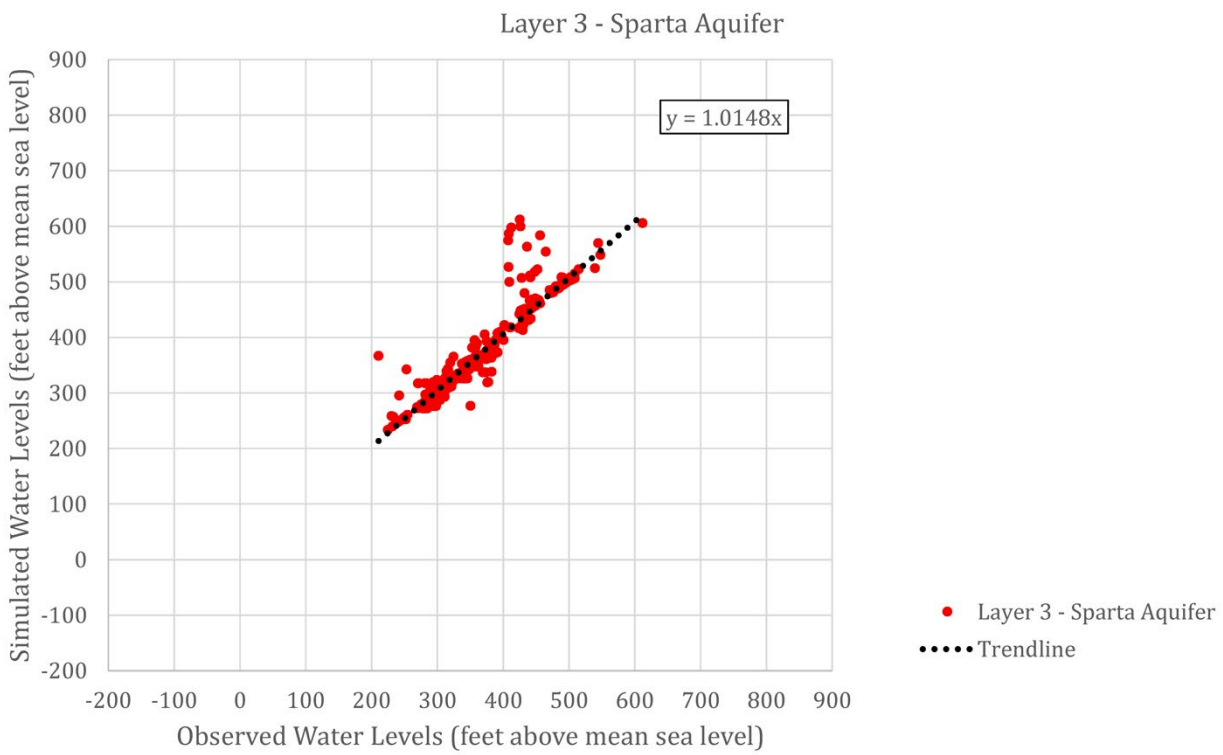


Figure 4-32. Observed versus Simulated Water Level Elevations for Calibrated 1980 to 2017 Simulation for Layer 3

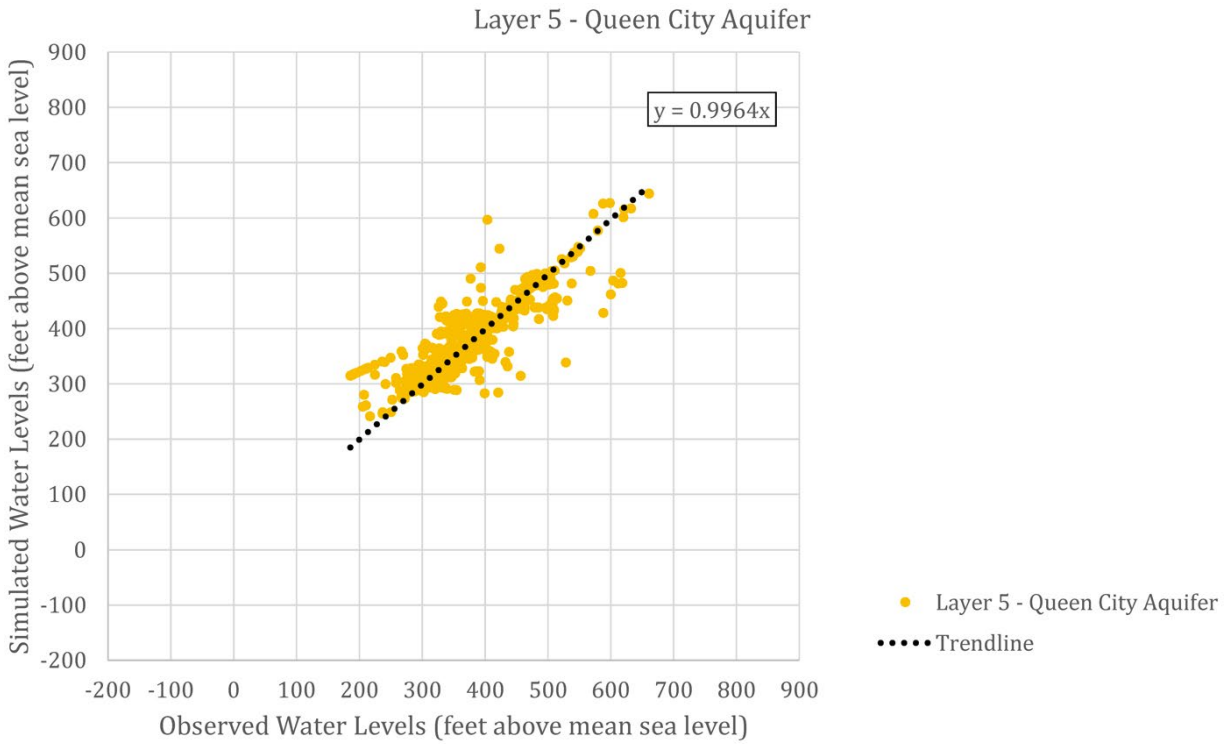


Figure 4-33. Observed versus Simulated Water Level Elevations for Calibrated 1980 to 2017 Simulation for Layer 5

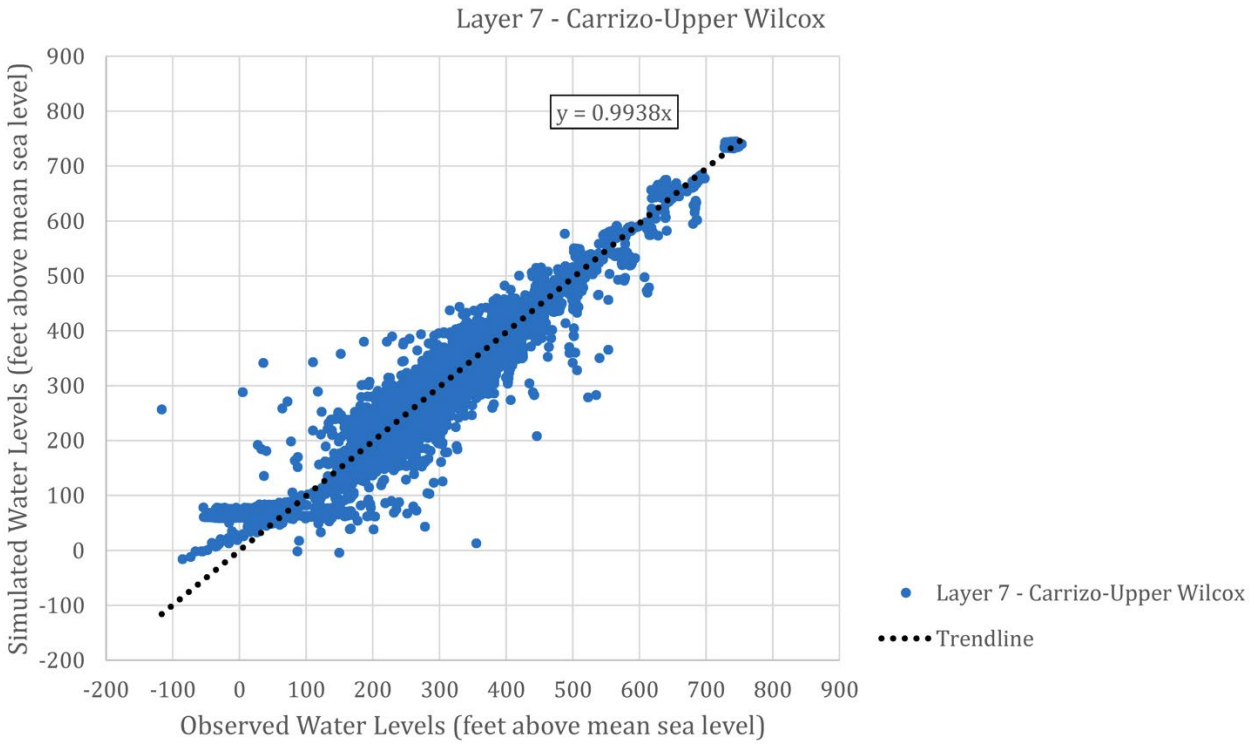


Figure 4-34. Observed versus Simulated Water Level Elevations for Calibrated 1980 to 2017 Simulation for Layer 7

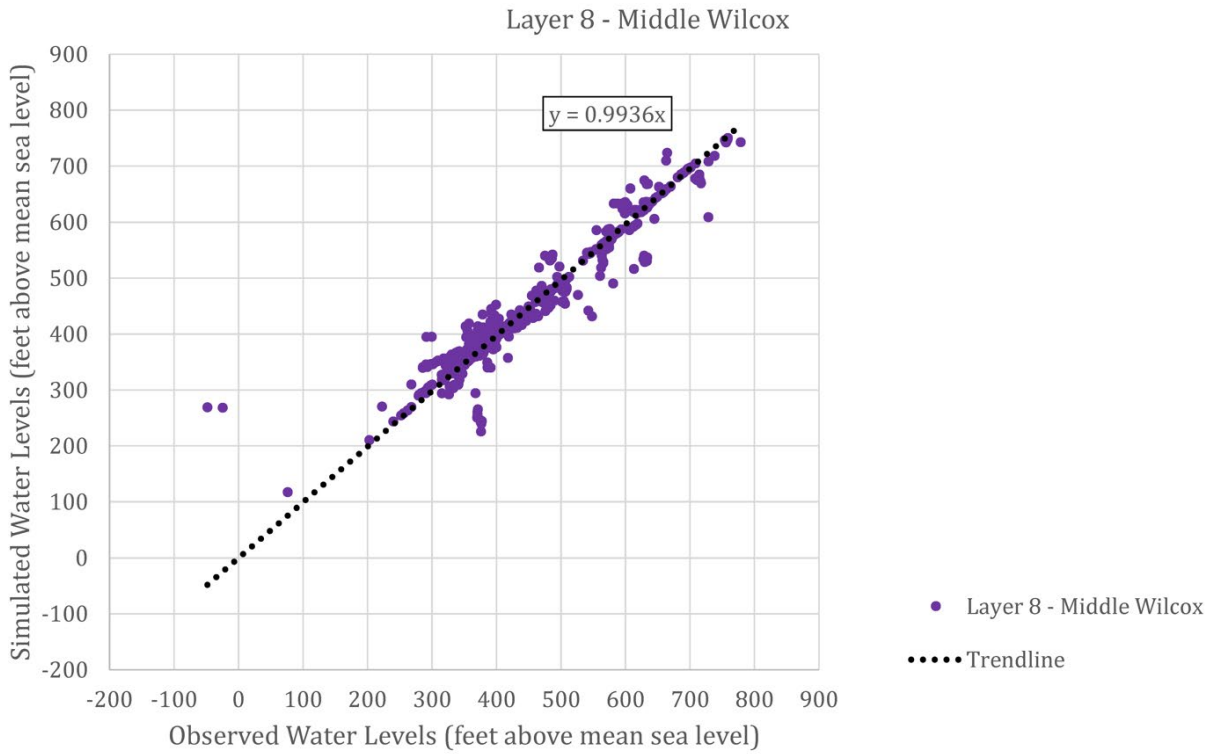


Figure 4-35. Observed versus Simulated Water Level Elevations for Calibrated 1980 to 2017 Simulation for Layer 8

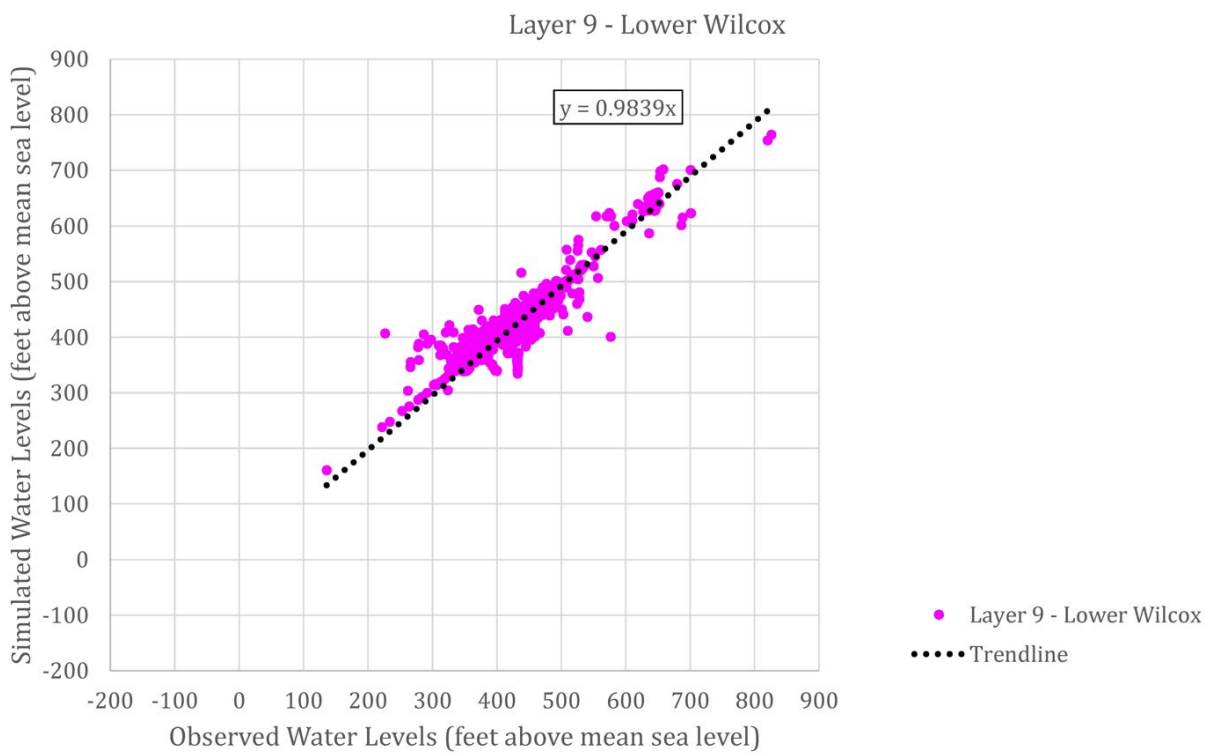


Figure 4-36. Observed versus Simulated Water Level Elevations for Calibrated 1980 to 2017 Simulation for Layer 9

4.2.3 Spatial Distribution and Frequency of Residuals

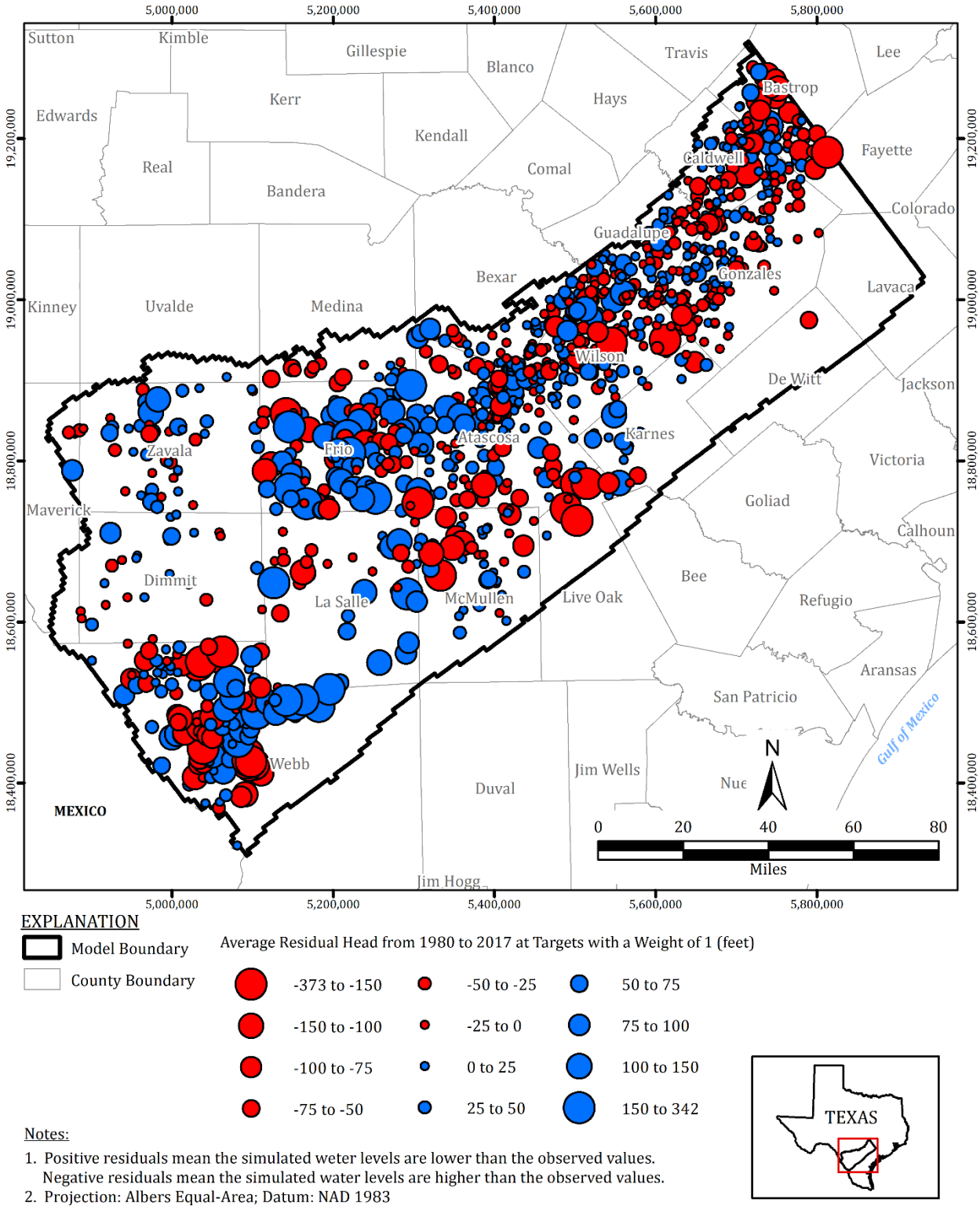
The spatial distribution of head residuals for the 1980 through 2017 simulation period is shown for target wells without quality control issues on Figure 4-37. The figure plots 1,170 target wells with a weight of 1 from the 2,024 total targets used for model calibration. Residual values are an average of residuals from 1980 through 2017 at that well.

Consistent with the calibration statistics (Table 4-6), Figure 4-37 shows that residuals range from approximately -373 to 342 feet across the model for targets with weights of 1 (those with no quality control issues). However, consistent with the calibration statistics, the residuals tend to be small across the model domain. Slightly larger errors occur more frequently in the southern portion of the model domain with clusters of larger residuals in Frio, McMullen, and Webb counties. Finer resolution on aquifer parameter heterogeneity or more accurate pumping values might improve the calibration in these counties, especially as some of these counties had pumping discrepancies compared to recorded groundwater elevations which necessitated pumping simulation modifications as discussed in Section 4.1.1. In general, however, negative and positive residuals are evenly distributed across the model domain with no noticeable bias.

Figure 4-38 through 4-42 present the average weighted residuals for all target wells (with and without weights, where weights used are 1, 0.5, and 0.1) in each aquifer layer. The residuals are scaled by the target weight to include the impact of data uncertainty. A negative residual indicates that simulated water level elevations are greater than observed and a positive residual indicates that simulated water level elevations are lower than observed.

In general, negative and positive residuals are evenly distributed across the model domain in each aquifer. Exceptions include large negative residuals clustered in the southwest end of the Sparta Aquifer (Figure 4-38) and large positive residuals clustered in the western portion of Frio County in the Queen City Aquifer (Figure 4-39). The model layers appeared generally consistent in their range of residual values; no layer appeared to have greater errors. The calibration statistics by layer (Table 4-8) show scaled root mean square errors were very similar across model layers and ranged from 2.7 to 6.1 percent; the Carrizo-Upper Wilcox, which has the largest portion of target data, has a scaled root mean square error of 3.5 percent. These residual statistics indicate a good calibration. The layer residuals figures show that Frio and Webb counties in the Queen City Aquifer and Atascosa, Frio, La Salle, McMullen, and Webb counties in the Carrizo-Upper Wilcox would benefit from more reliable water level data, better well construction information, and more accurate pumping information for improved calibration.

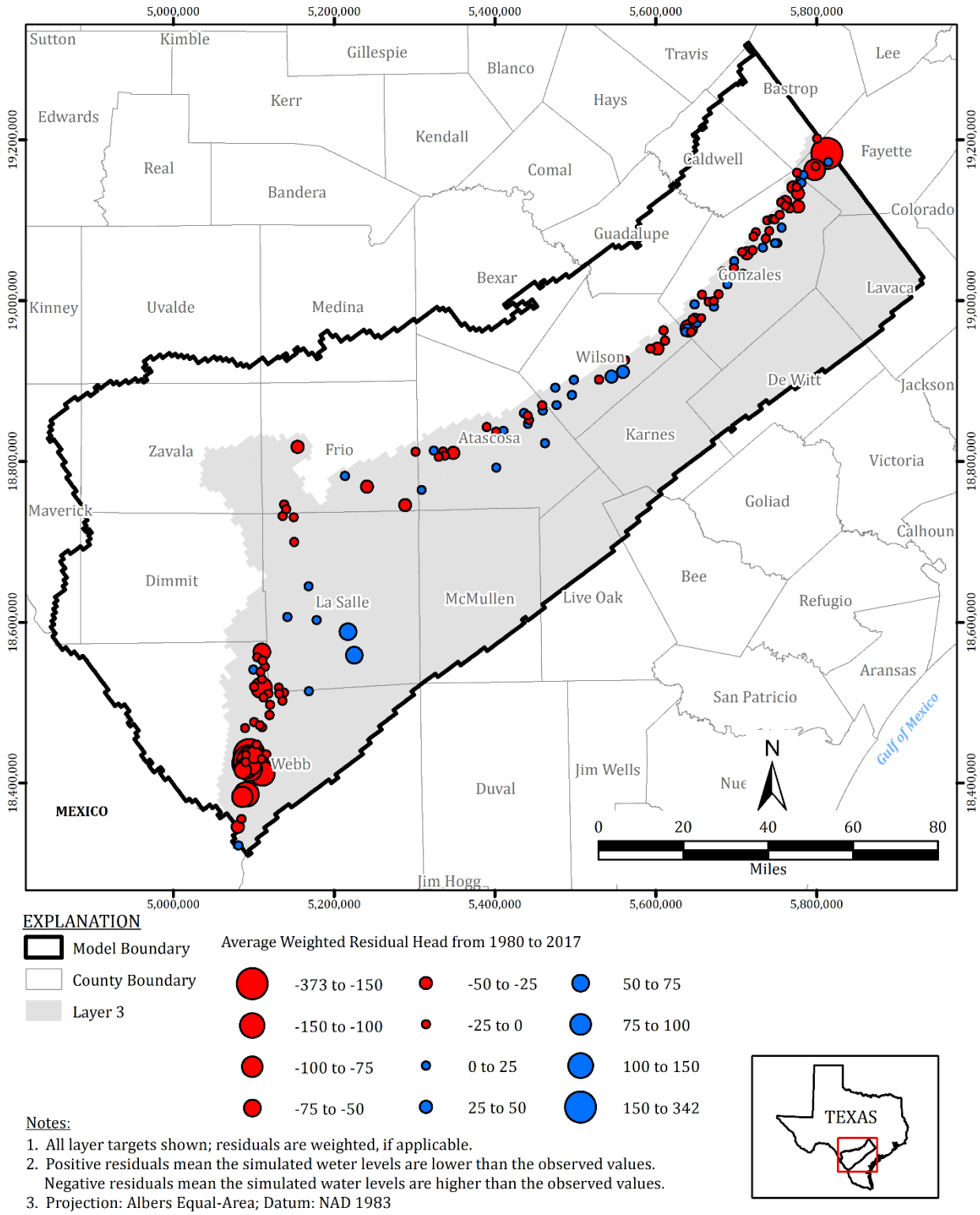
Figures 4-43 through 4-45 show the frequency of residual values by model aquifer layer (layers 3, 5, 7, 8, and 9). Residuals cluster around a value of zero in each aquifer layer. The Carrizo-Upper Wilcox Aquifer (model layer 7) has more water level elevation data and also showed more spread in residual values than the rest of the layers, but no noticeable bias towards high or low residuals. Appendix H compares the final simulated water level elevation to each observed data point for all targets and includes the calculated weighted residual value along with additional target data.



Notes:

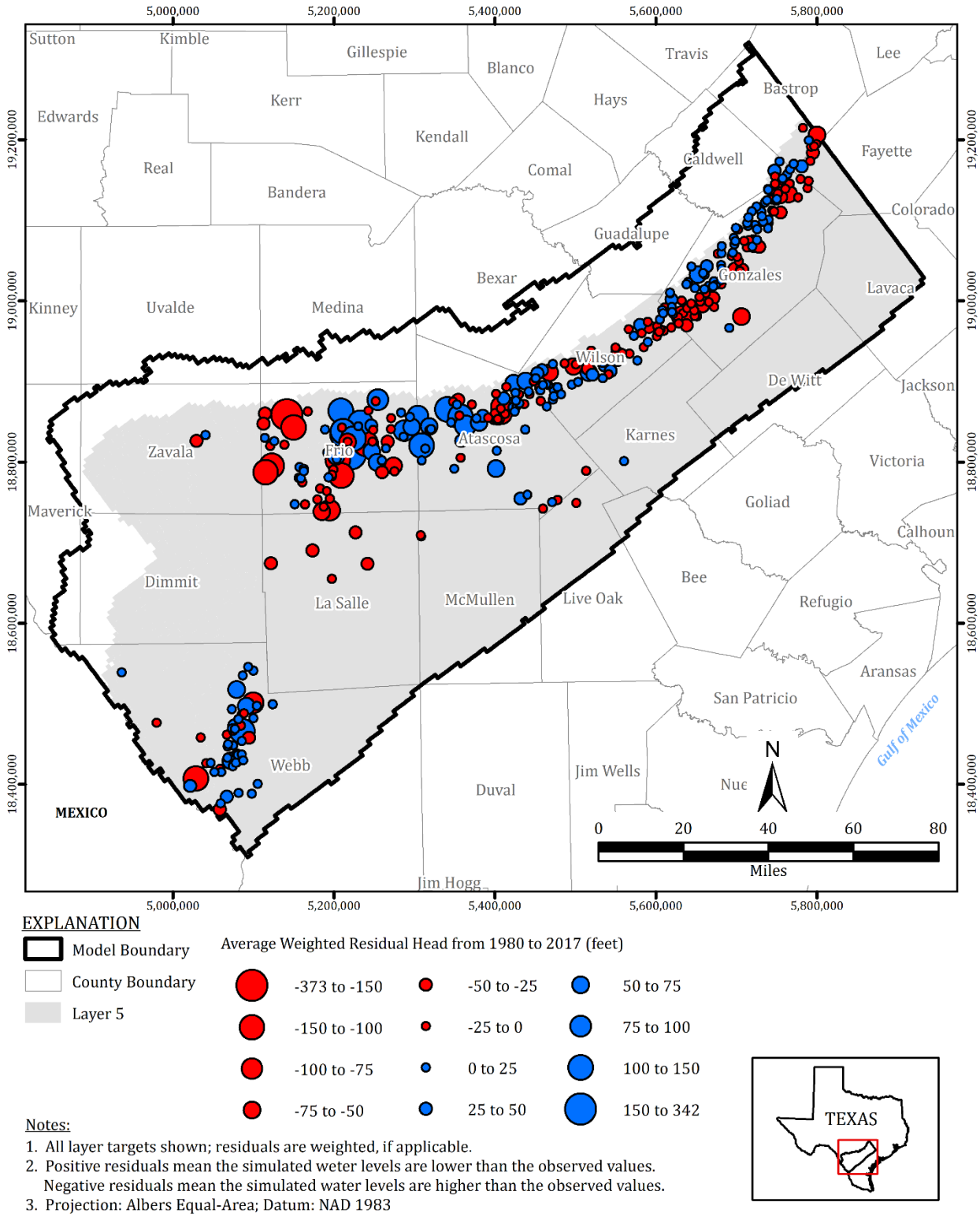
1. Positive residuals mean the simulated weter levels are lower than the observed values. Negative residuals mean the simulated water levels are higher than the observed values.
2. Projection: Albers Equal-Area; Datum: NAD 1983

Figure 4-37. Distribution of Water Level Elevation Errors for Calibrated 1980 to 2017 Simulation at Weight = 1



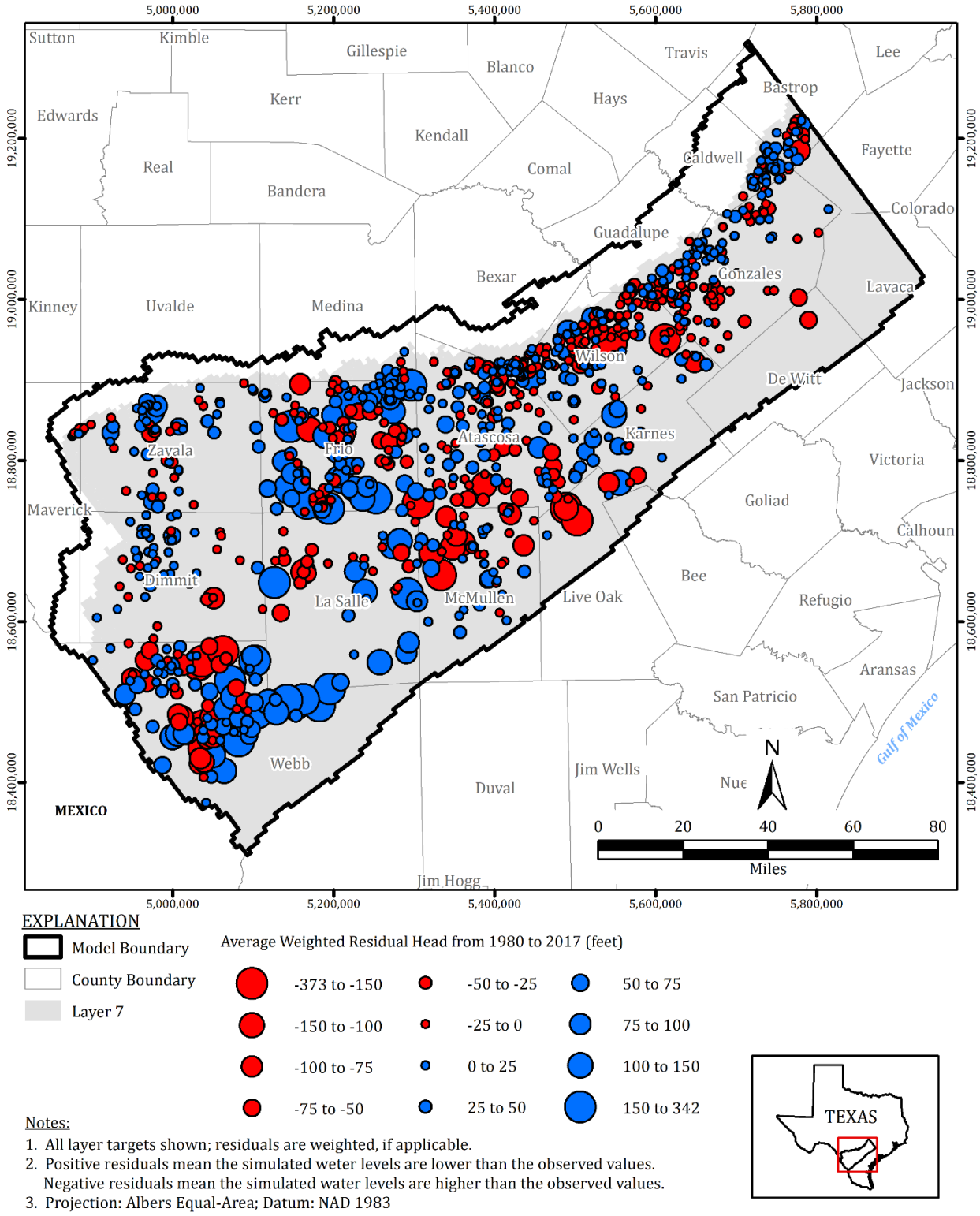
Notes:
1. All layer targets shown; residuals are weighted, if applicable.
2. Positive residuals mean the simulated weter levels are lower than the observed values. Negative residuals mean the simulated water levels are higher than the observed values.
3. Projection: Albers Equal-Area; Datum: NAD 1983

Figure 4-38. Distribution of Weighted Water Level Elevation Errors for Calibrated 1980 to 2017 Simulation in Sparta Aquifer (Layer 3)



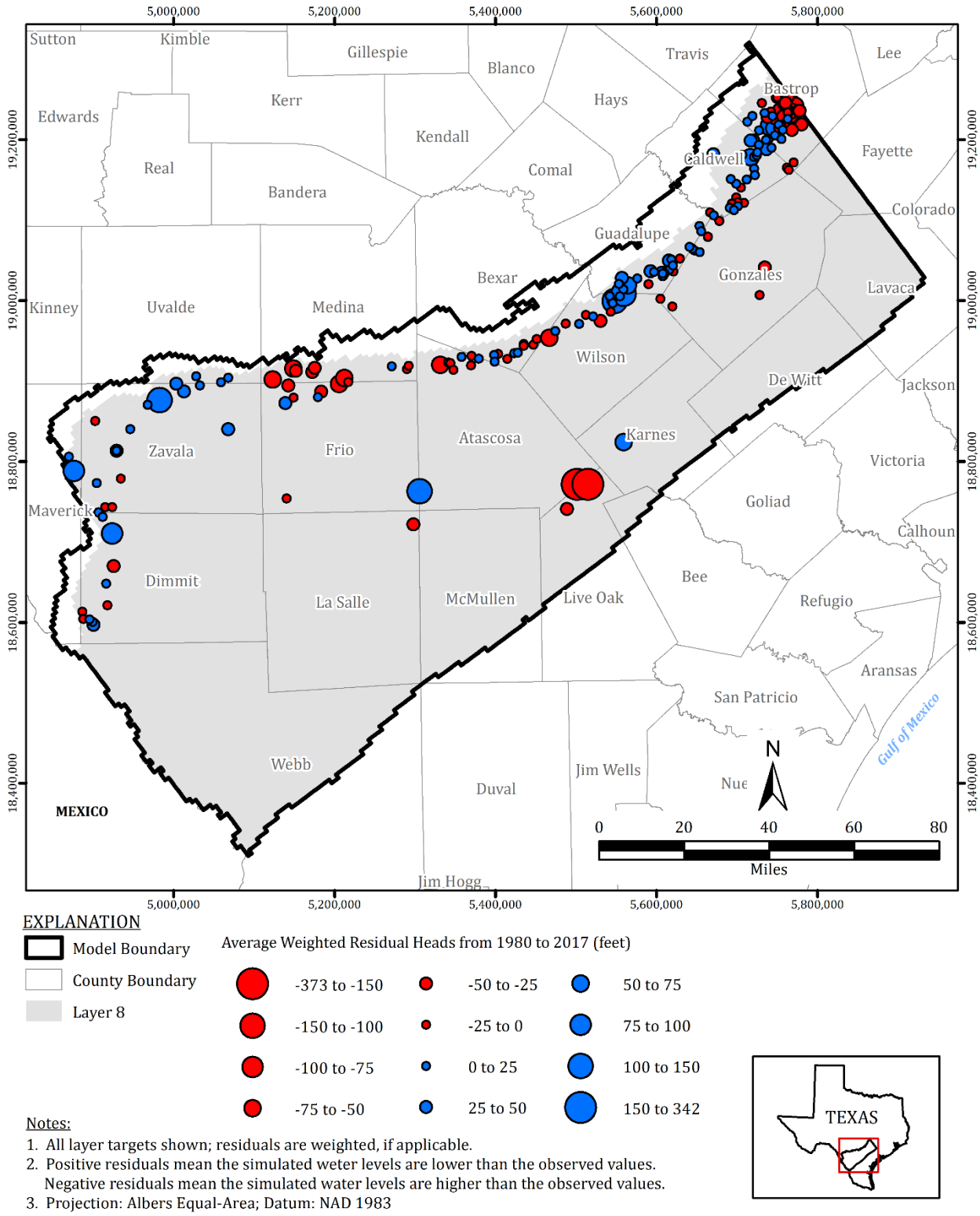
Notes:
1. All layer targets shown; residuals are weighted, if applicable.
2. Positive residuals mean the simulated weter levels are lower than the observed values. Negative residuals mean the simulated water levels are higher than the observed values.
3. Projection: Albers Equal-Area; Datum: NAD 1983

Figure 4-39. Distribution of Weighted Water Level Elevation Errors for Calibrated 1980 to 2017 Simulation in Queen City Aquifer (Layer 5)



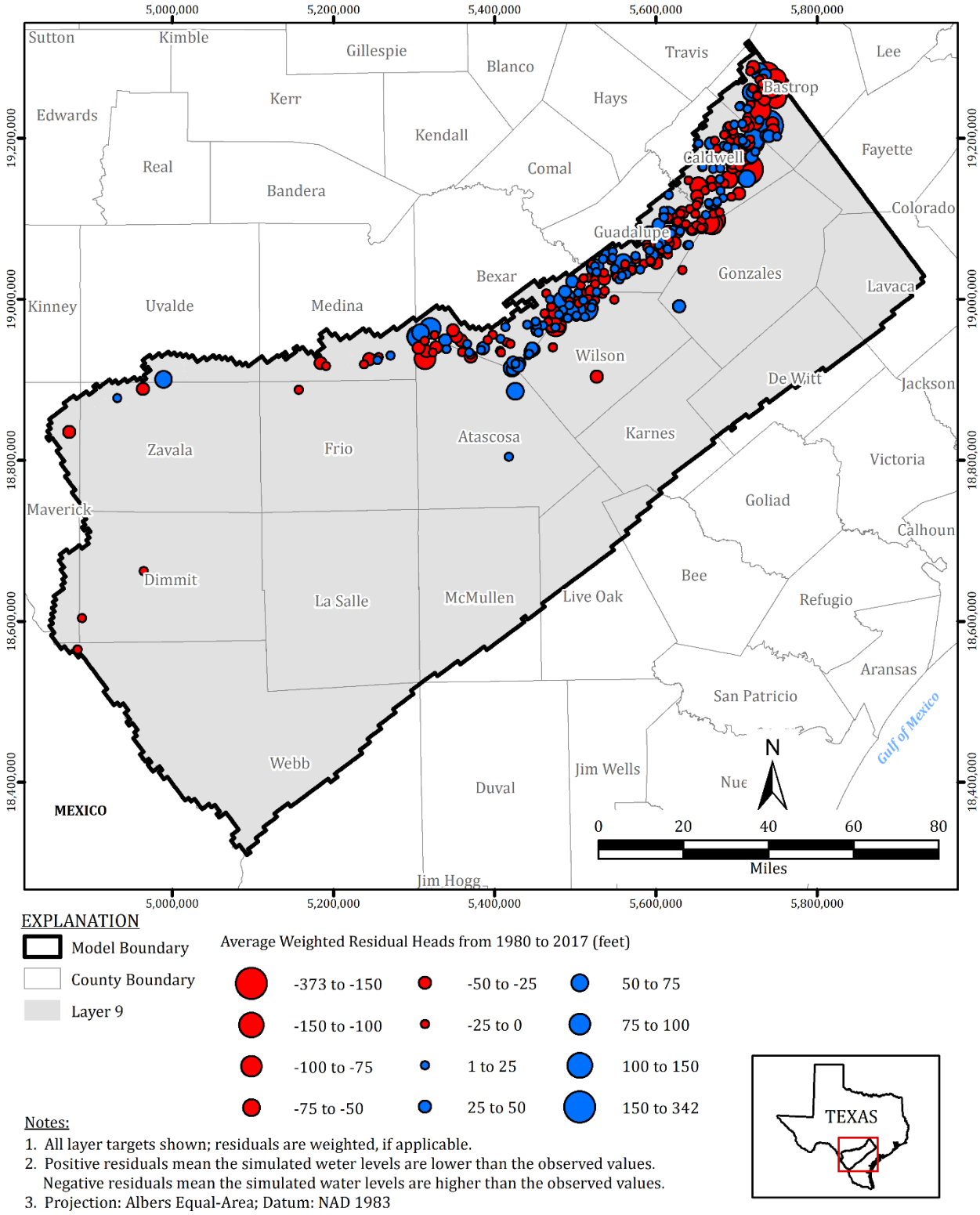
Notes:
1. All layer targets shown; residuals are weighted, if applicable.
2. Positive residuals mean the simulated weter levels are lower than the observed values. Negative residuals mean the simulated water levels are higher than the observed values.
3. Projection: Albers Equal-Area; Datum: NAD 1983

Figure 4-40. Distribution of Weighted Water Level Elevation Errors for Calibrated 1980 to 2017 Simulation in Carrizo-Upper Wilcox (Layer 7)



Notes:
1. All layer targets shown; residuals are weighted, if applicable.
2. Positive residuals mean the simulated weter levels are lower than the observed values. Negative residuals mean the simulated water levels are higher than the observed values.
3. Projection: Albers Equal-Area; Datum: NAD 1983

Figure 4-41. Distribution of Weighted Water Level Elevation Errors for Calibrated 1980 to 2017 Simulation in Middle Wilcox (Layer 8)



Notes:
1. All layer targets shown; residuals are weighted, if applicable.
2. Positive residuals mean the simulated weter levels are lower than the observed values. Negative residuals mean the simulated water levels are higher than the observed values.
3. Projection: Albers Equal-Area; Datum: NAD 1983

Figure 4-42. Distribution of Weighted Water Level Elevation Errors for Calibrated 1980 to 2017 Simulation in Lower Wilcox (Layer 9)

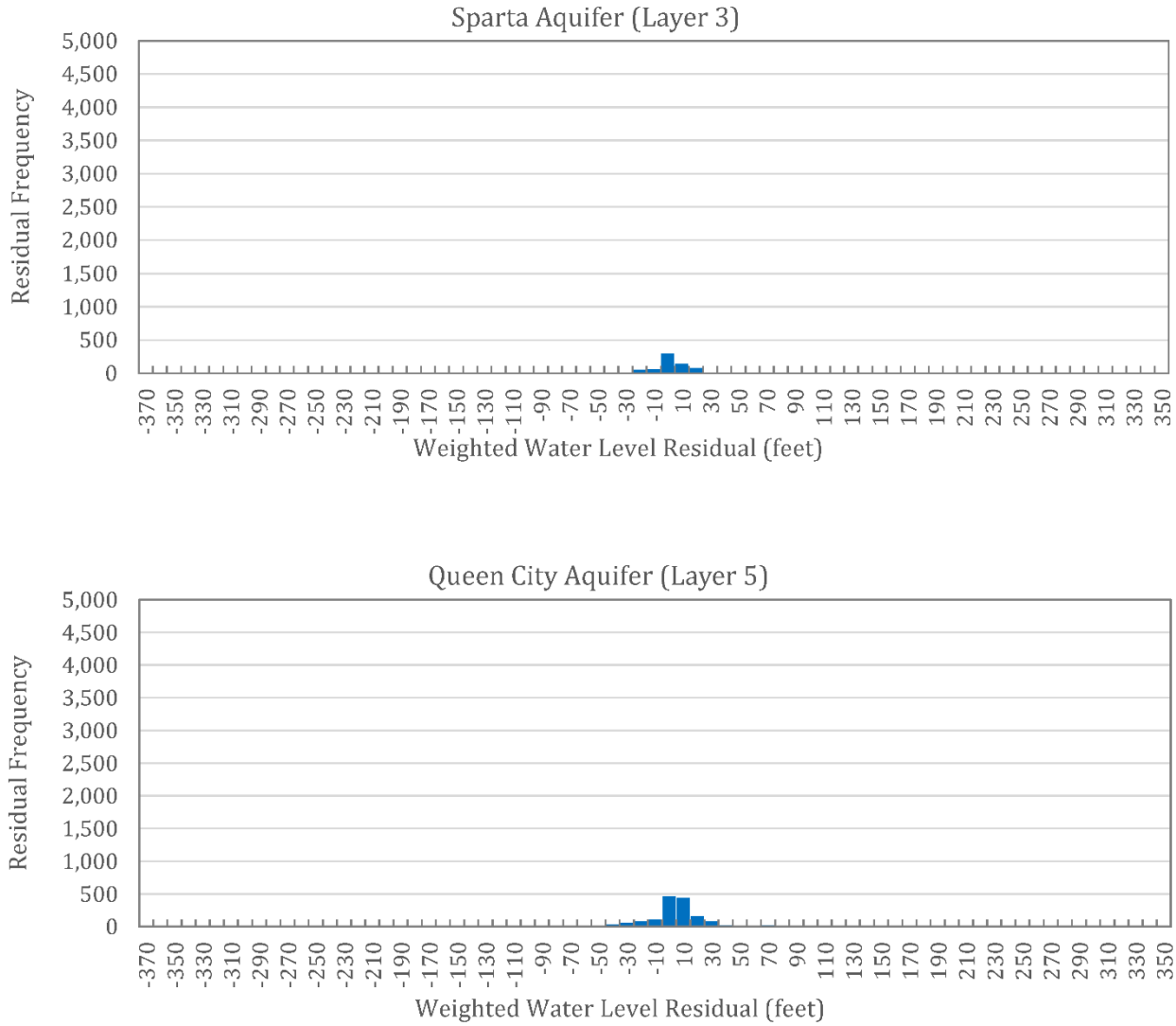


Figure 4-43. Histograms of Weighted Water Level Elevation Residuals in Model Layers 3 and 5

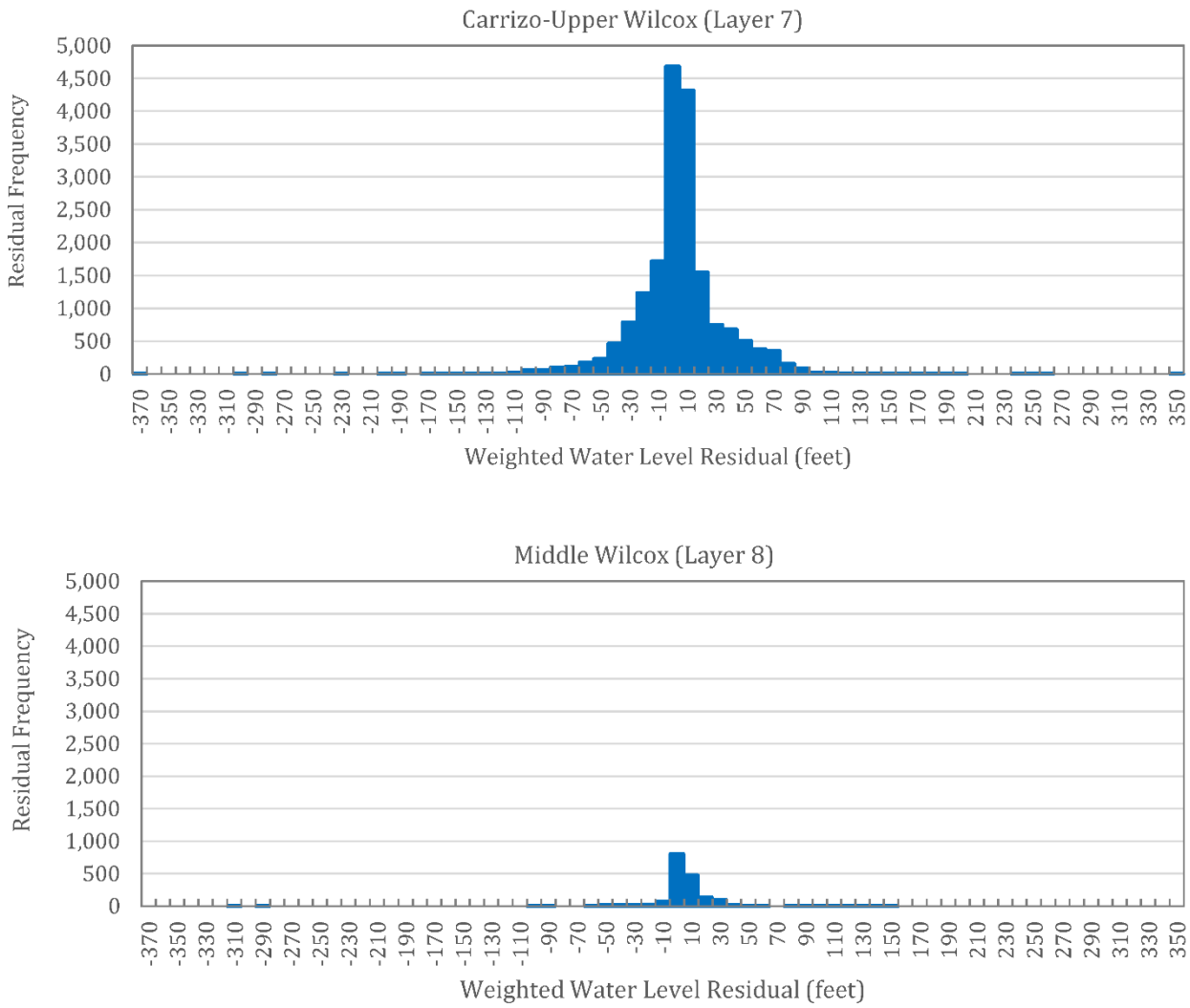


Figure 4-44. Histograms of Weighted Water Level Elevation Residuals in Model Layers 7 and 8

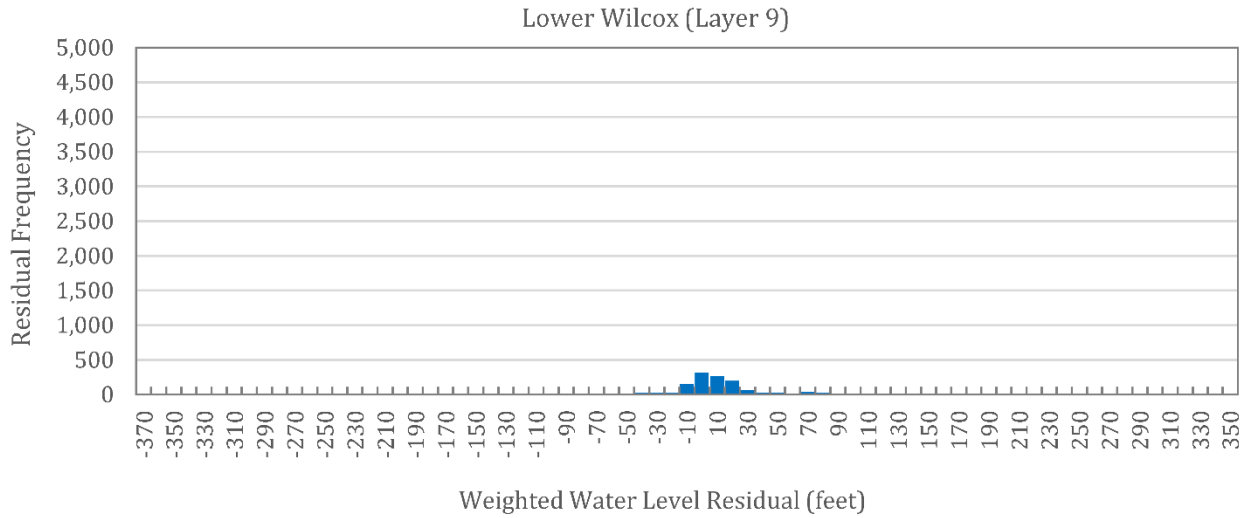


Figure 4-45. Histograms of Weighted Water Level Elevation Residuals in Model Layer 9

4.2.4 Water Level Hydrographs

Figures 4-46 through 4-50 show the observed and simulated hydrographs for select wells with observations spanning the simulation period from 1980 through 2017 within the various aquifer units.

Simulated water level elevations in the Sparta Aquifer (model layer 3) are higher and lower compared to observed, depending on the location as seen on Figure 4-38. However, at target wells with longer records, shown on Figure 4-46, the simulation tended to be similar to or slightly lower than measured water level elevations. Simulated fluctuations tend to be smaller than observed. Simulated water level elevations in the Queen City Aquifer (model layer 5) are shown on Figure 4-47 and they generally match observed trends. Simulated fluctuations are of similar magnitude or larger than observed in this dataset.

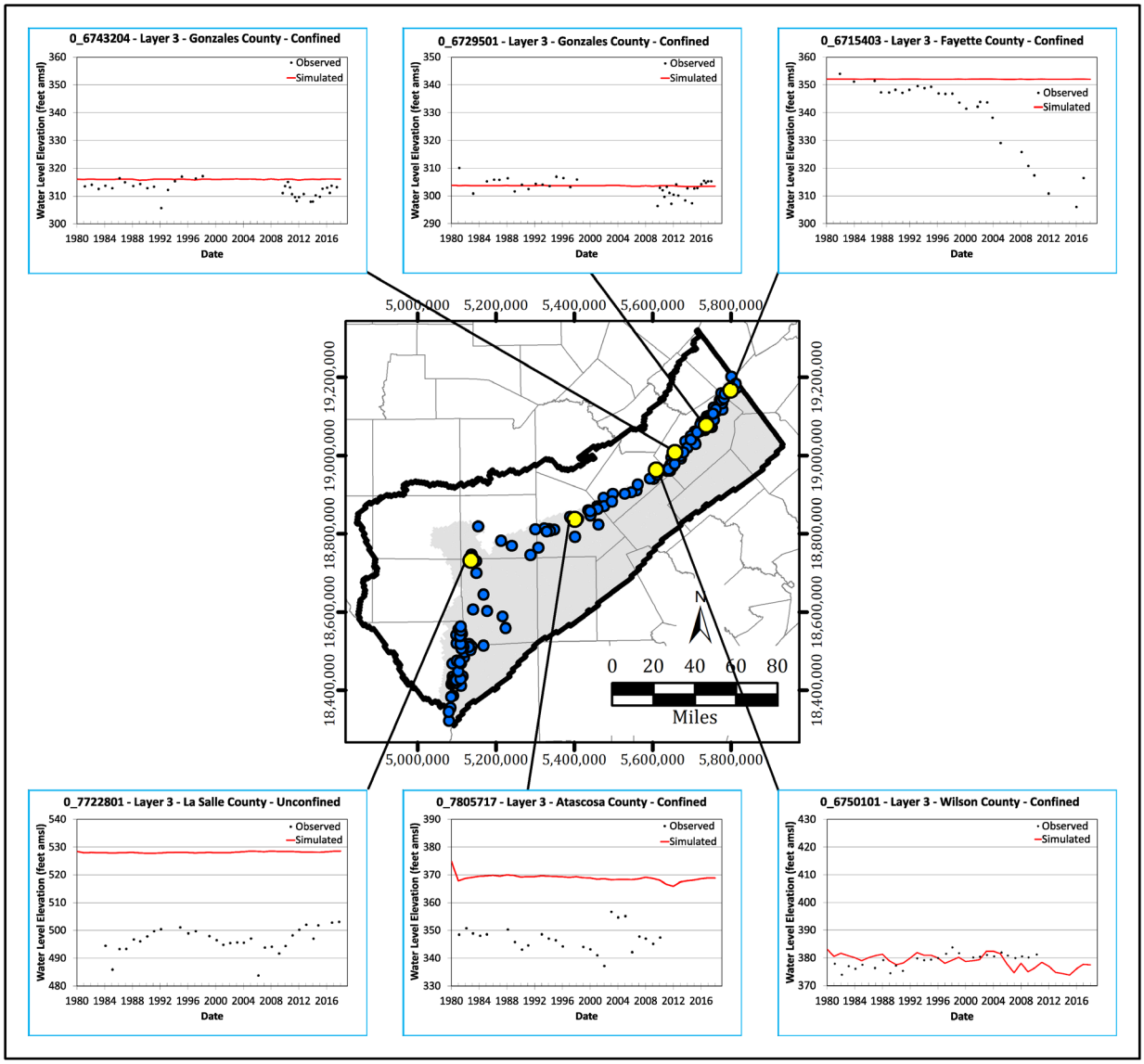
Simulated water level elevations in the Carrizo-Upper Wilcox (model layer 7) generally match observed water level elevations and trends as seen on Figure 4-48. In the western portion of layer 7, hydrographs in Zavala, Dimmit, Frio, and La Salle counties show distinctive decreasing trends of varying amplitudes across a large area (showing decreasing water levels by about 300 feet in La Salle County) and this has been generally captured by the model. Elsewhere in layer 7, water levels appear to be relatively stable throughout the simulation period (Atascosa and Gonzales counties). Water level elevations across the layer show strong seasonal fluctuations, even while trending downwards in the western counties, which are not captured by the model with annual stress periods. Although residuals were generally small across the Carrizo-Upper Wilcox, a better definition of pumping changes through time in this layer would help to better match the observed water levels changes during the simulation period.

Simulated water level elevations in the Middle Wilcox (model layer 8) (Figure 4-49) generally match well with observed water level elevations trends although the simulated water level elevations tend to be higher than observed in the eastern portion of the model. In Gonzales County, observed water levels trend downwards towards the end of the model period; simulated water levels were able to capture this trend.

Simulated water level elevations in the Lower Wilcox (model layer 9) generally match well with observed water level elevations trends but may be higher than observed at some wells and lower in others, as shown on Figure 4-50. Simulated fluctuations are generally similar to or greater than observed fluctuations. The observed water level elevations in Guadalupe County show a decreasing trend not simulated by the model, but this may reflect a localized effect rather than a regional trend.

Appendix I provides water level hydrographs for all target wells, showing simulated water level elevations and observed water level elevations for 2,024 target wells. Hydrographs are grouped by county then model layer. Overall, the final simulated water level measurements, on average, closely match the measurements for most of the target wells shown. Though the final simulated water level measurements are higher or lower than the measurements at some locations, the general shape of the response is consistent. Also, as

noted from Figures 4-37 through 4-42, the higher and lower water levels are mixed throughout the domain without significant location bias.



EXPLANATION

- Model Boundary
- County Boundary
- Layer 3
- Layer 3 Targets
- Select Layer 3 Targets

Chart Name

Well Name - Layer - County - Aquifer Type

Chart Legend

- Observed Water Level
- Simulated Water Level

Chart Outline Color for Y-Axis Range

- Y-Axis = 60 feet

Note:

1. Projection: Albers Equal-Area
   Datum: NAD 1983

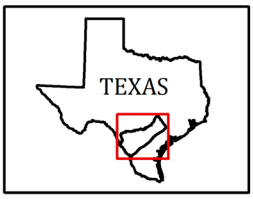
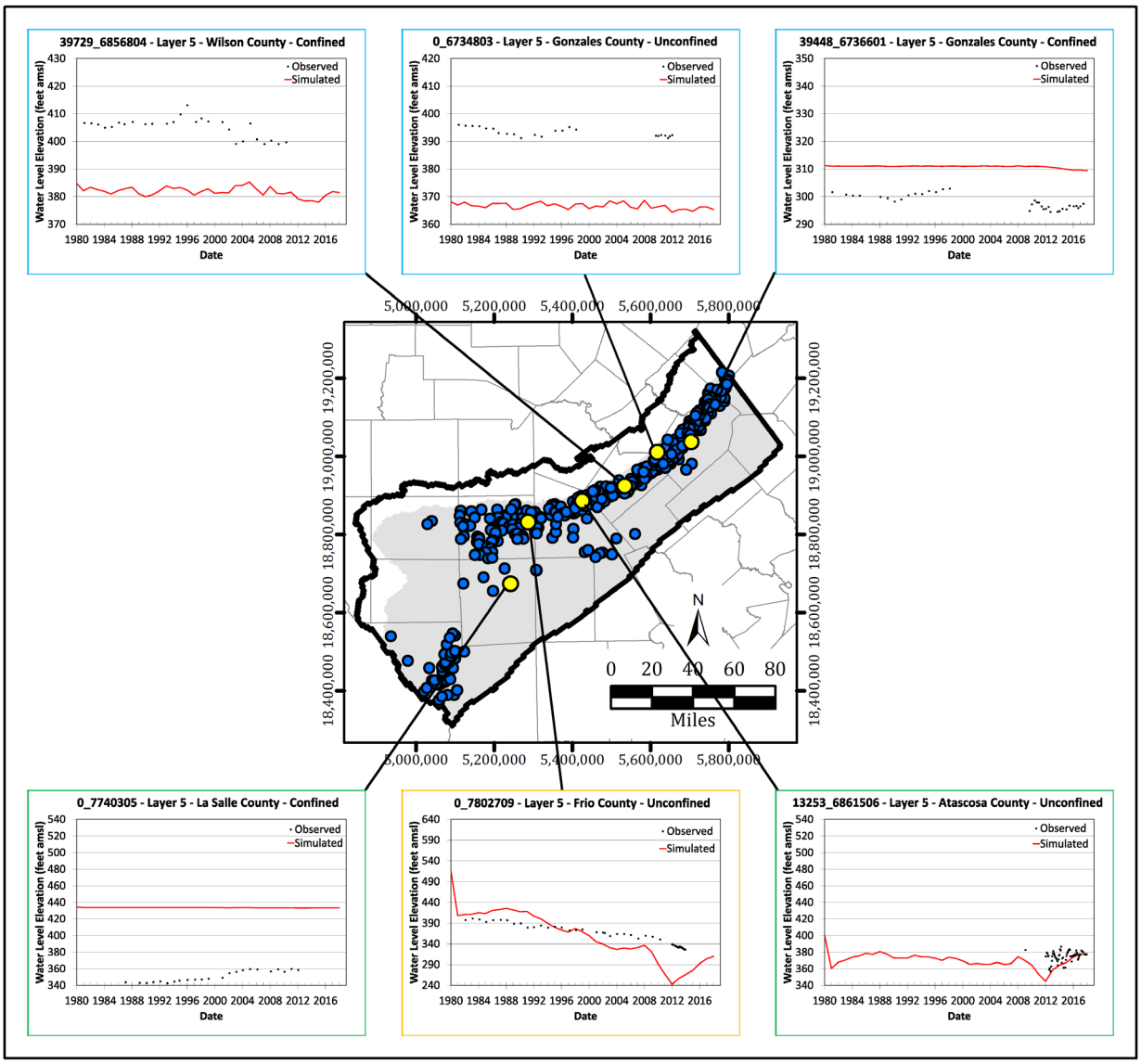


Figure 4-46. Measured and Simulated Water Level Elevation Hydrographs for Select Wells, Sparta Aquifer (Layer 3)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 5
- Layer 5 Targets
- Select Layer 5 Targets

Chart Name

Well Name - Layer - County - Aquifer Type

Chart Legend

- Observed Water Level
- Simulated Water Level

Chart Outline Color for Y-Axis Range

- Y-Axis = 400 feet
- Y-Axis = 200 feet
- Y-Axis = 60 feet

Note:

1. Projection: Albers Equal-Area
   Datum: NAD 1983

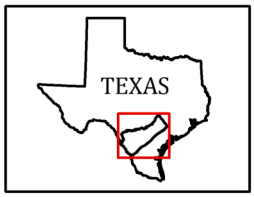
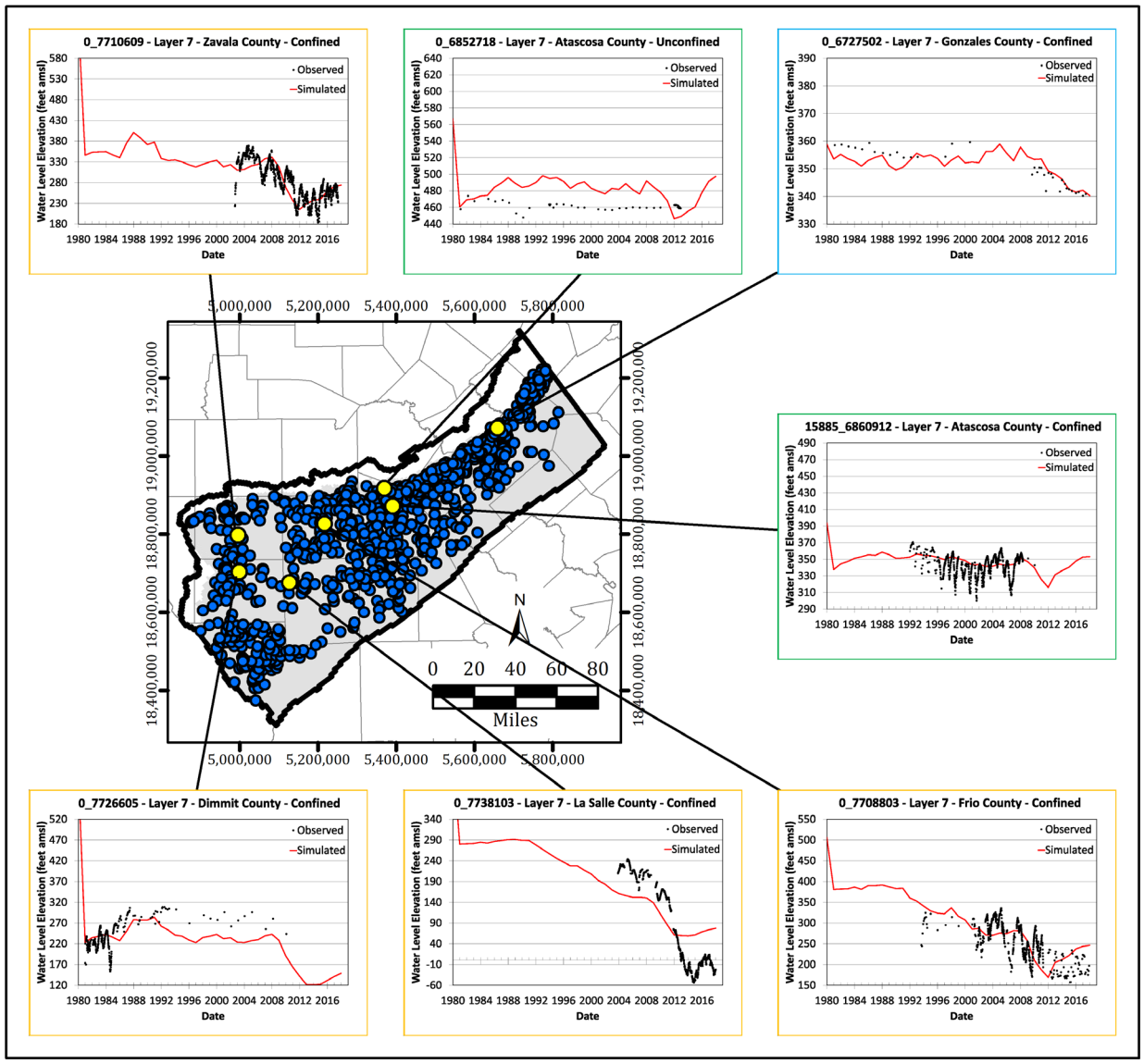


Figure 4-47. Measured and Simulated Water Level Elevation Hydrographs for Select Wells, Queen City Aquifer (Layer 5)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 7
- Layer 7 Targets
- Select Layer 7 Targets

Chart Name

Well Name - Layer - County - Aquifer Type

Chart Legend

- Observed Water Level
- Simulated Water Level

Chart Outline Color for Y-Axis Range

- Y-Axis = 400 feet
- Y-Axis = 200 feet
- Y-Axis = 60 feet

Note:

1. Projection: Albers Equal-Area
   Datum: NAD 1983

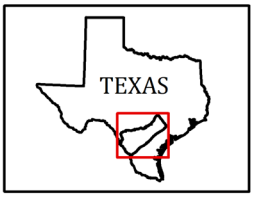
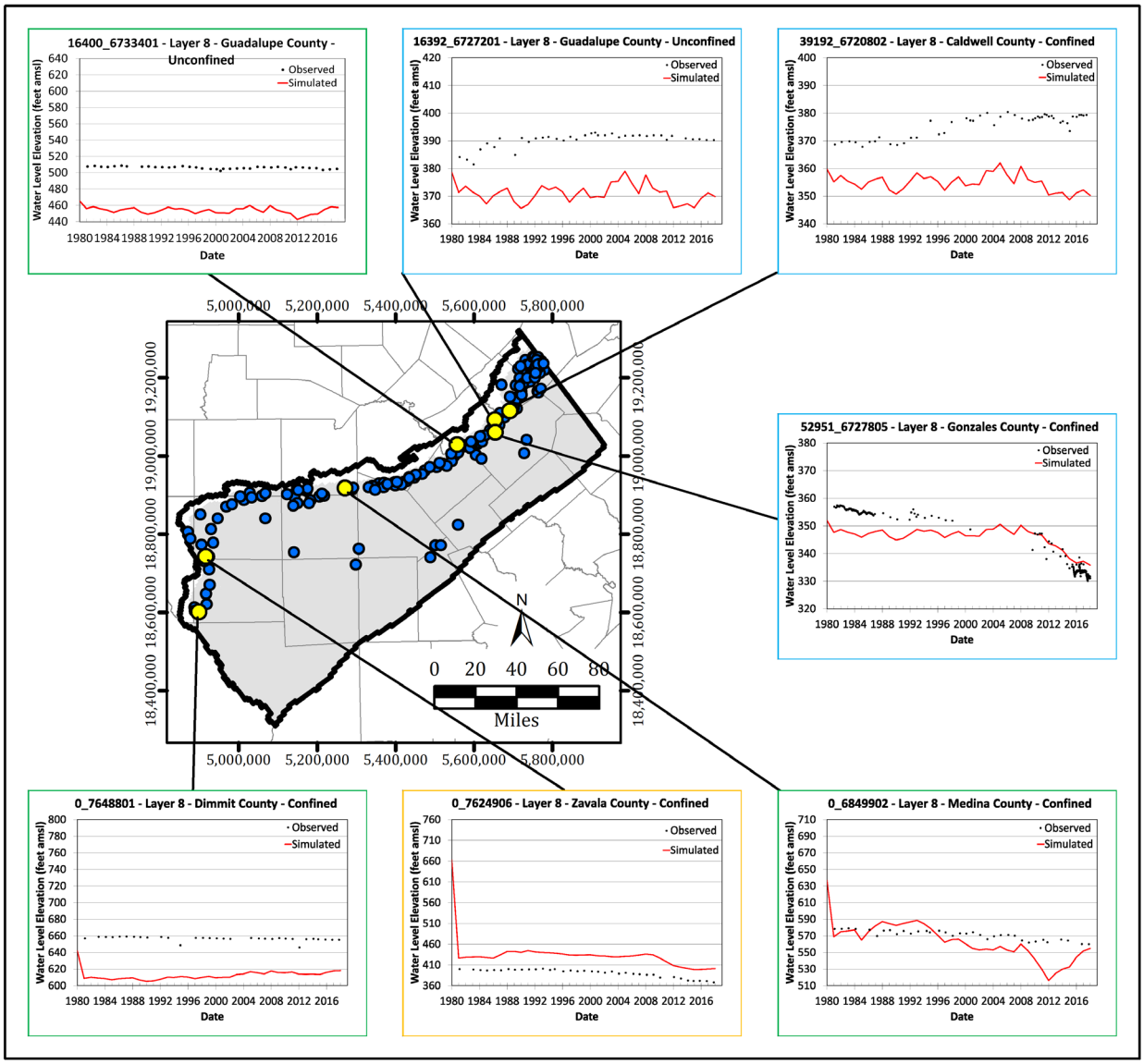


Figure 4-48. Measured and Simulated Water Level Elevation Hydrographs for Select Wells, Carrizo-Upper Wilcox (Layer 7)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 8
- Layer 8 Targets
- Select Layer 8 Targets

Chart Name

Well Name - Layer - County - Aquifer Type

Chart Legend

- Observed Water Level
- Simulated Water Level

Chart Outline Color for Y-Axis Range

- Y-Axis = 400 feet
- Y-Axis = 200 feet
- Y-Axis = 60 feet

Note:

1. Projection: Albers Equal-Area
   Datum: NAD 1983

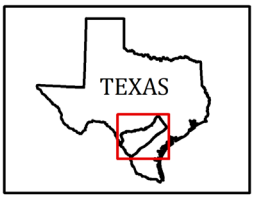
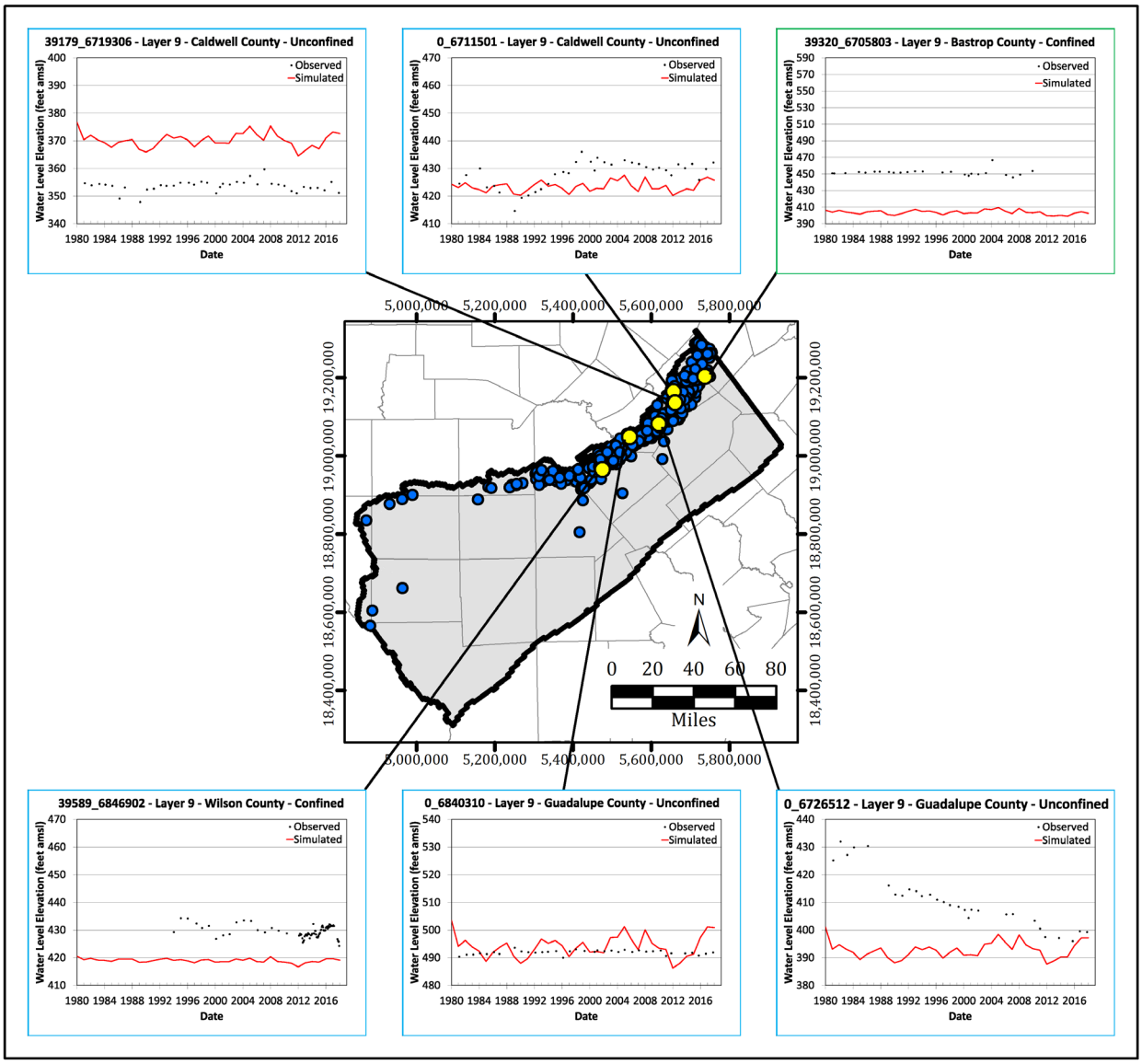


Figure 4-49. Measured and Simulated Water Level Elevation Hydrographs for Select Wells, Middle Wilcox (Layer 8)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 9
- Layer 9 Targets
- Select Layer 9 Targets

Chart Name

Well Name - Layer - County - Aquifer Type

Chart Legend

- Observed Water Level
- Simulated Water Level

Chart Outline Color for Y-Axis Range

- Y-Axis = 60 feet
- Y-Axis = 200 feet

Note:

1. Projection: Albers Equal-Area
   Datum: NAD 1983

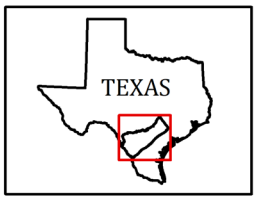


Figure 4-50. Measured and Simulated Water Level Elevation Hydrographs for Select Wells, Upper Wilcox (Layer 9)

4.2.5 Simulated Water Levels

Figures 4-51 through 4-58 show the simulated water level elevations in model layer 1, and layers 3 through 9 at the end of the simulation period in 2017. Model layer 2 representing the Younger Units was conceptualized as a boundary condition to the underlying Sparta Aquifer and is therefore not shown. Water level elevations show water flows generally to the southeastern boundary in all layers. Simulated groundwater in the alluvium (model layer 1) is consistent with this flow direction, as shown on Figure 4-51.

In the Sparta Aquifer (layer 3), groundwater in 2017 reflects the streambed geometry of the Guadalupe, Atascosa, and Frio Rivers that were provided as the head value for the GHB boundary in the Younger Units above. Groundwater across the Sparta Aquifer flows from outcrop areas towards the southeast boundary (Figure 4-52).

The Queen City Aquifer shows flow of water from west to the east in the southern counties and flow generally in a southeastern direction in the northern counties (Figure 4-54). A local cone of depression is centered on Atascosa County. The northern portion of the Queen City Aquifer in Frio County shows areas of steep water table gradients which result from localized recharge, aquifer parameterization, and pumping within the unconfined portions of the aquifer.

Within the Carrizo-Upper Wilcox, Middle, and Lower Wilcox Aquifers (layers 7 through 9), there is a large simulated cone of depression in La Salle County extending into parts of adjacent counties (Zavala, Dimmit, Webb, McMullen, and Frio counties) (Figure 4-56 through 4-58). The area of drawdown is very similar in all three model layers with simulated heads over 100 feet lower than in nearby areas. This depression cone extends to the southeast boundary which indicates that deeper water from outside the domain is being pulled into this cone of depression.

Figures 4-59 through 4-66 show the change in water level elevations within model layer 1, and layers 3 through 9 from predevelopment conditions to 2017. Changes in water level elevation in the alluvium are small (Figure 4-59), except in small stretches along upstream reaches of the Nueces, Frio, and Atascosa Rivers which overlie the large cones of depression noted in the Carrizo Wilcox Aquifers. Water level elevation changes in the Sparta and Queen City Aquifers, (model layers 3 and 5) are small with most changes within 25 feet except for areas in Atascosa and Frio counties (Figures 4-60 and 4-62). Water level elevation changes in the lower layers (Carrizo-Upper Wilcox, Middle, and Lower Wilcox) show a large drawdown area in the western portion of the model, centered about Zavala and La Salle counties and extending into adjacent Dimmit and Frio counties to the east and west (Figures 4-64 to 4-66). Simulated head changes from predevelopment to 2017 show groundwater level elevations decreasing in excess of 350 feet in the Carrizo-Upper Wilcox, Middle Wilcox, and Lower Wilcox as shown on Figures 4-64 through 4-66.

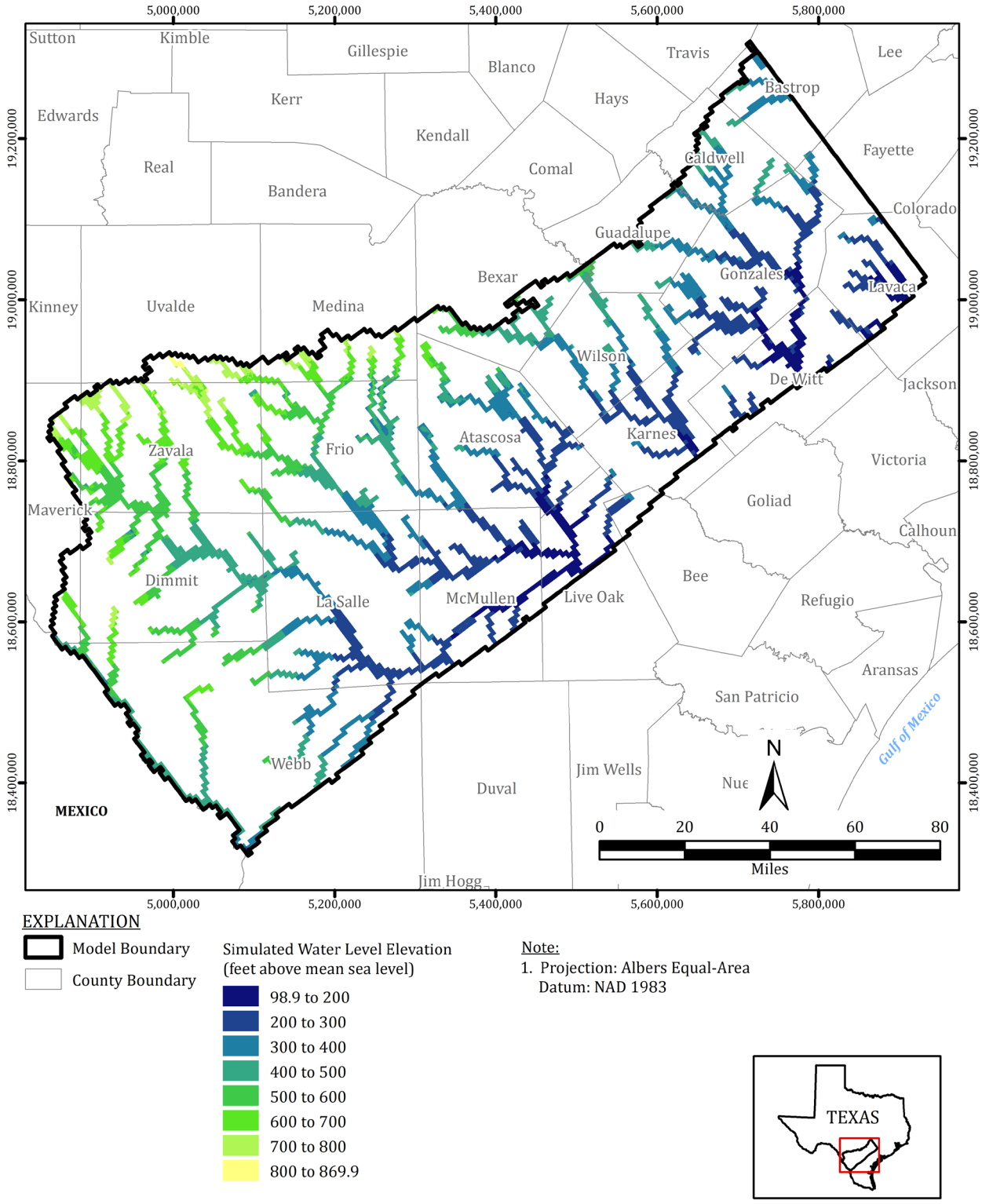


Figure 4-51. Simulated Water Level Elevations in Quaternary Alluvium (Layer 1) for 2017

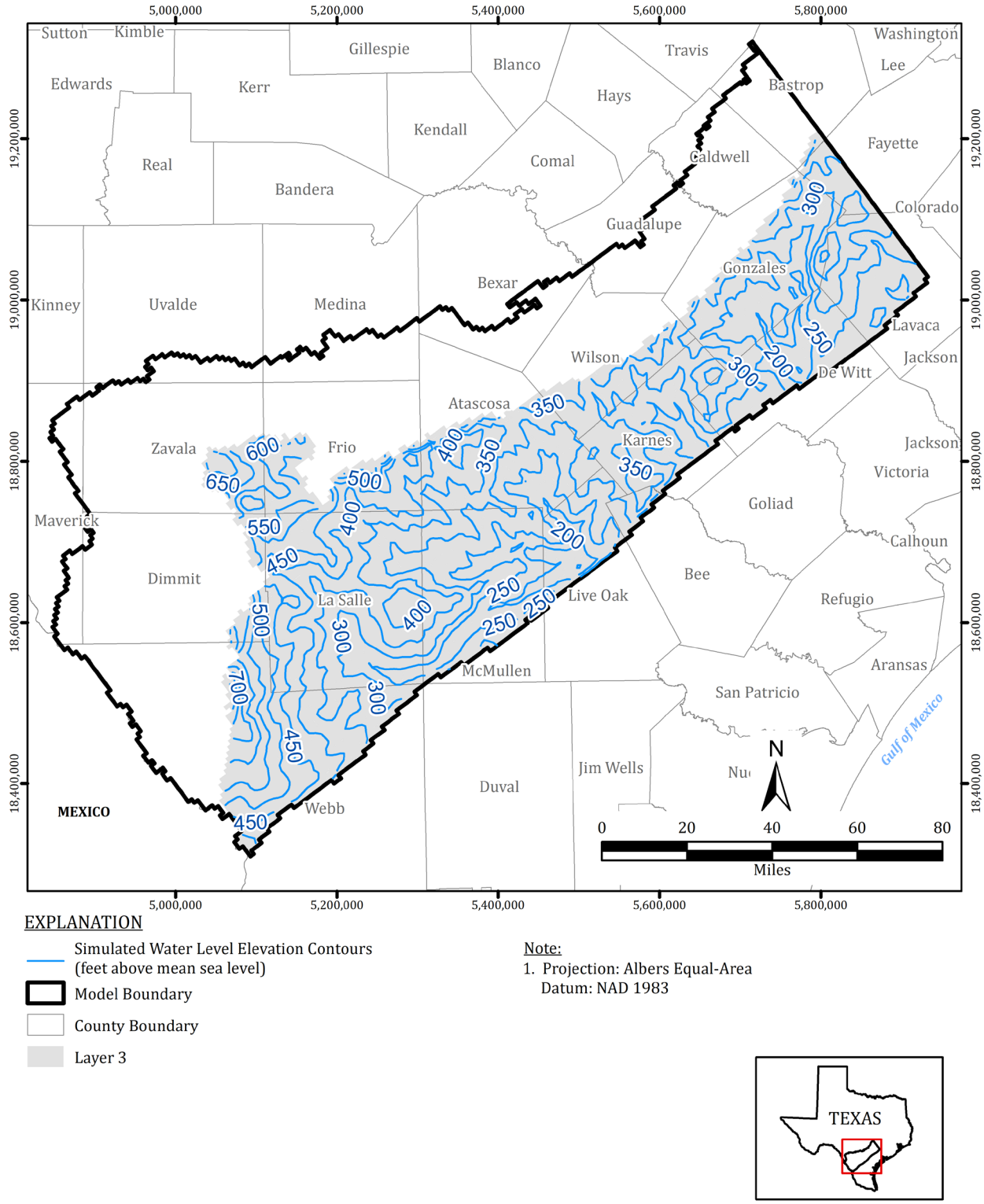


Figure 4-52. Simulated Water Level Elevations in Sparta Aquifer (Layer 3) for 2017

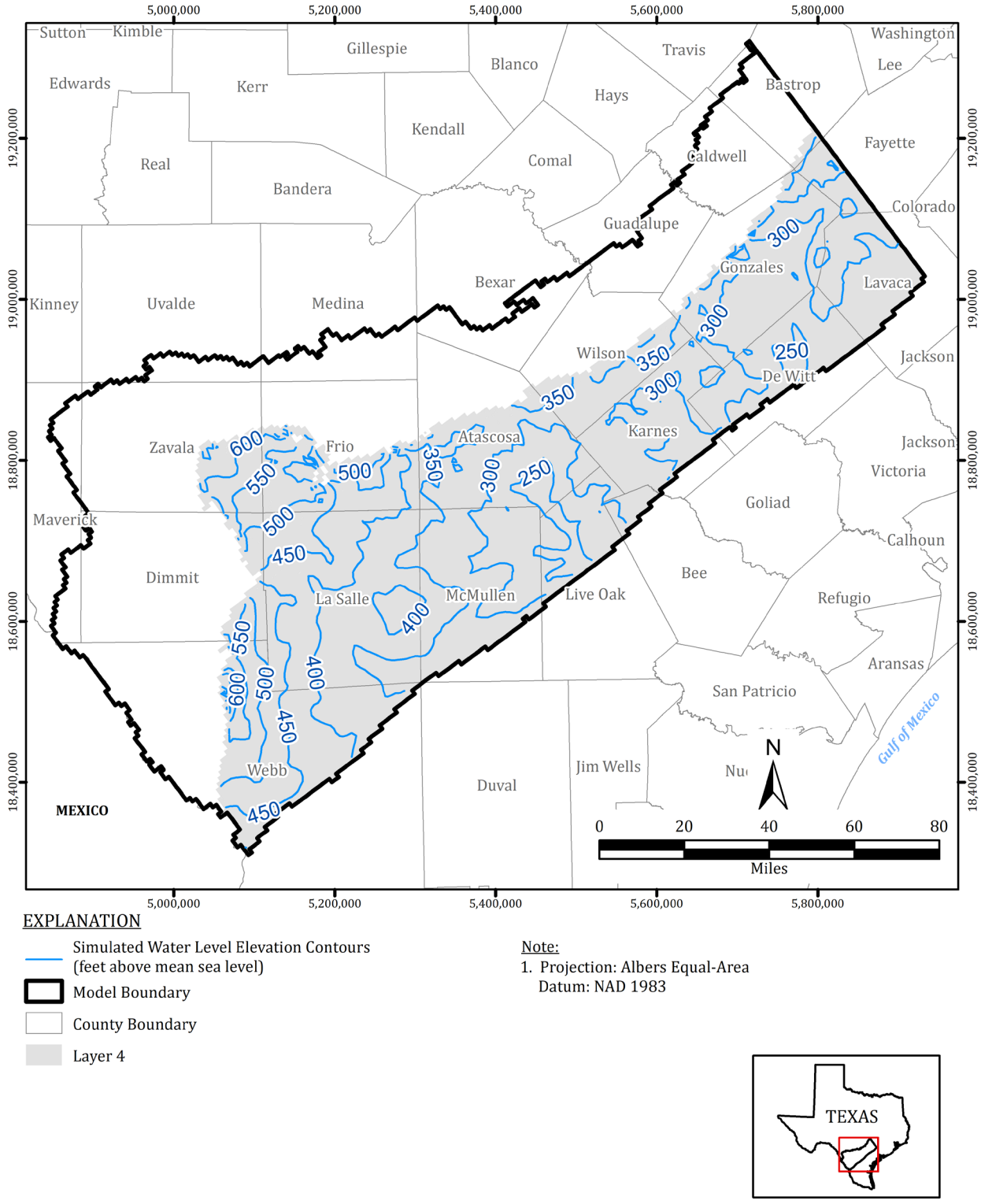


Figure 4-53. Simulated Water Level Elevations in Weches Aquitard (Layer 4) for 2017

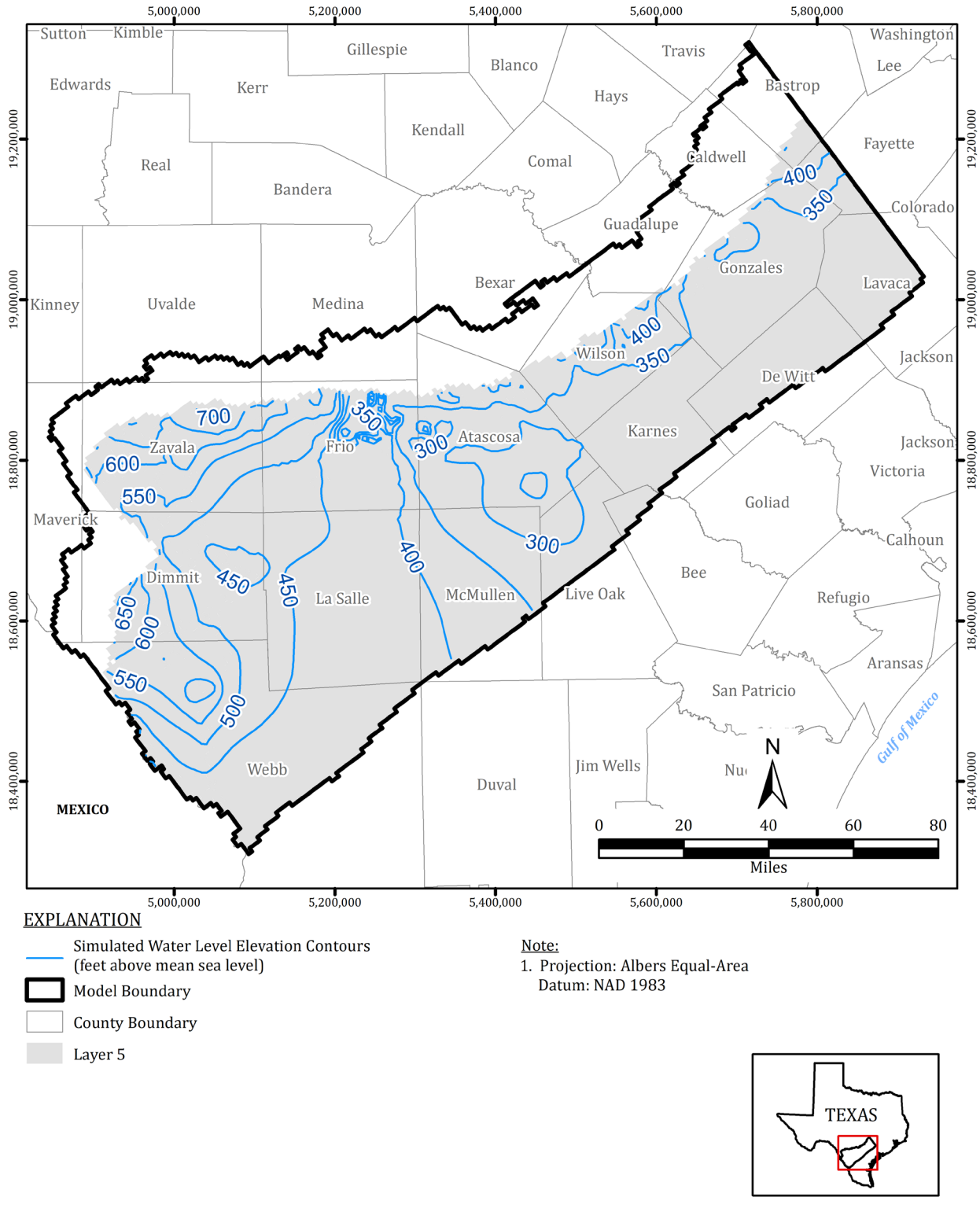
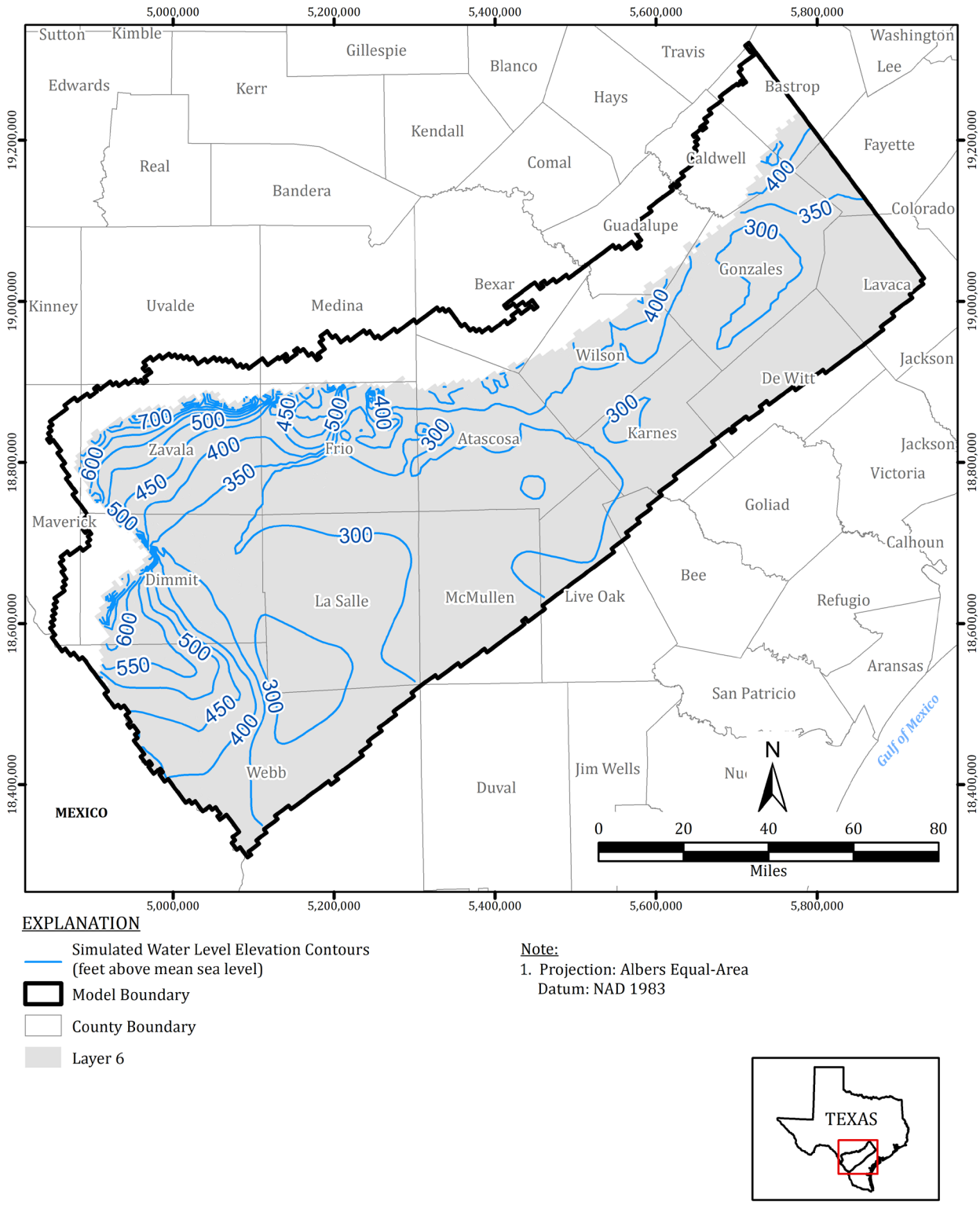


Figure 4-54. Simulated Water Level Elevations in Queen City Aquifer (Layer 5) for 2017



EXPLANATION

Simulated Water Level Elevation Contours (feet above mean sea level)

Model Boundary

County Boundary

Layer 6

Note:
1. Projection: Albers Equal-Area
Datum: NAD 1983

Figure 4-55. Simulated Water Level Elevations in Reklaw Aquitard (Layer 6) for 2017

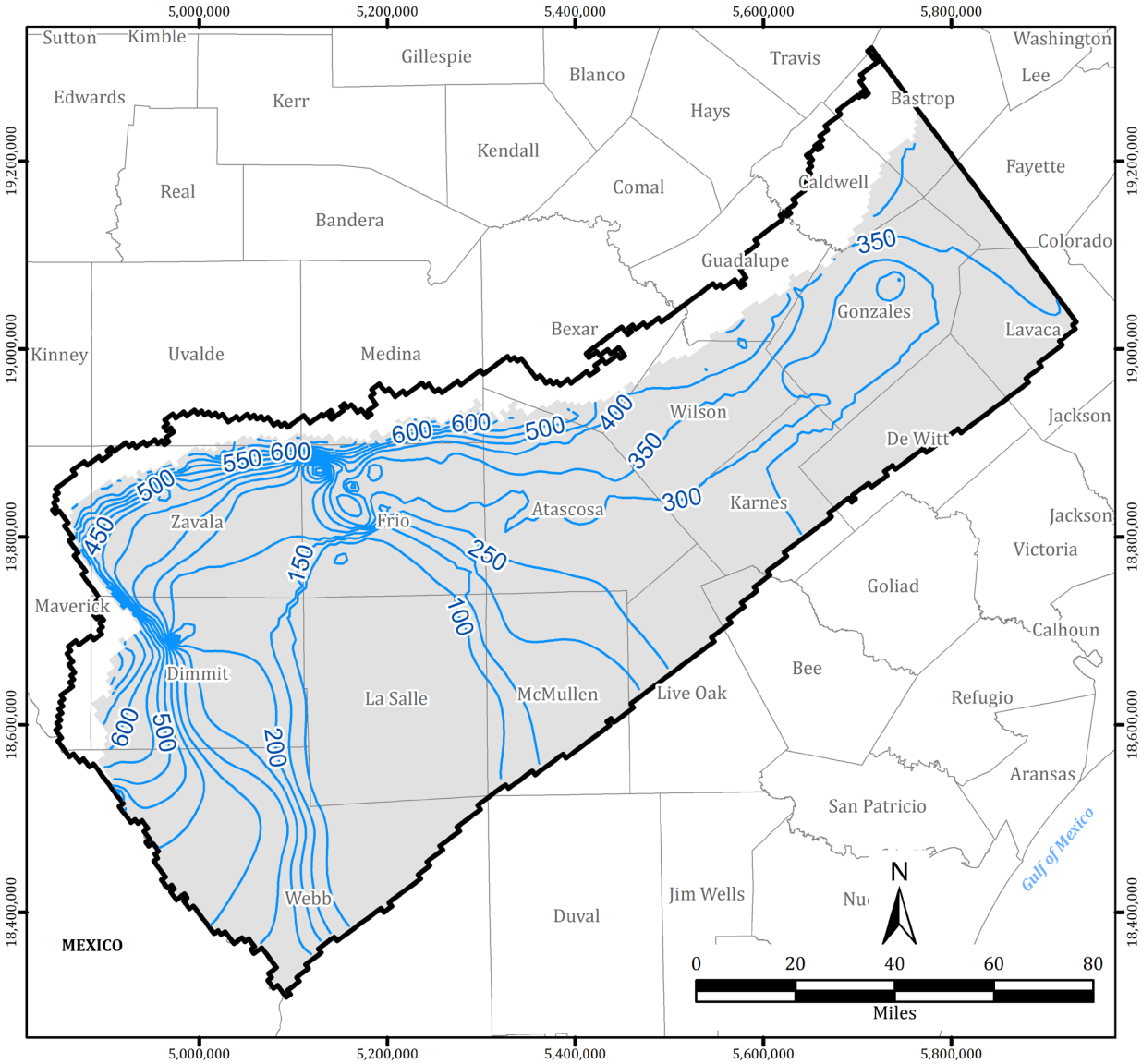


Figure 4-56. Simulated Water Level Elevations in Carrizo-Upper Wilcox (Layer 7) for 2017

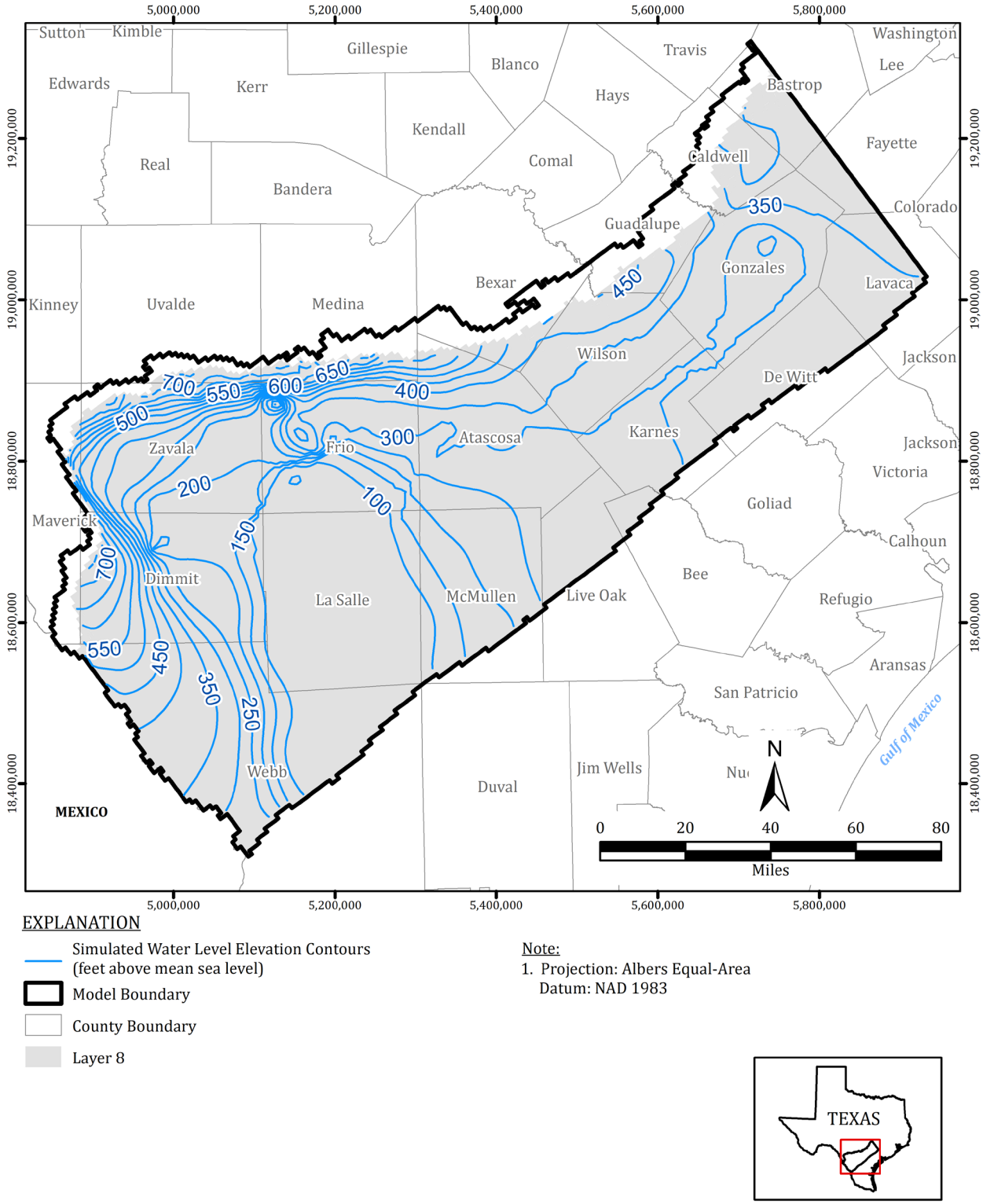
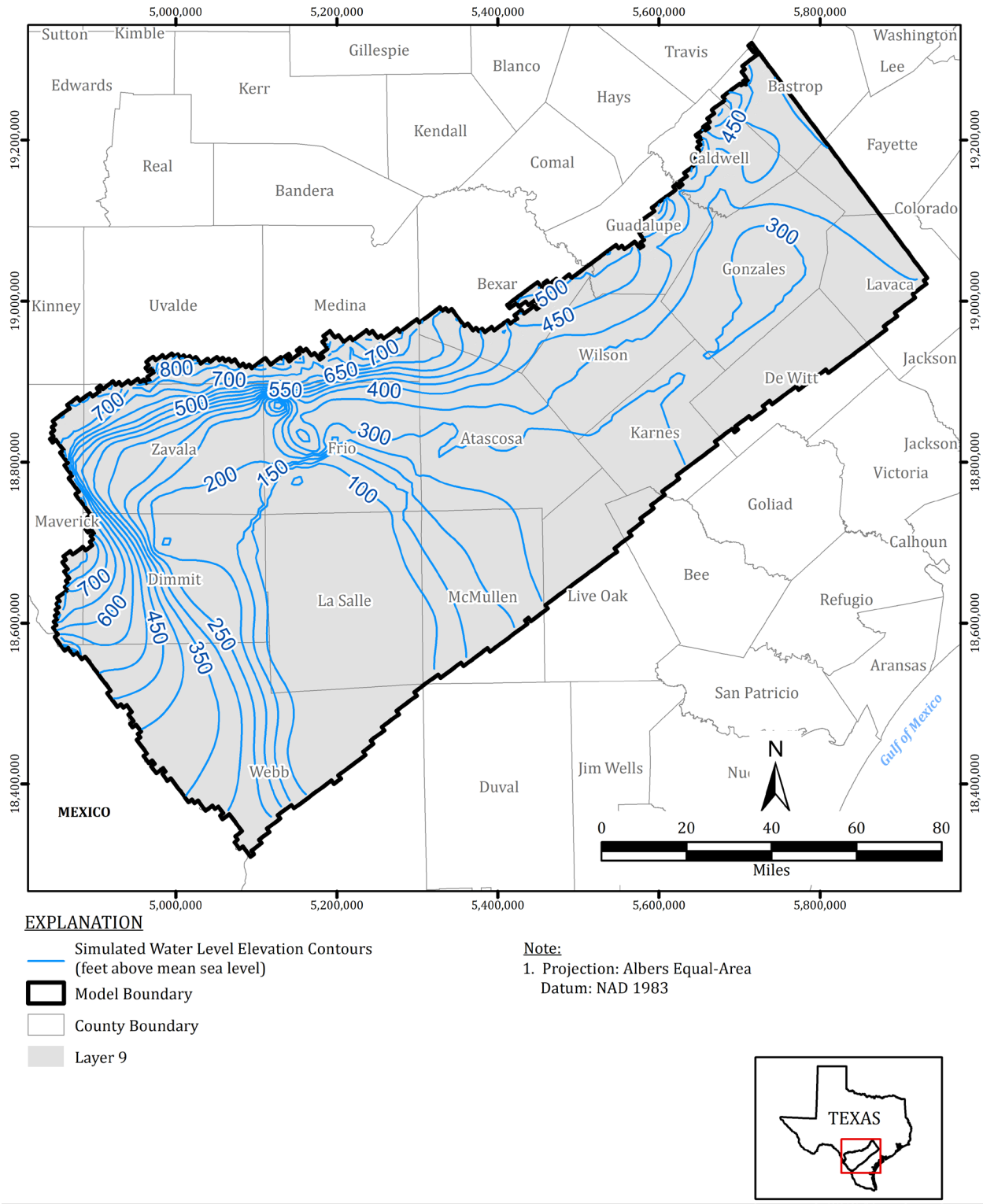


Figure 4-57. Simulated Water Level Elevations in Middle Wilcox (Layer 8) for 2017



EXPLANATION

Simulated Water Level Elevation Contours (feet above mean sea level)

Model Boundary

County Boundary

Layer 9

Note:
1. Projection: Albers Equal-Area
Datum: NAD 1983

Figure 4-58. Simulated Water Level Elevations in Lower Wilcox (Layer 9) for 2017

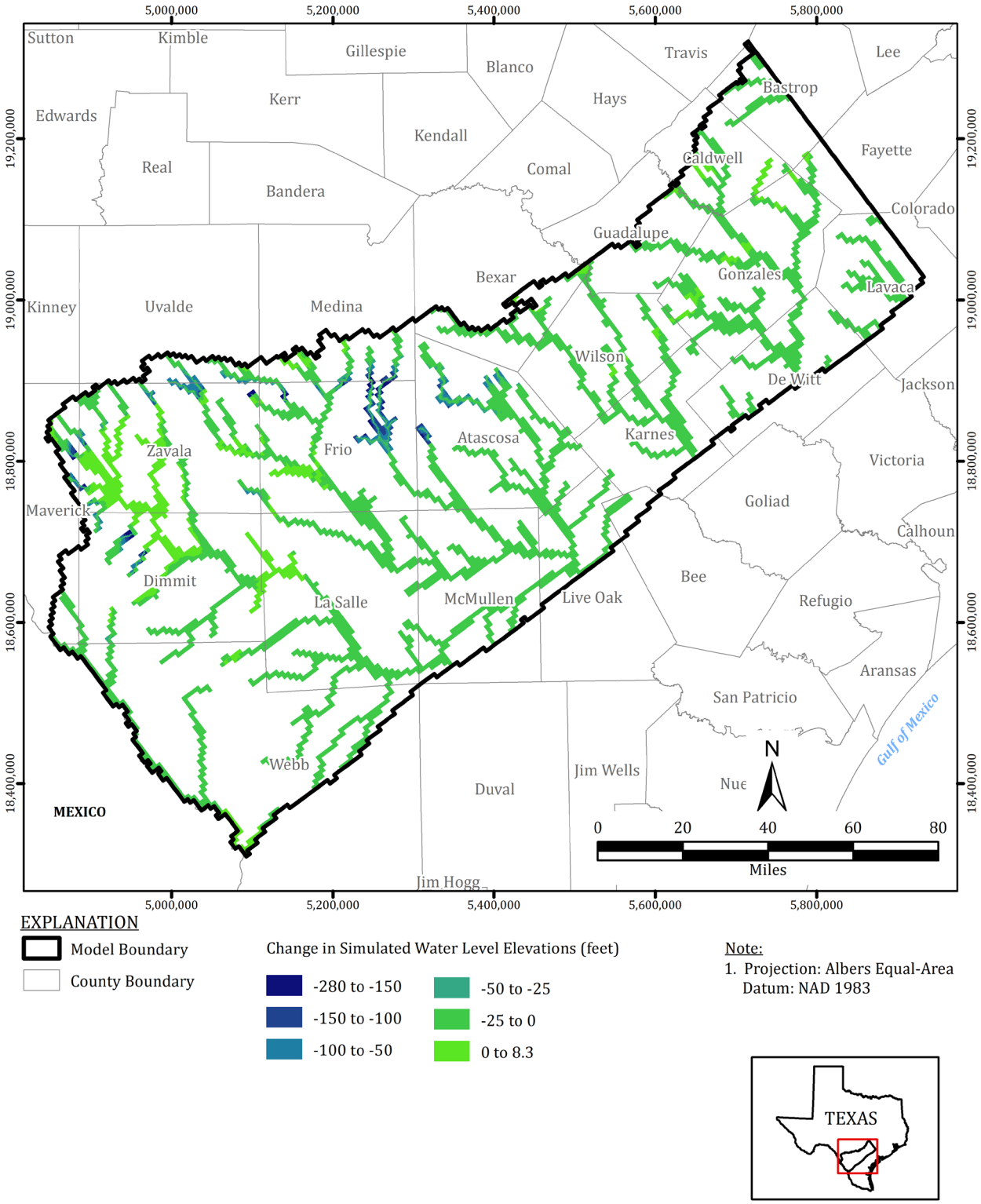


Figure 4-59. Change in Water Level Elevations Between Predevelopment and 2017 in Quaternary Alluvium (Layer 1)

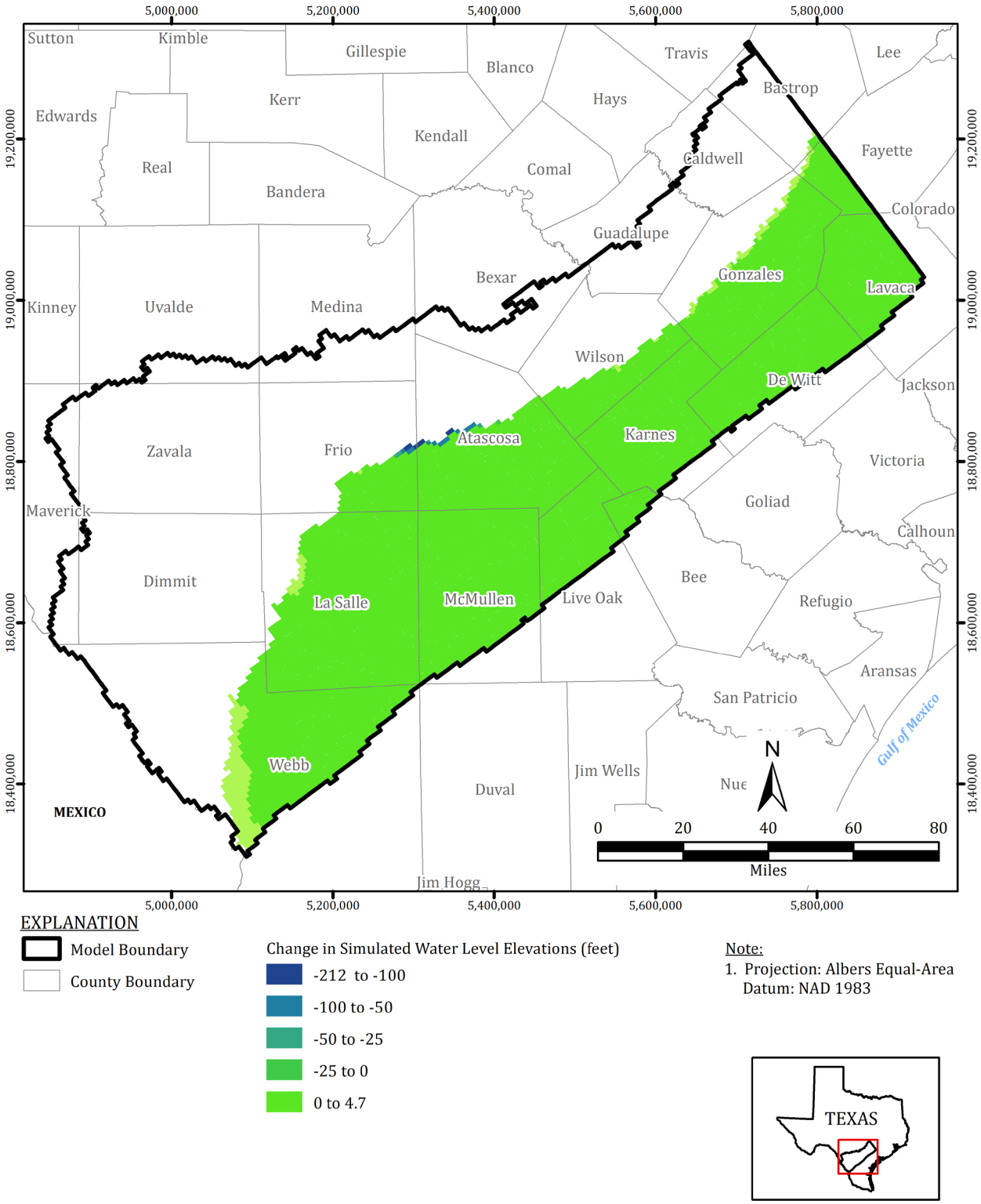


Figure 4-60. Change in Water Level Elevations Between Predevelopment and 2017 in Sparta Aquifer (Layer 3)

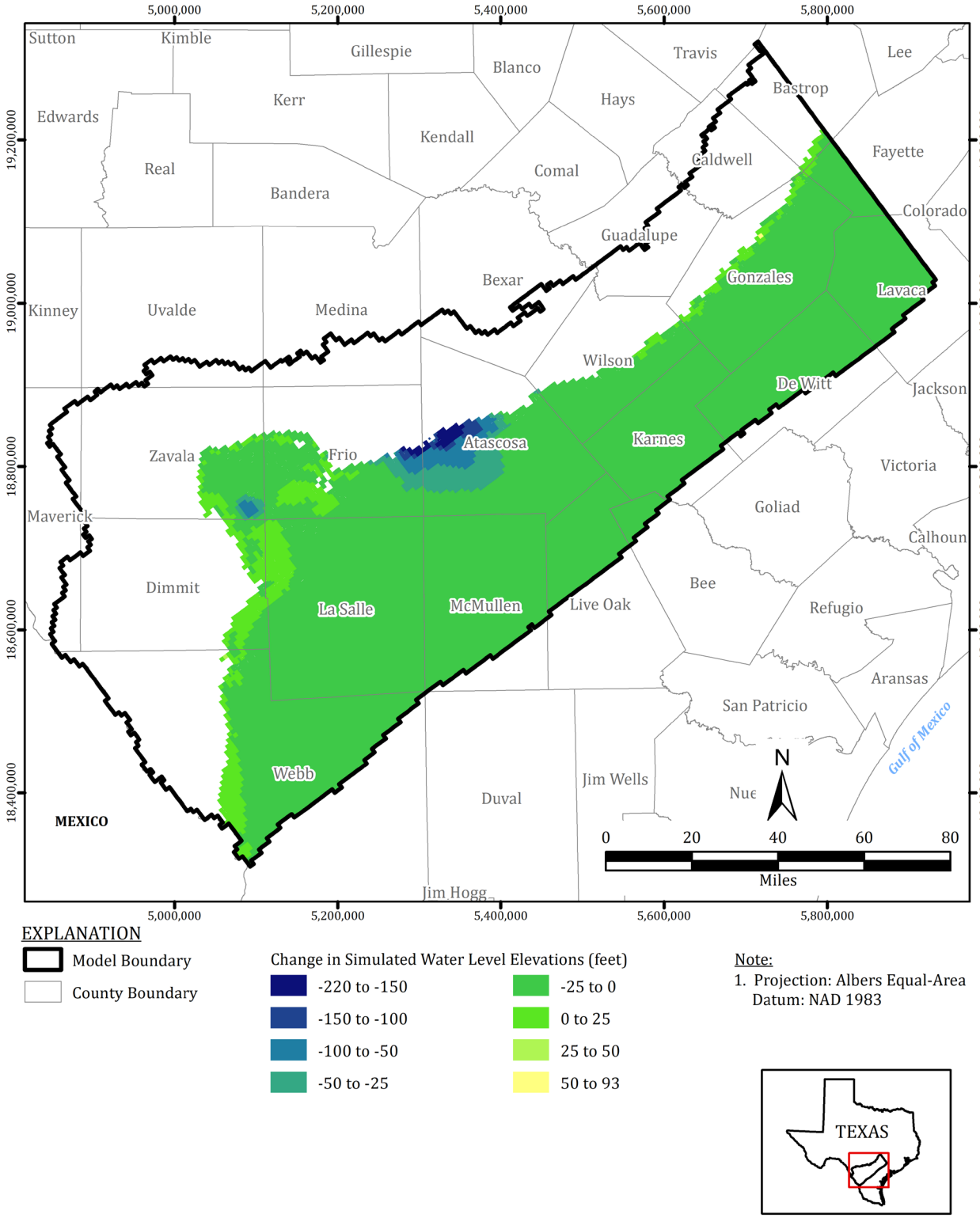


Figure 4-61. Change in Water Level Elevations Between Predevelopment and 2017 in Weches Aquitard (Layer 4)

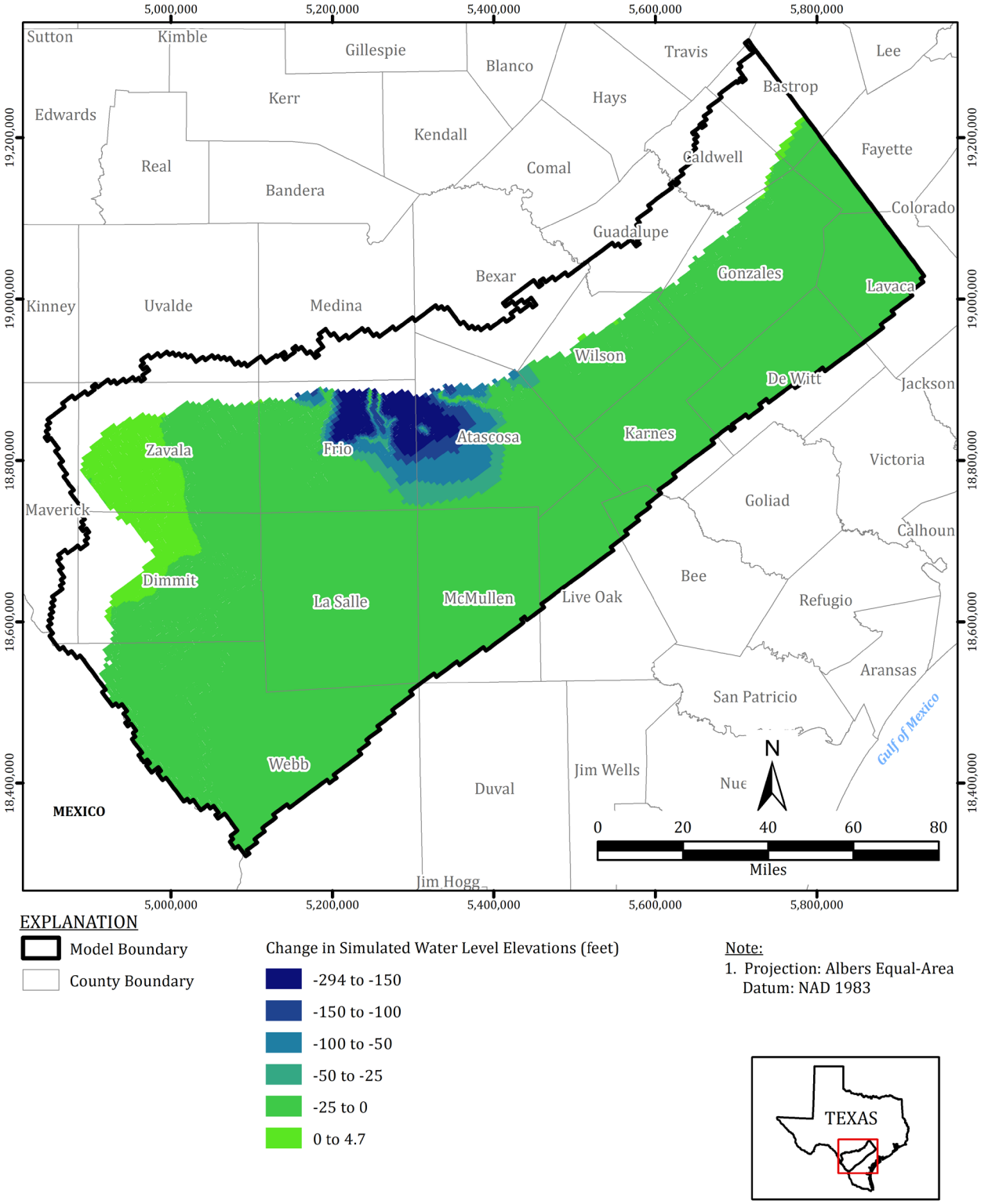


Figure 4-62. Change in Water Level Elevations Between Predevelopment and 2017 in Queen City Aquifer (Layer 5)

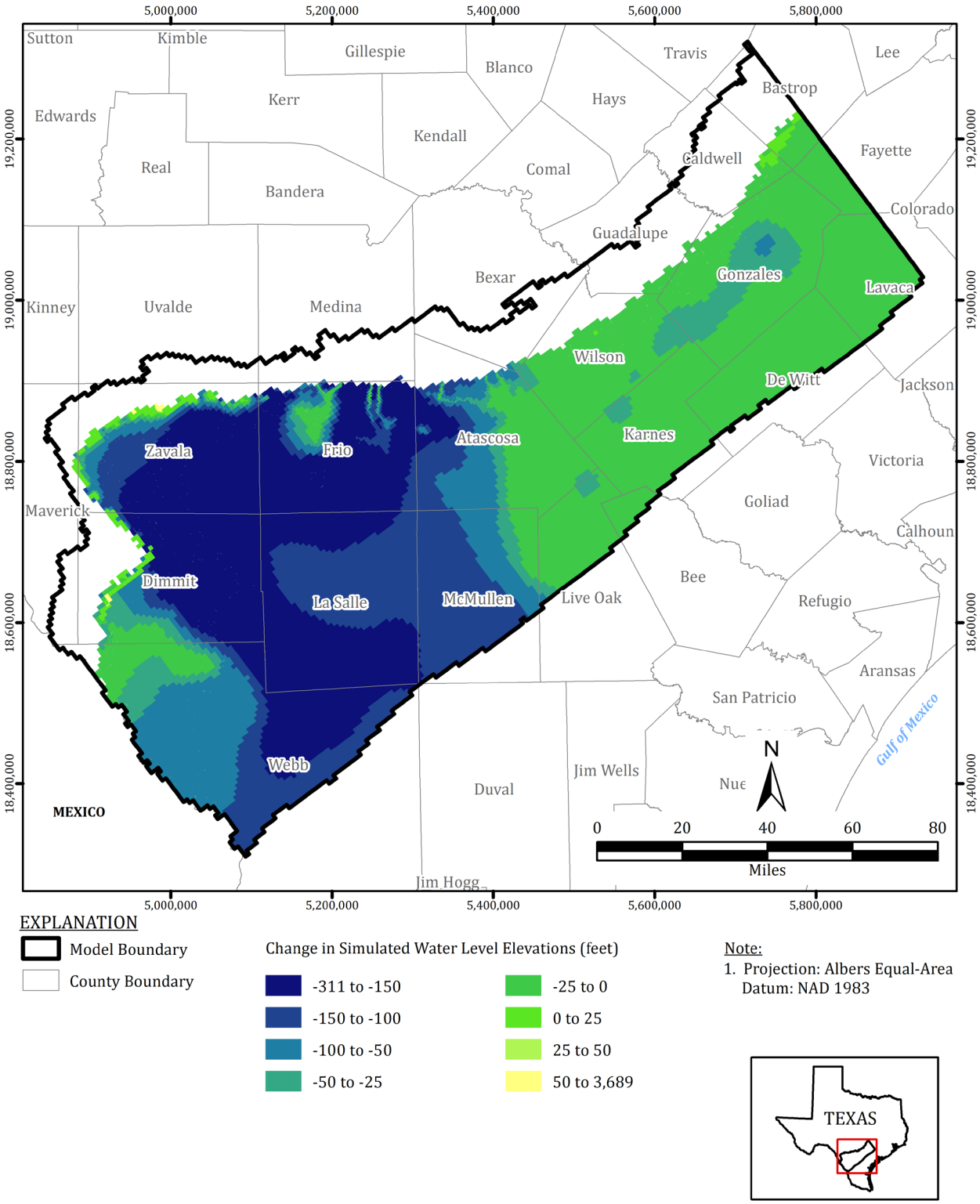


Figure 4-63. Change in Water Level Elevations Between Predevelopment and 2017 in Reklaw Aquitard (Layer 6)

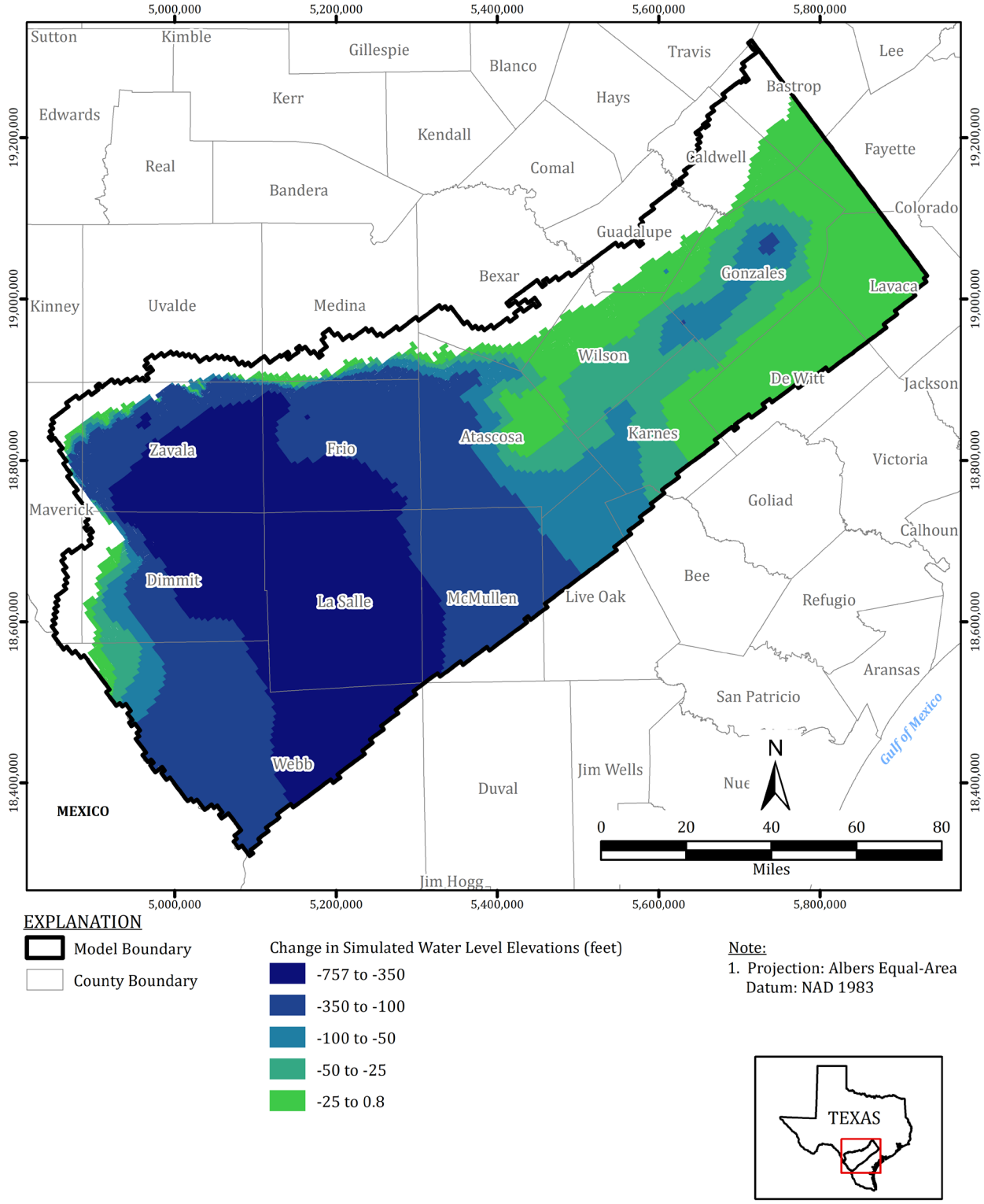


Figure 4-64. Change in Water Level Elevations Between Predevelopment and 2017 in Carrizo-Upper Wilcox (Layer 7)

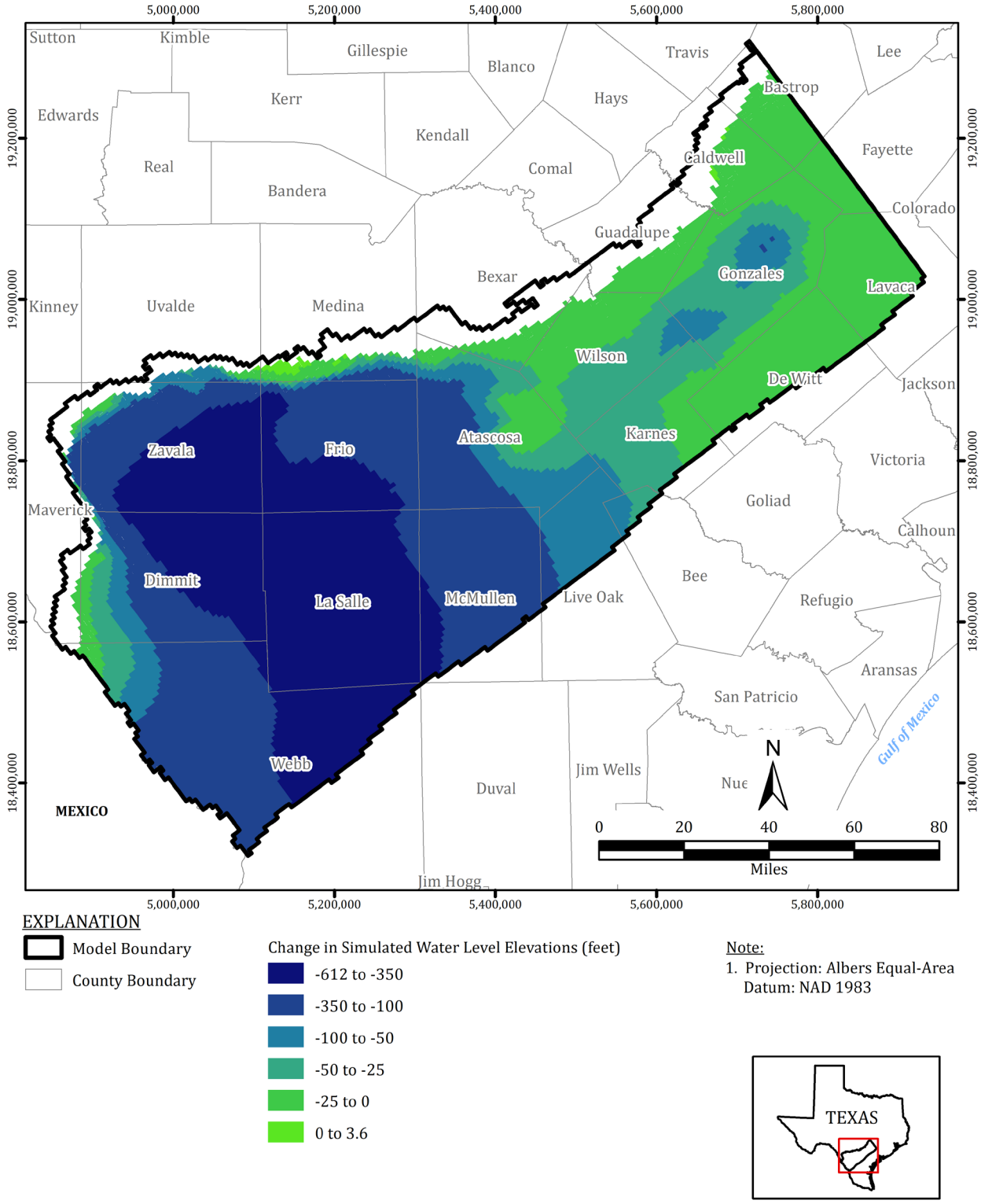


Figure 4-65. Change in Water Level Elevations Between Predevelopment and 2017 in Middle Wilcox (Layer 8)

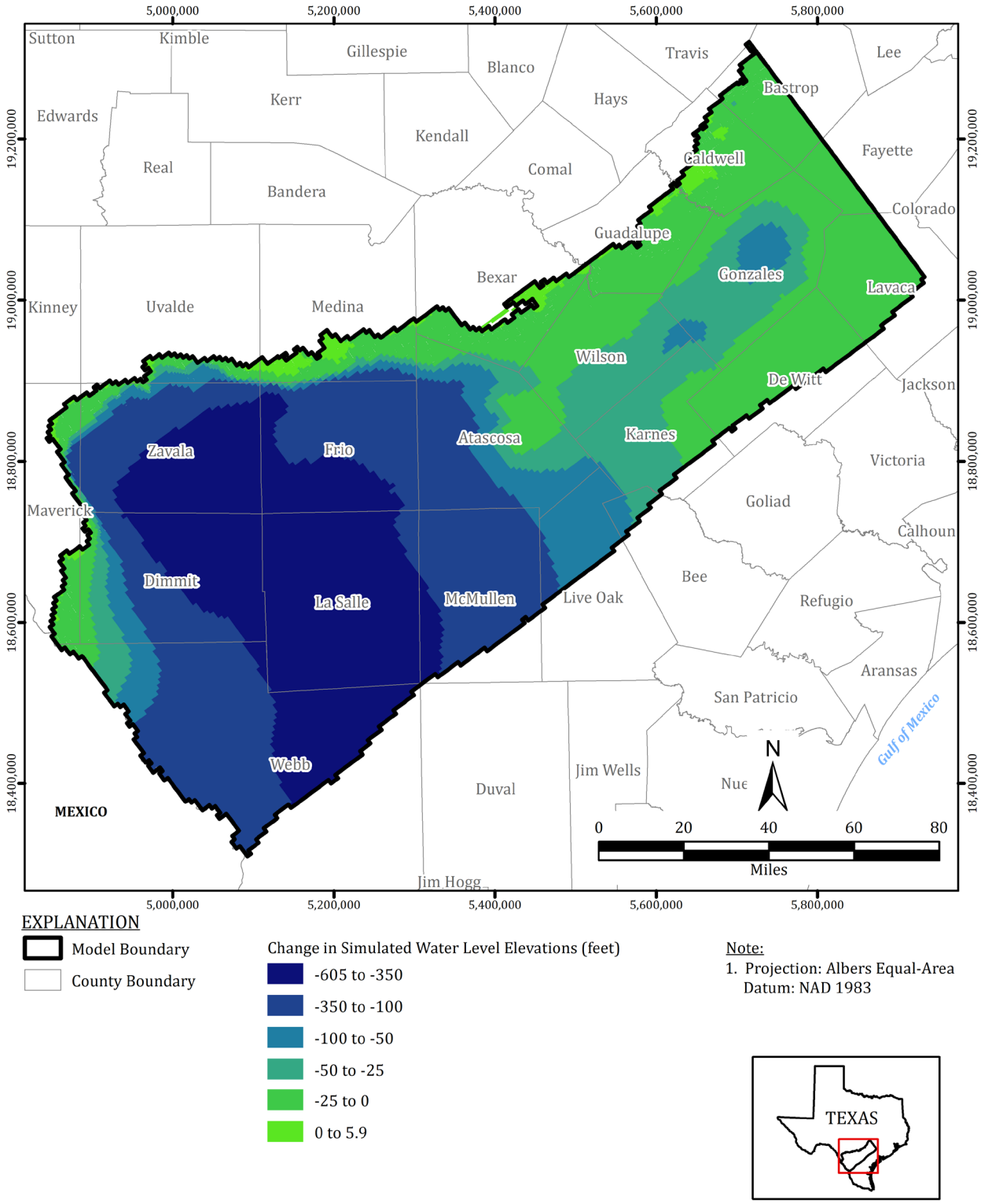


Figure 4-66. Change in Water Level Elevations Between Predevelopment and 2017 in Lower Wilcox (Layer 9)

In general, the head change figures (Figures 4-59 to 4-66) show that much of the northeastern counties experience little head change over the simulation period, with the southwestern counties experiencing groundwater drawdown over large areas in the Carrizo and Wilcox Aquifers. This is consistent with generally greater pumping occurring in the southern counties. The decrease in simulated heads in Gonzales County in the Carrizo-Upper Wilcox shown on Figure 4-64 is reflected in hydrographs which show observed heads declining in recent years in Gonzales and Guadalupe counties in the lower layers (Appendix I).

Figures 4-67 through 4-69 compare simulated groundwater level elevation contours from the end of the model simulation period, 2017, to the estimated groundwater level elevation contours interpolated using 2017 data presented in the conceptual model, Section 2.2.3, for the Sparta Aquifer (layer 3), the Queen City Aquifer (layer 5), and the Carrizo-Upper Wilcox (layer 7).

The Sparta Aquifer (model layer 3) conceptual contours are uncertain over much of the layer, as indicated on Figure 4-67 by dashed lines and by the sparsity of data points shown on Figure 2-19. However, both the contours and simulated water level elevations show higher water levels to the northwest, declining to the southeast. The Queen City Aquifer (model layer 5) 2017 simulated and 2017 observed groundwater contours both show eastward flow in the southern portion of the domain and southeastern flow in the northern portion of the model domain (Figure 4-68). The conceptual contour representation is additionally uncertain in much of the domain due to sparsity of data noted on Figure 2-20. The Carrizo-Upper Wilcox Aquifer (layer 7) observed and simulated contours both show pumping centers in La Salle County with similar water level elevations (Figure 4-69). The conceptual contours show two pumping centers in La Salle County, where there is little to no pumping in the data (Figures 3-49 through 3-51) indicating a large data gap on the pumping history in the area.

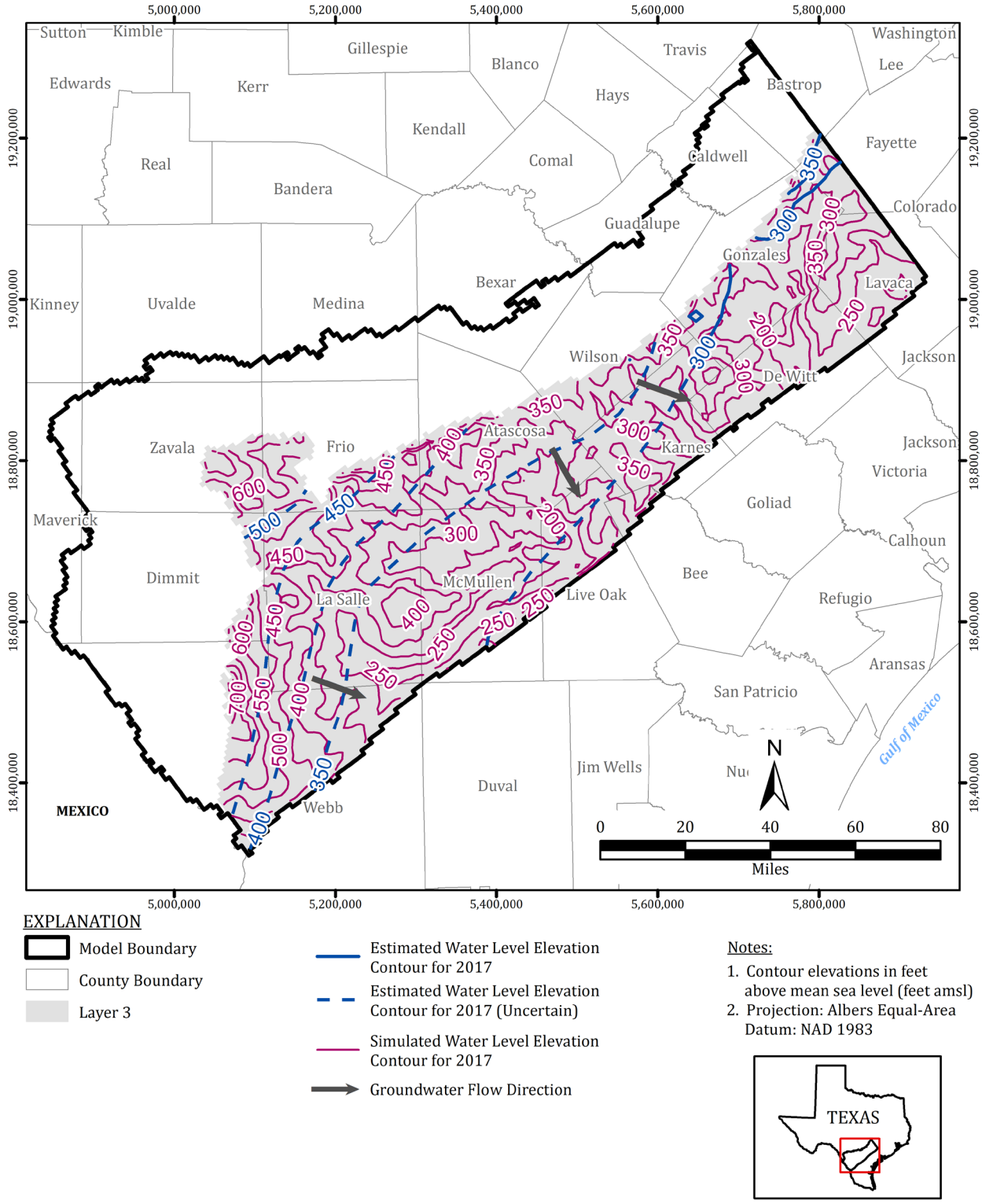


Figure 4-67. Estimated and Simulated 2017 Water Level Elevation Contours for Sparta Aquifer (Layer 3)

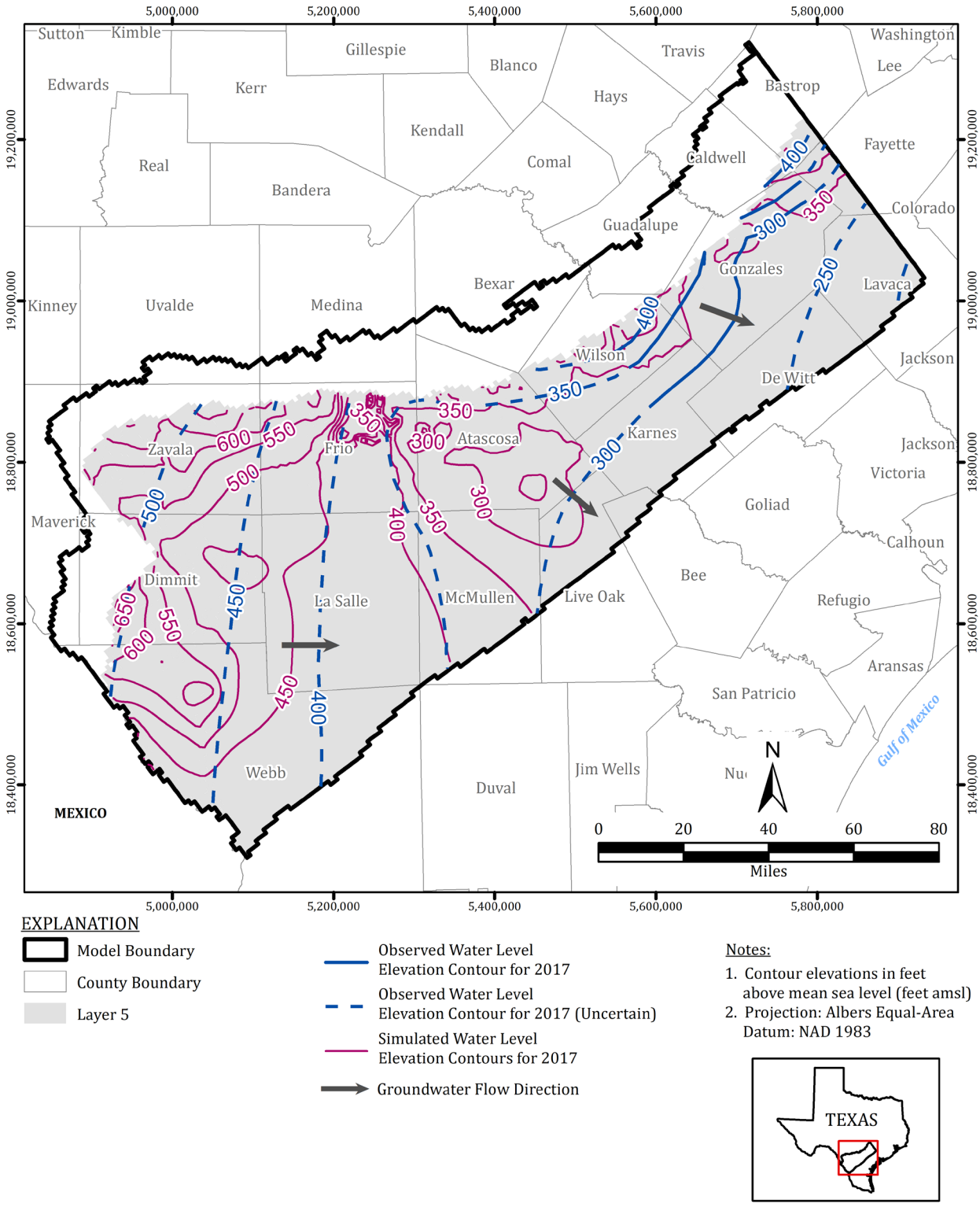


Figure 4-68. Estimated and Simulated 2017 Water Level Elevation Contours for Queen City Aquifer (Layer 5)

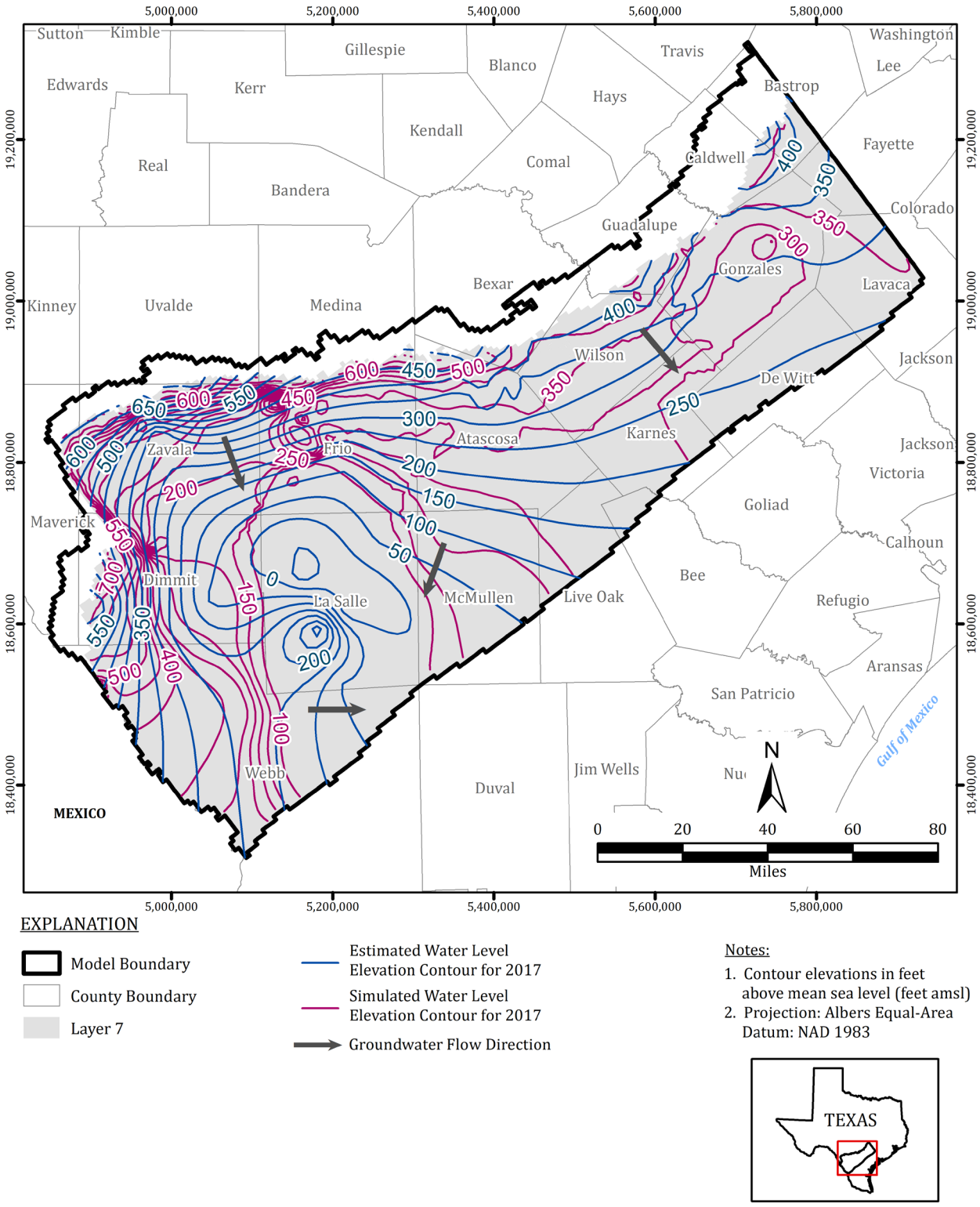


Figure 4-69. Estimated and Simulated 2017 Water Level Elevation Contours for Carrizo-Upper Wilcox (Layer 7)

4.3 Model Simulated Versus Measured River Flow Differences

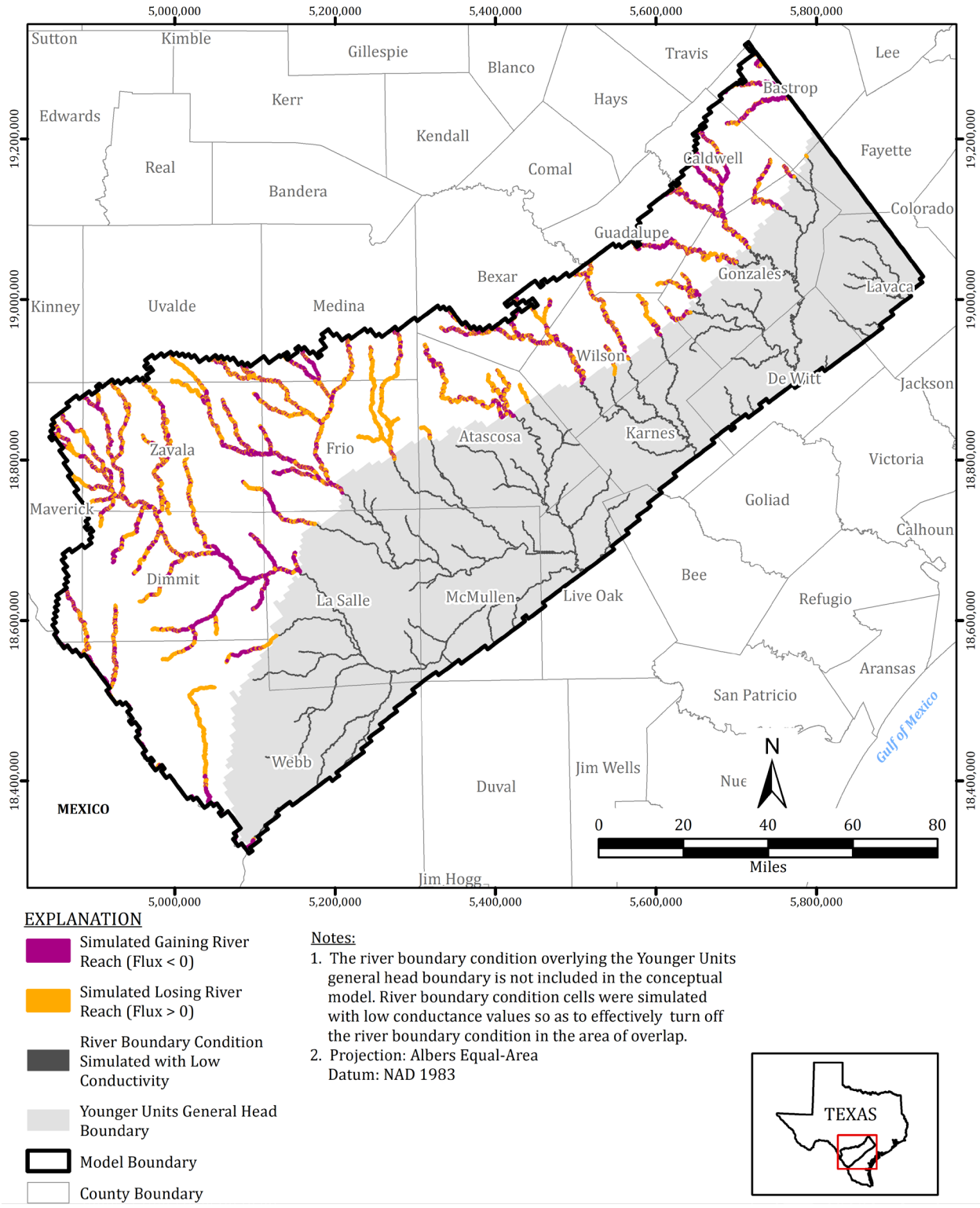
Surface-water to groundwater fluxes were used to constrain the model. The major rivers in the model domain were simulated with the RIV package as described in Section 3.10. Rivers in the model domain consist of the Rio Grande, Nueces River, Frio River, Atascosa River, San Antonio River, Guadalupe River and Lavaca River, along with their major tributaries.

Figures 2-37 through 2-43 show the annual flows at stream gages located on these rivers in the model domain, and Table 2-3 shows differences in stream-flows along major rivers between upstream and downstream gages. A positive flow difference from upstream to downstream gage signifies the river is gaining along the reach, and a negative difference in flow signifies the river is losing along the reach. The gage differences on rivers within the domain indicate rivers generally have experienced gaining flow conditions during most years since 1980. It is noted that the differences are not the baseflow but also include other factors such as overland runoff, tributaries, diversions, and other influences that may occur between the upstream and downstream gages.

Since the flow differences do not fully reflect baseflow, the flux between river and groundwater was evaluated qualitatively against the upstream and downstream gage flow differences. Figure 4-70 shows the flux between the simulated rivers and the groundwater in the model domain for 2017. A negative groundwater flux value indicates a gaining reach, and a positive flux value indicates a losing reach. The river reaches simulated in the model at the end of the simulation alternate between gaining and losing conditions. It is noted that inflow and outflow cycling occurs between adjacent segments of a reach. This is due to approximations made to the RIV boundary bottom elevation and stages at a grid-block level which were estimated from coarse topographic elevation data and can vary widely between adjacent grid-blocks.

Even though streamflow differences between gages do not represent baseflow, these flow differences were added as calibration targets and stream bed conductance was included as a calibration parameter for those reaches. Figures 4-71 to 4-73 compare three river reaches that have upstream and downstream gage measurements against the model simulation. The figures present the measured flux differences from upstream to downstream compared to the simulated groundwater interaction flux along the same segment over the model period of 1980 and 2017. River reaches evaluated were on the Guadalupe River, the San Antonio River, and the Nueces River because these reaches had unobstructed gage pairs within the active model domain. River gages used to compare against modeled results are listed on each figure and presented in Section 2.4.1 in Figures 2-38 (Nueces River gages), Figure 2-41 (San Antonio River gages), and Figure 2-42 (Guadalupe River gages). As Figures 4-71 to 4-73 show, the large fluctuations in measured flow differences are not captured by the simulated baseflow because the current model setup uses a constant (1-foot) river depth throughout the simulation among other uncertainties in representing the rivers. However, the median flow conditions are generally represented in the simulated river reaches on the San Antonio River and Nueces River segments. Within the modeled Guadalupe River reach segment, however, simulated

baseflow was low at about 20,000 acre-feet compared to significantly higher gage measurements differences between upstream and downstream gages (Figure 4-71).



EXPLANATION

- Simulated Gaining River Reach (Flux < 0)
- Simulated Losing River Reach (Flux > 0)
- River Boundary Condition Simulated with Low Conductivity
- Younger Units General Head Boundary
- Model Boundary
- County Boundary

Notes:

1. The river boundary condition overlying the Younger Units general head boundary is not included in the conceptual model. River boundary condition cells were simulated with low conductance values so as to effectively turn off the river boundary condition in the area of overlap.
2. Projection: Albers Equal-Area
   Datum: NAD 1983

Figure 4-70. Simulated Groundwater-River Interaction Fluxes for 2017

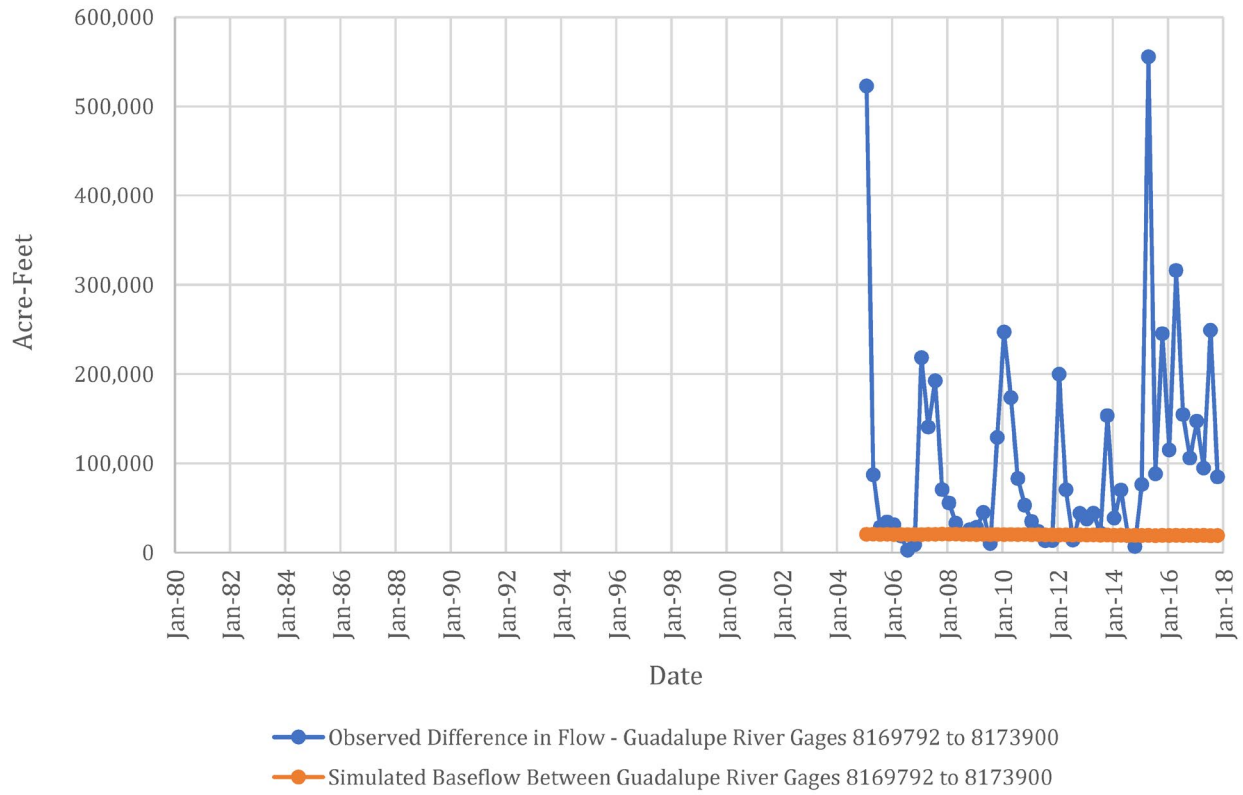


Figure 4-71. Flow Difference Between Upstream and Downstream Gages Compared to Groundwater Interaction Flux for Simulated Guadalupe River Segment

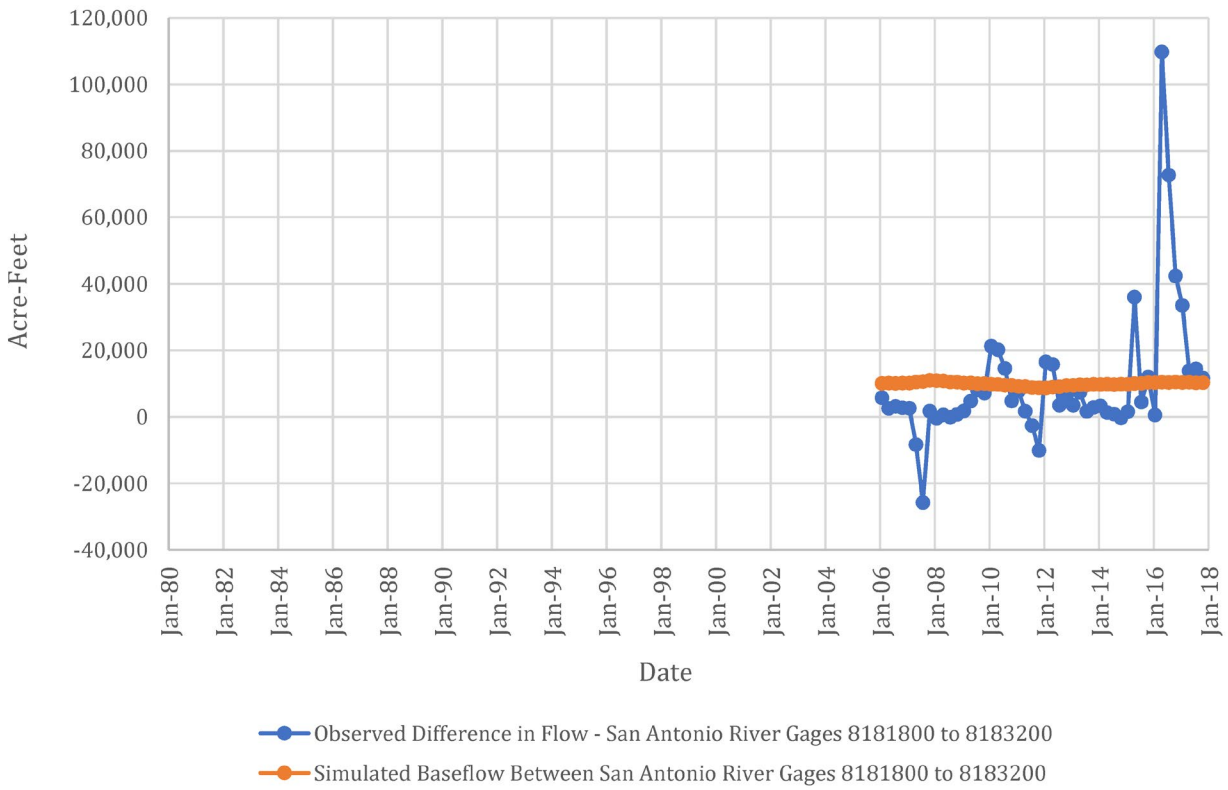


Figure 4-72. Flow Difference Between Upstream and Downstream Gages Compared to Groundwater Interaction Flux for Simulated San Antonio River Segment

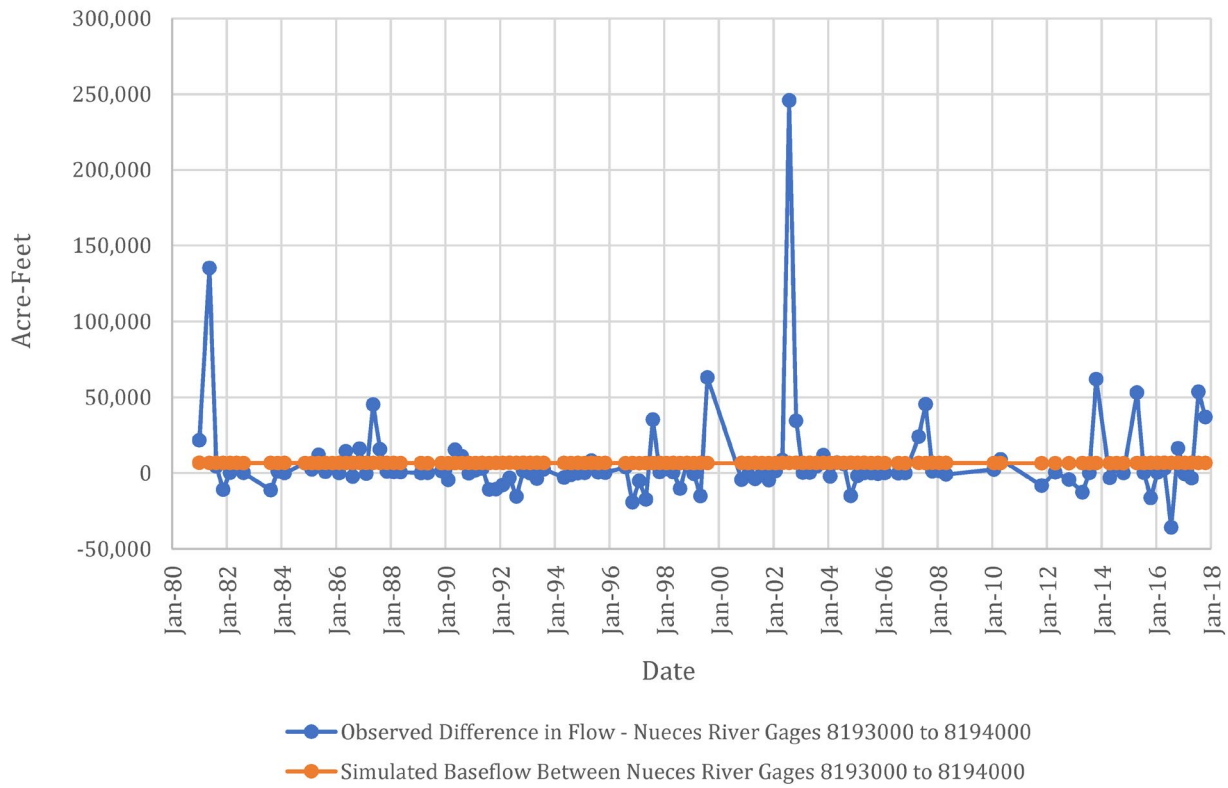


Figure 4-73. Flow Difference Between Upstream and Downstream Gages Compared to Groundwater Interaction Flux for Simulated Nueces River Segment

4.4 Model Simulated Water Budgets

The water budgets for the groundwater availability model are presented in Table 4-9 for the predevelopment period and in Table 4-10 for the transient 1980 to 2017 simulation. Water budget values for each layer are exported from Groundwater Vistas. These values match the MODFLOW 6 output for mass balance.

As shown on Table 4-9, the boundary flow components of the predevelopment period include GHBs, rivers, precipitation recharge, and evapotranspiration. There was no pumping simulated for the predevelopment period. Flows into and out of the rivers dominate the predevelopment period; however, a large part of the inflows and outflows are due to local cycling of the inflow and outflow terms between adjacent cells caused by the river boundary bed elevation and stage approximations set in the model. The river outflow rate exceeds the river inflow rate by about 130,000 acre-feet per year indicating that the model rivers are gaining streams during predevelopment. The second largest boundary inflows and outflows occur via the GHB conditions, mostly from the Younger Units of layer 2. As shown on the table, the mass balance error across the model during the predevelopment period is zero.

Table 4-10 presents a model-wide water budget and water budgets for each layer (layers 1 through 9) at the end of the model simulation in 2017. Model-wide, the river inflows and outflows were the largest budget terms, followed by inflow and outflow to GHBs, primarily from the Younger Units in layer 2 which were set as a general head boundary. Unlike the predevelopment period, the transient river boundary inflow rate (to groundwater) exceeds the outflow rate by 94,000 acre-feet per year in 2017, indicating that the model rivers are simulated as losing streams at the end of the simulation. This is consistent with the conceptual model presented in Section 2.4.1 which describes variability in gaining and losing reaches across the domain with a shift towards losing reaches in later years. The river flux over the simulation period is presented in Figure 4.74 and shows that simulated rivers were losing over the model period.

Recharge and well pumping were also significant components of the 2017 water budgets, with recharge slightly less than groundwater withdrawal model-wide. Layer by layer, the Carrizo-Wilcox pumping rate accounts for about 85 percent of the model pumping total. After the Carrizo-Wilcox unit, groundwater extraction rates were greatest in the Middle Wilcox and Lower Wilcox aquifer units. Storage and evapotranspiration provided a negligible amount of inflow and outflow across the model. The mass balance error was zero.

The water budget over the simulation period is charted in Figure 4.75. Consistent with the mass balance tables, simulated inflow and outflow from the river boundary were the largest portion of the water budget, at about 2,500,000 acre-feet per year each. These large values are caused by cycling of flows between adjacent grid blocks of the RIV boundary. GHB inflows and outflows appear fairly consistent at about 300,000 acre-feet per year. Well pumping fluctuates but exceeds recharge and GHB flow rates in most of the years simulated.

Figure 4-76 shows the fluxes through the Younger Units GHB boundary for 2017. There is some cycling of fluxes noted on the GHB boundaries with inflow being compensated by outflow in adjacent cells; however, most of the area overlying the Sparta Aquifer has a small amount of recharge through the Younger Units except in the river valleys where there is a significant discharge to the GHB condition on the Younger Units. Though not simulated, this also indicates that most of the rivers overlying the Younger Units are gaining river reaches.

The net flows for water balance components are charted in Figure 4-77. This chart shows that flow from the Younger Units GHB boundary to the Sparta Aquifer is negative (flow is from the Sparta Aquifer to the GHB in the Younger Units) between 1980 and 2011 by about 40,000 acre-feet per year, which is noted to reverse between 2011 and 2015. Flow from the southeast and northeast lateral GHB conditions in the aquifer layers constituted only a small portion of the water budget, with most of the GHB inflow and outflow occurring through the GHB conditions applied on the Younger Units as noted in the water budget Tables 4-9 and 4-10.

Figure 4-77 indicates that the largest net inflow to the model domain is via recharge, and the largest outflow component is pumping. Recharge fluctuates from year to year but does not show a long-term trend, while pumping shows an increase through time with a significant increase between 2007 and 2011. Net storage and river inflow also fluctuate from year to year with storage depletion compensating for the large increase in pumping between 2007 and 2011. Net river inflow is noted to show an increasing long-term trend to compensate for the increased pumping.

It is noted that pumping output of the model was slightly reduced (by about 5 to 6 percent) compared to the pumping input due to supply and demand conditions at some wells. Conceptual pumping values are estimates and the simulated model pumping is not much different from the conceptualized pumping estimates for the model. According to Table 4-1, and shown on Figure 4-77, pumping averaged about 284,000 acre-feet per year of groundwater outflow from the model. Groundwater extraction showed an increasing trend from 1980 to 2017 with a significant increase up to about 550,000 acre-feet per year during 2009 through 2012 (Figures 4-75 and 4-77).

From Figure 4-77, evapotranspiration was the smallest mass balance component and averaged about 21,000 acre-feet per year. Similar to the GHB fluxes, outflow from ET showed minimal variability with time.

The mass balance error was zero throughout the simulation period. Detailed water budgets are provided in Appendix J for fourteen Texas Groundwater Conservation Districts present in the model domain and seven Texas counties which are not part of a groundwater district. Water budgets were tabulated for each year of the model simulation (1980 through 2017) and for each model layer.

Table 4-9. Water Budget by Layer for the Steady-State Predevelopment Simulation

	Mass Balance Components	Layer 1 Flow (Quaternary Alluvium)	Layer 2 Flow (Younger Units)	Layer 3 Flow (Sparta Aquifer)	Layer 4 Flow (Weches Aquitard)	Layer 5 Flow (Queen City Aquifer)	Layer 6 Flow (Reklaw Aquitard)	Layer 7 Flow (Carrizo-Upper Wilcox)	Layer 8 Flow (Middle Wilcox)	Layer 9 Flow (Lower Wilcox)	Total Model Flow
		(acre-feet per year)									
Inflows	Storage	--	--	--	--	--	--	--	--	--	--
	Layer Top	--	11,141	159,495	59,186	1,980,488	22,166	164,083	88,922	432,071	--
	Layer Bottom	2,591,613	239,130	135,139	135,316	58,373	55,421	108,909	103,759	--	--
	Well	--	--	--	--	--	--	--	--	--	--
	General Head Boundary	--	154,129	30,549	0	51,447	0	1,090	7,629	19,976	264,821
	River	2,463,142	--	--	--	--	--	--	--	--	2,463,142
	Recharge	43,380	1,800	20,946	4,814	52,226	6,300	52,819	16,429	25,458	224,170
	Evapotranspiration	--	--	--	--	--	--	--	--	--	--
	Total Inflows	5,098,135	406,200	346,128	199,317	2,142,534	83,887	326,900	216,739	477,505	2,952,133
Outflows	Storage	--	--	--	--	--	--	--	--	--	--
	Layer Top	--	9,969	257,967	135,583	2,069,456	60,535	254,802	166,845	472,504	--
	Layer Bottom	2,499,740	151,571	59,012	62,644	20,467	21,268	63,024	39,826	--	--
	Well	--	--	--	--	--	--	--	--	--	--
	General Head Boundary	--	244,641	21,980	0	49,311	0	4,438	8,255	2,393	331,018
	River	2,592,521	--	--	--	--	--	--	--	--	2,592,521
	Recharge	--	--	--	--	--	--	--	--	--	--
	Evapotranspiration	5,874	19.2	7,169	1,090	3,300	2,084	4,637	1,813	2,607	28,594
	Total Outflows	5,098,135	406,200	346,128	199,317	2,142,534	83,887	326,900	216,739	477,505	2,952,133
Net Flows	In-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent Discrepancy	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 4-10. Water Budget by Layer at End of the Simulation in 2017

	Mass Balance Components	Layer 1 Flow (Quaternary Alluvium)	Layer 2 Flow (Younger Units)	Layer 3 Flow (Sparta Aquifer)	Layer 4 Flow (Weches Aquitard)	Layer 5 Flow (Queen City Aquifer)	Layer 6 Flow (Reklaw Aquitard)	Layer 7 Flow (Carrizo-Upper Wilcox)	Layer 8 Flow (Middle Wilcox)	Layer 9 Flow (Lower Wilcox)	Total Model Flows
		(acre-feet per year)									
Inflows	Storage	978	34	636	115	2,193	418	4,759	3,529	5,592	18,254
	Layer Top	0	11,169	189,411	85,873	2,088,541	154,356	328,582	125,201	470,262	0
	Layer Bottom	2,499,351	223,150	119,640	119,658	10,882	7,231	173,779	150,302	0	0
	Well	0	0	0	0	0	0	0	0	0	0
	General Head Boundary	0	182,863	30,567	0	53,275	0	2,801	10,350	22,010	301,866
	River	2,595,521	0	0	0	0	0	0	0	0	2,595,521
	Recharge	49,358	2,048	23,832	5,477	59,422	7,168	60,097	18,693	28,965	255,060
	Evapotranspiration	0	0	0	0	0	0	0	0	0	0
	Total Inflows	5,145,208	419,264	364,086	211,123	2,214,314	169,173	570,017	308,074	526,830	3,170,702
Outflows	Storage	1,084	14	636	73	5,817	278	16,951	4,224	4,932	34,009
	Layer Top	0	9,907	241,209	119,906	1,999,596	11,882	191,459	225,360	504,674	0
	Layer Bottom	2,639,477	180,552	85,499	89,894	150,916	155,615	95,212	56,230	0	0
	Well	0	0	7,485	0	9,225	0	263,224	14,891	13,326	308,150
	General Head Boundary	0	228,776	21,946	0	47,437	0	2,548	6,518	1,719	308,945
	River	2,501,473	0	0	0	0	0	0	0	0	2,501,473
	Recharge	0	0	0	0	0	0	0	0	0	0
	Evapotranspiration	3173.4369	16	7,311	1,250	1,324	1,398	624	850	2,178	18,125
	Total Outflows	5,145,208	419,264	364,086	211,123	2,214,314	169,173	570,017	308,074	526,830	3,170,702
Net Flows	In-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent Discrepancy	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Notes:
1. Mass balance rates shown are for the end of the transient simulation at stress period 39, time step 1 (end of 2017).
2. Pumping was not simulated in model layers 1, 2, 4, and 6 (Quaternary Alluvium, Younger Units, Weches Formation, and Reklaw Formation).

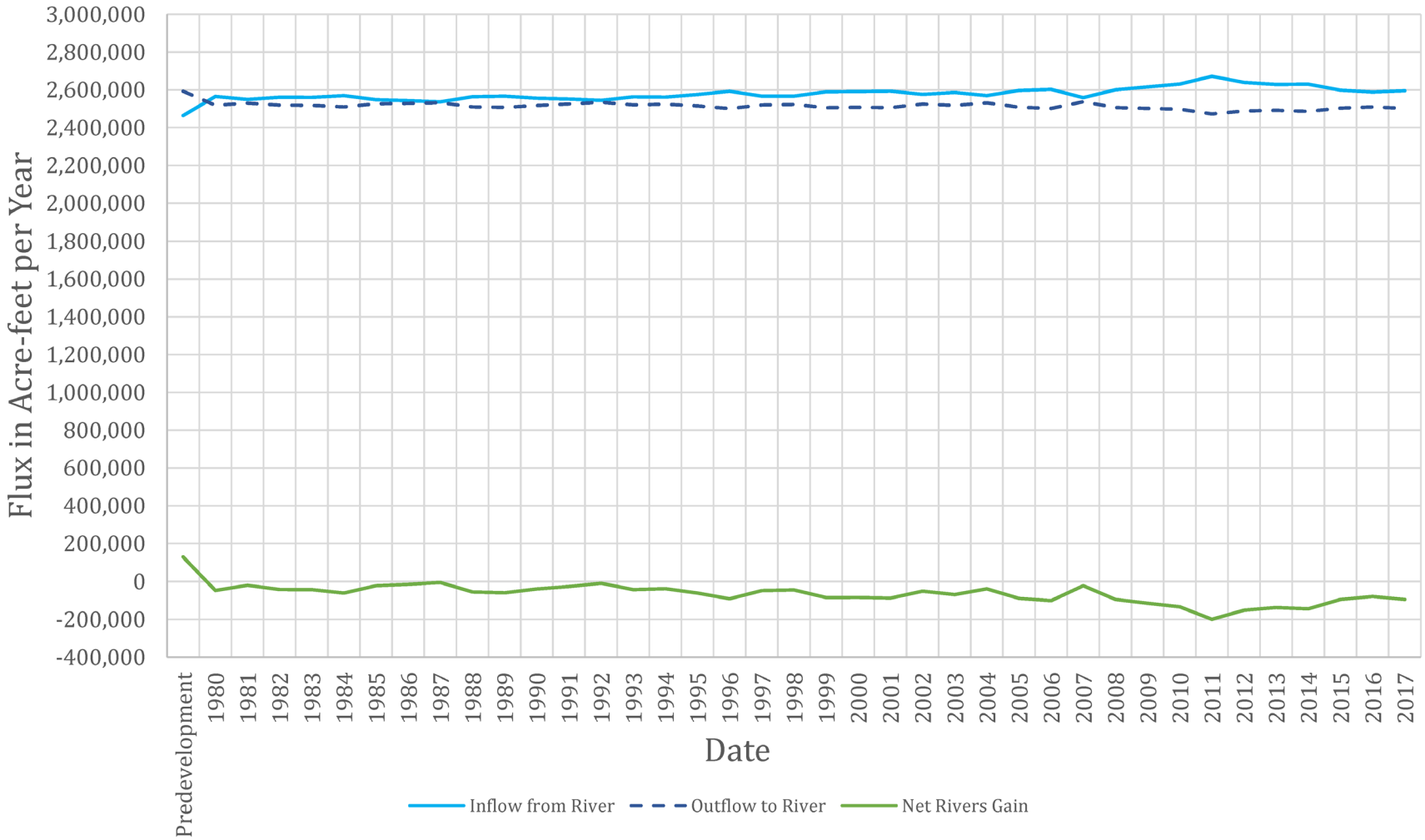


Figure 4-74. Groundwater Budget for River Flux for the 1980 to 2017 Calibration Simulations

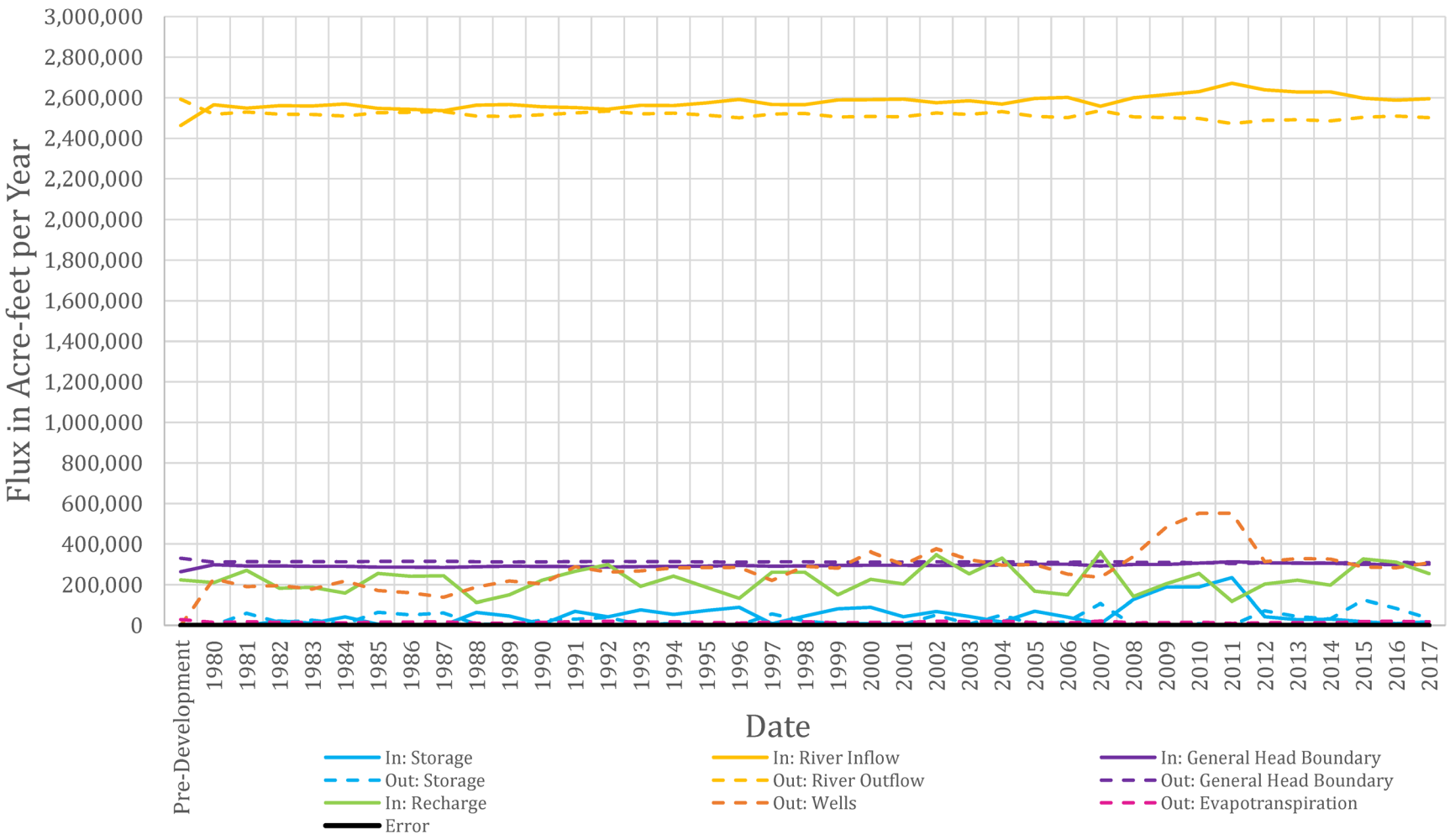


Figure 4-75. Water Budget for the 1980 to 2017 Calibrated Simulation

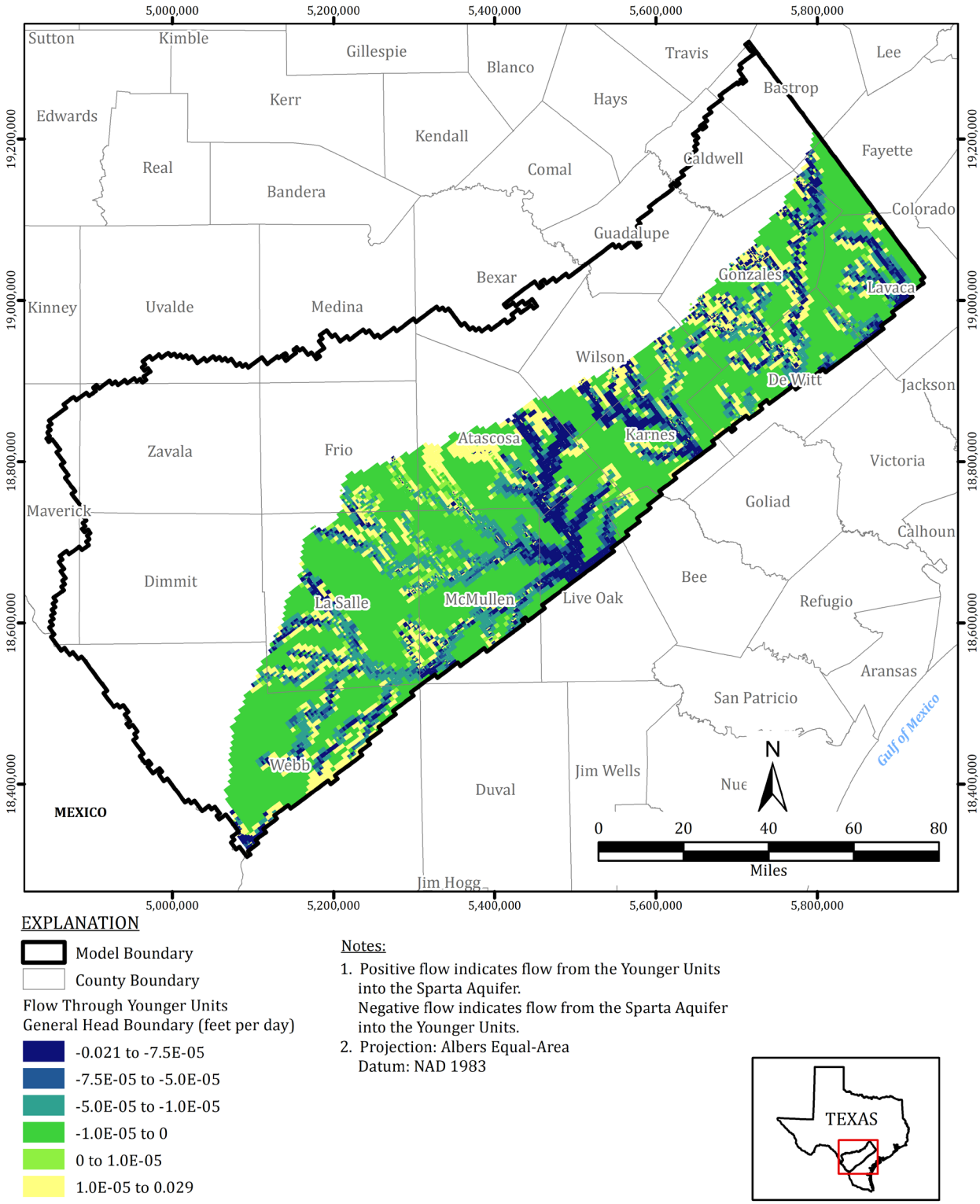


Figure 4-76. Flow Through General Head Boundary in Younger Units in 2017

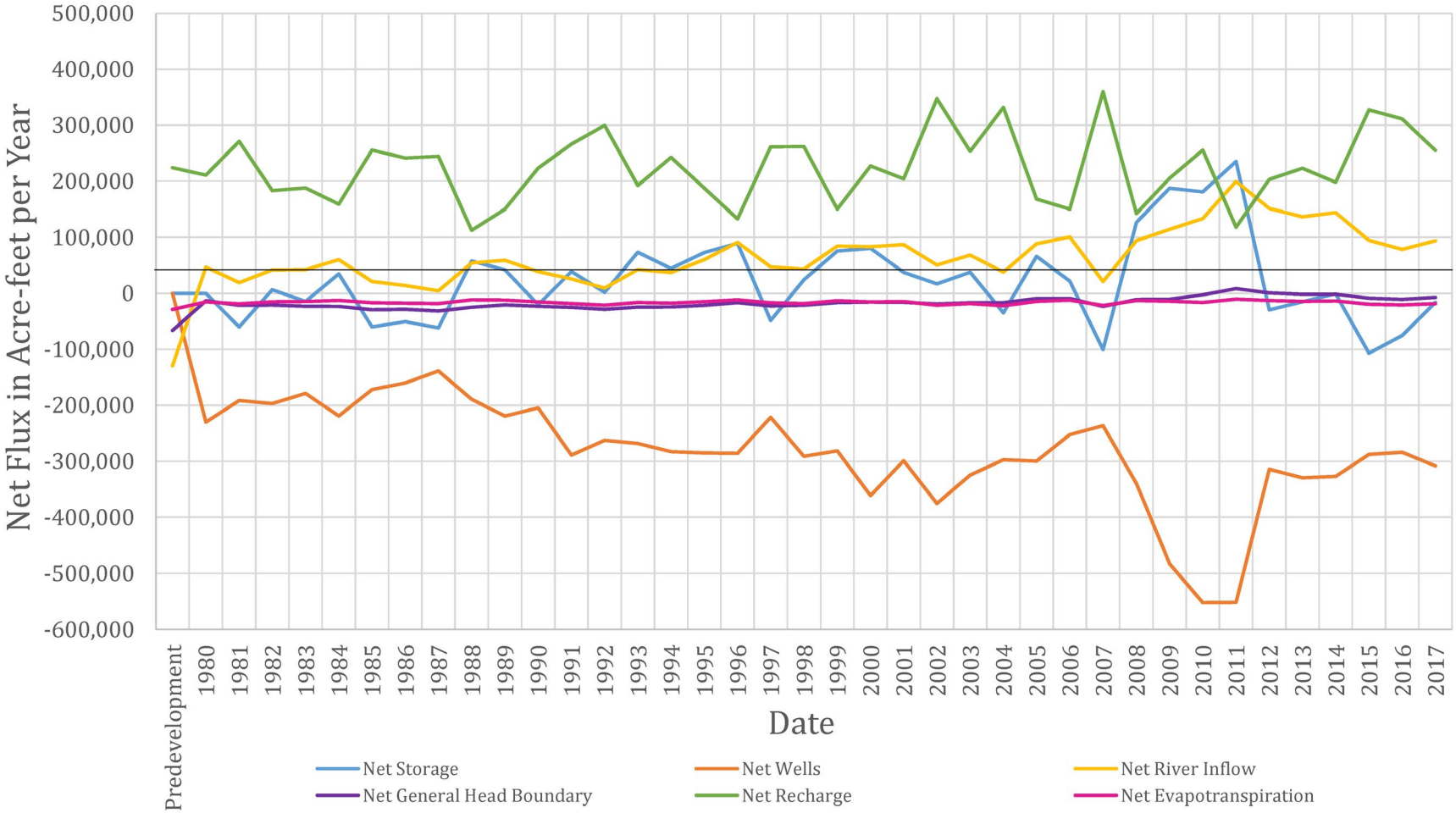


Figure 4-77. Net Water Budget for the 1980 to 2017 Calibrated Simulation

5 Model Sensitivity

Sensitivity analyses were performed using the calibrated model to determine the impact of parameter changes on the simulated calibration results. For these analyses, parameter values were lowered and raised by prescribed factors and the changes in model calibration root mean squared error and absolute residual mean for groundwater elevations were evaluated to establish model behavior. The head absolute residual mean change indicates whether and how much the overall simulated water level elevations have additionally migrated away from observed values because of the parameter change. The root mean squared error change indicates how the spread in observed versus modeled water level elevation has changed.

Parameters were then categorized into low, medium, and high sensitivity groups based on the change in calibration statistics resulting from the change in the parameter value. The parameters are categorized into "sensitivity types" as defined by ASTM International (formerly the American Society for Testing and Materials) (ASTM, 1994, 2000) for uncertainty evaluations of predictive analyses. The sensitivity types categorize how parameters impact the model calibration versus the model predictions and are as follows:

- Type I sensitivity is defined for parameters that cause insignificant changes to the calibration residuals as well as to model conclusions/predictions of interest. Type I sensitivity is of no concern because regardless of the value of the input, the prediction is also insensitive to the parameter change.
- Type II sensitivity is defined for parameters that cause significant changes to the calibration residuals but insignificant changes to model conclusions/predictions of interest. Type II sensitivity is not of consequence to the prediction because the prediction is not sensitive to the change in parameter value regardless of how the calibration is affected.
- Type III sensitivity is defined for parameters that cause significant changes to the calibration residuals as well as to the model conclusions/predictions. Type III sensitivity is of no concern because even though the model's predictions change as a result of variation of the input variable value, the calibration residuals are also sensitive, and the model becomes uncalibrated as a result. Thus, model calibration ensures that the predictions considered are appropriate for the modeled system.
- Type IV sensitivity is defined for parameters that cause insignificant changes to model calibration residuals but significant changes to the model predictions. Type IV sensitivity is of concern because, over the range of parameter values for which the model can be considered calibrated, the conclusions or predictions of the model can change considerably. Type IV sensitive parameters need more attention and additional data collection may help to better bound the predictions.

The parameters that were evaluated for the sensitivity study include horizontal and vertical hydraulic conductivity, recharge, evapotranspiration, storage, and groundwater pumping rates.

5.1 Sensitivity to Aquifer and Aquitard Hydraulic Conductivity Parameters

Sensitivity of the model calibration to hydraulic conductivity values of the various geologic units was evaluated for the entire duration of the simulation period. The parameter sensitivity study was conducted by using the automated sensitivity analysis option in Groundwater Vistas Version 8.28 (Rumbaugh and Rumbaugh, 2022). The automated sensitivity evaluated the model while adjusting hydraulic conductivity one layer at a time. For each layer, hydraulic conductivity values were multiplied by factors of 0.5, 0.9, 1.1, and 1.5. The factors of 0.5 and 1.5 represent a 50 percent reduction and increase in the hydraulic conductivity, while the factors of 0.9 and 1.1 represent a 10 percent reduction and increase in the hydraulic conductivity. The automated sensitivity analysis calculated the calibration statistics for each parameter change and compiled the results in an autosens.out file.

Most model layers were not sensitive to multiplying-factor changes in value of the hydraulic conductivity; those that were showed various degrees of sensitivity. Figures 5-1 and 5-2 show the absolute residual mean for the hydraulic conductivity sensitivity and Figures 5-3 and 5-4 show the root mean squared error for the hydraulic conductivity sensitivity.

For horizontal hydraulic conductivity, the Carrizo-Upper Wilcox, and Lower Wilcox had the greatest sensitivity as shown on Figures 5-1 and 5-3 with maximum absolute residual mean and root mean squared error of 28 and 46 feet respectively, for a multiplying factor of 0.5. The remaining layers showed little to no sensitivity to increases or decreases in the horizontal hydraulic conductivity.

For vertical hydraulic conductivity, overall model calibration was less sensitive to changes in parameter values relative to sensitivity results for horizontal hydraulic conductivity. The Recklaw Aquitard showed the greatest sensitivity to changes in vertical hydraulic conductivity values followed by the Carrizo-Upper Wilcox aquifer as shown on Figures 5-2 and 5-4. The root mean squared error and absolute residual mean calibration metrics were either minimized or very near their minimum values for the model parameterization of the calibrated model. The remaining layers showed little to no sensitivity to increases or decreases in the sand hydraulic conductivity.

Table 5-1 categorizes the sensitivity simulations into low, medium, and high sensitivity values based on sensitivity statistics. Parameters with low, medium, or high sensitivity to calibration based on the absolute residual mean heads and root mean squared head error were categorized as possible Sensitivity Type II or III. These included horizontal hydraulic conductivity for the Queen City Aquifer, Carrizo-Upper Wilcox, Middle Wilcox, and Lower Wilcox units. For vertical hydraulic conductivity, this included only the Reklaw Formation and Carrizo-Upper Wilcox. The remaining layers showing little to no sensitivity to increases or decreases in horizontal or vertical hydraulic conductivity values and were categorized as possible Sensitivity Type I or IV.

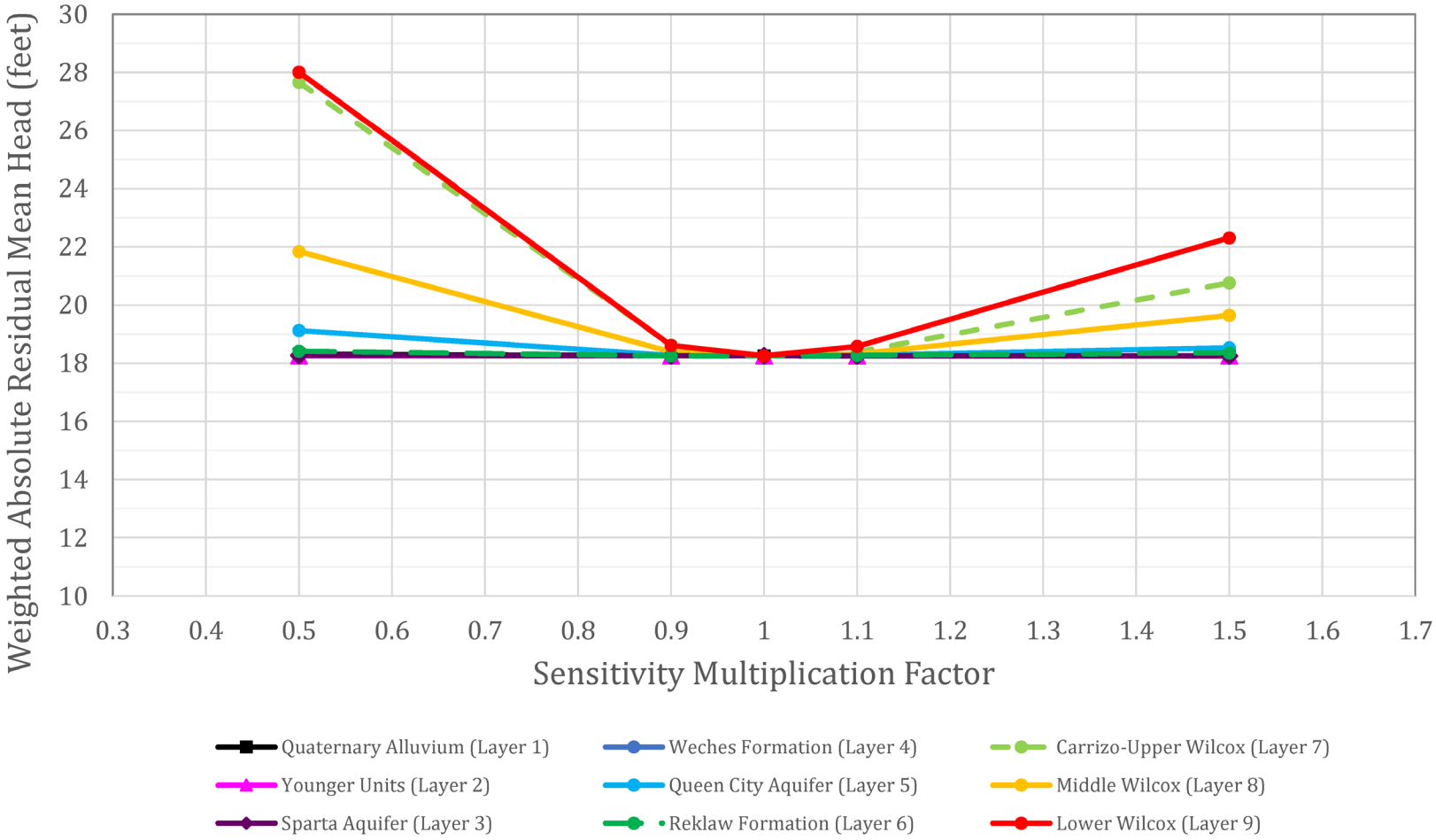


Figure 5-1. Sensitivity of Weighted Absolute Mean Head Error to the Horizontal Hydraulic Conductivity Value for Geologic Units

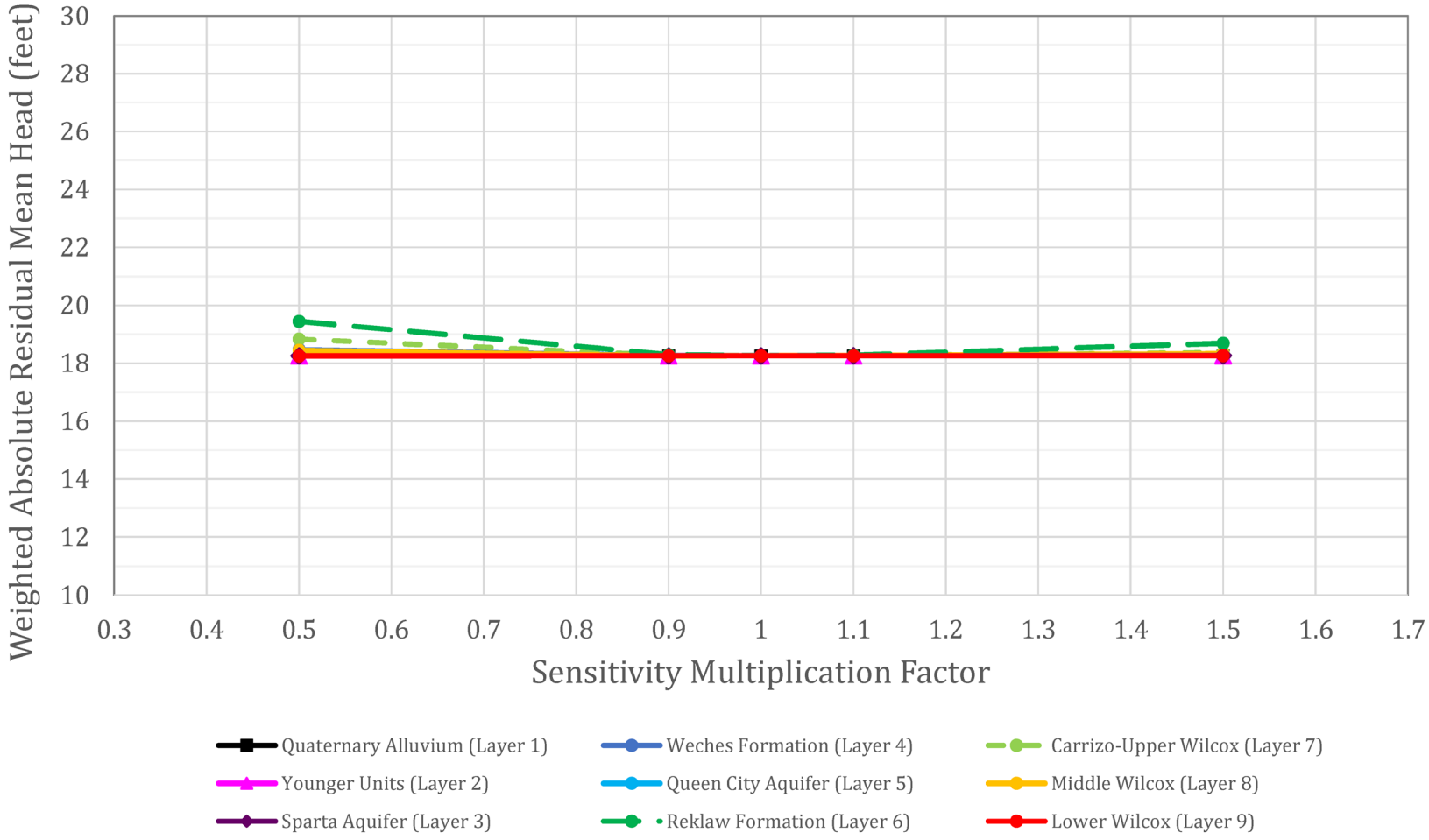


Figure 5-2. Sensitivity of Weighted Absolute Mean Head Error to the Vertical Hydraulic Conductivity Value for Geologic Units

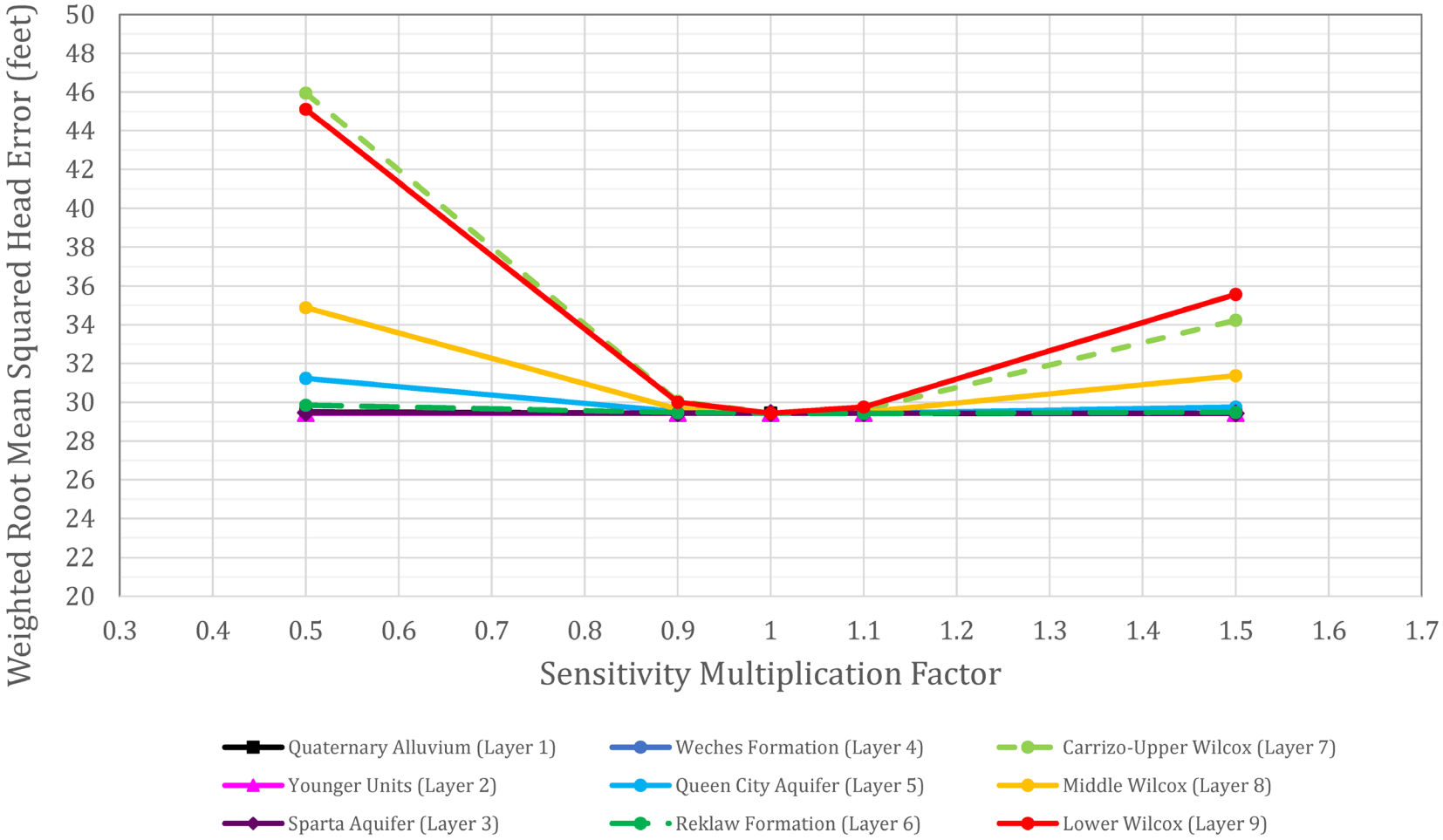


Figure 5-3. Sensitivity of Weighted Root Mean Squared Head Error to the Horizontal Hydraulic Conductivity Value for Geologic Units

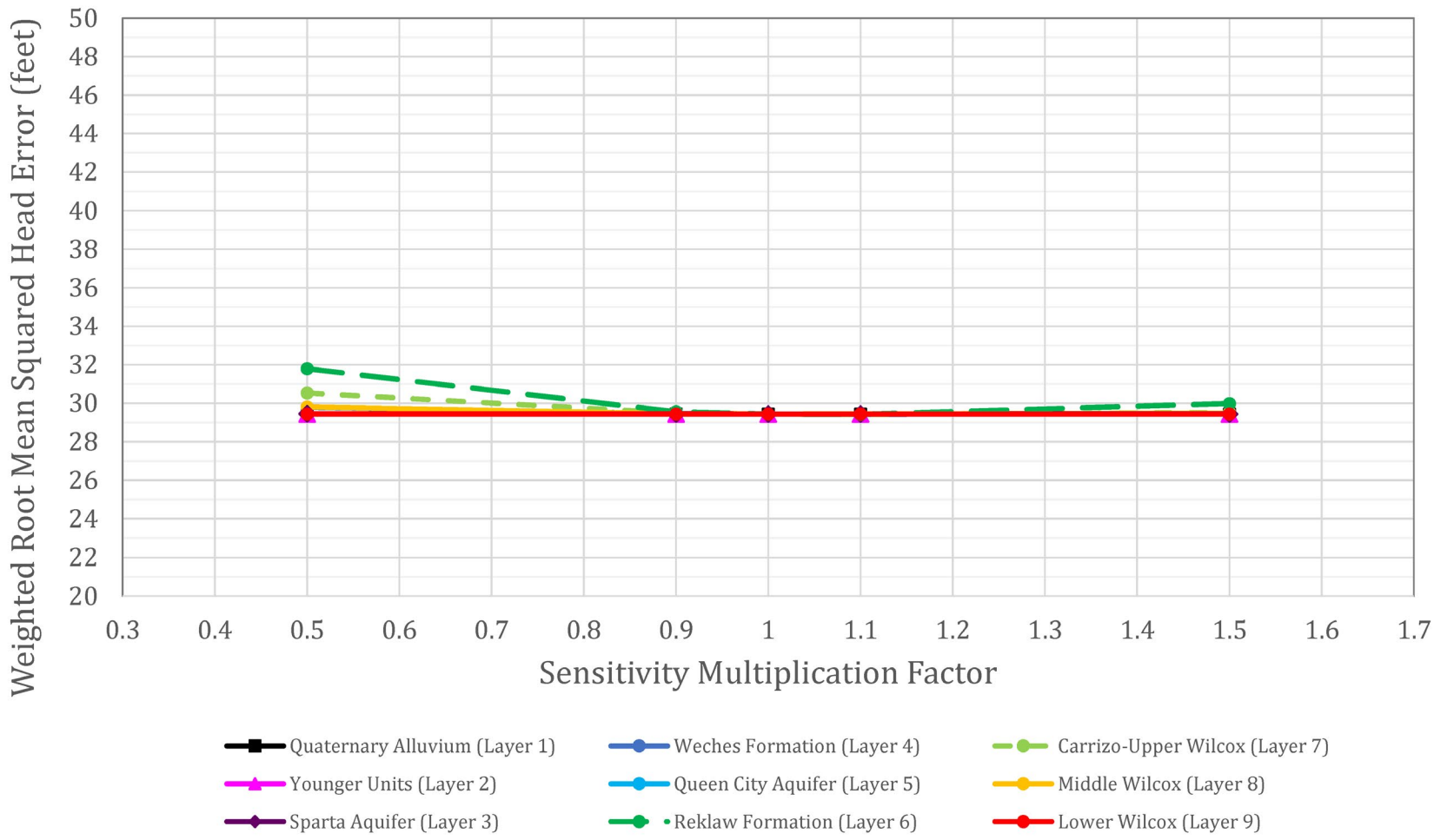


Figure 5-4. Sensitivity of Weighted Root Mean Squared Head Error to the Vertical Hydraulic Conductivity Value for Geologic Units

Table 5-1. Model Parameter Sensitivity Type

Model Parameter	Absolute Residual Mean Sensitivity	Root Mean Square Head Error Sensitivity	Possible ASTM Sensitivity Type
Horizontal Hydraulic Conductivity			
Quaternary Alluvium (Layer 1)	No sensitivity	No sensitivity	Type I or IV
Younger Units (Layer 2)	No sensitivity	No sensitivity	Type I or IV
Sparta Aquifer (Layer 3)	No sensitivity	No sensitivity	Type I or IV
Weches Formation (Layer 4)	No sensitivity	No sensitivity	Type I or IV
Queen City Aquifer (Layer 5)	Low	Low	Type II or III
Reklaw Formation (Layer 6)	No sensitivity	No sensitivity	Type I or IV
Carrizo-Upper Wilcox (Layer 7)	High	High	Type II or III
Middle Wilcox (Layer 8)	Medium	Medium	Type II or III
Lower Wilcox (Layer 9)	High	High	Type II or III
Vertical Hydraulic Conductivity			
Quaternary Alluvium (Layer 1)	No sensitivity	No sensitivity	Type I or IV
Younger Units (Layer 2)	No sensitivity	No sensitivity	Type I or IV
Sparta Aquifer (Layer 3)	No sensitivity	No sensitivity	Type I or IV
Weches Formation (Layer 4)	No sensitivity	No sensitivity	Type I or IV
Queen City Aquifer (Layer 5)	No sensitivity	No sensitivity	Type I or IV
Reklaw Formation (Layer 6)	Low	Low	Type II or III
Carrizo-Upper Wilcox (Layer 7)	Low	Low	Type II or III
Middle Wilcox (Layer 8)	No sensitivity	No sensitivity	Type I or IV
Lower Wilcox (Layer 9)	No sensitivity	No sensitivity	Type I or IV
Recharge	Low	Low	Type II or III
Pumping	High	High	Type II or III
Evapotranspiration	No sensitivity	No sensitivity	Type I or IV

Notes:
1. The specific yield model sensitivity was evaluated for its impact on water level fluctuations and is not categorized by ASTM sensitivity type.
2. ASTM sensitivity types are from ASTM D 5611-94 dated 1994, reappproved 2000.

5.2 Sensitivity to Model Stresses

The model calibration sensitivity to recharge, evapotranspiration, and groundwater pumping was evaluated for each parameter across all layers and using the entire time duration of the model. Stress values were multiplied by factors of 0.5, 0.9, 1.1 and 1.5 to note the impact on calibration errors where factors 0.5 and 1.5 represent a 50 percent reduction and increase in the respective flux values, while the factors of 0.9 and 1.1 represent a 10 percent reduction and increase in the respective flux values.

Figure 5-5 and 5-6 show sensitivity results of the absolute residual mean head residual and root mean squared error to changes in recharge, evapotranspiration rate, and groundwater pumping rates. Pumping has the largest impact on both metrics computed at the target groundwater cells, while both recharge and evapotranspiration rates have minimal impacts.

As with hydraulic conductivity, Table 5-1 also groups sensitivity simulations into low, medium, and high sensitivity values based on sensitivity statistics. Neither evapotranspiration nor recharge appreciably affected the root mean squared head error or the absolute residual mean head values.

Evapotranspiration was categorized as a possible Sensitivity Type I or IV parameter (Table 5-1). If future predictive simulations for evapotranspiration indicate large prediction changes, then this stress could be classified as Sensitivity Type IV, indicating that predictions would be more accurate for better estimates of this parameter even though it may not affect the calibration.

Pumping and recharge were categorized as a possible Sensitivity Type II or III (Table 5-1). The model showed highest sensitivity to both increase and decreases in pumping, as reflected by the increase in both the absolute residual mean and root mean squared error of up to 60 and 100 feet respectively which is double the highest sensitivity to hydraulic conductivity for similar multiplying factors. This result helps to illustrate the importance of parameterizing the model with accurate pumping rates in order to achieve better model calibration that is also consistent with the hydrogeologic conceptual model.

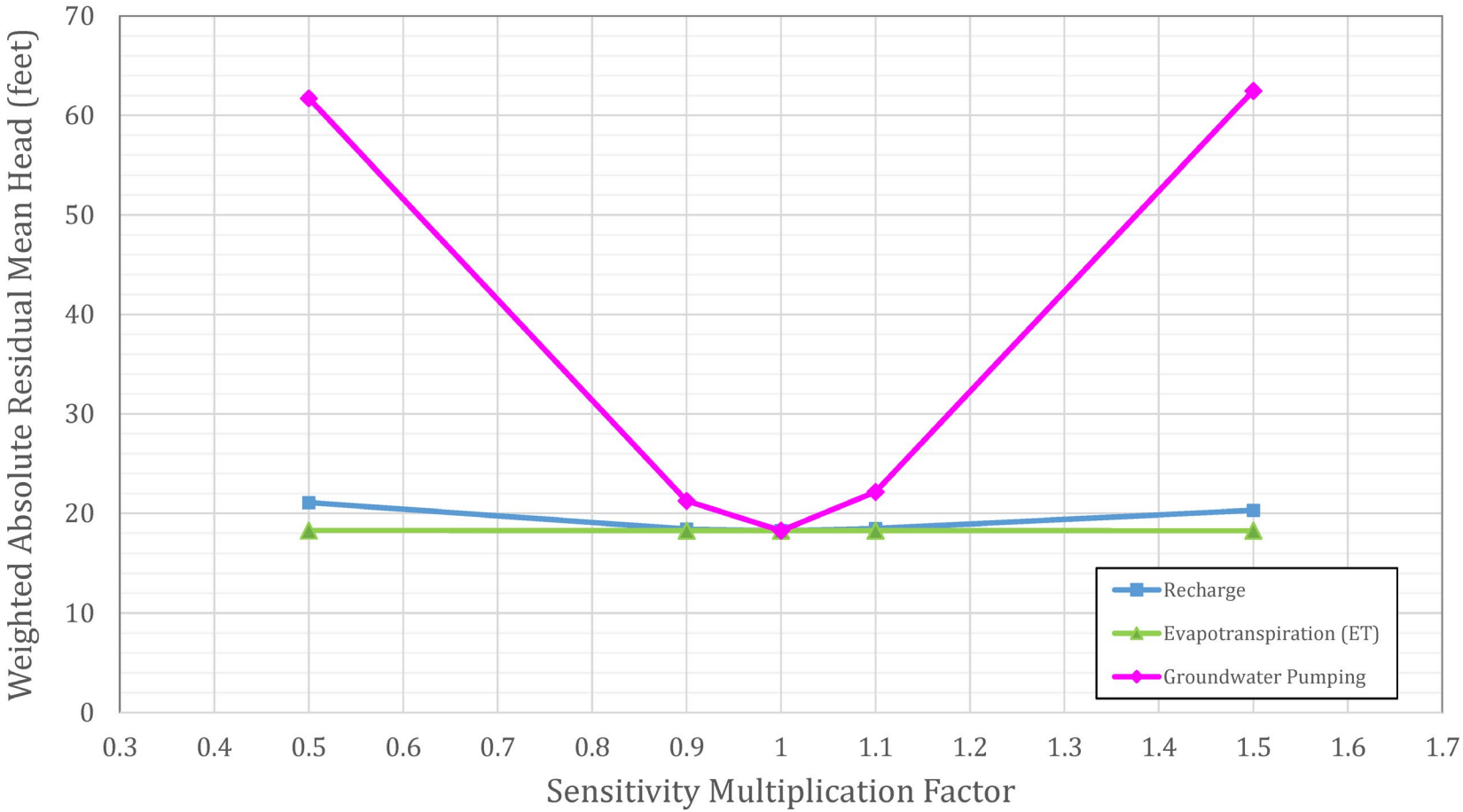


Figure 5-5. Weighted Absolute Mean Head Error Sensitivity Graph for Model Parameters

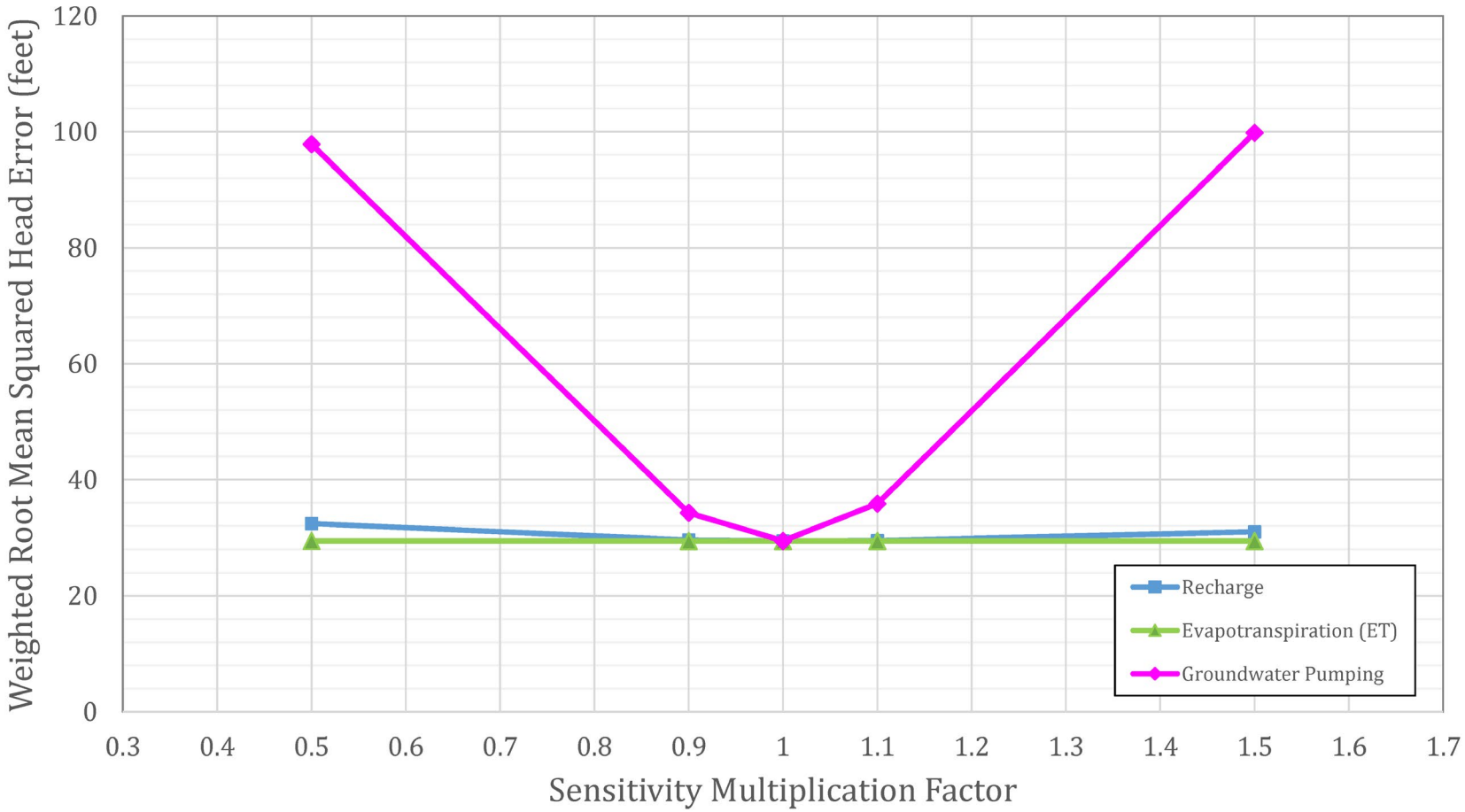


Figure 5-6. Weighted Root Mean Squared Head Error Sensitivity Graph for Model Parameters

5.3 Sensitivity for No Pumping and Constant Recharge Conditions

The groundwater model was also used to evaluate the effects of no pumping and constant recharge. The no pumping model, in comparison to the calibration simulation, demonstrates the impact of pumping on water level elevation fluctuations, and the fluctuations of the no pumping model are largely due to changes in recharge. Comparing the constant recharge model with the calibration simulation demonstrates the impact of recharge fluctuations on water level elevations, with the fluctuations of the constant recharge model being due to changes in pumping. Figures 5-7 through 5-11 show the hydrographs at select wells for these sensitivity studies.

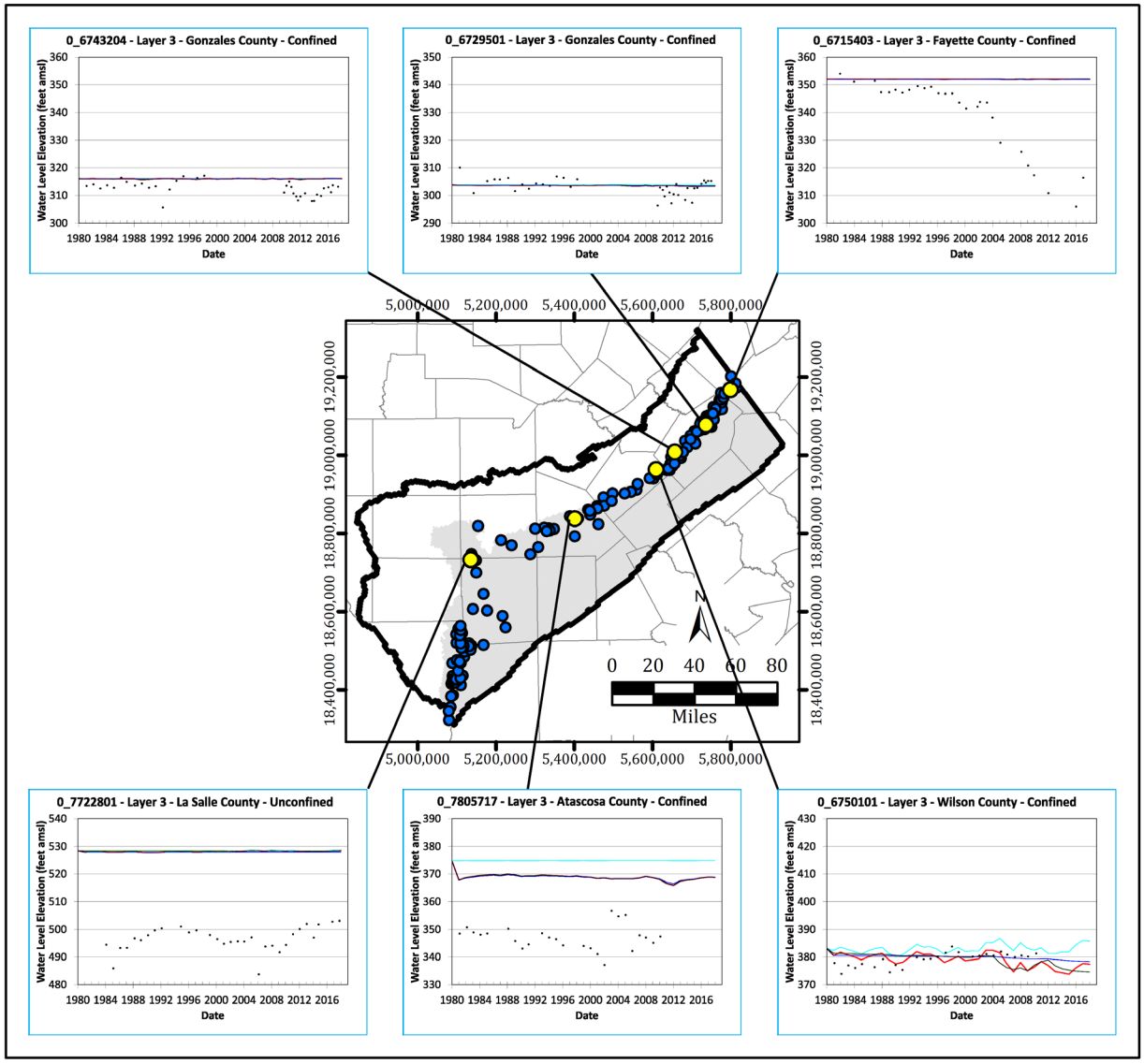
The groundwater model with no pumping generally results in increased water level elevations, as shown on Figures 5-7 through 5-11. This could be indicative of pumping within the wrong layer at locations where the no pumping case improved the fit to water levels. The increase in water levels is much larger in confined areas than in unconfined areas indicating the importance of pumping to the confined water levels. Also, since the only other transient boundary condition in the model was annual changes in recharge, the fluctuations noted in the no pumping case are due to variations in recharge. It is noted that the no pumping case shows fluctuations due to recharge in unconfined areas, while the lines are flatter in confined areas.

Applying a constant recharge rate over all model stress periods generally resulted in similar water level elevation hydrographs as the calibrated model, but with dampened water level fluctuations at the unconfined observation wells. These sensitivities indicate that both pumping and recharge stress fluctuations contribute to water level fluctuations in unconfined areas, while water level fluctuations are more sensitive to pumping variations in confined areas. Establishing a better pumping dataset through the years is therefore critical in obtaining better calibrated models with similar water level fluctuations as observed, in these confined areas.

5.4 Sensitivity to Aquifer Storage Parameters

A sensitivity analysis was conducted to evaluate the impact of aquifer storage properties on water level fluctuations in the domain. Since the focus of this sensitivity was to evaluate water fluctuations and not the general calibration statistics, the results were not categorized into ASTM sensitivity types. To evaluate the effect of the specific yield, specific yield was assigned a uniform value of 0.10 for the transient model; this value is larger than the specific yield values used in the calibrated model. The value of 0.1 was used for this sensitivity to test the impact of a typical literature value, as compared to the much lower values used in the calibrated model resulting from aquifer tests and model calibration.

Figures 5-7 through 5-11 show the hydrographs at select wells for this sensitivity study. Water level fluctuations were generally dampened for the sensitivity simulation with a uniform higher value of specific yield compared to the calibrated simulation. Hydrographs show that simulated water level elevations at unconfined monitoring well locations exhibit a more significant flattening of the response.



EXPLANATION

- Model Boundary
- County Boundary
- Layer 3
- Layer 3 Targets
- Select Layer 3 Targets

Chart Name

Well Name - Layer - County - Aquifer Type

Chart Legend

- Observed Water Level
- Simulated Water Level
- Sensitivity 1 - No Pumping
- Sensitivity 2 - Recharge
- Sensitivity 3 - Specific Yield

Chart Outline Color for Y-Axis Range

- Y-Axis = 60 feet

Note:

1. Projection: Albers Equal-Area
   Datum: NAD 1983

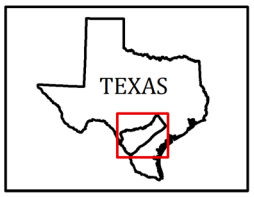
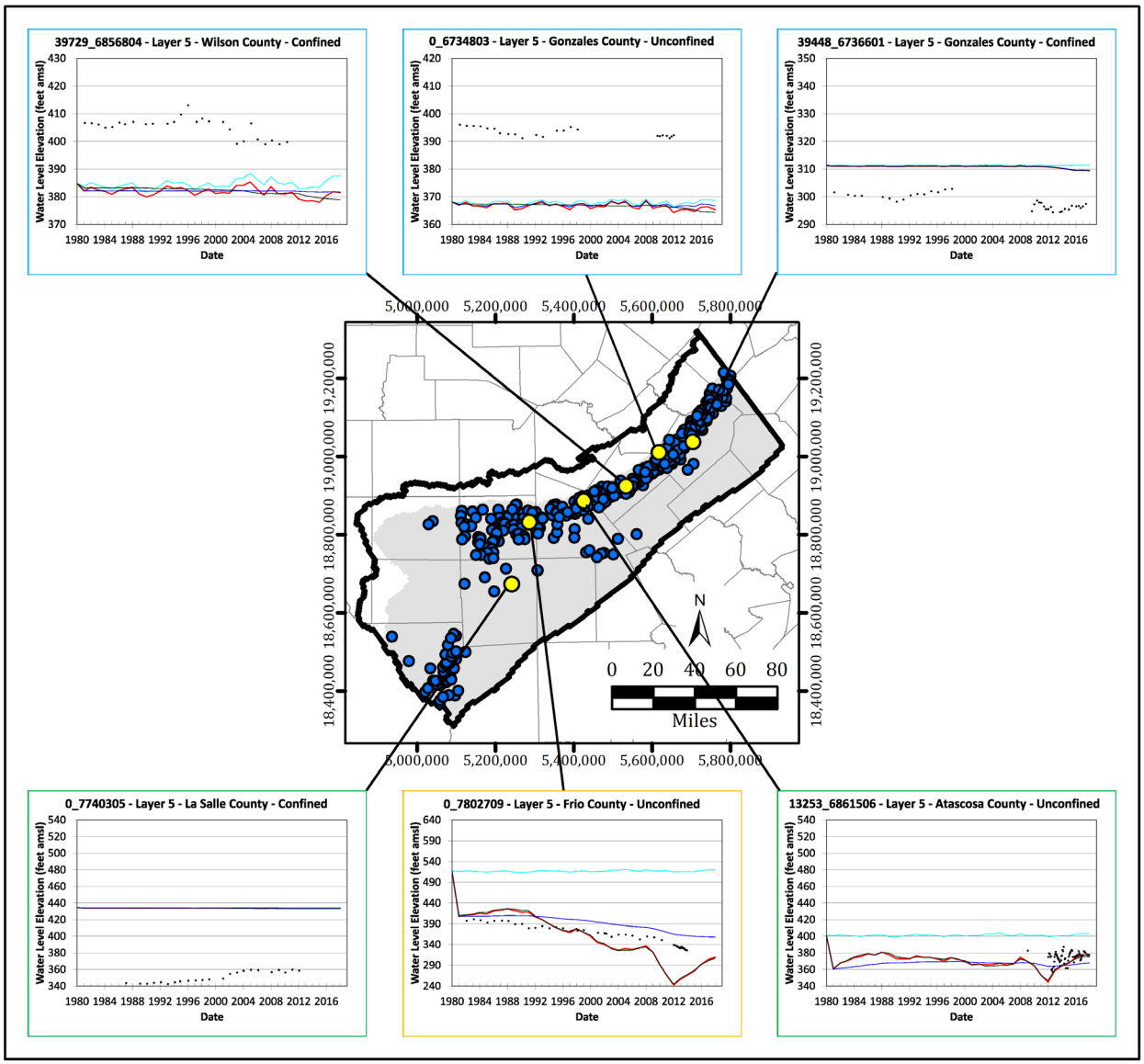


Figure 5-7. Measured and Simulated Hydrographs at Select Wells Showing Model Sensitivity – Sparta Aquifer (Layer 3)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 5
- Layer 5 Targets
- Select Layer 5 Targets

Chart Name
Well Name - Layer - County - Aquifer Type

Chart Legend
- Observed Water Level
- Simulated Water Level
- Sensitivity 1 - No Pumping
- Sensitivity 2 - Recharge
- Sensitivity 3 - Specific Yield

Chart Outline Color for Y-Axis Range
- Y-Axis = 400 feet
- Y-Axis = 200 feet
- Y-Axis = 60 feet

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

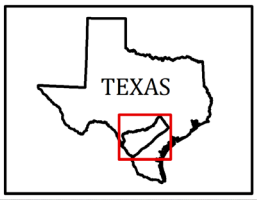
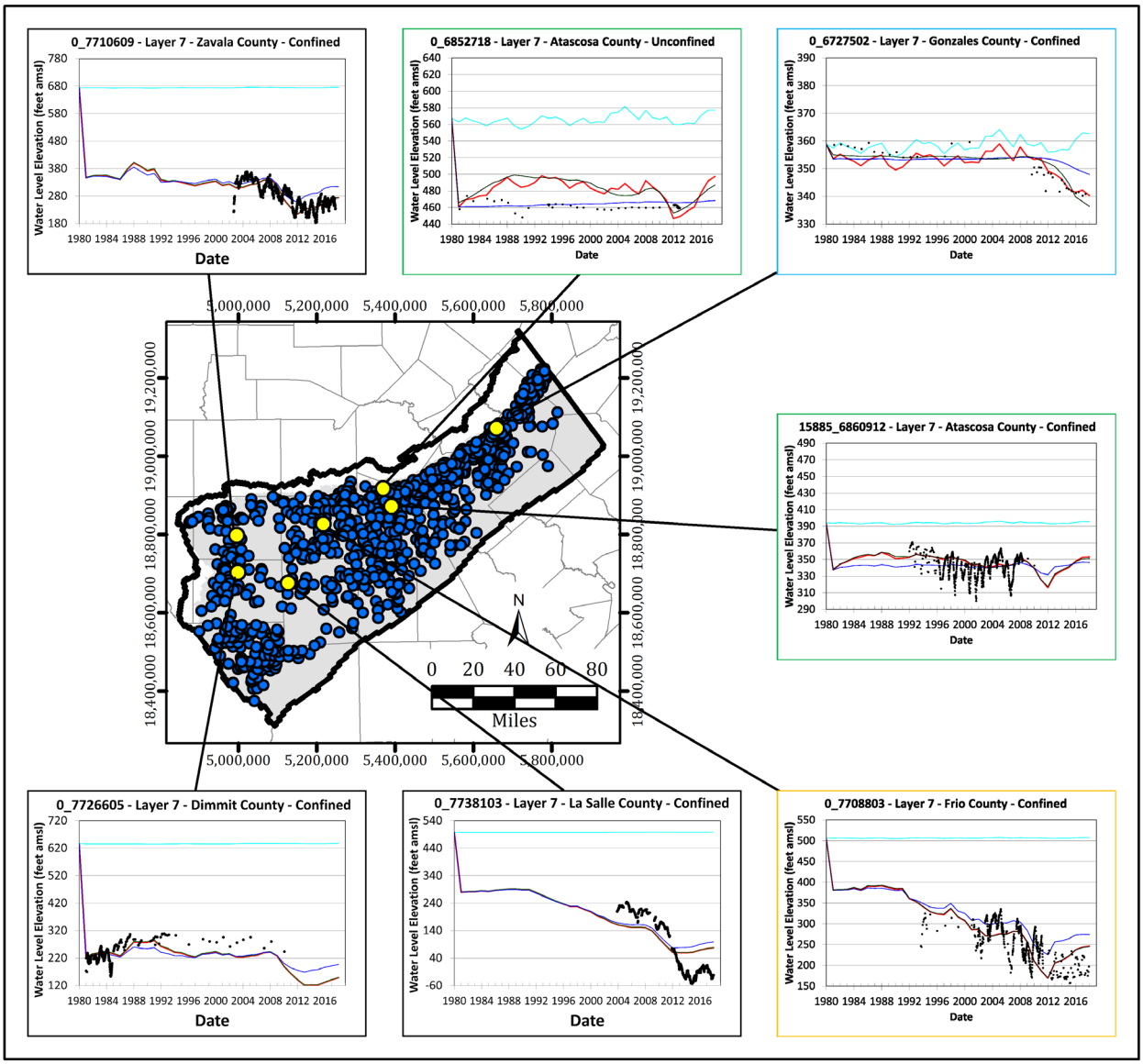


Figure 5-8. Measured and Simulated Hydrographs at Select Wells Showing Model Sensitivity – Queen City Aquifer (Layer 5)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 7
- Layer 7 Targets
- Select Layer 7 Targets

Chart Name
Well Name - Layer - County - Aquifer Type

Chart Legend
- Observed Water Level
- Simulated Water Level
- Sensitivity 1 - No Pumping
- Sensitivity 2 - Recharge
- Sensitivity 3 - Specific Yield

Chart Outline Color for Y-Axis Range
- Y-Axis = 600 feet
- Y-Axis = 200 feet
- Y-Axis = 400 feet
- Y-Axis = 60 feet

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

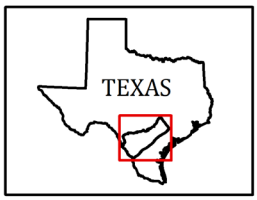
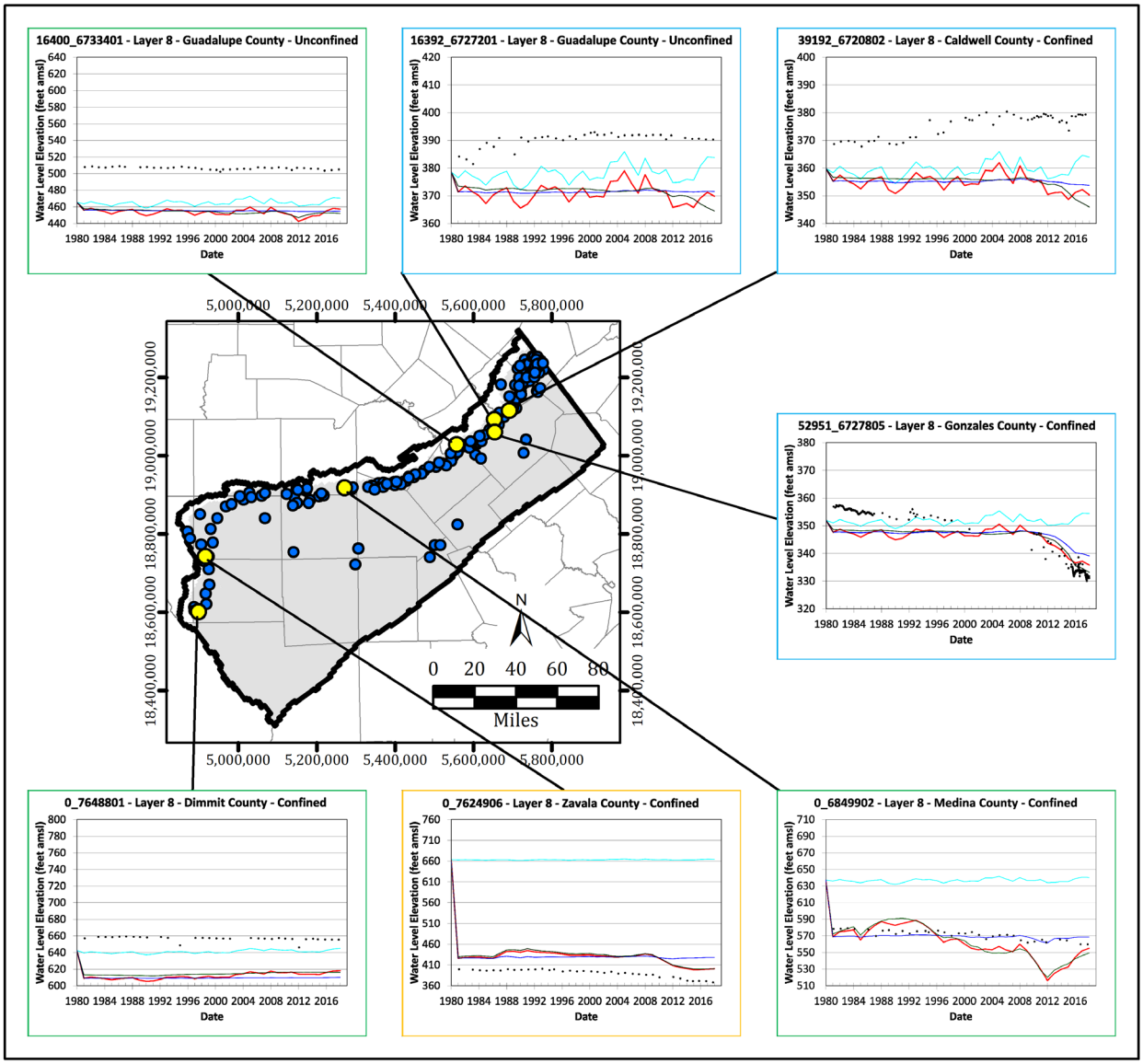


Figure 5-9. Measured and Simulated Hydrographs at Select Wells Showing Model Sensitivity – Carrizo-Upper Wilcox Aquifer (Layer 7)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 8
- Layer 8 Targets
- Select Layer 8 Targets

Chart Name
Well Name - Layer - County - Aquifer Type

Chart Legend
- Observed Water Level
- Simulated Water Level
- Sensitivity 1 - No Pumping
- Sensitivity 2 - Recharge
- Sensitivity 3 - Specific Yield

Chart Outline Color for Y-Axis Range
- Y-Axis = 400 feet
- Y-Axis = 200 feet
- Y-Axis = 60 feet

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

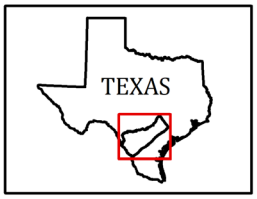
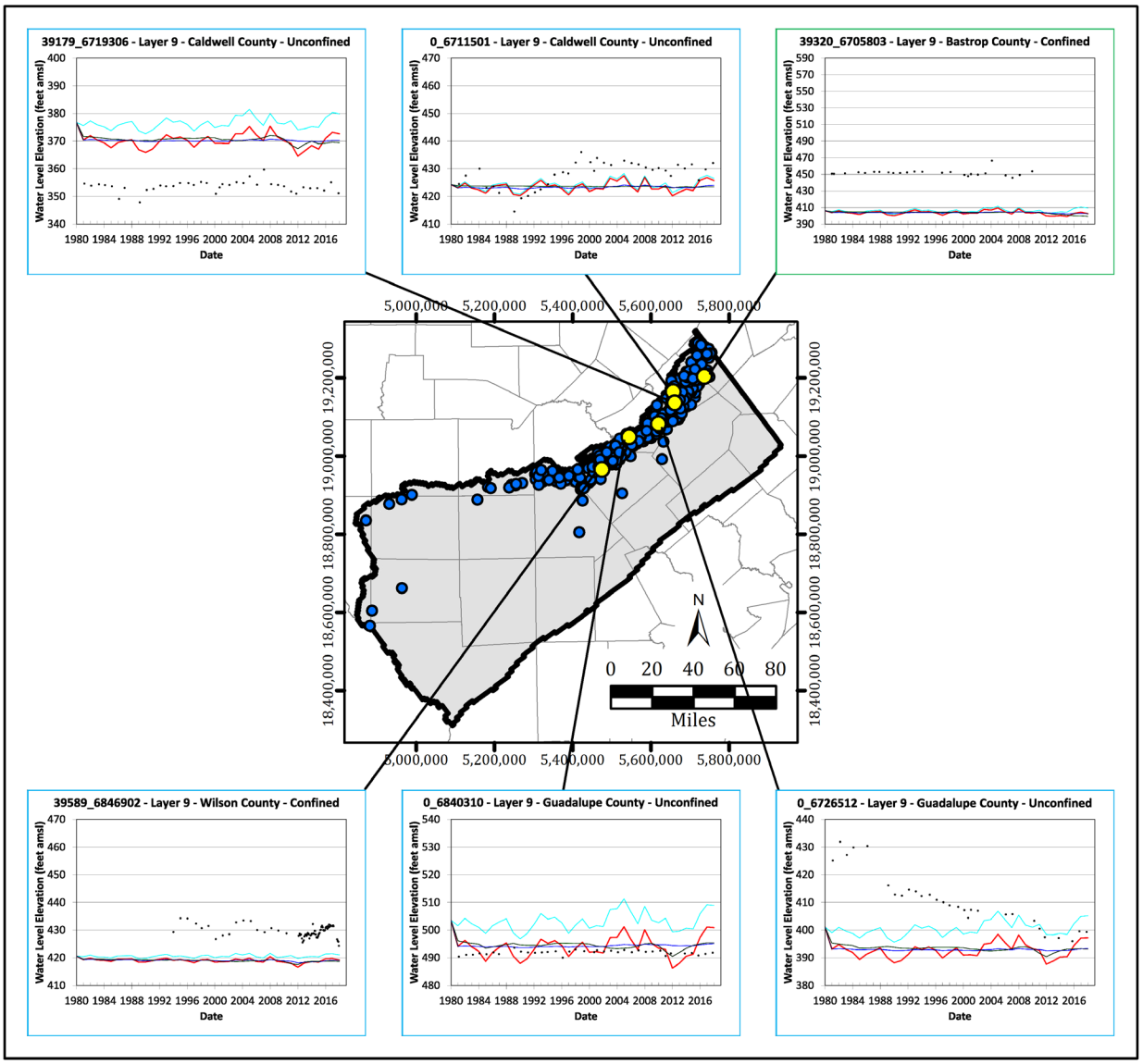


Figure 5-10. Measured and Simulated Hydrographs at Select Wells Showing Model Sensitivity – Middle Wilcox (Layer 8)



EXPLANATION

- Model Boundary
- County Boundary
- Layer 9
- Layer 9 Targets
- Select Layer 9 Targets

Chart Name
Well Name - Layer - County - Aquifer Type

Chart Legend
- Observed Water Level
- Simulated Water Level
- Sensitivity 1 - No Pumping
- Sensitivity 2 - Recharge
- Sensitivity 3 - Specific Yield

Chart Outline Color for Y-Axis Range
- Y-Axis = 200 feet
- Y-Axis = 60 feet

Note:
1. Projection: Albers Equal-Area
   Datum: NAD 1983

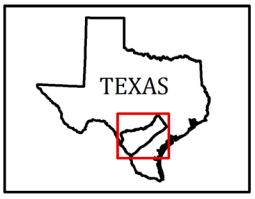


Figure 5-11. Measured and Simulated Hydrographs at Select Wells Showing Model Sensitivity – Lower Wilcox (Layer 9)

However, the general trends in the hydrographs for the calibration and specific yield simulations are similar and indicate the storage parameters are not very significant to the calibrated simulation except in their effect of dampening fluctuations.

5.5 Generation of Ensembles

The calibrated model of the Southern Portion of the Carrizo-Wilcox, Queen City, and Sparta Aquifers is one representation of the hydrogeologic system that calibrates to field data. However, due to lack of continuous spatial information on the hydraulic properties of the subsurface materials, there could be many representations of the system that also calibrate to field data. Thus, an ensemble of models may be used to evaluate predictions instead of just one model, to also provide a band of uncertainty to the model results. This approach is popularized by the availability of tools that can generate ensembles of models for groundwater flow studies. Specifically, the PEST software that was used for calibrating the model also includes an ensemble generator called Iterative Ensemble Smoother. This version of PEST is called PEST++IES.

Pest++ IES uses a powerful approach for history-matching and uncertainty analysis that combine gradient-based inversion with the use of random parameter fields. Since PEST++ IES does not rely on strict local gradient information, it has a high tolerance for nonlinearities in relationships between model parameters and model outputs. In addition, PEST++ IES is not as subject to the issue of local minima as in the strictly gradient-based inversion of PEST-HP. However, robustness of the iterative approach in PEST++IES depends on the number of ensembles used and can provide a poorer calibration than with the PEST-HP approach. Therefore, the model was calibrated with PEST-HP using pilot points and highly regularized inversion as discussed earlier, with PEST++IES generating an ensemble starting from the calibrated model. Although use of an ensemble smoother does not require that a model first be calibrated, pre-calibration of a model has the advantage of speeding up the convergence of the ensemble smoother algorithm.

Operation of an ensemble smoother requires only as many model-runs per iteration as there are parameter realizations in an ensemble. A hundred realizations were generated to provide ensembles for future uncertainty analysis. This was about 20% of the number of parameters that comprise the original calibration.

Of the original 100 realizations, 80 were successful; these PEST++IES models are included in the model files provided with this Groundwater Availability Model update. Output from the process includes matrices for each parameter type (Kx, Kz, Sy) and spreadsheets summarizing the statistical properties of each realization and of each target observation. In addition, the mean and standard deviation of these parameter fields are also provided for reference. A Groundwater Vistas file was also created illustrating the mean parameter fields. In the future, use of this model can include uncertainty analysis by running all 80 parameter fields to generate a probabilistic result.

6 Modeling Limitations

Several simplifications, assumptions, and approximations have been made in developing the groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers. Representation of the domain by discrete finite-volumes, approximation of groundwater flow by the continuity equation and Darcy's Law, and approximation of the various boundary conditions and stresses by steady-state or annual average conditions create an idealized representation of the flow system. This enables regional evaluations at long time-scales (of years to decades), but such an idealized system contains inherent divergence from actual conditions, though the effect of these differences can be assessed. Errors are also associated with mesh design, aquifer or boundary geometry or areal extent, and the configuration of hydrologic components (conceptualization errors). These errors were minimized during model development and further evaluated and reduced during model calibration and sensitivity analysis as described.

Data that are incorporated into a model may be incomplete, may contain errors, or may be incompatible with the modeled spatial and temporal scale. Possible measurement errors in the water level elevations were accounted for in this model by using a lower calibration weighting when these errors were discernable. A limitation of the model is that water level elevations measured instantly were compared to simulated water levels that result from annual stress periods.

Limitations in simulating pumping consisted of difficulty simulating early-time (1981 through 1983), historical pumping in down-dip portions of the Carrizo-Upper Wilcox Aquifer in Zavala, Frio, La Salle, and Dimmit Counties, and simulating pumping using coarse spatial resolution. Pumping information from the conceptual model derived from TWDB databases was incomplete for years 1981 through 1983 so values had to be extrapolated for this period. A scaling approach was used for pumping rates in down-dip portions of the Carrizo-Upper Wilcox Aquifer to improve consistency between pumping and measured water levels.

Sensitivity analysis and automatic calibration methods showed that the model has high sensitivity to pumping. Sensitivity analyses suggest pumping rates could be more accurately assigned to hydrostratigraphic units and potential lack of records, especially in La Salle and other counties noted directly above, may significantly affect calibration and predictive model reliability in western portions of the Carrizo-Upper Wilcox aquifer. Improved historical transient pumping information could provide a better transient calibrated model.

A groundwater flow model requires that the entire domain be appropriately parameterized. Although information exists on general aquifer characteristics, and more detailed sand fraction distributions were available for the geologic units, detailed hydrologic characterization is not possible except by extrapolating information from areas where data is available. This lack of hydrogeologic information can introduce uncertainty and errors in model results, especially in complex systems such as the groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers. Additionally, horizontal and vertical hydraulic conductivities

from sand and clay fractions may contain errors and were limited in their overall range of values, which in turn caused a narrow interval of possible hydraulic conductivity values for use in calibrating the aquifer and aquitard units. To address this issue, the model was calibrated using hydraulic conductivities for aquifer and aquitard units, rather than estimated sand and clay fraction hydraulic conductivities.

The spatial resolution of the model was set to provide a regional evaluation of groundwater flow with refined discretization around surface-water features to capture the groundwater to surface-water interaction in a detailed manner. The temporal resolution of the model was set to annual stress periods for recharge and pumping for long-term planning purposes. Annually-averaged stresses were calibrated to available water level elevation records and therefore it is assumed that the calibration is representative despite the different time scales of water level data and simulated stresses.

The model limitations further include uncertainty in predictions. Predictive sensitivity analyses should also be conducted with predictions of significance, to evaluate the impact of parameter variations on the prediction. Categorizing the predictive sensitivities along with calibration sensitivities as per ASTM (1994, 2000) would provide further information on the significance of data to the predictions.

7 Summary and Conclusions

The groundwater availability model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers has been updated to simulate impacts of groundwater pumping on groundwater resources in south-central Texas. The large model domain, complex geology, fine resolution, inconsistent pumping data, water level elevation quality control issues, and the 38-year time frame proved challenging and contributed to the considerable computational effort and model uncertainty.

Modeling challenges were addressed by selecting a robust and flexible software to best alleviate the computational burdens and still provide results at the scale of the modeling objectives. The MODFLOW 6 groundwater flow model was used for the simulations with the Groundwater Vistas graphic user interface. The numerical model was built in accordance with the conceptual model and consisted of 9 model layers to represent the 9 hydrostratigraphic units of interest: the Quaternary Alluvium, Younger Units, Sparta Aquifer, Weches Formation, Queen City Aquifer, Reklaw Formation, Carrizo-Upper Wilcox Aquifer, Middle Wilcox, and Lower Wilcox Aquifers.

The model simulation consisted of a steady-state period representing predevelopment conditions, and a steady state period representing 1980 conditions followed by transient conditions from 1981 through 2017 using annual stress periods for recharge and pumping.

The model calibration was guided by available data. Quantitative and qualitative metrics were implemented in evaluating representativeness of the model. Observed water level elevations in wells and groundwater to surface water flow estimates were used to constrain the model. Calibration statistics show the model was well calibrated for the spatial and temporal scales of investigation. Mass balance errors were negligible and water fluxes at the various boundaries into and out of the domain were reasonable and consistent with the conceptual model. Qualitative comparison of estimated conceptual groundwater elevation contours to simulated contours confirm that the calibration matched observed conditions across the model domain.

Sensitivity analyses were conducted on the draft model to evaluate impact of parameter uncertainties and variations in boundary fluxes. Parameters evaluated were storage, hydraulic conductivity, recharge, evapotranspiration, and groundwater pumping. The model was highly sensitive to both pumping and horizontal hydraulic conductivity specifically in the Lower Wilcox aquifer. A better estimation of pumping changes through time, especially in La Salle County in the Carrizo-Upper Wilcox aquifer, would have provided better transient calibration to water level elevation changes. In addition, groundwater elevations in unconfined portions of aquifer units were sensitive to variability in recharge while confined portions did not demonstrate significant fluctuations in water levels attributable to changing recharge. Furthermore, groundwater elevations are generally not sensitive to changes in storage, although increased storage values can dampen simulated water level fluctuations. As data collection continues and the conceptual model is improved, the uncertainties associated with the model can be reduced.

8 Future Work

The conceptual model for the southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers would improve with additional data. This is often the case for regional-scale groundwater modeling studies. Additional data that could be collected to better support the development of the groundwater availability model include groundwater recharge studies, groundwater pumping studies, and additional groundwater level monitoring and aquifer testing in both unconfined and/or confined portions of the groundwater system in the study area where data is most sparse.

The data-gap with the largest impact to the model is spatial and temporal distribution of pumping. As noted in the model calibration section, large observed drawdowns in LaSalle County between 2007 and 2012 could not be simulated due to lack of pumping in the area. As noted from the sensitivity analyses, pumping changes were most sensitive to model calibration. Uncertainties regarding groundwater pumping in the study area exist due to limited reported information. The best available pumping information for the area is provided in the annual TWDB water use surveys. However, inconsistent or inaccurate information is likely reported in the surveys. The methods used by TWDB and users to estimate and report groundwater use also changed over time, which resulted in shifts in the reported data. Furthermore, the distribution of pumping within areas is uncertain because pumping volumes for individual wells are not reported in the surveys. More reliable information on pumping locations and rates would improve the accuracy of the groundwater model.

Recharge is also an important component to the groundwater availability model because it can be used to constrain hydraulic properties during model calibration. Although regional-scale relationships were determined to be reasonable for this study, the accuracy of future predictions of groundwater conditions would improve with additional recharge studies conducted in the study area.

Due to lack of continuous spatial information on hydraulic properties, uncertainty analysis, using such tools as PEST++IES and the ensemble models generated in this model update, can be included in future work to generate a probabilistic result, providing a band of uncertainty to the model results. Data science approaches can also help to cleanse available data and synthesize missing information. Clustering approaches can help identify similarity in water level hydrographs for further evaluation of hydraulic connectivity or lack thereof, between wells across faults or aquitards. Some level of quality assurance and quality control was performed in the current study using clustering to evaluate if water level measurements were in the correct aquifer, or to assign a target aquifer for multi-aquifer wells. Deconvolution approaches can be used to separate out the signals from different stresses, to note significant stress data that may be missing and fill the data gap. This is significant to better establish pumping values in known deficient locations as noted in the model in LaSalle County where large drawdowns did not include changes in pumping.

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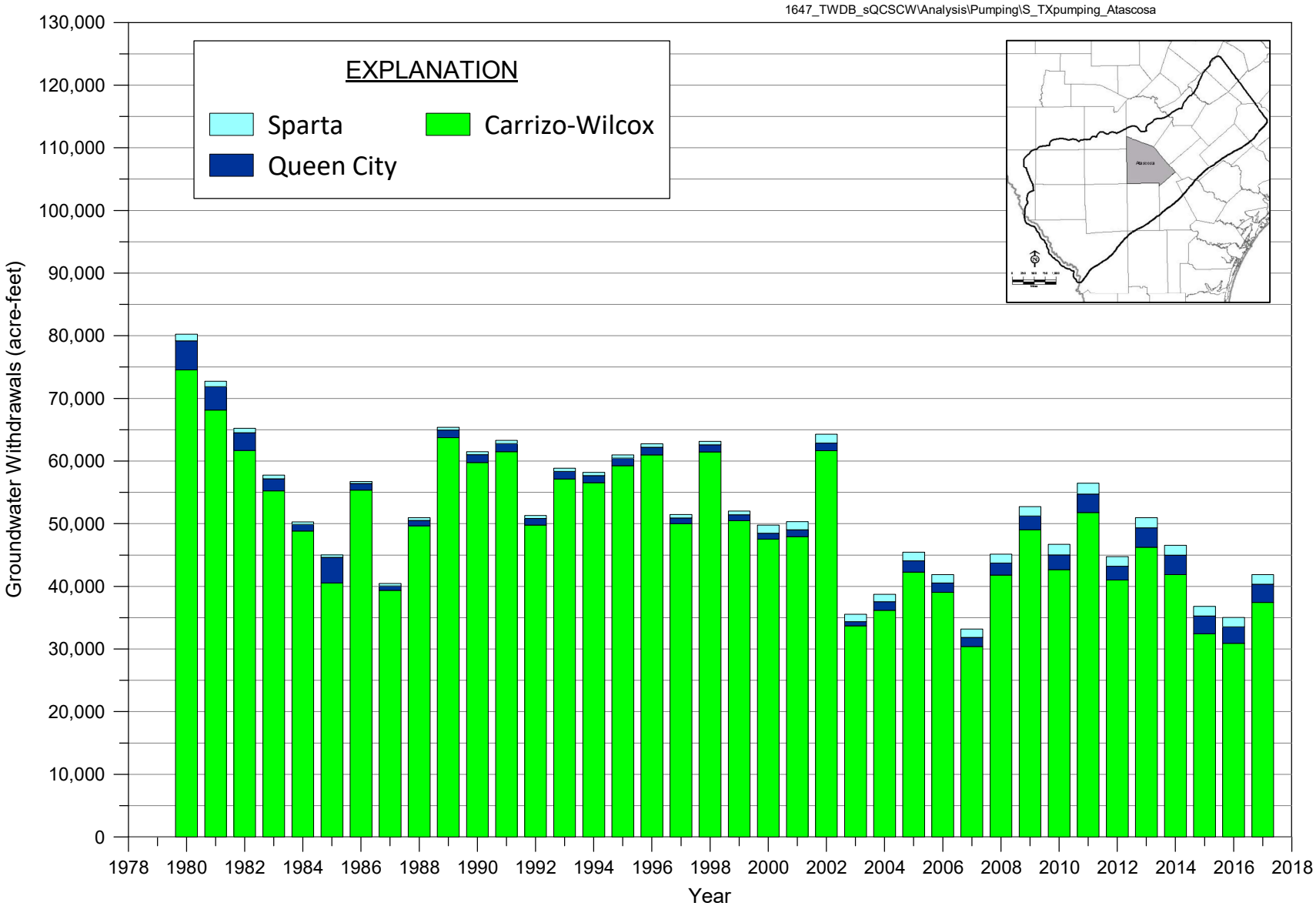
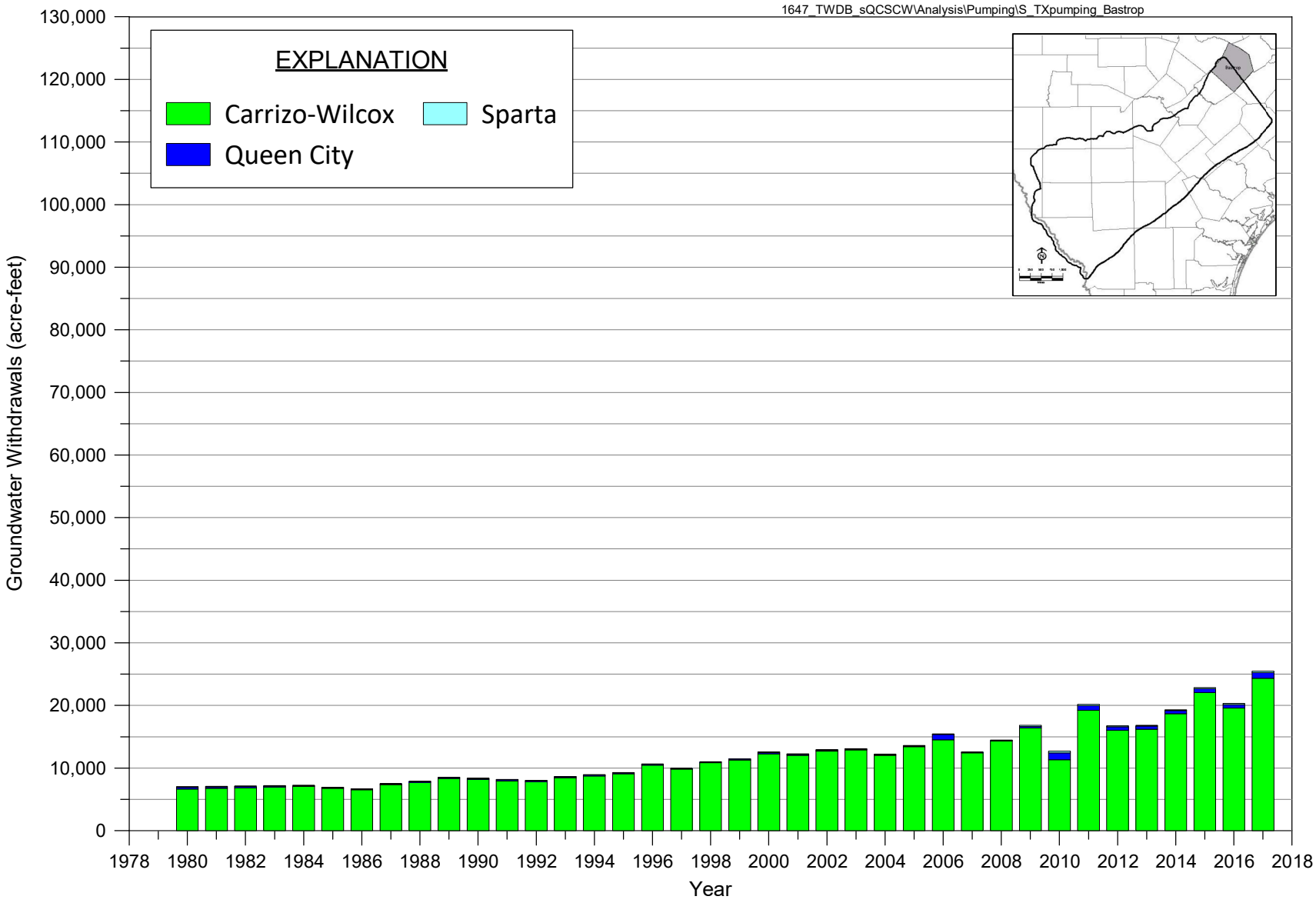
11 Appendices

APPENDIX A

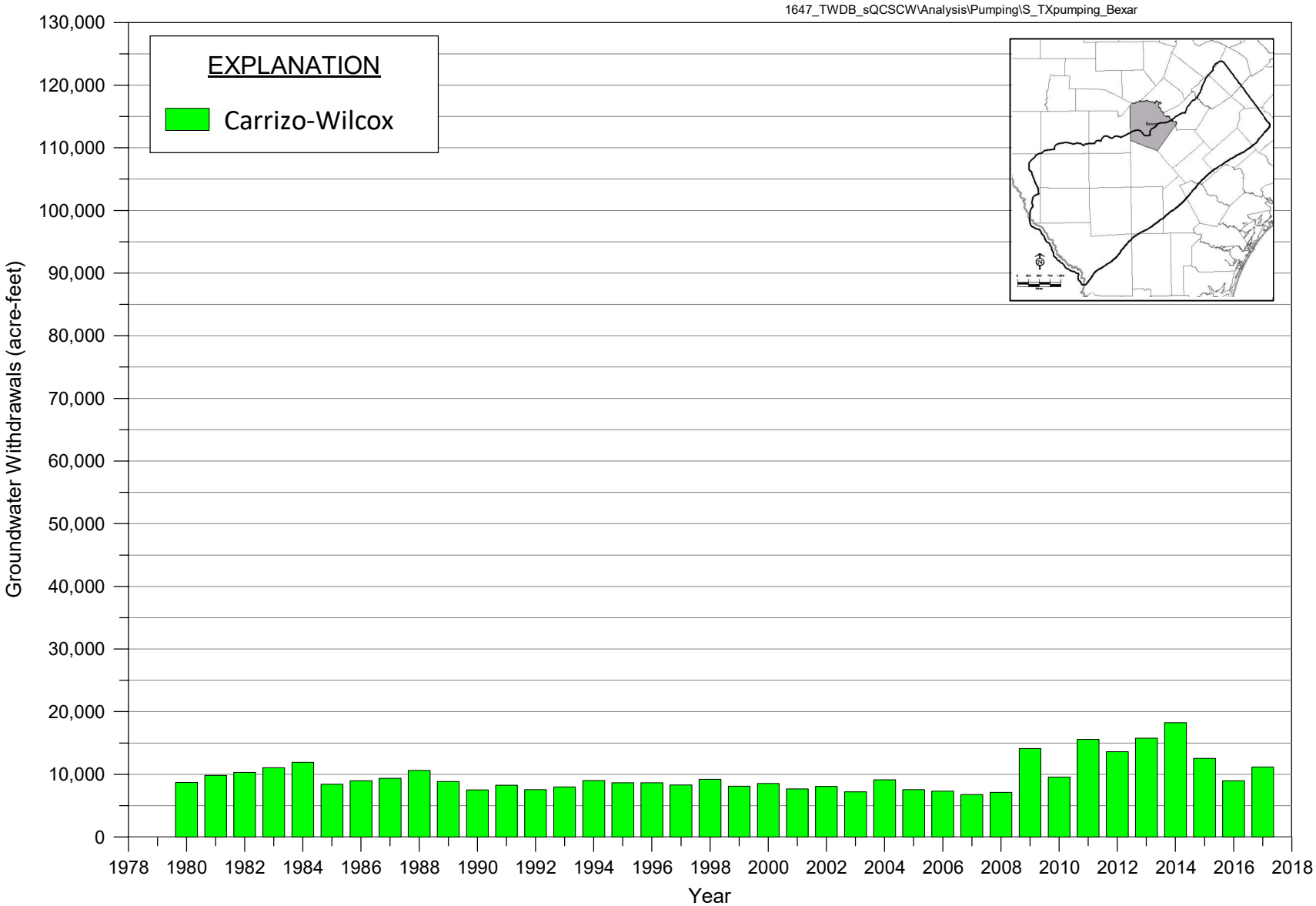
Charts of Estimated Groundwater Pumping by County and Aquifer Source for Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers



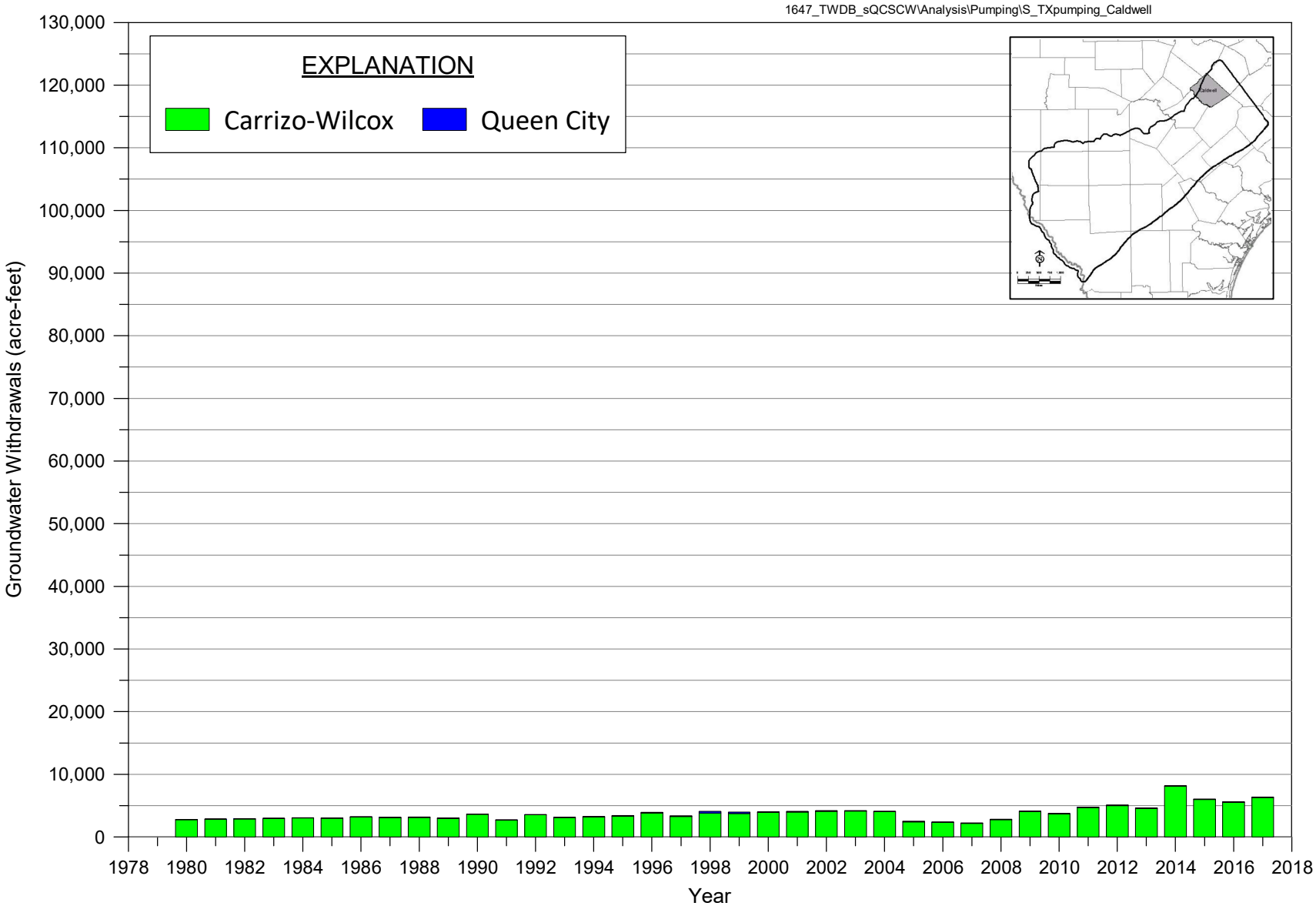
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers



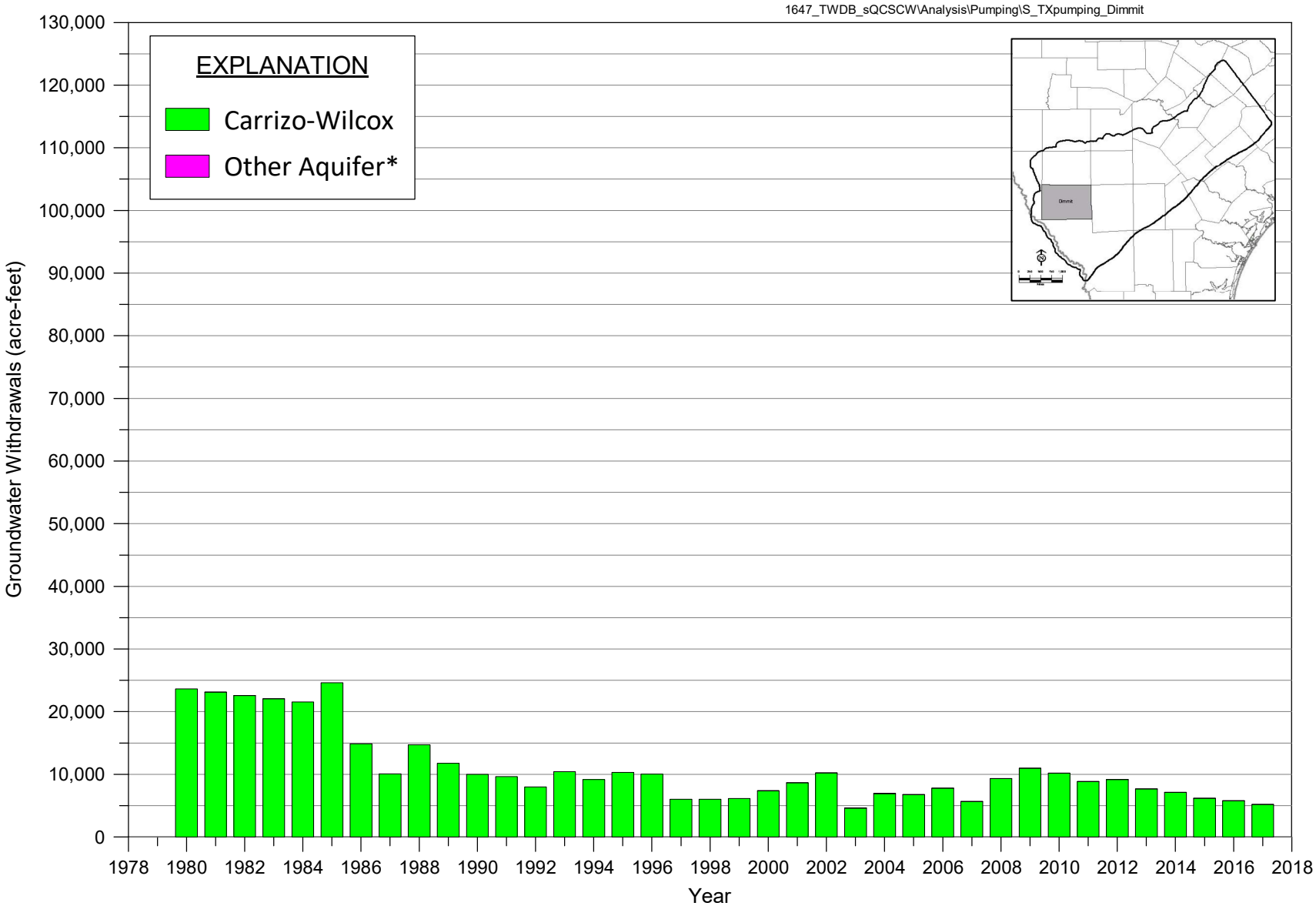
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers



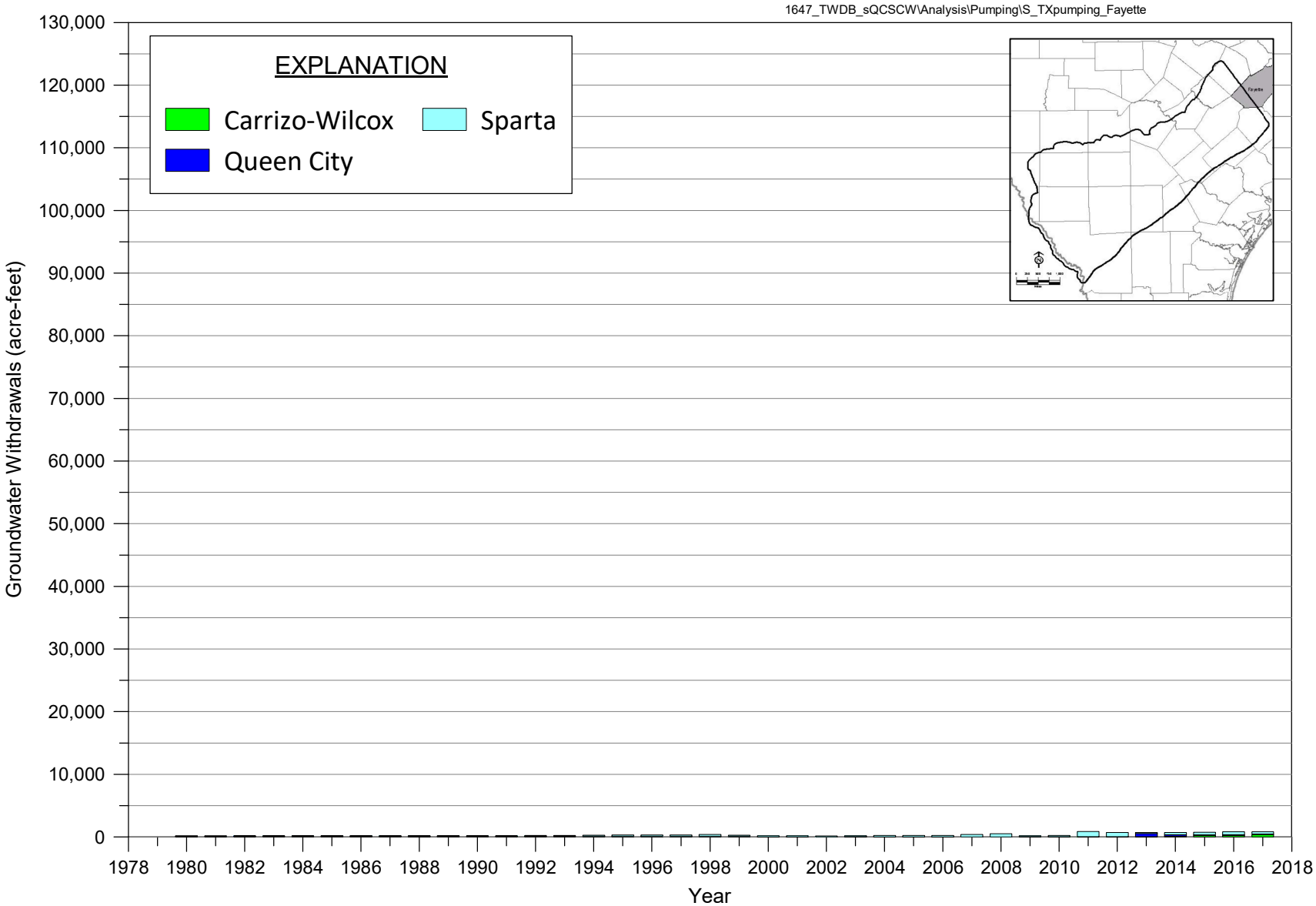
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
** No reported values for Queen City or Sparta aquifers*



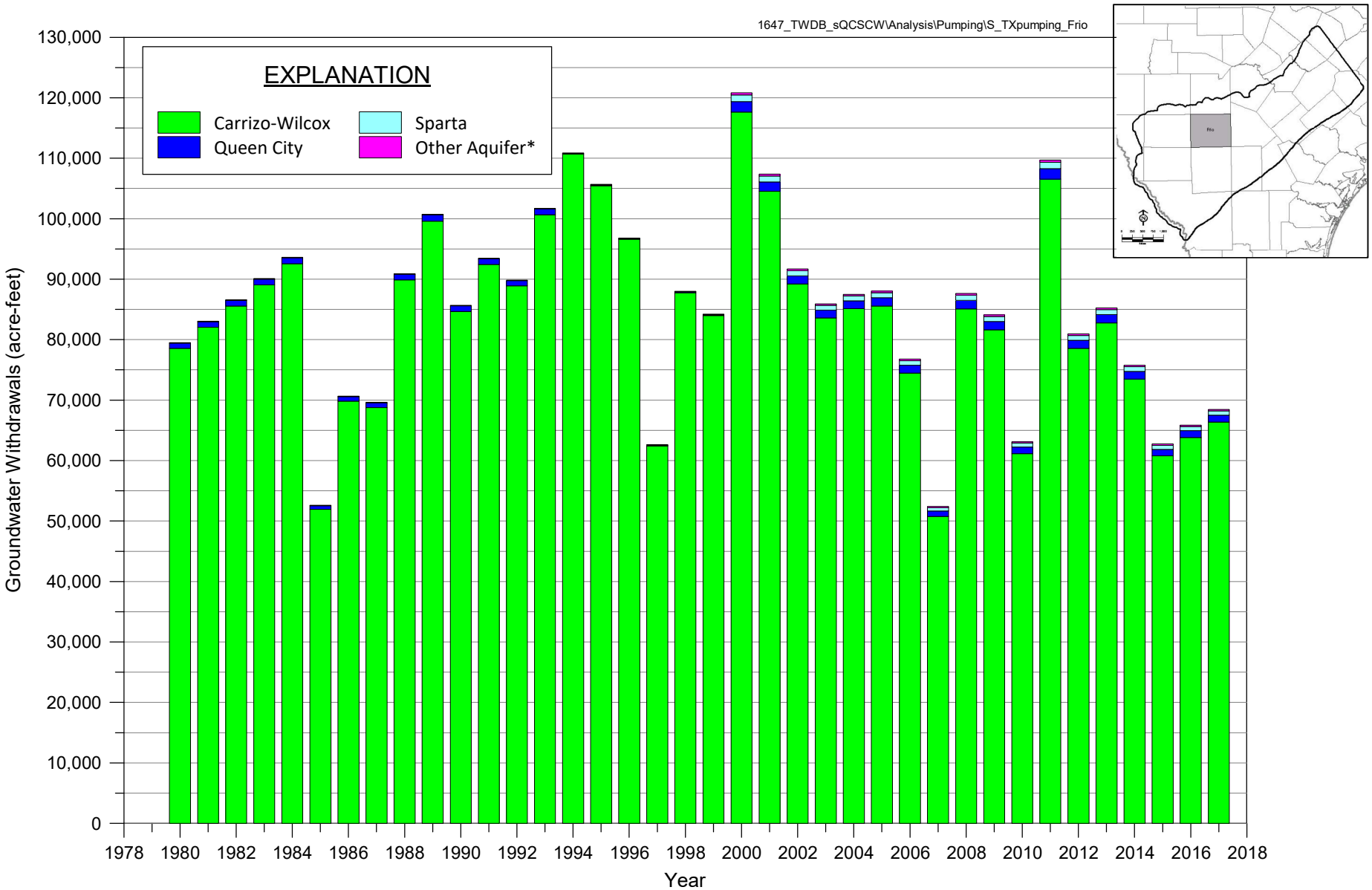
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
** No reported values for Sparta Aquifer*



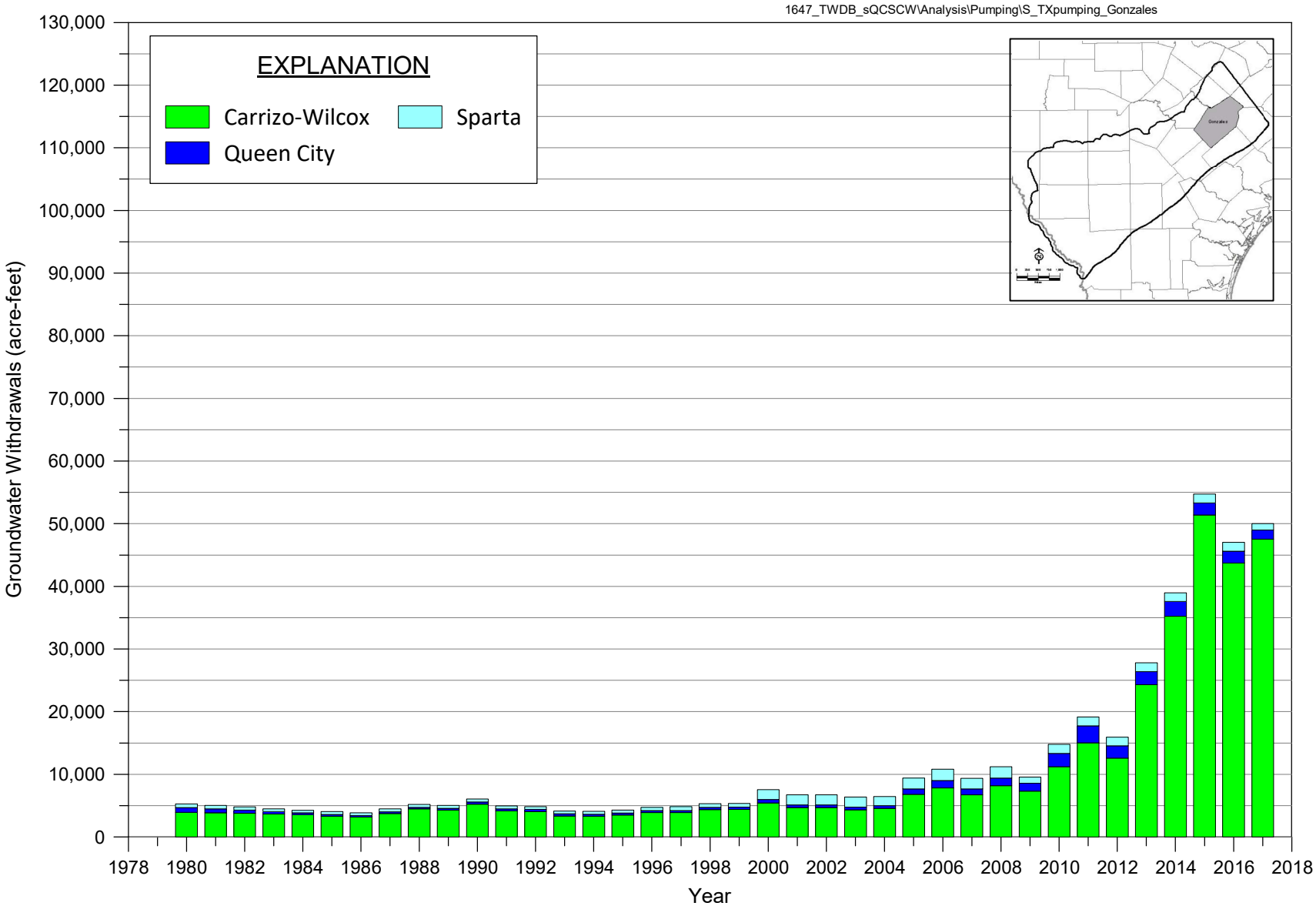
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
**Other category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than the Yegua-Jackson aquifer.*
No reported values for Sparta or Queen City aquifers



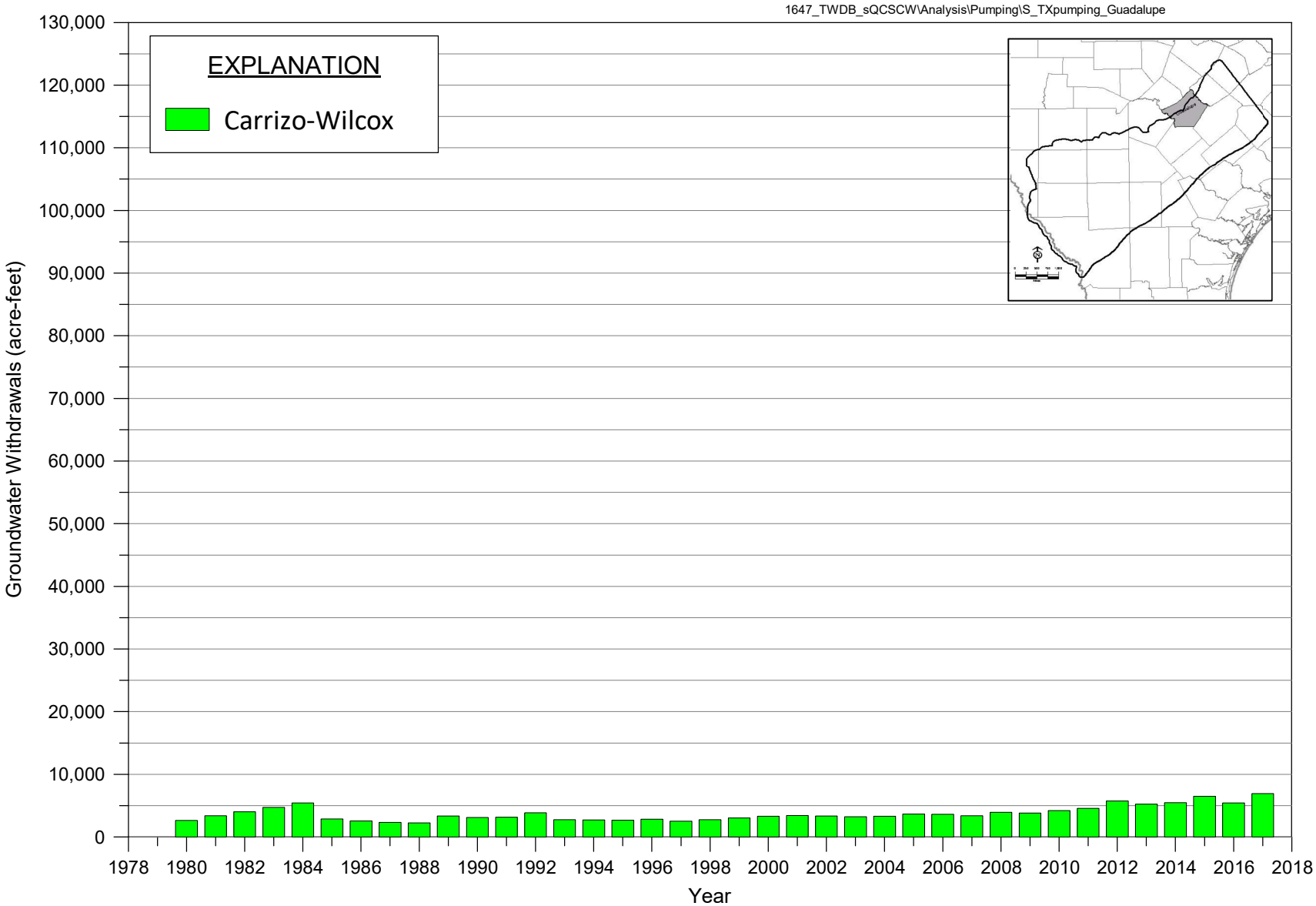
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers



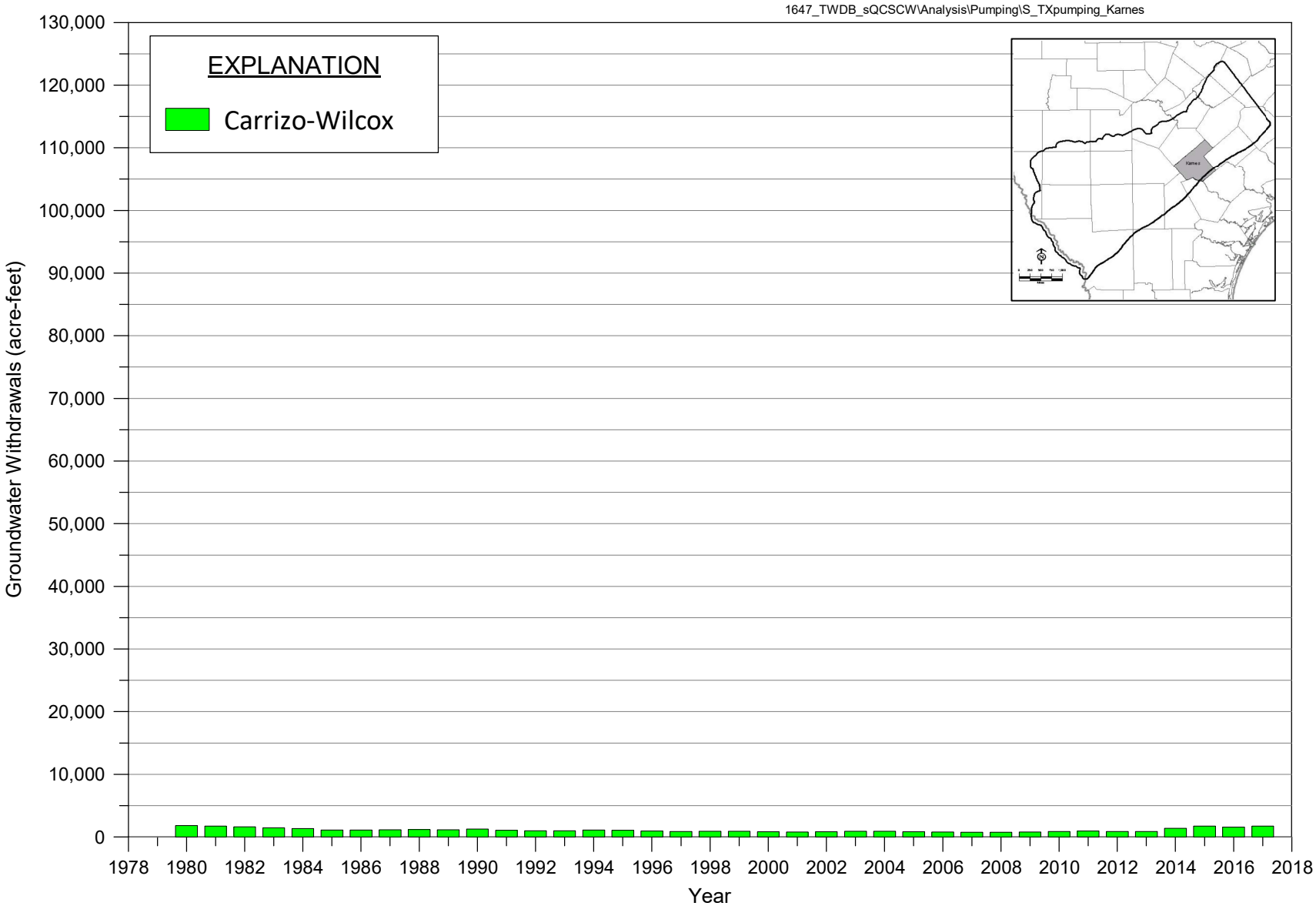
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
**Other category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than the Yegua-Jackson aquifer.*



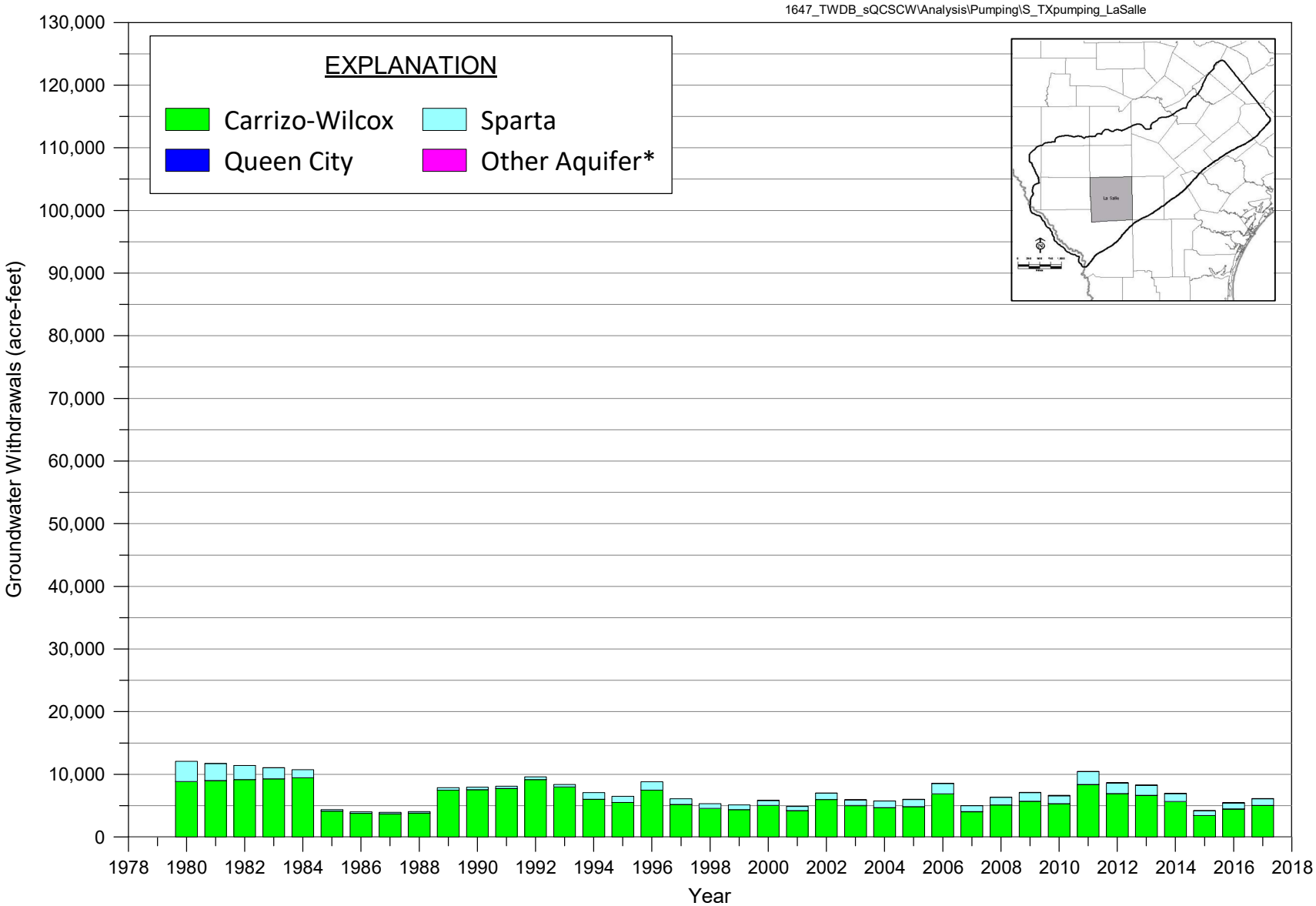
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers



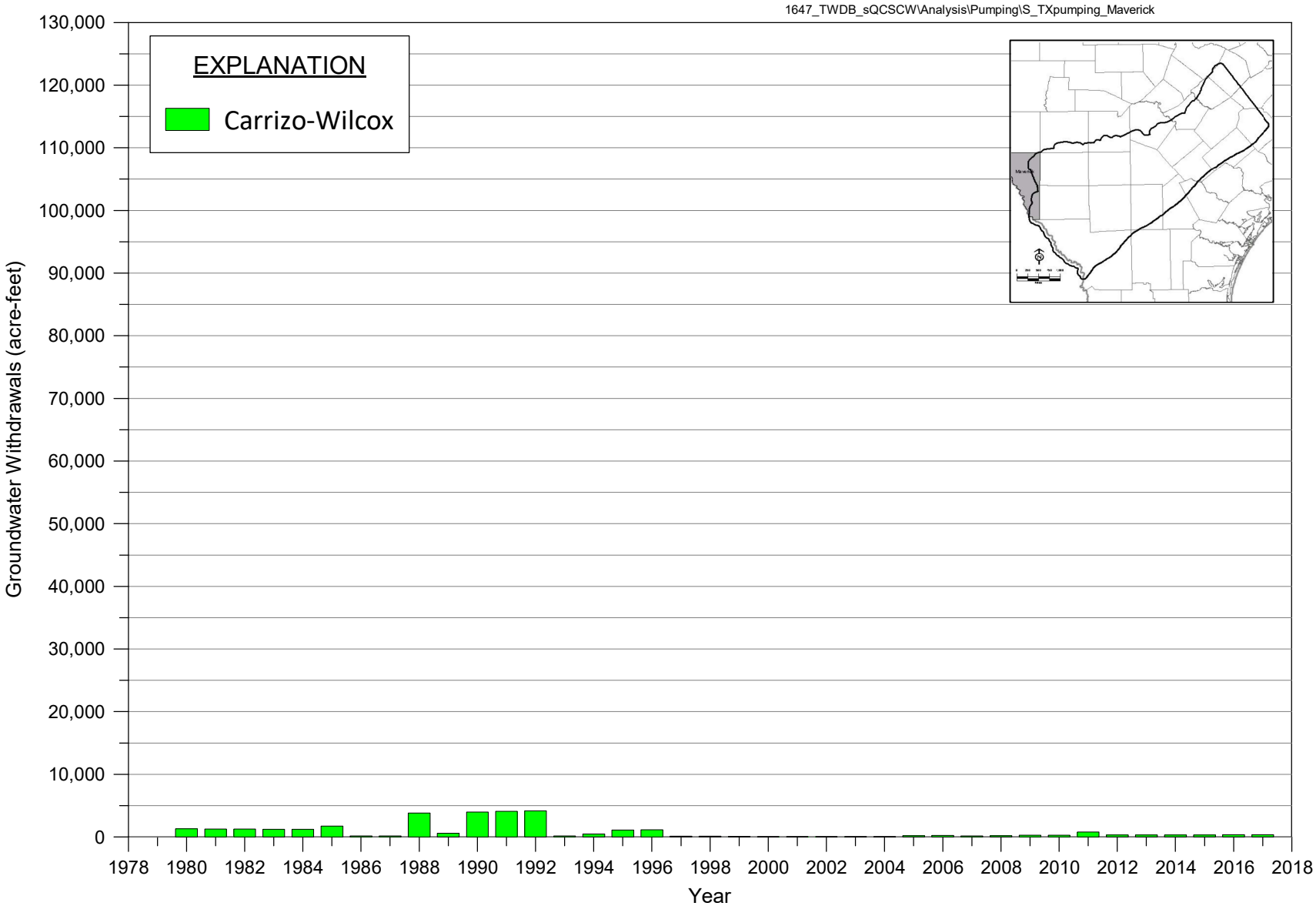
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
** No values reported for Queen City and Sparta aquifers*



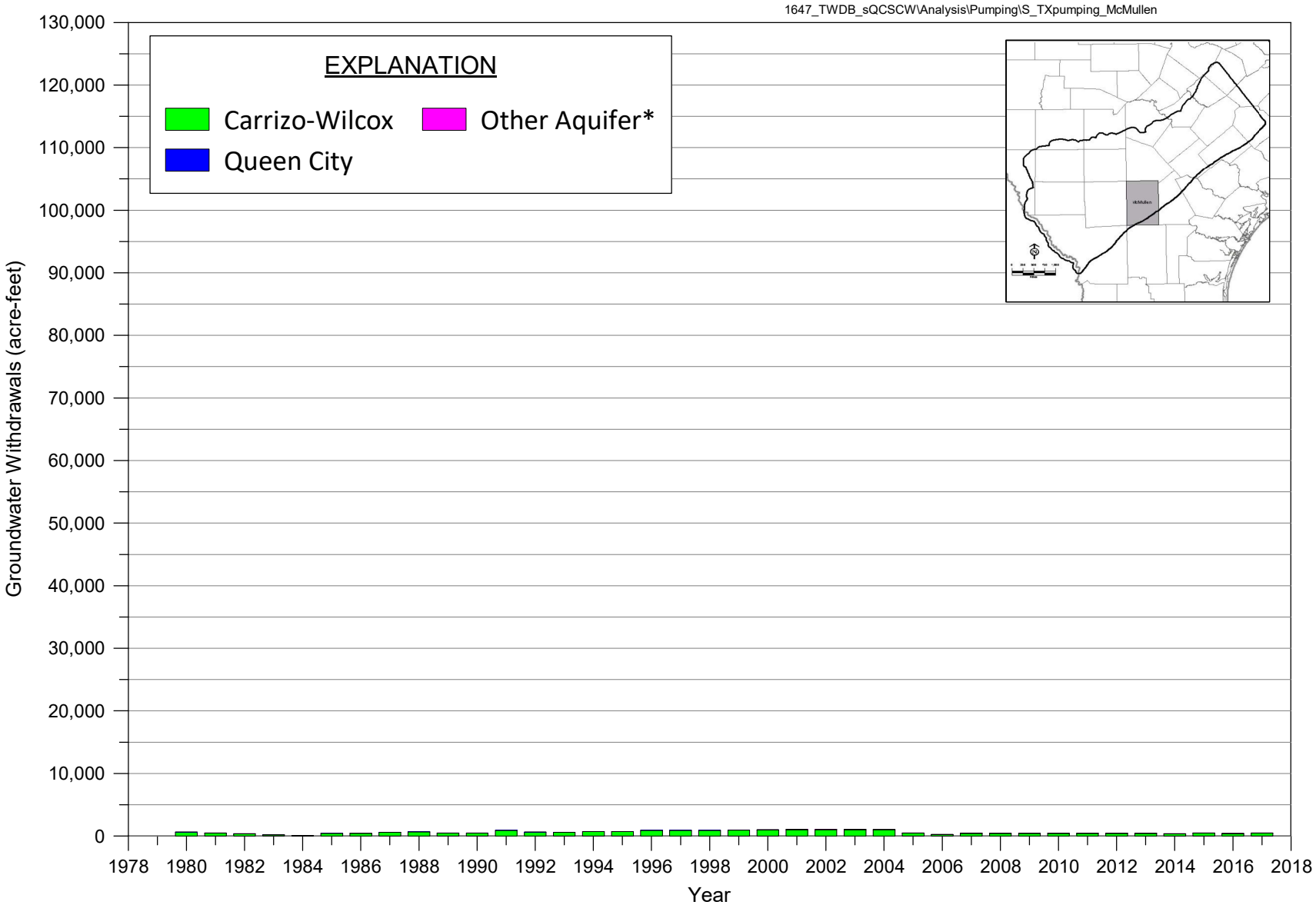
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
** No values reported for Queen City and Sparta aquifers*



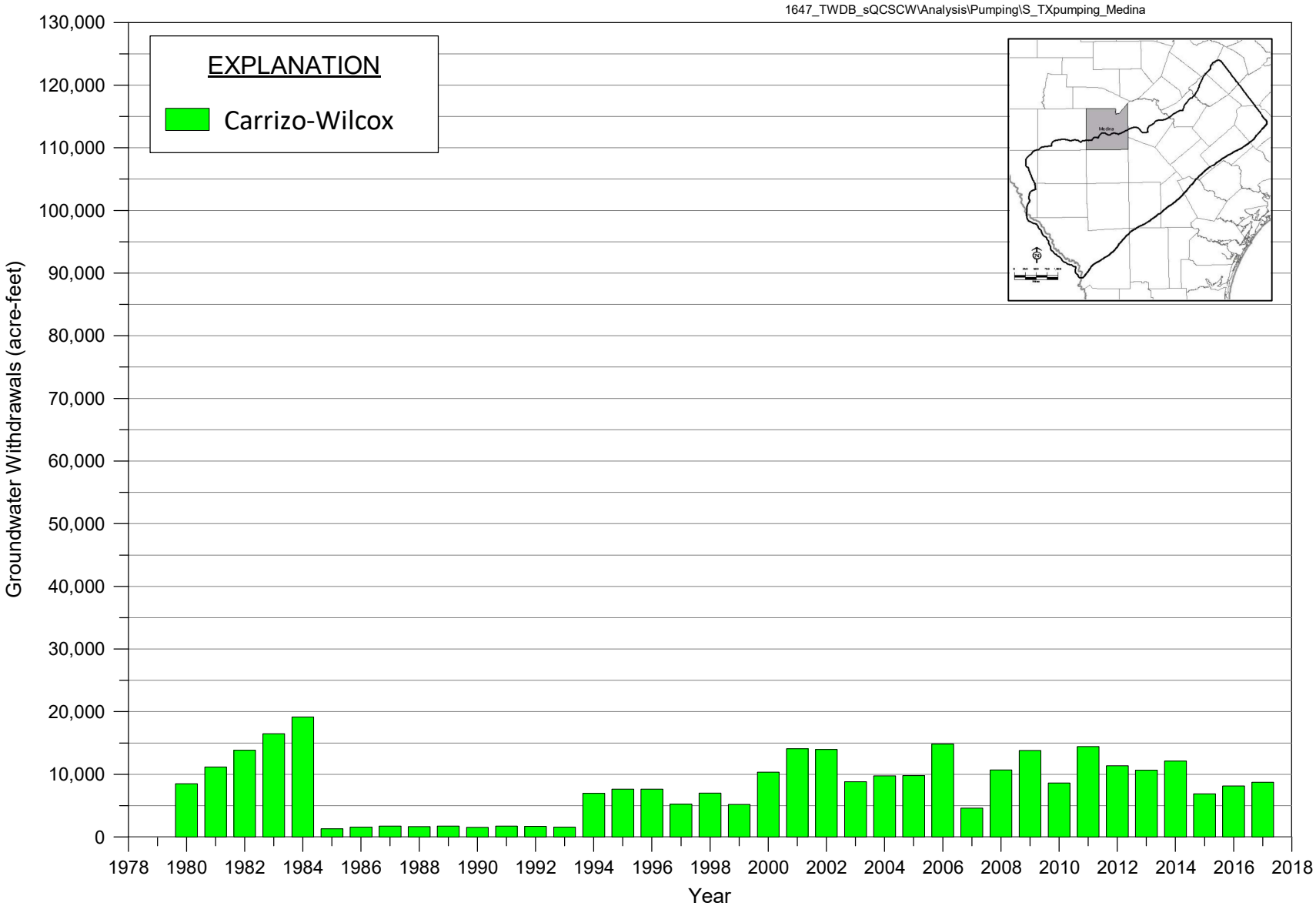
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
**Other category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than the Yegua-Jackson aquifer.*



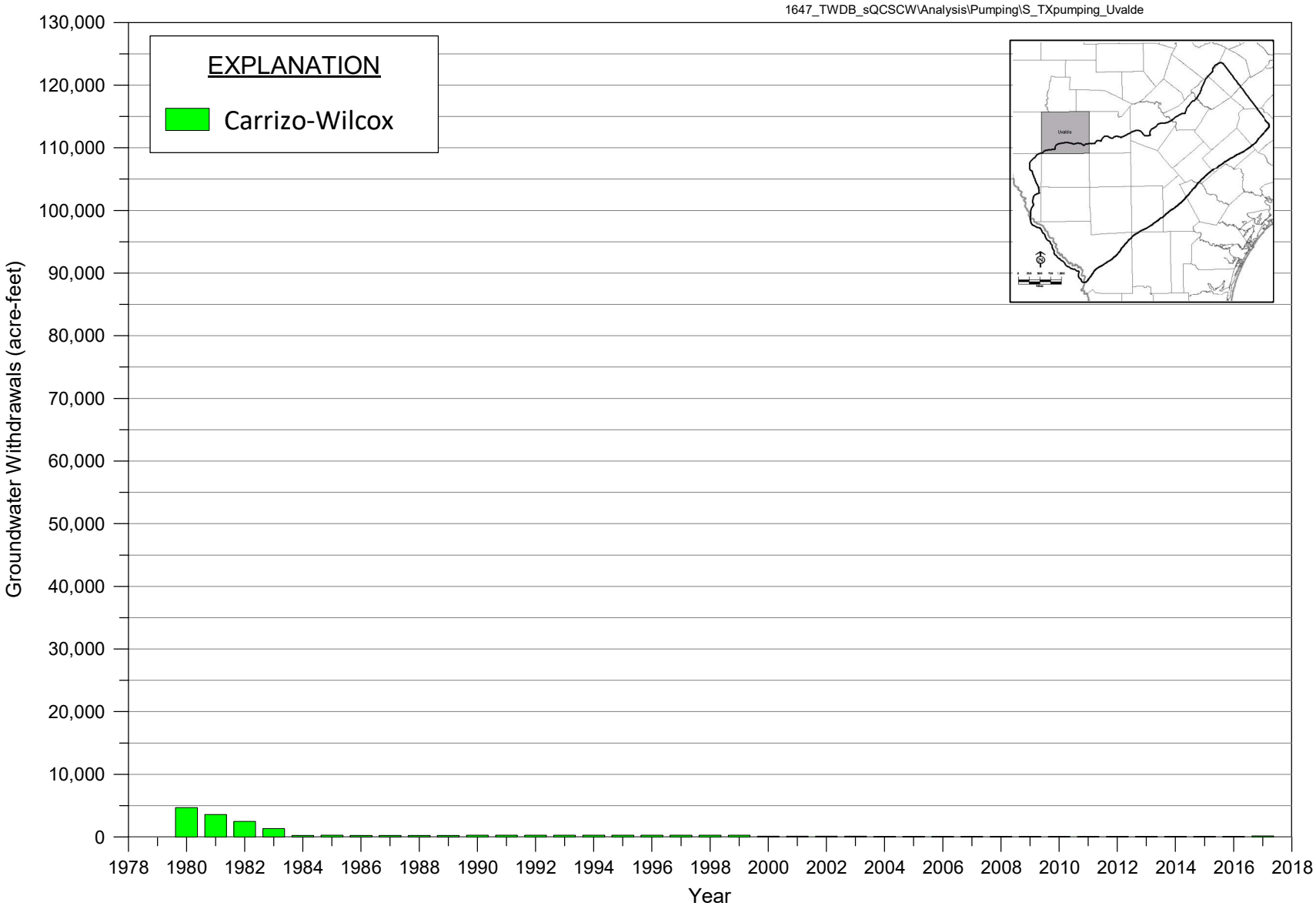
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers



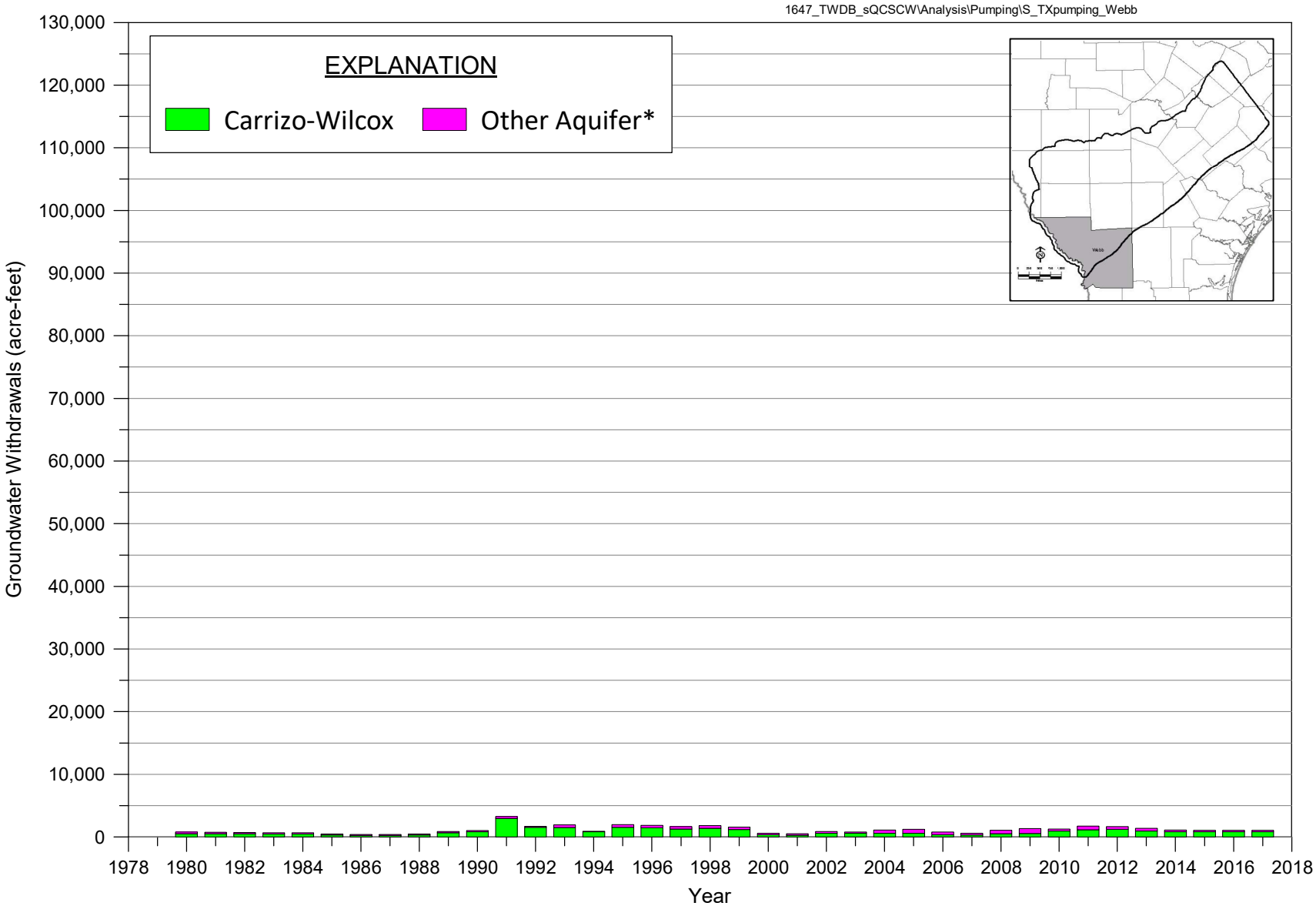
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
**Other category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than the Yegua-Jackson aquifer.*
No reported values for Sparta aquifer



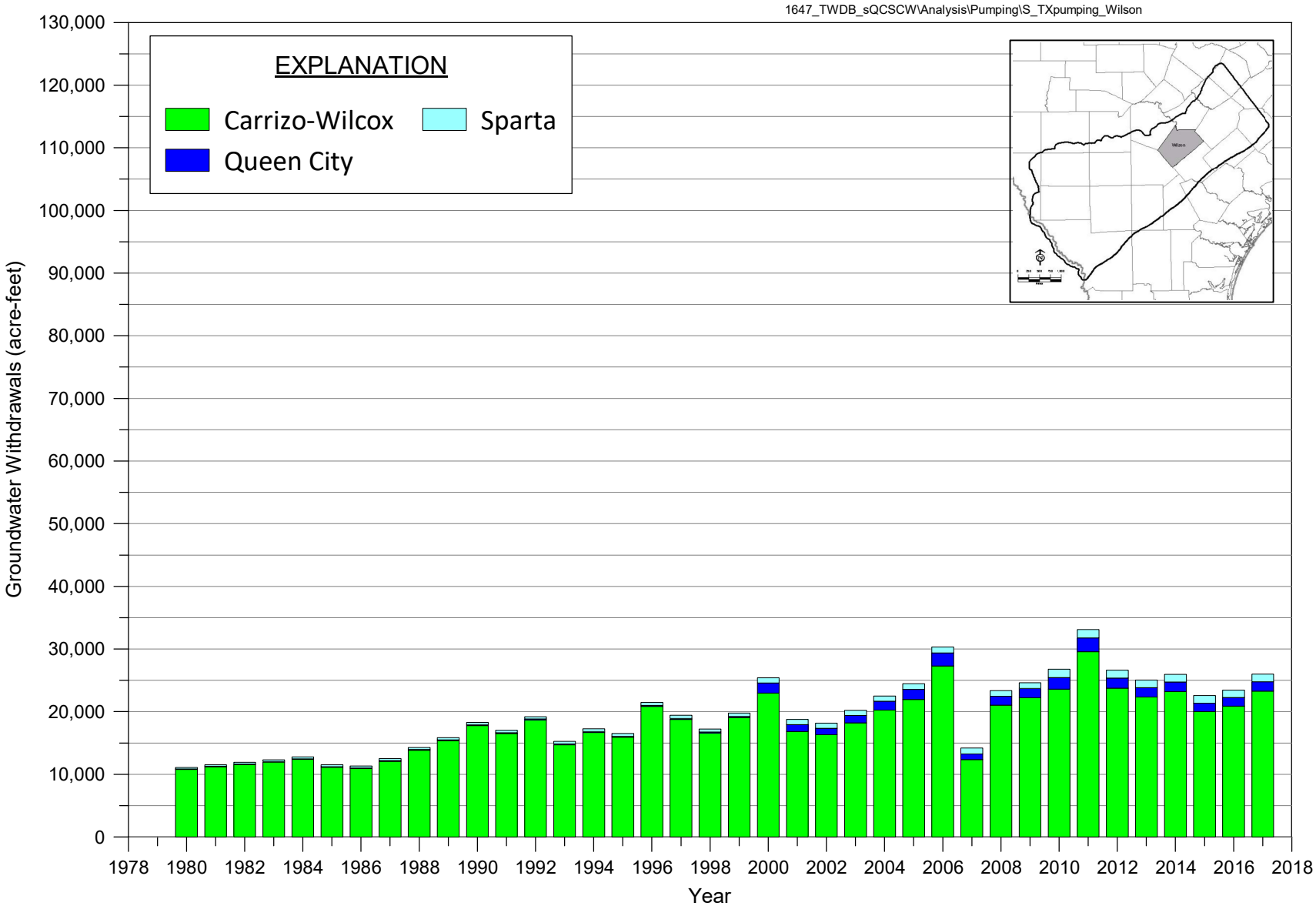
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
** No values reported for Queen City and Sparta Aquifers*



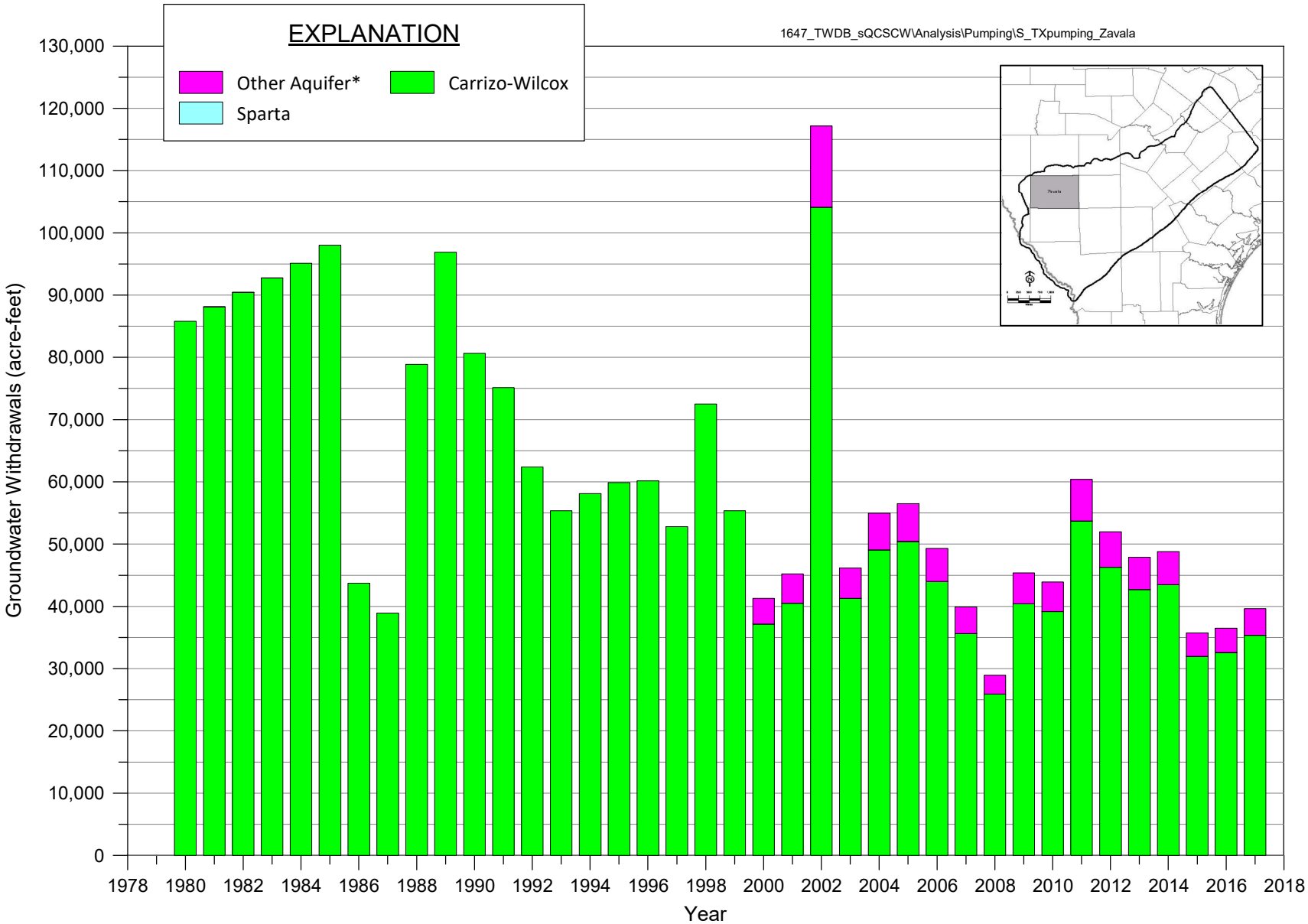
Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
** No values reported for Queen City and Sparta aquifers.*



Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
**Other category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than the Yegua-Jackson aquifer.*
No reported values for Sparta or Queen City aquifers



Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers



Source: TWDB annual water use surveys; totals include estimated pumpage from Queen City, Sparta, and Carrizo-Wilcox aquifers
**Other category may contain data from wells completed in alluvium and in any other units shallower than the Carrizo but deeper than the Yegua-Jackson aquifer.*
No reported values for Queen City aquifer; Values for Sparta aquifer are only reported after 1999.

APPENDIX B

Summary Table of Estimated Groundwater Pumping by County and Water Use Sector for Southern Portion of The Queen City, Sparta, And Carrizo-Wilcox Aquifers

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Municipal																				
	ATASCOSA	3,735	4,434	5,133	5,832	6,531	5,752	4,630	4,701	5,757	6,065	5,195	3,140	4,453	4,842	4,909	4,992	5,436	4,881	4,910
	BASTROP	3,963	4,377	4,791	5,205	5,619	5,532	5,312	6,172	6,494	6,844	6,635	6,416	6,260	6,927	6,890	7,151	8,358	7,893	8,929
	BEXAR	814	999	1,184	1,370	1,555	779	777	819	1,019	862	886	1,453	875	1,023	938	1,061	1,473	1,419	1,431
	CALDWELL	2,061	2,069	2,078	2,086	2,094	2,199	2,353	2,200	2,250	2,166	2,270	1,861	1,988	2,116	2,184	2,217	2,697	2,233	2,379
	DIMMIT	2,829	2,698	2,568	2,438	2,307	2,221	2,347	2,122	2,573	2,685	2,210	3,906	2,376	2,617	2,522	2,704	2,816	2,408	2,488
	FAYETTE	62	56	51	47	41	38	38	37	36	42	59	57	68	71	66	106	83	83	167
	FRIO	2,946	2,935	2,924	2,915	2,904	2,714	2,690	2,490	3,026	3,337	3,045	3,059	2,598	3,033	2,951	2,542	3,063	2,617	2,586
	GONZALES	1,626	1,578	1,531	1,483	1,435	1,368	1,328	1,748	2,061	1,977	2,146	1,854	1,605	2,004	2,010	1,983	2,415	2,750	3,021
	GUADALUPE	538	506	475	444	412	553	465	441	473	661	413	576	1,045	1,233	1,154	1,086	1,112	998	1,035
	KARNES	192	201	210	219	228	194	213	211	209	225	326	197	207	216	212	231	237	198	251
	LA SALLE	998	1,036	1,074	1,112	1,150	964	953	1,030	1,161	1,302	1,232	1,336	1,300	1,328	1,268	1,307	1,383	1,183	1,435
	MAVERICK	39	54	69	84	99	130	60	84	7	93	133	150	99	92	140	129	91	85	74
	MCMULLEN	83	62	42	21	0	118	113	170	181	174	193	458	173	179	259	279	463	473	476
	MEDINA	97	124	150	176	203	207	201	202	221	159	110	109	117	130	266	267	136	422	488
	UVALDE	55	47	38	30	22	60	45	47	43	46	18	19	20	20	20	18	18	18	21
	WEBB	55	53	51	50	48	61	48	26	16	59	90	390	153	663	37	708	554	642	813
	WILSON	2,504	2,697	2,890	3,083	3,276	2,944	2,958	3,389	3,558	3,971	3,775	3,384	3,343	3,601	3,886	4,084	4,529	4,205	4,486
	ZAVALA	2,147	2,264	2,382	2,500	2,617	2,199	2,412	2,423	2,686	2,611	2,362	2,492	2,313	2,520	2,583	2,577	2,701	2,472	2,797
Manufacturing																				
	ATASCOSA	0	1	2	2	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
	BASTROP	152	147	142	138	133	128	132	59	24	24	23	10	12	62	67	62	69	65	19
	BEXAR	0	207	414	620	827	50	664	664	1,378	24	1	449	673	23	15	40	3	58	1
	CALDWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DIMMIT	22	19	16	13	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FAYETTE	0	0	1	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0
	FRIO	12	12	12	12	12	12	12	0	0	0	0	0	0	0	0	0	0	0	0
	GONZALES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	167	154	157	141
	GUADALUPE	19	14	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KARNES	0	74	148	223	297	96	90	122	105	211	176	213	107	85	190	127	10	1	0
	LA SALLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAVERICK	0	3	6	10	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MCMULLEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEDINA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	0	2	7
	UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEBB	52	42	33	24	14	11	10	0	8	4	2	0	0	11	9	14	0	12	1
	WILSON	175	164	153	142	131	167	140	93	76	43	47	0	0	0	0	0	1	0	0
	ZAVALA	974	997	1,020	1,042	1,065	905	880	835	891	1,214	1,293	1,083	1,261	1,037	722	688	710	685	712
Mining																				
	ATASCOSA	1,171	1,116	1,060	1,004	949	1,752	1,002	1,373	1,313	597	664	1,428	1,412	1,344	1,264	1,377	1,377	1,256	1,125
	BASTROP	0	2	5	8	10	10	10	12	10	10	10	26	20	20	20	22	22	22	22
	BEXAR	53	104	156	208	259	207	0	183	158	147	147	168	168	168	168	168	168	168	74
	CALDWELL	0	1	2	2	3	21	1	22	19	21	21	11	11	10	10	10	10	10	10
	DIMMIT	732	657	582	507	432	582	74	587	498	506	506	920	920	920	920	919	919	919	919
	FAYETTE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

County	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
FRIO	341	336	332	328	323	438	7	388	339	313	313	222	222	215	214	139	139	139	139
GONZALES	0	4	8	14	18	18	0	20	22	22	22	33	33	33	33	33	33	33	33
GUADALUPE	0	0	0	0	0	14	0	8	202	8	8	15	15	157	157	157	157	157	157
KARNES	1,102	885	668	450	233	255	257	266	334	149	162	102	132	132	132	133	133	128	115
LA SALLE	0	0	0	0	0	86	91	131	177	190	190	193	0	0	0	0	0	0	0
MAVERICK	0	2	4	7	9	25	0	22	22	20	20	11	11	11	11	11	11	11	11
MCMULLEN	446	334	223	112	0	226	238	256	258	235	239	391	399	390	390	390	390	399	399
MEDINA	0	6	12	18	24	31	0	28	28	26	26	24	24	24	24	24	24	24	24
UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEBB	253	217	180	143	107	60	0	91	123	132	132	159	306	280	138	175	176	131	89
WILSON	228	230	232	235	237	309	0	277	300	281	281	285	285	277	277	277	277	277	277
ZAVALA	68	85	102	118	135	143	0	127	124	116	116	114	114	114	114	114	114	114	114
Electric Power																			
ATASCOSA	0	1,448	2,896	4,344	5,792	3,950	5,550	5,626	6,352	5,532	6,036	6,637	5,987	6,474	6,146	5,980	5,848	6,839	7,209
BASTROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BEXAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALDWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIMMIT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FAYETTE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FRIO	682	599	515	432	348	289	73	92	794	7	1	51	50	111	185	192	227	125	134
GONZALES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GUADALUPE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KARNES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA SALLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MAVERICK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MCMULLEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEDINA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEBB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WILSON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZAVALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation																			
ATASCOSA	73,608	63,966	54,323	44,681	35,039	31,571	43,600	26,783	35,450	50,914	47,208	49,666	37,072	43,729	43,327	46,042	47,415	35,842	47,135
BASTROP	1,474	1,185	896	609	320	103	50	50	74	267	317	316	317	177	423	443	443	395	343
BEXAR	3,385	3,174	2,962	2,750	2,539	1,018	997	777	936	1,098	1,644	1,123	1,067	1,683	3,950	3,358	3,576	3,256	4,292
CALDWELL	50	86	123	160	196	104	105	105	105	108	488	0	741	147	147	220	227	203	715
DIMMIT	19,051	18,708	18,365	18,022	17,679	20,821	11,529	6,225	10,497	7,382	6,085	3,579	3,652	5,886	4,507	5,489	5,185	1,706	1,786
FAYETTE	23	18	14	9	4	7	6	9	9	9	3	3	2	19	49	41	40	40	41
FRIO	74,763	78,393	82,022	85,653	89,283	48,460	67,217	65,970	86,068	96,369	81,568	89,352	86,200	97,561	106,657	101,885	92,487	58,877	84,215
GONZALES	600	722	844	967	1,089	940	840	976	1,429	1,335	2,125	1,294	1,376	159	170	241	351	156	264
GUADALUPE	1,249	1,926	2,602	3,279	3,956	1,251	980	737	389	1,359	1,376	1,214	1,488	8	23	6	41	41	41
KARNES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA SALLE	10,759	10,379	10,001	9,622	9,242	3,003	2,666	2,467	2,426	6,051	6,198	6,278	7,974	6,750	5,524	4,895	7,137	4,721	3,618
MAVERICK	1,200	1,151	1,102	1,053	1,004	1,500	0	0	3,756	428	3,759	3,867	4,006	0	250	942	998	0	0
MCMULLEN	0	0	0	0	0	0	0	93	116	0	0	0	0	0	0	0	0	0	0
MEDINA	7,787	10,403	13,020	15,636	18,252	424	702	797	696	746	574	760	718	489	5,733	6,380	6,439	3,751	5,475

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	UVALDE	4,435	3,326	2,218	1,109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEBB	0	0	0	0	0	0	0	0	0	168	179	2,093	699	327	228	337	389	187	211
	WILSON	6,499	6,677	6,855	7,033	7,211	6,174	6,257	6,734	8,245	9,139	11,642	10,818	13,031	8,677	10,274	9,300	13,656	11,919	9,432
	ZAVALA	81,800	84,018	86,236	88,455	90,673	94,200	39,865	34,968	74,621	92,370	76,296	70,894	58,125	51,085	54,095	55,914	56,062	49,288	68,653
Livestock																				
	ATASCOSA	211	206	202	196	191	201	176	151	156	154	160	164	180	191	214	196	183	167	156
	BASTROP	998	874	751	629	505	456	423	453	478	470	463	474	494	493	512	485	570	413	474
	BEXAR	29	26	24	21	18	38	40	34	35	35	38	38	42	44	31	29	51	50	32
	CALDWELL	127	114	100	86	73	12	13	13	14	13	13	14	14	13	15	15	13	15	14
	DIMMIT	674	695	716	736	757	633	596	841	795	783	790	807	617	590	789	788	682	655	401
	FAYETTE	14	13	11	10	9	9	9	9	9	9	10	10	13	12	12	12	9	10	10
	FRIO	215	195	176	154	134	119	107	111	109	107	109	112	119	131	148	149	91	90	125
	GONZALES	1,966	1,569	1,172	774	377	382	404	401	377	384	410	419	507	544	452	483	342	403	419
	GUADALUPE	119	102	86	70	53	64	75	72	76	75	76	79	85	85	87	84	137	77	76
	KARNES	57	57	57	57	57	46	45	46	46	45	46	25	24	23	21	22	31	21	21
	LA SALLE	118	121	122	125	128	104	105	101	100	99	98	101	108	100	77	75	57	61	61
	MAVERICK	54	61	68	75	82	77	77	58	38	37	41	43	42	49	57	38	23	23	17
	MCMULLEN	45	34	22	11	0	21	22	23	25	25	24	25	16	15	24	23	36	26	24
	MEDINA	90	82	75	68	60	50	49	59	56	56	57	58	70	88	72	77	71	62	45
	UVALDE	31	31	30	30	30	28	20	21	20	20	20	21	30	29	28	28	39	28	29
	WEBB	176	170	163	157	151	153	164	167	175	172	170	174	93	81	105	111	152	99	134
	WILSON	255	234	212	191	170	162	181	167	167	165	180	183	190	218	217	207	203	194	168
	ZAVALA	397	330	263	196	129	113	92	83	69	68	71	73	88	89	96	92	81	86	69
Domestic																				
	ATASCOSA	1,519	1,584	1,631	1,691	1,782	1,791	1,784	1,809	1,914	2,137	2,216	2,262	2,224	2,269	2,334	2,390	2,489	2,487	2,625
	BASTROP	440	509	547	596	661	704	755	771	807	914	942	946	938	969	1,031	1,098	1,178	1,191	1,224
	BEXAR	4,402	5,305	5,551	6,068	6,723	6,312	6,503	6,872	7,086	6,669	4,815	5,041	4,712	5,036	3,911	4,005	3,369	3,330	3,360
	CALDWELL	562	602	622	659	710	709	770	795	803	717	880	869	848	882	917	947	993	937	956
	DIMMIT	341	330	341	348	361	350	321	311	337	392	400	406	414	425	415	412	426	321	445
	FAYETTE	118	128	135	135	138	137	141	140	135	139	146	145	146	154	152	166	169	170	162
	FRIO	549	570	583	588	602	569	562	568	579	616	627	650	654	656	729	765	791	770	797
	GONZALES	1,092	1,176	1,232	1,267	1,327	1,330	1,305	1,333	1,316	1,333	1,362	1,349	1,326	1,409	1,392	1,392	1,434	1,323	1,426
	GUADALUPE	727	820	852	913	994	991	1,033	1,057	1,105	1,257	1,257	1,259	1,244	1,276	1,303	1,334	1,394	1,244	1,464
	KARNES	480	505	515	514	521	500	484	493	486	520	546	535	525	542	531	553	555	517	522
	LA SALLE	198	196	202	207	215	208	186	191	176	212	209	204	210	216	201	212	220	143	201
	MAVERICK	10	11	12	12	13	13	13	14	14	17	14	15	14	15	16	3	3	3	3
	MCMULLEN	55	59	59	67	77	81	73	70	82	40	39	39	38	27	29	32	33	30	24
	MEDINA	522	563	576	590	614	603	625	636	639	764	776	764	764	850	852	878	963	970	977
	UVALDE	164	174	178	185	196	185	161	173	167	192	233	224	227	234	236	237	242	238	244
	WEBB	252	280	295	312	336	204	169	106	148	333	444	467	460	558	410	608	568	581	576
	WILSON	1,428	1,535	1,570	1,641	1,745	1,757	1,784	1,832	1,926	2,251	2,354	2,343	2,355	2,503	2,604	2,642	2,818	2,816	2,878
	ZAVALA	393	417	425	445	474	464	465	472	471	496	509	494	484	497	499	490	490	152	153
	County	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
TOTALS	ATASCOSA	80,244	72,755	65,247	57,750	50,287	45,020	56,745	40,443	50,942	65,399	61,479	63,297	51,328	58,849	58,194	60,977	62,748	51,472	63,160
	BASTROP	7,027	7,094	7,132	7,185	7,248	6,933	6,682	7,517	7,887	8,529	8,390	8,188	8,041	8,648	8,943	9,261	10,640	9,979	11,011
	BEXAR	8,683	9,815	10,291	11,037	11,921	8,404	8,981	9,349	10,612	8,835	7,531	8,272	7,537	7,977	9,013	8,661	8,640	8,281	9,190
	CALDWELL	2,800	2,872	2,925	2,993	3,076	3,045	3,242	3,135	3,191	3,025	3,672	2,755	3,602	3,168	3,273	3,409	3,940	3,398	4,074
	DIMMIT	23,649	23,107	22,588	22,064	21,546	24,607	14,867	10,086	14,700	11,748	9,991	9,618	7,979	10,438	9,153	10,312	10,028	6,009	6,039
	FAYETTE	217	215	212	203	194	193	196	195	189	199	218	215	229	256	279	325	301	303	380
	FRIO	79,508	83,039	86,564	90,081	93,606	52,601	70,668	69,619	90,915	100,749	85,663	93,446	89,843	101,707	110,884	105,672	96,798	62,618	87,996
	GONZALES	5,284	5,049	4,787	4,505	4,246	4,038	3,877	4,478	5,205	5,051	6,065	4,949	4,847	4,149	4,094	4,299	4,729	4,822	5,304
	GUADALUPE	2,652	3,368	4,025	4,711	5,415	2,873	2,553	2,315	2,245	3,360	3,130	3,143	3,877	2,759	2,724	2,667	2,841	2,517	2,773
	KARNES	1,831	1,722	1,598	1,463	1,336	1,091	1,089	1,138	1,180	1,150	1,256	1,072	995	998	1,086	1,066	966	865	909
	LA SALLE	12,073	11,732	11,399	11,066	10,735	4,365	4,001	3,920	4,040	7,854	7,927	8,112	9,592	8,394	7,070	6,489	8,797	6,108	5,315
	MAVERICK	1,303	1,282	1,261	1,241	1,220	1,745	150	178	3,837	595	3,967	4,086	4,172	167	474	1,123	1,126	122	105
	MCMULLEN	629	489	346	211	77	446	446	612	662	474	495	913	626	611	702	724	922	928	923
	MEDINA	8,496	11,178	13,833	16,488	19,153	1,315	1,577	1,722	1,640	1,751	1,543	1,715	1,693	1,582	6,949	7,630	7,633	5,231	7,016
	UVALDE	4,685	3,578	2,464	1,354	248	273	226	241	230	258	271	264	277	283	284	283	299	284	294
	WEBB	788	762	722	686	656	489	391	390	470	868	1,017	3,283	1,711	1,920	927	1,953	1,839	1,652	1,824
	WILSON	11,089	11,537	11,912	12,325	12,770	11,513	11,320	12,492	14,272	15,850	18,279	17,013	19,204	15,276	17,258	16,510	21,484	19,411	17,241
	ZAVALA	85,779	88,111	90,428	92,756	95,093	98,024	43,714	38,908	78,862	96,875	80,647	75,150	62,385	55,342	58,109	59,875	60,158	52,797	72,498
	TOTAL	336,737	337,705	337,733	338,120	338,828	266,974	230,724	206,738	291,080	332,569	301,542	305,491	277,939	282,524	299,418	301,236	303,889	236,798	296,050

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Municipal																				
	ATASCOSA	4,995	5,123	5,120	4,745	4,678	4,640	5,027	7,716	4,036	4,944	5,369	6,643	6,749	6,976	6,467	6,669	6,294	5,975	6,076
	BASTROP	9,395	9,181	9,140	9,822	10,373	9,398	10,768	12,635	10,035	11,903	11,713	3,459	13,354	10,965	11,364	10,531	11,177	11,243	12,245
	BEXAR	1,532	1,150	43	41	43	42	35	43	36	61	6,064	734	6,558	4,428	6,886	9,562	3,823	228	2,182
	CALDWELL	2,363	2,568	2,581	2,695	2,803	2,717	1,017	908	889	1,381	2,131	1,424	2,235	2,781	2,424	5,954	3,931	3,451	4,208
	DIMMIT	2,543	2,531	2,424	2,274	2,078	1,983	2,331	2,383	1,805	2,267	2,303	2,180	2,437	2,460	2,475	2,042	2,053	1,998	2,000
	FAYETTE	85	32	42	35	27	25	20	25	239	421	21	76	416	366	515	487	520	521	510
	FRIO	2,956	3,169	3,194	2,576	2,414	2,565	2,938	3,115	2,593	2,518	3,387	2,700	3,446	3,385	3,401	3,480	3,214	3,209	3,401
	GONZALES	2,702	2,728	2,671	2,663	2,428	2,373	2,735	2,911	2,518	3,303	3,028	3,257	5,840	5,637	16,858	26,825	44,566	36,909	42,616
	GUADALUPE	1,225	1,054	1,209	1,122	1,062	1,132	1,154	994	976	1,514	1,231	948	677	2,535	2,199	2,376	3,481	2,447	3,838
	KARNES	251	137	130	148	248	246	150	111	99	98	109	83	144	111	112	577	1,008	814	949
	LA SALLE	1,537	1,568	1,460	1,460	1,138	1,148	1,194	1,405	1,287	1,403	1,582	1,703	1,739	1,745	1,731	1,831	1,716	1,938	1,863
	MAVERICK	40	22	22	23	25	24	26	8	7	7	93	181	198	180	162	136	121	133	114
	MCMULLEN	521	649	690	712	708	705	166	142	139	133	130	346	347	347	343	292	394	323	392
	MEDINA	481	898	956	1,098	1,078	1,118	1,252	1,835	417	1,519	1,654	394	1,038	1,185	1,148	1,167	1,008	971	959
	UVALDE	23	2	3	3	3	3	3	19	15	17	18	19	22	18	16	15	13	11	108
	WEBB	597	214	213	497	506	407	362	268	225	341	221	230	430	748	421	159	151	147	150
	WILSON	4,823	4,884	4,501	4,680	4,807	4,492	5,737	6,105	4,859	6,040	6,336	6,092	7,654	7,103	7,262	6,962	6,551	6,586	7,519
	ZAVALA	2,543	4,426	3,096	3,089	2,731	2,727	2,868	2,915	2,788	2,808	2,832	2,792	2,925	2,906	2,840	2,801	2,728	2,238	2,233
Manufacturing																				
	ATASCOSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BASTROP	30	46	25	27	18	14	19	49	52	61	64	68	74	53	76	83	76	61	161
	BEXAR	1	1	4	4	8	2	1	8	1	1	1	4	5	4	7	8	17	5	4
	CALDWELL	0	0	0	0	0	0	0	0	0	0	630	182	220	142	122	112	133	171	179
	DIMMIT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FAYETTE	0	0	0	0	0	0	0	0	0	0	34	33	34	24	29	37	52	48	61
	FRIO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GONZALES	356	705	861	836	787	826	792	877	780	802	654	556	781	581	581	507	548	548	570
	GUADALUPE	0	0	4	0	4	3	3	3	3	3	3	0	0	2	2	0	0	2	2
	KARNES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LA SALLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAVERICK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MCMULLEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEDINA	10	1	1	3	3	3	3	3	3	3	3	12	14	12	10	9	11	10	9
	UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEBB	19	19	16	16	16	16	22	11	9	8	0	0	0	0	0	0	0	0	0
	WILSON	1	1	6	5	5	5	5	5	5	5	19	37	37	36	36	36	46	54	48
	ZAVALA	1,100	922	758	1,412	920	982	1,103	1,103	707	566	541	541	495	495	551	603	668	662	456
Mining																				
	ATASCOSA	1,256	0	0	0	0	0	0	159	152	132	87	72	82	93	113	97	114	280	396
	BASTROP	22	0	0	0	0	0	0	0	0	0	0	0	0	45	44	22	44	22	29
	BEXAR	168	109	250	153	164	2,070	482	164	177	187	199	209	215	221	227	229	231	234	252
	CALDWELL	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DIMMIT	919	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FAYETTE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	FRIO	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GONZALES	30	313	39	36	36	36	36	36	36	0	3	40	34	10	0	0	0	0	0
	GUADALUPE	157	0	0	0	0	0	0	0	0	0	0	0	0	56	22	35	15	10	0
	KARNES	115	4	6	0	0	0	0	1	0	0	6	1	1	1	3	2	1	0	1
	LA SALLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAVERICK	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MCMULLEN	399	221	220	218	220	219	219	0	219	219	219	0	0	0	0	0	0	0	0
	MEDINA	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6	6	5	1	1
	WEBB	97	13	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
	WILSON	277	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ZAVALA	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electric Power																				
	ATASCOSA	6,839	7,379	7,379	7,363	7,363	7,363	7,363	8,196	3,816	6,448	7,879	7,197	7,954	8,427	7,934	5,750	3,478	5,036	7,962
	BASTROP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,400	5,519	3,272	5,080
	BEXAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CALDWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DIMMIT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FAYETTE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FRIO	134	327	204	217	188	62	153	214	121	189	169	50	124	64	88	88	54	40	43
	GONZALES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GUADALUPE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KARNES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LA SALLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAVERICK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MCMULLEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEDINA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEBB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WILSON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ZAVALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation																				
	ATASCOSA	36,072	33,434	33,386	48,362	19,674	22,927	28,469	21,243	20,553	28,768	34,422	26,674	35,511	23,710	30,890	28,440	21,280	18,112	21,842
	BASTROP	234	905	835	835	400	539	627	596	365	371	2,915	6,299	3,861	2,829	2,533	2,443	3,204	2,872	5,092
	BEXAR	3,017	1,004	1,102	1,623	743	782	798	855	325	607	1,606	766	970	1,178	841	642	665	714	920
	CALDWELL	616	137	223	223	129	83	156	181	32	136	77	373	533	395	300	339	210	206	202
	DIMMIT	1,792	3,793	5,230	7,015	1,643	4,055	3,612	4,507	3,041	6,191	7,831	7,170	5,570	5,894	4,433	4,323	3,353	3,022	2,416
	FAYETTE	40	83	79	77	105	125	150	126	65	0	77	42	330	228	87	88	79	146	179
	FRIO	80,040	116,538	103,227	88,091	82,548	84,080	83,641	72,150	48,495	83,726	79,212	59,000	104,755	76,209	80,348	70,601	57,809	60,913	63,570
	GONZALES	358	1,675	1,029	1,071	962	1,064	1,321	2,441	1,668	2,664	1,552	3,316	4,964	2,425	3,060	4,450	2,263	2,083	2,475
	GUADALUPE	41	157	154	182	114	135	144	294	36	132	291	250	868	503	339	364	261	253	343
	KARNES	0	0	0	0	0	0	0	0	0	0	0	107	131	78	94	146	68	89	96
	LA SALLE	3,292	4,003	3,134	5,286	4,518	4,334	4,370	6,636	3,337	4,491	5,087	4,229	8,026	6,248	5,924	4,492	1,850	2,864	3,701
	MAVERICK	0	0	0	0	0	0	0	0	0	0	0	0	444	6	4	10	38	48	57
	MCMULLEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEDINA	3,642	8,462	12,132	11,865	6,730	7,623	7,297	11,733	2,926	8,005	10,966	6,724	11,908	8,888	8,194	9,645	4,537	5,858	6,419

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	UVALDE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEBB	143	59	91	136	47	460	512	168	0	335	692	92	392	4	23	1	1	4	11
	WILSON	11,424	16,171	9,968	9,179	11,112	13,686	13,727	19,270	4,300	12,211	13,201	13,553	18,309	13,019	11,265	12,434	9,448	10,276	11,858
	ZAVALA	51,353	35,140	40,617	111,873	41,692	50,481	51,396	44,019	35,241	24,283	40,682	39,298	55,645	47,350	43,368	44,246	31,193	32,430	35,759
Livestock																				
	ATASCOSA	168	151	772	123	140	135	931	863	965	1,175	1,291	1,479	1,535	908	915	951	978	987	955
	BASTROP	510	494	313	313	341	319	235	235	167	190	183	192	192	158	142	153	156	158	199
	BEXAR	34	33	31	32	27	3	13	12	11	33	34	61	61	24	27	23	24	24	26
	CALDWELL	16	30	14	15	15	16	58	41	44	36	34	41	40	36	36	37	38	39	51
	DIMMIT	442	442	405	327	300	300	217	294	217	258	233	228	233	203	156	150	152	155	179
	FAYETTE	11	11	3	3	3	12	21	21	21	20	20	20	19	17	14	16	18	18	17
	FRIO	131	121	82	126	98	101	632	619	522	533	674	484	491	420	535	717	776	817	554
	GONZALES	460	332	321	337	346	342	2,717	2,749	2,560	2,638	2,528	5,549	5,496	5,222	5,246	5,151	5,288	5,455	2,310
	GUADALUPE	81	74	49	49	51	44	337	323	369	293	295	601	611	253	280	299	313	326	324
	KARNES	21	21	8	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LA SALLE	69	57	71	56	49	52	225	313	164	238	238	234	236	204	156	169	169	173	88
	MAVERICK	15	17	8	10	7	12	158	233	170	174	188	97	143	123	140	165	172	180	167
	MCMULLEN	25	15	47	28	28	6	12	9	9	9	9	12	9	6	6	6	6	6	6
	MEDINA	51	15	11	13	13	23	264	272	278	194	200	323	327	155	163	165	167	170	203
	UVALDE	28	27	25	25	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEBB	140	129	31	56	45	45	193	203	203	211	275	173	175	147	166	172	165	169	140
	WILSON	190	143	101	113	109	109	815	751	847	903	867	1,244	1,267	621	654	677	695	705	726
	ZAVALA	91	75	52	77	101	87	420	584	470	573	597	513	556	448	358	357	363	378	429
Domestic																				
	ATASCOSA	2,686	3,679	3,679	3,679	3,679	3,679	3,679	3,679	3,679	3,679	3,679	4,645	4,645	4,645	4,645	4,645	4,645	4,645	4,645
	BASTROP	1,266	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	2,682	2,682	2,682	2,682	2,682	2,682	2,682	2,682
	BEXAR	3,369	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	7,770	7,770	7,770	7,770	7,770	7,770	7,770	7,770
	CALDWELL	963	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,749	1,749	1,749	1,749	1,749	1,749	1,749	1,749
	DIMMIT	448	613	613	613	613	613	613	613	613	613	613	612	612	612	612	612	612	612	612
	FAYETTE	163	65	65	65	65	65	65	65	65	65	65	80	80	80	80	80	80	80	80
	FRIO	808	671	671	671	671	671	671	671	671	671	671	880	880	880	880	880	880	880	880
	GONZALES	1,439	1,802	1,802	1,802	1,802	1,802	1,802	1,802	1,802	1,802	1,802	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050
	GUADALUPE	1,529	2,012	2,012	2,012	2,012	2,012	2,012	2,012	2,012	2,012	2,012	2,403	2,403	2,403	2,403	2,403	2,403	2,403	2,403
	KARNES	524	665	665	665	665	665	665	665	665	665	665	675	675	675	675	675	675	675	675
	LA SALLE	201	217	217	217	217	217	217	217	217	217	217	476	476	476	476	476	476	476	476
	MAVERICK	3	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
	MCMULLEN	21	90	90	90	90	90	90	90	90	90	90	76	76	76	76	76	76	76	76
	MEDINA	1,005	985	985	985	985	985	985	985	985	985	985	1,143	1,143	1,143	1,143	1,143	1,143	1,143	1,143
	UVALDE	247	81	81	81	81	81	81	81	81	81	81	72	72	72	72	72	72	72	72
	WEBB	595	153	153	153	153	153	153	153	153	153	153	755	755	755	755	755	755	755	755
	WILSON	3,052	4,190	4,190	4,190	4,190	4,190	4,190	4,190	4,190	4,190	4,190	5,834	5,834	5,834	5,834	5,834	5,834	5,834	5,834
	ZAVALA	153	704	704	704	704	704	704	704	704	704	704	772	772	772	772	772	772	772	772

County	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017

Appendix B. Summary of estimated groundwater pumping by water use sector in counties in the study area.

	County	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
TOTALS	ATASCOSA	52,016	49,766	50,336	64,272	35,534	38,744	45,469	41,856	33,201	45,146	52,727	46,710	56,476	44,759	50,964	46,552	36,789	35,035	41,876
	BASTROP	11,457	12,573	12,260	12,944	13,079	12,217	13,596	15,462	12,566	14,472	16,822	12,700	20,163	16,732	16,841	19,314	22,858	20,310	25,488
	BEXAR	8,121	8,527	7,660	8,083	7,215	9,129	7,559	7,312	6,780	7,119	14,134	9,544	15,579	13,625	15,758	18,234	12,530	8,975	11,154
	CALDWELL	3,968	4,010	4,093	4,208	4,222	4,091	2,506	2,405	2,240	2,828	4,147	3,769	4,777	5,103	4,631	8,191	6,061	5,616	6,389
	DIMMIT	6,144	7,379	8,672	10,229	4,634	6,951	6,773	7,797	5,676	9,329	10,980	10,190	8,852	9,169	7,676	7,127	6,170	5,787	5,207
	FAYETTE	299	191	189	180	200	227	256	237	390	506	217	251	879	715	725	708	749	813	847
	FRIO	84,208	120,826	107,378	91,681	85,919	87,479	88,035	76,769	52,402	87,637	84,113	63,114	109,696	80,958	85,252	75,766	62,733	65,859	68,448
	GONZALES	5,345	7,555	6,723	6,745	6,361	6,443	9,403	10,816	9,364	11,209	9,567	14,768	19,165	15,925	27,795	38,983	54,715	47,045	50,021
	GUADALUPE	3,033	3,297	3,428	3,365	3,243	3,326	3,650	3,626	3,396	3,954	3,832	4,202	4,559	5,752	5,245	5,477	6,473	5,441	6,910
	KARNES	911	827	809	822	922	911	815	777	764	763	780	866	951	865	884	1,400	1,752	1,578	1,721
	LA SALLE	5,099	5,845	4,882	7,019	5,922	5,751	6,006	8,571	5,005	6,349	7,124	6,642	10,477	8,673	8,287	6,968	4,211	5,451	6,128
	MAVERICK	69	40	31	34	33	37	185	242	178	182	282	280	787	311	308	313	333	363	340
	MCMULLEN	966	975	1,047	1,048	1,046	1,020	487	241	457	451	448	434	432	429	425	374	476	405	474
	MEDINA	5,213	10,361	14,085	13,964	8,809	9,752	9,801	14,828	4,609	10,706	13,808	8,596	14,430	11,383	10,658	12,129	6,866	8,152	8,733
	UVALDE	298	110	109	109	107	84	84	100	96	98	99	91	94	95	94	93	90	84	181
	WEBB	1,591	587	504	858	772	1,086	1,242	803	590	1,048	1,341	1,250	1,752	1,654	1,365	1,087	1,072	1,075	1,056
	WILSON	19,767	25,389	18,766	18,167	20,223	22,482	24,474	30,321	14,201	23,349	24,613	26,760	33,101	26,613	25,051	25,943	22,574	23,455	25,985
	ZAVALA	55,354	41,267	45,227	117,155	46,148	54,981	56,491	49,325	39,910	28,934	45,356	43,916	60,393	51,971	47,889	48,779	35,724	36,480	39,649
	TOTAL	263,857	299,524	286,198	360,882	244,388	264,710	276,831	271,487	191,824	254,079	290,389	254,082	362,562	294,731	309,847	317,437	282,175	271,923	300,606

APPENDIX C

Responses to Comments on Interim Draft Framework

Appendix C

The following report and data review comments shall be addressed and included in the final draft deliverables by no later than March 30, 2020. Please note that the suggested comments noted may improve the readability of the report and/or the usability of the data deliverables.

Note: Responses to comments related to the interim draft framework and associated report chapter are shown below in italic font.

Framework Report comments:

1. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Please use groundwater availability model instead of GAM or re-word to "model" as appropriate. GAM is used at least 18 times in the interim draft report.
Acronyms of GAM were changed accordingly to either groundwater availability model or simply model.

2. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Page 3, Section 2.4.1.1, First sentence: Please spell out BRACS when referring to the group, Brackish Resources Aquifer Characterization System Group.
Acronyms of BRACS were changed accordingly to Brackish Resources Aquifer Characterization System Group.

3. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Page 4, first paragraph, last sentence: Please spell out BRACS throughout the report when referring to the program or group; BRACS should only be used when citing the BRACS geodatabase.
Acronyms of BRACS were changed accordingly to Brackish Resources Aquifer Characterization System Group.

4. Per the Contract, Appendix A: GAM Standards, Attachment 4: Guidelines for Authors Submitting Contract Reports to the Texas Water Development Board, Section 4.2 on page 5 of 10, all sources that are cited within the report should be listed at the end of the paper under the heading References. Page 4, third paragraph, Section 2.4.1.2, end of paragraph: Stoeser and others, 2007 is not listed in the reference section. Please include this reference.
The reference section was updated to include this reference.

5. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Page 7, fourth paragraph, Section 2.4.1.4, last two lines: Please spell out Bureau of Economic Geology (BEG), Brackish Resources Aquifer Characterization System (BRACS), Montgomery & Associates (M&A), and United States Geological Survey (USGS).
These acronyms were changed accordingly.

6. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Page 8, second paragraph, Section 2.4.1.4, last line: Please spell out groundwater availability modeling and please clarify what is meant by GAM aquifer system. Please consider re-wording to aquifers in the study or aquifers to be modeled.
This acronym was changed accordingly and the GAM aquifer system was reworded to "aquifer system in the groundwater availability model".

7. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Page 7, first paragraph and page 8, fourth paragraph, Section 2.4.1.5: Please spell out Texas Natural Resource Information System.
This acronym was changed accordingly.

8. Per the Contract Section II, Article III, item 9, page 4 of 16, no acronyms except TWDB (Texas Water Development Board) will be used in the report. Page 8, fifth paragraph, Section 2.4.1.5, fourth line: Please spell out United States Geological Survey on this page and the other four times USGS is used in the report.
This acronym was changed accordingly.

Suggested comments to be addressed on Framework text:

9. Please capitalize aquifer when used with the aquifer name; for example, Sparta Aquifer, Queen City Aquifer, and so on.
The word aquifer was changed to be capitalized when a part of the aquifer name.

10. Page 2, paragraph 2, last sentence: Section 2.4.2 is cited for the hydrostratigraphic framework discussion; however, that section is 2.4.1.4. Please verify and update if appropriate.
The section reference was updated accordingly to the correct section. Please note: the draft report has the framework section in Section 2.2.

11. Page 3, third line: Section 2.4.1.5 is cited for discussion of the upper Wilcox and Carrizo; however, that section is 2.4.1.10. Please verify and update if appropriate.
The section reference was updated accordingly to the correct section. Please note: the draft report has the framework section in Section 2.2.

12. Page 3, second paragraph: The content of the second paragraph seems to be part of the first paragraph. We recommend combining paragraphs one and two on page 3.
This comment is addressed by combining the content of these paragraphs into one paragraph.

13. Page 7, fifth paragraph, Section 2.4.1.4, first sentence and Figure 2.27 on page 24: Text states "Quaternary Deposits within the stream channels and tributaries in the study area are shown on Figure 2.27"; however, the figure caption states that Quaternary Deposits are not shown.
This comment is addressed by removing the in-text reference since the figure did not show the Quaternary Deposits. Please note, this figure is now currently Figure 2.4 in the draft report and the framework section in Section 2.2.

14. Page 8, fifth paragraph, Section 2.4.1.5, second line: Bastrop is spelled as Batrop. Please update with correct spelling.
The spelling of Bastrop was corrected. Please note: the draft report has the framework section in Section 2.2.

15. Page 15, second paragraph, Section 2.4.11, fifth line: Please spell out percent rather than use the % symbol. In other words, 20 to 40 percent, rather than 20 to 40%.
Percent was spelled out instead of using the % symbol.

16. Page 25, Figure 2.28: Please consider marking and labeling county boundaries along the top of the cross-sections.
The county boundaries were labelled along the top of the cross-sections.

17. We suggest using miles rather than feet for the distance axis. Also please add commas to delineate multiples of 1,000s.
The horizontal axis distance was changed to mile units and commas were added to the vertical axis labels.

18. For the legends of formation elevations, please consider using "to" instead of hyphen. For example, -1,000 to -1,200 instead of -1,000 - -1,200.
The separator between formation elevation values in the explanation were changed to "to" instead of "-".

APPENDIX D

Responses to Comments on Draft Hydrogeologic Conceptual Model

Appendix D

Comments were copied from the original PDF comment document received from TWDB on March 30, 2021. Responses were prepared by Montgomery & Associates and are shown in *italics font* below each comment.

Conceptual model report comments:

General comments to be addressed

1. Per Contract Appendix A, Attachment 4, Guidelines for Authors Submitting Contract Reports: Please follow the report format specifications in the author guidelines. For example, figures should be embedded within the text after being called out in the report. Please place tables and figures in order of citation. In some cases, the tables occur before figures that were cited earlier.

Noted. The report document was reviewed for order of citation. Placement of figures and tables were adjusted as needed in Sections 2.3.1 (recharge), 2.7.1 (groundwater withdrawals), and 2.8.3 (total dissolved solids).

2. Please consistently refer to this project as the Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers. In some locations in the report it is referred to as Groundwater Availability Model for the Southern Portions (plural) of the Queen City, Sparta, and Carrizo-Wilcox Aquifers, For example caption for Figure 2-80 and throughout Sections 2.9 and 2.10.

The report document was reviewed for this reference and edits were made for consistency.

3. Per Contract Section II Article III number 10, please ensure that the final report is in compliance with Texas Administrative Code Chapters 206 and 213 (related to Accessibility and Usability of State Web Sites).

Noted. The final report was scanned for accessibility and usability.

Specific comments to be addressed

4. Report header: The report header lists the incorrect contract number. Please update the contract number to 1948312321.

This typographical error was corrected.

5. Executive Summary, page 1, third paragraph, fourth line: Please correct the spelling of Carrizo-Wilcox.

This typographical error was corrected.

6. Executive Summary, page 2, paragraph 3: The text mentions that peak pumping in the 1990s was 300,000 acre-feet per year. The statement is accurate according to Figure 2-60 on page 132; however, peak pumping for the entire model period occurs after 2000 and it is 360,000 acre-feet per year. It seems confusing to highlight the peak pumping of the 1990s and not mention the peak after 2000. Please consider clarifying this discussion.

Noted. This section was revised to clarify that peak reported pumping of about 360,000 AF occurred in 2002 and 2011. However, these volumes appear as anomalous increases that are isolated to those two particular years. These volumes will be verified during model calibration and adjusted if needed for the model to match measured groundwater levels. Pumping in 2014 is estimated to be about 320,000 AF.

7. Section 1.0 Introduction, page 3, paragraph 1, last sentence: Please change "When the program began almost 20 years ago, …" to "When the program began more than 20 years ago, …".

This edit was made to the text.

8. Section 1.1.1, page 15, paragraph 2, fourth line: Please change "Texas Brush County" to "Texas Brush Country".

This typographical error was corrected.

9. Section 1.1.1, page 15, paragraphs 3 and 4: Paragraph 3 states that the annual precipitation map shows a 30-year normal (1981 through 2010). Paragraph 4 and Figure 1-15 state the date range is 1981 through 2019. Please clarify the date range for Figure 1-15 in the text and on the figure.

The year range in paragraph 4 and Figure 1-15 are correct; the date range for precipitation shown on draft Figure 1-15 is not the 30-year normal period as stated in paragraph 3. However, based on Comment 30, this section was revised to include a higher resolution (800 meter) precipitation dataset for the study area. The new dataset is based on the 30-year normal (1981-2010). Clarifying text revisions were also made to paragraphs 3 and 4, and Figure 1-15 and the source geodatabase were updated with the new precipitation dataset.

10. Section 1.1.1, page 15 paragraph 4 and Figure 1-16, page 23: It is not clear whether the yearly average rainfall shown in the chart is for a particular station or whether it is the spatial average for the entire study area. Please clarify in Section 1.1.1, paragraph 4 what the rainfall values in Figure 1-16 represent.

The paragraph was revised to clarify that the figure represents the spatial average for the study area. The words "spatial" and "entire" were added to the second sentence.

11. Section 2.1, paragraph 2, second to last sentence: The text states that the general relationship between change in geologic formation across the Frio River is shown in Figure 2-1. Figure 2-1 includes only one column of units. Should this citation be to Figure 1-20 instead? Please verify and update as appropriate.

Correct. The sentence should cite Figure 1-20 instead of Figure 2-1. The error was corrected.

12. Section 2.1.4, page 37, paragraph 2, second sentence: This sentence suggests that the downdip model boundary does not fully cover the downdip extent of the TWDB-designated aquifer extents, implying that part of the downdip extent of the aquifers will not be included in the model. However, Figures 1-4 and 1-5 show that the downdip extents of the aquifers are fully within the study area. Please clarify this discussion.

That portion of the sentence was removed from the report to avoid confusion. The downdip extents of the aquifer layers are fully within the study area.

13. Figures 2-7 through 2-13: Please label the top elevation and bottom elevation maps for clarity on these figures, perhaps in the legend title as shown for the thickness maps.

This error was corrected in the respective figures.

14. Pages 38 through 45, Well Control and Formation Top, Bottom, Thickness subsections and Figures 2-7 through 2-13: The range of elevations mentioned in the text for the top and bottom elevations of the units is not always consistent with the legends on the Figures. Please verify that correct range of elevations is described and update the text if appropriate.

The elevation ranges were verified and corrected on the figures and in the text as needed.

15. Section 2.2.2, page 60, first paragraph, second sentence from end of paragraph: Text states "A total of 55,0518 approved groundwater levels …" Please replace 55,0518 with the correct number.

This typographical error was corrected. The correct number is 55,518.

16. Section 2.2.3, page 62, second paragraph, second line: Please replace period after Figure 2-21 with a comma.

This typographical error was corrected.

17. Section 2.4.1.1, page 87, second to last sentence: Please correct the spelling of "pattern".

This typographical error was corrected.

18. Section 2.4.1.2, page 89, first paragraph, second to last sentence: Please correct the number written as "7000,000". It looks as though a comma is missing.

This typographical error was corrected.

19. Sections 2.5.1.7 and 2.5.1.8, page 111, figure citations near top of page: The figures are cited as Figure 4-48 and Figure 4-49, but the text seems to discuss Figures 2-48 and 2-49. Please verify and correct the figure citations as appropriate.

The text was incorrect in citing Figures 4-48 and 4-49. The figure citations were corrected to 2-48 and 2-49.

20. Table 2-4 and Section 2.5.1, starting on page 110: For the Queen City Aquifer and the Lower Wilcox unit the lower end of hydraulic conductivity mentioned in the text does not match the value listed in Table 2-4. Please verify which is correct and update either Table 2-4 or the text as appropriate.

The minimum value for Queen City should be 0.01 feet/day, instead of 0.1 feet/day. This correction was made in Section 2.5.1.4. The correct value is presented in Table 2-4.

The minimum value for Lower Wilcox should be 0.11 feet/day, instead of 0.08 feet/day. This correction was made in Table 2-4. The correct value is presented in Section 2.5.1.8.

21. Section 2.7.1, Table 2-7, pages 129 and 130, column one, Aquifer Source: The row labels for the Sparta Aquifer and the Carrizo-Wilcox Aquifer pumping amounts appear to be switched. Please review Table 2-7 and update the table as appropriate.

The row heading were indeed switched. This error was fixed in Table 2-7.

22. Section 2.7.1, Figure 2-62, page 134: The population distribution is difficult to see in these figures because of a lack of contrast between the colors. Please consider a different color scheme with more contrast. Also, the legend label is unclear. Should yellow be less than 100 rather than greater than 100? Please review the legend for clarity and consider a color scheme with more contrast for Figure 2-62 and update the figure as appropriate.

Noted. This figure was revised for clarity as suggested.

23. Section 2.7.3, Figure 2-68, page 143: Please consider moving the county boundary feature class to the front of the figure so the county lines are not covered by the evapotranspiration rates.

Noted. The figure was revised for clarity as suggested.

24. Section 2.8.2, page 144, last paragraph: The text states that high or very high sodium found is found in 20 percent of wells; however, Table 2-10 indicates the percentage is 25 percent. Also, Table 2-10 indicates that for boron, chloride, and silica a few wells exceed irrigation standards while the text suggests no wells exceed the standards. Please verify these exceedances and clarify the text or update the table as appropriate.

The values shown in Table 2-10 are correct. High to very high sodium adsorption ratio is found in approximately 25 percent of wells. And groundwater from a small number of wells did indeed exceed irrigation standards for those constituents. The text in this paragraph was updated accordingly.

25. Figures 2-75 through 2-79, pages 156 through 160: On the labels for the upper right figures of slightly saline sand thickness, "slightly" is misspelled in all five figures. Please update the upper right figure labels.

This typographical error was corrected on these five figures.

26. Section 2.9, page 161, paragraph 1, last sentence: Please change "…northern portions …" to "… southern portion…".

This typographical error was corrected.

27. Section 2.9, page 161, paragraph 2, third sentence: Please capitalize aquifer when it is a singular specific aquifer, for example Sparta Aquifer and Queen City Aquifer.

This correction was made to this sentence.

28. Section 2.9, page 161, paragraph 4: Please clarify in the paragraph that climate becomes more arid towards the west. This paragraph discusses gaining streams in the east being partly related to climate, while there is no discussion about such relationships or lack thereof in the western part of the study area.

This paragraph was included in error and was removed from this section.

29. Section 2.10, page 164, paragraph 2: This paragraph states that "inputs for recharge from precipitation will be developed by applying a recharge precipitation relationship and scaling during calibration". However, Section 2.3 on page 82 states that the average recharge distribution from Kelley and others (2004) will be the starting point for calibration. Please elaborate on the recharge approach in Section 2.10 to clear up this possible discrepancy.

Clarifying text was added to these sections. Recharge in the updated model is indeed based on the average recharge distribution from Kelley and others (2004). The average rates from that study will be varied from year to year using annual scaling factors based on precipitation for 1980 through 2017. The scaling factors are based on average precipitation during that time period. This method and the annual applied factors are described in the model chapters of the report.

Suggestions for the conceptual model report:

30. Section 1.1.1, pages 21 and 22, Figures 1-14 and 1-15: These climate maps are fairly coarse resolution. Please consider using the PRISM 800-meter resolution maps instead if they are available.

These figures indeed were mistakenly displayed at a coarse resolution (4 kilometers) in the draft report. The datasets have been replaced with the 800-meter resolution datasets, and the figures and the source geodatabase were updated accordingly. This comment is related to Comment 9.

31. Per Contract, Exhibit A: GAM Standards, Attachment 1 Conceptual Model Checklist page 7 of 12: Please consider adding a map of estimated potential and actual evapotranspiration if available. Scanlon and others (2005) (http://www.twdb.texas.gov/groundwater/docs/BEG_ET.pdf) Figure 4.10 is available in digital format if needed. (https://s3.amazonaws.com/gwmodels/ET_Data_Model_all.zip)

Estimated actual evaporation is shown on Figure 2-68, represented as the average rates simulated in the previous groundwater availability model by Kelley and others (2004). Evapotranspiration rates presented on the referenced figure by Scanlon and others (2005) represent total maximum evapotranspiration and are substantially larger than estimated groundwater evapotranspiration rates reported for previous groundwater models for the study area. These rates include evapotranspiration from the unsaturated zone, and thus do not represent the portion of total evapotranspiration that is solely groundwater evapotranspiration. On the other hand, the study by Kelley and others (2004) attempted to account for groundwater evapotranspiration when calibrating the previous groundwater availability model, and those simulated rates are considered an estimate of maximum actual evapotranspiration. For these reasons, the Kelley and others (2004) distribution is shown in this report instead of the Scanlon and others (2005) distribution, which is not directly useful for the groundwater model.

32. Section 2.3.2, page 84, Table 2-2: Please consider adding information on the table about which hydrogeologic units directly underly and intersect the lakes.

The hydrostratigraphic unit underlying each lake was added to Table 2-2.

Geodatabase comments:

Specific comments to be addressed

33. GAM_SourceGeodatabase_sCWQCS_draft_20210113.gdb, Geology Feature Dataset, HSUOutcrop_Carrizo_Wilcox: Please add metadata to this feature class.

Metadata was added to this feature class.

34. GAM_SourceGeodatabase_sCWQCS_draft_20210113.gdb, SubSurfaceHydro Feature Dataset, TWDB_Groundwater: Please add metadata to this feature class.

Metadata was added to this feature class.

APPENDIX E

Conceptual Pumping Values by Layer for Simulated Counties

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Atascosa County	1980	1,032.3	0	4,508.4	0	69,033.3	668.2	2,310.7
Atascosa County	1981	857.7	0	3,588.7	0	45,118.1	538.6	2,207.0
Atascosa County	1982	680.3	0	2,668.3	0	47,043.9	531.4	2,173.9
Atascosa County	1983	505.3	0	1,748.5	0	40,165.0	411.0	1,519.3
Atascosa County	1984	336.0	0	830.4	0	40,641.2	432.4	1,648.1
Atascosa County	1985	337.9	0	762.2	0	37,665.4	396.9	1,500.7
Atascosa County	1986	336.6	0	994.7	0	48,704.4	521.3	2,055.7
Atascosa County	1987	339.9	0	658.3	0	33,591.6	347.5	1,269.2
Atascosa County	1988	359.6	0	837.3	0	43,097.5	441.7	1,676.0
Atascosa County	1989	402.3	0	1,168.8	0	57,449.6	557.8	1,931.2
Atascosa County	1990	416.9	0	1,087.8	0	52,844.7	591.6	2,279.7
Atascosa County	1991	425.3	0	1,140.0	0	54,981.2	619.6	2,379.7
Atascosa County	1992	418.1	0	892.3	0	42,914.0	483.6	1,786.0
Atascosa County	1993	426.5	0	1,045.4	0	50,507.8	484.0	1,530.1
Atascosa County	1994	439.8	0	981.6	0	50,510.3	454.5	1,229.4
Atascosa County	1995	463.6	0	1,036.1	0	52,934.0	481.0	1,295.7
Atascosa County	1996	478.0	0	1,063.4	0	54,541.6	496.1	1,335.8
Atascosa County	1997	488.0	0	847.8	0	44,144.1	401.4	1,017.9
Atascosa County	1998	501.0	0	949.4	0	58,744.6	632.8	2,229.6
Atascosa County	1999	516.6	0	962.5	0	52,427.1	598.4	1,956.0
Atascosa County	2000	295.4	0	889.8	0	67,610.0	771.6	2,522.5
Atascosa County	2001	341.2	0	765.4	0	55,562.2	633.8	2,072.9
Atascosa County	2002	358.8	0	821.5	0	68,737.0	784.5	2,564.5
Atascosa County	2003	453.3	0	1,819.8	0	60,144.3	686.2	2,243.9
Atascosa County	2004	1,187.5	0	5,673.8	0	52,516.0	599.3	1,959.3
Atascosa County	2005	1,266.7	0	6,745.4	0	52,516.0	599.3	1,959.3
Atascosa County	2006	1,198.0	0	6,844.3	0	43,465.8	496.1	1,621.3
Atascosa County	2007	944.8	0	4,138.7	0	32,457.8	370.6	1,210.9
Atascosa County	2008	1,352.0	0	6,708.2	0	47,200.5	539.3	1,761.0
Atascosa County	2009	545.2	0	957.9	0	70,477.8	804.1	2,629.4
Atascosa County	2010	499.6	0	968.8	0	105,058.6	1,199.0	3,919.6
Atascosa County	2011	497.5	0	973.8	0	105,058.6	1,199.0	3,919.6
Atascosa County	2012	1,552.0	0	2,199.0	0	39,131.3	446.5	1,459.9
Atascosa County	2013	1,605.4	0	3,129.1	0	44,115.4	504.0	1,645.9
Atascosa County	2014	1,578.2	0	3,112.3	0	39,946.5	456.4	1,490.3
Atascosa County	2015	1,519.7	0	2,850.6	0	30,936.8	353.5	1,154.2
Atascosa County	2016	1,494.5	0	2,649.5	0	29,479.1	336.8	1,099.8
Atascosa County	2017	1,515.6	0	2,945.6	0	35,704.4	407.6	1,332.0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Bastrop County	1980	47.0	0	108.6	0	81.5	141.2	90.1
Bastrop County	1981	45.0	0	105.8	0	88.8	157.4	100.7
Bastrop County	1982	43.0	0	101.7	0	93.1	166.5	106.6
Bastrop County	1983	41.0	0	98.5	0	98.6	178.4	114.2
Bastrop County	1984	39.0	0	95.5	0	107.0	194.9	124.7
Bastrop County	1985	30.0	0	90.7	0	108.6	202.1	129.3
Bastrop County	1986	26.0	0	87.7	0	112.7	212.5	135.9
Bastrop County	1987	28.0	0	93.4	0	116.2	218.2	139.6
Bastrop County	1988	30.0	0	97.8	0	121.9	228.8	146.5
Bastrop County	1989	36.0	0	101.0	0	132.8	254.5	162.7
Bastrop County	1990	36.0	0	101.5	0	139.6	269.8	172.4
Bastrop County	1991	37.0	0	103.8	0	132.2	247.8	176.6
Bastrop County	1992	38.0	0	106.5	0	132.5	247.4	176.1
Bastrop County	1993	35.0	0	107.7	0	135.8	254.0	181.3
Bastrop County	1994	31.0	0	113.5	0	143.9	270.0	192.3
Bastrop County	1995	29.0	0	112.5	0	147.3	278.8	198.8
Bastrop County	1996	34.0	0	126.1	0	156.6	293.3	209.0
Bastrop County	1997	25.0	0	105.8	0	151.4	291.7	208.4
Bastrop County	1998	6.7	0	83.1	0	156.0	300.4	215.0
Bastrop County	1999	6.7	0	88.0	0	160.4	309.4	221.4
Bastrop County	2000	3.9	0	81.4	0	206.9	398.9	285.5
Bastrop County	2001	4.5	0	70.1	0	170.0	327.9	234.6
Bastrop County	2002	4.8	0	75.2	0	210.4	405.6	290.3
Bastrop County	2003	5.9	0	169.6	0	184.0	354.9	253.9
Bastrop County	2004	15.5	0	524.0	0	160.5	309.7	221.5
Bastrop County	2005	17.2	0	619.3	0	160.5	309.7	221.5
Bastrop County	2006	16.3	0	628.1	0	132.9	256.5	183.5
Bastrop County	2007	12.3	0	380.9	0	99.3	191.5	137.0
Bastrop County	2008	17.6	0	613.2	0	144.5	278.5	199.4
Bastrop County	2009	7.1	0	87.6	0	215.6	415.9	297.6
Bastrop County	2010	6.5	0	89.1	0	321.3	620.0	443.4
Bastrop County	2011	6.5	0	89.1	0	321.3	620.0	443.4
Bastrop County	2012	51.7	0	179.9	0	1,216.9	2,347.1	1,679.5
Bastrop County	2013	47.8	0	163.2	0	1,229.9	2,372.3	1,697.5
Bastrop County	2014	46.5	0	159.3	0	1,419.0	2,736.8	1,958.3
Bastrop County	2015	56.3	0	199.9	0	1,676.4	3,233.4	2,313.7
Bastrop County	2016	52.4	0	182.2	0	1,488.0	2,869.9	2,053.6
Bastrop County	2017	80.5	0	298.4	0	1,847.7	3,563.7	2,550.1

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Bee County	1980	0	0	0	0	29.9	14.9	14.9
Bee County	1981	0	0	0	0	31.9	15.9	15.9
Bee County	1982	0	0	0	0	32.8	16.4	16.4
Bee County	1983	0	0	0	0	33.9	16.9	16.9
Bee County	1984	0	0	0	0	35.8	17.9	17.9
Bee County	1985	0	0	0	0	33.5	16.7	16.7
Bee County	1986	0	0	0	0	31.1	15.5	15.5
Bee County	1987	0	0	0	0	31.3	15.6	15.6
Bee County	1988	0	0	0	0	32.1	16.0	16.0
Bee County	1989	0	0	0	0	33.1	16.5	16.5
Bee County	1990	0	0	0	0	33.4	16.7	16.7
Bee County	1991	0	0	0	0	32.8	16.4	16.4
Bee County	1992	0	0	0	0	32.7	16.3	16.3
Bee County	1993	0	0	0	0	40.1	20.0	20.0
Bee County	1994	0	0	0	0	34.8	17.4	17.4
Bee County	1995	0	0	0	0	36.3	18.1	18.1
Bee County	1996	0	0	0	0	36.9	18.4	18.4
Bee County	1997	0	0	0	0	37.1	18.5	18.5
Bee County	1998	0	0	0	0	37.8	18.9	18.9
Bee County	1999	0	0	0	0	38.3	19.2	19.2
Bee County	2000	0	0	0	0	49.5	24.7	24.7
Bee County	2001	0	0	0	0	40.6	20.3	20.3
Bee County	2002	0	0	0	0	50.3	25.1	25.1
Bee County	2003	0	0	0	0	44.0	22.0	22.0
Bee County	2004	0	0	0	0	38.4	19.2	19.2
Bee County	2005	0	0	0	0	38.4	19.2	19.2
Bee County	2006	0	0	0	0	31.7	15.9	15.9
Bee County	2007	0	0	0	0	23.7	11.9	11.9
Bee County	2008	0	0	0	0	34.5	17.2	17.2
Bee County	2009	0	0	0	0	51.5	25.8	25.8
Bee County	2010	0	0	0	0	76.8	38.4	38.4
Bee County	2011	0	0	0	0	76.8	38.4	38.4
Bee County	2012	0	0	0	0	52.6	26.3	26.3
Bee County	2013	0	0	0	0	52.6	26.3	26.3
Bee County	2014	0	0	0	0	52.6	26.3	26.3
Bee County	2015	0	0	0	0	52.6	26.3	26.3
Bee County	2016	0	0	0	0	52.6	26.3	26.3
Bee County	2017	0	0	0	0	52.6	26.3	26.3

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Bexar County	1980	0	0	0	0	3,170.3	4,279.9	4,784.6
Bexar County	1981	0	0	0	0	3,118.1	5,134.6	4,421.4
Bexar County	1982	0	0	0	0	3,213.2	5,377.0	4,570.7
Bexar County	1983	0	0	0	0	3,431.2	5,868.5	4,766.9
Bexar County	1984	0	0	0	0	3,689.2	6,558.9	6,411.1
Bexar County	1985	0	0	0	0	3,321.6	6,122.0	4,731.9
Bexar County	1986	0	0	0	0	3,406.9	6,306.1	4,909.3
Bexar County	1987	0	0	0	0	3,482.4	6,660.6	4,961.0
Bexar County	1988	0	0	0	0	3,648.0	6,843.6	5,156.1
Bexar County	1989	0	0	0	0	3,522.2	6,444.3	4,938.5
Bexar County	1990	0	0	0	0	3,806.3	6,592.5	5,382.7
Bexar County	1991	0	0	0	0	3,748.9	6,894.4	5,369.7
Bexar County	1992	0	0	0	0	3,506.1	6,442.0	4,977.7
Bexar County	1993	0	0	0	0	3,964.3	6,871.7	5,401.7
Bexar County	1994	0	0	0	0	3,037.9	5,415.9	6,732.9
Bexar County	1995	0	0	0	0	3,577.9	6,626.1	7,047.1
Bexar County	1996	0	0	0	0	3,637.0	6,720.3	7,308.0
Bexar County	1997	0	0	0	0	3,471.9	6,380.2	6,746.2
Bexar County	1998	0	0	0	0	3,356.0	6,232.4	6,428.5
Bexar County	1999	0	0	0	0	3,513.8	6,633.3	6,725.1
Bexar County	2000	0	0	0	0	4,531.5	8,554.3	8,672.6
Bexar County	2001	0	0	0	0	3,724.0	7,029.9	7,127.3
Bexar County	2002	0	0	0	0	4,607.0	8,697.0	8,817.3
Bexar County	2003	0	0	0	0	4,031.1	7,609.8	7,715.0
Bexar County	2004	0	0	0	0	3,519.8	6,644.6	6,736.4
Bexar County	2005	0	0	0	0	3,519.8	6,644.6	6,736.4
Bexar County	2006	0	0	0	0	2,912.6	5,498.4	5,574.5
Bexar County	2007	0	0	0	0	2,175.4	4,106.7	4,163.5
Bexar County	2008	0	0	0	0	3,163.6	5,972.0	6,054.7
Bexar County	2009	0	0	0	0	4,723.7	8,917.2	9,040.5
Bexar County	2010	0	0	0	0	7,041.4	13,292.5	13,449.8
Bexar County	2011	0	0	0	0	7,041.4	13,292.5	13,476.4
Bexar County	2012	0	0	0	0	821.5	1,550.8	1,572.2
Bexar County	2013	0	0	0	0	950.1	1,793.5	1,818.3
Bexar County	2014	0	0	0	0	1,099.3	2,075.4	2,104.0
Bexar County	2015	0	0	0	0	755.4	1,426.1	1,445.9
Bexar County	2016	0	0	0	0	541.1	1,021.5	1,035.5
Bexar County	2017	0	0	0	0	672.5	1,269.5	1,287.1

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Caldwell County	1980	0	0	47.3	0	208.4	906.2	1,749.3
Caldwell County	1981	0	0	50.6	0	223.2	899.8	1,510.1
Caldwell County	1982	0	0	52.3	0	229.9	1,015.0	1,902.1
Caldwell County	1983	0	0	55.4	0	242.4	1,042.2	1,893.2
Caldwell County	1984	0	0	59.7	0	263.0	1,127.0	2,033.7
Caldwell County	1985	0	0	59.5	0	251.6	1,038.6	1,804.3
Caldwell County	1986	0	0	64.8	0	273.4	1,121.6	1,968.5
Caldwell County	1987	0	0	66.9	0	282.2	1,120.7	1,866.9
Caldwell County	1988	0	0	67.5	0	284.9	1,129.9	1,875.0
Caldwell County	1989	0	0	60.0	0	253.4	1,067.6	1,888.5
Caldwell County	1990	0	0	61.4	0	279.6	1,237.2	2,380.7
Caldwell County	1991	0	0	60.6	0	253.6	1,027.6	1,750.3
Caldwell County	1992	0	0	59.1	0	285.8	1,230.6	2,306.7
Caldwell County	1993	0	0	61.5	0	264.4	1,115.6	2,025.9
Caldwell County	1994	0	0	99.9	0	272.8	1,148.6	2,096.8
Caldwell County	1995	0	0	116.5	0	269.6	1,127.3	2,099.2
Caldwell County	1996	0	0	120.0	0	275.8	1,268.5	2,382.6
Caldwell County	1997	0	0	109.8	0	257.5	1,102.7	2,056.6
Caldwell County	1998	0	0	102.9	0	252.8	1,115.4	2,186.6
Caldwell County	1999	0	0	132.5	0	278.9	1,168.0	2,186.1
Caldwell County	2000	0	0	122.6	0	359.7	1,506.2	2,819.1
Caldwell County	2001	0	0	105.6	0	295.6	1,237.9	2,316.7
Caldwell County	2002	0	0	113.3	0	365.6	1,531.4	2,866.2
Caldwell County	2003	0	0	255.4	0	320.0	1,340.0	2,507.8
Caldwell County	2004	0	0	789.3	0	279.4	1,169.9	2,189.5
Caldwell County	2005	0	0	932.9	0	279.4	1,169.9	2,189.5
Caldwell County	2006	0	0	946.1	0	231.2	968.2	1,812.1
Caldwell County	2007	0	0	573.7	0	172.7	723.1	1,353.4
Caldwell County	2008	0	0	923.6	0	251.0	1,051.6	1,968.3
Caldwell County	2009	0	0	132.0	0	374.9	1,570.1	2,938.7
Caldwell County	2010	0	0	134.3	0	558.9	2,340.5	4,379.5
Caldwell County	2011	0	0	134.3	0	558.9	2,340.5	4,380.4
Caldwell County	2012	0	0	70.4	0	277.3	1,161.2	2,173.4
Caldwell County	2013	0	0	68.2	0	251.3	1,052.4	1,969.7
Caldwell County	2014	0	0	66.8	0	448.6	1,878.7	3,516.2
Caldwell County	2015	0	0	65.3	0	330.7	1,385.1	2,592.3
Caldwell County	2016	0	0	65.3	0	306.1	1,281.9	2,399.1
Caldwell County	2017	0	0	71.1	0	348.4	1,459.3	2,731.1

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Dewitt County	1980	0	0	0	0	7.2	0	0
Dewitt County	1981	0	0	0	0	7.3	0	0
Dewitt County	1982	0	0	0	0	6.9	0	0
Dewitt County	1983	0	0	0	0	6.6	0	0
Dewitt County	1984	0	0	0	0	5.0	0	0
Dewitt County	1985	0	0	0	0	4.4	0	0
Dewitt County	1986	0	0	0	0	4.1	0	0
Dewitt County	1987	0	0	0	0	4.5	0	0
Dewitt County	1988	0	0	0	0	6.0	0	0
Dewitt County	1989	0	0	0	0	5.7	0	0
Dewitt County	1990	0	0	0	0	7.2	0	0
Dewitt County	1991	0	0	0	0	4.9	0	0
Dewitt County	1992	0	0	0	0	5.3	0	0
Dewitt County	1993	0	0	0	0	2.0	0	0
Dewitt County	1994	0	0	0	0	1.6	0	0
Dewitt County	1995	0	0	0	0	1.9	0	0
Dewitt County	1996	0	0	0	0	1.8	0	0
Dewitt County	1997	0	0	0	0	1.5	0	0
Dewitt County	1998	0	0	0	0	1.8	0	0
Dewitt County	1999	0	0	0	0	1.5	0	0
Dewitt County	2000	0	0	0	0	2.0	0	0
Dewitt County	2001	0	0	0	0	1.6	0	0
Dewitt County	2002	0	0	0	0	2.0	0	0
Dewitt County	2003	0	0	0	0	1.8	0	0
Dewitt County	2004	0	0	0	0	1.5	0	0
Dewitt County	2005	0	0	0	0	1.5	0	0
Dewitt County	2006	0	0	0	0	1.3	0	0
Dewitt County	2007	0	0	0	0	1.0	0	0
Dewitt County	2008	0	0	0	0	1.4	0	0
Dewitt County	2009	0	0	0	0	2.1	0	0
Dewitt County	2010	0	0	0	0	3.1	0	0
Dewitt County	2011	0	0	0	0	3.1	0	0
Dewitt County	2012	0	0	0	0	2.1	0	0
Dewitt County	2013	0	0	0	0	2.1	0	0
Dewitt County	2014	0	0	0	0	2.1	0	0
Dewitt County	2015	0	0	0	0	2.1	0	0
Dewitt County	2016	0	0	0	0	2.1	0	0
Dewitt County	2017	0	0	0	0	2.1	0	0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Dimmit County	1980	0	0	0	0	20,796.8	1,953.5	202.2
Dimmit County	1981	0	0	0	0	16,298.8	1,557.9	167.8
Dimmit County	1982	0	0	0	0	16,713.1	1,594.6	170.4
Dimmit County	1983	0	0	0	0	15,367.0	1,456.4	156.5
Dimmit County	1984	0	0	0	0	19,215.9	1,859.3	194.7
Dimmit County	1985	0	0	0	0	21,846.5	2,139.8	215.6
Dimmit County	1986	0	0	0	0	13,411.5	1,176.1	133.0
Dimmit County	1987	0	0	0	0	8,727.8	705.2	98.7
Dimmit County	1988	0	0	0	0	13,146.0	1,181.2	133.7
Dimmit County	1989	0	0	0	0	10,643.4	950.5	106.6
Dimmit County	1990	0	0	0	0	8,978.1	813.1	96.8
Dimmit County	1991	0	0	0	0	6,783.7	573.3	76.0
Dimmit County	1992	0	0	0	0	6,574.5	538.6	67.5
Dimmit County	1993	0	0	0	0	8,739.6	724.8	86.0
Dimmit County	1994	0	0	0	0	7,539.1	616.8	83.7
Dimmit County	1995	0	0	0	0	8,643.3	713.0	92.4
Dimmit County	1996	0	0	0	0	8,408.3	680.3	84.6
Dimmit County	1997	0	0	0	0	4,919.7	344.5	52.8
Dimmit County	1998	0	0	0	0	5,217.1	363.5	58.6
Dimmit County	1999	0	0	0	0	4,449.6	271.9	50.1
Dimmit County	2000	7.5	0	7.6	0	5,736.4	345.2	64.5
Dimmit County	2001	8.6	0	8.5	0	4,715.0	283.4	53.1
Dimmit County	2002	6.5	0	6.5	0	5,831.1	350.9	65.6
Dimmit County	2003	6.0	0	6.1	0	5,102.2	306.9	57.3
Dimmit County	2004	6.0	0	6.1	0	4,454.2	268.0	50.1
Dimmit County	2005	4.5	0	4.4	0	4,454.2	268.0	50.1
Dimmit County	2006	8.6	0	8.5	0	3,685.8	221.9	41.5
Dimmit County	2007	6.5	0	6.5	0	2,752.5	165.7	31.0
Dimmit County	2008	7.5	0	7.6	0	4,005.6	241.2	45.2
Dimmit County	2009	7.5	0	7.6	0	5,978.2	359.6	67.1
Dimmit County	2010	7.0	0	7.0	0	8,910.9	536.1	100.0
Dimmit County	2011	7.0	0	7.0	0	8,910.9	536.1	100.2
Dimmit County	2012	6.4	0	6.5	0	8,456.5	516.9	95.3
Dimmit County	2013	5.4	0	5.5	0	7,079.5	432.6	79.8
Dimmit County	2014	4.9	0	5.0	0	6,574.0	401.4	73.9
Dimmit County	2015	4.5	0	4.4	0	5,688.8	347.6	63.9
Dimmit County	2016	4.5	0	4.4	0	5,335.2	325.9	60.0
Dimmit County	2017	4.0	0	4.1	0	4,801.7	293.2	54.0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Fayette County	1980	70.6	0	3.1	0	5.0	0	0
Fayette County	1981	67.5	0	3.3	0	3.8	0	0
Fayette County	1982	63.5	0	3.4	0	3.7	0	0
Fayette County	1983	57.7	0	3.3	0	3.6	0	0
Fayette County	1984	52.4	0	3.3	0	3.0	0	0
Fayette County	1985	55.0	0	3.3	0	2.9	0	0
Fayette County	1986	55.1	0	3.3	0	2.8	0	0
Fayette County	1987	57.9	0	3.3	0	2.8	0	0
Fayette County	1988	56.3	0	3.2	0	2.9	0	0
Fayette County	1989	57.5	0	3.3	0	2.9	0	0
Fayette County	1990	53.2	0	3.3	0	3.0	0	0
Fayette County	1991	53.5	0	3.6	0	3.0	0	0
Fayette County	1992	56.0	0	3.7	0	3.1	0	0
Fayette County	1993	66.1	0	7.6	0	4.8	0	0
Fayette County	1994	94.7	0	12.6	0	1.2	0	0
Fayette County	1995	88.3	0	10.5	0	3.0	0	0
Fayette County	1996	84.4	0	10.5	0	2.9	0	0
Fayette County	1997	86.3	0	10.6	0	2.9	0	0
Fayette County	1998	63.7	0	11.2	0	2.5	0	0
Fayette County	1999	66.2	0	12.2	0	2.4	0	0
Fayette County	2000	38.9	0	11.3	0	3.1	0	0
Fayette County	2001	44.4	0	9.7	0	2.5	0	0
Fayette County	2002	47.5	0	10.4	0	3.2	0	0
Fayette County	2003	58.7	0	23.5	0	2.7	0	0
Fayette County	2004	153.6	0	72.6	0	2.4	0	0
Fayette County	2005	170.3	0	85.6	0	2.4	0	0
Fayette County	2006	161.5	0	86.9	0	2.0	0	0
Fayette County	2007	121.8	0	52.7	0	1.5	0	0
Fayette County	2008	173.8	0	84.9	0	2.2	0	0
Fayette County	2009	70.1	0	12.1	0	3.2	0	0
Fayette County	2010	64.2	0	12.3	0	4.8	0	0
Fayette County	2011	64.2	0	12.3	0	4.8	0	0
Fayette County	2012	101.6	0	0.2	0	4.9	0	0
Fayette County	2013	26.6	0	76.3	0	5.3	0	0
Fayette County	2014	55.0	0	32.0	0	18.8	0	0
Fayette County	2015	55.7	0	19.3	0	36.9	0	0
Fayette County	2016	68.6	0	15.9	0	37.1	0	0
Fayette County	2017	57.6	0	10.8	0	58.2	0	0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Frio County	1980	76.8	0	815.2	0	73,867.1	2,827.9	46.7
Frio County	1981	77.4	0	849.7	0	74,396.1	2,876.4	47.3
Frio County	1982	77.0	0	883.5	0	74,504.0	2,851.4	46.9
Frio County	1983	75.7	0	916.7	0	59,855.6	2,289.5	37.7
Frio County	1984	75.3	0	950.5	0	87,110.8	3,374.9	55.4
Frio County	1985	67.0	0	538.5	0	48,576.8	1,835.2	30.2
Frio County	1986	66.1	0	722.9	0	65,770.8	2,542.1	41.7
Frio County	1987	66.9	0	712.4	0	64,380.4	2,495.2	41.0
Frio County	1988	68.2	0	914.0	0	84,415.3	3,252.9	53.3
Frio County	1989	72.7	0	1,018.3	0	93,708.1	3,641.7	59.6
Frio County	1990	74.7	0	872.0	0	79,700.4	3,064.4	48.0
Frio County	1991	77.8	0	861.4	0	87,126.4	3,360.3	52.6
Frio County	1992	78.9	0	834.9	0	83,734.4	3,242.2	50.8
Frio County	1993	78.7	0	938.9	0	94,864.5	3,668.4	57.5
Frio County	1994	93.0	0	70.3	0	104,276.6	4,047.1	63.4
Frio County	1995	90.0	0	69.2	0	99,292.6	3,866.5	60.6
Frio County	1996	92.3	0	60.7	0	90,947.8	3,510.0	54.9
Frio County	1997	92.9	0	62.6	0	58,539.3	2,238.8	35.0
Frio County	1998	97.3	0	68.1	0	104,671.0	4,078.3	63.7
Frio County	1999	98.1	0	66.4	0	105,344.5	4,089.0	63.9
Frio County	2000	382.3	0	234.3	0	135,851.9	5,273.1	82.4
Frio County	2001	347.6	0	205.5	0	111,643.7	4,333.4	67.7
Frio County	2002	308.7	0	187.1	0	138,116.5	5,361.0	83.7
Frio County	2003	302.8	0	251.1	0	120,851.0	4,690.8	73.3
Frio County	2004	402.1	0	521.2	0	105,523.4	4,095.9	64.0
Frio County	2005	442.4	0	600.8	0	105,523.4	4,095.9	64.0
Frio County	2006	417.7	0	602.8	0	87,320.6	3,389.5	53.0
Frio County	2007	301.9	0	375.7	0	65,218.9	2,531.6	39.5
Frio County	2008	457.3	0	604.4	0	94,841.5	3,681.5	57.5
Frio County	2009	348.3	0	204.9	0	141,614.8	5,496.8	85.9
Frio County	2010	277.3	0	173.1	0	211,099.9	8,193.9	128.0
Frio County	2011	410.4	0	239.8	0	211,099.9	8,193.9	128.0
Frio County	2012	952.7	0	1,444.9	0	75,634.9	2,935.9	45.9
Frio County	2013	986.6	0	1,505.7	0	79,677.2	3,093.0	48.3
Frio County	2014	892.1	0	1,373.9	0	70,761.5	2,746.7	42.9
Frio County	2015	764.0	0	1,177.7	0	58,526.4	2,271.9	35.5
Frio County	2016	801.0	0	1,242.3	0	61,439.5	2,385.0	37.3
Frio County	2017	822.0	0	1,246.8	0	63,906.7	2,480.7	38.8

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Gonzales County	1980	632.9	0	703.9	0	3,225.6	65.5	0.5
Gonzales County	1981	589.6	0	580.6	0	3,458.1	73.1	0.5
Gonzales County	1982	559.2	0	455.9	0	3,442.4	74.7	0.5
Gonzales County	1983	500.9	0	330.2	0	3,131.2	75.2	0.5
Gonzales County	1984	470.4	0	205.6	0	2,807.5	73.3	0.6
Gonzales County	1985	467.1	0	203.7	0	2,667.8	71.4	0.6
Gonzales County	1986	433.7	0	208.5	0	2,534.7	69.2	0.6
Gonzales County	1987	444.0	0	210.9	0	2,887.3	72.0	0.6
Gonzales County	1988	454.5	0	211.9	0	3,626.4	76.9	0.6
Gonzales County	1989	467.7	0	212.8	0	3,470.7	76.5	0.6
Gonzales County	1990	467.6	0	240.1	0	4,207.0	85.4	0.6
Gonzales County	1991	430.6	0	223.4	0	3,203.6	75.6	0.6
Gonzales County	1992	429.2	0	252.3	0	3,213.0	76.2	0.6
Gonzales County	1993	427.0	0	242.5	0	2,265.4	66.0	0.6
Gonzales County	1994	434.7	0	235.5	0	2,251.3	64.2	0.6
Gonzales County	1995	463.2	0	256.7	0	2,483.0	65.1	0.6
Gonzales County	1996	500.3	0	228.7	0	2,734.2	65.3	0.6
Gonzales County	1997	585.6	0	218.3	0	2,652.3	64.5	0.6
Gonzales County	1998	549.5	0	245.5	0	3,084.7	66.9	0.6
Gonzales County	1999	552.0	0	240.0	0	2,538.0	66.8	0.6
Gonzales County	2000	322.8	0	222.1	0	3,273.1	86.0	0.8
Gonzales County	2001	369.4	0	191.5	0	2,689.7	70.1	0.7
Gonzales County	2002	396.1	0	205.2	0	3,327.6	87.6	0.8
Gonzales County	2003	488.6	0	462.9	0	2,911.6	76.2	0.7
Gonzales County	2004	1,277.8	0	1,430.2	0	2,541.4	66.8	0.6
Gonzales County	2005	1,417.2	0	1,690.0	0	2,541.4	66.8	0.6
Gonzales County	2006	1,346.1	0	1,714.2	0	2,130.4	55.3	0.5
Gonzales County	2007	1,013.4	0	1,023.4	0	1,571.2	41.3	0.4
Gonzales County	2008	1,447.9	0	1,673.6	0	2,285.2	60.8	0.6
Gonzales County	2009	583.6	0	237.8	0	3,411.9	89.4	0.8
Gonzales County	2010	533.0	0	242.8	0	5,085.1	133.6	1.3
Gonzales County	2011	532.6	0	242.0	0	5,085.1	133.6	1.3
Gonzales County	2012	1,394.2	0	1,939.1	0	12,276.6	323.7	3.0
Gonzales County	2013	1,412.2	0	2,074.3	0	23,697.9	623.4	5.9
Gonzales County	2014	1,394.2	0	2,377.5	0	34,326.3	904.1	8.5
Gonzales County	2015	1,408.2	0	1,902.2	0	50,110.9	1,318.2	12.4
Gonzales County	2016	1,434.3	0	1,901.2	0	42,610.1	1,121.7	10.6
Gonzales County	2017	1,029.9	0	1,463.8	0	46,330.8	1,219.7	11.5

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Guadalupe County	1980	0	0	0	0	334.8	1,754.6	1,778.5
Guadalupe County	1981	0	0	0	0	378.7	2,092.1	2,501.3
Guadalupe County	1982	0	0	0	0	392.4	2,135.3	2,431.5
Guadalupe County	1983	0	0	0	0	419.1	2,237.9	2,388.0
Guadalupe County	1984	0	0	0	0	463.3	2,778.0	4,125.8
Guadalupe County	1985	0	0	0	0	451.4	2,293.2	1,997.1
Guadalupe County	1986	0	0	0	0	469.4	2,334.3	1,831.9
Guadalupe County	1987	0	0	0	0	479.0	2,339.3	1,661.9
Guadalupe County	1988	0	0	0	0	499.6	2,381.5	1,438.6
Guadalupe County	1989	0	0	0	0	572.2	2,868.5	2,352.1
Guadalupe County	1990	0	0	0	0	563.9	2,843.3	2,429.5
Guadalupe County	1991	0	0	0	0	563.8	2,820.4	2,299.4
Guadalupe County	1992	0	0	0	0	836.7	2,833.1	2,513.4
Guadalupe County	1993	0	0	0	0	1,080.1	2,678.8	1,331.9
Guadalupe County	1994	0	0	0	0	938.7	2,742.3	1,383.9
Guadalupe County	1995	0	0	0	0	958.4	2,911.8	1,451.5
Guadalupe County	1996	0	0	0	0	1,001.6	3,024.1	1,558.5
Guadalupe County	1997	0	0	0	0	989.8	3,044.2	1,540.4
Guadalupe County	1998	0	0	0	0	1,064.8	3,097.5	1,539.0
Guadalupe County	1999	0	0	0	0	1,224.4	3,240.4	1,609.4
Guadalupe County	2000	0	0	0	0	1,578.9	4,178.7	2,075.4
Guadalupe County	2001	0	0	0	0	1,297.6	3,434.1	1,705.6
Guadalupe County	2002	0	0	0	0	1,605.3	4,248.5	2,110.0
Guadalupe County	2003	0	0	0	0	1,404.6	3,717.3	1,846.3
Guadalupe County	2004	0	0	0	0	1,226.4	3,245.9	1,611.9
Guadalupe County	2005	0	0	0	0	1,226.4	3,245.9	1,611.9
Guadalupe County	2006	0	0	0	0	1,014.9	2,685.9	1,334.0
Guadalupe County	2007	0	0	0	0	758.0	2,006.1	996.3
Guadalupe County	2008	0	0	0	0	1,102.3	2,917.3	1,448.9
Guadalupe County	2009	0	0	0	0	1,645.9	4,356.1	2,163.4
Guadalupe County	2010	0	0	0	0	2,453.4	6,493.4	3,196.1
Guadalupe County	2011	0	0	0	0	2,453.4	6,493.4	3,225.0
Guadalupe County	2012	0	0	0	0	632.2	1,673.1	831.0
Guadalupe County	2013	0	0	0	0	576.5	1,525.7	757.7
Guadalupe County	2014	0	0	0	0	602.0	1,593.1	791.2
Guadalupe County	2015	0	0	0	0	711.4	1,882.8	935.1
Guadalupe County	2016	0	0	0	0	598.0	1,582.7	786.1
Guadalupe County	2017	0	0	0	0	759.4	2,010.0	998.3

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Karnes County	1980	0	0	0	0	1,556.6	0	0
Karnes County	1981	0	0	0	0	1,524.2	0	0
Karnes County	1982	0	0	0	0	1,913.2	0	0
Karnes County	1983	0	0	0	0	1,169.0	0	0
Karnes County	1984	0	0	0	0	1,019.8	0	0
Karnes County	1985	0	0	0	0	744.9	0	0
Karnes County	1986	0	0	0	0	724.5	0	0
Karnes County	1987	0	0	0	0	766.4	0	0
Karnes County	1988	0	0	0	0	831.7	0	0
Karnes County	1989	0	0	0	0	723.1	0	0
Karnes County	1990	0	0	0	0	715.5	0	0
Karnes County	1991	0	0	0	0	672.6	0	0
Karnes County	1992	0	0	0	0	585.7	0	0
Karnes County	1993	0	0	0	0	567.9	0	0
Karnes County	1994	0	0	0	0	569.2	0	0
Karnes County	1995	0	0	0	0	519.4	0	0
Karnes County	1996	0	0	0	0	480.8	0	0
Karnes County	1997	0	0	0	0	471.7	0	0
Karnes County	1998	0	0	0	0	464.2	0	0
Karnes County	1999	0	0	0	0	470.7	0	0
Karnes County	2000	0	0	0	0	606.9	0	0
Karnes County	2001	0	0	0	0	498.7	0	0
Karnes County	2002	0	0	0	0	617.0	0	0
Karnes County	2003	0	0	0	0	539.7	0	0
Karnes County	2004	0	0	0	0	471.2	0	0
Karnes County	2005	0	0	0	0	471.2	0	0
Karnes County	2006	0	0	0	0	415.5	0	0
Karnes County	2007	0	0	0	0	291.8	0	0
Karnes County	2008	0	0	0	0	424.1	0	0
Karnes County	2009	0	0	0	0	628.5	0	0
Karnes County	2010	0	0	0	0	943.0	0	0
Karnes County	2011	0	0	0	0	943.0	0	0
Karnes County	2012	0	0	0	0	751.2	0	0
Karnes County	2013	0	0	0	0	767.5	0	0
Karnes County	2014	0	0	0	0	1,215.6	0	0
Karnes County	2015	0	0	0	0	1,520.2	0	0
Karnes County	2016	0	0	0	0	1,369.8	0	0
Karnes County	2017	0	0	0	0	1,493.4	0	0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
La Salle County	1980	3,129.4	0	1.4	0	9,114.1	0	0
La Salle County	1981	2,636.8	0	1.4	0	6,994.3	0	0
La Salle County	1982	2,190.0	0	1.5	0	7,124.5	0	0
La Salle County	1983	1,722.1	0	1.5	0	4,440.1	0	0
La Salle County	1984	1,273.3	0	1.5	0	9,692.2	0	0
La Salle County	1985	229.0	0	1.5	0	4,316.7	0	0
La Salle County	1986	219.8	0	1.4	0	3,918.3	0	0
La Salle County	1987	209.8	0	1.4	0	3,558.0	0	0
La Salle County	1988	227.1	0	1.2	0	3,748.6	0	0
La Salle County	1989	353.7	0	1.5	0	7,309.2	0	0
La Salle County	1990	357.8	0	1.5	0	7,313.8	0	0
La Salle County	1991	355.0	0	1.8	0	7,491.2	0	0
La Salle County	1992	402.3	0	1.8	0	9,058.3	0	0
La Salle County	1993	376.3	0	1.9	0	8,120.0	0	0
La Salle County	1994	1,045.8	0	1.7	0	6,276.8	0	0
La Salle County	1995	953.0	0	1.9	0	5,794.5	0	0
La Salle County	1996	1,290.3	0	1.9	0	7,667.3	0	0
La Salle County	1997	884.9	0	2.0	0	5,361.4	0	0
La Salle County	1998	1,192.3	0	2.0	0	9,613.5	0	0
La Salle County	1999	1,305.0	0	2.0	0	8,297.3	0	0
La Salle County	2000	769.9	0	4.4	0	10,700.9	0	0
La Salle County	2001	878.5	0	4.6	0	8,792.2	0	0
La Salle County	2002	939.6	0	4.2	0	10,878.9	0	0
La Salle County	2003	1,157.3	0	5.9	0	9,516.7	0	0
La Salle County	2004	3,027.8	0	14.5	0	8,311.1	0	0
La Salle County	2005	3,366.9	0	24.2	0	8,311.1	0	0
La Salle County	2006	3,199.4	0	31.4	0	6,888.5	0	0
La Salle County	2007	2,410.0	0	18.7	0	5,137.4	0	0
La Salle County	2008	3,438.6	0	28.0	0	7,471.9	0	0
La Salle County	2009	1,402.1	0	23.0	0	11,069.8	0	0
La Salle County	2010	1,291.9	0	29.6	0	16,626.6	0	0
La Salle County	2011	1,294.9	0	32.6	0	16,626.6	0	0
La Salle County	2012	1,717.7	0	47.4	0	6,910.9	0	0
La Salle County	2013	1,626.6	0	43.4	0	6,620.9	0	0
La Salle County	2014	1,297.0	0	34.8	0	5,640.8	0	0
La Salle County	2015	751.6	0	32.8	0	3,428.4	0	0
La Salle County	2016	956.8	0	33.8	0	4,466.1	0	0
La Salle County	2017	1,071.3	0	24.3	0	5,037.0	0	0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Lavaca County	1980	0	0	0	0	2.1	0.01	0
Lavaca County	1981	0	0	0	0	2.9	0.01	0
Lavaca County	1982	0	0	0	0	2.8	0.01	0
Lavaca County	1983	0	0	0	0	2.7	0.01	0
Lavaca County	1984	0	0	0	0	2.2	0.01	0
Lavaca County	1985	0	0	0	0	2.0	0.01	0
Lavaca County	1986	0	0	0	0	1.8	0.01	0
Lavaca County	1987	0	0	0	0	2.0	0.01	0
Lavaca County	1988	0	0	0	0	2.8	0.01	0
Lavaca County	1989	0	0	0	0	2.7	0.01	0
Lavaca County	1990	0	0	0	0	4.8	0.01	0
Lavaca County	1991	0	0	0	0	3.2	0.02	0
Lavaca County	1992	0	0	0	0	3.4	0.02	0
Lavaca County	1993	0	0	0	0	0.9	0.03	0
Lavaca County	1994	0	0	0	0	0.8	0.03	0
Lavaca County	1995	0	0	0	0	0.9	0.03	0
Lavaca County	1996	0	0	0	0	1.0	0.03	0
Lavaca County	1997	0	0	0	0	0.8	0.03	0
Lavaca County	1998	0	0	0	0	1.3	0.03	0
Lavaca County	1999	0	0	0	0	1.2	0.03	0
Lavaca County	2000	0	0	0	0	1.5	0.03	0
Lavaca County	2001	0	0	0	0	1.2	0.03	0
Lavaca County	2002	0	0	0	0	1.5	0.03	0
Lavaca County	2003	0	0	0	0	1.3	0.03	0
Lavaca County	2004	0	0	0	0	1.2	0.03	0
Lavaca County	2005	0	0	0	0	1.2	0.03	0
Lavaca County	2006	0	0	0	0	1.0	0.02	0
Lavaca County	2007	0	0	0	0	0.7	0.02	0
Lavaca County	2008	0	0	0	0	1.0	0.03	0
Lavaca County	2009	0	0	0	0	1.6	0.03	0
Lavaca County	2010	0	0	0	0	2.3	0.05	0
Lavaca County	2011	0	0	0	0	2.3	0.05	0
Lavaca County	2012	0	0	0	0	1.6	0.03	0
Lavaca County	2013	0	0	0	0	1.6	0.03	0
Lavaca County	2014	0	0	0	0	1.6	0.03	0
Lavaca County	2015	0	0	0	0	1.6	0.03	0
Lavaca County	2016	0	0	0	0	1.6	0.03	0
Lavaca County	2017	0	0	0	0	1.6	0.03	0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Live Oak County	1980	0	0	0	0	114.2	0	0
Live Oak County	1981	0	0	0	0	72.8	0	0
Live Oak County	1982	0	0	0	0	71.2	0	0
Live Oak County	1983	0	0	0	0	56.7	0	0
Live Oak County	1984	0	0	0	0	56.4	0	0
Live Oak County	1985	0	0	0	0	50.7	0	0
Live Oak County	1986	0	0	0	0	69.8	0	0
Live Oak County	1987	0	0	0	0	43.0	0	0
Live Oak County	1988	0	0	0	0	56.8	0	0
Live Oak County	1989	0	0	0	0	82.5	0	0
Live Oak County	1990	0	0	0	0	77.3	0	0
Live Oak County	1991	0	0	0	0	81.3	0	0
Live Oak County	1992	0	0	0	0	60.8	0	0
Live Oak County	1993	0	0	0	0	73.1	0	0
Live Oak County	1994	0	0	0	0	73.4	0	0
Live Oak County	1995	0	0	0	0	77.9	0	0
Live Oak County	1996	0	0	0	0	80.2	0	0
Live Oak County	1997	0	0	0	0	60.7	0	0
Live Oak County	1998	0	0	0	0	85.8	0	0
Live Oak County	1999	0	0	0	0	84.9	0	0
Live Oak County	2000	0	0	0	0	109.5	0	0
Live Oak County	2001	0	0	0	0	90.0	0	0
Live Oak County	2002	0	0	0	0	111.4	0	0
Live Oak County	2003	0	0	0	0	97.4	0	0
Live Oak County	2004	0	0	0	0	85.1	0	0
Live Oak County	2005	0	0	0	0	85.1	0	0
Live Oak County	2006	0	0	0	0	70.4	0	0
Live Oak County	2007	0	0	0	0	52.6	0	0
Live Oak County	2008	0	0	0	0	76.5	0	0
Live Oak County	2009	0	0	0	0	114.2	0	0
Live Oak County	2010	0	0	0	0	170.2	0	0
Live Oak County	2011	0	0	0	0	170.2	0	0
Live Oak County	2012	0	0	0	0	116.7	0	0
Live Oak County	2013	0	0	0	0	116.7	0	0
Live Oak County	2014	0	0	0	0	116.7	0	0
Live Oak County	2015	0	0	0	0	116.7	0	0
Live Oak County	2016	0	0	0	0	116.7	0	0
Live Oak County	2017	0	0	0	0	116.7	0	0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Maverick County	1980	0	0	0	0	808.3	407.4	849.6
Maverick County	1981	0	0	0	0	969.6	463.5	980.9
Maverick County	1982	0	0	0	0	971.7	481.2	1,008.3
Maverick County	1983	0	0	0	0	973.0	493.4	1,026.4
Maverick County	1984	0	0	0	0	698.7	474.8	951.6
Maverick County	1985	0	0	0	0	1,013.3	514.0	1,074.8
Maverick County	1986	0	0	0	0	57.3	388.9	682.4
Maverick County	1987	0	0	0	0	57.5	408.8	701.9
Maverick County	1988	0	0	0	0	2,447.4	741.5	1,702.5
Maverick County	1989	0	0	0	0	340.3	532.6	942.5
Maverick County	1990	0	0	0	0	2,479.2	865.3	1,857.1
Maverick County	1991	0	0	0	0	2,497.5	895.1	1,919.5
Maverick County	1992	0	0	0	0	2,585.7	894.6	1,933.7
Maverick County	1993	0	0	0	0	20.0	548.0	922.0
Maverick County	1994	0	0	0	0	182.6	633.1	1,093.6
Maverick County	1995	0	0	0	0	624.1	706.4	1,278.2
Maverick County	1996	0	0	0	0	658.8	733.3	1,318.3
Maverick County	1997	0	0	0	0	19.8	672.2	1,105.8
Maverick County	1998	0	0	0	0	945.9	827.2	1,524.5
Maverick County	1999	0	0	0	0	946.2	856.2	1,569.9
Maverick County	2000	0	0	0	0	126.4	504.1	713.6
Maverick County	2001	0	0	0	0	103.8	414.2	586.5
Maverick County	2002	0	0	0	0	128.5	512.4	725.5
Maverick County	2003	0	0	0	0	112.4	448.4	634.8
Maverick County	2004	0	0	0	0	98.2	391.5	554.3
Maverick County	2005	0	0	0	0	98.2	391.5	554.3
Maverick County	2006	0	0	0	0	81.2	324.0	458.7
Maverick County	2007	0	0	0	0	60.7	242.0	342.5
Maverick County	2008	0	0	0	0	88.2	351.9	498.2
Maverick County	2009	0	0	0	0	131.8	525.4	743.9
Maverick County	2010	0	0	0	0	196.4	783.2	1,108.8
Maverick County	2011	0	0	0	0	196.4	783.2	1,108.8
Maverick County	2012	0	0	0	0	14.7	13.3	24.2
Maverick County	2013	0	0	0	0	14.5	13.1	24.0
Maverick County	2014	0	0	0	0	14.8	13.3	24.4
Maverick County	2015	0	0	0	0	15.7	14.2	25.9
Maverick County	2016	0	0	0	0	17.1	15.5	28.3
Maverick County	2017	0	0	0	0	16.0	14.5	26.5

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Mcmullen County	1980	1.7	0	7.3	0	457.5	0.31	0.07
Mcmullen County	1981	1.4	0	5.9	0	409.7	0.23	0.05
Mcmullen County	1982	1.2	0	4.6	0	1,176.3	0.23	0.05
Mcmullen County	1983	0.9	0	3.3	0	1,498.2	0.12	0.03
Mcmullen County	1984	0.7	0	2.0	0	1,565.9	0.24	0.05
Mcmullen County	1985	0.7	0	1.9	0	1,174.9	0.12	0.03
Mcmullen County	1986	0.7	0	2.1	0	1,501.5	0.12	0.03
Mcmullen County	1987	0.6	0	1.6	0	1,613.5	0.12	0.03
Mcmullen County	1988	0.7	0	1.8	0	1,800.4	0.16	0.03
Mcmullen County	1989	0.8	0	2.2	0	1,545.0	0.16	0.03
Mcmullen County	1990	0.8	0	2.1	0	1,580.0	0.12	0.03
Mcmullen County	1991	0.6	0	2.2	0	1,718.0	0.16	0.03
Mcmullen County	1992	0.6	0	1.9	0	1,566.5	0.06	0.01
Mcmullen County	1993	0.6	0	2.2	0	1,661.6	0.06	0.01
Mcmullen County	1994	0.7	0	2.2	0	1,599.2	0.12	0.03
Mcmullen County	1995	0.7	0	2.2	0	1,554.4	0.12	0.03
Mcmullen County	1996	0.7	0	2.1	0	1,548.0	0.24	0.05
Mcmullen County	1997	0.7	0	1.8	0	1,740.3	0.17	0.03
Mcmullen County	1998	0.7	0	2.0	0	1,841.8	0.17	0.03
Mcmullen County	1999	0.8	0	2.1	0	153.3	0.16	0.03
Mcmullen County	2000	1.0	0	2.4	0	198.9	0.22	0.04
Mcmullen County	2001	2.0	0	3.1	0	161.1	0.16	0.03
Mcmullen County	2002	1.6	0	2.8	0	201.8	0.22	0.04
Mcmullen County	2003	1.7	0	5.0	0	172.7	0.16	0.03
Mcmullen County	2004	2.8	0	13.3	0	153.5	0.16	0.03
Mcmullen County	2005	4.0	0	16.5	0	153.5	0.16	0.03
Mcmullen County	2006	5.4	0	18.2	0	128.0	0.12	0.03
Mcmullen County	2007	4.4	0	11.9	0	95.6	0.10	0.03
Mcmullen County	2008	5.0	0	17.4	0	140.2	0.16	0.03
Mcmullen County	2009	3.8	0	5.1	0	192.5	0.22	0.04
Mcmullen County	2010	3.7	0	5.1	0	307.0	0.32	0.06
Mcmullen County	2011	3.7	0	5.1	0	307.0	0.32	0.07
Mcmullen County	2012	1.5	0	4.6	0	343.2	0.36	0.08
Mcmullen County	2013	1.2	0	4.2	0	341.1	0.36	0.08
Mcmullen County	2014	1.2	0	4.2	0	299.0	0.32	0.07
Mcmullen County	2015	1.2	0	4.2	0	377.6	0.38	0.08
Mcmullen County	2016	1.2	0	4.2	0	320.6	0.32	0.07
Mcmullen County	2017	0.9	0	3.8	0	376.9	0.38	0.08

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County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Medina County	1980	0	0	0	0	2,453.8	1,086.3	5,035.3
Medina County	1981	0	0	0	0	1,367.4	697.2	2,428.0
Medina County	1982	0	0	0	0	1,368.8	703.6	2,430.4
Medina County	1983	0	0	0	0	1,327.5	707.6	2,433.1
Medina County	1984	0	0	0	0	5,270.9	2,132.7	11,547.1
Medina County	1985	0	0	0	0	451.8	400.7	437.6
Medina County	1986	0	0	0	0	588.9	444.5	616.0
Medina County	1987	0	0	0	0	614.9	459.9	680.9
Medina County	1988	0	0	0	0	650.4	455.9	618.7
Medina County	1989	0	0	0	0	733.0	534.1	681.2
Medina County	1990	0	0	0	0	649.2	533.9	576.8
Medina County	1991	0	0	0	0	717.8	546.8	687.0
Medina County	1992	0	0	0	0	699.6	544.2	666.7
Medina County	1993	0	0	0	0	703.6	579.0	557.5
Medina County	1994	0	0	0	0	2,110.5	1,090.7	3,800.1
Medina County	1995	0	0	0	0	2,279.5	1,178.3	4,211.3
Medina County	1996	0	0	0	0	2,276.2	1,200.5	4,253.7
Medina County	1997	0	0	0	0	1,470.2	936.4	2,583.9
Medina County	1998	0	0	0	0	1,594.9	955.5	2,509.6
Medina County	1999	0	0	0	0	1,609.6	980.9	2,520.7
Medina County	2000	0	0	0	0	2,075.7	1,264.9	3,250.7
Medina County	2001	0	0	0	0	1,705.8	1,039.5	2,671.4
Medina County	2002	0	0	0	0	2,110.3	1,286.0	3,304.9
Medina County	2003	0	0	0	0	1,846.4	1,125.2	2,891.7
Medina County	2004	0	0	0	0	1,612.3	982.4	2,524.9
Medina County	2005	0	0	0	0	1,612.3	982.4	2,524.9
Medina County	2006	0	0	0	0	1,334.2	813.0	2,089.4
Medina County	2007	0	0	0	0	996.5	607.3	1,560.5
Medina County	2008	0	0	0	0	1,449.2	883.1	2,269.3
Medina County	2009	0	0	0	0	2,163.7	1,318.6	3,388.6
Medina County	2010	0	0	0	0	3,225.3	1,965.5	5,051.1
Medina County	2011	0	0	0	0	3,225.3	1,965.5	5,051.1
Medina County	2012	0	0	0	0	924.7	563.5	1,448.2
Medina County	2013	0	0	0	0	865.8	527.6	1,356.0
Medina County	2014	0	0	0	0	985.4	600.5	1,543.1
Medina County	2015	0	0	0	0	557.7	339.9	873.5
Medina County	2016	0	0	0	0	662.2	403.6	1,037.2
Medina County	2017	0	0	0	0	709.4	432.3	1,110.9

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Uvalde County	1980	0	0	0	0	268.4	239.5	4,455.5
Uvalde County	1981	0	0	0	0	284.5	159.7	1,561.4
Uvalde County	1982	0	0	0	0	290.5	160.8	1,440.5
Uvalde County	1983	0	0	0	0	302.7	161.3	1,317.1
Uvalde County	1984	0	0	0	0	320.7	142.7	186.2
Uvalde County	1985	0	0	0	0	302.5	140.6	184.9
Uvalde County	1986	0	0	0	0	262.5	92.5	108.3
Uvalde County	1987	0	0	0	0	282.4	93.9	107.0
Uvalde County	1988	0	0	0	0	271.7	119.0	149.7
Uvalde County	1989	0	0	0	0	313.4	141.6	176.8
Uvalde County	1990	0	0	0	0	323.7	133.8	164.5
Uvalde County	1991	0	0	0	0	311.1	127.1	156.6
Uvalde County	1992	0	0	0	0	315.1	119.4	150.3
Uvalde County	1993	0	0	0	0	324.4	116.6	142.2
Uvalde County	1994	0	0	0	0	327.8	119.5	145.9
Uvalde County	1995	0	0	0	0	335.4	122.6	149.3
Uvalde County	1996	0	0	0	0	341.9	124.8	161.3
Uvalde County	1997	0	0	0	0	347.1	120.8	143.0
Uvalde County	1998	0	0	0	0	353.3	120.0	138.9
Uvalde County	1999	0	0	0	0	357.8	120.1	138.4
Uvalde County	2000	0	0	0	0	461.4	144.8	74.7
Uvalde County	2001	0	0	0	0	379.2	119.0	61.2
Uvalde County	2002	0	0	0	0	469.1	147.2	75.8
Uvalde County	2003	0	0	0	0	410.5	128.8	66.4
Uvalde County	2004	0	0	0	0	358.4	112.4	57.9
Uvalde County	2005	0	0	0	0	358.4	112.4	57.9
Uvalde County	2006	0	0	0	0	296.6	93.1	48.1
Uvalde County	2007	0	0	0	0	221.5	69.5	35.7
Uvalde County	2008	0	0	0	0	322.2	101.1	52.1
Uvalde County	2009	0	0	0	0	481.0	150.9	77.9
Uvalde County	2010	0	0	0	0	717.0	225.0	115.9
Uvalde County	2011	0	0	0	0	717.0	225.0	115.9
Uvalde County	2012	0	0	0	0	5.5	1.8	1.9
Uvalde County	2013	0	0	0	0	5.5	1.8	1.8
Uvalde County	2014	0	0	0	0	5.4	1.8	1.8
Uvalde County	2015	0	0	0	0	5.2	1.7	1.7
Uvalde County	2016	0	0	0	0	4.9	1.6	1.7
Uvalde County	2017	0	0	0	0	10.5	3.5	4.3

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Webb County	1980	0	0	0	0	347.1	3.5	0.6
Webb County	1981	0	0	0	0	657.5	3.9	0.6
Webb County	1982	0	0	0	0	671.9	4.0	0.6
Webb County	1983	0	0	0	0	686.3	4.1	0.6
Webb County	1984	0	0	0	0	421.8	4.1	0.6
Webb County	1985	0	0	0	0	279.5	2.9	0.5
Webb County	1986	0	0	0	0	247.0	2.6	0.5
Webb County	1987	0	0	0	0	184.2	2.2	0.4
Webb County	1988	0	0	0	0	232.3	2.7	0.4
Webb County	1989	0	0	0	0	594.9	4.2	0.6
Webb County	1990	0	0	0	0	582.3	4.1	0.6
Webb County	1991	0	0	0	0	2,507.9	5.2	0.6
Webb County	1992	0	0	0	0	1,072.5	4.0	0.5
Webb County	1993	0	0	0	0	769.7	4.6	0.6
Webb County	1994	0	0	0	0	571.3	3.7	0.5
Webb County	1995	0	0	0	0	806.8	5.0	0.6
Webb County	1996	0	0	0	0	904.3	5.5	0.6
Webb County	1997	0	0	0	0	696.9	5.2	0.6
Webb County	1998	0	0	0	0	865.7	5.4	0.7
Webb County	1999	0	0	0	0	908.5	5.7	0.7
Webb County	2000	237.3	0	0	0	839.1	5.7	0.7
Webb County	2001	215.9	0	0	0	689.0	4.7	0.6
Webb County	2002	256.3	0	0	0	852.8	5.8	0.7
Webb County	2003	189.8	0	0	0	747.9	5.1	0.6
Webb County	2004	505.4	0	0	0	652.8	4.4	0.6
Webb County	2005	657.3	0	0	0	652.8	4.4	0.6
Webb County	2006	436.6	0	0	0	1,257.9	3.7	0.5
Webb County	2007	282.4	0	0	0	403.6	2.8	0.4
Webb County	2008	538.7	0	0	0	589.7	4.0	0.5
Webb County	2009	783.1	0	0	0	1,884.9	5.9	0.7
Webb County	2010	296.6	0	0	0	1,306.0	8.9	2.4
Webb County	2011	602.7	0	0	0	1,306.0	8.9	1.1
Webb County	2012	128.1	0	0	0	702.8	4.5	0.6
Webb County	2013	118.6	0	0	0	555.1	3.5	0.4
Webb County	2014	68.8	0	0	0	492.9	3.2	0.4
Webb County	2015	64.1	0	0	0	492.9	3.2	0.4
Webb County	2016	66.4	0	0	0	492.3	3.2	0.4
Webb County	2017	61.7	0	0	0	489.6	3.2	0.4

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Wilson County	1980	223.6	0	74.5	0	8,982.9	379.7	343.4
Wilson County	1981	240.1	0	80.2	0	8,057.9	369.1	320.7
Wilson County	1982	245.5	0	81.9	0	8,421.9	389.0	345.5
Wilson County	1983	256.6	0	85.6	0	8,788.1	403.6	345.7
Wilson County	1984	272.8	0	91.2	0	9,780.9	456.2	445.6
Wilson County	1985	274.9	0	92.0	0	8,529.0	409.4	335.7
Wilson County	1986	279.3	0	93.3	0	8,689.8	417.1	342.6
Wilson County	1987	286.6	0	95.9	0	9,040.0	435.0	355.2
Wilson County	1988	301.8	0	101.1	0	10,809.9	500.9	434.3
Wilson County	1989	354.1	0	119.0	0	12,010.6	532.6	448.1
Wilson County	1990	371.6	0	124.8	0	14,161.3	643.9	545.5
Wilson County	1991	369.8	0	124.2	0	13,164.2	614.2	503.7
Wilson County	1992	371.9	0	124.9	0	15,059.4	684.3	588.2
Wilson County	1993	395.5	0	133.0	0	11,323.8	562.6	415.2
Wilson County	1994	412.4	0	138.8	0	12,908.9	649.1	535.7
Wilson County	1995	436.3	0	146.8	0	12,190.4	631.1	494.4
Wilson County	1996	452.6	0	152.4	0	16,347.7	764.4	625.9
Wilson County	1997	467.3	0	157.4	0	14,462.4	721.2	566.3
Wilson County	1998	482.6	0	162.7	0	15,490.1	753.8	591.3
Wilson County	1999	504.5	0	170.0	0	16,027.1	771.8	577.0
Wilson County	2000	306.9	0	157.4	0	20,668.6	995.5	744.2
Wilson County	2001	338.5	0	135.6	0	16,985.5	818.0	611.5
Wilson County	2002	362.3	0	145.5	0	21,013.2	1,012.0	756.5
Wilson County	2003	446.6	0	326.4	0	18,386.2	885.4	662.0
Wilson County	2004	1,169.6	0	1,012.5	0	16,054.3	772.9	578.0
Wilson County	2005	1,297.8	0	1,197.1	0	16,054.3	772.9	578.0
Wilson County	2006	1,230.3	0	1,212.3	0	13,327.8	639.7	478.3
Wilson County	2007	927.8	0	723.8	0	9,922.4	477.8	357.3
Wilson County	2008	1,324.0	0	1,185.4	0	14,429.2	695.2	519.5
Wilson County	2009	534.0	0	169.8	0	21,545.2	1,037.6	775.7
Wilson County	2010	488.8	0	171.9	0	32,116.6	1,546.3	1,155.8
Wilson County	2011	488.8	0	171.9	0	32,116.6	1,546.3	1,156.4
Wilson County	2012	1,246.2	0	1,636.2	0	21,904.7	1,055.0	788.7
Wilson County	2013	1,237.2	0	1,477.2	0	20,618.0	992.9	742.3
Wilson County	2014	1,217.2	0	1,540.1	0	21,401.7	1,030.6	770.5
Wilson County	2015	1,227.3	0	1,315.3	0	18,490.5	890.4	665.8
Wilson County	2016	1,218.2	0	1,367.2	0	19,264.0	927.7	693.6
Wilson County	2017	1,221.3	0	1,503.2	0	21,470.8	1,033.8	773.0

Appendix E. Conceptual Pumping Values by Layer for Simulated Counties

Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

County	Year	Pumping Totals in Acre-feet per Year						
		Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8	Layer 9
Zavala County	1980	0	0	0	0	76310.82891	7547.586037	982.4772211
Zavala County	1981	0	0	0	0	68,959.9	6,814.0	862.4
Zavala County	1982	0	0	0	0	72,998.3	7,251.8	909.8
Zavala County	1983	0	0	0	0	74,401.4	7,631.7	925.0
Zavala County	1984	0	0	0	0	84,619.5	8,383.9	1,044.2
Zavala County	1985	0	0	0	0	87,187.0	8,433.5	1,081.5
Zavala County	1986	0	0	0	0	38,694.3	4,295.7	467.1
Zavala County	1987	0	0	0	0	34,281.5	3,874.6	410.3
Zavala County	1988	0	0	0	0	70,152.2	7,022.2	853.7
Zavala County	1989	0	0	0	0	86,172.3	8,595.9	1,053.2
Zavala County	1990	0	0	0	0	71,499.5	7,315.2	823.3
Zavala County	1991	0	0	0	0	66,713.5	6,776.6	766.0
Zavala County	1992	0	0	0	0	55,148.2	5,900.3	632.8
Zavala County	1993	0	0	0	0	49,009.6	5,258.7	558.6
Zavala County	1994	0	0	0	0	51,759.3	5,261.2	591.8
Zavala County	1995	0	0	0	0	53,389.6	5,367.7	610.3
Zavala County	1996	0	0	0	0	53,521.4	5,396.1	610.3
Zavala County	1997	0	0	0	0	47,068.0	4,777.9	539.3
Zavala County	1998	0	0	0	0	44,869.0	4,663.7	498.6
Zavala County	1999	0	0	0	0	43,478.8	4,817.8	481.9
Zavala County	2000	2,053.3	0	2,052.6	0	56,003.7	6,212.7	374.2
Zavala County	2001	2,370.5	0	2,370.8	0	46,023.8	5,105.6	307.6
Zavala County	2002	6,523.0	0	6,522.3	0	56,937.4	6,316.3	380.5
Zavala County	2003	2,437.6	0	2,437.5	0	49,819.4	5,526.7	333.0
Zavala County	2004	2,948.7	0	2,949.0	0	43,500.8	4,825.8	290.8
Zavala County	2005	3,033.1	0	3,032.8	0	43,500.8	4,825.8	290.8
Zavala County	2006	2,665.5	0	2,665.0	0	35,996.7	3,993.4	240.7
Zavala County	2007	2,136.1	0	2,136.5	0	26,885.9	2,982.7	179.9
Zavala County	2008	1,512.1	0	1,512.1	0	39,097.8	4,337.4	261.5
Zavala County	2009	2,466.7	0	2,466.6	0	58,379.0	6,476.2	390.0
Zavala County	2010	2,376.1	0	2,375.9	0	87,023.5	9,654.0	581.7
Zavala County	2011	3,337.8	0	3,337.3	0	87,023.5	9,654.0	581.7
Zavala County	2012	2,827.0	0	2,820.7	0	40,910.1	4,533.2	453.6
Zavala County	2013	2,585.0	0	2,579.5	0	37,732.0	4,181.1	418.3
Zavala County	2014	2,630.8	0	2,624.0	0	38,437.4	4,259.2	426.2
Zavala County	2015	1,874.1	0	1,867.9	0	28,245.5	3,130.0	313.3
Zavala County	2016	1,939.8	0	1,934.6	0	28,796.3	3,191.0	319.4
Zavala County	2017	2,135.4	0	2,127.9	0	31,250.2	3,462.9	346.5

APPENDIX F

Simulated Pumping by County, Layer, and Year for the Transient 1980 to 2017 Simulation

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Atascosa County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	654.6	0.0	4287.5	0.0	69001.2	585.8	2320.9	76850.0
1981	0.0	562.6	0.0	3414.4	0.0	44966.7	422.3	2220.5	51586.5
1982	0.0	465.6	0.0	2548.7	0.0	46890.1	409.8	2188.2	52502.4
1983	0.0	371.3	0.0	1673.8	0.0	40025.1	328.9	1532.7	43931.9
1984	0.0	279.8	0.0	797.6	0.0	40619.1	335.1	1670.5	43702.1
1985	0.0	281.7	0.0	732.1	0.0	37529.2	315.8	1519.4	40378.3
1986	0.0	281.5	0.0	956.3	0.0	48545.3	423.1	2076.2	52282.4
1987	0.0	285.1	0.0	635.2	0.0	33473.5	283.0	1289.5	35966.4
1988	0.0	301.7	0.0	809.0	0.0	43073.2	349.1	1702.1	46235.1
1989	0.0	333.5	0.0	1123.0	0.0	57255.4	463.1	1954.5	61129.6
1990	0.0	348.0	0.0	1041.1	0.0	52647.8	467.3	2298.5	56802.6
1991	0.0	337.2	0.0	1091.0	0.0	54811.0	505.3	2396.9	59141.5
1992	0.0	333.6	0.0	858.7	0.0	42887.2	402.5	1807.3	46289.3
1993	0.0	338.7	0.0	1001.3	0.0	50359.9	424.9	1540.6	53665.4
1994	0.0	349.3	0.0	938.5	0.0	50362.8	408.2	1243.9	53302.8
1995	0.0	367.3	0.0	989.0	0.0	52771.9	433.1	1312.4	55873.7
1996	0.0	377.7	0.0	1016.3	0.0	54497.1	446.5	1356.5	57694.0
1997	0.0	385.3	0.0	809.0	0.0	43963.1	355.6	1035.6	46548.6
1998	0.0	395.8	0.0	906.1	0.0	58559.3	526.2	2251.9	62639.3
1999	0.0	406.4	0.0	917.0	0.0	52236.2	497.8	1978.6	56036.0
2000	0.0	231.8	0.0	850.9	0.0	67549.0	640.9	2558.7	71831.4
2001	0.0	267.0	0.0	728.6	0.0	55358.9	523.6	2097.0	58974.9
2002	0.0	279.4	0.0	780.7	0.0	68495.9	661.4	2594.2	72811.6
2003	0.0	357.7	0.0	1725.9	0.0	59931.8	575.4	2269.8	64860.6
2004	0.0	935.5	0.0	5404.7	0.0	52476.5	513.0	1987.3	61316.9
2005	0.0	1001.0	0.0	6375.2	0.0	52327.1	499.4	1981.9	62184.6
2006	0.0	955.3	0.0	6474.4	0.0	43305.3	409.0	1640.1	52784.1
2007	0.0	741.7	0.0	3941.3	0.0	32374.5	318.3	1225.0	38600.8
2008	0.0	1063.0	0.0	6375.2	0.0	47201.6	452.1	1786.1	56878.0
2009	0.0	425.7	0.0	907.0	0.0	70284.1	662.6	2659.8	74939.2
2010	0.0	380.5	0.0	912.2	0.0	104672.4	980.6	3965.1	110910.8
2011	0.0	353.3	0.0	914.4	0.0	104613.3	980.6	3965.1	110826.8
2012	0.0	1132.0	0.0	2089.9	0.0	39178.0	362.2	1480.0	44242.1
2013	0.0	1197.3	0.0	2959.0	0.0	44021.8	408.1	1663.7	50249.8
2014	0.0	1189.2	0.0	2945.7	0.0	39882.1	371.0	1506.8	45894.8
2015	0.0	1186.3	0.0	2709.9	0.0	30914.9	297.4	1166.6	36275.1
2016	0.0	1173.1	0.0	2540.7	0.0	29560.1	287.6	1114.8	34676.3
2017	0.0	1187.5	0.0	2819.9	0.0	35675.1	347.1	1346.4	41375.9

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Bastrop County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	47.1	0.0	101.5	0.0	75.0	126.3	103.2	453.1
1981	0.0	44.9	0.0	99.1	0.0	81.0	140.0	115.3	480.4
1982	0.0	42.9	0.0	94.7	0.0	84.5	147.8	122.2	492.2
1983	0.0	40.9	0.0	91.6	0.0	89.2	158.2	131.1	511.1
1984	0.0	39.1	0.0	88.7	0.0	96.7	173.2	143.8	541.5
1985	0.0	29.9	0.0	84.7	0.0	97.0	178.6	149.0	539.2
1986	0.0	25.9	0.0	81.4	0.0	100.5	187.6	156.8	552.3
1987	0.0	27.9	0.0	86.9	0.0	103.8	192.8	161.0	572.4
1988	0.0	30.0	0.0	89.7	0.0	109.0	202.6	169.4	600.7
1989	0.0	35.9	0.0	91.9	0.0	117.1	223.7	187.8	656.4
1990	0.0	35.9	0.0	92.9	0.0	123.5	236.9	199.1	688.4
1991	0.0	37.0	0.0	93.4	0.0	114.8	219.6	201.4	666.2
1992	0.0	38.0	0.0	97.1	0.0	117.4	219.9	201.3	673.7
1993	0.0	34.9	0.0	95.8	0.0	118.2	225.0	206.7	680.7
1994	0.0	30.9	0.0	102.0	0.0	124.9	239.2	219.4	716.4
1995	0.0	28.9	0.0	99.3	0.0	127.5	246.5	226.9	729.1
1996	0.0	34.0	0.0	111.2	0.0	136.3	259.9	238.9	780.3
1997	0.0	24.9	0.0	93.6	0.0	130.0	257.1	238.2	743.9
1998	0.0	6.7	0.0	70.5	0.0	133.8	264.5	245.7	721.2
1999	0.0	6.7	0.0	72.1	0.0	137.7	272.4	253.1	742.0
2000	0.0	3.9	0.0	68.6	0.0	178.0	352.2	327.0	929.7
2001	0.0	4.5	0.0	58.5	0.0	145.9	288.7	268.3	765.8
2002	0.0	4.8	0.0	66.5	0.0	181.6	357.2	331.7	941.7
2003	0.0	5.9	0.0	144.7	0.0	158.2	312.5	290.1	911.4
2004	0.0	15.6	0.0	458.2	0.0	138.9	273.4	253.8	1139.9
2005	0.0	17.2	0.0	510.2	0.0	137.7	272.7	253.1	1190.9
2006	0.0	16.3	0.0	512.1	0.0	114.1	225.9	210.0	1078.3
2007	0.0	12.3	0.0	335.4	0.0	85.7	168.6	157.0	758.9
2008	0.0	17.6	0.0	502.5	0.0	124.3	245.9	228.5	1118.9
2009	0.0	7.1	0.0	73.0	0.0	185.0	366.2	340.2	971.4
2010	0.0	6.5	0.0	75.9	0.0	275.8	545.9	506.8	1410.8
2011	0.0	6.5	0.0	72.3	0.0	275.7	545.9	506.8	1407.2
2012	0.0	51.8	0.0	148.8	0.0	1024.6	2041.1	1922.6	5188.9
2013	0.0	47.8	0.0	135.8	0.0	1032.5	2056.9	1937.8	5210.7
2014	0.0	46.5	0.0	131.6	0.0	1193.1	2375.6	2235.9	5982.7
2015	0.0	56.3	0.0	171.0	0.0	1410.7	2803.3	2641.3	7082.5
2016	0.0	52.5	0.0	156.1	0.0	1256.0	2495.2	2350.8	6310.6
2017	0.0	80.5	0.0	250.6	0.0	1551.3	3089.4	2911.1	7882.8

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Bee County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	30.0	14.9	14.9	59.8
1981	0.0	0.0	0.0	0.0	0.0	31.9	15.9	15.9	63.8
1982	0.0	0.0	0.0	0.0	0.0	32.7	16.3	16.3	65.4
1983	0.0	0.0	0.0	0.0	0.0	33.9	16.9	16.9	67.8
1984	0.0	0.0	0.0	0.0	0.0	35.9	17.9	17.9	71.7
1985	0.0	0.0	0.0	0.0	0.0	33.5	16.7	16.7	67.0
1986	0.0	0.0	0.0	0.0	0.0	31.1	15.5	15.5	62.1
1987	0.0	0.0	0.0	0.0	0.0	31.3	15.6	15.6	62.6
1988	0.0	0.0	0.0	0.0	0.0	32.2	16.1	16.1	64.3
1989	0.0	0.0	0.0	0.0	0.0	33.1	16.5	16.5	66.1
1990	0.0	0.0	0.0	0.0	0.0	33.3	16.7	16.7	66.7
1991	0.0	0.0	0.0	0.0	0.0	32.8	16.4	16.4	65.6
1992	0.0	0.0	0.0	0.0	0.0	32.7	16.4	16.4	65.4
1993	0.0	0.0	0.0	0.0	0.0	40.1	20.0	20.0	80.1
1994	0.0	0.0	0.0	0.0	0.0	34.7	17.4	17.4	69.4
1995	0.0	0.0	0.0	0.0	0.0	36.3	18.1	18.1	72.5
1996	0.0	0.0	0.0	0.0	0.0	37.0	18.5	18.5	74.0
1997	0.0	0.0	0.0	0.0	0.0	37.1	18.5	18.5	74.1
1998	0.0	0.0	0.0	0.0	0.0	37.8	18.9	18.9	75.5
1999	0.0	0.0	0.0	0.0	0.0	38.3	19.1	19.1	76.6
2000	0.0	0.0	0.0	0.0	0.0	49.6	24.8	24.8	99.1
2001	0.0	0.0	0.0	0.0	0.0	40.6	20.3	20.3	81.2
2002	0.0	0.0	0.0	0.0	0.0	50.3	25.1	25.1	100.5
2003	0.0	0.0	0.0	0.0	0.0	44.0	22.0	22.0	87.9
2004	0.0	0.0	0.0	0.0	0.0	38.5	19.2	19.2	76.9
2005	0.0	0.0	0.0	0.0	0.0	38.4	19.2	19.2	76.7
2006	0.0	0.0	0.0	0.0	0.0	31.7	15.9	15.9	63.4
2007	0.0	0.0	0.0	0.0	0.0	23.7	11.8	11.8	47.4
2008	0.0	0.0	0.0	0.0	0.0	34.6	17.3	17.3	69.2
2009	0.0	0.0	0.0	0.0	0.0	51.5	25.7	25.7	103.0
2010	0.0	0.0	0.0	0.0	0.0	76.7	38.3	38.3	153.4
2011	0.0	0.0	0.0	0.0	0.0	76.7	38.3	38.3	153.4
2012	0.0	0.0	0.0	0.0	0.0	52.8	26.4	26.4	105.5
2013	0.0	0.0	0.0	0.0	0.0	52.6	26.3	26.3	105.2
2014	0.0	0.0	0.0	0.0	0.0	52.6	26.3	26.3	105.2
2015	0.0	0.0	0.0	0.0	0.0	52.6	26.3	26.3	105.2
2016	0.0	0.0	0.0	0.0	0.0	52.8	26.4	26.4	105.5
2017	0.0	0.0	0.0	0.0	0.0	52.6	26.3	26.3	105.2

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Bexar County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	1986.3	1475.2	6224.3	9685.7
1981	0.0	0.0	0.0	0.0	0.0	1687.3	1746.3	6415.3	9848.9
1982	0.0	0.0	0.0	0.0	0.0	1710.3	1832.4	6628.6	10171.3
1983	0.0	0.0	0.0	0.0	0.0	1780.7	2001.5	7026.9	10809.1
1984	0.0	0.0	0.0	0.0	0.0	1850.4	2268.9	8687.2	12806.5
1985	0.0	0.0	0.0	0.0	0.0	1610.3	2100.5	7183.1	10894.0
1986	0.0	0.0	0.0	0.0	0.0	1646.6	2156.7	7436.7	11240.0
1987	0.0	0.0	0.0	0.0	0.0	1624.2	2283.8	7646.2	11554.1
1988	0.0	0.0	0.0	0.0	0.0	1706.8	2330.6	7874.1	11911.5
1989	0.0	0.0	0.0	0.0	0.0	1690.3	2200.4	7474.0	11364.7
1990	0.0	0.0	0.0	0.0	0.0	1948.8	2254.8	7967.9	12171.5
1991	0.0	0.0	0.0	0.0	0.0	2405.8	3177.0	7593.2	13176.0
1992	0.0	0.0	0.0	0.0	0.0	2262.9	2982.0	7090.2	12335.1
1993	0.0	0.0	0.0	0.0	0.0	2620.1	3172.8	7548.5	13341.3
1994	0.0	0.0	0.0	0.0	0.0	2003.2	2534.3	8066.1	12603.6
1995	0.0	0.0	0.0	0.0	0.0	2294.4	3083.7	8814.1	14192.1
1996	0.0	0.0	0.0	0.0	0.0	2324.1	3145.7	9063.6	14533.3
1997	0.0	0.0	0.0	0.0	0.0	2230.6	2954.4	8506.0	13691.0
1998	0.0	0.0	0.0	0.0	0.0	2149.5	2877.1	8207.1	13233.7
1999	0.0	0.0	0.0	0.0	0.0	2211.1	3062.7	8567.9	13841.7
2000	0.0	0.0	0.0	0.0	0.0	2848.4	3960.6	11111.8	17920.8
2001	0.0	0.0	0.0	0.0	0.0	2334.1	3246.0	9103.3	14683.3
2002	0.0	0.0	0.0	0.0	0.0	2916.8	4016.2	11353.8	18286.8
2003	0.0	0.0	0.0	0.0	0.0	2547.4	3513.9	9889.0	15950.3
2004	0.0	0.0	0.0	0.0	0.0	2242.9	3076.8	8705.2	14024.9
2005	0.0	0.0	0.0	0.0	0.0	2222.8	3068.1	8594.9	13885.7
2006	0.0	0.0	0.0	0.0	0.0	1831.1	2538.7	7101.1	11471.0
2007	0.0	0.0	0.0	0.0	0.0	1387.4	1899.4	5383.4	8670.2
2008	0.0	0.0	0.0	0.0	0.0	2010.2	2765.1	7738.8	12514.1
2009	0.0	0.0	0.0	0.0	0.0	2967.5	4117.1	11537.3	18621.9
2010	0.0	0.0	0.0	0.0	0.0	4363.7	6114.4	17189.4	27667.6
2011	0.0	0.0	0.0	0.0	0.0	4272.0	5998.6	17094.4	27365.0
2012	0.0	0.0	0.0	0.0	0.0	522.1	728.4	2034.3	3284.8
2013	0.0	0.0	0.0	0.0	0.0	609.2	839.4	2350.5	3799.1
2014	0.0	0.0	0.0	0.0	0.0	705.0	969.6	2709.6	4384.2
2015	0.0	0.0	0.0	0.0	0.0	488.8	671.6	1883.8	3044.2
2016	0.0	0.0	0.0	0.0	0.0	355.7	488.7	1358.2	2202.6
2017	0.0	0.0	0.0	0.0	0.0	439.2	604.1	1675.2	2718.5

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Caldwell County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	42.2	0.0	160.8	658.4	1989.7	2851.1
1981	0.0	0.0	0.0	45.8	0.0	176.2	625.7	1772.6	2620.4
1982	0.0	0.0	0.0	45.1	0.0	177.4	727.1	2176.6	3126.3
1983	0.0	0.0	0.0	47.2	0.0	184.2	739.1	2180.6	3151.1
1984	0.0	0.0	0.0	49.4	0.0	199.1	800.8	2357.9	3407.2
1985	0.0	0.0	0.0	52.0	0.0	192.8	721.6	2102.6	3068.9
1986	0.0	0.0	0.0	56.5	0.0	211.7	780.4	2287.4	3335.9
1987	0.0	0.0	0.0	58.4	0.0	219.9	768.8	2194.7	3241.8
1988	0.0	0.0	0.0	54.4	0.0	212.6	776.8	2202.1	3245.8
1989	0.0	0.0	0.0	48.8	0.0	188.5	745.7	2185.2	3168.3
1990	0.0	0.0	0.0	52.6	0.0	213.4	888.4	2707.1	3861.4
1991	0.0	0.0	0.0	51.5	0.0	190.0	740.0	2026.6	3008.0
1992	0.0	0.0	0.0	50.9	0.0	225.6	915.2	2618.9	3810.6
1993	0.0	0.0	0.0	51.0	0.0	200.5	815.6	2304.7	3371.8
1994	0.0	0.0	0.0	81.9	0.0	207.6	840.2	2383.5	3513.2
1995	0.0	0.0	0.0	91.1	0.0	201.3	828.2	2377.0	3497.5
1996	0.0	0.0	0.0	89.0	0.0	202.8	925.9	2699.7	3917.3
1997	0.0	0.0	0.0	89.3	0.0	193.3	811.4	2328.1	3422.1
1998	0.0	0.0	0.0	85.0	0.0	193.5	831.4	2451.0	3560.9
1999	0.0	0.0	0.0	99.8	0.0	205.0	858.8	2473.6	3637.2
2000	0.0	0.0	0.0	97.5	0.0	267.4	1094.6	3198.4	4657.8
2001	0.0	0.0	0.0	83.0	0.0	218.3	905.3	2621.5	3828.1
2002	0.0	0.0	0.0	95.3	0.0	280.0	1126.2	3243.1	4744.5
2003	0.0	0.0	0.0	207.0	0.0	245.0	985.4	2837.6	4274.9
2004	0.0	0.0	0.0	626.4	0.0	214.5	862.7	2484.3	4187.9
2005	0.0	0.0	0.0	672.0	0.0	213.8	860.2	2477.5	4223.6
2006	0.0	0.0	0.0	668.9	0.0	170.4	711.9	2050.6	3601.8
2007	0.0	0.0	0.0	464.1	0.0	132.2	531.8	1531.5	2659.6
2008	0.0	0.0	0.0	659.9	0.0	189.2	775.4	2233.2	3857.6
2009	0.0	0.0	0.0	102.0	0.0	279.5	1140.6	3325.5	4847.6
2010	0.0	0.0	0.0	108.8	0.0	423.5	1647.8	4955.2	7135.2
2011	0.0	0.0	0.0	97.9	0.0	410.0	1576.0	4941.4	7025.4
2012	0.0	0.0	0.0	58.9	0.0	207.5	829.6	2474.3	3570.3
2013	0.0	0.0	0.0	58.4	0.0	192.1	775.2	2238.0	3263.8
2014	0.0	0.0	0.0	56.7	0.0	340.0	1328.2	3984.1	5709.1
2015	0.0	0.0	0.0	59.0	0.0	268.3	1017.3	2945.7	4290.3
2016	0.0	0.0	0.0	59.0	0.0	249.1	952.7	2732.8	3993.6
2017	0.0	0.0	0.0	63.5	0.0	279.8	1080.3	3104.3	4528.0

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
De Witt County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	8.8	0.0	0.0	8.8
1981	0.0	0.0	0.0	0.0	0.0	8.2	0.0	0.0	8.3
1982	0.0	0.0	0.0	0.0	0.0	7.9	0.0	0.0	7.9
1983	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	7.6
1984	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	5.5
1985	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	4.9
1986	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
1987	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	5.1
1988	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0	6.7
1989	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	6.3
1990	0.0	0.0	0.0	0.0	0.0	7.9	0.0	0.0	7.9
1991	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	5.6
1992	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	6.0
1993	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	2.6
1994	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1
1995	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.4
1996	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	2.3
1997	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.9
1998	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1
1999	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.9
2000	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.4
2001	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0
2002	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.4
2003	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1
2004	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.9
2005	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.9
2006	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2007	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2
2008	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.7
2009	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	2.5
2010	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	3.7
2011	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	3.7
2012	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.7
2013	0.0	0.0	0.0	0.0	0.0	5.1	0.1	0.0	5.1
2014	0.0	0.0	0.0	0.0	0.0	6.4	0.1	0.0	6.5
2015	0.0	0.0	0.0	0.0	0.0	8.4	0.2	0.0	8.5
2016	0.0	0.0	0.0	0.0	0.0	7.5	0.1	0.0	7.6
2017	0.0	0.0	0.0	0.0	0.0	7.9	0.2	0.0	8.1

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Dimmit County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	10058.0	1744.5	261.4	12063.9
1981	0.0	0.0	0.0	0.0	0.0	7842.2	1377.2	232.8	9452.2
1982	0.0	0.0	0.0	0.0	0.0	8035.1	1405.9	238.9	9679.9
1983	0.0	0.0	0.0	0.0	0.0	7370.1	1272.7	227.6	8870.4
1984	0.0	0.0	0.0	0.0	0.0	9254.0	1643.3	270.2	11167.5
1985	0.0	0.0	0.0	0.0	0.0	10514.6	1899.6	289.5	12703.7
1986	0.0	0.0	0.0	0.0	0.0	6508.4	1066.1	208.6	7783.1
1987	0.0	0.0	0.0	0.0	0.0	4217.8	627.0	178.4	5023.2
1988	0.0	0.0	0.0	0.0	0.0	6315.3	1022.4	213.9	7551.5
1989	0.0	0.0	0.0	0.0	0.0	5026.3	775.9	203.5	6005.7
1990	0.0	0.0	0.0	0.0	0.0	4234.9	658.3	198.4	5091.6
1991	0.0	0.0	0.0	0.0	0.0	6347.6	429.9	76.2	6853.7
1992	0.0	0.0	0.0	0.0	0.0	6230.7	418.6	67.8	6717.1
1993	0.0	0.0	0.0	0.0	0.0	8375.8	604.7	86.1	9066.6
1994	0.0	0.0	0.0	0.0	0.0	7174.3	498.1	83.8	7756.2
1995	0.0	0.0	0.0	0.0	0.0	8248.5	586.1	92.6	8927.2
1996	0.0	0.0	0.0	0.0	0.0	8036.6	556.4	84.9	8677.9
1997	0.0	0.0	0.0	0.0	0.0	4622.1	248.5	52.9	4923.5
1998	0.0	0.0	0.0	0.0	0.0	4931.3	271.3	58.7	5261.2
1999	0.0	0.0	0.0	0.0	0.0	4181.4	187.0	50.2	4418.6
2000	0.0	6.3	0.0	7.6	0.0	5408.6	238.1	64.8	5725.3
2001	0.0	7.1	0.0	8.5	0.0	4433.3	194.9	53.1	4696.8
2002	0.0	5.5	0.0	6.5	0.0	5491.6	241.3	65.6	5810.5
2003	0.0	5.0	0.0	6.1	0.0	4805.4	211.0	57.5	5085.0
2004	0.0	5.3	0.0	6.1	0.0	4209.7	184.8	50.4	4456.2
2005	0.0	4.2	0.0	4.4	0.0	4194.7	184.3	50.2	4437.8
2006	0.0	7.3	0.0	8.5	0.0	3468.3	152.6	41.6	3678.3
2007	0.0	5.5	0.0	6.5	0.0	3890.5	113.9	31.1	4047.5
2008	0.0	6.6	0.0	7.6	0.0	5671.9	166.4	45.4	5897.8
2009	0.0	6.8	0.0	7.6	0.0	8438.6	247.3	67.3	8767.4
2010	0.0	5.9	0.0	7.0	0.0	8120.6	368.6	100.1	8602.3
2011	0.0	6.2	0.0	7.0	0.0	7912.4	368.6	100.3	8394.6
2012	0.0	5.3	0.0	6.5	0.0	10508.1	356.5	95.7	10972.0
2013	0.0	4.5	0.0	5.5	0.0	8903.8	297.5	79.9	9291.2
2014	0.0	4.0	0.0	5.0	0.0	8317.3	276.0	74.0	8676.3
2015	0.0	3.7	0.0	4.4	0.0	7355.1	239.0	64.0	7666.2
2016	0.0	3.7	0.0	4.4	0.0	6995.7	224.7	60.2	7288.7
2017	0.0	3.3	0.0	4.1	0.0	6399.5	201.6	54.1	6662.5

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Fayette County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	71.5	0.0	4.1	0.0	4.6	0.0	0.0	80.3
1981	0.0	68.1	0.0	4.4	0.0	3.6	0.0	0.0	76.1
1982	0.0	63.9	0.0	4.6	0.0	3.5	0.0	0.0	71.9
1983	0.0	57.9	0.0	4.5	0.0	3.4	0.0	0.0	65.9
1984	0.0	52.6	0.0	4.6	0.0	2.9	0.0	0.0	60.1
1985	0.0	55.1	0.0	4.5	0.0	2.8	0.0	0.0	62.4
1986	0.0	55.2	0.0	4.6	0.0	2.7	0.0	0.0	62.5
1987	0.0	58.0	0.0	4.7	0.0	2.8	0.0	0.0	65.5
1988	0.0	56.5	0.0	4.6	0.0	2.8	0.0	0.0	64.0
1989	0.0	57.6	0.0	4.7	0.0	2.8	0.0	0.0	65.2
1990	0.0	53.4	0.0	4.8	0.0	2.9	0.0	0.0	61.1
1991	0.0	53.4	0.0	4.8	0.0	2.9	0.0	0.0	61.1
1992	0.0	56.0	0.0	4.9	0.0	3.0	0.0	0.0	63.9
1993	0.0	65.9	0.0	8.8	0.0	4.8	0.0	0.0	79.5
1994	0.0	94.6	0.0	13.9	0.0	1.2	0.0	0.0	109.6
1995	0.0	88.3	0.0	11.7	0.0	2.9	0.0	0.0	102.8
1996	0.0	84.5	0.0	11.9	0.0	2.9	0.0	0.0	99.3
1997	0.0	86.1	0.0	11.7	0.0	2.8	0.0	0.0	100.6
1998	0.0	63.6	0.0	12.4	0.0	2.4	0.0	0.0	78.4
1999	0.0	66.1	0.0	13.5	0.0	2.4	0.0	0.0	82.0
2000	0.0	39.0	0.0	12.5	0.0	3.1	0.0	0.0	54.6
2001	0.0	44.3	0.0	10.8	0.0	2.5	0.0	0.0	57.6
2002	0.0	47.5	0.0	11.5	0.0	3.1	0.0	0.0	62.1
2003	0.0	58.6	0.0	25.9	0.0	2.7	0.0	0.0	87.2
2004	0.0	153.8	0.0	80.4	0.0	2.4	0.0	0.0	236.6
2005	0.0	169.6	0.0	94.6	0.0	2.4	0.0	0.0	266.6
2006	0.0	161.3	0.0	96.1	0.0	2.0	0.0	0.0	259.3
2007	0.0	121.6	0.0	58.3	0.0	1.5	0.0	0.0	181.3
2008	0.0	174.0	0.0	94.1	0.0	2.2	0.0	0.0	270.4
2009	0.0	70.0	0.0	13.4	0.0	3.2	0.0	0.0	86.6
2010	0.0	64.1	0.0	13.6	0.0	4.8	0.0	0.0	82.4
2011	0.0	64.1	0.0	13.6	0.0	4.8	0.0	0.0	82.4
2012	0.0	102.2	0.0	3.0	0.0	4.9	0.0	0.0	110.1
2013	0.0	27.7	0.0	78.5	0.0	5.3	0.0	0.0	111.5
2014	0.0	55.8	0.0	34.3	0.0	18.6	0.0	0.0	108.7
2015	0.0	56.5	0.0	22.2	0.0	36.5	0.0	0.0	115.3
2016	0.0	69.5	0.0	18.6	0.0	36.8	0.0	0.0	124.9
2017	0.0	58.0	0.0	15.3	0.0	57.6	0.0	0.0	130.8

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Frio County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	61.5	0.0	754.7	0.0	37278.6	2842.7	46.8	40984.2
1981	0.0	62.7	0.0	784.8	0.0	37409.5	2880.6	47.3	41184.9
1982	0.0	63.3	0.0	816.1	0.0	37465.7	2855.7	46.8	41247.7
1983	0.0	63.2	0.0	847.2	0.0	30119.5	2293.6	37.7	33361.1
1984	0.0	63.8	0.0	880.7	0.0	44038.5	3398.2	55.5	48436.7
1985	0.0	58.5	0.0	497.5	0.0	24446.8	1837.0	30.1	26870.0
1986	0.0	57.7	0.0	668.6	0.0	33032.9	2544.3	41.6	36345.2
1987	0.0	58.4	0.0	659.5	0.0	32335.1	2497.6	40.9	35591.4
1988	0.0	59.7	0.0	847.9	0.0	42533.8	3264.4	53.4	46759.2
1989	0.0	63.2	0.0	941.4	0.0	47093.0	3644.6	59.6	51801.8
1990	0.0	64.3	0.0	804.2	0.0	40041.2	3067.5	48.0	44025.2
1991	0.0	66.4	0.0	793.3	0.0	87522.0	3364.3	52.6	91798.6
1992	0.0	67.1	0.0	771.1	0.0	84331.0	3255.1	50.9	88475.3
1993	0.0	67.0	0.0	864.8	0.0	95250.5	3672.7	57.5	99912.4
1994	0.0	76.0	0.0	63.3	0.0	104782.2	4055.5	63.4	109040.5
1995	0.0	73.9	0.0	62.1	0.0	99795.8	3875.4	60.6	103867.8
1996	0.0	74.2	0.0	54.1	0.0	91669.6	3528.5	55.0	95381.3
1997	0.0	76.4	0.0	55.7	0.0	58855.2	2244.9	35.0	61267.3
1998	0.0	78.9	0.0	60.7	0.0	105128.7	4085.4	63.7	109417.4
1999	0.0	79.0	0.0	59.0	0.0	105802.0	4096.2	63.9	110100.1
2000	0.0	354.8	0.0	228.3	0.0	136539.1	5296.8	82.6	142501.6
2001	0.0	332.7	0.0	204.5	0.0	111787.8	4341.0	67.7	116733.7
2002	0.0	410.5	0.0	228.7	0.0	137580.7	5370.4	83.7	143674.0
2003	0.0	302.4	0.0	245.3	0.0	120398.1	4699.0	73.3	125718.1
2004	0.0	395.1	0.0	490.6	0.0	105636.8	4114.3	64.2	110701.0
2005	0.0	429.2	0.0	558.6	0.0	105374.0	4103.1	64.0	110528.9
2006	0.0	395.3	0.0	556.6	0.0	87492.7	3395.4	53.0	91892.9
2007	0.0	293.0	0.0	352.4	0.0	97994.9	2536.1	39.5	101215.8
2008	0.0	403.2	0.0	547.0	0.0	141870.7	3698.0	57.7	146576.6
2009	0.0	338.7	0.0	202.3	0.0	209396.6	5506.4	85.9	215529.9
2010	0.0	280.7	0.0	173.2	0.0	207274.8	8208.2	128.0	216064.9
2011	0.0	408.8	0.0	239.6	0.0	206774.0	8208.2	128.0	215758.7
2012	0.0	825.4	0.0	1275.6	0.0	112453.7	2947.6	46.0	117548.2
2013	0.0	843.6	0.0	1322.7	0.0	118206.6	3096.1	48.3	123517.3
2014	0.0	769.7	0.0	1210.2	0.0	105372.8	2750.9	42.9	110146.5
2015	0.0	652.8	0.0	1036.5	0.0	87430.3	2273.8	35.5	91428.8
2016	0.0	685.7	0.0	1098.6	0.0	92145.7	2393.9	37.4	96361.2
2017	0.0	705.4	0.0	1103.4	0.0	95647.3	2483.4	38.8	99978.3

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Gonzales County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	629.9	0.0	688.6	0.0	3234.9	72.2	1.6	4627.3
1981	0.0	584.9	0.0	566.7	0.0	3459.3	81.0	1.8	4693.8
1982	0.0	554.6	0.0	445.2	0.0	3443.5	82.7	1.9	4527.9
1983	0.0	496.4	0.0	322.8	0.0	3132.7	83.5	2.0	4037.4
1984	0.0	467.3	0.0	202.1	0.0	2817.7	85.0	2.1	3574.2
1985	0.0	462.8	0.0	199.7	0.0	2670.3	79.6	2.2	3414.5
1986	0.0	429.5	0.0	204.3	0.0	2537.8	77.5	2.2	3251.3
1987	0.0	439.7	0.0	206.7	0.0	2890.4	80.2	2.3	3619.2
1988	0.0	451.4	0.0	208.3	0.0	3639.4	85.0	2.3	4386.4
1989	0.0	463.3	0.0	208.7	0.0	3473.2	86.0	2.5	4233.7
1990	0.0	463.1	0.0	235.4	0.0	4210.6	94.8	2.6	5006.6
1991	0.0	426.3	0.0	219.4	0.0	3208.2	83.6	1.8	3939.3
1992	0.0	426.0	0.0	248.2	0.0	3226.6	84.8	1.8	3987.3
1993	0.0	422.7	0.0	237.8	0.0	2269.5	73.4	1.8	3005.3
1994	0.0	430.2	0.0	231.3	0.0	2255.8	71.8	1.9	2991.1
1995	0.0	458.6	0.0	252.1	0.0	2487.6	73.0	1.9	3273.3
1996	0.0	496.8	0.0	225.6	0.0	2746.5	73.7	2.0	3544.7
1997	0.0	581.0	0.0	214.7	0.0	2657.0	72.6	2.0	3527.3
1998	0.0	544.8	0.0	241.4	0.0	3089.9	74.9	2.0	3953.0
1999	0.0	547.2	0.0	236.1	0.0	2544.0	75.3	2.1	3404.8
2000	0.0	320.8	0.0	219.0	0.0	3289.9	97.3	2.7	3929.8
2001	0.0	366.4	0.0	188.4	0.0	2696.1	79.1	2.2	3332.2
2002	0.0	392.7	0.0	201.9	0.0	3335.5	98.8	2.8	4031.6
2003	0.0	484.4	0.0	455.1	0.0	2918.5	86.0	2.4	3946.4
2004	0.0	1270.2	0.0	1411.0	0.0	2554.4	75.5	2.1	5313.4
2005	0.0	1405.5	0.0	1662.4	0.0	2547.5	75.3	2.1	5692.8
2006	0.0	1334.5	0.0	1686.2	0.0	2135.3	62.3	1.8	5220.1
2007	0.0	1004.7	0.0	1006.7	0.0	1574.9	46.6	1.3	3634.2
2008	0.0	1439.4	0.0	1650.7	0.0	2296.9	68.7	1.9	5457.6
2009	0.0	578.6	0.0	235.5	0.0	3420.0	100.8	2.8	4337.7
2010	0.0	528.4	0.0	238.9	0.0	5097.1	150.7	4.2	6019.3
2011	0.0	528.1	0.0	238.0	0.0	5097.1	150.7	4.2	6018.2
2012	0.0	1386.0	0.0	1914.4	0.0	12292.1	327.6	3.9	15924.0
2013	0.0	1400.1	0.0	2040.4	0.0	23649.6	622.9	6.6	27719.7
2014	0.0	1382.2	0.0	2337.4	0.0	34254.6	903.2	9.4	38886.8
2015	0.0	1396.1	0.0	1870.9	0.0	49996.1	1312.4	13.4	54588.8
2016	0.0	1425.8	0.0	1875.4	0.0	42630.6	1120.1	11.4	47063.2
2017	0.0	1021.1	0.0	1443.1	0.0	46227.1	1215.3	12.5	49919.0

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Guadalupe County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	168.1	937.5	2473.7	3579.3
1981	0.0	0.0	0.0	0.0	0.0	195.7	1149.3	3289.9	4635.0
1982	0.0	0.0	0.0	0.0	0.0	196.4	1161.0	3231.3	4588.7
1983	0.0	0.0	0.0	0.0	0.0	207.2	1202.3	3236.3	4645.7
1984	0.0	0.0	0.0	0.0	0.0	228.8	1583.4	5043.6	6855.8
1985	0.0	0.0	0.0	0.0	0.0	221.9	1197.0	2920.0	4338.8
1986	0.0	0.0	0.0	0.0	0.0	232.0	1204.7	2792.8	4229.5
1987	0.0	0.0	0.0	0.0	0.0	238.1	1196.1	2642.9	4077.1
1988	0.0	0.0	0.0	0.0	0.0	237.6	1196.4	2443.9	3877.9
1989	0.0	0.0	0.0	0.0	0.0	267.0	1480.3	3480.1	5227.5
1990	0.0	0.0	0.0	0.0	0.0	268.8	1445.9	3581.9	5296.6
1991	0.0	0.0	0.0	0.0	0.0	295.2	1467.4	3427.9	5190.6
1992	0.0	0.0	0.0	0.0	0.0	582.2	1490.3	3659.4	5731.9
1993	0.0	0.0	0.0	0.0	0.0	808.0	1363.7	2449.9	4621.7
1994	0.0	0.0	0.0	0.0	0.0	661.6	1397.5	2540.6	4599.7
1995	0.0	0.0	0.0	0.0	0.0	659.5	1479.8	2668.6	4807.8
1996	0.0	0.0	0.0	0.0	0.0	681.0	1537.5	2810.5	5029.0
1997	0.0	0.0	0.0	0.0	0.0	676.8	1545.9	2817.0	5039.6
1998	0.0	0.0	0.0	0.0	0.0	751.6	1574.4	2840.7	5166.7
1999	0.0	0.0	0.0	0.0	0.0	881.5	1641.3	2951.0	5473.8
2000	0.0	0.0	0.0	0.0	0.0	1140.8	2120.9	3822.3	7084.0
2001	0.0	0.0	0.0	0.0	0.0	932.4	1737.3	3133.7	5803.5
2002	0.0	0.0	0.0	0.0	0.0	1183.1	2160.0	3901.4	7244.5
2003	0.0	0.0	0.0	0.0	0.0	1028.9	1890.6	3404.9	6324.4
2004	0.0	0.0	0.0	0.0	0.0	919.6	1664.7	2995.1	5579.5
2005	0.0	0.0	0.0	0.0	0.0	895.4	1651.0	2964.4	5510.7
2006	0.0	0.0	0.0	0.0	0.0	730.7	1362.0	2447.2	4539.8
2007	0.0	0.0	0.0	0.0	0.0	571.3	1025.9	1850.8	3448.0
2008	0.0	0.0	0.0	0.0	0.0	805.0	1487.1	2670.5	4962.6
2009	0.0	0.0	0.0	0.0	0.0	1189.5	2208.7	3970.6	7368.8
2010	0.0	0.0	0.0	0.0	0.0	1735.0	3282.3	5884.2	10901.5
2011	0.0	0.0	0.0	0.0	0.0	1447.1	3260.7	5838.2	10545.9
2012	0.0	0.0	0.0	0.0	0.0	448.6	847.2	1548.3	2844.1
2013	0.0	0.0	0.0	0.0	0.0	415.0	773.9	1414.0	2602.9
2014	0.0	0.0	0.0	0.0	0.0	435.0	810.0	1481.8	2726.8
2015	0.0	0.0	0.0	0.0	0.0	526.8	961.6	1747.3	3235.8
2016	0.0	0.0	0.0	0.0	0.0	448.5	815.2	1478.3	2742.0
2017	0.0	0.0	0.0	0.0	0.0	563.5	1031.1	1863.4	3458.1

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Karnes County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	1551.0	0.0	0.0	1551.0
1981	0.0	0.0	0.0	0.0	0.0	1514.1	0.0	0.0	1514.1
1982	0.0	0.0	0.0	0.0	0.0	1902.6	0.0	0.0	1902.6
1983	0.0	0.0	0.0	0.0	0.0	1158.6	0.0	0.0	1158.6
1984	0.0	0.0	0.0	0.0	0.0	1011.9	0.0	0.0	1011.9
1985	0.0	0.0	0.0	0.0	0.0	735.2	0.0	0.0	735.2
1986	0.0	0.0	0.0	0.0	0.0	715.0	0.0	0.0	715.0
1987	0.0	0.0	0.0	0.0	0.0	756.3	0.0	0.0	756.3
1988	0.0	0.0	0.0	0.0	0.0	823.4	0.0	0.0	823.4
1989	0.0	0.0	0.0	0.0	0.0	712.4	0.0	0.0	712.4
1990	0.0	0.0	0.0	0.0	0.0	703.1	0.0	0.0	703.1
1991	0.0	0.0	0.0	0.0	0.0	661.2	0.0	0.0	661.2
1992	0.0	0.0	0.0	0.0	0.0	574.8	0.0	0.0	574.8
1993	0.0	0.0	0.0	0.0	0.0	557.4	0.0	0.0	557.4
1994	0.0	0.0	0.0	0.0	0.0	558.1	0.0	0.0	558.1
1995	0.0	0.0	0.0	0.0	0.0	508.8	0.0	0.0	508.8
1996	0.0	0.0	0.0	0.0	0.0	469.4	0.0	0.0	469.4
1997	0.0	0.0	0.0	0.0	0.0	459.8	0.0	0.0	459.8
1998	0.0	0.0	0.0	0.0	0.0	452.0	0.0	0.0	452.0
1999	0.0	0.0	0.0	0.0	0.0	458.3	0.0	0.0	458.3
2000	0.0	0.0	0.0	0.0	0.0	592.5	0.0	0.0	592.5
2001	0.0	0.0	0.0	0.0	0.0	485.5	0.0	0.0	485.5
2002	0.0	0.0	0.0	0.0	0.0	600.7	0.0	0.0	600.7
2003	0.0	0.0	0.0	0.0	0.0	525.4	0.0	0.0	525.4
2004	0.0	0.0	0.0	0.0	0.0	460.0	0.0	0.0	460.0
2005	0.0	0.0	0.0	0.0	0.0	458.7	0.0	0.0	458.7
2006	0.0	0.0	0.0	0.0	0.0	405.1	0.0	0.0	405.1
2007	0.0	0.0	0.0	0.0	0.0	284.2	0.0	0.0	284.2
2008	0.0	0.0	0.0	0.0	0.0	414.1	0.0	0.0	414.1
2009	0.0	0.0	0.0	0.0	0.0	611.8	0.0	0.0	611.8
2010	0.0	0.0	0.0	0.0	0.0	918.1	0.0	0.0	918.1
2011	0.0	0.0	0.0	0.0	0.0	918.1	0.0	0.0	918.1
2012	0.0	0.0	0.0	0.0	0.0	732.7	0.0	0.0	732.7
2013	0.0	0.0	0.0	0.0	0.0	746.7	0.0	0.0	746.7
2014	0.0	0.0	0.0	0.0	0.0	1182.2	0.0	0.0	1182.2
2015	0.0	0.0	0.0	0.0	0.0	1478.1	0.0	0.0	1478.1
2016	0.0	0.0	0.0	0.0	0.0	1335.6	0.0	0.0	1335.6
2017	0.0	0.0	0.0	0.0	0.0	1452.2	0.0	0.0	1452.2

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
La Salle County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	3143.2	0.0	1.2	0.0	4575.2	0.0	0.0	7719.6
1981	0.0	2641.3	0.0	1.2	0.0	3502.0	0.0	0.0	6144.5
1982	0.0	2193.6	0.0	1.3	0.0	3567.1	0.0	0.0	5761.9
1983	0.0	1724.9	0.0	1.3	0.0	2224.0	0.0	0.0	3950.1
1984	0.0	1278.8	0.0	1.3	0.0	4865.1	0.0	0.0	6145.2
1985	0.0	229.1	0.0	1.3	0.0	2163.1	0.0	0.0	2393.5
1986	0.0	219.9	0.0	1.2	0.0	1962.7	0.0	0.0	2183.8
1987	0.0	209.9	0.0	1.2	0.0	1782.1	0.0	0.0	1993.2
1988	0.0	227.8	0.0	1.0	0.0	1883.3	0.0	0.0	2112.2
1989	0.0	354.1	0.0	1.3	0.0	3658.6	0.0	0.0	4014.0
1990	0.0	358.9	0.0	1.3	0.0	3661.1	0.0	0.0	4021.4
1991	0.0	356.5	0.0	1.6	0.0	7499.1	0.0	0.0	7857.3
1992	0.0	405.2	0.0	1.7	0.0	9090.8	0.0	0.0	9497.6
1993	0.0	378.0	0.0	1.7	0.0	8128.0	0.0	0.0	8507.7
1994	0.0	1051.2	0.0	1.6	0.0	6285.1	0.0	0.0	7337.9
1995	0.0	957.8	0.0	1.7	0.0	5802.7	0.0	0.0	6762.2
1996	0.0	1300.8	0.0	1.7	0.0	7696.1	0.0	0.0	8998.6
1997	0.0	889.6	0.0	1.8	0.0	5366.3	0.0	0.0	6257.7
1998	0.0	1198.7	0.0	1.8	0.0	9621.6	0.0	0.0	10822.1
1999	0.0	1312.0	0.0	1.8	0.0	8304.8	0.0	0.0	9618.5
2000	0.0	807.7	0.0	3.9	0.0	10739.8	0.0	0.0	11551.5
2001	0.0	911.0	0.0	4.2	0.0	8800.0	0.0	0.0	9715.2
2002	0.0	967.2	0.0	3.8	0.0	10888.6	0.0	0.0	11859.6
2003	0.0	1183.2	0.0	5.3	0.0	9525.2	0.0	0.0	10713.8
2004	0.0	3069.9	0.0	13.1	0.0	8341.3	0.0	0.0	11424.3
2005	0.0	3404.1	0.0	21.7	0.0	8318.5	0.0	0.0	11744.4
2006	0.0	3235.2	0.0	28.1	0.0	6894.6	0.0	0.0	10158.0
2007	0.0	2435.5	0.0	16.8	0.0	7713.0	0.0	0.0	10165.3
2008	0.0	3486.6	0.0	25.3	0.0	11248.5	0.0	0.0	14760.4
2009	0.0	1433.3	0.0	20.6	0.0	16619.8	0.0	0.0	18073.7
2010	0.0	1315.7	0.0	26.6	0.0	16641.4	0.0	0.0	17983.7
2011	0.0	1330.7	0.0	29.2	0.0	16641.4	0.0	0.0	18001.4
2012	0.0	1800.9	0.0	42.7	0.0	10407.6	0.0	0.0	12251.2
2013	0.0	1707.6	0.0	39.0	0.0	9943.5	0.0	0.0	11690.1
2014	0.0	1370.2	0.0	31.3	0.0	8472.6	0.0	0.0	9874.1
2015	0.0	814.7	0.0	29.5	0.0	5153.8	0.0	0.0	5997.9
2016	0.0	1025.6	0.0	30.5	0.0	6727.6	0.0	0.0	7783.7
2017	0.0	1138.8	0.0	21.9	0.0	7564.7	0.0	0.0	8725.3

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Lavaca County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1
1981	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	2.9
1982	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	2.8
1983	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.7
1984	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	2.2
1985	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0
1986	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8
1987	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.1
1988	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	2.8
1989	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.7
1990	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	4.8
1991	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	3.2
1992	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	3.5
1993	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.0
1994	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.8
1995	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.0
1996	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.1
1997	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.8
1998	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.3
1999	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2
2000	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.5
2001	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.3
2002	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.6
2003	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.4
2004	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2
2005	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2
2006	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0
2007	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7
2008	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1
2009	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2010	0.0	0.0	0.0	0.0	0.0	2.3	0.1	0.0	2.4
2011	0.0	0.0	0.0	0.0	0.0	2.3	0.1	0.0	2.4
2012	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2013	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2014	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2015	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2016	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6
2017	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Live Oak County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	173.7	0.0	0.0	173.7
1981	0.0	0.0	0.0	0.0	0.0	110.8	0.0	0.0	110.8
1982	0.0	0.0	0.0	0.0	0.0	108.2	0.0	0.0	108.2
1983	0.0	0.0	0.0	0.0	0.0	86.4	0.0	0.0	86.4
1984	0.0	0.0	0.0	0.0	0.0	86.2	0.0	0.0	86.2
1985	0.0	0.0	0.0	0.0	0.0	77.4	0.0	0.0	77.4
1986	0.0	0.0	0.0	0.0	0.0	106.2	0.0	0.0	106.2
1987	0.0	0.0	0.0	0.0	0.0	65.8	0.0	0.0	65.8
1988	0.0	0.0	0.0	0.0	0.0	86.9	0.0	0.0	86.9
1989	0.0	0.0	0.0	0.0	0.0	125.6	0.0	0.0	125.6
1990	0.0	0.0	0.0	0.0	0.0	118.1	0.0	0.0	118.1
1991	0.0	0.0	0.0	0.0	0.0	123.6	0.0	0.0	123.6
1992	0.0	0.0	0.0	0.0	0.0	92.7	0.0	0.0	92.7
1993	0.0	0.0	0.0	0.0	0.0	111.2	0.0	0.0	111.2
1994	0.0	0.0	0.0	0.0	0.0	111.5	0.0	0.0	111.5
1995	0.0	0.0	0.0	0.0	0.0	118.4	0.0	0.0	118.4
1996	0.0	0.0	0.0	0.0	0.0	122.3	0.0	0.0	122.3
1997	0.0	0.0	0.0	0.0	0.0	92.3	0.0	0.0	92.3
1998	0.0	0.0	0.0	0.0	0.0	130.4	0.0	0.0	130.4
1999	0.0	0.0	0.0	0.0	0.0	129.1	0.0	0.0	129.1
2000	0.0	0.0	0.0	0.0	0.0	167.0	0.0	0.0	167.0
2001	0.0	0.0	0.0	0.0	0.0	136.8	0.0	0.0	136.8
2002	0.0	0.0	0.0	0.0	0.0	169.3	0.0	0.0	169.3
2003	0.0	0.0	0.0	0.0	0.0	148.1	0.0	0.0	148.1
2004	0.0	0.0	0.0	0.0	0.0	129.7	0.0	0.0	129.7
2005	0.0	0.0	0.0	0.0	0.0	129.3	0.0	0.0	129.3
2006	0.0	0.0	0.0	0.0	0.0	107.0	0.0	0.0	107.0
2007	0.0	0.0	0.0	0.0	0.0	79.9	0.0	0.0	79.9
2008	0.0	0.0	0.0	0.0	0.0	116.6	0.0	0.0	116.6
2009	0.0	0.0	0.0	0.0	0.0	173.6	0.0	0.0	173.6
2010	0.0	0.0	0.0	0.0	0.0	258.7	0.0	0.0	258.7
2011	0.0	0.0	0.0	0.0	0.0	258.7	0.0	0.0	258.7
2012	0.0	0.0	0.0	0.0	0.0	142.9	0.0	0.0	142.9
2013	0.0	0.0	0.0	0.0	0.0	147.9	0.0	0.0	147.9
2014	0.0	0.0	0.0	0.0	0.0	143.8	0.0	0.0	143.8
2015	0.0	0.0	0.0	0.0	0.0	134.5	0.0	0.0	134.5
2016	0.0	0.0	0.0	0.0	0.0	133.2	0.0	0.0	133.2
2017	0.0	0.0	0.0	0.0	0.0	139.5	0.0	0.0	139.5

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Maverick County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	728.5	163.9	724.4	1616.8
1981	0.0	0.0	0.0	0.0	0.0	874.6	189.5	820.7	1884.8
1982	0.0	0.0	0.0	0.0	0.0	874.5	185.6	845.4	1905.5
1983	0.0	0.0	0.0	0.0	0.0	874.4	183.8	864.8	1922.9
1984	0.0	0.0	0.0	0.0	0.0	616.0	156.0	881.4	1653.4
1985	0.0	0.0	0.0	0.0	0.0	910.2	187.5	912.4	2010.1
1986	0.0	0.0	0.0	0.0	0.0	14.4	96.7	791.5	902.7
1987	0.0	0.0	0.0	0.0	0.0	13.5	100.3	816.7	930.6
1988	0.0	0.0	0.0	0.0	0.0	2225.2	326.8	1133.8	3685.9
1989	0.0	0.0	0.0	0.0	0.0	269.8	144.9	1009.4	1424.2
1990	0.0	0.0	0.0	0.0	0.0	2109.3	370.3	1294.0	3773.6
1991	0.0	0.0	0.0	0.0	0.0	1997.7	272.8	1599.4	3869.9
1992	0.0	0.0	0.0	0.0	0.0	2053.9	286.3	1570.2	3910.3
1993	0.0	0.0	0.0	0.0	0.0	13.0	20.7	1319.0	1352.8
1994	0.0	0.0	0.0	0.0	0.0	165.1	39.8	1490.2	1695.1
1995	0.0	0.0	0.0	0.0	0.0	579.9	84.6	1553.7	2218.2
1996	0.0	0.0	0.0	0.0	0.0	614.1	88.0	1576.4	2278.4
1997	0.0	0.0	0.0	0.0	0.0	11.9	24.5	1564.3	1600.7
1998	0.0	0.0	0.0	0.0	0.0	881.6	120.6	1766.7	2768.9
1999	0.0	0.0	0.0	0.0	0.0	881.7	119.9	1778.8	2780.3
2000	0.0	0.0	0.0	0.0	0.0	106.1	35.7	927.7	1069.5
2001	0.0	0.0	0.0	0.0	0.0	87.0	29.0	758.7	874.7
2002	0.0	0.0	0.0	0.0	0.0	107.6	38.7	956.3	1102.6
2003	0.0	0.0	0.0	0.0	0.0	94.2	33.0	831.3	958.4
2004	0.0	0.0	0.0	0.0	0.0	82.5	29.8	747.8	860.1
2005	0.0	0.0	0.0	0.0	0.0	82.2	27.5	721.2	830.9
2006	0.0	0.0	0.0	0.0	0.0	68.0	22.0	593.9	684.0
2007	0.0	0.0	0.0	0.0	0.0	50.8	18.4	476.5	545.7
2008	0.0	0.0	0.0	0.0	0.0	74.1	24.5	657.9	756.4
2009	0.0	0.0	0.0	0.0	0.0	110.3	36.5	955.2	1102.1
2010	0.0	0.0	0.0	0.0	0.0	164.3	55.6	1399.4	1619.3
2011	0.0	0.0	0.0	0.0	0.0	164.2	51.9	1323.1	1539.2
2012	0.0	0.0	0.0	0.0	0.0	14.3	2.6	29.6	46.5
2013	0.0	0.0	0.0	0.0	0.0	14.0	2.5	29.3	45.8
2014	0.0	0.0	0.0	0.0	0.0	14.3	2.4	29.7	46.5
2015	0.0	0.0	0.0	0.0	0.0	15.0	2.6	31.7	49.3
2016	0.0	0.0	0.0	0.0	0.0	16.4	2.7	34.6	53.7
2017	0.0	0.0	0.0	0.0	0.0	15.4	2.5	32.3	50.2

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
McMullen County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	2.0	0.0	7.4	0.0	459.2	0.3	0.1	469.0
1981	0.0	1.7	0.0	6.0	0.0	410.2	0.2	0.1	418.2
1982	0.0	1.4	0.0	4.7	0.0	1176.3	0.2	0.1	1182.8
1983	0.0	1.2	0.0	3.4	0.0	1498.1	0.1	0.0	1502.9
1984	0.0	0.9	0.0	2.1	0.0	1570.0	0.2	0.1	1573.3
1985	0.0	0.9	0.0	2.1	0.0	1174.9	0.1	0.0	1177.9
1986	0.0	0.9	0.0	2.2	0.0	1501.2	0.1	0.0	1504.4
1987	0.0	0.8	0.0	1.7	0.0	1613.4	0.1	0.0	1616.1
1988	0.0	0.9	0.0	1.9	0.0	1805.1	0.2	0.0	1808.1
1989	0.0	1.0	0.0	2.4	0.0	1544.7	0.2	0.0	1548.3
1990	0.0	1.0	0.0	2.2	0.0	1579.8	0.1	0.0	1583.1
1991	0.0	0.9	0.0	2.3	0.0	1717.6	0.2	0.0	1721.0
1992	0.0	0.9	0.0	2.0	0.0	1570.5	0.1	0.0	1573.5
1993	0.0	0.9	0.0	2.3	0.0	1661.2	0.1	0.0	1664.4
1994	0.0	0.9	0.0	2.3	0.0	1598.8	0.1	0.0	1602.1
1995	0.0	0.9	0.0	2.3	0.0	1554.1	0.1	0.0	1557.4
1996	0.0	0.9	0.0	2.3	0.0	1552.0	0.2	0.1	1555.4
1997	0.0	0.9	0.0	1.9	0.0	1739.9	0.2	0.0	1742.9
1998	0.0	0.9	0.0	2.2	0.0	1841.3	0.2	0.0	1844.6
1999	0.0	0.9	0.0	2.2	0.0	154.0	0.2	0.0	157.3
2000	0.0	1.0	0.0	2.8	0.0	200.4	0.2	0.0	204.4
2001	0.0	2.1	0.0	3.5	0.0	161.9	0.2	0.0	167.6
2002	0.0	1.6	0.0	3.1	0.0	202.7	0.2	0.0	207.7
2003	0.0	1.7	0.0	5.4	0.0	173.5	0.2	0.0	180.8
2004	0.0	3.1	0.0	14.4	0.0	154.6	0.2	0.0	172.2
2005	0.0	4.3	0.0	18.4	0.0	154.2	0.2	0.0	177.1
2006	0.0	5.6	0.0	20.8	0.0	128.6	0.1	0.0	155.2
2007	0.0	4.6	0.0	13.4	0.0	96.0	0.1	0.0	114.2
2008	0.0	5.3	0.0	19.7	0.0	141.2	0.2	0.0	166.4
2009	0.0	3.9	0.0	7.3	0.0	193.5	0.2	0.0	204.9
2010	0.0	3.8	0.0	7.9	0.0	308.4	0.3	0.1	320.5
2011	0.0	3.8	0.0	8.2	0.0	308.4	0.3	0.1	320.9
2012	0.0	1.8	0.0	9.4	0.0	344.4	0.4	0.1	355.9
2013	0.0	1.5	0.0	8.5	0.0	341.3	0.4	0.1	351.7
2014	0.0	1.4	0.0	7.6	0.0	299.2	0.3	0.1	308.6
2015	0.0	1.4	0.0	7.4	0.0	377.4	0.4	0.1	386.6
2016	0.0	1.4	0.0	7.5	0.0	321.5	0.3	0.1	330.8
2017	0.0	1.1	0.0	6.2	0.0	376.9	0.4	0.1	384.6

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Medina County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	2209.2	806.2	4478.0	7493.4
1981	0.0	0.0	0.0	0.0	0.0	1210.9	483.5	2325.4	4019.9
1982	0.0	0.0	0.0	0.0	0.0	1208.6	487.0	2312.6	4008.2
1983	0.0	0.0	0.0	0.0	0.0	1175.4	488.1	2318.2	3981.7
1984	0.0	0.0	0.0	0.0	0.0	4781.1	1641.4	9796.2	16218.7
1985	0.0	0.0	0.0	0.0	0.0	374.9	238.4	542.1	1155.5
1986	0.0	0.0	0.0	0.0	0.0	494.7	271.0	711.6	1477.3
1987	0.0	0.0	0.0	0.0	0.0	524.4	281.6	775.4	1581.3
1988	0.0	0.0	0.0	0.0	0.0	542.8	278.7	712.1	1533.6
1989	0.0	0.0	0.0	0.0	0.0	608.6	324.2	795.9	1728.7
1990	0.0	0.0	0.0	0.0	0.0	546.8	319.8	717.5	1584.1
1991	0.0	0.0	0.0	0.0	0.0	602.7	316.7	833.7	1753.1
1992	0.0	0.0	0.0	0.0	0.0	590.1	316.4	822.5	1729.0
1993	0.0	0.0	0.0	0.0	0.0	581.7	329.4	736.5	1647.7
1994	0.0	0.0	0.0	0.0	0.0	1876.2	742.8	3630.9	6249.8
1995	0.0	0.0	0.0	0.0	0.0	2015.9	807.1	3951.5	6774.5
1996	0.0	0.0	0.0	0.0	0.0	2010.2	821.6	3964.5	6796.3
1997	0.0	0.0	0.0	0.0	0.0	1283.6	602.7	2577.2	4463.5
1998	0.0	0.0	0.0	0.0	0.0	1382.4	612.3	2532.6	4527.3
1999	0.0	0.0	0.0	0.0	0.0	1385.8	625.4	2519.2	4530.4
2000	0.0	0.0	0.0	0.0	0.0	1794.2	808.6	3261.7	5864.6
2001	0.0	0.0	0.0	0.0	0.0	1469.7	662.6	2678.3	4810.6
2002	0.0	0.0	0.0	0.0	0.0	1830.0	820.0	3355.7	6005.6
2003	0.0	0.0	0.0	0.0	0.0	1596.4	717.5	2918.4	5232.2
2004	0.0	0.0	0.0	0.0	0.0	1404.1	628.1	2587.8	4620.0
2005	0.0	0.0	0.0	0.0	0.0	1390.1	626.4	2532.5	4549.1
2006	0.0	0.0	0.0	0.0	0.0	1146.8	517.8	2092.2	3756.8
2007	0.0	0.0	0.0	0.0	0.0	868.3	387.2	1608.8	2864.3
2008	0.0	0.0	0.0	0.0	0.0	1252.2	564.7	2286.6	4103.5
2009	0.0	0.0	0.0	0.0	0.0	1861.3	838.0	3380.8	6080.1
2010	0.0	0.0	0.0	0.0	0.0	2773.2	1248.6	5005.2	9027.0
2011	0.0	0.0	0.0	0.0	0.0	2731.7	1205.3	4921.5	8858.4
2012	0.0	0.0	0.0	0.0	0.0	798.6	353.6	1464.1	2616.3
2013	0.0	0.0	0.0	0.0	0.0	755.3	335.3	1379.0	2469.6
2014	0.0	0.0	0.0	0.0	0.0	847.3	381.6	1565.4	2794.3
2015	0.0	0.0	0.0	0.0	0.0	496.9	216.8	903.1	1616.7
2016	0.0	0.0	0.0	0.0	0.0	588.4	258.1	1075.5	1922.0
2017	0.0	0.0	0.0	0.0	0.0	626.0	275.7	1140.0	2041.7

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Uvalde County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	9.4	280.2	4001.1	4290.7
1981	0.0	0.0	0.0	0.0	0.0	9.9	192.1	1472.9	1675.0
1982	0.0	0.0	0.0	0.0	0.0	10.2	197.6	1352.5	1560.2
1983	0.0	0.0	0.0	0.0	0.0	10.6	198.8	1240.0	1449.3
1984	0.0	0.0	0.0	0.0	0.0	11.2	189.9	179.4	380.6
1985	0.0	0.0	0.0	0.0	0.0	10.6	193.6	184.1	388.3
1986	0.0	0.0	0.0	0.0	0.0	9.2	98.1	114.2	221.4
1987	0.0	0.0	0.0	0.0	0.0	10.1	92.4	115.0	217.5
1988	0.0	0.0	0.0	0.0	0.0	9.5	158.1	145.3	313.0
1989	0.0	0.0	0.0	0.0	0.0	10.9	192.2	169.8	373.0
1990	0.0	0.0	0.0	0.0	0.0	11.3	170.5	164.7	346.4
1991	0.0	0.0	0.0	0.0	0.0	0.1	167.3	156.3	323.7
1992	0.0	0.0	0.0	0.0	0.0	0.1	146.7	155.9	302.6
1993	0.0	0.0	0.0	0.0	0.0	0.1	135.2	140.9	276.2
1994	0.0	0.0	0.0	0.0	0.0	0.1	140.9	146.1	287.1
1995	0.0	0.0	0.0	0.0	0.0	0.1	144.9	144.8	289.7
1996	0.0	0.0	0.0	0.0	0.0	0.1	146.4	149.0	295.5
1997	0.0	0.0	0.0	0.0	0.0	0.1	134.8	142.1	276.9
1998	0.0	0.0	0.0	0.0	0.0	0.1	130.6	141.7	272.4
1999	0.0	0.0	0.0	0.0	0.0	0.1	128.5	131.9	260.4
2000	0.0	0.0	0.0	0.0	0.0	0.1	166.1	98.6	264.7
2001	0.0	0.0	0.0	0.0	0.0	0.1	136.1	80.1	216.3
2002	0.0	0.0	0.0	0.0	0.0	0.1	168.9	99.9	268.8
2003	0.0	0.0	0.0	0.0	0.0	0.1	147.8	87.2	235.0
2004	0.0	0.0	0.0	0.0	0.0	0.1	129.6	76.2	205.9
2005	0.0	0.0	0.0	0.0	0.0	0.1	129.0	75.9	205.0
2006	0.0	0.0	0.0	0.0	0.0	0.0	106.6	62.8	169.5
2007	0.0	0.0	0.0	0.0	0.0	0.0	80.0	47.2	127.2
2008	0.0	0.0	0.0	0.0	0.0	0.1	116.3	68.2	184.5
2009	0.0	0.0	0.0	0.0	0.0	0.1	172.6	102.9	275.6
2010	0.0	0.0	0.0	0.0	0.0	0.1	256.6	152.1	408.8
2011	0.0	0.0	0.0	0.0	0.0	0.1	255.2	152.0	407.3
2012	0.0	0.0	0.0	0.0	0.0	0.0	44.4	6.2	50.7
2013	0.0	0.0	0.0	0.0	0.0	0.0	41.0	5.9	46.8
2014	0.0	0.0	0.0	0.0	0.0	0.0	41.7	5.9	47.6
2015	0.0	0.0	0.0	0.0	0.0	0.0	30.9	4.9	35.9
2016	0.0	0.0	0.0	0.0	0.0	0.0	31.5	4.9	36.5
2017	0.0	0.0	0.0	0.0	0.0	0.0	35.3	7.9	43.2

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Webb County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	348.4	3.4	0.8	352.6
1981	0.0	0.0	0.0	0.0	0.0	656.2	3.8	0.9	660.9
1982	0.0	0.0	0.0	0.0	0.0	670.7	3.9	0.9	675.5
1983	0.0	0.0	0.0	0.0	0.0	685.0	4.0	0.9	689.9
1984	0.0	0.0	0.0	0.0	0.0	423.3	4.0	0.9	428.2
1985	0.0	0.0	0.0	0.0	0.0	279.8	2.8	0.8	283.4
1986	0.0	0.0	0.0	0.0	0.0	247.3	2.5	0.8	250.6
1987	0.0	0.0	0.0	0.0	0.0	184.8	2.2	0.6	187.6
1988	0.0	0.0	0.0	0.0	0.0	233.4	2.6	0.6	236.6
1989	0.0	0.0	0.0	0.0	0.0	594.6	4.1	0.8	599.6
1990	0.0	0.0	0.0	0.0	0.0	581.6	4.0	0.8	586.4
1991	0.0	0.0	0.0	0.0	0.0	2496.4	5.1	0.8	2502.3
1992	0.0	0.0	0.0	0.0	0.0	1071.9	3.9	0.7	1076.5
1993	0.0	0.0	0.0	0.0	0.0	768.5	4.6	0.7	773.8
1994	0.0	0.0	0.0	0.0	0.0	571.0	3.7	0.7	575.3
1995	0.0	0.0	0.0	0.0	0.0	805.8	4.9	0.8	811.5
1996	0.0	0.0	0.0	0.0	0.0	905.2	5.4	0.8	911.5
1997	0.0	0.0	0.0	0.0	0.0	696.4	5.2	0.7	702.3
1998	0.0	0.0	0.0	0.0	0.0	864.5	5.4	0.8	870.6
1999	0.0	0.0	0.0	0.0	0.0	907.3	5.7	0.8	913.8
2000	0.0	235.7	0.0	0.0	0.0	842.5	5.7	0.7	1084.6
2001	0.0	214.0	0.0	0.0	0.0	689.9	4.7	0.6	909.1
2002	0.0	253.7	0.0	0.0	0.0	853.9	5.8	0.7	1114.1
2003	0.0	188.0	0.0	0.0	0.0	748.8	5.1	0.6	942.5
2004	0.0	501.3	0.0	0.0	0.0	655.4	4.5	0.6	1161.7
2005	0.0	649.9	0.0	0.0	0.0	653.6	4.4	0.6	1308.5
2006	0.0	432.1	0.0	0.0	0.0	1258.1	3.7	0.5	1694.4
2007	0.0	279.5	0.0	0.0	0.0	404.4	2.8	0.4	687.0
2008	0.0	534.3	0.0	0.0	0.0	592.4	4.1	0.5	1131.3
2009	0.0	774.4	0.0	0.0	0.0	1885.9	5.9	0.7	2666.9
2010	0.0	293.6	0.0	0.0	0.0	1307.6	8.9	2.4	1612.5
2011	0.0	596.1	0.0	0.0	0.0	1307.6	8.9	1.1	1913.8
2012	0.0	127.4	0.0	0.0	0.0	705.8	4.6	0.6	838.5
2013	0.0	117.6	0.0	0.0	0.0	556.2	3.7	0.5	677.9
2014	0.0	68.3	0.0	0.0	0.0	493.9	3.3	0.5	566.0
2015	0.0	63.6	0.0	0.0	0.0	493.6	3.3	0.5	560.9
2016	0.0	66.1	0.0	0.0	0.0	494.3	3.3	0.5	564.2
2017	0.0	61.2	0.0	0.0	0.0	490.0	3.2	0.5	554.9

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Wilson County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	216.9	0.0	80.4	0.0	9085.9	393.7	346.5	10123.5
1981	0.0	232.5	0.0	83.8	0.0	8100.6	388.3	322.9	9128.1
1982	0.0	237.7	0.0	83.3	0.0	8464.2	409.2	347.7	9542.2
1983	0.0	248.4	0.0	84.9	0.0	8819.4	426.5	348.6	9927.9
1984	0.0	264.7	0.0	88.5	0.0	9838.9	487.2	447.1	11126.3
1985	0.0	266.1	0.0	89.0	0.0	8551.0	432.8	340.3	9679.1
1986	0.0	270.3	0.0	90.8	0.0	8727.3	441.4	347.5	9877.3
1987	0.0	277.4	0.0	92.6	0.0	9056.9	461.0	360.5	10248.3
1988	0.0	292.6	0.0	98.0	0.0	10867.1	527.9	440.4	12226.0
1989	0.0	341.7	0.0	115.3	0.0	12051.3	554.2	453.6	13516.2
1990	0.0	358.2	0.0	126.3	0.0	14197.1	666.4	548.9	15896.9
1991	0.0	355.1	0.0	124.9	0.0	13177.2	622.6	504.2	14784.0
1992	0.0	358.1	0.0	124.2	0.0	15099.2	693.0	588.4	16862.9
1993	0.0	379.7	0.0	132.3	0.0	11321.6	566.7	419.7	12820.0
1994	0.0	395.9	0.0	137.4	0.0	12901.3	648.8	541.0	14624.3
1995	0.0	418.5	0.0	145.1	0.0	12181.6	634.0	500.7	13879.9
1996	0.0	435.0	0.0	150.8	0.0	16391.5	768.2	632.4	18377.9
1997	0.0	447.8	0.0	153.7	0.0	14436.9	721.5	571.9	16331.8
1998	0.0	462.5	0.0	159.6	0.0	15481.0	752.0	596.4	17451.5
1999	0.0	483.2	0.0	166.1	0.0	16013.7	770.1	583.4	18016.5
2000	0.0	295.1	0.0	154.4	0.0	20707.9	996.0	754.4	22907.8
2001	0.0	324.1	0.0	132.5	0.0	16971.3	816.3	618.3	18862.5
2002	0.0	346.9	0.0	142.8	0.0	20995.7	1010.6	765.0	23261.0
2003	0.0	427.6	0.0	320.2	0.0	18370.9	883.9	669.2	20671.8
2004	0.0	1123.4	0.0	996.9	0.0	16084.9	774.1	586.0	19565.3
2005	0.0	1242.7	0.0	1170.4	0.0	16040.9	771.3	584.4	19809.8
2006	0.0	1178.1	0.0	1183.8	0.0	13316.8	638.2	483.7	16800.5
2007	0.0	889.6	0.0	711.9	0.0	9914.3	477.3	361.1	12354.1
2008	0.0	1272.0	0.0	1161.4	0.0	14456.7	695.6	526.8	18112.6
2009	0.0	511.3	0.0	165.9	0.0	21527.3	1035.3	784.4	24024.1
2010	0.0	467.9	0.0	168.2	0.0	32089.8	1542.6	1168.5	35436.9
2011	0.0	467.9	0.0	167.6	0.0	32089.8	1541.4	1169.0	35435.7
2012	0.0	1196.4	0.0	1555.9	0.0	21800.8	999.5	788.3	26340.9
2013	0.0	1184.7	0.0	1409.1	0.0	20494.9	940.3	740.3	24769.2
2014	0.0	1165.5	0.0	1467.6	0.0	21262.9	977.2	768.6	25641.8
2015	0.0	1175.2	0.0	1259.0	0.0	18368.4	844.4	664.4	22311.4
2016	0.0	1170.1	0.0	1310.7	0.0	19171.5	878.2	693.1	23223.6
2017	0.0	1167.6	0.0	1435.5	0.0	21319.9	977.2	770.9	25671.1

Appendix F Table F-1 Simulated Pumping by County, Layer, and Year for Transient 1980 to 2017 Simulation

Simulation Period	Pumping Totals in Acre-feet per Year								
	Quaternary Alluvium (Layer 1)	Sparta Aquifer (Layer 3)	Weches Formation (Layer 4)	Queen City Aquifer (Layer 5)	Reklaw Formation (Layer 6)	Carrizo-Upper Wilcox (Layer 7)	Middle Wilcox (Layer 8)	Lower Wilcox (Layer 9)	Total Pumping
Zavala County									
Predevelopment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	36859.9	7699.9	975.0	45534.8
1981	0.0	0.0	0.0	0.0	0.0	33290.8	6922.5	854.2	41067.5
1982	0.0	0.0	0.0	0.0	0.0	35218.7	7364.1	901.1	43483.9
1983	0.0	0.0	0.0	0.0	0.0	35906.4	7737.7	916.2	44560.2
1984	0.0	0.0	0.0	0.0	0.0	40787.2	8538.9	1037.3	50363.5
1985	0.0	0.0	0.0	0.0	0.0	41970.0	8581.3	1071.6	51622.9
1986	0.0	0.0	0.0	0.0	0.0	18814.9	4370.2	462.9	23648.0
1987	0.0	0.0	0.0	0.0	0.0	16760.8	3922.7	406.6	21090.1
1988	0.0	0.0	0.0	0.0	0.0	34219.6	7132.0	848.2	42199.9
1989	0.0	0.0	0.0	0.0	0.0	41599.8	8682.8	1043.6	51326.3
1990	0.0	0.0	0.0	0.0	0.0	34571.9	7396.6	814.8	42783.3
1991	0.0	0.0	0.0	0.0	0.0	63723.6	6841.3	758.1	71323.0
1992	0.0	0.0	0.0	0.0	0.0	52783.8	5973.0	627.9	59384.7
1993	0.0	0.0	0.0	0.0	0.0	46680.1	5321.5	552.7	52554.3
1994	0.0	0.0	0.0	0.0	0.0	49202.6	5319.4	585.6	55107.5
1995	0.0	0.0	0.0	0.0	0.0	50700.8	5432.0	603.8	56736.6
1996	0.0	0.0	0.0	0.0	0.0	50919.6	5474.0	605.4	56998.9
1997	0.0	0.0	0.0	0.0	0.0	44831.0	4819.0	533.5	50183.5
1998	0.0	0.0	0.0	0.0	0.0	42701.3	4704.0	493.5	47898.8
1999	0.0	0.0	0.0	0.0	0.0	41369.4	4852.1	477.1	46698.5
2000	0.0	2004.8	0.0	1993.6	0.0	53152.3	6274.1	371.4	63796.1
2001	0.0	2308.2	0.0	2294.6	0.0	43669.9	5142.0	304.4	53719.0
2002	0.0	6351.4	0.0	6312.2	0.0	53841.7	6361.3	376.6	73243.0
2003	0.0	2373.4	0.0	2359.6	0.0	47160.3	5566.0	329.5	57788.8
2004	0.0	2879.0	0.0	2865.6	0.0	41477.3	4873.4	288.5	52383.8
2005	0.0	2953.3	0.0	2932.5	0.0	41352.6	4860.1	287.8	52386.2
2006	0.0	2595.4	0.0	2573.7	0.0	34320.4	4021.8	238.3	43749.6
2007	0.0	2079.9	0.0	2070.8	0.0	38523.1	3004.0	178.1	45855.8
2008	0.0	1476.4	0.0	1466.7	0.0	55755.7	4380.2	259.4	63338.3
2009	0.0	2401.8	0.0	2385.6	0.0	81979.8	6522.3	386.0	93675.4
2010	0.0	2313.6	0.0	2299.8	0.0	80586.4	9722.7	575.7	95498.1
2011	0.0	3221.2	0.0	3220.9	0.0	79603.0	9720.4	575.7	96341.2
2012	0.0	2693.5	0.0	2732.2	0.0	57403.9	4655.9	449.9	67935.5
2013	0.0	2439.4	0.0	2493.7	0.0	53060.4	4269.0	413.8	62676.3
2014	0.0	2416.6	0.0	2536.0	0.0	54051.8	4336.7	421.6	63762.8
2015	0.0	1799.8	0.0	1810.1	0.0	40053.9	3203.9	309.9	47177.7
2016	0.0	1882.1	0.0	1880.9	0.0	41036.7	3267.0	316.8	48383.5
2017	0.0	2060.2	0.0	2061.9	0.0	44336.4	3517.3	342.8	52318.6

APPENDIX G

Model Targets and Weights for 1980 to 2017 Transient Simulation

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
3	0_6715403	12/07/1981 to 01/25/2017	27	0.1	Confined
3	0_6715502	12/15/1983 to 02/14/2014	27	1	Confined
3	0_6722201	02/18/1981 to 12/01/1986	6	0.5	Confined
3	0_6722202	02/09/2012 to 06/01/2017	13	1	Confined
3	0_6722403	07/22/2002	1	0.5	Confined
3	0_6722404	01/27/2011 to 06/07/2017	15	0.5	Unconfined
3	0_6722701	06/24/2011 to 06/07/2017	14	1	Confined
3	0_6722803	08/22/2014 to 01/04/2017	6	1	Confined
3	0_6728904	09/11/2013 to 06/20/2017	9	0.1	Confined
3	0_6729204	09/20/2011 to 09/13/2012	4	0.1	Confined
3	0_6729302	02/18/1981 to 02/13/1991	11	0.1	Confined
3	0_6729304	09/24/2010 to 06/14/2017	16	0.5	Confined
3	0_6729403	07/26/2011 to 06/21/2017	15	0.1	Unconfined
3	0_6729501	02/18/1981 to 06/14/2017	36	0.5	Confined
3	0_6729604	06/16/2010 to 06/19/2017	18	1	Confined
3	0_6729806	06/23/2011 to 06/01/2017	17	1	Confined
3	0_6729904	01/27/2015 to 01/23/2017	6	1	Confined
3	0_6736201	03/25/2011 to 06/20/2017	16	1	Unconfined
3	0_6736402	07/26/2011 to 06/21/2017	15	1	Confined
3	0_6736606	08/06/1998	1	0.5	Confined
3	0_6736702	09/01/2011 to 06/22/2017	12	1	Confined
3	0_6743107	07/15/2011 to 01/17/2017	13	0.1	Confined
3	0_6743204	02/19/1981 to 06/21/2017	35	0.1	Confined
3	0_6743706	09/23/2010 to 06/21/2017	16	0.5	Confined
3	0_6743708	09/30/2014 to 01/09/2017	7	1	Confined
3	0_6743709	09/14/2014	1	1	Confined
3	0_6750101	02/13/1981 to 04/07/2010	27	0.1	Confined
3	0_6757101	02/13/1981	1	1	Confined
3	0_6862607	02/17/1981 to 12/12/1990	4	0.1	Unconfined
3	0_6863207	02/17/1981 to 01/14/1993	11	0.1	Unconfined
3	0_7722503	02/18/1981	1	0.1	Unconfined
3	0_7722801	02/13/1984 to 10/19/2017	31	0.1	Unconfined
3	0_7722902	02/17/1981 to 01/24/1996	14	0.5	Unconfined
3	0_7730605	02/17/1981 to 05/14/2002	13	0.5	Unconfined
3	0_7739709	02/14/1983 to 02/05/2002	13	0.5	Confined
3	0_7746801	02/11/1983 to 02/15/1984	2	0.1	Confined
3	0_7747803	05/15/2002	1	0.5	Confined
3	0_7756202	02/16/1981	1	1	Confined
3	0_7756802	02/16/1981 to 02/16/1983	2	0.5	Confined
3	0_7762401	02/13/1981 to 02/23/2000	14	1	Confined
3	0_7805717	02/10/1981 to 02/05/2010	25	0.5	Confined
3	0_7811204	02/26/1982 to 01/22/1991	6	0.5	Confined
3	0_7813701	02/24/1982	1	0.1	Confined
3	0_7814203	02/13/1981 to 03/12/1990	9	0.1	Confined
3	0_7818305	02/10/1981 to 01/24/1991	10	0.5	Confined
3	11815_0	02/22/2011	1	0.5	Confined
3	13282_7804613	12/22/1995	1	0.1	Confined
3	39036_0	01/10/2006	1	0.5	Confined
3	39038_0	04/16/2011	1	0.5	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
3	39039_0	11/30/2005	1	0.5	Confined
3	39040_0	06/09/2009	1	0.5	Confined
3	39041_0	08/09/2007	1	0.1	Confined
3	39361_6714906	06/22/2010 to 06/01/2017	18	1	Confined
3	42643_7805718	12/31/1980	1	1	Confined
3	43098_6864202	09/15/1998 to 07/23/2002	2	1	Confined
3	48245_6743302	09/14/2003 to 06/05/2017	12	0.1	Confined
3	48247_6743605	10/20/2003 to 06/05/2017	12	1	Confined
3	48452_0	02/10/2010	1	1	Confined
3	48467_0	03/19/2012	1	0.5	Confined
3	48473_0	11/15/2006	1	0.1	Confined
3	48568_0	12/09/2009	1	0.1	Confined
3	48595_0	08/18/2003	1	1	Unconfined
3	48597_0	05/30/2006	1	0.5	Confined
3	48606_0	02/22/2010	1	1	Confined
3	48607_0	07/07/2010	1	1	Confined
3	48627_0	05/06/2010	1	1	Confined
3	48630_0	09/10/2005	1	0.5	Confined
3	48631_0	11/12/2007	1	1	Confined
3	48632_0	08/21/2009	1	0.5	Confined
3	48633_0	11/10/2006	1	0.5	Confined
3	48634_0	08/13/2004	1	1	Confined
3	48635_0	08/30/2012	1	1	Confined
3	48657_0	03/27/2014	1	1	Confined
3	48658_0	11/11/2013	1	0.1	Confined
3	48660_0	03/14/2008	1	0.1	Confined
3	48661_0	04/18/2013	1	1	Confined
3	48662_0	04/06/2010	1	0.5	Confined
3	48667_0	03/06/2012	1	1	Confined
3	48669_0	03/22/2007	1	0.1	Confined
3	48672_0	08/02/2010	1	0.1	Confined
3	48678_0	10/20/2009	1	0.1	Confined
3	48707_0	04/06/2012	1	0.1	Confined
3	48716_0	01/13/2011	1	0.1	Confined
3	48729_0	04/22/2011	1	0.1	Confined
3	48732_0	09/06/2003	1	0.1	Confined
3	48733_0	11/28/2008	1	0.1	Confined
3	48768_0	05/02/2005	1	1	Confined
3	48783_0	12/29/2006	1	0.1	Confined
3	48791_0	04/14/2006	1	0.5	Confined
3	48802_0	12/05/2012	1	0.1	Confined
3	48803_0	10/07/2010	1	0.1	Confined
3	48805_0	01/26/2010	1	0.1	Confined
3	48806_0	06/25/2004	1	0.1	Confined
3	48823_0	06/11/2008	1	0.1	Confined
3	48825_0	08/11/2006	1	0.5	Confined
3	48826_0	03/04/2005	1	1	Confined
3	48827_0	05/07/2014	1	0.1	Confined
3	48828_0	09/23/2006	1	0.1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
3	48829_0	02/15/2011	1	0.1	Confined
3	48873_0	03/27/2006	1	0.1	Unconfined
3	48875_0	09/22/2009	1	0.1	Confined
3	48876_0	08/18/2008	1	1	Unconfined
3	48951_0	11/28/2011	1	0.1	Confined
3	48952_0	12/10/2005	1	1	Confined
3	48989_0	06/07/2011	1	0.5	Confined
3	49178_0	12/20/2013	1	1	Confined
3	49458_0	06/08/2005	1	0.5	Confined
3	50129_0	08/15/2006	1	1	Confined
3	50148_0	06/14/2007	1	1	Unconfined
3	50180_0	03/04/2004	1	1	Unconfined
3	50196_0	06/26/2010	1	1	Confined
3	50216_0	08/07/2006	1	0.1	Unconfined
3	50222_0	10/24/2010	1	0.5	Confined
3	50615_0	11/21/2003	1	0.1	Unconfined
3	50619_0	08/22/2003	1	0.1	Confined
3	50674_0	05/16/2006	1	0.5	Confined
3	50675_0	05/30/2006	1	1	Confined
3	50727_0	12/05/2007	1	0.1	Confined
3	50786_0	12/15/2008	1	0.5	Confined
3	50795_0	09/09/2004	1	0.5	Confined
3	50800_0	08/02/2004	1	0.1	Confined
3	50803_0	02/26/2009	1	1	Confined
3	50817_0	03/14/2009	1	0.1	Confined
3	50908_0	01/25/2005	1	0.5	Confined
3	50937_0	06/23/2010	1	0.1	Confined
3	50981_0	08/18/2009	1	1	Unconfined
3	50996_0	02/04/2011	1	0.5	Confined
3	51009_0	04/09/2011	1	0.5	Confined
3	51010_0	04/14/2011	1	0.1	Confined
3	51067_0	10/24/2011	1	0.1	Confined
3	51071_0	12/01/2011	1	0.1	Confined
3	51122_0	04/11/2012	1	0.5	Confined
3	51219_0	05/10/2013	1	0.5	Confined
3	51253_0	04/07/2011	1	1	Confined
3	51263_0	12/21/2011	1	0.1	Confined
3	51276_0	07/31/2013	1	1	Confined
3	51306_0	09/04/2013	1	0.1	Confined
3	51327_0	08/30/2013	1	0.5	Confined
3	51335_0	09/28/2013	1	0.5	Confined
3	51363_0	02/28/2014	1	0.1	Confined
5	0_6713907	09/23/2009 to 01/12/2012	8	0.5	Unconfined
5	0_6714703	01/07/2010 to 09/13/2013	10	0.5	Confined
5	0_6714707	11/15/2011	1	0.5	Confined
5	0_6714801	02/20/1981 to 06/14/2017	48	0.5	Unconfined
5	0_6721201	02/18/1981 to 02/19/1993	12	1	Unconfined
5	0_6721207	01/19/2010 to 01/13/2011	4	1	Unconfined
5	0_6721501	01/19/2010 to 06/14/2017	18	0.5	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	0_6721904	09/22/2009 to 06/17/2014	10	0.1	Confined
5	0_6722103	06/18/2010 to 01/23/2017	16	0.5	Confined
5	0_6722104	06/17/2010 to 06/01/2017	15	0.1	Unconfined
5	0_6728210	06/14/2010 to 06/20/2017	18	0.1	Unconfined
5	0_6728303	02/18/1981 to 06/23/2017	38	0.5	Unconfined
5	0_6728509	06/09/2011 to 01/23/2017	12	0.5	Unconfined
5	0_6728702	06/14/2010 to 09/12/2014	11	1	Unconfined
5	0_6728705	06/14/2010 to 06/20/2017	18	1	Unconfined
5	0_6728801	06/14/2010 to 06/20/2017	18	0.1	Confined
5	0_6728903	06/28/2010 to 06/20/2017	18	1	Confined
5	0_6729203	05/10/2001 to 06/14/2017	21	0.1	Confined
5	0_6729402	03/25/2011 to 06/20/2017	16	0.5	Confined
5	0_6734803	02/17/1981 to 01/11/2012	23	0.5	Unconfined
5	0_6734807	01/02/2014 to 09/02/2014	3	0.5	Unconfined
5	0_6735303	06/23/2010 to 06/21/2017	16	1	Unconfined
5	0_6735506	06/15/2010 to 09/12/2014	11	1	Unconfined
5	0_6735703	06/10/2010 to 01/09/2017	16	0.1	Unconfined
5	0_6735704	11/19/2010 to 09/12/2014	9	1	Unconfined
5	0_6735705	06/07/2016 to 06/05/2017	3	0.1	Unconfined
5	0_6735905	02/29/2000 to 03/01/2000	2	1	Confined
5	0_6736103	06/23/2010 to 06/12/2015	13	1	Confined
5	0_6736403	09/22/2015 to 06/21/2017	7	1	Confined
5	0_6736602	06/10/2010 to 01/11/2017	17	1	Confined
5	0_6742401	02/16/1983 to 12/11/1990	8	0.5	Unconfined
5	0_6742701	07/01/1998	1	1	Confined
5	0_6750103	02/13/1981 to 12/12/1989	9	0.5	Confined
5	0_6854904	07/02/1998	1	0.5	Unconfined
5	0_6855705	02/13/1986 to 02/16/1993	5	1	Unconfined
5	0_6856901	02/17/1981 to 12/12/1990	9	0.1	Confined
5	0_6862705	02/06/2012 to 06/01/2017	53	0.1	Confined
5	0_7703901	01/30/2006 to 06/02/2006	2	1	Unconfined
5	0_7703902	01/18/2005	1	1	Unconfined
5	0_7708718	04/11/2002	1	0.5	Unconfined
5	0_7708806	02/08/1982 to 04/13/2010	24	0.1	Unconfined
5	0_7708808	02/16/1983 to 04/13/2010	24	1	Unconfined
5	0_7714901	02/07/1990 to 01/27/1992	3	0.5	Confined
5	0_7714902	02/11/1982 to 02/15/1989	8	0.1	Confined
5	0_7715903	02/09/1982 to 01/27/1993	12	0.1	Confined
5	0_7716408	04/10/2002	1	1	Unconfined
5	0_7716710	01/26/1994 to 01/18/2010	16	0.5	Confined
5	0_7723802	02/09/1982 to 02/22/1990	8	0.1	Confined
5	0_7723810	05/20/2002	1	0.1	Confined
5	0_7731703	02/17/1981 to 02/05/2007	25	0.5	Confined
5	0_7732501	02/22/1983 to 10/19/2017	19	0.5	Confined
5	0_7737301	02/16/1982 to 02/18/1997	15	0.5	Confined
5	0_7739601	02/16/1982 to 02/11/1992	8	0.5	Confined
5	0_7740305	02/04/1987 to 01/24/2012	23	0.5	Confined
5	0_7801303	01/15/1993	1	0.5	Unconfined
5	0_7802709	02/08/1982 to 12/03/2013	50	0.5	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	0_7826502	02/16/1981 to 10/19/2017	34	0.5	Confined
5	0_8521501	04/07/1998	1	1	Confined
5	11814_0	08/08/2007	1	0.1	Confined
5	11816_0	12/15/2006	1	1	Confined
5	11818_0	07/19/2006	1	0.1	Confined
5	11820_0	04/04/2001	1	1	Confined
5	11822_0	08/25/2009	1	1	Confined
5	11823_0	05/18/2004	1	1	Confined
5	11825_0	01/28/2008	1	0.1	Confined
5	11828_0	11/30/2006	1	1	Confined
5	11842_0	06/15/2010	1	0.5	Confined
5	13248_7804308	12/12/1989	1	1	Confined
5	13249_7804310	12/12/1989	1	1	Confined
5	13251_6859922	05/17/1990 to 07/20/1990	2	1	Unconfined
5	13253_6861506	01/29/2009 to 12/01/2017	66	1	Unconfined
5	13254_6861414	02/19/2004 to 02/14/2010	7	1	Unconfined
5	13261_7805121	11/01/1988	1	1	Confined
5	13264_7805123	08/08/1986	1	1	Confined
5	13265_7805108	06/30/2010	1	1	Confined
5	13288_7813103	12/07/1999	1	1	Confined
5	13292_7823502	12/31/1980 to 02/05/1996	11	1	Confined
5	13295_7826504	08/28/1992 to 10/19/2017	18	0.5	Confined
5	14273_0	01/01/2006	1	1	Confined
5	15926_6861805	02/12/1981 to 04/12/2010	24	1	Unconfined
5	15949_7805107	12/12/1989	1	1	Confined
5	15965_7805409	03/11/1982 to 02/05/2010	20	1	Confined
5	16151_7804311	05/26/1990	1	1	Confined
5	39004_0	09/25/2006	1	1	Unconfined
5	39007_0	05/26/2011	1	1	Unconfined
5	39009_0	01/07/2011	1	1	Unconfined
5	39012_0	04/21/2009	1	1	Unconfined
5	39013_0	07/13/2007	1	1	Unconfined
5	39014_0	07/07/2005	1	0.1	Confined
5	39015_0	09/19/2005	1	0.1	Confined
5	39016_0	07/31/2003	1	0.1	Unconfined
5	39017_0	06/12/2009	1	1	Unconfined
5	39018_0	02/17/2011	1	1	Unconfined
5	39019_0	08/17/2008	1	1	Unconfined
5	39020_0	09/28/2006	1	1	Unconfined
5	39021_0	05/04/2004	1	1	Unconfined
5	39023_0	01/10/2011	1	0.1	Confined
5	39024_0	06/13/2007	1	1	Confined
5	39025_0	02/25/2004	1	1	Confined
5	39026_0	12/26/2002	1	1	Confined
5	39027_0	10/17/2005	1	1	Confined
5	39028_0	08/22/2006	1	0.1	Confined
5	39029_0	07/12/2006	1	0.1	Confined
5	39030_0	07/07/2009	1	1	Confined
5	39031_0	04/21/2004	1	1	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	39032_0	12/19/2010	1	0.1	Confined
5	39033_0	02/12/2006	1	1	Unconfined
5	39034_0	09/15/2004	1	0.1	Confined
5	39035_0	10/24/2005	1	1	Confined
5	39174_6714402	02/20/1981 to 11/15/2017	28	0.1	Unconfined
5	39374_6722506	08/13/1997	1	0.1	Confined
5	39443_6735904	06/03/1991	1	1	Confined
5	39448_6736601	02/18/1981 to 06/21/2017	35	0.1	Confined
5	39467_6742610	10/23/2006	1	0.1	Confined
5	39489_6743504	01/22/2014 to 01/09/2017	5	0.5	Confined
5	39578_6749202	02/16/1981 to 12/01/2017	56	1	Unconfined
5	39579_6749205	09/27/1990 to 06/30/1998	2	1	Unconfined
5	39584_6750104	04/08/1987 to 07/24/2002	3	0.1	Confined
5	39729_6856804	02/17/1981 to 04/29/2010	27	0.1	Confined
5	39733_6862102	02/14/1983 to 02/07/1984	2	1	Unconfined
5	39745_6862502	10/22/2002	1	0.1	Confined
5	39746_6862503	02/17/1981 to 04/29/2010	27	0.1	Confined
5	39826_7816601	12/31/1980 to 01/04/2012	23	1	Confined
5	42713_7813702	02/24/1982 to 02/08/1983	2	1	Confined
5	48205_0	09/09/2010	1	0.1	Confined
5	48226_6743606	09/14/2003 to 06/05/2017	12	1	Confined
5	48228_6743303	09/12/2003 to 06/01/2016	12	1	Confined
5	48237_6735804	09/14/2003 to 06/01/2016	12	1	Confined
5	48239_6735907	10/08/2003 to 06/05/2017	12	1	Confined
5	48259_6742206	01/05/2011 to 09/02/2014	7	1	Unconfined
5	48262_6742503	01/05/2011 to 01/04/2017	10	0.5	Unconfined
5	48264_6743409	06/01/2011 to 06/05/2017	15	1	Confined
5	48423_8519201	02/17/1984 to 02/13/1992	7	1	Unconfined
5	48450_0	06/26/2006	1	0.1	Confined
5	48468_0	05/23/2007	1	0.1	Confined
5	48471_0	08/10/2012	1	1	Confined
5	48594_0	03/08/2011	1	1	Unconfined
5	48601_0	04/13/2011	1	1	Confined
5	48608_0	08/08/2011	1	0.1	Confined
5	48610_0	09/06/2011	1	1	Confined
5	48611_0	02/19/2011	1	1	Unconfined
5	48621_0	06/17/2012	1	0.1	Confined
5	48636_0	10/12/2010	1	1	Confined
5	48637_0	03/18/2009	1	0.1	Confined
5	48639_0	12/12/2003	1	0.1	Confined
5	48640_0	05/31/2011	1	1	Unconfined
5	48644_0	08/08/2011	1	0.1	Unconfined
5	48648_0	10/07/2012	1	1	Unconfined
5	48649_0	12/12/2005	1	0.1	Confined
5	48650_0	11/14/2005	1	1	Confined
5	48651_0	06/14/2011	1	0.1	Confined
5	48652_0	12/24/2009	1	0.1	Confined
5	48653_0	08/24/2005	1	0.1	Confined
5	48654_0	11/26/2008	1	0.1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	48656_0	03/15/2012	1	0.1	Confined
5	48659_0	11/01/2010	1	0.1	Confined
5	48679_0	12/09/2008	1	0.1	Confined
5	48681_0	06/27/2009	1	1	Confined
5	48682_0	06/20/2008	1	0.1	Confined
5	48683_0	05/28/2010	1	0.1	Confined
5	48696_0	05/27/2010	1	0.1	Unconfined
5	48700_0	04/20/2009	1	0.1	Confined
5	48701_0	12/01/2008	1	0.1	Confined
5	48702_0	03/16/2006	1	0.1	Confined
5	48703_0	02/12/2010	1	1	Confined
5	48704_0	06/10/2008	1	0.1	Confined
5	48710_0	07/31/2010	1	1	Confined
5	48711_0	10/10/2008	1	1	Confined
5	48731_0	08/19/2008	1	0.1	Confined
5	48735_0	10/08/2007	1	0.1	Confined
5	48736_0	08/09/2009	1	0.1	Confined
5	48740_0	01/28/2009	1	0.1	Confined
5	48742_0	03/25/2011	1	1	Confined
5	48750_0	03/24/2009	1	0.1	Unconfined
5	48753_0	09/08/2006	1	0.1	Confined
5	48755_0	08/28/2003	1	0.1	Confined
5	48757_0	10/09/2008	1	1	Confined
5	48759_0	12/17/2013	1	0.1	Confined
5	48761_0	02/04/2013	1	1	Confined
5	48770_0	04/27/2012	1	0.1	Confined
5	48822_0	01/26/2006	1	1	Confined
5	48830_0	03/20/2006	1	0.1	Confined
5	48831_0	10/02/2009	1	0.1	Confined
5	48833_0	11/14/2011	1	0.1	Confined
5	48845_0	11/20/2003	1	0.1	Unconfined
5	48953_0	06/20/2003	1	0.1	Confined
5	48988_0	08/06/2001	1	1	Confined
5	49063_0	06/05/2003	1	0.1	Unconfined
5	49080_0	03/26/2008	1	0.1	Confined
5	49098_0	07/09/2008	1	1	Confined
5	49456_0	11/20/2012	1	1	Confined
5	49457_0	04/16/2014	1	1	Confined
5	49459_0	07/17/2013	1	1	Confined
5	49460_0	01/31/2013	1	1	Unconfined
5	49461_0	12/09/2006	1	0.5	Unconfined
5	50036_0	07/01/2009	1	1	Unconfined
5	50038_0	01/15/2012	1	0.1	Unconfined
5	50056_0	07/23/2004	1	1	Unconfined
5	50059_0	06/27/2012	1	1	Unconfined
5	50063_0	04/12/2011	1	0.1	Unconfined
5	50067_0	09/24/2009	1	1	Unconfined
5	50074_7801101	02/12/1982 to 03/05/2010	23	0.5	Unconfined
5	50079_0	02/07/2006	1	0.1	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	50081_0	08/20/2003	1	0.1	Unconfined
5	50083_0	05/13/2005	1	1	Unconfined
5	50086_0	01/22/2008	1	0.1	Unconfined
5	50090_0	01/23/2014	1	1	Unconfined
5	50091_0	09/05/2008	1	1	Unconfined
5	50092_0	08/05/2013	1	1	Unconfined
5	50093_0	01/25/2011	1	0.1	Unconfined
5	50096_0	09/06/2006	1	0.5	Unconfined
5	50097_0	12/22/2008	1	0.1	Unconfined
5	50099_0	04/02/2013	1	1	Unconfined
5	50104_0	07/20/2007	1	1	Unconfined
5	50106_0	01/20/2006	1	1	Unconfined
5	50107_0	09/13/2008	1	0.1	Confined
5	50109_0	11/01/2008	1	0.1	Confined
5	50110_0	07/22/2008	1	0.1	Confined
5	50116_0	02/21/2008	1	1	Unconfined
5	50117_0	09/08/2006	1	0.5	Unconfined
5	50120_0	12/21/2003	1	1	Unconfined
5	50121_0	06/17/2009	1	1	Unconfined
5	50122_0	03/06/2014	1	1	Unconfined
5	50134_0	04/05/2011	1	0.5	Unconfined
5	50137_7809105	02/08/1982 to 04/13/2010	26	1	Unconfined
5	50139_0	12/21/2007	1	1	Unconfined
5	50141_0	11/11/2005	1	1	Unconfined
5	50145_0	12/30/2005	1	0.1	Confined
5	50152_0	01/06/2011	1	0.1	Confined
5	50154_0	09/10/2008	1	1	Confined
5	50158_0	09/15/2009	1	0.1	Confined
5	50161_0	12/05/2003	1	0.1	Confined
5	50163_0	03/20/2012	1	0.1	Confined
5	50165_0	11/14/2012	1	1	Unconfined
5	50172_0	02/20/2012	1	1	Confined
5	50173_0	05/19/2006	1	1	Confined
5	50174_0	03/30/2008	1	1	Confined
5	50177_0	02/21/2008	1	0.1	Confined
5	50178_0	10/08/2013	1	1	Confined
5	50182_0	03/20/2013	1	0.1	Confined
5	50183_0	08/23/2013	1	0.1	Confined
5	50184_0	09/02/2008	1	0.1	Confined
5	50187_0	02/29/2004	1	1	Confined
5	50190_0	08/30/2012	1	0.1	Confined
5	50191_0	07/08/2008	1	0.1	Confined
5	50193_0	09/14/2012	1	0.1	Confined
5	50209_0	09/13/2004	1	0.1	Confined
5	50211_0	05/24/2013	1	0.1	Confined
5	50213_0	09/01/2012	1	1	Confined
5	50214_0	11/19/2007	1	0.1	Confined
5	50217_0	09/04/2012	1	1	Confined
5	50220_0	02/10/2012	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	50263_0	02/18/1981 to 02/13/1989	9	0.5	Unconfined
5	50520_0	11/17/2001	1	0.1	Confined
5	50537_0	07/06/2002	1	0.1	Unconfined
5	50549_0	12/10/2002	1	0.1	Confined
5	50553_0	03/21/2003	1	0.1	Unconfined
5	50556_0	04/23/2003	1	0.1	Confined
5	50564_0	07/23/2003	1	0.1	Unconfined
5	50591_0	03/19/2004	1	1	Unconfined
5	50594_0	03/27/2004	1	1	Confined
5	50597_0	04/15/2004	1	0.1	Confined
5	50598_0	06/28/2004	1	0.1	Unconfined
5	50604_0	06/30/2004	1	1	Unconfined
5	50609_0	08/01/2003	1	1	Unconfined
5	50610_0	09/18/2004	1	0.1	Confined
5	50614_0	10/29/2003	1	1	Confined
5	50631_0	11/25/2003	1	1	Confined
5	50648_0	08/15/2005	1	1	Confined
5	50652_0	10/03/2005	1	1	Confined
5	50657_0	03/11/2004	1	1	Confined
5	50661_0	03/21/2004	1	1	Unconfined
5	50669_0	04/07/2006	1	0.1	Unconfined
5	50673_0	03/09/2004	1	1	Unconfined
5	50692_0	07/26/2006	1	0.5	Confined
5	50702_0	11/05/2006	1	0.5	Unconfined
5	50704_0	01/15/2007	1	1	Unconfined
5	50706_0	02/08/2007	1	0.5	Confined
5	50712_0	04/09/2007	1	1	Confined
5	50736_0	03/05/2008	1	1	Confined
5	50738_0	02/12/2008	1	0.5	Confined
5	50755_0	07/09/2008	1	0.5	Unconfined
5	50761_0	07/14/2005	1	1	Unconfined
5	50773_0	11/24/2008	1	1	Confined
5	50775_0	10/10/2005	1	0.5	Confined
5	50782_0	05/01/2006	1	0.5	Confined
5	50789_0	09/12/2006	1	1	Unconfined
5	50801_0	01/14/2009	1	0.5	Confined
5	50806_0	07/20/2004	1	0.5	Confined
5	50809_0	07/28/2004	1	0.5	Confined
5	50811_0	04/16/2009	1	0.5	Confined
5	50814_0	06/03/2004	1	0.1	Confined
5	50830_0	10/29/2004	1	0.5	Confined
5	50831_0	09/22/2004	1	0.5	Confined
5	50861_0	11/02/2005	1	1	Confined
5	50862_0	11/07/2005	1	0.5	Confined
5	50869_0	08/28/2008	1	0.5	Confined
5	50870_0	05/07/2009	1	0.5	Unconfined
5	50872_0	11/26/2008	1	0.1	Unconfined
5	50878_0	05/31/2006	1	0.5	Confined
5	50895_0	08/21/2007	1	0.1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	50896_0	07/18/2007	1	1	Unconfined
5	50897_0	07/13/2007	1	1	Unconfined
5	50899_0	10/25/2009	1	0.5	Confined
5	50916_0	03/04/2010	1	0.1	Confined
5	50930_0	04/14/2010	1	0.1	Unconfined
5	50934_0	06/16/2010	1	0.1	Unconfined
5	50938_0	02/21/2008	1	0.5	Confined
5	50946_0	12/13/2007	1	0.5	Confined
5	50949_0	06/08/2006	1	1	Unconfined
5	50954_0	04/23/2008	1	1	Confined
5	50955_0	08/05/2010	1	0.5	Unconfined
5	50956_0	07/02/2010	1	0.1	Confined
5	50964_0	09/15/2010	1	0.5	Unconfined
5	50970_0	10/23/2010	1	0.5	Unconfined
5	50994_0	03/04/2011	1	0.5	Confined
5	51014_0	03/02/2006	1	1	Unconfined
5	51017_0	05/27/2011	1	0.1	Unconfined
5	51019_0	05/11/2011	1	0.1	Confined
5	51027_0	07/29/2010	1	0.5	Confined
5	51028_0	07/13/2011	1	1	Unconfined
5	51056_0	10/27/2011	1	1	Confined
5	51060_0	11/03/2011	1	0.5	Unconfined
5	51062_0	11/17/2011	1	0.5	Confined
5	51064_0	11/30/2011	1	1	Unconfined
5	51066_0	10/07/2011	1	0.5	Unconfined
5	51069_0	10/28/2011	1	0.5	Confined
5	51072_0	12/30/2011	1	0.5	Confined
5	51074_0	01/06/2012	1	0.5	Confined
5	51082_0	02/13/2012	1	0.5	Confined
5	51092_0	03/05/2012	1	1	Unconfined
5	51112_0	05/23/2012	1	0.5	Unconfined
5	51113_0	05/21/2012	1	0.5	Confined
5	51123_0	06/28/2012	1	0.5	Confined
5	51127_0	08/02/2012	1	0.1	Unconfined
5	51144_0	08/06/2012	1	0.5	Confined
5	51146_0	09/07/2012	1	0.1	Confined
5	51147_0	09/09/2012	1	0.1	Unconfined
5	51172_0	11/29/2012	1	0.5	Unconfined
5	51193_0	04/15/2013	1	1	Confined
5	51198_0	05/02/2013	1	0.1	Unconfined
5	51203_0	03/19/2013	1	0.5	Unconfined
5	51213_0	03/30/2013	1	0.5	Confined
5	51215_0	05/30/2013	1	0.5	Unconfined
5	51216_0	05/23/2013	1	0.5	Confined
5	51218_0	05/22/2013	1	0.5	Confined
5	51235_0	01/15/2012	1	0.5	Confined
5	51248_0	04/30/2012	1	0.5	Confined
5	51252_0	05/12/2011	1	0.5	Confined
5	51256_0	01/26/2012	1	1	Unconfined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
5	51257_0	12/15/2011	1	0.5	Confined
5	51275_0	04/25/2013	1	0.5	Unconfined
5	51284_0	08/11/2013	1	0.5	Confined
5	51297_0	03/30/2010	1	0.1	Unconfined
5	51299_0	07/29/2013	1	0.5	Confined
5	51317_0	10/09/2013	1	1	Confined
5	51326_0	08/30/2013	1	0.5	Confined
5	51329_0	09/23/2013	1	0.1	Unconfined
5	51344_0	01/06/2014	1	0.5	Confined
5	51349_0	12/26/2013	1	0.5	Unconfined
5	51351_0	11/17/2013	1	1	Confined
5	51362_0	01/28/2014	1	1	Confined
5	51368_0	03/28/2014	1	0.5	Confined
5	51370_0	04/01/2014	1	0.5	Confined
5	51373_0	05/12/2014	1	1	Confined
5	56023_6744605	06/06/2001 to 07/10/2002	2	0.5	Confined
5	56024_6744802	09/02/2009 to 06/07/2017	21	1	Confined
5	59577_0	05/18/2013	1	0.5	Confined
5	59586_0	01/28/2014	1	0.5	Confined
5	59588_0	02/14/2014	1	0.5	Confined
5	59591_0	06/15/2010	1	0.5	Confined
5	59599_0	07/25/2012	1	0.5	Confined
5	59605_0	05/14/2011	1	0.5	Confined
7	0_6706501	07/24/1987 to 10/27/2014	27	1	Confined
7	0_6713201	02/20/1981 to 12/12/1996	17	0.1	Confined
7	0_6713204	12/11/2006 to 02/18/2009	2	1	Unconfined
7	0_6713310	12/11/2006 to 01/09/2014	11	0.1	Confined
7	0_6713619	09/23/2009 to 06/27/2017	20	0.5	Confined
7	0_6713702	09/23/2009 to 09/15/2014	14	1	Unconfined
7	0_6713801	02/20/1981 to 12/12/1986	6	0.1	Confined
7	0_6720603	02/20/1981 to 06/14/2017	35	0.5	Unconfined
7	0_6721101	09/23/2009 to 06/22/2012	5	0.5	Confined
7	0_6721104	02/20/1981 to 01/05/1994	9	0.1	Confined
7	0_6721106	01/19/2016 to 06/19/2017	4	1	Unconfined
7	0_6721607	09/22/2009 to 01/23/2017	19	1	Confined
7	0_6721701	02/18/1981 to 06/14/2017	22	0.1	Confined
7	0_6721703	02/18/1981 to 06/14/2017	38	0.1	Confined
7	0_6721803	06/09/2010 to 06/05/2017	13	1	Confined
7	0_6727502	02/19/1981 to 06/05/2017	36	0.1	Confined
7	0_6727503	02/18/1982 to 06/05/2017	32	0.1	Confined
7	0_6727801	04/16/1981 to 06/14/1985	29	1	Confined
7	0_6727807	10/24/2001 to 06/14/2007	9	1	Confined
7	0_6727809	08/22/2002 to 06/02/2016	29	0.5	Confined
7	0_6727909	04/17/1981 to 03/12/1985	30	1	Confined
7	0_6727910	10/24/2001 to 09/24/2003	4	0.1	Confined
7	0_6728104	02/18/1981 to 06/27/2017	40	1	Confined
7	0_6728507	01/25/2011 to 06/12/2015	11	0.5	Confined
7	0_6728508	09/28/2016 to 06/27/2017	3	1	Confined
7	0_6729201	05/06/1981	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	0_6729602	04/08/1982 to 06/14/2017	32	0.1	Confined
7	0_6730509	08/31/2009 to 06/14/2017	21	1	Confined
7	0_6733602	08/17/2008 to 01/31/2017	20	1	Unconfined
7	0_6734303	10/24/2001 to 06/05/2017	27	0.1	Confined
7	0_6734709	01/14/2015 to 06/19/2017	7	1	Confined
7	0_6734710	08/17/2008 to 09/18/2017	27	1	Confined
7	0_6735109	10/24/2001 to 06/05/2017	32	1	Confined
7	0_6735110	10/24/2001 to 06/05/2017	28	0.1	Confined
7	0_6735113	10/24/2012	1	0.1	Confined
7	0_6736105	06/15/2007 to 06/07/2017	21	1	Confined
7	0_6741102	02/16/1981 to 12/01/2017	99	0.1	Confined
7	0_6741305	02/11/2002 to 03/01/2017	43	1	Confined
7	0_6741801	02/16/1981 to 12/11/1990	10	1	Confined
7	0_6742104	06/02/2010 to 06/05/2017	15	1	Confined
7	0_6742204	05/08/2001 to 01/04/2017	33	0.1	Confined
7	0_6742304	08/15/2001 to 06/05/2017	33	1	Confined
7	0_6742608	08/15/2001 to 06/05/2017	31	0.5	Confined
7	0_6749207	03/21/2000	1	1	Confined
7	0_6750203	02/13/1981	1	1	Confined
7	0_6848502	02/19/1982 to 02/16/2010	38	1	Unconfined
7	0_6848907	02/17/1981 to 04/07/2010	20	0.1	Confined
7	0_6850406	05/15/1987	1	0.5	Unconfined
7	0_6850702	02/17/1982 to 02/11/1985	4	1	Unconfined
7	0_6851701	02/11/1981 to 02/24/2010	25	1	Unconfined
7	0_6852718	02/11/1981 to 12/06/2012	40	0.5	Unconfined
7	0_6852722	01/07/2002 to 01/01/2015	43	1	Unconfined
7	0_6852906	04/05/1988	1	1	Unconfined
7	0_6853703	02/19/1981 to 03/18/1996	12	1	Unconfined
7	0_6853707	02/11/1984	1	1	Unconfined
7	0_6853805	02/19/1981 to 02/12/1985	3	0.1	Confined
7	0_6853810	10/20/2012 to 12/01/2017	61	1	Unconfined
7	0_6853907	04/07/1999	1	0.1	Confined
7	0_6853928	10/07/2009 to 12/30/2017	341	0.1	Confined
7	0_6854506	02/17/1981 to 12/01/2017	78	1	Unconfined
7	0_6854602	02/17/1981 to 04/07/2010	25	0.1	Confined
7	0_6854809	05/20/2004 to 12/01/2017	70	1	Confined
7	0_6855111	01/05/1994 to 05/10/2010	18	1	Unconfined
7	0_6855112	06/09/2009 to 05/16/2012	3	1	Unconfined
7	0_6855601	02/17/1981 to 12/03/1986	4	1	Confined
7	0_6856101	02/16/1981 to 04/29/2010	26	1	Confined
7	0_6856302	02/17/1981 to 04/29/2010	29	1	Confined
7	0_6857210	02/09/1981 to 02/07/1990	10	1	Unconfined
7	0_6857316	04/12/2006	1	0.5	Unconfined
7	0_6857402	02/12/1982 to 01/07/1992	10	0.1	Confined
7	0_6857505	02/18/1981 to 02/24/1983	2	0.5	Unconfined
7	0_6857616	02/12/1985	1	0.1	Confined
7	0_6857622	05/21/2002	1	0.1	Confined
7	0_6857701	02/12/1982 to 02/04/2010	25	0.5	Confined
7	0_6857704	08/23/1991	1	0.5	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	0_6857901	02/18/1981	1	0.5	Confined
7	0_6857919	02/25/2013	1	1	Confined
7	0_6858101	02/17/1982 to 03/15/1999	16	1	Unconfined
7	0_6858110	02/09/1981 to 03/16/1988	8	1	Unconfined
7	0_6858410	04/09/2002	1	1	Confined
7	0_6858602	03/11/1982 to 04/20/2010	22	0.1	Confined
7	0_6859213	08/19/2009 to 05/16/2012	3	0.5	Unconfined
7	0_6859303	02/11/1981 to 02/22/1984	4	1	Unconfined
7	0_6859312	02/08/1985 to 02/24/2010	19	1	Unconfined
7	0_6859501	02/11/1981 to 04/12/2010	26	0.1	Confined
7	0_6859509	01/07/2002 to 12/01/2017	69	0.1	Confined
7	0_6859517	09/20/1991 to 03/04/2010	14	0.1	Confined
7	0_6859518	01/21/2002 to 12/01/2017	75	0.1	Confined
7	0_6859621	02/11/1981 to 02/14/1983	3	0.5	Confined
7	0_6860312	02/11/1981 to 01/08/1991	10	0.1	Confined
7	0_6860610	02/11/1981 to 02/21/1984	4	1	Confined
7	0_6860853	05/04/2015	1	1	Confined
7	0_6861201	02/04/2005 to 12/01/2017	61	0.1	Confined
7	0_6861203	01/07/2003 to 02/01/2015	41	0.1	Confined
7	0_6861219	08/04/2004	1	1	Confined
7	0_6861401	07/06/2012 to 12/01/2017	62	1	Confined
7	0_6861415	02/04/2005 to 12/01/2017	75	1	Confined
7	0_6861505	02/04/2005 to 12/01/2017	71	1	Confined
7	0_6861905	03/12/1982 to 12/01/2013	40	1	Confined
7	0_6862101	01/14/1993	1	1	Confined
7	0_6863101	02/17/1981 to 04/28/2010	27	1	Confined
7	0_6863302	02/17/1982	1	1	Confined
7	0_6958701	02/10/1981 to 10/24/2017	36	0.1	Confined
7	0_6958704	02/10/1981 to 02/06/1986	3	0.1	Confined
7	0_6958715	02/10/1981 to 02/25/1998	17	1	Unconfined
7	0_6958717	04/17/2006 to 06/28/2006	2	0.1	Unconfined
7	0_6958801	02/10/1981 to 11/24/2014	34	0.1	Confined
7	0_6958807	10/14/2015 to 10/24/2017	3	0.5	Confined
7	0_6959606	10/23/2001 to 12/30/2017	1152	1	Unconfined
7	0_6959904	02/21/1984 to 02/12/2007	11	0.1	Confined
7	0_6959913	02/15/1981	1	0.1	Confined
7	0_6960802	11/20/2003	1	0.1	Confined
7	0_6960803	02/26/2004	1	0.1	Confined
7	0_6961502	02/11/1983 to 06/09/1998	15	1	Unconfined
7	0_6961525	02/10/1981 to 10/25/2016	35	1	Unconfined
7	0_6961606	02/24/1983 to 04/13/2010	15	0.1	Confined
7	0_6961608	09/03/1998	1	0.1	Confined
7	0_6962601	02/18/1981	1	0.5	Unconfined
7	0_6964405	05/23/2002	1	0.1	Confined
7	0_7607901	02/12/1981 to 10/24/2017	31	0.5	Unconfined
7	0_7607904	01/28/2013 to 10/24/2017	5	0.5	Unconfined
7	0_7607907	01/23/2013 to 10/24/2017	5	0.5	Unconfined
7	0_7607919	02/12/1981 to 10/24/2017	31	1	Unconfined
7	0_7607923	12/31/1980 to 03/24/1993	2	1	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	0_7608401	02/12/1981 to 02/19/1990	5	1	Unconfined
7	0_7608406	02/04/1986 to 01/24/2012	21	1	Unconfined
7	0_7608503	02/09/1983 to 03/11/1988	3	0.5	Unconfined
7	0_7608704	02/08/1986	1	0.5	Unconfined
7	0_7648803	04/14/1998	1	0.1	Confined
7	0_7701101	02/11/1981 to 01/13/1999	4	1	Unconfined
7	0_7701311	02/11/1981 to 02/04/2014	24	0.1	Confined
7	0_7701404	02/11/1981 to 02/13/2003	16	1	Confined
7	0_7701605	02/11/1981 to 02/09/1983	2	1	Confined
7	0_7701701	05/18/2012	1	0.1	Confined
7	0_7701702	02/11/1981 to 10/24/2017	23	1	Confined
7	0_7702103	02/11/1981 to 02/20/1990	7	0.1	Confined
7	0_7702114	02/11/1981 to 02/12/1987	6	1	Confined
7	0_7702403	02/10/1981 to 02/09/2007	2	0.1	Confined
7	0_7702412	02/11/1981 to 02/09/1983	2	0.1	Confined
7	0_7702414	02/04/1986 to 02/17/2004	10	1	Confined
7	0_7702509	09/05/2002 to 12/30/2017	1021	1	Confined
7	0_7702513	03/16/2006 to 02/09/2007	2	1	Confined
7	0_7702514	12/07/2001 to 10/24/2017	10	1	Confined
7	0_7702606	02/21/1984 to 02/25/1998	7	1	Confined
7	0_7702706	02/10/1981 to 02/05/1985	3	1	Confined
7	0_7703401	02/21/1984 to 02/25/1998	9	1	Confined
7	0_7703404	12/13/2006	1	1	Confined
7	0_7703405	09/01/2006	1	1	Confined
7	0_7704202	02/05/1986 to 02/14/1989	2	0.5	Confined
7	0_7704431	02/10/1981 to 02/09/2007	14	1	Confined
7	0_7704441	04/02/1987	1	1	Confined
7	0_7704718	02/10/1981 to 03/11/1994	9	0.5	Confined
7	0_7705501	05/17/1999	1	1	Confined
7	0_7706308	10/26/2002	1	1	Confined
7	0_7706601	01/13/2003 to 03/01/2012	10	0.5	Confined
7	0_7707901	02/14/1984 to 04/13/2010	19	0.5	Confined
7	0_7708409	02/12/1982 to 05/03/2010	18	1	Confined
7	0_7708511	11/05/2011 to 12/30/2017	435	0.5	Confined
7	0_7708719	08/03/2013	1	1	Confined
7	0_7708803	09/01/1993 to 12/01/2017	626	1	Confined
7	0_7708812	02/16/1984 to 02/18/2009	9	1	Confined
7	0_7709105	05/07/2002	1	0.1	Confined
7	0_7709303	10/31/2010	1	1	Confined
7	0_7710101	02/11/1981 to 02/05/1985	4	1	Confined
7	0_7710601	07/30/2017 to 12/30/2017	36	1	Confined
7	0_7710604	02/09/1981 to 02/10/1983	2	1	Confined
7	0_7710609	08/25/2002 to 07/25/2017	1128	1	Confined
7	0_7710809	08/29/2010 to 06/23/2011	2	1	Confined
7	0_7711703	02/09/1981 to 03/11/1994	12	1	Confined
7	0_7711715	02/09/1981 to 02/05/1985	4	1	Confined
7	0_7713202	07/26/2003	1	1	Confined
7	0_7714504	05/23/2002	1	1	Confined
7	0_7714904	02/23/1983 to 05/03/2010	22	0.5	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	0_7714910	06/26/2005	1	1	Confined
7	0_7715907	02/09/1982 to 01/22/1992	7	0.5	Confined
7	0_7715911	02/08/1991	1	1	Confined
7	0_7716409	01/03/1997 to 04/11/2006	19	1	Confined
7	0_7716705	02/10/1982 to 01/18/2010	23	1	Confined
7	0_7717201	02/12/1981	1	1	Confined
7	0_7718207	11/11/1993	1	1	Confined
7	0_7718401	02/12/1981	1	1	Confined
7	0_7718406	02/07/1986	1	1	Confined
7	0_7718407	09/24/1997	1	1	Confined
7	0_7718516	12/31/1980 to 01/25/2012	222	1	Confined
7	0_7718704	02/11/1985 to 10/17/2017	31	0.5	Confined
7	0_7718807	12/13/1995	1	1	Confined
7	0_7718904	02/10/1981	1	1	Confined
7	0_7719102	02/09/1981 to 03/23/2000	17	1	Confined
7	0_7719503	03/28/2005	1	1	Confined
7	0_7719703	02/10/1981 to 02/11/1986	3	1	Confined
7	0_7722301	02/10/1982 to 03/20/1987	6	0.5	Confined
7	0_7722703	12/28/2001 to 04/13/2010	10	1	Confined
7	0_7723301	02/09/1982 to 04/15/2010	20	0.5	Confined
7	0_7723509	02/10/1982 to 02/15/1985	3	1	Confined
7	0_7723513	03/05/2011 to 05/01/2017	56	0.5	Confined
7	0_7723602	02/15/1984 to 04/13/2010	17	1	Confined
7	0_7723701	02/09/1982 to 02/14/1989	5	0.5	Confined
7	0_7723803	02/09/1982 to 02/18/1986	5	1	Confined
7	0_7723807	02/22/1990 to 05/03/2010	15	1	Confined
7	0_7723808	02/14/1989	1	1	Confined
7	0_7723809	02/18/1992	1	1	Confined
7	0_7725201	02/10/1981	1	0.1	Confined
7	0_7725307	10/09/2008 to 12/30/2017	677	0.1	Confined
7	0_7725604	02/10/1981 to 02/15/1990	4	0.1	Confined
7	0_7726101	02/10/1981 to 01/25/1996	10	0.1	Confined
7	0_7726418	02/08/1983 to 01/25/1996	6	0.1	Confined
7	0_7726430	05/16/2002	1	0.1	Confined
7	0_7726431	05/28/2009 to 05/18/2012	3	0.1	Confined
7	0_7726601	04/15/1986 to 06/15/1986	3	1	Confined
7	0_7726605	12/31/1980 to 01/27/2010	341	1	Confined
7	0_7726610	12/27/1984 to 02/12/1986	2	1	Confined
7	0_7726612	02/10/1981 to 02/08/1983	2	0.5	Confined
7	0_7726613	02/08/1983 to 03/09/1988	6	1	Confined
7	0_7726708	02/10/1981 to 10/17/2017	32	0.1	Confined
7	0_7726805	02/10/1981 to 02/10/1986	2	0.1	Confined
7	0_7726817	05/18/2000	1	0.1	Confined
7	0_7726904	02/10/1981	1	0.1	Confined
7	0_7727504	04/01/1997 to 09/22/1997	2	1	Confined
7	0_7728503	02/11/1981 to 01/24/2013	23	1	Confined
7	0_7728507	09/18/1997	1	1	Confined
7	0_7728804	02/08/1983	1	0.5	Confined
7	0_7730502	02/17/1981 to 01/24/2012	17	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	0_7730801	02/17/1981 to 02/05/2007	22	1	Confined
7	0_7731706	10/17/1997	1	1	Confined
7	0_7733201	02/11/1981	1	1	Unconfined
7	0_7733301	12/31/1980 to 03/30/2002	1422	0.1	Confined
7	0_7733309	04/14/1998	1	1	Unconfined
7	0_7733322	02/11/1981 to 01/21/2004	21	1	Unconfined
7	0_7733611	02/10/1981 to 10/17/2017	33	0.5	Unconfined
7	0_7733617	05/20/2001	1	0.5	Confined
7	0_7733701	02/11/1981 to 02/26/2008	19	0.1	Confined
7	0_7734204	02/11/1981	1	0.1	Confined
7	0_7734217	12/19/2007	1	0.1	Confined
7	0_7734319	02/11/1981 to 02/12/1985	3	0.1	Confined
7	0_7734402	02/10/1981 to 02/10/1987	5	0.1	Confined
7	0_7734606	01/30/1990 to 09/17/1997	2	1	Confined
7	0_7734607	02/11/1981 to 02/24/2009	18	0.5	Confined
7	0_7734702	02/11/1981 to 10/17/2017	31	0.5	Confined
7	0_7735601	02/11/1981 to 01/25/1996	10	0.5	Confined
7	0_7735802	02/10/1981 to 02/10/1987	5	1	Confined
7	0_7737101	02/11/1981 to 02/18/1993	11	0.5	Confined
7	0_7737501	02/10/1981 to 05/18/2006	24	1	Confined
7	0_7738103	11/15/2003 to 12/30/2017	872	1	Confined
7	0_7738201	02/17/1981 to 10/13/2016	18	1	Confined
7	0_7738703	10/25/2012	1	1	Confined
7	0_7738901	02/14/1983 to 11/23/1994	11	1	Confined
7	0_7739301	02/17/1981 to 10/30/2015	18	1	Confined
7	0_7739407	04/20/1982 to 10/17/2017	24	1	Confined
7	0_7739408	05/25/1988	1	1	Confined
7	0_7739409	02/08/2016	1	1	Confined
7	0_7740303	02/17/1981 to 02/11/2002	12	0.5	Confined
7	0_7741202	03/09/2011	1	1	Confined
7	0_7741401	02/11/1981 to 01/29/1996	9	0.5	Confined
7	0_7742101	01/19/2011	1	1	Confined
7	0_7742801	02/11/1981 to 10/17/2017	23	0.5	Confined
7	0_7744101	02/10/1981 to 02/05/2014	25	0.5	Confined
7	0_7744106	03/28/1997	1	1	Confined
7	0_7744107	10/17/2017	1	0.5	Confined
7	0_7745602	10/21/1994	1	1	Confined
7	0_7748301	02/17/1981 to 10/18/2017	32	1	Confined
7	0_7748303	04/06/2012	1	1	Confined
7	0_7748801	08/12/1997 to 10/18/2017	12	1	Confined
7	0_7749501	05/01/1989	1	1	Confined
7	0_7750201	02/10/1981 to 02/19/1992	5	1	Confined
7	0_7750601	02/22/1985 to 03/15/1988	3	1	Confined
7	0_7750603	05/15/1988 to 04/11/2006	4	1	Confined
7	0_7752801	04/01/1995	1	1	Confined
7	0_7756801	02/16/1981 to 02/15/1982	2	0.1	Confined
7	0_7758301	02/18/1984 to 03/15/1988	4	1	Confined
7	0_7759401	02/18/1984 to 12/03/1990	5	0.5	Confined
7	0_7759501	03/18/1998	1	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	0_7760201	01/05/1988	1	1	Confined
7	0_7764401	02/13/1981 to 10/18/2017	23	1	Confined
7	0_7802702	02/08/1982 to 05/03/2010	23	1	Confined
7	0_7802815	03/04/1997 to 12/01/2017	54	0.5	Confined
7	0_7803302	03/11/1982	1	0.5	Confined
7	0_7804107	10/20/2000	1	1	Confined
7	0_7804204	02/07/1985 to 01/08/1993	5	0.5	Confined
7	0_7809305	02/13/1985 to 05/03/2010	23	1	Confined
7	0_7809506	01/02/1992 to 01/18/2010	110	0.5	Confined
7	0_7809507	03/05/1991 to 01/18/2010	18	0.5	Confined
7	0_7818702	03/28/2006	1	1	Confined
7	0_7821804	10/26/2015 to 10/16/2017	3	1	Confined
7	0_7825502	06/05/2011 to 12/25/2017	523	1	Confined
7	0_7825803	02/17/1981	1	1	Confined
7	0_7827303	02/16/1981	1	0.5	Confined
7	0_7841301	02/17/1981 to 02/14/1985	4	1	Confined
7	0_8501301	02/02/1983 to 02/26/1986	4	0.5	Confined
7	0_8503905	01/27/1998	1	0.5	Confined
7	0_8504401	02/11/1982 to 10/14/2014	17	0.5	Confined
7	0_8511302	02/12/1982	1	1	Confined
7	10206_0	06/17/2006	1	1	Confined
7	10207_0	12/14/2009	1	1	Confined
7	11644_0	03/15/2011	1	1	Confined
7	11666_7836204	05/07/1987	1	1	Confined
7	11817_0	08/10/2001	1	1	Confined
7	11819_0	01/26/2011	1	1	Confined
7	11821_0	07/25/2009	1	1	Confined
7	11824_7804509	07/15/2007	1	1	Confined
7	11826_7803311	07/30/2006	1	1	Confined
7	11830_0	12/06/2010	1	1	Confined
7	11831_0	07/20/2010	1	1	Confined
7	11832_0	11/12/2010	1	1	Confined
7	11833_0	08/13/2003	1	1	Confined
7	11834_0	08/31/2001	1	1	Confined
7	11835_0	06/30/2011	1	1	Confined
7	11836_0	06/23/2011	1	1	Confined
7	11837_0	11/16/2010	1	1	Confined
7	11838_0	12/20/2010	1	1	Confined
7	11840_0	04/14/2009	1	1	Confined
7	11841_0	01/08/2010	1	1	Confined
7	11845_0	01/20/2010	1	1	Confined
7	11846_0	08/12/2010	1	1	Confined
7	11847_0	11/19/2010	1	1	Confined
7	11848_0	06/25/2010	1	1	Confined
7	11850_0	12/12/2010	1	1	Confined
7	11851_0	12/20/2010	1	1	Confined
7	11852_0	08/05/2010	1	1	Confined
7	11853_0	01/24/2011	1	1	Confined
7	11855_0	09/08/2009	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	11856_0	12/02/2010	1	1	Confined
7	11857_0	06/09/2011	1	1	Confined
7	11858_0	08/06/2009	1	1	Confined
7	11860_0	05/11/2011	1	1	Confined
7	11861_0	11/16/2010	1	1	Confined
7	11862_0	01/22/2010	1	1	Confined
7	11863_0	07/02/2010	1	1	Confined
7	11865_0	05/26/2010	1	1	Confined
7	11866_0	12/22/2009	1	1	Confined
7	11867_0	05/23/2011	1	1	Confined
7	11868_0	10/22/2010	1	1	Confined
7	11869_0	05/05/2010	1	1	Confined
7	11870_0	05/16/2011	1	1	Confined
7	11871_0	01/27/2011	1	1	Confined
7	11872_0	06/09/2011	1	1	Confined
7	13227_0	07/15/2010	1	1	Confined
7	13228_0	03/15/2010	1	1	Confined
7	13229_0	12/13/2010	1	1	Confined
7	13230_0	11/13/2006	1	1	Confined
7	13231_0	04/26/2011	1	1	Confined
7	13232_0	11/12/2010	1	1	Confined
7	13233_0	07/29/2010	1	1	Confined
7	13234_0	11/03/2006	1	1	Confined
7	13235_0	04/30/2009	1	0.1	Confined
7	13236_0	07/21/2009	1	1	Confined
7	13237_7811218	07/10/1990	1	1	Confined
7	13244_7804820	08/22/1995	1	0.5	Confined
7	13246_7804313	12/20/2001	1	1	Confined
7	13247_7804612	05/17/1991 to 02/05/2010	15	1	Confined
7	13255_7805212	01/14/1994 to 02/05/2010	13	1	Confined
7	13256_6861909	05/18/2008	1	1	Confined
7	13260_7804312	08/26/1996	1	1	Confined
7	13263_7805124	08/01/1997 to 06/01/1999	2	1	Confined
7	13287_7815805	02/24/1982 to 11/02/2016	45	1	Confined
7	13290_7813705	10/18/1995	1	1	Confined
7	13294_7828501	02/16/1981 to 10/26/2015	22	1	Confined
7	13298_7834205	05/17/1996	1	1	Confined
7	13301_7836205	12/10/1996	1	1	Confined
7	13426_7814802	03/18/1988 to 01/21/2010	17	1	Confined
7	13452_7818601	02/17/1984	1	1	Confined
7	14368_0	05/06/2001	1	1	Confined
7	14369_0	12/21/2003	1	1	Confined
7	14376_0	04/11/2008	1	1	Confined
7	14470_0	02/12/2009	1	1	Confined
7	14471_0	11/10/2010	1	1	Confined
7	15302_6743903	01/10/2001 to 09/09/2005	11	1	Confined
7	15321_6721903	02/18/1981 to 09/15/2010	15	1	Confined
7	15769_6861413	08/09/1982	1	1	Confined
7	15773_7803601	02/10/1981 to 01/28/1991	11	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	15776_6729603	05/01/1990 to 09/11/2000	8	1	Confined
7	15791_6858506	02/16/1984 to 04/13/2010	16	1	Confined
7	15802_6859804	02/11/1981 to 04/20/2010	20	1	Confined
7	15831_6860401	02/11/1981 to 03/18/1987	7	0.5	Confined
7	15879_6860850	01/04/1995	1	1	Confined
7	15881_6860852	01/13/2000 to 12/01/2017	80	1	Confined
7	15885_6860912	01/02/1992 to 01/15/2010	830	1	Confined
7	15898_6860527	08/30/1985 to 03/02/2010	2	1	Confined
7	15903_6861304	01/07/2003 to 12/05/2013	31	1	Confined
7	15908_6861319	05/06/2002	1	1	Confined
7	15909_6861320	07/20/2005 to 12/01/2017	70	1	Confined
7	15910_6861322	08/28/2005	1	1	Confined
7	15917_6861507	01/29/2009 to 06/01/2017	59	1	Confined
7	15920_6861602	02/12/1981 to 04/12/2010	27	1	Confined
7	15935_6862405	02/12/1981 to 04/12/2010	27	1	Confined
7	15948_7805104	01/03/1994 to 03/03/1997	13	1	Confined
7	15951_7805116	02/10/1981 to 04/12/2010	27	1	Confined
7	15966_7805501	02/10/1981 to 01/08/1991	10	1	Confined
7	15976_7805802	02/21/1984 to 02/05/2010	13	1	Confined
7	15979_7806103	02/21/1984 to 02/05/2010	20	1	Confined
7	15986_7806507	02/07/1983 to 04/06/2010	11	1	Confined
7	15996_7810303	02/09/1981 to 12/03/2013	40	1	Confined
7	16001_7810606	02/09/1981 to 04/20/2010	18	1	Confined
7	16008_7811202	02/26/1982 to 02/20/2010	27	1	Confined
7	16011_7811301	02/09/1981 to 04/20/2010	16	1	Confined
7	16015_7811501	02/09/1981 to 02/07/1985	2	1	Confined
7	16023_7811903	02/09/1981 to 02/26/1990	9	1	Confined
7	16029_7812701	02/09/1981 to 03/17/1987	4	1	Confined
7	16036_7814204	02/07/1983	1	1	Confined
7	16040_7814801	03/18/1988 to 01/21/2010	17	1	Confined
7	16041_7815301	02/24/1982 to 02/17/1989	8	0.5	Confined
7	16044_7815810	05/20/1997	1	1	Confined
7	16046_7818206	02/09/1982 to 04/13/2010	27	0.5	Confined
7	16050_7820101	02/24/1982 to 01/01/2014	53	1	Confined
7	16055_7821106	02/24/1982 to 01/21/1991	7	1	Confined
7	16056_7821801	02/16/1981 to 10/16/2017	24	1	Confined
7	16057_7822201	03/18/1988 to 01/21/2010	18	1	Confined
7	16058_7822202	02/09/1981 to 12/31/1993	6	1	Confined
7	16063_7826601	02/16/1981	1	1	Confined
7	16065_7827503	02/16/1981 to 01/25/1995	12	0.5	Confined
7	16068_7828602	02/05/1985 to 02/24/2003	17	1	Confined
7	16070_7828702	02/16/1981 to 02/19/1997	11	0.5	Confined
7	16084_7836902	02/16/1981	1	1	Confined
7	16085_7837103	02/16/1981 to 01/26/2012	21	0.5	Confined
7	16086_7842902	02/16/1981	1	0.5	Confined
7	16162_7804803	01/12/1994 to 01/23/1995	2	1	Confined
7	16286_6855902	02/18/2000	1	1	Confined
7	16301_0	09/12/2007	1	1	Unconfined
7	16302_0	04/06/2008	1	0.1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	16305_0	07/23/2008	1	0.1	Unconfined
7	16316_0	09/29/2008	1	1	Confined
7	16317_0	09/30/2008	1	1	Confined
7	16336_0	12/31/2010	1	0.1	Confined
7	16393_6727401	01/21/2013 to 06/19/2017	11	0.1	Confined
7	16404_6733803	09/07/2005 to 06/19/2017	32	1	Unconfined
7	16408_6734301	04/29/2008 to 06/05/2017	27	0.1	Confined
7	16409_6734302	02/17/1981 to 02/06/1985	5	0.1	Confined
7	16412_6734704	02/17/1981 to 02/18/2004	22	0.1	Confined
7	2569_8519903	08/31/1993 to 03/27/1997	2	1	Confined
7	35771_6857307	02/09/1981 to 10/23/2017	36	1	Unconfined
7	3841_0	11/15/2001	1	1	Confined
7	3842_0	05/28/2002	1	1	Confined
7	38947_6734706	02/20/1998 to 09/18/2017	35	1	Confined
7	38953_6733704	09/16/1986	1	1	Unconfined
7	38998_6733705	05/10/1996	1	0.5	Unconfined
7	39003_0	02/06/2009	1	0.1	Confined
7	39005_0	04/29/2005	1	0.1	Confined
7	39006_0	02/21/2010	1	0.1	Confined
7	39170_6713605	02/20/1981 to 09/23/2009	6	1	Confined
7	39324_6706502	04/15/1981	1	1	Confined
7	39327_6706609	07/23/1987	1	1	Confined
7	39328_6706802	04/15/1981	1	1	Confined
7	39344_6736501	06/15/2007 to 06/07/2017	25	1	Confined
7	39352_6735201	05/04/1999 to 01/23/2017	32	1	Confined
7	39363_6720805	09/22/2009 to 06/01/2012	8	1	Unconfined
7	39364_6721204	05/06/1981	1	0.1	Confined
7	39367_6721705	12/23/1996	1	1	Confined
7	39375_6727703	12/31/1980 to 06/14/1985	33	1	Confined
7	39376_6727806	04/17/1981 to 06/14/1985	34	0.1	Confined
7	39379_6727903	06/14/2000 to 01/04/2017	32	0.5	Confined
7	39405_6728704	08/09/2004	1	1	Confined
7	39408_6729303	08/15/1989	1	1	Confined
7	39423_6734612	10/15/1999 to 06/06/2017	22	0.1	Confined
7	39428_6734905	06/30/2000 to 06/05/2017	36	0.1	Confined
7	39430_6735401	05/04/1999 to 06/05/2017	37	1	Confined
7	39433_6735404	01/17/2012 to 01/02/2014	3	1	Confined
7	39442_6735903	07/14/1993	1	1	Confined
7	39455_6736806	02/28/2007	1	1	Confined
7	39458_6742202	02/17/1981 to 01/17/2012	23	1	Confined
7	39459_6742205	07/28/2003 to 06/11/2015	8	1	Confined
7	39460_6742303	07/17/2000 to 06/05/2017	16	1	Confined
7	39463_6742602	09/02/2009 to 09/06/2011	7	1	Confined
7	39471_6742905	03/20/2001 to 06/03/2014	28	1	Confined
7	39472_6742906	07/11/2002	1	1	Confined
7	39473_6742913	08/19/1998	1	1	Confined
7	39474_6742914	05/22/2000	1	1	Confined
7	39475_6742915	05/25/2003 to 06/05/2017	7	1	Confined
7	39476_6743103	01/13/2000 to 06/05/2017	44	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	39494_6743805	08/22/2002 to 06/07/2017	27	1	Confined
7	39496_6743901	02/19/1981	1	1	Confined
7	39499_6743907	01/16/2006 to 06/07/2017	16	1	Confined
7	39501_6751102	06/02/2010 to 09/11/2014	12	1	Confined
7	39502_6727701	02/17/1981 to 02/07/1985	5	1	Confined
7	39506_6749201	02/16/1981 to 12/01/2017	94	1	Confined
7	39531_6855704	02/17/1981 to 04/29/2010	26	1	Confined
7	39542_6854301	02/17/1981 to 02/05/1985	5	1	Unconfined
7	39550_6863802	02/17/1981 to 04/30/2010	20	1	Confined
7	39551_6863803	10/22/2002	1	1	Confined
7	39555_6864401	02/17/1981 to 01/05/1993	9	1	Confined
7	39556_6864402	09/01/1993 to 04/30/2010	22	1	Confined
7	39559_6741304	09/18/2000	1	1	Confined
7	39560_6741401	02/16/1981 to 12/02/1986	5	0.1	Confined
7	39580_6749206	03/17/2000 to 12/05/2013	29	1	Confined
7	39585_6750302	10/19/1999 to 12/01/2017	62	1	Confined
7	39603_6847903	02/17/1981 to 12/12/1990	10	0.5	Unconfined
7	39620_6848402	05/01/1989	1	0.1	Unconfined
7	39621_6848407	04/29/2005	1	1	Unconfined
7	39624_6848508	01/24/1994	1	1	Unconfined
7	39625_6848601	02/19/1982 to 04/07/2010	19	1	Unconfined
7	39634_6848708	02/29/1996 to 07/01/2002	2	0.1	Confined
7	39635_6848709	01/23/2008	1	0.1	Confined
7	39647_6853902	01/06/1994 to 12/01/2017	80	0.1	Confined
7	39659_6854802	02/11/1983 to 02/14/1989	5	1	Confined
7	39663_6854807	08/14/1998	1	1	Confined
7	39664_6854808	08/05/1998	1	1	Confined
7	39665_6854901	02/17/1982 to 04/27/2010	45	1	Confined
7	39669_6855107	08/15/1986 to 01/12/1995	3	1	Unconfined
7	39674_6855202	02/18/1982 to 01/11/1996	8	0.1	Confined
7	39676_6855206	09/30/1990	1	0.1	Confined
7	39683_6855407	02/17/1981 to 04/29/2010	25	1	Confined
7	39694_6855706	02/11/1983 to 02/16/1988	4	1	Confined
7	39697_6855806	02/19/1986	1	1	Confined
7	39698_6855901	01/31/2000	1	1	Confined
7	39699_6855903	02/16/1981 to 02/18/1982	2	1	Confined
7	39702_6855908	07/10/2002	1	0.5	Confined
7	39708_6856201	02/17/1981 to 04/29/2010	27	1	Confined
7	39714_6856401	02/17/1981 to 02/05/1985	4	1	Confined
7	39725_6856704	05/26/1982	1	1	Confined
7	39732_6856902	02/17/1981 to 03/07/1997	11	1	Confined
7	39734_6862104	01/01/1994 to 12/20/2017	949	1	Confined
7	39738_6862108	02/01/1993 to 04/29/2010	14	1	Confined
7	39739_6862202	02/17/1981 to 12/04/1986	5	1	Confined
7	39742_6862205	02/14/1983 to 12/12/1990	8	1	Confined
7	39752_6862902	02/17/1981 to 04/28/2010	22	1	Confined
7	39754_6862906	10/10/1991 to 04/28/2010	18	1	Confined
7	39756_6863208	07/14/1984	1	1	Confined
7	39776_7808306	09/18/2000	1	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	39820_7808301	09/18/2000	1	1	Confined
7	39821_7808302	09/18/2000	1	1	Confined
7	39950_0	08/14/2003	1	1	Confined
7	39951_0	09/16/2003	1	1	Confined
7	39952_0	04/02/2012	1	1	Confined
7	39953_0	04/16/2011	1	1	Confined
7	39954_0	06/19/2012	1	1	Confined
7	39975_6863804	09/05/2002	1	1	Confined
7	39995_6864902	12/31/1980	1	1	Confined
7	42152_6848507	02/17/1981 to 07/01/1994	23	1	Unconfined
7	42155_6848812	02/17/1981 to 04/07/2010	27	1	Confined
7	42665_6860913	02/11/1981 to 02/21/1984	4	1	Confined
7	42672_7802303	02/09/1981 to 01/24/1991	4	1	Confined
7	42679_7803509	02/10/1981 to 01/24/1991	10	1	Confined
7	42692_7804812	02/10/1981 to 01/29/1991	9	1	Confined
7	42711_7812502	10/18/2006	1	1	Confined
7	42748_6852713	02/11/1981 to 06/01/2017	98	0.5	Unconfined
7	42952_6742308	09/02/2009 to 06/05/2017	16	0.5	Confined
7	42953_0	10/06/2003	1	1	Confined
7	43043_7822304	07/30/2013	1	1	Confined
7	43060_6734705	04/09/1985	1	1	Confined
7	43099_6856409	02/01/1988	1	1	Confined
7	43262_7711718	02/09/1981 to 03/16/2006	18	1	Confined
7	48075_6853811	05/22/2002	1	0.1	Confined
7	48076_6853908	05/01/2002	1	0.1	Confined
7	48077_6853909	07/20/2002	1	0.1	Confined
7	48080_6861313	04/26/2002	1	1	Confined
7	48081_6853911	06/04/2002	1	0.1	Confined
7	48082_6853912	09/05/2002	1	0.1	Confined
7	48083_6853913	09/24/2002	1	0.1	Confined
7	48089_6861318	08/01/2002	1	1	Confined
7	48091_6853918	04/25/2005	1	0.1	Confined
7	48092_6853919	07/07/2005	1	0.1	Confined
7	48093_6853920	09/13/2005	1	0.1	Confined
7	48094_6853812	06/14/2005	1	0.1	Confined
7	48096_6853922	05/14/2005	1	0.1	Confined
7	48097_6853923	07/18/2005	1	1	Confined
7	48098_6861222	06/19/2005	1	0.1	Confined
7	48099_6853924	06/24/2005	1	1	Confined
7	48101_6861323	08/17/2005	1	1	Confined
7	48102_6861324	07/28/2005	1	1	Confined
7	48103_6853910	05/02/2005	1	0.1	Confined
7	48104_6853914	08/21/2002	1	0.1	Confined
7	48105_6853915	09/18/2007	1	0.1	Confined
7	48106_6853916	09/06/2007	1	0.1	Confined
7	48107_6853917	08/11/2007	1	0.1	Confined
7	48108_0	01/12/2009	1	0.1	Confined
7	48109_0	03/02/2009	1	0.1	Confined
7	48110_0	02/12/2009	1	0.1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	48111_0	03/30/2009	1	1	Confined
7	48112_0	08/13/2007	1	0.1	Confined
7	48113_0	12/15/2008	1	0.1	Confined
7	48193_0	08/23/2004	1	0.1	Confined
7	48194_0	09/21/2004	1	0.1	Confined
7	48204_0	11/30/2010	1	1	Confined
7	48220_0	11/20/2013	1	0.1	Confined
7	48224_6743607	09/14/2003 to 06/01/2016	15	1	Confined
7	48227_6743304	09/12/2003 to 06/05/2017	15	1	Confined
7	48235_6735805	08/15/2003 to 01/04/2016	14	1	Confined
7	48238_6735908	10/14/2003 to 06/05/2017	14	1	Confined
7	48248_0	09/03/2012	1	1	Confined
7	48249_0	11/07/2012	1	1	Confined
7	48253_0	09/28/2012	1	1	Confined
7	48255_0	08/10/2012	1	1	Confined
7	48257_0	07/20/2012	1	1	Confined
7	48258_0	12/08/2010	1	1	Confined
7	48263_0	04/28/2011	1	1	Confined
7	48404_0	01/21/2013	1	0.1	Confined
7	48405_0	05/22/2012	1	1	Unconfined
7	48406_0	03/02/2012	1	1	Unconfined
7	48407_0	02/07/2012	1	0.1	Unconfined
7	48408_0	06/27/2012	1	1	Unconfined
7	48427_0	09/10/2011	1	1	Confined
7	48428_0	10/30/2009	1	1	Confined
7	48429_0	04/06/2012	1	1	Confined
7	48434_0	02/14/2014	1	1	Confined
7	48436_0	07/14/2012	1	1	Confined
7	48438_0	12/17/2010	1	1	Confined
7	48440_0	09/01/2013	1	1	Confined
7	48441_0	05/31/2006	1	1	Confined
7	48442_0	01/17/2012	1	1	Confined
7	48446_0	05/19/2011	1	1	Confined
7	48447_0	01/09/2014	1	1	Confined
7	48448_0	12/21/2012	1	1	Confined
7	48461_6736106	03/15/2004	1	0.5	Confined
7	48463_0	01/28/2013	1	1	Confined
7	48464_0	01/15/2014	1	1	Confined
7	48466_0	09/01/2011	1	1	Confined
7	48470_0	06/07/2003	1	1	Confined
7	48472_0	08/04/2013	1	0.1	Confined
7	48612_0	05/13/2011	1	1	Confined
7	48613_0	05/21/2011	1	1	Confined
7	48638_0	07/14/2011	1	1	Confined
7	48641_0	12/09/2009	1	1	Confined
7	48642_0	08/08/2011	1	1	Confined
7	48643_0	10/10/2009	1	1	Confined
7	48645_0	07/18/2013	1	1	Confined
7	48647_0	08/09/2013	1	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	48680_0	01/27/2011	1	1	Confined
7	48684_0	01/25/2011	1	1	Confined
7	48685_0	08/03/2010	1	1	Confined
7	48686_0	06/15/2010	1	1	Confined
7	48687_0	09/24/2007	1	1	Confined
7	48689_0	05/05/2009	1	1	Confined
7	48690_0	03/09/2010	1	1	Confined
7	48691_0	02/27/2010	1	1	Confined
7	48692_0	08/15/2010	1	1	Confined
7	48693_0	10/15/2010	1	1	Confined
7	48694_0	11/18/2010	1	1	Confined
7	48695_0	07/22/2010	1	1	Confined
7	48697_0	05/10/2010	1	1	Confined
7	48698_0	04/15/2010	1	1	Confined
7	48699_0	09/02/2010	1	1	Confined
7	48705_0	04/01/2011	1	1	Confined
7	48708_0	11/28/2010	1	1	Confined
7	48709_0	04/28/2011	1	1	Confined
7	48712_0	04/23/2010	1	1	Confined
7	48714_0	05/13/2010	1	1	Confined
7	48721_0	07/20/2011	1	1	Confined
7	48730_0	10/07/2011	1	1	Confined
7	48734_0	12/22/2009	1	1	Confined
7	48741_0	11/09/2009	1	1	Confined
7	48743_0	11/05/2010	1	1	Confined
7	48744_0	10/21/2011	1	1	Confined
7	48745_0	11/01/2010	1	1	Confined
7	48746_0	09/20/2010	1	1	Confined
7	48747_0	08/10/2011	1	1	Confined
7	48748_0	10/19/2010	1	1	Confined
7	48749_0	08/20/2011	1	1	Confined
7	48751_0	06/17/2003	1	1	Confined
7	48752_0	05/09/2011	1	1	Confined
7	48754_0	05/25/2011	1	1	Confined
7	48756_0	04/07/2010	1	1	Confined
7	48758_0	12/06/2009	1	1	Confined
7	48760_0	02/13/2010	1	1	Confined
7	48762_0	02/28/2011	1	1	Confined
7	48771_0	03/20/2011	1	1	Confined
7	48774_0	09/23/2011	1	1	Confined
7	48778_0	12/19/2011	1	1	Confined
7	48779_0	09/04/2009	1	1	Confined
7	48785_0	10/04/2011	1	1	Confined
7	48788_0	02/12/2011	1	1	Confined
7	48800_0	06/10/2011	1	1	Confined
7	48807_0	05/17/2011	1	1	Confined
7	48808_0	07/25/2011	1	1	Confined
7	48809_0	04/29/2006	1	1	Confined
7	48810_0	03/15/2006	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	48811_0	06/28/2011	1	1	Confined
7	48813_0	07/30/2005	1	1	Confined
7	48814_0	01/19/2009	1	1	Confined
7	48815_0	12/23/2009	1	1	Confined
7	48816_0	05/10/2010	1	1	Confined
7	48817_0	10/21/2011	1	1	Confined
7	48818_0	04/04/2014	1	1	Confined
7	48819_0	02/03/2010	1	1	Confined
7	48820_0	04/16/2010	1	1	Confined
7	48821_0	08/24/2006	1	1	Confined
7	48824_0	07/10/2011	1	1	Confined
7	48832_0	06/26/2010	1	1	Confined
7	48835_0	03/30/2011	1	1	Confined
7	48836_0	12/16/2010	1	1	Confined
7	48837_0	02/27/2010	1	1	Confined
7	48838_0	08/23/2011	1	1	Confined
7	48839_0	01/14/2010	1	1	Confined
7	48840_0	07/24/2009	1	1	Confined
7	48841_0	01/18/2010	1	1	Confined
7	48842_0	09/09/2011	1	1	Confined
7	48843_0	12/15/2010	1	1	Confined
7	48844_0	01/08/2010	1	1	Confined
7	48846_0	08/04/2009	1	1	Unconfined
7	48865_0	11/05/2011	1	1	Confined
7	48866_0	07/25/2012	1	1	Confined
7	48867_0	08/06/2010	1	1	Confined
7	48868_0	06/22/2010	1	1	Confined
7	48869_0	12/26/2011	1	1	Confined
7	48870_0	12/20/2010	1	1	Confined
7	48871_0	01/09/2012	1	1	Confined
7	48874_0	04/06/2007	1	1	Confined
7	48880_0	11/21/2011	1	1	Confined
7	48881_0	09/21/2012	1	1	Confined
7	48883_0	11/30/2010	1	1	Confined
7	48887_0	01/28/2010	1	1	Confined
7	48888_0	05/03/2010	1	0.5	Confined
7	48940_0	01/10/2014	1	1	Confined
7	48955_0	06/07/2007	1	1	Confined
7	48960_0	02/02/2008	1	1	Confined
7	48961_0	11/25/2003	1	1	Confined
7	48972_0	08/10/2010	1	1	Confined
7	48975_0	01/30/2013	1	1	Confined
7	48976_0	12/27/2013	1	1	Confined
7	48978_0	09/02/2010	1	1	Confined
7	48981_0	03/10/2012	1	0.1	Confined
7	49068_0	09/01/2005	1	1	Confined
7	49069_0	10/12/2005	1	1	Confined
7	49116_0	10/22/2011	1	1	Confined
7	49122_0	01/24/2012	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	49124_0	02/08/2012	1	1	Confined
7	49125_0	02/23/2012	1	1	Confined
7	49128_0	11/06/2011	1	1	Confined
7	49129_0	03/30/2012	1	1	Confined
7	49134_0	06/13/2012	1	1	Confined
7	49135_0	02/17/2012	1	0.1	Confined
7	49145_0	11/13/2012	1	0.1	Confined
7	49148_0	12/28/2012	1	1	Confined
7	49154_0	03/15/2013	1	1	Confined
7	49181_0	01/19/2014	1	1	Confined
7	49189_0	11/22/2013	1	0.1	Confined
7	49215_0	08/13/2008	1	0.1	Confined
7	49216_0	09/09/2008	1	0.1	Confined
7	49217_0	10/05/2004	1	1	Confined
7	49222_0	11/01/2010	1	1	Confined
7	49410_0	10/09/2005	1	0.1	Confined
7	49411_0	10/01/2005	1	1	Confined
7	49412_0	05/06/2005	1	0.1	Confined
7	49442_0	11/12/2012	1	0.1	Confined
7	49443_0	12/01/2008	1	0.1	Confined
7	49445_0	07/17/2012	1	0.1	Confined
7	50008_6961609	06/11/2009	1	0.1	Confined
7	50017_0	12/29/2008	1	0.1	Confined
7	50018_6963605	02/24/1983 to 01/09/2010	14	0.1	Confined
7	50019_0	08/30/2010	1	0.1	Confined
7	50020_6964104	01/04/1994 to 01/11/2010	16	0.5	Unconfined
7	50021_0	06/18/2008	1	0.1	Confined
7	50024_0	07/16/2011	1	0.1	Confined
7	50025_0	05/05/2010	1	0.1	Confined
7	50027_6857623	03/28/2002	1	0.1	Confined
7	50028_0	03/22/2013	1	1	Confined
7	50029_0	12/23/2005	1	0.1	Confined
7	50030_0	06/04/2012	1	1	Confined
7	50034_6857918	08/24/2001	1	1	Confined
7	50039_0	06/22/2006	1	1	Confined
7	50041_0	07/17/2008	1	0.1	Confined
7	50042_0	05/19/2012	1	1	Confined
7	50043_0	11/21/2008	1	0.1	Confined
7	50044_0	11/10/2009	1	1	Confined
7	50050_6962902	02/11/1982 to 04/13/2010	25	1	Confined
7	50051_0	06/05/2005	1	0.1	Confined
7	50055_0	07/17/2011	1	0.1	Confined
7	50058_0	08/28/2003	1	0.1	Confined
7	50060_7706205	02/11/1982 to 01/29/1992	10	1	Confined
7	50061_0	06/05/2012	1	1	Confined
7	50062_7706301	02/14/1984 to 01/29/1992	7	0.5	Confined
7	50065_7707201	02/24/1983 to 01/08/2010	17	0.5	Confined
7	50066_0	02/05/2011	1	1	Confined
7	50069_7708201	02/24/1983 to 01/29/1992	8	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	50070_0	07/22/2005	1	1	Confined
7	50072_0	03/27/2009	1	1	Confined
7	50075_0	11/11/2011	1	1	Confined
7	50078_0	08/15/2011	1	1	Confined
7	50084_7802402	02/25/1983 to 02/06/1991	5	1	Confined
7	50087_0	01/22/2007	1	1	Confined
7	50089_7801501	02/12/1982 to 05/03/2010	20	1	Confined
7	50094_0	04/16/2012	1	1	Confined
7	50098_7708406	03/31/2006	1	1	Confined
7	50100_0	04/29/2009	1	1	Confined
7	50101_7707501	02/11/1982 to 04/13/2010	24	0.5	Confined
7	50103_0	09/20/2011	1	1	Confined
7	50105_0	10/28/2013	1	1	Confined
7	50112_0	09/08/2011	1	1	Confined
7	50113_7708716	02/11/1982 to 04/13/2010	23	1	Confined
7	50114_0	08/03/2013	1	1	Confined
7	50118_7708814	02/15/2000	1	1	Confined
7	50124_7801801	02/12/1982 to 02/20/1996	12	1	Confined
7	50125_0	01/30/2013	1	1	Confined
7	50127_0	02/25/2012	1	1	Confined
7	50128_7802701	02/08/1982 to 02/05/1991	7	0.5	Confined
7	50131_0	04/24/2012	1	1	Confined
7	50140_7716201	02/10/1982 to 02/15/1984	2	1	Confined
7	50142_0	09/15/2011	1	1	Confined
7	50149_0	09/20/2013	1	1	Confined
7	50156_0	06/27/2013	1	1	Confined
7	50159_7714601	02/11/1982 to 01/28/1993	10	1	Confined
7	50164_0	11/02/2005	1	1	Confined
7	50168_0	08/29/2005	1	1	Confined
7	50171_7716603	02/10/1982 to 01/18/2010	24	1	Confined
7	50175_0	07/15/2013	1	1	Confined
7	50179_0	05/10/2013	1	1	Confined
7	50181_0	01/12/2012	1	1	Confined
7	50186_0	09/10/2012	1	1	Confined
7	50188_0	03/29/2012	1	1	Confined
7	50189_0	09/16/2011	1	1	Confined
7	50192_0	06/25/2009	1	1	Confined
7	50194_0	02/09/2012	1	1	Confined
7	50195_0	07/21/2011	1	1	Confined
7	50197_0	08/25/2011	1	1	Confined
7	50198_0	06/18/2008	1	1	Confined
7	50203_0	02/03/2014	1	1	Confined
7	50207_0	01/23/2013	1	1	Confined
7	50208_0	06/13/2010	1	1	Confined
7	50210_0	04/02/2013	1	1	Confined
7	50212_0	04/13/2012	1	1	Confined
7	50215_0	04/08/2012	1	1	Confined
7	50218_0	09/30/2012	1	1	Confined
7	50219_0	03/14/2012	1	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	50223_0	08/23/2013	1	1	Confined
7	50227_7809503	01/07/2003 to 06/01/2017	74	0.5	Confined
7	50229_7809602	02/16/1984 to 02/13/1986	2	1	Confined
7	50233_7716801	02/10/1982 to 12/01/2017	102	0.5	Confined
7	50251_7721301	02/23/1983 to 04/15/2010	20	1	Confined
7	50257_7723106	02/15/1984 to 02/15/1985	2	1	Confined
7	50267_7724202	02/10/1982 to 03/10/2010	24	1	Confined
7	50291_6861107	06/08/1994	1	0.1	Confined
7	50294_6848401	03/03/1997 to 02/02/1998	2	1	Unconfined
7	50295_6848510	03/20/2000	1	1	Confined
7	50303_0	12/31/1980	1	1	Confined
7	50319_6861416	07/12/2006	1	1	Confined
7	50426_6855907	05/17/2003 to 11/01/2013	23	1	Confined
7	50474_0	10/21/2011	1	1	Confined
7	50476_0	08/08/2012	1	1	Confined
7	50477_0	02/08/2013	1	1	Confined
7	50478_0	02/08/2013	1	1	Confined
7	50479_0	01/14/2010	1	1	Confined
7	50489_0	07/16/2012	1	1	Confined
7	50493_0	10/18/2012	1	1	Unconfined
7	50512_0	05/16/2001	1	0.1	Confined
7	50531_0	05/16/2002	1	0.1	Confined
7	50596_0	05/28/2004	1	0.1	Confined
7	50599_0	10/08/2004	1	1	Confined
7	50602_0	07/23/2003	1	0.1	Confined
7	50632_0	02/18/2005	1	1	Unconfined
7	50649_0	08/04/2005	1	0.1	Confined
7	50659_0	05/07/2004	1	1	Confined
7	50671_0	05/17/2006	1	0.1	Confined
7	50676_0	06/25/2006	1	0.1	Confined
7	50686_0	09/26/2006	1	1	Confined
7	50693_0	09/03/2003	1	1	Confined
7	50698_0	04/28/2004	1	1	Confined
7	50703_0	01/11/2007	1	0.1	Confined
7	50710_0	03/23/2005	1	0.5	Confined
7	50718_0	01/25/2005	1	0.1	Confined
7	50732_0	02/04/2005	1	0.5	Confined
7	50733_0	10/16/2003	1	0.1	Confined
7	50734_0	12/14/2007	1	1	Confined
7	50737_0	01/28/2008	1	0.5	Confined
7	50741_0	09/18/2007	1	0.5	Confined
7	50743_0	04/09/2008	1	1	Unconfined
7	50748_0	03/20/2007	1	0.5	Confined
7	50750_0	11/22/2007	1	0.1	Confined
7	50781_0	06/08/2006	1	0.1	Confined
7	50785_0	12/24/2008	1	1	Confined
7	50790_0	09/30/2006	1	1	Confined
7	50792_0	01/14/2009	1	0.1	Confined
7	50796_0	02/02/2009	1	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	50798_0	12/09/2008	1	1	Unconfined
7	50802_0	01/05/2009	1	0.1	Confined
7	50810_0	08/17/2004	1	0.1	Confined
7	50820_0	05/20/2009	1	1	Confined
7	50827_0	08/24/2006	1	0.1	Confined
7	50833_0	04/24/2009	1	1	Confined
7	50834_0	02/01/2006	1	0.1	Confined
7	50835_0	01/24/2006	1	1	Unconfined
7	50842_0	05/17/2009	1	0.1	Confined
7	50855_0	04/22/2005	1	0.1	Confined
7	50871_0	10/24/2008	1	0.5	Confined
7	50875_0	11/14/2008	1	0.1	Confined
7	50877_0	05/03/2006	1	1	Confined
7	50888_0	05/02/2008	1	0.5	Confined
7	50907_0	12/18/2010	1	1	Unconfined
7	50912_0	06/09/2005	1	1	Confined
7	50915_0	05/13/2005	1	0.5	Confined
7	50939_0	09/18/2008	1	1	Confined
7	50952_0	06/08/2006	1	0.5	Confined
7	50960_0	08/24/2010	1	0.5	Confined
7	50967_0	10/26/2010	1	1	Confined
7	50972_0	11/28/2010	1	1	Unconfined
7	50984_0	01/07/2011	1	1	Confined
7	50993_0	02/21/2011	1	0.5	Confined
7	51001_0	04/07/2011	1	1	Confined
7	51004_0	07/13/2010	1	0.1	Confined
7	51005_0	04/06/2011	1	0.5	Unconfined
7	51015_0	05/11/2011	1	1	Confined
7	51016_0	05/12/2011	1	1	Confined
7	51018_0	05/26/2011	1	0.5	Confined
7	51022_0	06/03/2011	1	1	Confined
7	51030_0	08/13/2011	1	0.5	Unconfined
7	51040_0	08/30/2011	1	0.5	Confined
7	51050_0	09/01/2011	1	1	Unconfined
7	51055_0	11/02/2011	1	1	Confined
7	51105_0	05/10/2012	1	1	Confined
7	51115_0	05/18/2012	1	0.1	Confined
7	51117_0	06/19/2012	1	0.5	Unconfined
7	51130_0	07/20/2012	1	1	Confined
7	51138_0	08/07/2012	1	1	Confined
7	51142_0	09/19/2012	1	0.1	Confined
7	51145_0	08/17/2012	1	0.5	Confined
7	51152_0	07/27/2012	1	1	Confined
7	51157_0	09/27/2012	1	1	Confined
7	51159_0	11/15/2012	1	1	Unconfined
7	51173_0	10/20/2012	1	1	Unconfined
7	51175_0	12/28/2012	1	1	Confined
7	51181_0	02/07/2013	1	1	Confined
7	51189_0	03/06/2013	1	1	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	51249_0	06/13/2013	1	0.5	Confined
7	51271_0	09/14/2006	1	0.1	Confined
7	51273_0	01/10/2006	1	0.5	Confined
7	51285_0	05/09/2006	1	0.5	Confined
7	51289_0	10/22/2006	1	0.1	Confined
7	51300_0	08/08/2013	1	0.1	Confined
7	51305_0	09/10/2013	1	0.1	Confined
7	51308_0	09/12/2013	1	0.1	Confined
7	51314_0	10/02/2013	1	1	Unconfined
7	51336_0	10/30/2013	1	0.5	Confined
7	51356_0	12/15/2013	1	0.5	Unconfined
7	51381_0	05/20/2014	1	0.5	Confined
7	51444_0	10/12/2010	1	1	Confined
7	51636_6706611	08/19/1987	1	0.5	Confined
7	51921_0	11/02/2014	1	0.1	Confined
7	52950_6713805	09/23/2009 to 06/14/2017	19	1	Unconfined
7	52963_6861310	02/11/1981 to 03/06/1990	9	0.5	Confined
7	52975_7804508	07/10/2008 to 12/30/2017	667	1	Confined
7	56000_0	01/25/2011	1	1	Confined
7	56003_0	04/15/2014	1	1	Confined
7	56005_0	07/27/2011	1	1	Confined
7	56008_0	09/19/2014	1	0.5	Confined
7	56011_0	01/24/2011	1	0.5	Confined
7	56015_0	12/20/2010	1	1	Confined
7	56016_0	03/10/2010	1	0.5	Confined
7	56017_0	01/20/2011	1	1	Confined
7	56020_0	03/22/2015	1	1	Confined
7	56021_0	06/10/2011	1	0.5	Confined
7	56022_6745203	06/15/2000 to 07/29/2004	5	0.5	Confined
7	56026_6723801	07/24/2002	1	0.5	Confined
7	56052_0	03/18/2010	1	1	Confined
7	56126_0	06/28/2012	1	1	Confined
7	56151_0	08/31/2012	1	1	Confined
7	56163_0	02/03/2014	1	1	Confined
7	56169_0	08/25/2012	1	1	Confined
7	56170_0	04/20/2015	1	1	Confined
7	56171_0	12/13/2014	1	1	Confined
7	59526_0	07/22/2015	1	0.5	Unconfined
7	59530_0	05/18/2014	1	0.5	Unconfined
7	59531_0	11/22/2013	1	0.1	Confined
7	59539_0	03/21/2012	1	1	Unconfined
7	59546_0	09/17/2010	1	0.5	Unconfined
7	59551_0	10/19/2004	1	1	Unconfined
7	59552_0	06/01/2009	1	1	Unconfined
7	59560_0	10/07/2005	1	0.5	Unconfined
7	59564_0	10/14/2004	1	1	Unconfined
7	59581_0	05/20/2011	1	1	Confined
7	59583_0	04/22/2011	1	0.5	Confined
7	59584_0	07/27/2011	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
7	59585_0	03/11/2013	1	1	Confined
7	59597_0	12/20/2010	1	1	Confined
7	59741_0	04/06/2011	1	0.5	Confined
7	59743_0	07/10/2012	1	1	Confined
7	59905_0	04/28/2013	1	1	Confined
7	59908_0	02/17/2015	1	1	Confined
7	59911_0	02/16/2012	1	0.5	Confined
7	59913_0	01/08/2014	1	0.5	Confined
7	59918_0	07/15/2014	1	1	Confined
7	59923_0	04/20/2013	1	1	Confined
7	59925_0	03/16/2014	1	1	Confined
7	59926_0	04/27/2012	1	1	Confined
7	59930_0	04/18/2012	1	1	Confined
7	59937_0	07/22/2011	1	1	Confined
7	59939_0	11/10/2009	1	0.5	Confined
7	59941_0	12/01/2014	1	1	Confined
7	59944_0	04/16/2012	1	1	Confined
7	59946_0	10/21/2014	1	1	Confined
7	59950_0	08/30/2013	1	1	Confined
7	59951_0	01/06/2014	1	1	Confined
7	59954_0	06/25/2011	1	0.5	Confined
7	59962_0	10/28/2011	1	1	Confined
7	59964_0	10/13/2014	1	1	Confined
7	59978_0	09/03/2014	1	1	Confined
7	59980_0	07/22/2014	1	0.5	Confined
7	59981_0	03/18/2013	1	1	Confined
7	59983_0	07/23/2014	1	0.5	Confined
7	59984_0	03/06/2014	1	1	Confined
7	59991_0	01/18/2014	1	1	Confined
7	59993_0	10/31/2014	1	1	Confined
7	61776_0	10/04/2013	1	0.5	Confined
7	68251_6864403	09/15/1999	1	1	Confined
7	68252_6859519	01/06/2003 to 03/01/2014	25	0.1	Confined
7	86408_6855505	02/05/1997 to 05/11/2010	15	1	Confined
7	9630_7826802	02/14/1985 to 02/24/1994	3	1	Confined
8	0_5861801	04/14/1981 to 11/12/1991	9	1	Unconfined
8	0_5862707	08/31/2005 to 12/19/2005	3	0.5	Unconfined
8	0_6705609	08/18/1987	1	0.5	Unconfined
8	0_6705801	01/09/2014 to 06/17/2017	9	0.1	Confined
8	0_6705802	01/17/2014 to 01/09/2017	7	0.1	Confined
8	0_6706205	08/18/2009 to 07/12/2010	2	1	Confined
8	0_6706612	08/19/1987	1	0.5	Confined
8	0_6711307	02/20/1981 to 12/12/1996	15	0.5	Unconfined
8	0_6712303	02/20/1981 to 02/17/1982	2	0.5	Unconfined
8	0_6712901	01/17/2014 to 06/19/2017	9	0.1	Confined
8	0_6713205	02/27/2008 to 06/14/2017	23	0.5	Confined
8	0_6714706	09/23/2009 to 06/14/2017	20	0.5	Confined
8	0_6719904	09/28/2009 to 06/20/2017	19	0.5	Unconfined
8	0_6720502	09/28/2009 to 06/24/2015	13	0.5	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
8	0_6720503	09/28/2009 to 06/19/2017	18	0.5	Unconfined
8	0_6727606	09/22/2009 to 06/27/2017	20	0.5	Confined
8	0_6727707	09/27/2011 to 06/05/2017	14	0.5	Confined
8	0_6727708	01/19/2006 to 09/17/2016	28	0.5	Confined
8	0_6733509	08/29/1989 to 06/22/2016	7	0.1	Confined
8	0_6733706	01/04/2006 to 05/15/2012	5	0.1	Confined
8	0_6734407	09/28/1985 to 09/18/2017	15	0.1	Confined
8	0_6734505	08/20/2002 to 09/05/2017	35	0.5	Confined
8	0_6742106	01/08/2015 to 06/21/2017	7	1	Confined
8	0_6848305	04/01/1996	1	1	Confined
8	0_6849902	02/09/1981 to 10/23/2017	35	1	Confined
8	0_6850709	03/04/1993	1	0.1	Confined
8	0_6851602	02/11/1981 to 01/24/1991	11	0.1	Confined
8	0_6851801	02/11/1981 to 02/10/1983	2	0.1	Confined
8	0_6852410	08/11/1994 to 01/01/1998	2	0.1	Confined
8	0_6852601	11/10/1983	1	0.5	Confined
8	0_6852721	08/20/1998	1	0.5	Confined
8	0_6852903	03/19/1989	1	0.1	Confined
8	0_6852904	05/09/1994	1	0.1	Confined
8	0_6852905	05/11/1989	1	0.1	Confined
8	0_6854402	02/19/1981 to 10/27/2017	23	1	Confined
8	0_6954903	09/13/1991	1	1	Unconfined
8	0_6958707	02/06/1985 to 11/24/2014	30	0.1	Confined
8	0_6959302	09/21/2004 to 05/18/2012	4	0.5	Unconfined
8	0_6959401	02/10/1981 to 02/24/1994	13	1	Confined
8	0_6960201	02/05/1986 to 03/02/2006	17	0.1	Confined
8	0_6960202	07/05/1984	1	0.1	Confined
8	0_6963102	09/13/1991	1	1	Unconfined
8	0_6964411	02/24/1983 to 03/26/1987	5	1	Confined
8	0_7615303	01/16/1989 to 05/24/1994	2	0.1	Confined
8	0_7624201	02/12/1981 to 02/10/1983	2	0.5	Confined
8	0_7624801	02/10/1983 to 10/25/2016	26	0.1	Confined
8	0_7624906	02/12/1981 to 10/23/2017	36	0.1	Confined
8	0_7640901	02/09/1981 to 02/03/1983	2	1	Confined
8	0_7648401	02/10/1987 to 02/24/1998	10	1	Unconfined
8	0_7648601	09/22/2011 to 12/30/2017	383	1	Confined
8	0_7648702	02/06/2002 to 10/17/2017	13	1	Unconfined
8	0_7648801	02/09/1981 to 10/17/2017	32	0.1	Confined
8	0_7648802	08/18/2009 to 05/19/2012	2	0.1	Confined
8	0_7648805	02/08/2007	1	0.1	Confined
8	0_7701501	02/11/1981 to 02/16/1993	9	1	Confined
8	0_7704603	02/04/1985 to 02/13/2003	16	0.5	Confined
8	0_7709101	02/11/1981 to 10/24/2017	31	1	Confined
8	0_7709102	02/11/1981 to 10/24/2017	28	0.1	Confined
8	0_7709704	02/12/1981 to 02/15/1990	6	0.1	Confined
8	0_7717707	02/10/1983	1	0.5	Confined
8	0_7722502	02/09/1982 to 03/18/1991	6	0.1	Confined
8	0_7725401	02/10/1981 to 02/19/1992	7	1	Unconfined
8	14270_0	03/29/2011	1	0.5	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
8	14361_6714410	05/31/2006	1	0.1	Confined
8	14362_6713311	01/14/2002	1	0.1	Confined
8	14371_0	06/11/2008	1	0.5	Unconfined
8	14375_0	04/27/2010	1	0.5	Unconfined
8	14377_0	11/29/2010	1	0.5	Unconfined
8	14379_0	01/30/2006	1	0.5	Unconfined
8	14380_0	05/28/2005	1	0.1	Confined
8	14381_0	05/11/2011	1	0.5	Unconfined
8	14387_0	09/21/2003	1	0.5	Confined
8	14464_0	05/27/2004	1	0.5	Unconfined
8	14465_0	06/19/2009	1	0.5	Unconfined
8	14466_0	09/30/2010	1	0.5	Unconfined
8	14472_0	12/06/2010	1	0.1	Confined
8	15094_6705409	12/31/1980	1	0.5	Unconfined
8	16241_7818201	04/08/1997 to 04/21/2010	13	1	Confined
8	16290_0	03/15/2003	1	0.5	Confined
8	16293_0	01/30/2004	1	0.5	Unconfined
8	16320_0	06/20/2006	1	0.5	Confined
8	16325_0	04/12/2007	1	1	Confined
8	16329_0	05/05/2010	1	0.5	Confined
8	16392_6727201	02/17/1981 to 10/27/2017	37	0.5	Unconfined
8	16400_6733401	02/17/1981 to 10/27/2017	38	0.5	Unconfined
8	16410_6734402	02/17/1981 to 02/09/1990	8	0.5	Confined
8	35759_6850710	05/10/1993	1	0.1	Confined
8	36177_6850717	09/24/1991	1	0.1	Confined
8	38956_6734503	04/15/1992	1	0.1	Confined
8	38957_6734406	11/30/1991 to 04/01/1992	2	0.1	Confined
8	38958_6734405	04/01/1992 to 06/05/2017	37	0.1	Confined
8	39169_6713102	02/20/1981 to 09/28/2012	21	0.1	Confined
8	39192_6720802	02/19/1981 to 06/19/2017	48	0.5	Confined
8	39275_5861908	08/25/2005 to 12/19/2005	3	0.5	Unconfined
8	39319_6705509	02/06/2003 to 05/27/2011	3	0.5	Unconfined
8	39590_6846903	02/12/1988	1	0.1	Confined
8	39591_6846904	06/30/1990	1	0.5	Confined
8	39617_6848302	05/01/1986	1	0.1	Confined
8	39618_6848303	12/18/1995	1	0.1	Confined
8	39622_6848408	07/27/2004	1	0.1	Confined
8	43042_6720205	02/20/1981 to 12/12/1996	15	0.5	Unconfined
8	43103_6853502	11/04/1986	1	0.1	Confined
8	43108_6853605	11/27/1996	1	0.1	Confined
8	48260_0	02/08/2011	1	0.1	Confined
8	48456_0	06/20/2008	1	0.1	Confined
8	48460_0	01/06/2014	1	1	Confined
8	48475_0	12/14/2005	1	0.5	Confined
8	48552_0	07/27/2006	1	0.5	Confined
8	48850_0	02/17/2012	1	0.1	Confined
8	48957_0	08/06/2009	1	0.1	Confined
8	48970_0	08/21/2012	1	0.1	Confined
8	49076_0	02/12/2008	1	1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
8	49219_6734504	10/24/2001 to 06/06/2017	19	1	Confined
8	50012_0	03/29/2005	1	0.5	Confined
8	50016_0	12/31/2008	1	0.5	Confined
8	50022_0	09/23/2005	1	0.5	Confined
8	50047_0	06/19/2010	1	0.1	Confined
8	50049_0	05/01/2006	1	0.1	Confined
8	50052_0	04/13/2012	1	0.1	Confined
8	50498_0	10/18/2007	1	0.5	Confined
8	50499_0	08/24/2010	1	0.5	Confined
8	50500_0	03/25/2014	1	0.1	Confined
8	50535_0	07/08/2002	1	0.5	Unconfined
8	50547_0	11/22/2002	1	0.5	Confined
8	50548_0	11/19/2002	1	0.5	Confined
8	50566_0	08/08/2003	1	0.5	Confined
8	50569_0	08/27/2003	1	0.5	Confined
8	50578_0	11/30/2003	1	0.5	Confined
8	50583_0	11/22/2003	1	0.1	Confined
8	50589_0	03/03/2004	1	0.5	Unconfined
8	50590_0	03/01/2004	1	1	Confined
8	50606_0	05/27/2004	1	0.1	Confined
8	50608_0	05/05/2004	1	0.5	Confined
8	50635_0	03/06/2005	1	0.5	Unconfined
8	50637_0	03/16/2005	1	0.5	Unconfined
8	50639_0	05/29/2005	1	0.1	Confined
8	50655_0	09/29/2005	1	0.1	Confined
8	50683_0	08/16/2006	1	0.1	Confined
8	50695_0	12/16/2006	1	0.1	Confined
8	50705_0	02/08/2007	1	0.5	Confined
8	50715_0	05/18/2007	1	0.5	Unconfined
8	50724_0	06/22/2005	1	0.5	Confined
8	50742_0	06/20/2007	1	0.5	Confined
8	50753_0	03/01/2008	1	0.1	Confined
8	50777_0	05/21/2007	1	0.5	Unconfined
8	50783_0	04/25/2006	1	0.5	Confined
8	50829_0	11/16/2004	1	0.5	Confined
8	50841_0	07/12/2009	1	0.5	Confined
8	50850_0	06/23/2009	1	0.5	Unconfined
8	50910_0	12/14/2004	1	0.5	Confined
8	50914_0	05/27/2005	1	1	Confined
8	50935_0	08/11/2009	1	0.5	Unconfined
8	50976_0	08/25/2008	1	1	Confined
8	50978_0	12/20/2008	1	1	Confined
8	51003_0	03/22/2011	1	0.5	Unconfined
8	51076_0	01/03/2012	1	0.5	Confined
8	51089_0	02/03/2012	1	0.5	Unconfined
8	51090_0	02/28/2012	1	0.5	Confined
8	51094_0	02/24/2012	1	1	Confined
8	51121_0	07/06/2012	1	0.5	Confined
8	51125_0	07/31/2012	1	0.1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
8	51136_0	07/05/2012	1	0.5	Confined
8	51148_0	09/19/2012	1	0.1	Confined
8	51183_0	02/27/2013	1	0.5	Confined
8	51187_0	01/19/2013	1	0.1	Confined
8	51190_0	03/13/2013	1	0.5	Confined
8	51217_0	05/10/2013	1	0.5	Confined
8	51278_0	09/09/2003	1	0.5	Confined
8	51279_0	07/26/2013	1	0.5	Confined
8	51301_0	08/17/2013	1	0.1	Confined
8	51316_0	09/20/2013	1	0.5	Confined
8	51319_0	08/31/2013	1	0.5	Confined
8	51325_0	10/04/2013	1	0.5	Confined
8	51366_0	03/19/2014	1	1	Confined
8	51376_0	03/31/2014	1	0.5	Confined
8	51378_0	04/17/2014	1	0.5	Confined
8	51621_0	05/10/2006	1	0.5	Unconfined
8	51789_0	04/15/2002	1	0.5	Confined
8	52951_6727805	01/22/1981 to 12/30/2017	293	0.5	Confined
8	56014_0	04/21/2011	1	1	Confined
8	56050_0	03/12/2015	1	1	Confined
8	56168_0	03/11/2015	1	1	Confined
8	59536_0	09/12/2012	1	1	Unconfined
8	59538_0	06/17/2012	1	0.5	Confined
8	59541_0	10/18/2011	1	0.5	Unconfined
8	59542_0	09/23/2011	1	1	Confined
8	59543_0	06/23/2011	1	1	Confined
8	59544_0	03/15/2011	1	1	Confined
8	59545_0	11/05/2010	1	1	Confined
8	59547_0	10/04/2007	1	1	Confined
8	59549_0	04/23/2009	1	0.5	Unconfined
8	59550_0	05/15/2006	1	0.1	Confined
8	59553_0	06/26/2009	1	0.1	Confined
8	59554_0	03/24/2009	1	1	Unconfined
8	59557_0	04/24/2008	1	1	Confined
8	59565_0	02/20/2004	1	0.5	Confined
8	59568_0	06/21/2002	1	0.5	Unconfined
8	59570_0	10/14/2001	1	1	Confined
8	59600_0	06/10/2011	1	1	Confined
8	59988_0	11/18/2014	1	0.5	Confined
8	86410_6745102	01/29/2015 to 06/09/2016	5	0.5	Confined
9	0_5860902	04/15/1981	1	1	Confined
9	0_5861201	04/13/1981 to 12/05/1996	14	1	Unconfined
9	0_6704503	02/20/1981 to 02/18/1982	2	1	Confined
9	0_6704902	02/20/1981 to 12/12/1996	16	1	Confined
9	0_6705608	08/18/1987	1	1	Confined
9	0_6711501	02/20/1981 to 11/15/2017	36	1	Unconfined
9	0_6712503	02/20/1981 to 12/12/1996	17	1	Confined
9	0_6712530	08/18/2009 to 05/14/2012	2	0.1	Confined
9	0_6712533	10/03/2002	1	0.1	Confined

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Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	0_6712601	02/20/1981 to 01/05/1994	13	0.5	Confined
9	0_6712902	01/31/2014	1	1	Confined
9	0_6718807	03/29/2004	1	1	Unconfined
9	0_6719608	02/20/1981 to 12/10/1996	16	1	Confined
9	0_6719609	02/19/1981 to 12/11/1996	16	1	Unconfined
9	0_6719610	02/19/1981 to 12/11/1996	13	1	Unconfined
9	0_6719708	06/09/2014 to 09/18/2017	11	1	Unconfined
9	0_6720409	08/18/2009 to 05/14/2012	4	1	Confined
9	0_6725910	09/02/2010 to 09/18/2017	21	1	Unconfined
9	0_6726311	04/19/1990	1	1	Unconfined
9	0_6726512	02/17/1981 to 10/27/2017	29	1	Unconfined
9	0_6726704	01/19/2004 to 10/01/2009	16	0.5	Confined
9	0_6727110	02/23/2012 to 09/18/2017	16	1	Confined
9	0_6727706	09/24/2003 to 09/18/2017	42	1	Confined
9	0_6733407	02/17/1981 to 02/12/1991	10	1	Confined
9	0_6734601	10/24/2001 to 06/05/2017	31	0.5	Confined
9	0_6832801	02/17/1981 to 09/12/2000	18	1	Unconfined
9	0_6840204	10/04/1985 to 09/18/2017	11	1	Unconfined
9	0_6840310	02/17/1981 to 10/27/2017	36	1	Unconfined
9	0_6840607	07/14/1998 to 01/14/2015	3	1	Unconfined
9	0_6846801	04/30/1987	1	1	Confined
9	0_6846802	08/20/1984	1	1	Confined
9	0_6847301	02/13/1981 to 04/09/1982	2	0.5	Unconfined
9	0_6847601	02/17/1981 to 12/12/1990	11	0.5	Confined
9	0_6849605	04/05/1999	1	0.1	Confined
9	0_6849707	05/24/2011	1	0.5	Confined
9	0_6849808	02/09/1981 to 10/23/2017	33	0.5	Confined
9	0_6850207	09/16/1991	1	1	Unconfined
9	0_6850208	09/18/1991	1	1	Unconfined
9	0_6850603	02/22/1984 to 08/23/2004	10	1	Confined
9	0_6852408	08/18/1998	1	0.1	Confined
9	0_6853101	02/19/1981 to 02/08/1982	2	0.1	Confined
9	0_6853814	04/18/2007	1	1	Confined
9	0_6854102	02/16/1988	1	1	Confined
9	0_6955801	06/03/1992	1	1	Confined
9	0_6955901	02/10/1981 to 10/23/2017	34	0.5	Confined
9	0_6956903	03/01/1989	1	1	Confined
9	0_6958301	08/19/2009 to 05/18/2012	2	0.5	Confined
9	0_6958402	05/17/2006	1	1	Unconfined
9	0_7648703	05/31/2007	1	0.5	Confined
9	0_7734412	12/29/2010	1	0.1	Confined
9	14313_5861112	07/17/1985	1	0.1	Unconfined
9	14370_0	01/08/2004	1	1	Confined
9	14382_0	02/23/2011	1	1	Unconfined
9	15097_6705606	04/15/1981	1	1	Confined
9	15365_6846702	02/19/1981 to 10/27/2017	22	1	Confined
9	15918_6861508	12/10/2007 to 11/01/2017	68	1	Confined
9	16283_0	01/15/2004	1	0.1	Confined
9	16291_0	05/29/2003	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	16294_0	07/03/2004	1	1	Unconfined
9	16295_0	05/28/2005	1	1	Unconfined
9	16296_0	01/22/2004	1	1	Unconfined
9	16298_0	05/30/2005	1	1	Confined
9	16300_0	08/09/2007	1	1	Unconfined
9	16303_0	02/28/2008	1	1	Unconfined
9	16304_0	02/27/2007	1	1	Confined
9	16306_0	10/01/2008	1	1	Unconfined
9	16307_0	07/28/2005	1	1	Confined
9	16309_0	10/28/2004	1	0.1	Confined
9	16312_0	09/09/2004	1	1	Unconfined
9	16315_0	06/30/2009	1	0.1	Unconfined
9	16322_0	06/05/2008	1	1	Unconfined
9	16323_0	06/02/2008	1	1	Unconfined
9	16324_0	05/31/2007	1	1	Unconfined
9	16326_0	12/10/2003	1	1	Unconfined
9	16327_0	04/25/2005	1	1	Confined
9	16328_0	06/23/2010	1	1	Unconfined
9	16330_0	05/03/2010	1	1	Unconfined
9	16331_0	08/12/2010	1	0.1	Confined
9	16332_0	08/04/2010	1	1	Confined
9	16333_0	08/08/2007	1	1	Confined
9	16334_0	08/14/2007	1	0.1	Unconfined
9	16335_0	11/17/2010	1	1	Unconfined
9	16337_0	02/16/2011	1	1	Confined
9	16338_0	04/05/2011	1	1	Unconfined
9	16339_0	05/17/2011	1	0.1	Unconfined
9	16413_6840101	06/15/2006	1	1	Unconfined
9	16414_6840102	02/17/1981 to 12/02/1986	6	0.5	Unconfined
9	16418_6840401	02/17/1981 to 10/27/2017	34	0.5	Unconfined
9	38966_6718806	03/11/2002	1	1	Unconfined
9	39070_0	08/22/2005	1	1	Confined
9	39082_0	07/18/1987	1	1	Confined
9	39083_6712532	12/02/2002	1	0.1	Confined
9	39123_6704512	04/23/1985 to 02/28/1996	2	1	Confined
9	39128_6704803	01/01/1996	1	0.1	Confined
9	39129_6704804	08/30/2000	1	0.1	Confined
9	39140_6711623	07/15/1983	1	1	Confined
9	39141_6711905	02/20/1981 to 12/11/1996	11	1	Unconfined
9	39148_6712111	02/20/1981 to 11/15/2017	33	1	Confined
9	39154_6712119	06/27/1990	1	0.1	Confined
9	39160_6712520	12/31/1980 to 07/21/1987	10	0.1	Confined
9	39162_6712522	12/31/1980 to 07/21/1987	14	0.1	Confined
9	39163_6712524	06/27/1990	1	0.1	Confined
9	39164_6712527	04/28/1995	1	0.1	Confined
9	39165_6712529	01/02/1998	1	1	Confined
9	39166_6712531	05/08/1996	1	0.1	Confined
9	39167_6712705	05/01/1981	1	1	Confined
9	39168_6713101	08/18/2009 to 01/26/2017	19	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	39179_6719306	02/20/1981 to 11/15/2017	38	1	Unconfined
9	39190_6720103	02/20/1981 to 12/12/1996	16	1	Confined
9	39232_5853706	04/16/1981	1	1	Unconfined
9	39273_5861207	10/05/2001 to 11/16/2001	3	1	Unconfined
9	39294_5862410	10/05/2005	1	0.1	Confined
9	39320_6705803	12/31/1980 to 12/10/2009	25	1	Confined
9	39362_6719901	02/18/1981 to 01/12/2011	20	1	Confined
9	39589_6846902	01/05/1994 to 12/01/2017	78	1	Confined
9	39592_6847303	01/08/2003 to 12/01/2017	69	0.1	Confined
9	39619_6848304	05/20/1987	1	0.1	Confined
9	41935_6864104	01/29/2001	1	0.5	Confined
9	42614_6853813	01/29/2007	1	1	Confined
9	42615_6854406	01/30/2007	1	1	Confined
9	42626_6853406	10/10/1985	1	0.1	Confined
9	42628_6853408	03/07/1997	1	1	Confined
9	42838_6852502	08/02/1996	1	1	Confined
9	43100_6847101	06/30/2003	1	1	Unconfined
9	48202_6742611	04/11/2001 to 06/05/2017	26	1	Confined
9	48385_0	05/30/2012	1	0.1	Confined
9	48386_0	07/06/2012	1	0.1	Confined
9	48387_0	02/17/2012	1	1	Confined
9	48388_0	09/10/2012	1	1	Confined
9	48389_0	04/23/2013	1	1	Confined
9	48390_0	02/26/2013	1	0.1	Confined
9	48391_0	01/22/2013	1	1	Confined
9	48443_0	09/18/2002	1	1	Confined
9	48851_0	04/22/2002	1	0.1	Confined
9	48852_0	10/24/2013	1	1	Confined
9	48889_0	10/20/2005	1	0.5	Confined
9	48958_0	11/21/2012	1	1	Confined
9	48959_0	06/20/2001	1	1	Confined
9	48967_0	10/15/2006	1	1	Confined
9	48968_0	02/27/2004	1	1	Confined
9	48969_0	07/12/2007	1	1	Confined
9	49071_0	12/21/2005	1	1	Confined
9	49091_0	12/10/2004	1	0.1	Confined
9	49112_0	06/21/2011	1	1	Confined
9	49117_0	11/11/2011	1	1	Confined
9	49121_0	11/16/2011	1	1	Confined
9	49126_0	02/28/2012	1	1	Confined
9	49168_0	03/10/2010	1	1	Confined
9	49169_0	01/17/2006	1	1	Confined
9	49171_0	08/15/2013	1	1	Confined
9	49179_0	01/22/2014	1	1	Confined
9	49235_0	10/03/2011	1	1	Unconfined
9	49444_0	11/20/2012	1	1	Confined
9	50013_0	09/20/2008	1	0.1	Confined
9	50278_0	06/14/2002	1	0.1	Confined
9	50280_0	07/11/2005	1	1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	50293_0	04/03/1990	1	1	Confined
9	50335_6712528	07/22/1997	1	1	Confined
9	50336_0	05/31/2011	1	1	Confined
9	50337_0	03/07/2011	1	0.1	Confined
9	50491_0	06/03/2011	1	1	Confined
9	50492_0	12/24/2007	1	1	Confined
9	50495_0	10/10/2008	1	1	Confined
9	50496_0	04/05/2012	1	1	Unconfined
9	50497_0	05/16/2013	1	1	Unconfined
9	50516_0	07/16/2001	1	1	Confined
9	50518_0	09/27/2001	1	1	Confined
9	50525_0	02/05/2002	1	1	Unconfined
9	50529_0	04/24/2002	1	1	Unconfined
9	50533_0	05/24/2002	1	0.1	Confined
9	50544_0	11/05/2002	1	1	Confined
9	50546_0	01/09/2003	1	1	Confined
9	50552_0	02/17/2003	1	1	Confined
9	50554_0	02/12/2003	1	0.1	Confined
9	50560_0	06/18/2003	1	0.1	Confined
9	50561_0	06/26/2003	1	1	Confined
9	50579_0	12/04/2003	1	1	Unconfined
9	50586_0	06/13/2003	1	0.1	Confined
9	50603_0	06/04/2004	1	1	Unconfined
9	50617_0	09/05/2004	1	0.1	Confined
9	50620_0	11/12/2003	1	1	Unconfined
9	50624_0	12/01/2004	1	1	Confined
9	50625_0	12/19/2003	1	1	Confined
9	50628_0	12/10/2004	1	1	Confined
9	50634_0	01/15/2004	1	1	Unconfined
9	50636_0	03/14/2005	1	1	Confined
9	50642_0	05/16/2005	1	0.1	Unconfined
9	50645_0	09/18/2004	1	1	Unconfined
9	50654_0	08/22/2005	1	1	Unconfined
9	50663_0	01/28/2006	1	1	Unconfined
9	50664_0	01/18/2006	1	1	Confined
9	50665_0	07/09/2003	1	0.1	Confined
9	50672_0	03/23/2006	1	0.1	Unconfined
9	50680_0	03/23/2006	1	1	Unconfined
9	50681_0	03/20/2006	1	1	Unconfined
9	50682_0	05/02/2006	1	1	Unconfined
9	50684_0	08/04/2006	1	1	Unconfined
9	50689_0	11/11/2006	1	1	Confined
9	50707_0	02/23/2007	1	1	Confined
9	50716_0	06/14/2007	1	1	Confined
9	50729_0	11/02/2006	1	1	Unconfined
9	50730_0	09/05/2007	1	1	Confined
9	50740_0	10/10/2007	1	1	Confined
9	50749_0	11/30/2006	1	1	Unconfined
9	50751_0	05/14/2008	1	1	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	50754_0	05/19/2008	1	1	Confined
9	50757_0	09/12/2008	1	1	Unconfined
9	50762_0	08/23/2005	1	1	Unconfined
9	50769_0	08/22/2008	1	1	Confined
9	50779_0	03/08/2006	1	0.5	Unconfined
9	50780_0	04/02/2006	1	1	Unconfined
9	50784_0	03/20/2006	1	0.5	Confined
9	50794_0	04/21/2004	1	1	Confined
9	50807_0	06/23/2004	1	1	Confined
9	50813_0	04/20/2004	1	0.1	Confined
9	50839_0	06/25/2006	1	0.1	Confined
9	50840_0	07/15/2009	1	1	Unconfined
9	50846_0	06/11/2009	1	0.1	Confined
9	50851_0	07/26/2009	1	1	Confined
9	50858_0	06/15/2009	1	1	Confined
9	50860_0	07/22/2009	1	0.1	Confined
9	50863_0	11/19/2005	1	0.1	Confined
9	50876_0	12/30/2004	1	1	Unconfined
9	50883_0	10/11/2005	1	1	Confined
9	50887_0	06/16/2008	1	1	Unconfined
9	50891_0	03/30/2007	1	1	Confined
9	50892_0	08/27/2009	1	1	Unconfined
9	50893_0	10/07/2009	1	1	Confined
9	50900_0	11/04/2009	1	1	Unconfined
9	50903_0	04/05/2005	1	0.5	Unconfined
9	50911_0	06/01/2005	1	1	Unconfined
9	50913_0	06/23/2005	1	1	Confined
9	50920_0	04/04/2008	1	1	Unconfined
9	50921_0	03/10/2010	1	1	Confined
9	50925_0	04/14/2010	1	1	Confined
9	50927_0	03/25/2010	1	1	Unconfined
9	50951_0	04/21/2008	1	1	Unconfined
9	50992_0	03/08/2011	1	1	Unconfined
9	51006_0	03/13/2011	1	1	Unconfined
9	51008_0	10/20/2005	1	1	Confined
9	51012_0	05/10/2011	1	1	Confined
9	51023_0	06/22/2011	1	1	Unconfined
9	51024_0	05/25/2011	1	0.5	Unconfined
9	51026_0	07/08/2011	1	1	Confined
9	51029_0	07/13/2011	1	0.1	Confined
9	51036_0	06/09/2011	1	1	Unconfined
9	51037_0	05/17/2011	1	1	Unconfined
9	51043_0	09/15/2011	1	0.5	Confined
9	51058_0	09/24/2011	1	1	Confined
9	51059_0	11/08/2011	1	1	Confined
9	51075_0	10/25/2011	1	1	Confined
9	51081_0	12/28/2011	1	1	Confined
9	51084_0	11/07/2011	1	1	Unconfined
9	51095_0	03/28/2012	1	1	Unconfined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	51096_0	04/05/2012	1	1	Confined
9	51097_0	04/09/2012	1	1	Unconfined
9	51103_0	03/31/2012	1	1	Confined
9	51104_0	04/05/2012	1	1	Confined
9	51110_0	05/17/2012	1	1	Confined
9	51114_0	06/13/2012	1	1	Confined
9	51119_0	06/27/2012	1	1	Unconfined
9	51129_0	08/13/2012	1	1	Confined
9	51135_0	08/23/2012	1	1	Confined
9	51151_0	10/15/2012	1	0.1	Confined
9	51153_0	08/01/2012	1	1	Confined
9	51156_0	11/08/2012	1	1	Confined
9	51169_0	11/22/2012	1	0.5	Confined
9	51170_0	12/06/2012	1	1	Unconfined
9	51177_0	12/13/2012	1	1	Confined
9	51188_0	03/19/2013	1	1	Confined
9	51199_0	10/04/2012	1	1	Confined
9	51211_0	04/23/2013	1	0.5	Confined
9	51221_0	06/13/2013	1	0.1	Confined
9	51223_0	04/03/2013	1	1	Confined
9	51225_0	05/02/2013	1	1	Unconfined
9	51230_0	07/03/2013	1	1	Unconfined
9	51258_0	11/07/2012	1	0.5	Confined
9	51260_0	07/25/2013	1	0.1	Confined
9	51269_0	10/27/2006	1	1	Confined
9	51270_0	01/24/2006	1	1	Confined
9	51272_0	09/27/2006	1	1	Unconfined
9	51274_0	09/21/2006	1	1	Confined
9	51277_0	08/01/2013	1	1	Unconfined
9	51280_0	02/05/2012	1	0.5	Unconfined
9	51283_0	12/03/2009	1	0.1	Confined
9	51296_0	11/05/2009	1	1	Confined
9	51309_0	09/06/2013	1	1	Confined
9	51313_0	10/04/2013	1	1	Unconfined
9	51324_0	09/20/2013	1	1	Unconfined
9	51332_0	10/20/2013	1	1	Confined
9	51342_0	10/07/2013	1	1	Confined
9	51347_0	12/23/2013	1	0.1	Confined
9	51350_0	10/24/2013	1	1	Unconfined
9	51357_0	12/13/2013	1	1	Unconfined
9	51367_0	11/30/2013	1	1	Unconfined
9	51369_0	03/05/2014	1	1	Unconfined
9	51380_0	04/22/2014	1	1	Confined
9	51778_0	12/17/2012	1	1	Confined
9	51779_0	07/18/2004	1	1	Confined
9	51783_0	03/12/2003	1	1	Confined
9	51784_0	04/19/2004	1	1	Confined
9	51785_0	08/01/2006	1	1	Confined
9	51788_0	05/28/2010	1	0.1	Confined

Appendix G Table 1 Model Targets and Weights for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Date Range	Number of Water Levels	Average Water Level Weight	Aquifer Type Designation
9	56500_0	10/16/1999	1	1	Unconfined
9	56504_0	06/24/1995	1	1	Confined
9	59529_0	07/08/2014	1	0.1	Confined
9	59533_0	03/22/2013	1	1	Unconfined
9	59534_0	10/05/2011	1	0.5	Confined
9	59540_0	12/09/2011	1	1	Unconfined
9	59556_0	08/22/2008	1	1	Unconfined
9	59558_0	09/12/2007	1	0.1	Confined
9	59559_0	01/27/2007	1	1	Confined
9	59562_0	03/03/2005	1	1	Confined
9	59563_0	01/05/2005	1	1	Unconfined
9	59566_0	06/25/2003	1	0.5	Confined
9	59567_0	09/26/2002	1	1	Unconfined
9	59969_0	06/15/2014	1	0.5	Confined
9	86418_6726312	12/01/1999 to 09/18/2017	19	1	Unconfined

APPENDIX H

Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6715403	Confined	1,072	12/7/1981	354.05	352.07	0.20	0.1
3	0_6715403	Confined	1,810	12/15/1983	351.17	352.05	-0.09	0.1
3	0_6715403	Confined	2,903	12/12/1986	351.45	352.07	-0.06	0.1
3	0_6715403	Confined	3,237	11/11/1987	347.34	352.07	-0.47	0.1
3	0_6715403	Confined	3,663	1/10/1989	347.30	352.04	-0.47	0.1
3	0_6715403	Confined	3,994	12/7/1989	348.24	352.04	-0.38	0.1
3	0_6715403	Confined	4,363	12/11/1990	347.18	352.06	-0.49	0.1
3	0_6715403	Confined	4,722	12/5/1991	348.22	352.07	-0.39	0.1
3	0_6715403	Confined	5,167	2/22/1993	349.54	352.08	-0.25	0.1
3	0_6715403	Confined	5,524	2/14/1994	348.80	352.05	-0.33	0.1
3	0_6715403	Confined	5,874	1/30/1995	349.29	352.05	-0.28	0.1
3	0_6715403	Confined	6,267	2/27/1996	346.94	352.04	-0.51	0.1
3	0_6715403	Confined	6,624	2/18/1997	346.79	352.03	-0.52	0.1
3	0_6715403	Confined	6,991	2/20/1998	346.89	352.05	-0.52	0.1
3	0_6715403	Confined	7,359	2/23/1999	343.62	352.06	-0.84	0.1
3	0_6715403	Confined	7,723	2/22/2000	341.46	352.04	-1.06	0.1
3	0_6715403	Confined	8,324	10/15/2001	342.15	352.06	-0.99	0.1
3	0_6715403	Confined	8,453	2/21/2002	343.84	352.06	-0.82	0.1
3	0_6715403	Confined	8,824	2/27/2003	343.67	352.09	-0.84	0.1
3	0_6715403	Confined	9,110	12/10/2003	338.17	352.07	-1.39	0.1
3	0_6715403	Confined	9,532	2/4/2005	329.11	352.04	-2.29	0.1
3	0_6715403	Confined	10,638	2/15/2008	325.80	352.05	-2.62	0.1
3	0_6715403	Confined	10,995	2/6/2009	320.81	352.00	-3.12	0.1
3	0_6715403	Confined	11,307	12/15/2009	317.39	352.04	-3.47	0.1
3	0_6715403	Confined	12,064	1/11/2012	310.84	352.03	-4.12	0.1
3	0_6715403	Confined	13,525	1/11/2016	305.98	352.06	-4.61	0.1
3	0_6715403	Confined	13,905	1/25/2017	316.49	352.05	-3.56	0.1
3	0_6715502	Confined	1,810	12/15/1983	341.81	326.20	15.61	1
3	0_6715502	Confined	2,172	12/11/1984	340.64	326.21	14.43	1
3	0_6715502	Confined	2,903	12/12/1986	345.84	326.21	19.63	1
3	0_6715502	Confined	3,237	11/11/1987	344.57	326.21	18.36	1
3	0_6715502	Confined	3,663	1/10/1989	344.52	326.20	18.32	1
3	0_6715502	Confined	3,994	12/7/1989	345.01	326.20	18.81	1
3	0_6715502	Confined	4,363	12/11/1990	344.48	326.21	18.27	1
3	0_6715502	Confined	4,722	12/5/1991	344.60	326.22	18.38	1
3	0_6715502	Confined	5,167	2/22/1993	345.41	326.21	19.20	1
3	0_6715502	Confined	5,524	2/14/1994	345.11	326.21	18.90	1
3	0_6715502	Confined	6,267	2/27/1996	344.29	326.19	18.10	1
3	0_6715502	Confined	6,624	2/18/1997	343.89	326.20	17.69	1
3	0_6715502	Confined	6,991	2/20/1998	343.09	326.20	16.89	1
3	0_6715502	Confined	7,358	2/22/1999	341.27	326.22	15.05	1
3	0_6715502	Confined	7,723	2/22/2000	341.16	326.22	14.94	1
3	0_6715502	Confined	8,324	10/15/2001	341.87	326.22	15.65	1
3	0_6715502	Confined	8,453	2/21/2002	341.22	326.22	15.00	1
3	0_6715502	Confined	8,824	2/27/2003	342.13	326.22	15.91	1
3	0_6715502	Confined	9,110	12/10/2003	339.53	326.22	13.31	1
3	0_6715502	Confined	9,532	2/4/2005	340.29	326.20	14.09	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6715502	Confined	9,915	2/22/2006	336.49	326.19	10.30	1
3	0_6715502	Confined	10,286	2/28/2007	340.32	326.19	14.13	1
3	0_6715502	Confined	10,638	2/15/2008	334.86	326.20	8.66	1
3	0_6715502	Confined	11,307	12/15/2009	338.69	326.21	12.48	1
3	0_6715502	Confined	12,064	1/11/2012	339.09	326.22	12.87	1
3	0_6715502	Confined	12,468	2/18/2013	340.53	326.21	14.32	1
3	0_6715502	Confined	12,829	2/14/2014	340.46	326.22	14.24	1
3	0_6722201	Confined	780	2/18/1981	370.63	357.28	6.67	0.5
3	0_6722201	Confined	1,194	4/8/1982	368.04	357.32	5.36	0.5
3	0_6722201	Confined	1,510	2/18/1983	367.46	357.30	5.08	0.5
3	0_6722201	Confined	1,866	2/9/1984	366.34	357.28	4.53	0.5
3	0_6722201	Confined	2,230	2/7/1985	362.88	357.26	2.81	0.5
3	0_6722201	Confined	2,892	12/1/1986	362.77	357.33	2.72	0.5
3	0_6722202	Confined	12,093	2/9/2012	354.86	381.79	-26.93	1
3	0_6722202	Confined	12,227	6/22/2012	354.81	381.75	-26.94	1
3	0_6722202	Confined	12,315	9/18/2012	355.83	381.72	-25.89	1
3	0_6722202	Confined	12,675	9/13/2013	353.59	381.75	-28.16	1
3	0_6722202	Confined	12,794	1/10/2014	356.81	381.78	-24.97	1
3	0_6722202	Confined	13,043	9/16/2014	352.82	381.76	-28.94	1
3	0_6722202	Confined	13,165	1/16/2015	355.45	381.77	-26.32	1
3	0_6722202	Confined	13,315	6/15/2015	356.83	381.95	-25.12	1
3	0_6722202	Confined	13,527	1/13/2016	356.92	382.19	-25.27	1
3	0_6722202	Confined	13,667	6/1/2016	357.67	382.25	-24.58	1
3	0_6722202	Confined	13,771	9/13/2016	356.93	382.30	-25.37	1
3	0_6722202	Confined	13,884	1/4/2017	357.74	382.34	-24.60	1
3	0_6722202	Confined	14,032	6/1/2017	358.04	382.33	-24.29	1
3	0_6722403	Confined	8,604	7/22/2002	293.55	345.35	-25.90	0.5
3	0_6722404	Unconfined	11,715	1/27/2011	345.55	357.67	-6.06	0.5
3	0_6722404	Unconfined	11,845	6/6/2011	345.89	353.21	-3.66	0.5
3	0_6722404	Unconfined	11,951	9/20/2011	344.62	349.57	-2.47	0.5
3	0_6722404	Unconfined	12,065	1/12/2012	343.98	346.26	-1.14	0.5
3	0_6722404	Unconfined	12,224	6/19/2012	343.84	348.80	-2.48	0.5
3	0_6722404	Unconfined	12,315	9/18/2012	343.65	350.26	-3.30	0.5
3	0_6722404	Unconfined	12,678	9/16/2013	342.68	353.81	-5.56	0.5
3	0_6722404	Unconfined	12,794	1/10/2014	342.48	354.51	-6.02	0.5
3	0_6722404	Unconfined	13,043	9/16/2014	342.16	352.86	-5.35	0.5
3	0_6722404	Unconfined	13,315	6/15/2015	342.69	358.14	-7.72	0.5
3	0_6722404	Unconfined	13,527	1/13/2016	343.53	365.29	-10.88	0.5
3	0_6722404	Unconfined	13,683	6/17/2016	345.33	365.04	-9.86	0.5
3	0_6722404	Unconfined	13,771	9/13/2016	345.33	364.90	-9.79	0.5
3	0_6722404	Unconfined	13,884	1/4/2017	346.03	364.67	-9.32	0.5
3	0_6722404	Unconfined	14,038	6/7/2017	346.83	362.35	-7.76	0.5
3	0_6722701	Confined	11,863	6/24/2011	297.44	307.43	-9.99	1
3	0_6722701	Confined	11,951	9/20/2011	289.59	307.43	-17.84	1
3	0_6722701	Confined	12,065	1/12/2012	290.04	307.42	-17.38	1
3	0_6722701	Confined	12,224	6/19/2012	291.55	307.40	-15.85	1
3	0_6722701	Confined	12,315	9/18/2012	290.00	307.39	-17.39	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6722701	Confined	12,678	9/16/2013	290.04	307.37	-17.33	1
3	0_6722701	Confined	13,043	9/16/2014	297.31	307.36	-10.05	1
3	0_6722701	Confined	13,165	1/16/2015	295.73	307.35	-11.62	1
3	0_6722701	Confined	13,325	6/25/2015	295.67	307.36	-11.69	1
3	0_6722701	Confined	13,525	1/11/2016	291.72	307.36	-15.64	1
3	0_6722701	Confined	13,667	6/1/2016	300.36	307.37	-7.01	1
3	0_6722701	Confined	13,771	9/13/2016	294.60	307.37	-12.77	1
3	0_6722701	Confined	13,884	1/4/2017	294.64	307.37	-12.73	1
3	0_6722701	Confined	14,038	6/7/2017	293.52	307.37	-13.85	1
3	0_6722803	Confined	13,018	8/22/2014	283.06	317.59	-34.53	1
3	0_6722803	Confined	13,325	6/25/2015	281.34	317.57	-36.23	1
3	0_6722803	Confined	13,525	1/11/2016	271.57	317.56	-45.99	1
3	0_6722803	Confined	13,683	6/17/2016	270.94	317.56	-46.62	1
3	0_6722803	Confined	13,771	9/13/2016	270.39	317.55	-47.16	1
3	0_6722803	Confined	13,884	1/4/2017	271.14	317.55	-46.41	1
3	0_6728904	Confined	12,673	9/11/2013	282.45	318.75	-3.63	0.1
3	0_6728904	Confined	12,801	1/17/2014	282.22	319.09	-3.69	0.1
3	0_6728904	Confined	13,039	9/12/2014	282.17	318.82	-3.67	0.1
3	0_6728904	Confined	13,157	1/8/2015	282.07	318.80	-3.67	0.1
3	0_6728904	Confined	13,540	1/26/2016	281.23	323.57	-4.23	0.1
3	0_6728904	Confined	13,673	6/7/2016	282.68	324.15	-4.15	0.1
3	0_6728904	Confined	13,765	9/7/2016	282.38	324.55	-4.22	0.1
3	0_6728904	Confined	13,890	1/10/2017	282.33	325.02	-4.27	0.1
3	0_6728904	Confined	14,051	6/20/2017	282.38	324.47	-4.21	0.1
3	0_6729204	Confined	11,951	9/20/2011	331.17	368.55	-3.74	0.1
3	0_6729204	Confined	12,065	1/12/2012	331.23	367.80	-3.66	0.1
3	0_6729204	Confined	12,218	6/13/2012	331.52	367.93	-3.64	0.1
3	0_6729204	Confined	12,310	9/13/2012	331.48	368.00	-3.65	0.1
3	0_6729302	Confined	780	2/18/1981	329.78	342.29	-1.25	0.1
3	0_6729302	Confined	1,194	4/8/1982	328.46	342.75	-1.43	0.1
3	0_6729302	Confined	1,510	2/18/1983	327.09	342.06	-1.50	0.1
3	0_6729302	Confined	1,866	2/9/1984	327.24	341.94	-1.47	0.1
3	0_6729302	Confined	2,230	2/7/1985	328.21	341.81	-1.36	0.1
3	0_6729302	Confined	2,614	2/26/1986	322.42	342.53	-2.01	0.1
3	0_6729302	Confined	2,892	12/1/1986	325.22	342.64	-1.74	0.1
3	0_6729302	Confined	3,333	2/15/1988	327.58	342.59	-1.50	0.1
3	0_6729302	Confined	3,701	2/17/1989	330.46	341.59	-1.11	0.1
3	0_6729302	Confined	4,076	2/27/1990	327.24	341.54	-1.43	0.1
3	0_6729302	Confined	4,427	2/13/1991	313.77	341.98	-2.82	0.1
3	0_6729304	Confined	11,590	9/24/2010	324.53	333.75	-4.61	0.5
3	0_6729304	Confined	11,701	1/13/2011	324.74	333.84	-4.55	0.5
3	0_6729304	Confined	11,958	9/27/2011	326.61	333.36	-3.38	0.5
3	0_6729304	Confined	12,079	1/26/2012	326.90	333.19	-3.15	0.5
3	0_6729304	Confined	12,207	6/2/2012	327.31	333.22	-2.95	0.5
3	0_6729304	Confined	12,310	9/13/2012	326.62	333.23	-3.31	0.5
3	0_6729304	Confined	12,675	9/13/2013	327.19	333.36	-3.08	0.5
3	0_6729304	Confined	12,794	1/10/2014	327.56	333.40	-2.92	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6729304	Confined	13,043	9/16/2014	326.86	333.33	-3.23	0.5
3	0_6729304	Confined	13,165	1/16/2015	327.48	333.34	-2.93	0.5
3	0_6729304	Confined	13,325	6/25/2015	328.14	333.76	-2.81	0.5
3	0_6729304	Confined	13,527	1/13/2016	327.95	334.27	-3.16	0.5
3	0_6729304	Confined	13,667	6/1/2016	328.33	334.29	-2.98	0.5
3	0_6729304	Confined	13,765	9/7/2016	328.26	334.30	-3.02	0.5
3	0_6729304	Confined	13,883	1/3/2017	328.27	334.32	-3.02	0.5
3	0_6729304	Confined	14,045	6/14/2017	327.93	334.12	-3.09	0.5
3	0_6729403	Unconfined	11,895	7/26/2011	321.46	349.94	-2.85	0.1
3	0_6729403	Unconfined	11,947	9/16/2011	320.51	347.89	-2.74	0.1
3	0_6729403	Unconfined	12,065	1/12/2012	322.11	343.75	-2.16	0.1
3	0_6729403	Unconfined	12,212	6/7/2012	322.42	344.40	-2.20	0.1
3	0_6729403	Unconfined	12,310	9/13/2012	321.37	344.83	-2.35	0.1
3	0_6729403	Unconfined	12,678	9/16/2013	319.05	349.04	-3.00	0.1
3	0_6729403	Unconfined	12,794	1/10/2014	321.61	350.47	-2.89	0.1
3	0_6729403	Unconfined	13,043	9/16/2014	319.99	348.01	-2.80	0.1
3	0_6729403	Unconfined	13,170	1/21/2015	321.55	348.48	-2.69	0.1
3	0_6729403	Unconfined	13,322	6/22/2015	326.51	359.39	-3.29	0.1
3	0_6729403	Unconfined	13,529	1/15/2016	323.97	373.13	-4.92	0.1
3	0_6729403	Unconfined	13,694	6/28/2016	326.32	372.72	-4.64	0.1
3	0_6729403	Unconfined	13,778	9/20/2016	323.66	372.51	-4.89	0.1
3	0_6729403	Unconfined	13,890	1/10/2017	324.26	371.93	-4.77	0.1
3	0_6729403	Unconfined	14,052	6/21/2017	324.99	366.62	-4.16	0.1
3	0_6729501	Confined	780	2/18/1981	310.05	303.71	3.17	0.5
3	0_6729501	Confined	1,510	2/18/1983	300.86	303.70	-1.42	0.5
3	0_6729501	Confined	2,230	2/7/1985	305.26	303.67	0.80	0.5
3	0_6729501	Confined	2,614	2/26/1986	305.89	303.70	1.09	0.5
3	0_6729501	Confined	2,892	12/1/1986	305.85	303.72	1.07	0.5
3	0_6729501	Confined	3,333	2/15/1988	306.39	303.72	1.34	0.5
3	0_6729501	Confined	3,700	2/16/1989	301.59	303.66	-1.04	0.5
3	0_6729501	Confined	4,076	2/27/1990	304.03	303.65	0.19	0.5
3	0_6729501	Confined	4,427	2/13/1991	302.45	303.66	-0.60	0.5
3	0_6729501	Confined	4,807	2/28/1992	304.35	303.71	0.32	0.5
3	0_6729501	Confined	5,164	2/19/1993	304.05	303.75	0.15	0.5
3	0_6729501	Confined	5,534	2/24/1994	303.55	303.71	-0.08	0.5
3	0_6729501	Confined	5,890	2/15/1995	306.95	303.70	1.63	0.5
3	0_6729501	Confined	6,260	2/20/1996	306.45	303.67	1.39	0.5
3	0_6729501	Confined	6,627	2/21/1997	303.15	303.64	-0.24	0.5
3	0_6729501	Confined	6,976	2/5/1998	305.93	303.68	1.12	0.5
3	0_6729501	Confined	11,223	9/22/2009	296.35	303.59	-3.62	0.5
3	0_6729501	Confined	11,341	1/18/2010	302.93	303.64	-0.36	0.5
3	0_6729501	Confined	11,490	6/16/2010	302.03	303.66	-0.82	0.5
3	0_6729501	Confined	11,583	9/17/2010	299.69	303.68	-1.99	0.5
3	0_6729501	Confined	11,701	1/13/2011	303.27	303.69	-0.21	0.5
3	0_6729501	Confined	11,845	6/6/2011	301.09	303.67	-1.29	0.5
3	0_6729501	Confined	11,947	9/16/2011	297.17	303.66	-3.24	0.5
3	0_6729501	Confined	12,065	1/12/2012	300.45	303.63	-1.59	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6729501	Confined	12,206	6/1/2012	304.16	303.55	0.31	0.5
3	0_6729501	Confined	12,310	9/13/2012	300.17	303.49	-1.66	0.5
3	0_6729501	Confined	12,675	9/13/2013	298.39	303.40	-2.50	0.5
3	0_6729501	Confined	12,794	1/10/2014	302.69	303.39	-0.35	0.5
3	0_6729501	Confined	13,037	9/10/2014	297.36	303.36	-3.00	0.5
3	0_6729501	Confined	13,157	1/8/2015	302.65	303.35	-0.35	0.5
3	0_6729501	Confined	13,315	6/15/2015	302.79	303.37	-0.29	0.5
3	0_6729501	Confined	13,527	1/13/2016	304.24	303.40	0.42	0.5
3	0_6729501	Confined	13,667	6/1/2016	305.46	303.41	1.03	0.5
3	0_6729501	Confined	13,765	9/7/2016	304.71	303.41	0.65	0.5
3	0_6729501	Confined	13,883	1/3/2017	305.31	303.42	0.94	0.5
3	0_6729501	Confined	14,045	6/14/2017	305.30	303.44	0.93	0.5
3	0_6729604	Confined	11,490	6/16/2010	308.28	315.28	-7.00	1
3	0_6729604	Confined	11,582	9/16/2010	307.64	315.29	-7.65	1
3	0_6729604	Confined	11,701	1/13/2011	308.62	315.31	-6.69	1
3	0_6729604	Confined	11,845	6/6/2011	307.59	315.28	-7.69	1
3	0_6729604	Confined	11,951	9/20/2011	305.22	315.26	-10.04	1
3	0_6729604	Confined	12,084	1/31/2012	308.33	315.23	-6.90	1
3	0_6729604	Confined	12,218	6/13/2012	308.79	315.18	-6.39	1
3	0_6729604	Confined	12,310	9/13/2012	306.67	315.14	-8.47	1
3	0_6729604	Confined	12,678	9/16/2013	305.89	315.07	-9.18	1
3	0_6729604	Confined	12,806	1/22/2014	307.90	315.06	-7.16	1
3	0_6729604	Confined	13,037	9/10/2014	305.70	315.03	-9.33	1
3	0_6729604	Confined	13,165	1/16/2015	308.21	315.02	-6.81	1
3	0_6729604	Confined	13,315	6/15/2015	309.15	315.04	-5.89	1
3	0_6729604	Confined	13,527	1/13/2016	307.85	315.07	-7.22	1
3	0_6729604	Confined	13,667	6/1/2016	309.45	315.08	-5.63	1
3	0_6729604	Confined	13,765	9/7/2016	309.56	315.09	-5.53	1
3	0_6729604	Confined	13,883	1/3/2017	308.87	315.10	-6.23	1
3	0_6729604	Confined	14,050	6/19/2017	309.52	315.11	-5.59	1
3	0_6729806	Confined	11,862	6/23/2011	280.24	272.88	7.36	1
3	0_6729806	Confined	11,947	9/16/2011	276.83	272.87	3.96	1
3	0_6729806	Confined	12,064	1/11/2012	281.54	272.85	8.69	1
3	0_6729806	Confined	12,206	6/1/2012	282.91	272.57	10.34	1
3	0_6729806	Confined	12,310	9/13/2012	280.58	272.37	8.21	1
3	0_6729806	Confined	12,673	9/11/2013	277.70	272.14	5.56	1
3	0_6729806	Confined	12,794	1/10/2014	281.98	272.13	9.85	1
3	0_6729806	Confined	13,037	9/10/2014	278.74	272.13	6.61	1
3	0_6729806	Confined	13,165	1/16/2015	281.93	272.13	9.80	1
3	0_6729806	Confined	13,312	6/12/2015	283.34	272.13	11.21	1
3	0_6729806	Confined	13,525	1/11/2016	283.01	272.12	10.89	1
3	0_6729806	Confined	13,667	6/1/2016	284.44	272.11	12.33	1
3	0_6729806	Confined	13,765	9/7/2016	282.74	272.11	10.63	1
3	0_6729806	Confined	13,771	9/13/2016	283.39	272.11	11.28	1
3	0_6729806	Confined	13,883	1/3/2017	283.87	272.11	11.76	1
3	0_6729806	Confined	13,884	1/4/2017	283.04	272.11	10.93	1
3	0_6729806	Confined	14,032	6/1/2017	284.70	272.24	12.46	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6729904	Confined	13,176	1/27/2015	293.25	284.00	9.25	1
3	0_6729904	Confined	13,325	6/25/2015	294.21	283.99	10.22	1
3	0_6729904	Confined	13,525	1/11/2016	293.56	283.98	9.58	1
3	0_6729904	Confined	13,683	6/17/2016	293.55	283.98	9.57	1
3	0_6729904	Confined	13,774	9/16/2016	295.15	283.98	11.17	1
3	0_6729904	Confined	13,903	1/23/2017	293.70	283.98	9.72	1
3	0_6736201	Unconfined	11,772	3/25/2011	284.37	280.92	3.45	1
3	0_6736201	Unconfined	11,854	6/15/2011	283.18	280.90	2.28	1
3	0_6736201	Unconfined	11,950	9/19/2011	282.49	280.87	1.62	1
3	0_6736201	Unconfined	12,064	1/11/2012	283.06	280.85	2.21	1
3	0_6736201	Unconfined	12,218	6/13/2012	283.63	280.84	2.79	1
3	0_6736201	Unconfined	12,309	9/12/2012	282.49	280.83	1.66	1
3	0_6736201	Unconfined	12,673	9/11/2013	282.00	280.83	1.17	1
3	0_6736201	Unconfined	12,801	1/17/2014	283.32	280.83	2.49	1
3	0_6736201	Unconfined	13,043	9/16/2014	282.46	280.83	1.63	1
3	0_6736201	Unconfined	13,157	1/8/2015	283.22	280.83	2.39	1
3	0_6736201	Unconfined	13,312	6/12/2015	288.03	280.88	7.15	1
3	0_6736201	Unconfined	13,519	1/5/2016	285.92	280.94	4.98	1
3	0_6736201	Unconfined	13,673	6/7/2016	285.95	280.98	4.97	1
3	0_6736201	Unconfined	13,765	9/7/2016	283.29	281.01	2.28	1
3	0_6736201	Unconfined	13,891	1/11/2017	281.06	281.04	0.02	1
3	0_6736201	Unconfined	14,051	6/20/2017	280.57	281.05	-0.48	1
3	0_6736402	Confined	11,895	7/26/2011	316.37	340.38	-24.01	1
3	0_6736402	Confined	11,950	9/19/2011	316.23	340.13	-23.90	1
3	0_6736402	Confined	12,064	1/11/2012	316.49	339.65	-23.16	1
3	0_6736402	Confined	12,212	6/7/2012	314.01	339.48	-25.47	1
3	0_6736402	Confined	12,309	9/12/2012	316.15	339.37	-23.22	1
3	0_6736402	Confined	12,673	9/11/2013	313.91	339.40	-25.49	1
3	0_6736402	Confined	12,806	1/22/2014	315.68	339.47	-23.79	1
3	0_6736402	Confined	13,038	9/11/2014	316.71	339.45	-22.74	1
3	0_6736402	Confined	13,157	1/8/2015	315.53	339.49	-23.96	1
3	0_6736402	Confined	13,312	6/12/2015	316.20	340.35	-24.15	1
3	0_6736402	Confined	13,540	1/26/2016	315.62	341.62	-26.00	1
3	0_6736402	Confined	13,674	6/8/2016	315.83	342.32	-26.49	1
3	0_6736402	Confined	13,772	9/14/2016	316.12	342.83	-26.71	1
3	0_6736402	Confined	13,891	1/11/2017	315.92	343.40	-27.48	1
3	0_6736402	Confined	14,052	6/21/2017	316.00	343.42	-27.42	1
3	0_6736606	Confined	7,158	8/6/1998	232.92	281.35	-24.22	0.5
3	0_6736702	Confined	11,932	9/1/2011	294.83	276.54	18.29	1
3	0_6736702	Confined	12,064	1/11/2012	297.14	276.54	20.60	1
3	0_6736702	Confined	12,212	6/7/2012	294.97	276.52	18.45	1
3	0_6736702	Confined	12,806	1/22/2014	292.73	276.49	16.24	1
3	0_6736702	Confined	13,038	9/11/2014	292.28	276.49	15.79	1
3	0_6736702	Confined	13,157	1/8/2015	294.63	276.49	18.14	1
3	0_6736702	Confined	13,312	6/12/2015	297.82	276.49	21.33	1
3	0_6736702	Confined	13,540	1/26/2016	297.03	276.49	20.54	1
3	0_6736702	Confined	13,674	6/8/2016	297.83	276.49	21.34	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6736702	Confined	13,778	9/20/2016	297.46	276.49	20.97	1
3	0_6736702	Confined	13,891	1/11/2017	297.45	276.49	20.96	1
3	0_6736702	Confined	14,053	6/22/2017	297.21	276.50	20.71	1
3	0_6743107	Confined	11,884	7/15/2011	308.39	292.32	1.61	0.1
3	0_6743107	Confined	11,950	9/19/2011	305.76	292.20	1.36	0.1
3	0_6743107	Confined	12,064	1/11/2012	312.08	292.00	2.01	0.1
3	0_6743107	Confined	12,218	6/13/2012	311.95	291.86	2.01	0.1
3	0_6743107	Confined	12,309	9/12/2012	313.07	291.78	2.13	0.1
3	0_6743107	Confined	12,673	9/11/2013	310.00	291.71	1.83	0.1
3	0_6743107	Confined	12,806	1/22/2014	312.76	291.72	2.10	0.1
3	0_6743107	Confined	13,039	9/12/2014	309.36	291.70	1.77	0.1
3	0_6743107	Confined	13,157	1/8/2015	314.44	291.71	2.27	0.1
3	0_6743107	Confined	13,302	6/2/2015	314.32	292.04	2.23	0.1
3	0_6743107	Confined	13,540	1/26/2016	313.83	292.58	2.12	0.1
3	0_6743107	Confined	13,694	6/28/2016	313.33	292.91	2.04	0.1
3	0_6743107	Confined	13,897	1/17/2017	315.05	293.31	2.17	0.1
3	0_6743204	Confined	781	2/19/1981	313.48	316.07	-0.26	0.1
3	0_6743204	Confined	1,145	2/18/1982	314.07	316.11	-0.20	0.1
3	0_6743204	Confined	1,509	2/17/1983	312.57	316.05	-0.35	0.1
3	0_6743204	Confined	1,866	2/9/1984	313.73	316.05	-0.23	0.1
3	0_6743204	Confined	2,229	2/6/1985	312.83	316.02	-0.32	0.1
3	0_6743204	Confined	2,612	2/24/1986	316.47	316.12	0.04	0.1
3	0_6743204	Confined	2,892	12/1/1986	314.97	316.11	-0.11	0.1
3	0_6743204	Confined	3,333	2/15/1988	313.63	316.06	-0.24	0.1
3	0_6743204	Confined	3,700	2/16/1989	314.37	315.73	-0.14	0.1
3	0_6743204	Confined	4,075	2/26/1990	312.84	315.87	-0.30	0.1
3	0_6743204	Confined	4,426	2/12/1991	313.37	316.08	-0.27	0.1
3	0_6743204	Confined	4,806	2/27/1992	305.67	316.14	-1.05	0.1
3	0_6743204	Confined	5,163	2/18/1993	312.20	316.15	-0.40	0.1
3	0_6743204	Confined	5,524	2/14/1994	315.36	316.07	-0.07	0.1
3	0_6743204	Confined	5,890	2/15/1995	317.02	316.10	0.09	0.1
3	0_6743204	Confined	6,626	2/20/1997	316.37	315.87	0.05	0.1
3	0_6743204	Confined	6,990	2/19/1998	317.19	316.12	0.11	0.1
3	0_6743204	Confined	11,204	9/3/2009	311.09	316.02	-0.49	0.1
3	0_6743204	Confined	11,328	1/5/2010	313.59	316.07	-0.25	0.1
3	0_6743204	Confined	11,477	6/3/2010	315.07	316.09	-0.10	0.1
3	0_6743204	Confined	11,588	9/22/2010	313.12	316.11	-0.30	0.1
3	0_6743204	Confined	11,694	1/6/2011	310.75	316.12	-0.54	0.1
3	0_6743204	Confined	11,846	6/7/2011	309.65	315.96	-0.63	0.1
3	0_6743204	Confined	11,938	9/7/2011	308.22	315.87	-0.77	0.1
3	0_6743204	Confined	12,064	1/11/2012	309.64	315.76	-0.61	0.1
3	0_6743204	Confined	12,309	9/12/2012	310.79	315.96	-0.52	0.1
3	0_6743204	Confined	12,673	9/11/2013	307.98	316.07	-0.81	0.1
3	0_6743204	Confined	12,787	1/3/2014	308.03	316.08	-0.81	0.1
3	0_6743204	Confined	12,940	6/5/2014	310.29	316.07	-0.58	0.1
3	0_6743204	Confined	13,157	1/8/2015	309.82	316.06	-0.62	0.1
3	0_6743204	Confined	13,302	6/2/2015	312.62	316.11	-0.35	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6743204	Confined	13,540	1/26/2016	313.00	316.18	-0.32	0.1
3	0_6743204	Confined	13,680	6/14/2016	311.18	316.17	-0.50	0.1
3	0_6743204	Confined	13,772	9/14/2016	313.73	316.17	-0.24	0.1
3	0_6743204	Confined	14,052	6/21/2017	313.22	316.15	-0.29	0.1
3	0_6743706	Confined	11,589	9/23/2010	321.18	302.38	9.40	0.5
3	0_6743706	Confined	11,700	1/12/2011	321.39	302.38	9.50	0.5
3	0_6743706	Confined	12,064	1/11/2012	317.33	302.38	7.47	0.5
3	0_6743706	Confined	12,218	6/13/2012	319.65	302.37	8.64	0.5
3	0_6743706	Confined	12,309	9/12/2012	314.60	302.37	6.12	0.5
3	0_6743706	Confined	12,673	9/11/2013	310.40	302.36	4.02	0.5
3	0_6743706	Confined	12,806	1/22/2014	315.40	302.36	6.52	0.5
3	0_6743706	Confined	12,953	6/18/2014	311.47	302.36	4.56	0.5
3	0_6743706	Confined	13,038	9/11/2014	309.35	302.36	3.50	0.5
3	0_6743706	Confined	13,157	1/8/2015	313.35	302.36	5.50	0.5
3	0_6743706	Confined	13,302	6/2/2015	318.05	302.35	7.85	0.5
3	0_6743706	Confined	13,540	1/26/2016	318.14	302.35	7.89	0.5
3	0_6743706	Confined	13,680	6/14/2016	319.05	302.35	8.35	0.5
3	0_6743706	Confined	13,778	9/20/2016	319.66	302.35	8.65	0.5
3	0_6743706	Confined	13,889	1/9/2017	319.20	302.35	8.42	0.5
3	0_6743706	Confined	14,052	6/21/2017	317.58	302.36	7.61	0.5
3	0_6743708	Confined	13,057	9/30/2014	296.66	293.23	3.43	1
3	0_6743708	Confined	13,155	1/6/2015	301.11	293.23	7.88	1
3	0_6743708	Confined	13,302	6/2/2015	306.56	293.23	13.33	1
3	0_6743708	Confined	13,534	1/20/2016	308.96	293.23	15.73	1
3	0_6743708	Confined	13,694	6/28/2016	310.77	293.23	17.54	1
3	0_6743708	Confined	13,778	9/20/2016	311.05	293.23	17.82	1
3	0_6743708	Confined	13,889	1/9/2017	310.43	293.23	17.20	1
3	0_6743709	Confined	13,041	9/14/2014	283.68	292.26	-8.58	1
3	0_6750101	Confined	775	2/13/1981	377.86	380.70	-0.28	0.1
3	0_6750101	Confined	1,145	2/18/1982	373.95	381.60	-0.76	0.1
3	0_6750101	Confined	1,508	2/16/1983	376.99	380.75	-0.38	0.1
3	0_6750101	Confined	1,865	2/8/1984	376.07	379.98	-0.39	0.1
3	0_6750101	Confined	2,229	2/6/1985	377.51	379.09	-0.16	0.1
3	0_6750101	Confined	2,894	12/3/1986	376.36	380.79	-0.44	0.1
3	0_6750101	Confined	3,333	2/15/1988	379.22	381.04	-0.18	0.1
3	0_6750101	Confined	3,700	2/16/1989	374.51	378.76	-0.42	0.1
3	0_6750101	Confined	3,999	12/12/1989	377.16	377.58	-0.04	0.1
3	0_6750101	Confined	4,363	12/11/1990	375.38	378.09	-0.27	0.1
3	0_6750101	Confined	5,120	1/6/1993	379.88	381.93	-0.21	0.1
3	0_6750101	Confined	5,485	1/6/1994	379.18	380.98	-0.18	0.1
3	0_6750101	Confined	5,850	1/6/1995	379.38	380.99	-0.16	0.1
3	0_6750101	Confined	6,217	1/8/1996	379.98	379.94	0.00	0.1
3	0_6750101	Confined	6,641	3/7/1997	381.53	378.22	0.33	0.1
3	0_6750101	Confined	6,975	2/4/1998	383.78	379.22	0.46	0.1
3	0_6750101	Confined	7,324	1/19/1999	381.73	380.16	0.16	0.1
3	0_6750101	Confined	8,074	2/7/2001	380.18	379.00	0.12	0.1
3	0_6750101	Confined	8,429	1/28/2002	380.48	379.59	0.09	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_6750101	Confined	8,793	1/27/2003	381.08	382.40	-0.13	0.1
3	0_6750101	Confined	9,172	2/10/2004	380.58	382.33	-0.17	0.1
3	0_6750101	Confined	9,564	3/8/2005	381.98	380.87	0.11	0.1
3	0_6750101	Confined	9,895	2/2/2006	380.88	377.40	0.35	0.1
3	0_6750101	Confined	10,293	3/7/2007	379.98	375.28	0.47	0.1
3	0_6750101	Confined	10,644	2/21/2008	380.58	377.60	0.30	0.1
3	0_6750101	Confined	10,991	2/2/2009	380.18	375.15	0.50	0.1
3	0_6750101	Confined	11,420	4/7/2010	381.28	376.94	0.43	0.1
3	0_6757101	Confined	775	2/13/1981	382.45	338.37	44.08	1
3	0_6862607	Unconfined	779	2/17/1981	438.81	363.85	7.50	0.1
3	0_6862607	Unconfined	3,335	2/17/1988	441.10	368.34	7.28	0.1
3	0_6862607	Unconfined	3,698	2/14/1989	440.09	364.64	7.54	0.1
3	0_6862607	Unconfined	4,364	12/12/1990	441.85	364.02	7.78	0.1
3	0_6863207	Unconfined	779	2/17/1981	430.62	355.37	7.53	0.1
3	0_6863207	Unconfined	1,144	2/17/1982	430.05	357.91	7.21	0.1
3	0_6863207	Unconfined	1,506	2/14/1983	428.35	354.30	7.40	0.1
3	0_6863207	Unconfined	1,863	2/6/1984	428.04	354.09	7.39	0.1
3	0_6863207	Unconfined	2,227	2/4/1985	427.71	353.09	7.46	0.1
3	0_6863207	Unconfined	2,602	2/14/1986	425.52	357.71	6.78	0.1
3	0_6863207	Unconfined	3,335	2/17/1988	426.09	356.99	6.91	0.1
3	0_6863207	Unconfined	3,698	2/14/1989	424.62	350.80	7.38	0.1
3	0_6863207	Unconfined	3,998	12/11/1989	428.97	351.43	7.75	0.1
3	0_6863207	Unconfined	4,365	12/13/1990	423.69	354.73	6.90	0.1
3	0_6863207	Unconfined	5,128	1/14/1993	424.92	359.46	6.55	0.1
3	0_7722503	Unconfined	780	2/18/1981	547.74	558.65	-1.09	0.1
3	0_7722801	Unconfined	1,870	2/13/1984	494.47	527.96	-3.35	0.1
3	0_7722801	Unconfined	2,237	2/14/1985	485.94	527.88	-4.19	0.1
3	0_7722801	Unconfined	2,608	2/20/1986	493.27	527.95	-3.47	0.1
3	0_7722801	Unconfined	2,962	2/9/1987	493.32	528.01	-3.47	0.1
3	0_7722801	Unconfined	3,363	3/16/1988	496.78	528.04	-3.13	0.1
3	0_7722801	Unconfined	3,699	2/15/1989	496.09	527.89	-3.18	0.1
3	0_7722801	Unconfined	4,071	2/22/1990	497.90	527.77	-2.99	0.1
3	0_7722801	Unconfined	4,428	2/14/1991	499.71	527.78	-2.81	0.1
3	0_7722801	Unconfined	4,791	2/12/1992	500.43	527.90	-2.75	0.1
3	0_7722801	Unconfined	5,805	11/22/1994	501.07	528.10	-2.70	0.1
3	0_7722801	Unconfined	6,233	1/24/1996	498.95	528.05	-2.91	0.1
3	0_7722801	Unconfined	6,624	2/18/1997	499.70	527.92	-2.82	0.1
3	0_7722801	Unconfined	7,340	2/4/1999	498.00	528.08	-3.01	0.1
3	0_7722801	Unconfined	7,725	2/24/2000	496.50	527.99	-3.15	0.1
3	0_7722801	Unconfined	8,076	2/9/2001	494.80	527.99	-3.32	0.1
3	0_7722801	Unconfined	8,436	2/4/2002	495.45	528.00	-3.26	0.1
3	0_7722801	Unconfined	8,807	2/10/2003	495.70	528.23	-3.25	0.1
3	0_7722801	Unconfined	9,151	1/20/2004	495.60	528.33	-3.27	0.1
3	0_7722801	Unconfined	9,535	2/7/2005	497.12	528.54	-3.14	0.1
3	0_7722801	Unconfined	9,920	2/27/2006	483.80	528.45	-4.46	0.1
3	0_7722801	Unconfined	10,263	2/5/2007	493.80	528.35	-3.45	0.1
3	0_7722801	Unconfined	10,630	2/7/2008	494.10	528.55	-3.45	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_7722801	Unconfined	11,014	2/25/2009	491.73	528.44	-3.67	0.1
3	0_7722801	Unconfined	11,352	1/29/2010	494.38	528.40	-3.40	0.1
3	0_7722801	Unconfined	11,721	2/2/2011	498.26	528.43	-3.02	0.1
3	0_7722801	Unconfined	12,076	1/23/2012	500.20	528.26	-2.81	0.1
3	0_7722801	Unconfined	12,443	1/24/2013	502.04	528.19	-2.62	0.1
3	0_7722801	Unconfined	12,822	2/7/2014	497.05	528.18	-3.11	0.1
3	0_7722801	Unconfined	13,072	10/15/2014	501.83	528.14	-2.63	0.1
3	0_7722801	Unconfined	13,802	10/14/2016	502.83	528.46	-2.56	0.1
3	0_7722801	Unconfined	14,172	10/19/2017	503.10	528.56	-2.55	0.1
3	0_7722902	Unconfined	779	2/17/1981	500.17	504.30	-2.06	0.5
3	0_7722902	Unconfined	1,143	2/16/1982	500.28	504.31	-2.01	0.5
3	0_7722902	Unconfined	1,513	2/21/1983	490.67	504.31	-6.82	0.5
3	0_7722902	Unconfined	1,870	2/13/1984	489.40	504.32	-7.46	0.5
3	0_7722902	Unconfined	2,237	2/14/1985	487.58	504.32	-8.37	0.5
3	0_7722902	Unconfined	2,608	2/20/1986	480.01	504.32	-12.16	0.5
3	0_7722902	Unconfined	2,962	2/9/1987	506.73	504.32	1.21	0.5
3	0_7722902	Unconfined	3,363	3/16/1988	508.82	504.32	2.25	0.5
3	0_7722902	Unconfined	4,071	2/22/1990	502.67	504.32	-0.82	0.5
3	0_7722902	Unconfined	4,428	2/14/1991	503.57	504.30	-0.36	0.5
3	0_7722902	Unconfined	4,791	2/12/1992	505.35	504.28	0.54	0.5
3	0_7722902	Unconfined	5,170	2/25/1993	504.47	504.27	0.10	0.5
3	0_7722902	Unconfined	5,805	11/22/1994	503.93	504.29	-0.18	0.5
3	0_7722902	Unconfined	6,233	1/24/1996	504.87	504.31	0.28	0.5
3	0_7730605	Unconfined	779	2/17/1981	426.33	470.40	-22.04	0.5
3	0_7730605	Unconfined	1,143	2/16/1982	427.21	470.45	-21.62	0.5
3	0_7730605	Unconfined	1,507	2/15/1983	432.00	470.48	-19.24	0.5
3	0_7730605	Unconfined	1,870	2/13/1984	432.03	470.46	-19.21	0.5
3	0_7730605	Unconfined	2,237	2/14/1985	430.42	470.40	-19.99	0.5
3	0_7730605	Unconfined	2,608	2/20/1986	430.30	470.38	-20.04	0.5
3	0_7730605	Unconfined	2,962	2/9/1987	431.85	470.40	-19.28	0.5
3	0_7730605	Unconfined	3,364	3/17/1988	428.70	470.45	-20.87	0.5
3	0_7730605	Unconfined	3,699	2/15/1989	431.18	470.41	-19.61	0.5
3	0_7730605	Unconfined	4,070	2/21/1990	431.35	470.30	-19.48	0.5
3	0_7730605	Unconfined	5,533	2/23/1994	431.60	470.43	-19.42	0.5
3	0_7730605	Unconfined	5,805	11/22/1994	432.33	470.50	-19.08	0.5
3	0_7730605	Unconfined	8,535	5/14/2002	428.10	470.47	-21.19	0.5
3	0_7739709	Confined	1,506	2/14/1983	386.98	355.12	15.93	0.5
3	0_7739709	Confined	2,957	2/4/1987	387.05	355.12	15.97	0.5
3	0_7739709	Confined	3,363	3/16/1988	382.09	355.12	13.49	0.5
3	0_7739709	Confined	3,699	2/15/1989	385.55	355.12	15.22	0.5
3	0_7739709	Confined	4,071	2/22/1990	385.50	355.12	15.19	0.5
3	0_7739709	Confined	4,790	2/11/1992	384.85	355.12	14.87	0.5
3	0_7739709	Confined	5,805	11/22/1994	382.00	355.12	13.44	0.5
3	0_7739709	Confined	6,232	1/23/1996	381.10	355.12	12.99	0.5
3	0_7739709	Confined	6,984	2/13/1998	384.11	355.12	14.50	0.5
3	0_7739709	Confined	7,340	2/4/1999	391.60	355.12	18.24	0.5
3	0_7739709	Confined	7,724	2/23/2000	382.70	355.12	13.79	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_7739709	Confined	8,083	2/16/2001	381.80	355.12	13.34	0.5
3	0_7739709	Confined	8,437	2/5/2002	382.32	355.12	13.60	0.5
3	0_7746801	Confined	1,503	2/11/1983	429.52	407.95	2.16	0.1
3	0_7746801	Confined	1,872	2/15/1984	431.06	407.95	2.31	0.1
3	0_7747803	Confined	8,536	5/15/2002	381.98	344.60	18.69	0.5
3	0_7756202	Confined	778	2/16/1981	350.34	276.90	73.44	1
3	0_7756802	Confined	778	2/16/1981	375.75	262.11	56.82	0.5
3	0_7756802	Confined	1,508	2/16/1983	377.39	262.11	57.64	0.5
3	0_7762401	Confined	775	2/13/1981	450.70	469.18	-18.48	1
3	0_7762401	Confined	1,139	2/12/1982	448.62	470.29	-21.67	1
3	0_7762401	Confined	1,503	2/11/1983	447.37	469.32	-21.95	1
3	0_7762401	Confined	1,872	2/15/1984	446.89	469.23	-22.34	1
3	0_7762401	Confined	2,957	2/4/1987	449.61	468.58	-18.97	1
3	0_7762401	Confined	3,363	3/16/1988	447.74	468.48	-20.74	1
3	0_7762401	Confined	3,700	2/16/1989	447.27	467.60	-20.33	1
3	0_7762401	Confined	4,071	2/22/1990	446.98	467.36	-20.38	1
3	0_7762401	Confined	4,427	2/13/1991	448.57	467.39	-18.82	1
3	0_7762401	Confined	4,791	2/12/1992	442.73	467.77	-25.04	1
3	0_7762401	Confined	5,812	11/29/1994	440.32	466.81	-26.49	1
3	0_7762401	Confined	6,232	1/23/1996	446.02	466.32	-20.30	1
3	0_7762401	Confined	6,984	2/13/1998	443.84	468.16	-24.32	1
3	0_7762401	Confined	7,724	2/23/2000	445.52	466.91	-21.39	1
3	0_7805717	Confined	772	2/10/1981	348.49	367.91	-9.71	0.5
3	0_7805717	Confined	1,153	2/26/1982	350.79	368.75	-8.98	0.5
3	0_7805717	Confined	1,500	2/8/1983	348.93	369.09	-10.08	0.5
3	0_7805717	Confined	1,878	2/21/1984	348.12	369.46	-10.67	0.5
3	0_7805717	Confined	2,230	2/7/1985	348.56	369.63	-10.54	0.5
3	0_7805717	Confined	3,336	2/18/1988	350.29	369.95	-9.83	0.5
3	0_7805717	Confined	3,706	2/22/1989	345.81	369.69	-11.94	0.5
3	0_7805717	Confined	4,084	3/7/1990	343.07	369.20	-13.06	0.5
3	0_7805717	Confined	4,412	1/29/1991	344.60	369.32	-12.36	0.5
3	0_7805717	Confined	5,121	1/7/1993	348.62	369.64	-10.51	0.5
3	0_7805717	Confined	5,491	1/12/1994	347.07	369.48	-11.21	0.5
3	0_7805717	Confined	5,863	1/19/1995	346.47	369.39	-11.46	0.5
3	0_7805717	Confined	6,228	1/19/1996	344.22	369.25	-12.51	0.5
3	0_7805717	Confined	7,313	1/8/1999	344.02	368.93	-12.46	0.5
3	0_7805717	Confined	7,682	1/12/2000	343.17	368.84	-12.83	0.5
3	0_7805717	Confined	8,045	1/9/2001	341.07	368.40	-13.67	0.5
3	0_7805717	Confined	8,417	1/16/2002	337.17	368.58	-15.70	0.5
3	0_7805717	Confined	8,789	1/23/2003	356.67	368.24	-5.79	0.5
3	0_7805717	Confined	9,150	1/19/2004	354.67	368.29	-6.81	0.5
3	0_7805717	Confined	9,529	2/1/2005	355.17	368.31	-6.57	0.5
3	0_7805717	Confined	9,885	1/23/2006	342.17	368.28	-13.06	0.5
3	0_7805717	Confined	10,263	2/5/2007	347.87	368.58	-10.35	0.5
3	0_7805717	Confined	10,601	1/9/2008	347.07	369.12	-11.02	0.5
3	0_7805717	Confined	10,992	2/3/2009	345.17	368.65	-11.74	0.5
3	0_7805717	Confined	11,359	2/5/2010	347.47	367.94	-10.23	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	0_7811204	Confined	1,153	2/26/1982	395.93	423.08	-13.58	0.5
3	0_7811204	Confined	1,501	2/9/1983	394.68	423.62	-14.47	0.5
3	0_7811204	Confined	1,874	2/17/1984	391.37	424.23	-16.43	0.5
3	0_7811204	Confined	2,230	2/7/1985	394.81	424.59	-14.89	0.5
3	0_7811204	Confined	2,593	2/5/1986	395.22	424.94	-14.86	0.5
3	0_7811204	Confined	4,405	1/22/1991	411.76	424.66	-6.45	0.5
3	0_7813701	Confined	1,151	2/24/1982	362.39	292.92	6.95	0.1
3	0_7814203	Confined	775	2/13/1981	347.29	288.99	5.83	0.1
3	0_7814203	Confined	1,151	2/24/1982	348.38	289.48	5.89	0.1
3	0_7814203	Confined	1,499	2/7/1983	347.42	289.65	5.78	0.1
3	0_7814203	Confined	1,878	2/21/1984	347.93	289.88	5.81	0.1
3	0_7814203	Confined	2,229	2/6/1985	346.43	289.96	5.65	0.1
3	0_7814203	Confined	2,594	2/6/1986	345.45	289.98	5.55	0.1
3	0_7814203	Confined	3,336	2/18/1988	346.75	290.12	5.66	0.1
3	0_7814203	Confined	3,706	2/22/1989	345.77	289.96	5.58	0.1
3	0_7814203	Confined	4,089	3/12/1990	344.75	289.65	5.51	0.1
3	0_7818305	Confined	772	2/10/1981	380.30	347.54	16.38	0.5
3	0_7818305	Confined	1,150	2/23/1982	379.83	347.57	16.13	0.5
3	0_7818305	Confined	1,500	2/8/1983	378.34	347.61	15.37	0.5
3	0_7818305	Confined	1,874	2/17/1984	378.27	347.65	15.31	0.5
3	0_7818305	Confined	2,230	2/7/1985	376.38	347.68	14.35	0.5
3	0_7818305	Confined	2,594	2/6/1986	377.14	347.70	14.72	0.5
3	0_7818305	Confined	2,998	3/17/1987	377.68	347.71	14.98	0.5
3	0_7818305	Confined	3,337	2/19/1988	377.73	347.73	15.00	0.5
3	0_7818305	Confined	4,071	2/22/1990	374.04	347.72	13.16	0.5
3	0_7818305	Confined	4,407	1/24/1991	373.94	347.71	13.12	0.5
3	11815_0	Confined	11,741	2/22/2011	429.76	396.99	16.39	0.5
3	13282_7804613	Confined	6,200	12/22/1995	345.46	348.92	-0.35	0.1
3	39036_0	Confined	9,872	1/10/2006	331.33	328.20	1.56	0.5
3	39038_0	Confined	11,794	4/16/2011	314.68	364.29	-24.81	0.5
3	39039_0	Confined	9,831	11/30/2005	360.16	419.05	-29.45	0.5
3	39040_0	Confined	11,118	6/9/2009	374.93	411.07	-18.07	0.5
3	39041_0	Confined	10,448	8/9/2007	398.33	401.68	-0.34	0.1
3	39361_6714906	Confined	11,496	6/22/2010	361.21	347.63	13.58	1
3	39361_6714906	Confined	11,582	9/16/2010	362.18	347.64	14.54	1
3	39361_6714906	Confined	11,701	1/13/2011	361.49	347.64	13.85	1
3	39361_6714906	Confined	11,845	6/6/2011	358.01	347.63	10.38	1
3	39361_6714906	Confined	11,952	9/21/2011	348.43	347.62	0.81	1
3	39361_6714906	Confined	12,065	1/12/2012	351.33	347.62	3.71	1
3	39361_6714906	Confined	12,224	6/19/2012	355.93	347.61	8.32	1
3	39361_6714906	Confined	12,315	9/18/2012	356.07	347.61	8.46	1
3	39361_6714906	Confined	12,678	9/16/2013	353.70	347.60	6.10	1
3	39361_6714906	Confined	12,794	1/10/2014	356.99	347.60	9.39	1
3	39361_6714906	Confined	13,043	9/16/2014	355.30	347.60	7.70	1
3	39361_6714906	Confined	13,165	1/16/2015	356.71	347.60	9.11	1
3	39361_6714906	Confined	13,315	6/15/2015	357.71	347.61	10.10	1
3	39361_6714906	Confined	13,527	1/13/2016	357.71	347.62	10.09	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	39361_6714906	Confined	13,667	6/1/2016	359.61	347.62	11.99	1
3	39361_6714906	Confined	13,771	9/13/2016	358.49	347.63	10.86	1
3	39361_6714906	Confined	13,884	1/4/2017	359.38	347.63	11.75	1
3	39361_6714906	Confined	14,032	6/1/2017	360.19	347.63	12.56	1
3	42643_7805718	Confined	731	12/31/1980	351.78	347.75	4.03	1
3	43098_6864202	Confined	7,198	9/15/1998	373.28	337.16	36.12	1
3	43098_6864202	Confined	8,605	7/23/2002	368.93	337.16	31.77	1
3	48245_6743302	Confined	9,023	9/14/2003	319.08	313.56	0.55	0.1
3	48245_6743302	Confined	11,693	1/5/2011	298.72	313.56	-1.48	0.1
3	48245_6743302	Confined	11,938	9/7/2011	293.96	313.56	-1.96	0.1
3	48245_6743302	Confined	12,678	9/16/2013	224.72	313.56	-8.88	0.1
3	48245_6743302	Confined	12,786	1/2/2014	244.03	313.56	-6.95	0.1
3	48245_6743302	Confined	12,987	7/22/2014	240.43	313.56	-7.31	0.1
3	48245_6743302	Confined	13,029	9/2/2014	231.72	313.56	-8.18	0.1
3	48245_6743302	Confined	13,148	12/30/2014	243.24	313.56	-7.03	0.1
3	48245_6743302	Confined	13,301	6/1/2015	249.11	313.56	-6.44	0.1
3	48245_6743302	Confined	13,518	1/4/2016	249.17	313.56	-6.44	0.1
3	48245_6743302	Confined	13,667	6/1/2016	252.47	313.56	-6.11	0.1
3	48245_6743302	Confined	14,036	6/5/2017	249.97	313.56	-6.36	0.1
3	48247_6743605	Confined	9,059	10/20/2003	299.01	295.62	3.39	1
3	48247_6743605	Confined	11,693	1/5/2011	301.40	295.62	5.78	1
3	48247_6743605	Confined	11,840	6/1/2011	300.68	295.62	5.06	1
3	48247_6743605	Confined	11,938	9/7/2011	287.58	295.62	-8.04	1
3	48247_6743605	Confined	12,786	1/2/2014	291.21	295.60	-4.39	1
3	48247_6743605	Confined	12,938	6/3/2014	294.50	295.60	-1.10	1
3	48247_6743605	Confined	13,148	12/30/2014	291.26	295.60	-4.34	1
3	48247_6743605	Confined	13,301	6/1/2015	296.05	295.59	0.46	1
3	48247_6743605	Confined	13,518	1/4/2016	297.87	295.59	2.28	1
3	48247_6743605	Confined	13,667	6/1/2016	301.21	295.59	5.62	1
3	48247_6743605	Confined	13,884	1/4/2017	302.56	295.59	6.97	1
3	48247_6743605	Confined	14,036	6/5/2017	303.39	295.60	7.79	1
3	48452_0	Confined	11,364	2/10/2010	319.63	354.78	-35.15	1
3	48467_0	Confined	12,132	3/19/2012	285.27	294.00	-4.37	0.5
3	48473_0	Confined	10,181	11/15/2006	291.42	288.78	0.26	0.1
3	48568_0	Confined	11,301	12/9/2009	345.07	450.76	-10.57	0.1
3	48595_0	Unconfined	8,996	8/18/2003	400.65	395.46	5.19	1
3	48597_0	Confined	10,012	5/30/2006	371.79	439.13	-33.67	0.5
3	48606_0	Confined	11,376	2/22/2010	408.24	527.03	-118.79	1
3	48607_0	Confined	11,511	7/7/2010	427.98	507.17	-79.19	1
3	48627_0	Confined	11,449	5/6/2010	436.13	563.43	-127.30	1
3	48630_0	Confined	9,750	9/10/2005	440.77	582.25	-70.74	0.5
3	48631_0	Confined	10,543	11/12/2007	407.56	574.99	-167.43	1
3	48632_0	Confined	11,191	8/21/2009	448.18	588.25	-70.04	0.5
3	48633_0	Confined	10,176	11/10/2006	409.35	590.88	-90.77	0.5
3	48634_0	Confined	9,357	8/13/2004	455.97	583.90	-127.93	1
3	48635_0	Confined	12,296	8/30/2012	412.34	598.05	-185.71	1
3	48657_0	Confined	12,870	3/27/2014	425.14	612.42	-187.28	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	48658_0	Confined	12,734	11/11/2013	470.51	617.96	-14.74	0.1
3	48660_0	Confined	10,666	3/14/2008	424.59	601.50	-17.69	0.1
3	48661_0	Confined	12,527	4/18/2013	426.30	599.98	-173.68	1
3	48662_0	Confined	11,419	4/6/2010	452.06	593.55	-70.74	0.5
3	48667_0	Confined	12,119	3/6/2012	408.47	587.30	-178.83	1
3	48669_0	Confined	10,308	3/22/2007	444.82	537.61	-9.28	0.1
3	48672_0	Confined	11,537	8/2/2010	435.85	550.56	-11.47	0.1
3	48678_0	Confined	11,251	10/20/2009	453.72	592.40	-13.87	0.1
3	48707_0	Confined	12,150	4/6/2012	490.65	660.66	-17.00	0.1
3	48716_0	Confined	11,701	1/13/2011	454.93	557.54	-10.26	0.1
3	48729_0	Confined	11,800	4/22/2011	409.48	497.04	-8.76	0.1
3	48732_0	Confined	9,015	9/6/2003	514.94	594.94	-8.00	0.1
3	48733_0	Confined	10,925	11/28/2008	502.00	565.39	-6.34	0.1
3	48768_0	Confined	9,619	5/2/2005	472.30	479.97	-7.67	1
3	48783_0	Confined	10,225	12/29/2006	387.03	384.94	0.21	0.1
3	48791_0	Confined	9,966	4/14/2006	431.25	448.41	-8.58	0.5
3	48802_0	Confined	12,393	12/5/2012	385.32	433.63	-4.83	0.1
3	48803_0	Confined	11,603	10/7/2010	388.51	458.18	-6.97	0.1
3	48805_0	Confined	11,349	1/26/2010	456.12	510.55	-5.44	0.1
3	48806_0	Confined	9,308	6/25/2004	502.08	532.53	-3.05	0.1
3	48823_0	Confined	10,755	6/11/2008	508.66	572.85	-6.42	0.1
3	48825_0	Confined	10,085	8/11/2006	488.56	528.71	-20.07	0.5
3	48826_0	Confined	9,560	3/4/2005	464.77	554.63	-89.86	1
3	48827_0	Confined	12,911	5/7/2014	489.71	543.21	-5.35	0.1
3	48828_0	Confined	10,128	9/23/2006	611.69	556.90	5.48	0.1
3	48829_0	Confined	11,734	2/15/2011	299.11	541.95	-24.28	0.1
3	48873_0	Unconfined	9,948	3/27/2006	449.44	530.05	-8.06	0.1
3	48875_0	Confined	11,223	9/22/2009	476.32	529.04	-5.27	0.1
3	48876_0	Unconfined	10,823	8/18/2008	441.39	508.32	-66.93	1
3	48951_0	Confined	12,020	11/28/2011	324.49	301.57	2.29	0.1
3	48952_0	Confined	9,841	12/10/2005	350.34	359.44	-9.10	1
3	48989_0	Confined	11,846	6/7/2011	284.51	272.37	6.07	0.5
3	49178_0	Confined	12,773	12/20/2013	339.65	335.13	4.52	1
3	49458_0	Confined	9,656	6/8/2005	358.01	375.54	-8.77	0.5
3	50129_0	Confined	10,089	8/15/2006	401.66	422.24	-20.58	1
3	50148_0	Unconfined	10,392	6/14/2007	544.34	569.94	-25.60	1
3	50180_0	Unconfined	9,195	3/4/2004	539.46	524.69	14.77	1
3	50196_0	Confined	11,500	6/26/2010	432.36	479.95	-47.59	1
3	50216_0	Unconfined	10,081	8/7/2006	442.05	538.79	-9.67	0.1
3	50222_0	Confined	11,620	10/24/2010	356.58	433.62	-38.52	0.5
3	50615_0	Unconfined	9,091	11/21/2003	374.97	387.42	-1.24	0.1
3	50619_0	Confined	9,000	8/22/2003	336.98	342.93	-0.59	0.1
3	50674_0	Confined	9,998	5/16/2006	254.63	267.00	-6.18	0.5
3	50675_0	Confined	10,012	5/30/2006	324.53	365.31	-40.78	1
3	50727_0	Confined	10,566	12/5/2007	252.07	257.38	-0.53	0.1
3	50786_0	Confined	10,942	12/15/2008	344.99	341.51	1.74	0.5
3	50795_0	Confined	9,384	9/9/2004	304.01	270.49	16.76	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
3	50800_0	Confined	9,346	8/2/2004	285.39	306.63	-2.12	0.1
3	50803_0	Confined	11,015	2/26/2009	252.99	342.48	-89.49	1
3	50817_0	Confined	11,031	3/14/2009	342.47	339.43	0.30	0.1
3	50908_0	Confined	9,522	1/25/2005	380.18	395.09	-7.45	0.5
3	50937_0	Confined	11,497	6/23/2010	275.20	317.67	-4.25	0.1
3	50981_0	Unconfined	11,188	8/18/2009	311.99	327.86	-15.87	1
3	50996_0	Confined	11,723	2/4/2011	281.82	312.92	-15.55	0.5
3	51009_0	Confined	11,787	4/9/2011	378.80	359.06	9.87	0.5
3	51010_0	Confined	11,792	4/14/2011	352.31	354.46	-0.22	0.1
3	51067_0	Confined	11,985	10/24/2011	310.64	294.20	1.64	0.1
3	51071_0	Confined	12,023	12/1/2011	366.38	385.09	-1.87	0.1
3	51122_0	Confined	12,155	4/11/2012	310.97	293.17	8.90	0.5
3	51219_0	Confined	12,549	5/10/2013	313.56	332.36	-9.40	0.5
3	51253_0	Confined	11,785	4/7/2011	241.97	295.37	-53.40	1
3	51263_0	Confined	12,043	12/21/2011	270.45	290.14	-1.97	0.1
3	51276_0	Confined	12,631	7/31/2013	210.52	367.06	-156.54	1
3	51306_0	Confined	12,666	9/4/2013	307.49	316.35	-0.89	0.1
3	51327_0	Confined	12,661	8/30/2013	230.42	286.43	-28.01	0.5
3	51335_0	Confined	12,690	9/28/2013	269.21	279.50	-5.14	0.5
3	51363_0	Confined	12,843	2/28/2014	365.75	346.34	1.94	0.1
5	0_6713907	Unconfined	11,224	9/23/2009	461.84	410.66	25.59	0.5
5	0_6713907	Unconfined	11,341	1/18/2010	462.28	411.29	25.49	0.5
5	0_6713907	Unconfined	11,492	6/18/2010	462.51	411.72	25.40	0.5
5	0_6713907	Unconfined	11,582	9/16/2010	462.39	411.97	25.21	0.5
5	0_6713907	Unconfined	11,701	1/13/2011	462.16	412.21	24.98	0.5
5	0_6713907	Unconfined	11,845	6/6/2011	462.76	411.50	25.63	0.5
5	0_6713907	Unconfined	11,952	9/21/2011	462.03	410.98	25.53	0.5
5	0_6713907	Unconfined	12,065	1/12/2012	462.36	410.51	25.93	0.5
5	0_6714703	Confined	11,330	1/7/2010	405.59	403.88	0.86	0.5
5	0_6714703	Confined	11,491	6/17/2010	405.65	403.99	0.83	0.5
5	0_6714703	Confined	11,582	9/16/2010	405.14	404.05	0.55	0.5
5	0_6714703	Confined	11,701	1/13/2011	403.99	404.10	-0.06	0.5
5	0_6714703	Confined	11,845	6/6/2011	404.28	403.91	0.19	0.5
5	0_6714703	Confined	11,952	9/21/2011	402.85	403.77	-0.46	0.5
5	0_6714703	Confined	12,072	1/19/2012	403.48	403.63	-0.08	0.5
5	0_6714703	Confined	12,224	6/19/2012	403.78	403.67	0.06	0.5
5	0_6714703	Confined	12,315	9/18/2012	402.29	403.69	-0.70	0.5
5	0_6714703	Confined	12,675	9/13/2013	402.11	403.73	-0.81	0.5
5	0_6714707	Confined	12,007	11/15/2011	408.72	403.69	2.51	0.5
5	0_6714801	Unconfined	782	2/20/1981	413.87	405.53	4.17	0.5
5	0_6714801	Unconfined	1,144	2/17/1982	414.34	405.71	4.32	0.5
5	0_6714801	Unconfined	1,870	2/13/1984	414.88	405.40	4.74	0.5
5	0_6714801	Unconfined	2,235	2/12/1985	413.31	405.35	3.98	0.5
5	0_6714801	Unconfined	2,619	3/3/1986	414.28	405.66	4.31	0.5
5	0_6714801	Unconfined	2,903	12/12/1986	412.03	405.67	3.18	0.5
5	0_6714801	Unconfined	3,125	7/22/1987	415.45	405.68	4.88	0.5
5	0_6714801	Unconfined	3,704	2/20/1989	413.55	405.19	4.18	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6714801	Unconfined	4,051	2/2/1990	413.26	405.25	4.01	0.5
5	0_6714801	Unconfined	4,428	2/14/1991	412.50	405.53	3.49	0.5
5	0_6714801	Unconfined	4,793	2/14/1992	415.44	405.75	4.84	0.5
5	0_6714801	Unconfined	5,101	12/18/1992	414.11	405.91	4.10	0.5
5	0_6714801	Unconfined	5,484	1/5/1994	415.05	405.52	4.76	0.5
5	0_6714801	Unconfined	5,829	12/16/1994	414.19	405.64	4.27	0.5
5	0_6714801	Unconfined	6,556	12/12/1996	413.10	405.21	3.94	0.5
5	0_6714801	Unconfined	6,940	12/31/1997	413.35	405.66	3.85	0.5
5	0_6714801	Unconfined	7,242	10/29/1998	413.95	405.73	4.11	0.5
5	0_6714801	Unconfined	7,723	2/22/2000	414.53	405.35	4.59	0.5
5	0_6714801	Unconfined	8,068	2/1/2001	414.40	405.54	4.43	0.5
5	0_6714801	Unconfined	8,439	2/7/2002	412.26	405.55	3.35	0.5
5	0_6714801	Unconfined	8,816	2/19/2003	413.14	406.02	3.56	0.5
5	0_6714801	Unconfined	9,181	2/19/2004	413.35	405.74	3.80	0.5
5	0_6714801	Unconfined	9,509	1/12/2005	414.25	405.79	4.23	0.5
5	0_6714801	Unconfined	9,900	2/7/2006	413.85	405.12	4.37	0.5
5	0_6714801	Unconfined	10,264	2/6/2007	413.05	405.05	4.00	0.5
5	0_6714801	Unconfined	10,649	2/26/2008	413.15	405.75	3.70	0.5
5	0_6714801	Unconfined	11,007	2/18/2009	412.45	405.09	3.68	0.5
5	0_6714801	Unconfined	11,224	9/23/2009	411.42	405.32	3.05	0.5
5	0_6714801	Unconfined	11,330	1/7/2010	411.37	405.43	2.97	0.5
5	0_6714801	Unconfined	11,490	6/16/2010	412.25	405.53	3.36	0.5
5	0_6714801	Unconfined	11,581	9/15/2010	412.50	405.59	3.45	0.5
5	0_6714801	Unconfined	11,692	1/4/2011	412.34	405.66	3.34	0.5
5	0_6714801	Unconfined	11,845	6/6/2011	411.98	405.45	3.27	0.5
5	0_6714801	Unconfined	11,945	9/14/2011	411.62	405.31	3.16	0.5
5	0_6714801	Unconfined	12,065	1/12/2012	410.97	405.16	2.90	0.5
5	0_6714801	Unconfined	12,224	6/19/2012	411.06	405.21	2.92	0.5
5	0_6714801	Unconfined	12,315	9/18/2012	410.89	405.24	2.82	0.5
5	0_6714801	Unconfined	12,675	9/13/2013	410.05	405.30	2.37	0.5
5	0_6714801	Unconfined	12,794	1/10/2014	408.22	405.31	1.46	0.5
5	0_6714801	Unconfined	12,952	6/17/2014	409.59	405.24	2.17	0.5
5	0_6714801	Unconfined	13,042	9/15/2014	409.53	405.21	2.16	0.5
5	0_6714801	Unconfined	13,168	1/19/2015	409.38	405.19	2.10	0.5
5	0_6714801	Unconfined	13,315	6/15/2015	409.69	405.36	2.16	0.5
5	0_6714801	Unconfined	13,527	1/13/2016	410.05	405.61	2.22	0.5
5	0_6714801	Unconfined	13,682	6/16/2016	411.99	405.61	3.19	0.5
5	0_6714801	Unconfined	13,778	9/20/2016	413.14	405.62	3.76	0.5
5	0_6714801	Unconfined	13,903	1/23/2017	411.79	405.61	3.09	0.5
5	0_6714801	Unconfined	14,045	6/14/2017	412.35	405.51	3.42	0.5
5	0_6721201	Unconfined	780	2/18/1981	400.60	390.03	10.57	1
5	0_6721201	Unconfined	1,194	4/8/1982	401.05	391.14	9.91	1
5	0_6721201	Unconfined	1,510	2/18/1983	400.15	389.60	10.55	1
5	0_6721201	Unconfined	1,866	2/9/1984	399.38	388.96	10.42	1
5	0_6721201	Unconfined	2,230	2/7/1985	394.25	388.25	6.00	1
5	0_6721201	Unconfined	2,615	2/27/1986	399.87	390.67	9.20	1
5	0_6721201	Unconfined	2,892	12/1/1986	392.43	391.08	1.35	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6721201	Unconfined	3,333	2/15/1988	400.36	390.90	9.46	1
5	0_6721201	Unconfined	3,701	2/17/1989	395.95	387.35	8.60	1
5	0_6721201	Unconfined	4,076	2/27/1990	393.45	387.37	6.08	1
5	0_6721201	Unconfined	4,807	2/28/1992	396.77	391.64	5.13	1
5	0_6721201	Unconfined	5,164	2/19/1993	399.52	392.81	6.71	1
5	0_6721207	Unconfined	11,342	1/19/2010	396.66	385.09	11.57	1
5	0_6721207	Unconfined	11,488	6/14/2010	396.57	385.92	10.65	1
5	0_6721207	Unconfined	11,582	9/16/2010	397.26	386.45	10.81	1
5	0_6721207	Unconfined	11,701	1/13/2011	396.30	386.93	9.37	1
5	0_6721501	Unconfined	11,342	1/19/2010	354.42	340.51	6.95	0.5
5	0_6721501	Unconfined	11,490	6/16/2010	356.53	340.56	7.98	0.5
5	0_6721501	Unconfined	11,582	9/16/2010	355.46	340.60	7.43	0.5
5	0_6721501	Unconfined	11,701	1/13/2011	354.96	340.62	7.17	0.5
5	0_6721501	Unconfined	11,845	6/6/2011	354.16	340.51	6.83	0.5
5	0_6721501	Unconfined	11,951	9/20/2011	352.26	340.42	5.92	0.5
5	0_6721501	Unconfined	12,065	1/12/2012	347.88	340.34	3.77	0.5
5	0_6721501	Unconfined	12,218	6/13/2012	345.38	340.39	2.49	0.5
5	0_6721501	Unconfined	12,315	9/18/2012	345.26	340.42	2.42	0.5
5	0_6721501	Unconfined	12,675	9/13/2013	351.95	340.49	5.73	0.5
5	0_6721501	Unconfined	12,794	1/10/2014	352.73	340.50	6.12	0.5
5	0_6721501	Unconfined	13,043	9/16/2014	350.44	340.45	5.00	0.5
5	0_6721501	Unconfined	13,165	1/16/2015	350.83	340.44	5.20	0.5
5	0_6721501	Unconfined	13,315	6/15/2015	351.75	340.55	5.60	0.5
5	0_6721501	Unconfined	13,527	1/13/2016	352.29	340.70	5.79	0.5
5	0_6721501	Unconfined	13,786	9/28/2016	351.68	340.71	5.48	0.5
5	0_6721501	Unconfined	13,889	1/9/2017	354.84	340.71	7.06	0.5
5	0_6721501	Unconfined	14,045	6/14/2017	355.67	340.66	7.51	0.5
5	0_6721904	Confined	11,223	9/22/2009	322.24	338.86	-1.66	0.1
5	0_6721904	Confined	11,341	1/18/2010	328.09	338.96	-1.09	0.1
5	0_6721904	Confined	11,490	6/16/2010	332.28	339.10	-0.68	0.1
5	0_6721904	Confined	11,581	9/15/2010	328.63	339.18	-1.06	0.1
5	0_6721904	Confined	11,692	1/4/2011	330.03	339.27	-0.92	0.1
5	0_6721904	Confined	11,845	6/6/2011	315.13	338.88	-2.38	0.1
5	0_6721904	Confined	11,960	9/29/2011	313.05	338.59	-2.55	0.1
5	0_6721904	Confined	12,685	9/23/2013	318.85	337.66	-1.88	0.1
5	0_6721904	Confined	12,793	1/9/2014	323.14	337.53	-1.44	0.1
5	0_6721904	Confined	12,952	6/17/2014	329.81	337.16	-0.73	0.1
5	0_6722103	Confined	11,492	6/18/2010	378.70	394.95	-8.12	0.5
5	0_6722103	Confined	11,582	9/16/2010	378.25	395.08	-8.42	0.5
5	0_6722103	Confined	11,700	1/12/2011	378.38	395.20	-8.41	0.5
5	0_6722103	Confined	11,845	6/6/2011	377.01	394.79	-8.89	0.5
5	0_6722103	Confined	11,952	9/21/2011	370.39	394.48	-12.04	0.5
5	0_6722103	Confined	12,065	1/12/2012	372.61	394.19	-10.79	0.5
5	0_6722103	Confined	12,224	6/19/2012	374.87	394.18	-9.65	0.5
5	0_6722103	Confined	12,315	9/18/2012	373.73	394.17	-10.22	0.5
5	0_6722103	Confined	12,675	9/13/2013	374.46	394.18	-9.86	0.5
5	0_6722103	Confined	12,801	1/17/2014	377.63	394.16	-8.27	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6722103	Confined	13,043	9/16/2014	374.66	393.88	-9.61	0.5
5	0_6722103	Confined	13,165	1/16/2015	374.89	393.79	-9.45	0.5
5	0_6722103	Confined	13,315	6/15/2015	377.27	394.17	-8.45	0.5
5	0_6722103	Confined	13,527	1/13/2016	375.99	394.68	-9.34	0.5
5	0_6722103	Confined	13,787	9/29/2016	377.69	394.74	-8.52	0.5
5	0_6722103	Confined	13,903	1/23/2017	378.22	394.73	-8.26	0.5
5	0_6722104	Unconfined	11,491	6/17/2010	396.10	395.55	0.06	0.1
5	0_6722104	Unconfined	11,582	9/16/2010	396.11	395.82	0.03	0.1
5	0_6722104	Unconfined	11,701	1/13/2011	395.17	396.07	-0.09	0.1
5	0_6722104	Unconfined	11,952	9/21/2011	390.47	394.75	-0.43	0.1
5	0_6722104	Unconfined	12,065	1/12/2012	393.11	394.23	-0.11	0.1
5	0_6722104	Unconfined	12,224	6/19/2012	394.15	394.32	-0.02	0.1
5	0_6722104	Unconfined	12,315	9/18/2012	393.33	394.37	-0.10	0.1
5	0_6722104	Unconfined	12,675	9/13/2013	392.00	394.59	-0.26	0.1
5	0_6722104	Unconfined	12,794	1/10/2014	394.11	394.64	-0.05	0.1
5	0_6722104	Unconfined	13,043	9/16/2014	392.39	394.23	-0.18	0.1
5	0_6722104	Unconfined	13,165	1/16/2015	392.19	394.14	-0.20	0.1
5	0_6722104	Unconfined	13,667	6/1/2016	394.93	396.05	-0.11	0.1
5	0_6722104	Unconfined	13,771	9/13/2016	394.07	396.11	-0.20	0.1
5	0_6722104	Unconfined	13,889	1/9/2017	393.90	396.16	-0.23	0.1
5	0_6722104	Unconfined	14,032	6/1/2017	394.71	395.85	-0.11	0.1
5	0_6728210	Unconfined	11,488	6/14/2010	313.09	291.43	2.17	0.1
5	0_6728210	Unconfined	11,582	9/16/2010	312.63	291.48	2.12	0.1
5	0_6728210	Unconfined	11,700	1/12/2011	312.12	291.52	2.06	0.1
5	0_6728210	Unconfined	11,842	6/3/2011	312.16	291.31	2.09	0.1
5	0_6728210	Unconfined	11,952	9/21/2011	309.84	291.14	1.87	0.1
5	0_6728210	Unconfined	12,064	1/11/2012	311.20	291.00	2.02	0.1
5	0_6728210	Unconfined	12,206	6/1/2012	311.61	291.05	2.06	0.1
5	0_6728210	Unconfined	12,309	9/12/2012	310.71	291.09	1.96	0.1
5	0_6728210	Unconfined	12,673	9/11/2013	309.70	291.11	1.86	0.1
5	0_6728210	Unconfined	12,794	1/10/2014	310.48	291.09	1.94	0.1
5	0_6728210	Unconfined	13,043	9/16/2014	309.62	290.92	1.87	0.1
5	0_6728210	Unconfined	13,170	1/21/2015	312.04	290.86	2.12	0.1
5	0_6728210	Unconfined	13,323	6/23/2015	310.74	290.99	1.97	0.1
5	0_6728210	Unconfined	13,529	1/15/2016	308.64	291.15	1.75	0.1
5	0_6728210	Unconfined	13,674	6/8/2016	311.24	291.15	2.01	0.1
5	0_6728210	Unconfined	13,765	9/7/2016	313.19	291.14	2.20	0.1
5	0_6728210	Unconfined	13,890	1/10/2017	308.59	291.13	1.75	0.1
5	0_6728210	Unconfined	14,051	6/20/2017	310.10	291.02	1.91	0.1
5	0_6728303	Unconfined	780	2/18/1981	287.72	288.82	-0.55	0.5
5	0_6728303	Unconfined	1,146	2/19/1982	292.37	289.03	1.67	0.5
5	0_6728303	Unconfined	1,509	2/17/1983	289.42	288.70	0.36	0.5
5	0_6728303	Unconfined	1,866	2/9/1984	291.60	288.64	1.48	0.5
5	0_6728303	Unconfined	2,230	2/7/1985	289.12	288.55	0.29	0.5
5	0_6728303	Unconfined	2,615	2/27/1986	289.67	288.95	0.36	0.5
5	0_6728303	Unconfined	2,892	12/1/1986	289.05	288.96	0.04	0.5
5	0_6728303	Unconfined	3,333	2/15/1988	290.21	288.92	0.65	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6728303	Unconfined	3,705	2/21/1989	284.23	288.35	-2.06	0.5
5	0_6728303	Unconfined	4,076	2/27/1990	293.35	288.44	2.46	0.5
5	0_6728303	Unconfined	4,426	2/12/1991	288.12	288.76	-0.32	0.5
5	0_6728303	Unconfined	4,807	2/28/1992	290.57	289.05	0.76	0.5
5	0_6728303	Unconfined	5,164	2/19/1993	290.37	289.19	0.59	0.5
5	0_6728303	Unconfined	5,528	2/18/1994	290.67	288.82	0.92	0.5
5	0_6728303	Unconfined	5,891	2/16/1995	288.67	288.94	-0.14	0.5
5	0_6728303	Unconfined	6,260	2/20/1996	289.52	288.68	0.42	0.5
5	0_6728303	Unconfined	6,626	2/20/1997	288.57	288.47	0.05	0.5
5	0_6728303	Unconfined	6,990	2/19/1998	285.49	288.97	-1.74	0.5
5	0_6728303	Unconfined	11,223	9/22/2009	286.28	288.68	-1.20	0.5
5	0_6728303	Unconfined	11,342	1/19/2010	285.90	288.74	-1.42	0.5
5	0_6728303	Unconfined	11,496	6/22/2010	287.32	288.84	-0.76	0.5
5	0_6728303	Unconfined	11,582	9/16/2010	285.66	288.89	-1.62	0.5
5	0_6728303	Unconfined	11,712	1/24/2011	283.08	288.92	-2.92	0.5
5	0_6728303	Unconfined	11,854	6/15/2011	284.59	288.66	-2.04	0.5
5	0_6728303	Unconfined	11,952	9/21/2011	281.61	288.49	-3.44	0.5
5	0_6728303	Unconfined	12,066	1/13/2012	285.51	288.31	-1.40	0.5
5	0_6728303	Unconfined	12,232	6/27/2012	284.03	288.38	-2.17	0.5
5	0_6728303	Unconfined	12,330	10/3/2012	283.56	288.42	-2.43	0.5
5	0_6728303	Unconfined	12,675	9/13/2013	283.11	288.42	-2.65	0.5
5	0_6728303	Unconfined	12,794	1/10/2014	285.85	288.39	-1.27	0.5
5	0_6728303	Unconfined	13,043	9/16/2014	283.61	288.17	-2.28	0.5
5	0_6728303	Unconfined	13,170	1/21/2015	285.06	288.09	-1.52	0.5
5	0_6728303	Unconfined	13,324	6/24/2015	286.43	288.25	-0.91	0.5
5	0_6728303	Unconfined	13,529	1/15/2016	287.82	288.43	-0.31	0.5
5	0_6728303	Unconfined	13,674	6/8/2016	287.91	288.42	-0.26	0.5
5	0_6728303	Unconfined	13,765	9/7/2016	287.99	288.42	-0.21	0.5
5	0_6728303	Unconfined	13,890	1/10/2017	288.20	288.40	-0.10	0.5
5	0_6728303	Unconfined	14,054	6/23/2017	287.87	288.26	-0.20	0.5
5	0_6728509	Unconfined	11,848	6/9/2011	289.10	284.55	2.28	0.5
5	0_6728509	Unconfined	11,950	9/19/2011	288.57	284.52	2.03	0.5
5	0_6728509	Unconfined	12,064	1/11/2012	290.34	284.49	2.92	0.5
5	0_6728509	Unconfined	12,212	6/7/2012	291.37	284.49	3.44	0.5
5	0_6728509	Unconfined	12,309	9/12/2012	290.80	284.49	3.15	0.5
5	0_6728509	Unconfined	12,814	1/30/2014	289.38	284.44	2.47	0.5
5	0_6728509	Unconfined	13,039	9/12/2014	288.42	284.39	2.02	0.5
5	0_6728509	Unconfined	13,167	1/18/2015	289.76	284.36	2.70	0.5
5	0_6728509	Unconfined	13,312	6/12/2015	296.66	284.36	6.15	0.5
5	0_6728509	Unconfined	13,529	1/15/2016	296.66	284.36	6.15	0.5
5	0_6728509	Unconfined	13,673	6/7/2016	295.80	284.36	5.72	0.5
5	0_6728509	Unconfined	13,903	1/23/2017	294.34	284.36	4.99	0.5
5	0_6728702	Unconfined	11,488	6/14/2010	310.77	294.59	16.18	1
5	0_6728702	Unconfined	11,589	9/23/2010	309.83	294.60	15.23	1
5	0_6728702	Unconfined	11,700	1/12/2011	308.78	294.60	14.18	1
5	0_6728702	Unconfined	11,842	6/3/2011	308.52	294.54	13.98	1
5	0_6728702	Unconfined	11,950	9/19/2011	307.58	294.50	13.08	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6728702	Unconfined	12,064	1/11/2012	308.16	294.46	13.70	1
5	0_6728702	Unconfined	12,212	6/7/2012	308.60	294.44	14.16	1
5	0_6728702	Unconfined	12,309	9/12/2012	307.55	294.43	13.12	1
5	0_6728702	Unconfined	12,673	9/11/2013	306.60	294.35	12.25	1
5	0_6728702	Unconfined	12,801	1/17/2014	307.33	294.31	13.02	1
5	0_6728702	Unconfined	13,039	9/12/2014	306.06	294.20	11.86	1
5	0_6728705	Unconfined	11,488	6/14/2010	322.01	297.51	24.50	1
5	0_6728705	Unconfined	11,589	9/23/2010	322.57	297.53	25.04	1
5	0_6728705	Unconfined	11,700	1/12/2011	321.51	297.54	23.97	1
5	0_6728705	Unconfined	11,842	6/3/2011	320.53	297.40	23.13	1
5	0_6728705	Unconfined	11,940	9/9/2011	319.23	297.31	21.92	1
5	0_6728705	Unconfined	12,064	1/11/2012	320.66	297.20	23.46	1
5	0_6728705	Unconfined	12,212	6/7/2012	321.33	297.22	24.11	1
5	0_6728705	Unconfined	12,309	9/12/2012	320.70	297.23	23.47	1
5	0_6728705	Unconfined	12,673	9/11/2013	319.49	297.15	22.34	1
5	0_6728705	Unconfined	12,801	1/17/2014	319.93	297.09	22.84	1
5	0_6728705	Unconfined	13,039	9/12/2014	320.18	296.92	23.26	1
5	0_6728705	Unconfined	13,157	1/8/2015	319.95	296.84	23.11	1
5	0_6728705	Unconfined	13,312	6/12/2015	321.37	296.86	24.51	1
5	0_6728705	Unconfined	13,529	1/15/2016	320.56	296.88	23.68	1
5	0_6728705	Unconfined	13,673	6/7/2016	321.48	296.87	24.61	1
5	0_6728705	Unconfined	13,765	9/7/2016	321.22	296.87	24.35	1
5	0_6728705	Unconfined	13,891	1/11/2017	321.48	296.86	24.62	1
5	0_6728705	Unconfined	14,051	6/20/2017	320.66	296.78	23.88	1
5	0_6728801	Confined	11,488	6/14/2010	316.31	295.02	2.13	0.1
5	0_6728801	Confined	11,593	9/27/2010	316.49	295.02	2.15	0.1
5	0_6728801	Confined	11,705	1/17/2011	316.73	295.02	2.17	0.1
5	0_6728801	Confined	11,842	6/3/2011	315.54	294.95	2.06	0.1
5	0_6728801	Confined	11,950	9/19/2011	315.53	294.89	2.06	0.1
5	0_6728801	Confined	12,064	1/11/2012	315.76	294.83	2.09	0.1
5	0_6728801	Confined	12,206	6/1/2012	315.40	294.81	2.06	0.1
5	0_6728801	Confined	12,309	9/12/2012	315.36	294.79	2.06	0.1
5	0_6728801	Confined	12,673	9/11/2013	314.99	294.67	2.03	0.1
5	0_6728801	Confined	12,801	1/17/2014	315.26	294.61	2.07	0.1
5	0_6728801	Confined	13,039	9/12/2014	314.83	294.45	2.04	0.1
5	0_6728801	Confined	13,157	1/8/2015	318.13	294.38	2.38	0.1
5	0_6728801	Confined	13,312	6/12/2015	315.58	294.33	2.12	0.1
5	0_6728801	Confined	13,539	1/25/2016	315.07	294.27	2.08	0.1
5	0_6728801	Confined	13,673	6/7/2016	315.35	294.27	2.11	0.1
5	0_6728801	Confined	13,765	9/7/2016	315.50	294.27	2.12	0.1
5	0_6728801	Confined	13,890	1/10/2017	314.89	294.27	2.06	0.1
5	0_6728801	Confined	14,051	6/20/2017	315.39	294.22	2.12	0.1
5	0_6728903	Confined	11,502	6/28/2010	294.98	297.09	-2.11	1
5	0_6728903	Confined	11,589	9/23/2010	294.50	297.09	-2.59	1
5	0_6728903	Confined	11,700	1/12/2011	293.77	297.08	-3.31	1
5	0_6728903	Confined	11,842	6/3/2011	292.37	297.01	-4.64	1
5	0_6728903	Confined	11,952	9/21/2011	288.88	296.95	-8.07	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6728903	Confined	12,064	1/11/2012	291.35	296.89	-5.54	1
5	0_6728903	Confined	12,206	6/1/2012	292.77	296.80	-4.03	1
5	0_6728903	Confined	12,309	9/12/2012	291.28	296.74	-5.46	1
5	0_6728903	Confined	12,673	9/11/2013	287.79	296.45	-8.66	1
5	0_6728903	Confined	12,814	1/30/2014	292.05	296.32	-4.27	1
5	0_6728903	Confined	13,043	9/16/2014	287.57	296.06	-8.49	1
5	0_6728903	Confined	13,170	1/21/2015	291.58	295.92	-4.34	1
5	0_6728903	Confined	13,312	6/12/2015	291.21	295.79	-4.58	1
5	0_6728903	Confined	13,529	1/15/2016	290.18	295.61	-5.43	1
5	0_6728903	Confined	13,673	6/7/2016	283.93	295.61	-11.68	1
5	0_6728903	Confined	13,765	9/7/2016	291.11	295.62	-4.51	1
5	0_6728903	Confined	13,890	1/10/2017	291.37	295.62	-4.25	1
5	0_6728903	Confined	14,051	6/20/2017	291.14	295.55	-4.41	1
5	0_6729203	Confined	8,166	5/10/2001	336.01	325.06	1.09	0.1
5	0_6729203	Confined	11,223	9/22/2009	326.39	324.89	0.15	0.1
5	0_6729203	Confined	11,341	1/18/2010	327.28	324.98	0.23	0.1
5	0_6729203	Confined	11,490	6/16/2010	328.01	325.08	0.29	0.1
5	0_6729203	Confined	11,582	9/16/2010	329.18	325.14	0.40	0.1
5	0_6729203	Confined	11,701	1/13/2011	329.04	325.18	0.39	0.1
5	0_6729203	Confined	11,845	6/6/2011	326.51	324.81	0.17	0.1
5	0_6729203	Confined	11,951	9/20/2011	324.08	324.53	-0.05	0.1
5	0_6729203	Confined	12,065	1/12/2012	323.15	324.25	-0.11	0.1
5	0_6729203	Confined	12,227	6/22/2012	327.16	323.95	0.32	0.1
5	0_6729203	Confined	12,310	9/13/2012	325.32	323.80	0.15	0.1
5	0_6729203	Confined	12,675	9/13/2013	328.88	323.06	0.58	0.1
5	0_6729203	Confined	12,794	1/10/2014	327.41	322.79	0.46	0.1
5	0_6729203	Confined	13,043	9/16/2014	328.49	321.93	0.66	0.1
5	0_6729203	Confined	13,165	1/16/2015	333.13	321.54	1.16	0.1
5	0_6729203	Confined	13,315	6/15/2015	334.87	321.35	1.35	0.1
5	0_6729203	Confined	13,527	1/13/2016	327.05	321.10	0.59	0.1
5	0_6729203	Confined	13,689	6/23/2016	329.43	321.12	0.83	0.1
5	0_6729203	Confined	13,765	9/7/2016	331.11	321.13	1.00	0.1
5	0_6729203	Confined	13,883	1/3/2017	329.21	321.14	0.81	0.1
5	0_6729203	Confined	14,045	6/14/2017	329.81	320.87	0.89	0.1
5	0_6729402	Confined	11,772	3/25/2011	282.29	291.59	-4.65	0.5
5	0_6729402	Confined	11,862	6/23/2011	281.07	291.53	-5.23	0.5
5	0_6729402	Confined	11,960	9/29/2011	279.29	291.47	-6.09	0.5
5	0_6729402	Confined	12,064	1/11/2012	280.06	291.41	-5.67	0.5
5	0_6729402	Confined	12,227	6/22/2012	280.32	291.32	-5.50	0.5
5	0_6729402	Confined	12,314	9/17/2012	279.54	291.27	-5.86	0.5
5	0_6729402	Confined	12,673	9/11/2013	277.08	291.01	-6.97	0.5
5	0_6729402	Confined	12,801	1/17/2014	279.51	290.91	-5.70	0.5
5	0_6729402	Confined	13,043	9/16/2014	276.32	290.64	-7.16	0.5
5	0_6729402	Confined	13,170	1/21/2015	275.42	290.51	-7.54	0.5
5	0_6729402	Confined	13,324	6/24/2015	281.42	290.40	-4.49	0.5
5	0_6729402	Confined	13,529	1/15/2016	284.27	290.26	-2.99	0.5
5	0_6729402	Confined	13,673	6/7/2016	284.61	290.26	-2.83	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6729402	Confined	13,765	9/7/2016	285.36	290.27	-2.45	0.5
5	0_6729402	Confined	13,890	1/10/2017	285.12	290.27	-2.57	0.5
5	0_6729402	Confined	14,051	6/20/2017	283.61	290.19	-3.29	0.5
5	0_6734803	Unconfined	779	2/17/1981	396.07	367.14	14.46	0.5
5	0_6734803	Unconfined	1,145	2/18/1982	395.71	367.87	13.92	0.5
5	0_6734803	Unconfined	1,509	2/17/1983	395.61	366.69	14.46	0.5
5	0_6734803	Unconfined	1,866	2/9/1984	395.49	366.54	14.48	0.5
5	0_6734803	Unconfined	2,229	2/6/1985	394.72	366.16	14.28	0.5
5	0_6734803	Unconfined	2,608	2/20/1986	394.63	367.56	13.53	0.5
5	0_6734803	Unconfined	2,892	12/1/1986	393.01	367.55	12.73	0.5
5	0_6734803	Unconfined	3,333	2/15/1988	392.73	367.38	12.68	0.5
5	0_6734803	Unconfined	3,700	2/16/1989	392.61	365.40	13.60	0.5
5	0_6734803	Unconfined	4,076	2/27/1990	391.19	365.79	12.70	0.5
5	0_6734803	Unconfined	4,806	2/27/1992	392.38	367.76	12.31	0.5
5	0_6734803	Unconfined	5,161	2/16/1993	391.67	368.18	11.75	0.5
5	0_6734803	Unconfined	5,890	2/15/1995	393.86	367.29	13.28	0.5
5	0_6734803	Unconfined	6,261	2/21/1996	393.91	366.33	13.79	0.5
5	0_6734803	Unconfined	6,626	2/20/1997	395.21	365.61	14.80	0.5
5	0_6734803	Unconfined	6,990	2/19/1998	394.29	367.34	13.48	0.5
5	0_6734803	Unconfined	11,204	9/3/2009	392.04	366.21	12.92	0.5
5	0_6734803	Unconfined	11,328	1/5/2010	391.95	366.40	12.78	0.5
5	0_6734803	Unconfined	11,476	6/2/2010	392.26	366.59	12.83	0.5
5	0_6734803	Unconfined	11,693	1/5/2011	392.08	366.84	12.62	0.5
5	0_6734803	Unconfined	11,840	6/1/2011	391.21	365.82	12.70	0.5
5	0_6734803	Unconfined	11,937	9/6/2011	391.82	365.14	13.34	0.5
5	0_6734803	Unconfined	12,064	1/11/2012	392.27	364.36	13.95	0.5
5	0_6734807	Unconfined	12,786	1/2/2014	397.56	373.72	11.92	0.5
5	0_6734807	Unconfined	12,938	6/3/2014	397.48	373.02	12.23	0.5
5	0_6734807	Unconfined	13,029	9/2/2014	396.64	372.59	12.02	0.5
5	0_6735303	Unconfined	11,497	6/23/2010	341.85	311.94	29.91	1
5	0_6735303	Unconfined	11,590	9/24/2010	340.60	311.94	28.66	1
5	0_6735303	Unconfined	11,700	1/12/2011	340.37	311.93	28.44	1
5	0_6735303	Unconfined	11,842	6/3/2011	339.92	311.86	28.06	1
5	0_6735303	Unconfined	11,950	9/19/2011	339.56	311.81	27.75	1
5	0_6735303	Unconfined	12,064	1/11/2012	340.16	311.76	28.40	1
5	0_6735303	Unconfined	12,212	6/7/2012	340.28	311.74	28.54	1
5	0_6735303	Unconfined	12,309	9/12/2012	339.80	311.72	28.08	1
5	0_6735303	Unconfined	12,673	9/11/2013	338.00	311.59	26.41	1
5	0_6735303	Unconfined	12,801	1/17/2014	339.42	311.53	27.89	1
5	0_6735303	Unconfined	13,157	1/8/2015	339.25	311.31	27.94	1
5	0_6735303	Unconfined	13,312	6/12/2015	340.06	311.26	28.80	1
5	0_6735303	Unconfined	13,540	1/26/2016	339.83	311.19	28.64	1
5	0_6735303	Unconfined	13,772	9/14/2016	337.81	311.20	26.61	1
5	0_6735303	Unconfined	13,891	1/11/2017	339.69	311.20	28.49	1
5	0_6735303	Unconfined	14,052	6/21/2017	339.88	311.15	28.73	1
5	0_6735506	Unconfined	11,489	6/15/2010	385.60	322.49	63.11	1
5	0_6735506	Unconfined	11,590	9/24/2010	385.38	322.50	62.88	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6735506	Unconfined	11,700	1/12/2011	385.02	322.49	62.53	1
5	0_6735506	Unconfined	11,842	6/3/2011	385.04	322.41	62.63	1
5	0_6735506	Unconfined	11,950	9/19/2011	384.36	322.35	62.01	1
5	0_6735506	Unconfined	12,064	1/11/2012	384.94	322.29	62.65	1
5	0_6735506	Unconfined	12,218	6/13/2012	384.97	322.27	62.70	1
5	0_6735506	Unconfined	12,309	9/12/2012	384.48	322.26	62.22	1
5	0_6735506	Unconfined	12,673	9/11/2013	383.35	322.13	61.22	1
5	0_6735506	Unconfined	12,801	1/17/2014	384.05	322.07	61.98	1
5	0_6735506	Unconfined	13,039	9/12/2014	383.32	321.91	61.41	1
5	0_6735703	Unconfined	11,484	6/10/2010	347.73	323.63	2.41	0.1
5	0_6735703	Unconfined	11,590	9/24/2010	346.32	323.63	2.27	0.1
5	0_6735703	Unconfined	11,700	1/12/2011	346.45	323.63	2.28	0.1
5	0_6735703	Unconfined	11,960	9/29/2011	340.75	323.59	1.72	0.1
5	0_6735703	Unconfined	12,064	1/11/2012	345.09	323.57	2.15	0.1
5	0_6735703	Unconfined	12,218	6/13/2012	347.15	323.56	2.36	0.1
5	0_6735703	Unconfined	12,309	9/12/2012	340.64	323.55	1.71	0.1
5	0_6735703	Unconfined	12,673	9/11/2013	341.21	323.49	1.77	0.1
5	0_6735703	Unconfined	12,801	1/17/2014	344.70	323.46	2.12	0.1
5	0_6735703	Unconfined	13,039	9/12/2014	340.95	323.40	1.75	0.1
5	0_6735703	Unconfined	13,157	1/8/2015	343.52	323.37	2.01	0.1
5	0_6735703	Unconfined	13,312	6/12/2015	345.31	323.34	2.20	0.1
5	0_6735703	Unconfined	13,540	1/26/2016	344.42	323.30	2.11	0.1
5	0_6735703	Unconfined	13,680	6/14/2016	344.98	323.31	2.17	0.1
5	0_6735703	Unconfined	13,772	9/14/2016	343.75	323.31	2.04	0.1
5	0_6735703	Unconfined	13,889	1/9/2017	344.86	323.31	2.15	0.1
5	0_6735704	Unconfined	11,646	11/19/2010	350.44	341.94	8.50	1
5	0_6735704	Unconfined	11,854	6/15/2011	347.95	341.94	6.01	1
5	0_6735704	Unconfined	11,950	9/19/2011	346.85	341.93	4.92	1
5	0_6735704	Unconfined	12,064	1/11/2012	347.39	341.93	5.46	1
5	0_6735704	Unconfined	12,218	6/13/2012	350.44	341.93	8.51	1
5	0_6735704	Unconfined	12,309	9/12/2012	347.96	341.93	6.03	1
5	0_6735704	Unconfined	12,673	9/11/2013	347.50	341.93	5.57	1
5	0_6735704	Unconfined	12,801	1/17/2014	349.18	341.93	7.25	1
5	0_6735704	Unconfined	13,039	9/12/2014	346.34	341.93	4.41	1
5	0_6735705	Unconfined	13,673	6/7/2016	354.67	343.13	1.15	0.1
5	0_6735705	Unconfined	13,897	1/17/2017	354.50	343.13	1.14	0.1
5	0_6735705	Unconfined	14,036	6/5/2017	355.28	343.13	1.22	0.1
5	0_6735905	Confined	7,730	2/29/2000	323.51	322.83	0.68	1
5	0_6735905	Confined	7,731	3/1/2000	333.61	322.83	10.78	1
5	0_6736103	Confined	11,497	6/23/2010	315.86	305.12	10.74	1
5	0_6736103	Confined	11,590	9/24/2010	316.06	305.12	10.94	1
5	0_6736103	Confined	11,700	1/12/2011	315.57	305.11	10.46	1
5	0_6736103	Confined	11,842	6/3/2011	314.07	305.07	9.00	1
5	0_6736103	Confined	11,950	9/19/2011	312.72	305.03	7.69	1
5	0_6736103	Confined	12,064	1/11/2012	313.94	304.99	8.95	1
5	0_6736103	Confined	12,212	6/7/2012	313.54	304.95	8.59	1
5	0_6736103	Confined	12,309	9/12/2012	312.19	304.92	7.27	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6736103	Confined	12,673	9/11/2013	312.82	304.77	8.05	1
5	0_6736103	Confined	12,801	1/17/2014	312.90	304.71	8.19	1
5	0_6736103	Confined	13,039	9/12/2014	311.72	304.57	7.15	1
5	0_6736103	Confined	13,157	1/8/2015	311.50	304.49	7.01	1
5	0_6736103	Confined	13,312	6/12/2015	312.24	304.42	7.82	1
5	0_6736403	Confined	13,414	9/22/2015	313.89	308.18	5.71	1
5	0_6736403	Confined	13,515	1/1/2016	316.74	308.12	8.62	1
5	0_6736403	Confined	13,674	6/8/2016	317.15	308.13	9.02	1
5	0_6736403	Confined	13,772	9/14/2016	316.99	308.14	8.85	1
5	0_6736403	Confined	13,854	12/5/2016	316.74	308.14	8.60	1
5	0_6736403	Confined	13,897	1/17/2017	318.01	308.14	9.87	1
5	0_6736403	Confined	14,052	6/21/2017	317.19	308.09	9.10	1
5	0_6736602	Confined	11,484	6/10/2010	288.64	310.52	-21.88	1
5	0_6736602	Confined	11,590	9/24/2010	288.52	310.51	-21.99	1
5	0_6736602	Confined	11,705	1/17/2011	288.04	310.50	-22.46	1
5	0_6736602	Confined	11,854	6/15/2011	285.49	310.43	-24.94	1
5	0_6736602	Confined	11,950	9/19/2011	283.68	310.38	-26.70	1
5	0_6736602	Confined	12,064	1/11/2012	286.78	310.33	-23.55	1
5	0_6736602	Confined	12,212	6/7/2012	286.49	310.24	-23.75	1
5	0_6736602	Confined	12,309	9/12/2012	283.08	310.18	-27.10	1
5	0_6736602	Confined	12,806	1/22/2014	283.13	309.77	-26.64	1
5	0_6736602	Confined	12,953	6/18/2014	285.32	309.61	-24.29	1
5	0_6736602	Confined	13,039	9/12/2014	280.08	309.51	-29.43	1
5	0_6736602	Confined	13,157	1/8/2015	281.99	309.38	-27.39	1
5	0_6736602	Confined	13,312	6/12/2015	283.75	309.23	-25.48	1
5	0_6736602	Confined	13,540	1/26/2016	283.60	309.03	-25.43	1
5	0_6736602	Confined	13,674	6/8/2016	284.91	309.04	-24.13	1
5	0_6736602	Confined	13,772	9/14/2016	283.55	309.05	-25.50	1
5	0_6736602	Confined	13,891	1/11/2017	282.80	309.05	-26.25	1
5	0_6742401	Unconfined	1,508	2/16/1983	402.48	383.36	9.56	0.5
5	0_6742401	Unconfined	1,865	2/8/1984	402.95	383.36	9.80	0.5
5	0_6742401	Unconfined	2,229	2/6/1985	401.09	383.35	8.87	0.5
5	0_6742401	Unconfined	2,606	2/18/1986	400.27	383.39	8.44	0.5
5	0_6742401	Unconfined	3,333	2/15/1988	400.97	383.38	8.80	0.5
5	0_6742401	Unconfined	3,700	2/16/1989	399.30	383.32	7.99	0.5
5	0_6742401	Unconfined	3,999	12/12/1989	402.39	383.33	9.53	0.5
5	0_6742401	Unconfined	4,363	12/11/1990	401.74	383.36	9.19	0.5
5	0_6742701	Confined	7,122	7/1/1998	368.30	379.07	-10.77	1
5	0_6750103	Confined	775	2/13/1981	383.82	384.49	-0.34	0.5
5	0_6750103	Confined	1,508	2/16/1983	385.62	384.48	0.57	0.5
5	0_6750103	Confined	1,865	2/8/1984	385.79	384.47	0.66	0.5
5	0_6750103	Confined	2,229	2/6/1985	385.47	384.46	0.51	0.5
5	0_6750103	Confined	2,606	2/18/1986	381.32	384.52	-1.60	0.5
5	0_6750103	Confined	2,894	12/3/1986	381.55	384.52	-1.49	0.5
5	0_6750103	Confined	3,333	2/15/1988	384.23	384.52	-0.14	0.5
5	0_6750103	Confined	3,700	2/16/1989	383.79	384.42	-0.31	0.5
5	0_6750103	Confined	3,999	12/12/1989	384.03	384.42	-0.19	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6854904	Unconfined	7,123	7/2/1998	412.64	389.15	11.75	0.5
5	0_6855705	Unconfined	2,601	2/13/1986	379.80	397.34	-17.54	1
5	0_6855705	Unconfined	3,334	2/16/1988	381.06	398.99	-17.93	1
5	0_6855705	Unconfined	3,698	2/14/1989	377.84	395.35	-17.51	1
5	0_6855705	Unconfined	4,364	12/12/1990	377.37	394.62	-17.25	1
5	0_6855705	Unconfined	5,161	2/16/1993	383.16	399.64	-16.48	1
5	0_6856901	Confined	779	2/17/1981	413.31	364.37	4.89	0.1
5	0_6856901	Confined	1,507	2/15/1983	414.15	364.31	4.98	0.1
5	0_6856901	Confined	1,863	2/6/1984	413.59	364.09	4.95	0.1
5	0_6856901	Confined	2,227	2/4/1985	414.83	363.82	5.10	0.1
5	0_6856901	Confined	2,605	2/17/1986	412.79	364.52	4.83	0.1
5	0_6856901	Confined	2,894	12/3/1986	411.89	364.68	4.72	0.1
5	0_6856901	Confined	3,334	2/16/1988	412.99	364.67	4.83	0.1
5	0_6856901	Confined	3,699	2/15/1989	412.87	363.59	4.93	0.1
5	0_6856901	Confined	4,364	12/12/1990	409.69	363.87	4.58	0.1
5	0_6862705	Confined	12,090	2/6/2012	348.38	348.02	0.04	0.1
5	0_6862705	Confined	12,114	3/1/2012	351.88	348.77	0.31	0.1
5	0_6862705	Confined	12,149	4/5/2012	356.88	349.87	0.70	0.1
5	0_6862705	Confined	12,176	5/2/2012	355.28	350.72	0.46	0.1
5	0_6862705	Confined	12,241	7/6/2012	344.88	352.75	-0.79	0.1
5	0_6862705	Confined	12,269	8/3/2012	338.48	353.63	-1.51	0.1
5	0_6862705	Confined	12,308	9/11/2012	337.28	354.85	-1.76	0.1
5	0_6862705	Confined	12,347	10/20/2012	335.28	356.07	-2.08	0.1
5	0_6862705	Confined	12,386	11/28/2012	339.68	357.30	-1.76	0.1
5	0_6862705	Confined	12,394	12/6/2012	341.88	357.55	-1.57	0.1
5	0_6862705	Confined	12,425	1/6/2013	344.08	358.39	-1.43	0.1
5	0_6862705	Confined	12,456	2/6/2013	347.48	358.72	-1.12	0.1
5	0_6862705	Confined	12,514	4/5/2013	344.88	359.32	-1.44	0.1
5	0_6862705	Confined	12,571	6/1/2013	335.68	359.92	-2.42	0.1
5	0_6862705	Confined	12,606	7/6/2013	336.88	360.29	-2.34	0.1
5	0_6862705	Confined	12,634	8/3/2013	335.48	360.58	-2.51	0.1
5	0_6862705	Confined	12,673	9/11/2013	332.28	360.99	-2.87	0.1
5	0_6862705	Confined	12,693	10/1/2013	323.28	361.20	-3.79	0.1
5	0_6862705	Confined	12,744	11/21/2013	326.28	361.73	-3.54	0.1
5	0_6862705	Confined	12,754	12/1/2013	332.08	361.83	-2.98	0.1
5	0_6862705	Confined	12,785	1/1/2014	335.38	362.15	-2.68	0.1
5	0_6862705	Confined	12,816	2/1/2014	341.98	362.33	-2.03	0.1
5	0_6862705	Confined	12,844	3/1/2014	341.28	362.49	-2.12	0.1
5	0_6862705	Confined	12,875	4/1/2014	337.68	362.67	-2.50	0.1
5	0_6862705	Confined	12,905	5/1/2014	327.48	362.84	-3.54	0.1
5	0_6862705	Confined	12,966	7/1/2014	312.98	363.18	-5.02	0.1
5	0_6862705	Confined	12,997	8/1/2014	317.28	363.36	-4.61	0.1
5	0_6862705	Confined	13,028	9/1/2014	313.28	363.53	-5.03	0.1
5	0_6862705	Confined	13,058	10/1/2014	316.18	363.71	-4.75	0.1
5	0_6862705	Confined	13,089	11/1/2014	318.98	363.88	-4.49	0.1
5	0_6862705	Confined	13,119	12/1/2014	320.48	364.05	-4.36	0.1
5	0_6862705	Confined	13,150	1/1/2015	322.68	364.24	-4.16	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_6862705	Confined	13,181	2/1/2015	324.98	364.66	-3.97	0.1
5	0_6862705	Confined	13,209	3/1/2015	327.38	365.04	-3.77	0.1
5	0_6862705	Confined	13,270	5/1/2015	328.78	365.87	-3.71	0.1
5	0_6862705	Confined	13,515	1/1/2016	334.98	369.18	-3.42	0.1
5	0_6862705	Confined	13,546	2/1/2016	335.58	369.38	-3.38	0.1
5	0_6862705	Confined	13,575	3/1/2016	335.98	369.56	-3.36	0.1
5	0_6862705	Confined	13,606	4/1/2016	336.58	369.76	-3.32	0.1
5	0_6862705	Confined	13,636	5/1/2016	333.78	369.95	-3.62	0.1
5	0_6862705	Confined	13,667	6/1/2016	333.28	370.14	-3.69	0.1
5	0_6862705	Confined	13,697	7/1/2016	331.78	370.33	-3.86	0.1
5	0_6862705	Confined	13,728	8/1/2016	331.58	370.53	-3.89	0.1
5	0_6862705	Confined	13,759	9/1/2016	333.78	370.72	-3.69	0.1
5	0_6862705	Confined	13,789	10/1/2016	340.08	370.91	-3.08	0.1
5	0_6862705	Confined	13,820	11/1/2016	342.58	371.11	-2.85	0.1
5	0_6862705	Confined	13,850	12/1/2016	346.98	371.30	-2.43	0.1
5	0_6862705	Confined	13,881	1/1/2017	345.88	371.49	-2.56	0.1
5	0_6862705	Confined	13,912	2/1/2017	346.08	371.38	-2.53	0.1
5	0_6862705	Confined	13,940	3/1/2017	345.08	371.29	-2.62	0.1
5	0_6862705	Confined	13,971	4/1/2017	344.88	371.19	-2.63	0.1
5	0_6862705	Confined	14,001	5/1/2017	344.48	371.09	-2.66	0.1
5	0_6862705	Confined	14,032	6/1/2017	343.68	370.99	-2.73	0.1
5	0_7703901	Unconfined	9,892	1/30/2006	660.77	644.48	16.29	1
5	0_7703901	Unconfined	10,015	6/2/2006	660.97	644.17	16.80	1
5	0_7703902	Unconfined	9,515	1/18/2005	598.31	627.27	-28.96	1
5	0_7708718	Unconfined	8,502	4/11/2002	611.72	351.58	130.07	0.5
5	0_7708806	Unconfined	1,135	2/8/1982	362.87	422.33	-5.95	0.1
5	0_7708806	Unconfined	1,508	2/16/1983	355.47	421.95	-6.65	0.1
5	0_7708806	Unconfined	1,873	2/16/1984	341.26	422.90	-8.16	0.1
5	0_7708806	Unconfined	2,236	2/13/1985	328.12	421.74	-9.36	0.1
5	0_7708806	Unconfined	2,607	2/19/1986	351.57	425.50	-7.39	0.1
5	0_7708806	Unconfined	3,697	2/13/1989	326.93	424.11	-9.72	0.1
5	0_7708806	Unconfined	4,069	2/20/1990	302.80	422.24	-11.94	0.1
5	0_7708806	Unconfined	4,476	4/3/1991	313.11	420.77	-10.77	0.1
5	0_7708806	Unconfined	4,776	1/28/1992	354.67	414.63	-6.00	0.1
5	0_7708806	Unconfined	5,136	1/22/1993	359.67	409.76	-5.01	0.1
5	0_7708806	Unconfined	5,503	1/24/1994	376.47	402.38	-2.59	0.1
5	0_7708806	Unconfined	5,859	1/15/1995	375.57	396.67	-2.11	0.1
5	0_7708806	Unconfined	6,648	3/14/1997	366.12	390.45	-2.43	0.1
5	0_7708806	Unconfined	6,984	2/13/1998	367.62	394.61	-2.70	0.1
5	0_7708806	Unconfined	7,318	1/13/1999	363.97	389.66	-2.57	0.1
5	0_7708806	Unconfined	8,415	1/14/2002	267.07	370.59	-10.35	0.1
5	0_7708806	Unconfined	8,781	1/15/2003	280.27	365.69	-8.54	0.1
5	0_7708806	Unconfined	9,158	1/27/2004	294.97	362.91	-6.79	0.1
5	0_7708806	Unconfined	9,504	1/7/2005	302.87	364.38	-6.15	0.1
5	0_7708806	Unconfined	9,882	1/20/2006	281.67	362.28	-8.06	0.1
5	0_7708806	Unconfined	10,271	2/13/2007	272.87	364.29	-9.14	0.1
5	0_7708806	Unconfined	10,609	1/17/2008	270.97	366.77	-9.58	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_7708806	Unconfined	10,993	2/4/2009	236.87	354.20	-11.73	0.1
5	0_7708806	Unconfined	11,426	4/13/2010	236.67	332.14	-9.55	0.1
5	0_7708808	Unconfined	1,508	2/16/1983	368.47	421.95	-53.48	1
5	0_7708808	Unconfined	1,873	2/16/1984	362.55	422.90	-60.35	1
5	0_7708808	Unconfined	2,236	2/13/1985	355.30	421.74	-66.44	1
5	0_7708808	Unconfined	2,605	2/17/1986	363.92	425.50	-61.58	1
5	0_7708808	Unconfined	3,007	3/26/1987	354.59	426.69	-72.10	1
5	0_7708808	Unconfined	3,343	2/25/1988	369.72	427.03	-57.31	1
5	0_7708808	Unconfined	3,697	2/13/1989	350.19	424.11	-73.92	1
5	0_7708808	Unconfined	4,069	2/20/1990	337.49	422.24	-84.75	1
5	0_7708808	Unconfined	4,476	4/3/1991	327.87	420.77	-92.90	1
5	0_7708808	Unconfined	4,776	1/28/1992	338.12	414.63	-76.51	1
5	0_7708808	Unconfined	5,136	1/22/1993	347.42	409.76	-62.34	1
5	0_7708808	Unconfined	6,235	1/26/1996	334.57	392.01	-57.44	1
5	0_7708808	Unconfined	6,648	3/14/1997	323.12	390.45	-67.33	1
5	0_7708808	Unconfined	6,984	2/13/1998	329.87	394.61	-64.74	1
5	0_7708808	Unconfined	7,318	1/13/1999	330.67	389.66	-58.99	1
5	0_7708808	Unconfined	8,410	1/9/2002	306.47	370.66	-64.19	1
5	0_7708808	Unconfined	8,771	1/5/2003	315.27	365.77	-50.50	1
5	0_7708808	Unconfined	9,158	1/27/2004	306.17	362.91	-56.74	1
5	0_7708808	Unconfined	9,504	1/7/2005	326.97	364.38	-37.41	1
5	0_7708808	Unconfined	9,882	1/20/2006	319.07	362.28	-43.21	1
5	0_7708808	Unconfined	10,271	2/13/2007	300.47	364.29	-63.82	1
5	0_7708808	Unconfined	10,609	1/17/2008	307.47	366.77	-59.30	1
5	0_7708808	Unconfined	11,029	3/12/2009	301.27	352.24	-50.97	1
5	0_7708808	Unconfined	11,426	4/13/2010	299.47	332.14	-32.67	1
5	0_7714901	Confined	4,056	2/7/1990	501.53	457.62	21.95	0.5
5	0_7714901	Confined	4,461	3/19/1991	502.56	457.65	22.45	0.5
5	0_7714901	Confined	4,775	1/27/1992	503.16	457.62	22.77	0.5
5	0_7714902	Confined	1,138	2/11/1982	440.89	458.11	-1.72	0.1
5	0_7714902	Confined	1,515	2/23/1983	439.19	458.07	-1.89	0.1
5	0_7714902	Confined	1,872	2/15/1984	437.41	458.07	-2.07	0.1
5	0_7714902	Confined	2,238	2/15/1985	439.64	458.04	-1.84	0.1
5	0_7714902	Confined	2,606	2/18/1986	438.94	458.12	-1.92	0.1
5	0_7714902	Confined	3,001	3/20/1987	438.83	458.16	-1.93	0.1
5	0_7714902	Confined	3,343	2/25/1988	439.64	458.16	-1.85	0.1
5	0_7714902	Confined	3,699	2/15/1989	444.22	458.07	-1.38	0.1
5	0_7715903	Confined	1,136	2/9/1982	401.52	444.01	-4.25	0.1
5	0_7715903	Confined	1,514	2/22/1983	401.40	443.98	-4.26	0.1
5	0_7715903	Confined	1,872	2/15/1984	399.09	443.98	-4.49	0.1
5	0_7715903	Confined	2,238	2/15/1985	396.27	443.97	-4.77	0.1
5	0_7715903	Confined	2,606	2/18/1986	398.25	444.05	-4.58	0.1
5	0_7715903	Confined	3,000	3/19/1987	400.95	444.06	-4.31	0.1
5	0_7715903	Confined	3,343	2/25/1988	402.64	444.06	-4.14	0.1
5	0_7715903	Confined	3,698	2/14/1989	381.78	443.99	-6.22	0.1
5	0_7715903	Confined	4,069	2/20/1990	401.67	443.97	-4.23	0.1
5	0_7715903	Confined	4,455	3/13/1991	400.97	443.99	-4.30	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_7715903	Confined	4,770	1/22/1992	399.07	443.95	-4.49	0.1
5	0_7715903	Confined	5,141	1/27/1993	404.97	443.91	-3.89	0.1
5	0_7716408	Unconfined	8,501	4/10/2002	326.03	439.31	-113.28	1
5	0_7716710	Confined	5,505	1/26/1994	236.08	444.84	-104.38	0.5
5	0_7716710	Confined	5,860	1/16/1995	249.58	444.78	-97.60	0.5
5	0_7716710	Confined	6,228	1/19/1996	224.38	444.64	-110.13	0.5
5	0_7716710	Confined	6,654	3/20/1997	202.38	444.56	-121.09	0.5
5	0_7716710	Confined	6,989	2/18/1998	213.68	444.70	-115.51	0.5
5	0_7716710	Confined	7,319	1/14/1999	210.58	444.62	-117.02	0.5
5	0_7716710	Confined	7,731	3/1/2000	189.78	444.38	-127.30	0.5
5	0_7716710	Confined	8,409	1/8/2002	191.68	444.13	-126.22	0.5
5	0_7716710	Confined	8,782	1/16/2003	208.98	444.10	-117.56	0.5
5	0_7716710	Confined	9,158	1/27/2004	208.18	444.00	-117.91	0.5
5	0_7716710	Confined	9,516	1/19/2005	210.68	444.06	-116.69	0.5
5	0_7716710	Confined	9,882	1/20/2006	189.58	443.91	-127.16	0.5
5	0_7716710	Confined	10,264	2/6/2007	185.58	443.92	-129.17	0.5
5	0_7716710	Confined	10,599	1/7/2008	196.18	444.10	-123.96	0.5
5	0_7716710	Confined	11,015	2/26/2009	185.58	443.70	-129.06	0.5
5	0_7716710	Confined	11,341	1/18/2010	186.48	443.34	-128.43	0.5
5	0_7723802	Confined	1,136	2/9/1982	456.02	450.30	0.57	0.1
5	0_7723802	Confined	1,507	2/15/1983	455.89	450.26	0.56	0.1
5	0_7723802	Confined	1,872	2/15/1984	455.43	450.26	0.52	0.1
5	0_7723802	Confined	2,238	2/15/1985	425.39	450.24	-2.49	0.1
5	0_7723802	Confined	2,606	2/18/1986	454.59	450.31	0.43	0.1
5	0_7723802	Confined	3,343	2/25/1988	451.09	450.34	0.08	0.1
5	0_7723802	Confined	3,698	2/14/1989	441.61	450.26	-0.86	0.1
5	0_7723802	Confined	4,071	2/22/1990	454.80	450.24	0.46	0.1
5	0_7723810	Confined	8,541	5/20/2002	426.05	449.92	-2.39	0.1
5	0_7731703	Confined	779	2/17/1981	328.61	450.50	-60.94	0.5
5	0_7731703	Confined	1,143	2/16/1982	329.64	450.55	-60.45	0.5
5	0_7731703	Confined	1,507	2/15/1983	352.60	450.49	-48.94	0.5
5	0_7731703	Confined	1,871	2/14/1984	359.11	450.47	-45.68	0.5
5	0_7731703	Confined	2,238	2/15/1985	356.60	450.44	-46.92	0.5
5	0_7731703	Confined	2,613	2/25/1986	363.23	450.54	-43.65	0.5
5	0_7731703	Confined	2,962	2/9/1987	365.37	450.57	-42.60	0.5
5	0_7731703	Confined	3,700	2/16/1989	393.97	450.45	-28.24	0.5
5	0_7731703	Confined	4,071	2/22/1990	378.15	450.43	-36.14	0.5
5	0_7731703	Confined	4,425	2/11/1991	385.97	450.50	-32.26	0.5
5	0_7731703	Confined	4,790	2/11/1992	387.16	450.53	-31.68	0.5
5	0_7731703	Confined	5,170	2/25/1993	370.75	450.54	-39.89	0.5
5	0_7731703	Confined	5,533	2/23/1994	392.45	450.43	-28.99	0.5
5	0_7731703	Confined	5,811	11/28/1994	389.67	450.42	-30.38	0.5
5	0_7731703	Confined	6,233	1/24/1996	371.95	450.34	-39.19	0.5
5	0_7731703	Confined	6,624	2/18/1997	385.35	450.27	-32.46	0.5
5	0_7731703	Confined	6,980	2/9/1998	384.40	450.37	-32.99	0.5
5	0_7731703	Confined	7,340	2/4/1999	376.25	450.38	-37.07	0.5
5	0_7731703	Confined	7,725	2/24/2000	376.20	450.26	-37.03	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_7731703	Confined	8,076	2/9/2001	383.95	450.24	-33.14	0.5
5	0_7731703	Confined	8,437	2/5/2002	384.80	450.21	-32.70	0.5
5	0_7731703	Confined	9,151	1/20/2004	387.55	450.24	-31.34	0.5
5	0_7731703	Confined	9,536	2/8/2005	384.70	450.29	-32.79	0.5
5	0_7731703	Confined	9,920	2/27/2006	387.65	450.15	-31.25	0.5
5	0_7731703	Confined	10,263	2/5/2007	387.09	450.11	-31.51	0.5
5	0_7732501	Confined	1,514	2/22/1983	382.15	446.68	-32.27	0.5
5	0_7732501	Confined	1,870	2/13/1984	381.02	446.68	-32.83	0.5
5	0_7732501	Confined	2,613	2/25/1986	376.52	446.76	-35.12	0.5
5	0_7732501	Confined	4,428	2/14/1991	381.45	446.72	-32.64	0.5
5	0_7732501	Confined	4,791	2/12/1992	380.68	446.71	-33.01	0.5
5	0_7732501	Confined	5,811	11/28/1994	379.98	446.56	-33.29	0.5
5	0_7732501	Confined	6,994	2/23/1998	378.29	446.48	-34.09	0.5
5	0_7732501	Confined	7,725	2/24/2000	375.75	446.35	-35.30	0.5
5	0_7732501	Confined	8,436	2/4/2002	375.15	446.23	-35.54	0.5
5	0_7732501	Confined	8,807	2/10/2003	375.63	446.23	-35.30	0.5
5	0_7732501	Confined	9,151	1/20/2004	376.10	446.19	-35.05	0.5
5	0_7732501	Confined	9,535	2/7/2005	380.05	446.21	-33.08	0.5
5	0_7732501	Confined	11,014	2/25/2009	374.62	446.04	-35.71	0.5
5	0_7732501	Confined	12,076	1/23/2012	379.71	445.57	-32.93	0.5
5	0_7732501	Confined	12,818	2/3/2014	377.91	445.63	-33.86	0.5
5	0_7732501	Confined	13,072	10/15/2014	374.07	445.66	-35.80	0.5
5	0_7732501	Confined	13,452	10/30/2015	374.65	445.80	-35.58	0.5
5	0_7732501	Confined	13,800	10/12/2016	374.66	445.91	-35.62	0.5
5	0_7732501	Confined	14,172	10/19/2017	375.96	445.94	-34.99	0.5
5	0_7737301	Confined	1,143	2/16/1982	266.82	450.44	-91.81	0.5
5	0_7737301	Confined	1,506	2/14/1983	349.66	450.37	-50.35	0.5
5	0_7737301	Confined	1,871	2/14/1984	332.69	450.34	-58.83	0.5
5	0_7737301	Confined	2,236	2/13/1985	326.90	450.31	-61.70	0.5
5	0_7737301	Confined	2,608	2/20/1986	340.41	450.42	-55.01	0.5
5	0_7737301	Confined	2,962	2/9/1987	357.43	450.45	-46.51	0.5
5	0_7737301	Confined	3,356	3/9/1988	369.01	450.44	-40.72	0.5
5	0_7737301	Confined	3,699	2/15/1989	377.49	450.29	-36.40	0.5
5	0_7737301	Confined	4,063	2/14/1990	376.63	450.28	-36.83	0.5
5	0_7737301	Confined	4,428	2/14/1991	383.43	450.37	-33.47	0.5
5	0_7737301	Confined	4,797	2/18/1992	388.54	450.44	-30.95	0.5
5	0_7737301	Confined	5,531	2/21/1994	399.33	450.34	-25.50	0.5
5	0_7737301	Confined	5,804	11/21/1994	387.63	450.34	-31.36	0.5
5	0_7737301	Confined	6,233	1/24/1996	388.43	450.25	-30.91	0.5
5	0_7737301	Confined	6,624	2/18/1997	390.03	450.16	-30.07	0.5
5	0_7739601	Confined	1,143	2/16/1982	399.61	445.77	-23.08	0.5
5	0_7739601	Confined	1,513	2/21/1983	399.92	445.71	-22.90	0.5
5	0_7739601	Confined	1,871	2/14/1984	400.64	445.69	-22.53	0.5
5	0_7739601	Confined	2,616	2/28/1986	400.18	445.76	-22.79	0.5
5	0_7739601	Confined	2,957	2/4/1987	401.96	445.79	-21.91	0.5
5	0_7739601	Confined	3,699	2/15/1989	399.77	445.66	-22.95	0.5
5	0_7739601	Confined	4,427	2/13/1991	399.67	445.72	-23.02	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_7739601	Confined	4,790	2/11/1992	399.21	445.77	-23.28	0.5
5	0_7740305	Confined	2,957	2/4/1987	343.77	434.05	-45.14	0.5
5	0_7740305	Confined	3,700	2/16/1989	343.11	433.98	-45.44	0.5
5	0_7740305	Confined	4,070	2/21/1990	342.97	433.96	-45.49	0.5
5	0_7740305	Confined	4,426	2/12/1991	344.03	434.00	-44.98	0.5
5	0_7740305	Confined	4,789	2/10/1992	344.67	434.03	-44.68	0.5
5	0_7740305	Confined	5,168	2/23/1993	342.59	434.05	-45.73	0.5
5	0_7740305	Confined	5,533	2/23/1994	344.59	433.98	-44.70	0.5
5	0_7740305	Confined	5,805	11/22/1994	345.66	433.97	-44.15	0.5
5	0_7740305	Confined	6,232	1/23/1996	346.59	433.90	-43.66	0.5
5	0_7740305	Confined	6,625	2/19/1997	346.79	433.84	-43.52	0.5
5	0_7740305	Confined	6,983	2/12/1998	347.13	433.90	-43.38	0.5
5	0_7740305	Confined	7,340	2/4/1999	348.04	433.91	-42.94	0.5
5	0_7740305	Confined	8,075	2/8/2001	349.09	433.81	-42.36	0.5
5	0_7740305	Confined	8,437	2/5/2002	354.71	433.79	-39.54	0.5
5	0_7740305	Confined	8,807	2/10/2003	356.41	433.84	-38.71	0.5
5	0_7740305	Confined	9,150	1/19/2004	358.39	433.82	-37.71	0.5
5	0_7740305	Confined	9,536	2/8/2005	359.57	433.83	-37.13	0.5
5	0_7740305	Confined	9,921	2/28/2006	359.24	433.72	-37.24	0.5
5	0_7740305	Confined	10,630	2/7/2008	356.88	433.78	-38.45	0.5
5	0_7740305	Confined	11,014	2/25/2009	359.38	433.67	-37.15	0.5
5	0_7740305	Confined	11,351	1/28/2010	356.44	433.61	-38.59	0.5
5	0_7740305	Confined	11,721	2/2/2011	359.86	433.57	-36.86	0.5
5	0_7740305	Confined	12,077	1/24/2012	358.59	433.44	-37.42	0.5
5	0_7801303	Unconfined	5,129	1/15/1993	427.38	450.87	-11.74	0.5
5	0_7802709	Unconfined	1,135	2/8/1982	397.45	410.89	-6.72	0.5
5	0_7802709	Unconfined	1,517	2/25/1983	401.08	412.09	-5.51	0.5
5	0_7802709	Unconfined	1,873	2/16/1984	398.76	414.93	-8.09	0.5
5	0_7802709	Unconfined	2,236	2/13/1985	392.93	414.23	-10.65	0.5
5	0_7802709	Unconfined	2,601	2/13/1986	397.20	420.93	-11.86	0.5
5	0_7802709	Unconfined	3,000	3/19/1987	397.67	423.56	-12.94	0.5
5	0_7802709	Unconfined	3,342	2/24/1988	396.93	425.35	-14.21	0.5
5	0_7802709	Unconfined	3,700	2/16/1989	388.80	421.50	-16.35	0.5
5	0_7802709	Unconfined	4,062	2/13/1990	389.54	417.79	-14.12	0.5
5	0_7802709	Unconfined	4,419	2/5/1991	379.54	417.26	-18.86	0.5
5	0_7802709	Unconfined	4,755	1/7/1992	380.55	406.74	-13.09	0.5
5	0_7802709	Unconfined	5,129	1/15/1993	384.55	399.89	-7.67	0.5
5	0_7802709	Unconfined	5,506	1/27/1994	379.40	389.03	-4.81	0.5
5	0_7802709	Unconfined	5,859	1/15/1995	381.80	380.52	0.64	0.5
5	0_7802709	Unconfined	6,224	1/15/1996	379.55	373.36	3.10	0.5
5	0_7802709	Unconfined	6,648	3/14/1997	372.75	370.37	1.19	0.5
5	0_7802709	Unconfined	6,983	2/12/1998	373.50	376.34	-1.42	0.5
5	0_7802709	Unconfined	7,317	1/12/1999	375.10	369.18	2.96	0.5
5	0_7802709	Unconfined	8,066	1/30/2001	368.30	344.54	11.88	0.5
5	0_7802709	Unconfined	8,410	1/9/2002	367.30	339.60	13.85	0.5
5	0_7802709	Unconfined	8,499	4/8/2002	366.32	337.50	14.41	0.5
5	0_7802709	Unconfined	8,781	1/15/2003	358.90	331.02	13.94	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_7802709	Unconfined	9,151	1/20/2004	363.90	327.12	18.39	0.5
5	0_7802709	Unconfined	9,523	1/26/2005	363.90	329.97	16.97	0.5
5	0_7802709	Unconfined	9,882	1/20/2006	361.50	328.38	16.56	0.5
5	0_7802709	Unconfined	10,271	2/13/2007	352.70	332.08	10.31	0.5
5	0_7802709	Unconfined	10,656	3/4/2008	359.60	334.21	12.70	0.5
5	0_7802709	Unconfined	11,029	3/12/2009	357.30	316.15	20.57	0.5
5	0_7802709	Unconfined	11,426	4/13/2010	350.80	284.30	33.25	0.5
5	0_7802709	Unconfined	12,059	1/6/2012	339.10	242.92	48.09	0.5
5	0_7802709	Unconfined	12,114	3/1/2012	338.30	245.02	46.64	0.5
5	0_7802709	Unconfined	12,210	6/5/2012	336.20	248.68	43.76	0.5
5	0_7802709	Unconfined	12,237	7/2/2012	335.00	249.70	42.65	0.5
5	0_7802709	Unconfined	12,265	7/30/2012	334.60	250.77	41.91	0.5
5	0_7802709	Unconfined	12,307	9/10/2012	333.60	252.37	40.61	0.5
5	0_7802709	Unconfined	12,346	10/19/2012	333.10	253.86	39.62	0.5
5	0_7802709	Unconfined	12,367	11/9/2012	331.80	254.66	38.57	0.5
5	0_7802709	Unconfined	12,391	12/3/2012	331.30	255.57	37.86	0.5
5	0_7802709	Unconfined	12,425	1/6/2013	331.80	256.80	37.50	0.5
5	0_7802709	Unconfined	12,456	2/6/2013	334.20	257.63	38.29	0.5
5	0_7802709	Unconfined	12,479	3/1/2013	333.80	258.24	37.78	0.5
5	0_7802709	Unconfined	12,514	4/5/2013	333.00	259.18	36.91	0.5
5	0_7802709	Unconfined	12,541	5/2/2013	331.40	259.90	35.75	0.5
5	0_7802709	Unconfined	12,575	6/5/2013	331.40	260.81	35.30	0.5
5	0_7802709	Unconfined	12,602	7/2/2013	330.20	261.53	34.34	0.5
5	0_7802709	Unconfined	12,632	8/1/2013	329.60	262.33	33.64	0.5
5	0_7802709	Unconfined	12,672	9/10/2013	327.60	263.40	32.10	0.5
5	0_7802709	Unconfined	12,711	10/19/2013	326.80	264.44	31.18	0.5
5	0_7802709	Unconfined	12,732	11/9/2013	326.80	265.00	30.90	0.5
5	0_7802709	Unconfined	12,756	12/3/2013	326.60	265.64	30.48	0.5
5	0_7826502	Confined	778	2/16/1981	365.88	374.80	-4.46	0.5
5	0_7826502	Confined	1,150	2/23/1982	365.17	374.88	-4.85	0.5
5	0_7826502	Confined	1,502	2/10/1983	365.81	375.00	-4.60	0.5
5	0_7826502	Confined	1,877	2/20/1984	366.07	375.17	-4.55	0.5
5	0_7826502	Confined	2,228	2/5/1985	371.28	375.34	-2.03	0.5
5	0_7826502	Confined	2,593	2/5/1986	371.05	375.55	-2.25	0.5
5	0_7826502	Confined	2,956	2/3/1987	370.77	375.71	-2.47	0.5
5	0_7826502	Confined	3,364	3/17/1988	370.24	375.84	-2.80	0.5
5	0_7826502	Confined	3,700	2/16/1989	369.64	375.90	-3.13	0.5
5	0_7826502	Confined	4,072	2/23/1990	369.05	375.91	-3.43	0.5
5	0_7826502	Confined	4,426	2/12/1991	368.75	375.88	-3.57	0.5
5	0_7826502	Confined	4,789	2/10/1992	368.68	375.85	-3.58	0.5
5	0_7826502	Confined	5,063	11/10/1992	368.14	375.82	-3.84	0.5
5	0_7826502	Confined	5,869	1/25/1995	367.89	375.68	-3.89	0.5
5	0_7826502	Confined	6,231	1/22/1996	368.67	375.59	-3.46	0.5
5	0_7826502	Confined	6,625	2/19/1997	367.07	375.48	-4.20	0.5
5	0_7826502	Confined	6,983	2/12/1998	365.98	375.41	-4.72	0.5
5	0_7826502	Confined	7,337	2/1/1999	365.62	375.35	-4.86	0.5
5	0_7826502	Confined	7,718	2/17/2000	364.87	375.26	-5.20	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	0_7826502	Confined	8,075	2/8/2001	364.58	375.17	-5.30	0.5
5	0_7826502	Confined	8,443	2/11/2002	363.90	375.09	-5.59	0.5
5	0_7826502	Confined	8,821	2/24/2003	363.30	375.01	-5.85	0.5
5	0_7826502	Confined	9,593	4/6/2005	363.47	374.53	-5.53	0.5
5	0_7826502	Confined	9,928	3/7/2006	362.04	374.23	-6.09	0.5
5	0_7826502	Confined	10,278	2/20/2007	361.47	374.01	-6.27	0.5
5	0_7826502	Confined	10,998	2/9/2009	362.60	373.96	-5.68	0.5
5	0_7826502	Confined	11,348	1/25/2010	361.23	374.01	-6.39	0.5
5	0_7826502	Confined	11,723	2/4/2011	360.06	373.91	-6.92	0.5
5	0_7826502	Confined	12,079	1/26/2012	358.54	373.66	-7.56	0.5
5	0_7826502	Confined	12,433	1/14/2013	357.84	373.30	-7.73	0.5
5	0_7826502	Confined	12,825	2/10/2014	356.90	373.10	-8.10	0.5
5	0_7826502	Confined	13,448	10/26/2015	354.80	373.13	-9.16	0.5
5	0_7826502	Confined	13,800	10/12/2016	351.70	373.22	-10.76	0.5
5	0_7826502	Confined	14,172	10/19/2017	355.49	373.38	-8.94	0.5
5	0_8521501	Confined	7,037	4/7/1998	457.54	435.38	22.16	1
5	11814_0	Confined	10,447	8/8/2007	432.33	299.62	13.27	0.1
5	11816_0	Confined	10,211	12/15/2006	420.90	284.23	136.67	1
5	11818_0	Confined	10,062	7/19/2006	418.13	320.47	9.77	0.1
5	11820_0	Confined	8,130	4/4/2001	319.03	312.42	6.61	1
5	11822_0	Confined	11,195	8/25/2009	290.60	293.86	-3.26	1
5	11823_0	Confined	9,270	5/18/2004	352.64	319.16	33.48	1
5	11825_0	Confined	10,620	1/28/2008	397.26	303.22	9.40	0.1
5	11828_0	Confined	10,196	11/30/2006	313.42	293.26	20.16	1
5	11842_0	Confined	11,489	6/15/2010	264.06	312.68	-24.31	0.5
5	13248_7804308	Confined	3,999	12/12/1989	309.20	331.51	-22.31	1
5	13249_7804310	Confined	3,999	12/12/1989	294.45	326.03	-31.58	1
5	13251_6859922	Unconfined	4,155	5/17/1990	382.82	409.80	-26.98	1
5	13251_6859922	Unconfined	4,219	7/20/1990	380.27	409.81	-29.54	1
5	13253_6861506	Unconfined	10,987	1/29/2009	382.77	369.45	13.32	1
5	13253_6861506	Unconfined	12,059	1/6/2012	374.97	345.00	29.97	1
5	13253_6861506	Unconfined	12,114	3/1/2012	379.57	347.08	32.49	1
5	13253_6861506	Unconfined	12,149	4/5/2012	378.27	348.41	29.86	1
5	13253_6861506	Unconfined	12,176	5/2/2012	375.07	349.43	25.64	1
5	13253_6861506	Unconfined	12,206	6/1/2012	375.77	350.57	25.20	1
5	13253_6861506	Unconfined	12,241	7/6/2012	359.27	351.90	7.37	1
5	13253_6861506	Unconfined	12,269	8/3/2012	360.87	352.96	7.91	1
5	13253_6861506	Unconfined	12,308	9/11/2012	357.07	354.44	2.63	1
5	13253_6861506	Unconfined	12,347	10/20/2012	363.07	355.92	7.15	1
5	13253_6861506	Unconfined	12,386	11/28/2012	369.57	357.40	12.17	1
5	13253_6861506	Unconfined	12,394	12/6/2012	375.07	357.70	17.37	1
5	13253_6861506	Unconfined	12,425	1/6/2013	378.07	358.74	19.33	1
5	13253_6861506	Unconfined	12,456	2/6/2013	381.47	359.23	22.24	1
5	13253_6861506	Unconfined	12,479	3/1/2013	378.97	359.59	19.38	1
5	13253_6861506	Unconfined	12,514	4/5/2013	377.07	360.14	16.93	1
5	13253_6861506	Unconfined	12,541	5/2/2013	375.07	360.56	14.51	1
5	13253_6861506	Unconfined	12,571	6/1/2013	373.27	361.03	12.24	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	13253_6861506	Unconfined	12,606	7/6/2013	372.87	361.58	11.29	1
5	13253_6861506	Unconfined	12,634	8/3/2013	371.27	362.02	9.25	1
5	13253_6861506	Unconfined	12,673	9/11/2013	369.07	362.63	6.44	1
5	13253_6861506	Unconfined	12,693	10/1/2013	364.27	362.94	1.33	1
5	13253_6861506	Unconfined	12,744	11/21/2013	371.27	363.74	7.53	1
5	13253_6861506	Unconfined	12,754	12/1/2013	376.07	363.90	12.17	1
5	13253_6861506	Unconfined	12,785	1/1/2014	376.67	364.38	12.29	1
5	13253_6861506	Unconfined	12,816	2/1/2014	383.67	364.65	19.02	1
5	13253_6861506	Unconfined	12,844	3/1/2014	382.17	364.90	17.27	1
5	13253_6861506	Unconfined	12,875	4/1/2014	387.07	365.18	21.89	1
5	13253_6861506	Unconfined	12,905	5/1/2014	367.27	365.45	1.82	1
5	13253_6861506	Unconfined	12,936	6/1/2014	372.47	365.73	6.74	1
5	13253_6861506	Unconfined	12,966	7/1/2014	373.57	366.00	7.57	1
5	13253_6861506	Unconfined	12,997	8/1/2014	361.47	366.27	-4.80	1
5	13253_6861506	Unconfined	13,089	11/1/2014	361.67	367.10	-5.43	1
5	13253_6861506	Unconfined	13,119	12/1/2014	370.67	367.37	3.30	1
5	13253_6861506	Unconfined	13,150	1/1/2015	375.47	367.65	7.82	1
5	13253_6861506	Unconfined	13,181	2/1/2015	378.07	368.21	9.86	1
5	13253_6861506	Unconfined	13,209	3/1/2015	379.97	368.71	11.26	1
5	13253_6861506	Unconfined	13,240	4/1/2015	381.27	369.27	12.00	1
5	13253_6861506	Unconfined	13,270	5/1/2015	382.97	369.81	13.16	1
5	13253_6861506	Unconfined	13,301	6/1/2015	383.67	370.37	13.30	1
5	13253_6861506	Unconfined	13,331	7/1/2015	382.87	370.91	11.96	1
5	13253_6861506	Unconfined	13,362	8/1/2015	374.97	371.47	3.50	1
5	13253_6861506	Unconfined	13,423	10/1/2015	368.67	372.56	-3.89	1
5	13253_6861506	Unconfined	13,454	11/1/2015	374.97	373.12	1.85	1
5	13253_6861506	Unconfined	13,484	12/1/2015	375.67	373.66	2.01	1
5	13253_6861506	Unconfined	13,515	1/1/2016	375.87	374.21	1.66	1
5	13253_6861506	Unconfined	13,546	2/1/2016	376.37	374.51	1.86	1
5	13253_6861506	Unconfined	13,575	3/1/2016	376.57	374.79	1.78	1
5	13253_6861506	Unconfined	13,606	4/1/2016	377.47	375.09	2.38	1
5	13253_6861506	Unconfined	13,636	5/1/2016	376.17	375.38	0.79	1
5	13253_6861506	Unconfined	13,667	6/1/2016	382.27	375.68	6.59	1
5	13253_6861506	Unconfined	13,697	7/1/2016	379.67	375.97	3.70	1
5	13253_6861506	Unconfined	13,728	8/1/2016	377.77	376.27	1.50	1
5	13253_6861506	Unconfined	13,759	9/1/2016	370.97	376.57	-5.60	1
5	13253_6861506	Unconfined	13,789	10/1/2016	372.67	376.86	-4.19	1
5	13253_6861506	Unconfined	13,820	11/1/2016	375.17	377.16	-1.99	1
5	13253_6861506	Unconfined	13,850	12/1/2016	377.47	377.45	0.02	1
5	13253_6861506	Unconfined	13,881	1/1/2017	377.17	377.74	-0.57	1
5	13253_6861506	Unconfined	13,940	3/1/2017	382.07	377.60	4.47	1
5	13253_6861506	Unconfined	13,971	4/1/2017	381.37	377.53	3.84	1
5	13253_6861506	Unconfined	14,001	5/1/2017	380.67	377.46	3.21	1
5	13253_6861506	Unconfined	14,032	6/1/2017	379.97	377.38	2.59	1
5	13253_6861506	Unconfined	14,124	9/1/2017	377.87	377.16	0.71	1
5	13253_6861506	Unconfined	14,154	10/1/2017	377.17	377.09	0.08	1
5	13253_6861506	Unconfined	14,185	11/1/2017	377.47	377.02	0.45	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	13253_6861506	Unconfined	14,215	12/1/2017	377.67	376.95	0.72	1
5	13254_6861414	Unconfined	9,181	2/19/2004	393.95	392.63	1.32	1
5	13254_6861414	Unconfined	9,552	2/24/2005	395.25	393.04	2.21	1
5	13254_6861414	Unconfined	9,871	1/9/2006	392.35	392.40	-0.05	1
5	13254_6861414	Unconfined	10,257	1/30/2007	392.65	392.65	0.00	1
5	13254_6861414	Unconfined	10,614	1/22/2008	394.35	394.47	-0.12	1
5	13254_6861414	Unconfined	10,981	1/23/2009	392.95	393.19	-0.24	1
5	13254_6861414	Unconfined	11,368	2/14/2010	385.25	391.95	-6.70	1
5	13261_7805121	Confined	3,593	11/1/1988	282.93	328.56	-45.63	1
5	13264_7805123	Confined	2,777	8/8/1986	294.96	334.65	-39.69	1
5	13265_7805108	Confined	11,504	6/30/2010	224.53	316.39	-91.86	1
5	13288_7813103	Confined	7,646	12/7/1999	320.75	305.69	15.06	1
5	13292_7823502	Confined	731	12/31/1980	321.77	298.60	23.16	1
5	13292_7823502	Confined	2,168	12/7/1984	294.59	298.67	-4.08	1
5	13292_7823502	Confined	2,538	12/12/1985	295.92	298.67	-2.75	1
5	13292_7823502	Confined	2,938	1/16/1987	297.43	298.68	-1.25	1
5	13292_7823502	Confined	3,297	1/10/1988	296.30	298.70	-2.40	1
5	13292_7823502	Confined	4,001	12/14/1989	289.16	298.68	-9.52	1
5	13292_7823502	Confined	4,720	12/3/1991	288.45	298.66	-10.21	1
5	13292_7823502	Confined	5,063	11/10/1992	293.27	298.67	-5.40	1
5	13292_7823502	Confined	5,434	11/16/1993	294.60	298.67	-4.07	1
5	13292_7823502	Confined	5,868	1/24/1995	293.72	298.67	-4.95	1
5	13292_7823502	Confined	6,245	2/5/1996	295.12	298.66	-3.54	1
5	13295_7826504	Confined	4,989	8/28/1992	354.67	375.45	-10.39	0.5
5	13295_7826504	Confined	5,869	1/25/1995	351.72	375.29	-11.78	0.5
5	13295_7826504	Confined	6,231	1/22/1996	350.12	375.20	-12.54	0.5
5	13295_7826504	Confined	6,625	2/19/1997	349.22	375.08	-12.93	0.5
5	13295_7826504	Confined	7,718	2/17/2000	346.52	374.85	-14.16	0.5
5	13295_7826504	Confined	8,075	2/8/2001	345.46	374.75	-14.64	0.5
5	13295_7826504	Confined	8,443	2/11/2002	343.27	374.66	-15.69	0.5
5	13295_7826504	Confined	8,821	2/24/2003	342.56	374.57	-16.00	0.5
5	13295_7826504	Confined	9,593	4/6/2005	341.07	374.05	-16.49	0.5
5	13295_7826504	Confined	9,928	3/7/2006	340.17	373.73	-16.78	0.5
5	13295_7826504	Confined	10,278	2/20/2007	339.27	373.50	-17.11	0.5
5	13295_7826504	Confined	10,998	2/9/2009	337.42	373.45	-18.01	0.5
5	13295_7826504	Confined	12,079	1/26/2012	332.96	373.14	-20.09	0.5
5	13295_7826504	Confined	12,433	1/14/2013	330.51	372.74	-21.11	0.5
5	13295_7826504	Confined	12,825	2/10/2014	327.37	372.53	-22.58	0.5
5	13295_7826504	Confined	13,448	10/26/2015	318.44	372.56	-27.06	0.5
5	13295_7826504	Confined	13,800	10/12/2016	316.30	372.65	-28.18	0.5
5	13295_7826504	Confined	14,172	10/19/2017	314.70	372.83	-29.06	0.5
5	14273_0	Confined	9,863	1/1/2006	345.74	409.97	-64.23	1
5	15926_6861805	Unconfined	774	2/12/1981	377.24	347.26	29.98	1
5	15926_6861805	Unconfined	1,167	3/12/1982	376.38	353.48	22.90	1
5	15926_6861805	Unconfined	1,501	2/9/1983	377.74	355.47	22.27	1
5	15926_6861805	Unconfined	1,878	2/21/1984	372.56	358.34	14.22	1
5	15926_6861805	Unconfined	2,229	2/6/1985	364.79	359.64	5.15	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	15926_6861805	Unconfined	2,598	2/10/1986	368.97	361.62	7.35	1
5	15926_6861805	Unconfined	2,997	3/16/1987	373.17	360.93	12.24	1
5	15926_6861805	Unconfined	3,335	2/17/1988	368.90	362.95	5.95	1
5	15926_6861805	Unconfined	3,701	2/17/1989	361.34	360.00	1.34	1
5	15926_6861805	Unconfined	4,391	1/8/1991	356.48	356.31	0.17	1
5	15926_6861805	Unconfined	5,121	1/7/1993	376.94	359.69	17.25	1
5	15926_6861805	Unconfined	5,486	1/7/1994	375.14	357.89	17.25	1
5	15926_6861805	Unconfined	6,665	3/31/1997	362.89	354.82	8.07	1
5	15926_6861805	Unconfined	7,316	1/11/1999	355.14	355.74	-0.60	1
5	15926_6861805	Unconfined	8,051	1/15/2001	363.14	349.68	13.46	1
5	15926_6861805	Unconfined	8,416	1/15/2002	352.64	350.47	2.17	1
5	15926_6861805	Unconfined	8,789	1/23/2003	358.64	349.84	8.80	1
5	15926_6861805	Unconfined	9,152	1/21/2004	362.64	349.75	12.89	1
5	15926_6861805	Unconfined	9,539	2/11/2005	368.64	350.78	17.86	1
5	15926_6861805	Unconfined	9,885	1/23/2006	350.64	348.88	1.76	1
5	15926_6861805	Unconfined	10,267	2/9/2007	343.64	350.60	-6.96	1
5	15926_6861805	Unconfined	10,663	3/11/2008	346.44	356.55	-10.11	1
5	15926_6861805	Unconfined	11,007	2/18/2009	331.54	352.19	-20.65	1
5	15926_6861805	Unconfined	11,425	4/12/2010	362.64	345.59	17.05	1
5	15949_7805107	Confined	3,999	12/12/1989	287.55	324.07	-36.52	1
5	15965_7805409	Confined	1,166	3/11/1982	345.51	328.47	17.04	1
5	15965_7805409	Confined	1,501	2/9/1983	352.05	330.33	21.72	1
5	15965_7805409	Confined	2,599	2/11/1986	316.53	330.21	-13.68	1
5	15965_7805409	Confined	3,336	2/18/1988	306.46	331.51	-25.05	1
5	15965_7805409	Confined	4,084	3/7/1990	305.51	324.21	-18.70	1
5	15965_7805409	Confined	4,412	1/29/1991	309.44	326.80	-17.36	1
5	15965_7805409	Confined	5,486	1/7/1994	305.66	330.10	-24.44	1
5	15965_7805409	Confined	5,863	1/19/1995	309.56	329.24	-19.68	1
5	15965_7805409	Confined	6,228	1/19/1996	308.46	327.20	-18.74	1
5	15965_7805409	Confined	7,316	1/11/1999	305.56	324.29	-18.73	1
5	15965_7805409	Confined	8,051	1/15/2001	305.66	314.14	-8.48	1
5	15965_7805409	Confined	8,417	1/16/2002	303.66	316.52	-12.86	1
5	15965_7805409	Confined	8,769	1/3/2003	305.56	312.56	-7.00	1
5	15965_7805409	Confined	9,143	1/12/2004	305.16	314.08	-8.92	1
5	15965_7805409	Confined	9,522	1/25/2005	301.26	316.90	-15.64	1
5	15965_7805409	Confined	9,865	1/3/2006	299.96	315.44	-15.48	1
5	15965_7805409	Confined	10,263	2/5/2007	295.26	318.97	-23.71	1
5	15965_7805409	Confined	10,601	1/9/2008	299.76	327.02	-27.26	1
5	15965_7805409	Confined	10,992	2/3/2009	298.36	319.56	-21.20	1
5	15965_7805409	Confined	11,359	2/5/2010	300.06	308.39	-8.33	1
5	16151_7804311	Confined	4,164	5/26/1990	323.32	336.12	-12.80	1
5	39004_0	Unconfined	10,130	9/25/2006	438.10	357.85	80.25	1
5	39007_0	Unconfined	11,834	5/26/2011	411.24	345.33	65.91	1
5	39009_0	Unconfined	11,695	1/7/2011	403.40	348.63	54.77	1
5	39012_0	Unconfined	11,069	4/21/2009	408.72	358.53	50.19	1
5	39013_0	Unconfined	10,421	7/13/2007	414.99	354.45	60.54	1
5	39014_0	Confined	9,685	7/7/2005	416.95	358.04	5.89	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	39015_0	Confined	9,759	9/19/2005	413.03	324.35	8.87	0.1
5	39016_0	Unconfined	8,978	7/31/2003	286.27	430.24	-14.40	0.1
5	39017_0	Unconfined	11,121	6/12/2009	413.93	405.85	8.08	1
5	39018_0	Unconfined	11,736	2/17/2011	435.70	331.53	104.17	1
5	39019_0	Unconfined	10,822	8/17/2008	318.44	326.53	-8.09	1
5	39020_0	Unconfined	10,133	9/28/2006	456.57	314.49	142.08	1
5	39021_0	Unconfined	9,256	5/4/2004	341.02	360.20	-19.18	1
5	39023_0	Confined	11,698	1/10/2011	350.24	298.38	5.19	0.1
5	39024_0	Confined	10,391	6/13/2007	390.19	322.80	67.39	1
5	39025_0	Confined	9,187	2/25/2004	391.27	306.66	84.61	1
5	39026_0	Confined	8,761	12/26/2002	363.40	328.07	35.33	1
5	39027_0	Confined	9,787	10/17/2005	304.22	328.52	-24.30	1
5	39028_0	Confined	10,096	8/22/2006	344.19	342.01	0.22	0.1
5	39029_0	Confined	10,055	7/12/2006	350.53	344.92	0.56	0.1
5	39030_0	Confined	11,146	7/7/2009	344.20	337.80	6.40	1
5	39031_0	Unconfined	9,243	4/21/2004	374.98	351.75	23.23	1
5	39032_0	Confined	11,676	12/19/2010	370.99	351.23	1.98	0.1
5	39033_0	Unconfined	9,905	2/12/2006	350.75	363.99	-13.24	1
5	39034_0	Confined	9,390	9/15/2004	347.90	360.53	-1.26	0.1
5	39035_0	Confined	9,794	10/24/2005	374.58	359.67	14.91	1
5	39174_6714402	Unconfined	782	2/20/1981	449.19	421.35	2.78	0.1
5	39174_6714402	Unconfined	1,144	2/17/1982	450.30	421.83	2.85	0.1
5	39174_6714402	Unconfined	2,235	2/12/1985	449.43	420.74	2.87	0.1
5	39174_6714402	Unconfined	2,616	2/28/1986	447.19	421.65	2.55	0.1
5	39174_6714402	Unconfined	2,903	12/12/1986	448.47	421.64	2.68	0.1
5	39174_6714402	Unconfined	3,125	7/22/1987	451.14	421.67	2.95	0.1
5	39174_6714402	Unconfined	3,704	2/20/1989	451.60	420.24	3.14	0.1
5	39174_6714402	Unconfined	4,051	2/2/1990	448.81	420.48	2.83	0.1
5	39174_6714402	Unconfined	4,428	2/14/1991	448.94	421.31	2.76	0.1
5	39174_6714402	Unconfined	4,793	2/14/1992	450.82	421.92	2.89	0.1
5	39174_6714402	Unconfined	5,101	12/18/1992	450.65	422.35	2.83	0.1
5	39174_6714402	Unconfined	6,556	12/12/1996	449.18	420.30	2.89	0.1
5	39174_6714402	Unconfined	6,940	12/31/1997	448.19	421.56	2.66	0.1
5	39174_6714402	Unconfined	7,242	10/29/1998	450.69	421.74	2.90	0.1
5	39174_6714402	Unconfined	7,723	2/22/2000	450.67	420.65	3.00	0.1
5	39174_6714402	Unconfined	8,068	2/1/2001	450.99	421.20	2.98	0.1
5	39174_6714402	Unconfined	8,439	2/7/2002	450.94	421.25	2.97	0.1
5	39174_6714402	Unconfined	8,816	2/19/2003	454.32	422.51	3.18	0.1
5	39174_6714402	Unconfined	9,509	1/12/2005	458.25	421.35	3.69	0.1
5	39174_6714402	Unconfined	9,900	2/7/2006	455.34	419.92	3.54	0.1
5	39174_6714402	Unconfined	10,264	2/6/2007	460.29	419.83	4.05	0.1
5	39174_6714402	Unconfined	10,649	2/26/2008	460.60	421.38	3.92	0.1
5	39174_6714402	Unconfined	11,007	2/18/2009	458.90	419.92	3.90	0.1
5	39174_6714402	Unconfined	11,327	1/4/2010	456.61	420.89	3.57	0.1
5	39174_6714402	Unconfined	11,694	1/6/2011	456.22	421.52	3.47	0.1
5	39174_6714402	Unconfined	11,972	10/11/2011	456.21	420.47	3.57	0.1
5	39174_6714402	Unconfined	13,809	10/21/2016	462.93	422.34	4.06	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	39174_6714402	Unconfined	14,199	11/15/2017	464.64	421.78	4.29	0.1
5	39374_6722506	Confined	6,800	8/13/1997	272.52	378.28	-10.58	0.1
5	39443_6735904	Confined	4,537	6/3/1991	329.35	319.48	9.87	1
5	39448_6736601	Confined	780	2/18/1981	301.64	311.04	-0.94	0.1
5	39448_6736601	Confined	1,509	2/17/1983	300.71	311.03	-1.03	0.1
5	39448_6736601	Confined	1,866	2/9/1984	300.35	311.03	-1.07	0.1
5	39448_6736601	Confined	2,231	2/8/1985	300.34	311.01	-1.07	0.1
5	39448_6736601	Confined	3,333	2/15/1988	299.92	311.09	-1.12	0.1
5	39448_6736601	Confined	3,700	2/16/1989	299.43	310.96	-1.15	0.1
5	39448_6736601	Confined	4,075	2/26/1990	298.27	310.97	-1.27	0.1
5	39448_6736601	Confined	4,426	2/12/1991	299.02	311.00	-1.20	0.1
5	39448_6736601	Confined	4,806	2/27/1992	300.47	311.07	-1.06	0.1
5	39448_6736601	Confined	5,163	2/18/1993	301.03	311.11	-1.01	0.1
5	39448_6736601	Confined	5,524	2/14/1994	300.91	311.07	-1.02	0.1
5	39448_6736601	Confined	5,890	2/15/1995	302.02	311.10	-0.91	0.1
5	39448_6736601	Confined	6,260	2/20/1996	301.67	311.04	-0.94	0.1
5	39448_6736601	Confined	6,626	2/20/1997	302.67	310.99	-0.83	0.1
5	39448_6736601	Confined	6,990	2/19/1998	302.90	311.08	-0.82	0.1
5	39448_6736601	Confined	11,204	9/3/2009	294.82	311.00	-1.62	0.1
5	39448_6736601	Confined	11,328	1/5/2010	297.27	311.02	-1.37	0.1
5	39448_6736601	Confined	11,477	6/3/2010	298.67	311.00	-1.23	0.1
5	39448_6736601	Confined	11,588	9/22/2010	297.95	310.99	-1.30	0.1
5	39448_6736601	Confined	11,694	1/6/2011	297.88	310.98	-1.31	0.1
5	39448_6736601	Confined	11,842	6/3/2011	296.51	310.92	-1.44	0.1
5	39448_6736601	Confined	11,938	9/7/2011	295.50	310.87	-1.54	0.1
5	39448_6736601	Confined	12,064	1/11/2012	295.57	310.82	-1.52	0.1
5	39448_6736601	Confined	12,211	6/6/2012	296.32	310.73	-1.44	0.1
5	39448_6736601	Confined	12,309	9/12/2012	294.44	310.67	-1.62	0.1
5	39448_6736601	Confined	12,685	9/23/2013	294.49	310.38	-1.59	0.1
5	39448_6736601	Confined	12,787	1/3/2014	294.73	310.30	-1.56	0.1
5	39448_6736601	Confined	12,940	6/5/2014	295.62	310.13	-1.45	0.1
5	39448_6736601	Confined	13,157	1/8/2015	295.40	309.91	-1.45	0.1
5	39448_6736601	Confined	13,312	6/12/2015	296.77	309.76	-1.30	0.1
5	39448_6736601	Confined	13,540	1/26/2016	296.52	309.57	-1.30	0.1
5	39448_6736601	Confined	13,674	6/8/2016	296.67	309.58	-1.29	0.1
5	39448_6736601	Confined	13,772	9/14/2016	295.91	309.59	-1.37	0.1
5	39448_6736601	Confined	13,891	1/11/2017	296.52	309.59	-1.31	0.1
5	39448_6736601	Confined	14,052	6/21/2017	297.44	309.53	-1.21	0.1
5	39467_6742610	Confined	10,158	10/23/2006	273.26	351.04	-7.78	0.1
5	39489_6743504	Confined	12,806	1/22/2014	294.38	342.15	-23.88	0.5
5	39489_6743504	Confined	13,515	1/1/2016	295.78	341.67	-22.95	0.5
5	39489_6743504	Confined	13,667	6/1/2016	298.22	341.69	-21.74	0.5
5	39489_6743504	Confined	13,778	9/20/2016	297.02	341.70	-22.34	0.5
5	39489_6743504	Confined	13,889	1/9/2017	298.57	341.71	-21.57	0.5
5	39578_6749202	Unconfined	778	2/16/1981	401.70	401.65	0.05	1
5	39578_6749202	Unconfined	1,145	2/18/1982	401.79	402.02	-0.23	1
5	39578_6749202	Unconfined	1,507	2/15/1983	398.16	401.48	-3.32	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	39578_6749202	Unconfined	1,865	2/8/1984	398.51	401.35	-2.84	1
5	39578_6749202	Unconfined	2,227	2/4/1985	400.61	401.16	-0.55	1
5	39578_6749202	Unconfined	2,893	12/2/1986	396.91	401.90	-4.99	1
5	39578_6749202	Unconfined	3,334	2/16/1988	396.26	401.81	-5.55	1
5	39578_6749202	Unconfined	3,999	12/12/1989	393.67	400.85	-7.18	1
5	39578_6749202	Unconfined	4,364	12/12/1990	393.89	401.37	-7.48	1
5	39578_6749202	Unconfined	6,975	2/4/1998	397.00	401.73	-4.73	1
5	39578_6749202	Unconfined	7,121	6/30/1998	390.30	401.81	-11.51	1
5	39578_6749202	Unconfined	7,325	1/20/1999	395.30	401.87	-6.57	1
5	39578_6749202	Unconfined	8,069	2/2/2001	395.30	401.40	-6.10	1
5	39578_6749202	Unconfined	8,429	1/28/2002	395.50	401.41	-5.91	1
5	39578_6749202	Unconfined	8,774	1/8/2003	389.40	402.45	-13.05	1
5	39578_6749202	Unconfined	9,143	1/12/2004	392.00	401.96	-9.96	1
5	39578_6749202	Unconfined	9,558	3/2/2005	393.90	402.17	-8.27	1
5	39578_6749202	Unconfined	9,873	1/11/2006	395.50	401.09	-5.59	1
5	39578_6749202	Unconfined	10,230	1/3/2007	392.60	400.69	-8.09	1
5	39578_6749202	Unconfined	10,600	1/8/2008	390.90	402.44	-11.54	1
5	39578_6749202	Unconfined	10,992	2/3/2009	390.50	400.96	-10.46	1
5	39578_6749202	Unconfined	11,343	1/20/2010	391.91	401.25	-9.34	1
5	39578_6749202	Unconfined	12,785	1/1/2014	418.30	400.70	17.60	1
5	39578_6749202	Unconfined	12,816	2/1/2014	414.50	400.68	13.82	1
5	39578_6749202	Unconfined	12,875	4/1/2014	418.70	400.63	18.07	1
5	39578_6749202	Unconfined	12,905	5/1/2014	419.00	400.61	18.39	1
5	39578_6749202	Unconfined	12,936	6/1/2014	419.40	400.59	18.81	1
5	39578_6749202	Unconfined	12,966	7/1/2014	419.00	400.57	18.43	1
5	39578_6749202	Unconfined	12,997	8/1/2014	418.80	400.54	18.26	1
5	39578_6749202	Unconfined	13,028	9/1/2014	418.90	400.52	18.38	1
5	39578_6749202	Unconfined	13,058	10/1/2014	418.90	400.50	18.40	1
5	39578_6749202	Unconfined	13,089	11/1/2014	418.50	400.47	18.03	1
5	39578_6749202	Unconfined	13,119	12/1/2014	418.20	400.45	17.75	1
5	39578_6749202	Unconfined	13,150	1/1/2015	418.00	400.43	17.57	1
5	39578_6749202	Unconfined	13,181	2/1/2015	418.10	400.51	17.59	1
5	39578_6749202	Unconfined	13,209	3/1/2015	418.70	400.59	18.11	1
5	39578_6749202	Unconfined	13,240	4/1/2015	418.50	400.67	17.83	1
5	39578_6749202	Unconfined	13,362	8/1/2015	419.10	400.99	18.11	1
5	39578_6749202	Unconfined	13,454	11/1/2015	418.90	401.24	17.66	1
5	39578_6749202	Unconfined	13,484	12/1/2015	418.60	401.32	17.28	1
5	39578_6749202	Unconfined	13,515	1/1/2016	419.30	401.40	17.90	1
5	39578_6749202	Unconfined	13,546	2/1/2016	419.30	401.41	17.89	1
5	39578_6749202	Unconfined	13,575	3/1/2016	418.90	401.42	17.48	1
5	39578_6749202	Unconfined	13,606	4/1/2016	418.80	401.43	17.37	1
5	39578_6749202	Unconfined	13,636	5/1/2016	419.20	401.44	17.76	1
5	39578_6749202	Unconfined	13,667	6/1/2016	418.60	401.45	17.15	1
5	39578_6749202	Unconfined	13,697	7/1/2016	419.10	401.46	17.64	1
5	39578_6749202	Unconfined	13,728	8/1/2016	419.10	401.47	17.63	1
5	39578_6749202	Unconfined	13,759	9/1/2016	419.60	401.48	18.12	1
5	39578_6749202	Unconfined	13,789	10/1/2016	419.70	401.48	18.22	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	39578_6749202	Unconfined	13,820	11/1/2016	419.70	401.49	18.21	1
5	39578_6749202	Unconfined	13,850	12/1/2016	418.80	401.50	17.30	1
5	39578_6749202	Unconfined	13,881	1/1/2017	418.90	401.51	17.39	1
5	39578_6749202	Unconfined	13,912	2/1/2017	419.40	401.47	17.93	1
5	39578_6749202	Unconfined	13,940	3/1/2017	419.70	401.43	18.27	1
5	39578_6749202	Unconfined	14,215	12/1/2017	420.00	401.05	18.95	1
5	39579_6749205	Unconfined	4,288	9/27/1990	402.35	401.30	1.05	1
5	39579_6749205	Unconfined	7,121	6/30/1998	403.20	401.86	1.34	1
5	39584_6750104	Confined	3,020	4/8/1987	362.18	378.55	-1.64	0.1
5	39584_6750104	Confined	7,122	7/1/1998	379.98	378.53	0.14	0.1
5	39584_6750104	Confined	8,606	7/24/2002	379.06	378.53	0.05	0.1
5	39729_6856804	Confined	779	2/17/1981	406.73	382.31	2.44	0.1
5	39729_6856804	Confined	1,145	2/18/1982	406.60	383.29	2.33	0.1
5	39729_6856804	Confined	1,507	2/15/1983	406.14	382.46	2.37	0.1
5	39729_6856804	Confined	1,863	2/6/1984	404.98	381.85	2.31	0.1
5	39729_6856804	Confined	2,227	2/4/1985	405.23	381.04	2.42	0.1
5	39729_6856804	Confined	2,602	2/14/1986	406.85	382.28	2.46	0.1
5	39729_6856804	Confined	2,894	12/3/1986	406.25	382.82	2.34	0.1
5	39729_6856804	Confined	3,334	2/16/1988	407.10	383.10	2.40	0.1
5	39729_6856804	Confined	4,000	12/13/1989	406.27	379.99	2.63	0.1
5	39729_6856804	Confined	4,364	12/12/1990	406.41	380.63	2.58	0.1
5	39729_6856804	Confined	5,141	1/27/1993	406.45	383.84	2.26	0.1
5	39729_6856804	Confined	5,485	1/6/1994	407.05	382.99	2.41	0.1
5	39729_6856804	Confined	5,854	1/10/1995	409.75	383.26	2.65	0.1
5	39729_6856804	Confined	6,220	1/11/1996	413.10	382.34	3.08	0.1
5	39729_6856804	Confined	6,675	4/10/1997	407.10	380.87	2.62	0.1
5	39729_6856804	Confined	6,969	1/29/1998	408.30	381.90	2.64	0.1
5	39729_6856804	Confined	7,325	1/20/1999	407.25	382.73	2.45	0.1
5	39729_6856804	Confined	8,074	2/7/2001	407.05	381.47	2.56	0.1
5	39729_6856804	Confined	8,424	1/23/2002	404.30	381.49	2.28	0.1
5	39729_6856804	Confined	8,794	1/28/2003	399.15	384.08	1.51	0.1
5	39729_6856804	Confined	9,157	1/26/2004	400.05	384.21	1.58	0.1
5	39729_6856804	Confined	9,546	2/18/2005	406.55	385.01	2.15	0.1
5	39729_6856804	Confined	9,895	2/2/2006	400.75	382.60	1.82	0.1
5	39729_6856804	Confined	10,294	3/8/2007	399.05	381.13	1.79	0.1
5	39729_6856804	Confined	10,644	2/21/2008	400.35	383.30	1.70	0.1
5	39729_6856804	Confined	11,040	3/23/2009	399.05	381.11	1.79	0.1
5	39729_6856804	Confined	11,442	4/29/2010	399.75	381.20	1.85	0.1
5	39733_6862102	Unconfined	1,506	2/14/1983	396.60	371.79	24.81	1
5	39733_6862102	Unconfined	1,864	2/7/1984	394.79	372.99	21.80	1
5	39745_6862502	Confined	8,696	10/22/2002	393.72	357.96	3.58	0.1
5	39746_6862503	Confined	779	2/17/1981	386.60	362.51	2.41	0.1
5	39746_6862503	Confined	1,144	2/17/1982	389.06	365.14	2.39	0.1
5	39746_6862503	Confined	1,506	2/14/1983	388.09	365.68	2.24	0.1
5	39746_6862503	Confined	1,864	2/7/1984	386.94	366.34	2.06	0.1
5	39746_6862503	Confined	2,228	2/5/1985	385.18	366.45	1.87	0.1
5	39746_6862503	Confined	2,895	12/4/1986	384.85	368.76	1.61	0.1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	39746_6862503	Confined	3,335	2/17/1988	386.81	369.46	1.73	0.1
5	39746_6862503	Confined	3,698	2/14/1989	369.94	366.94	0.30	0.1
5	39746_6862503	Confined	3,998	12/11/1989	367.87	364.77	0.31	0.1
5	39746_6862503	Confined	4,365	12/13/1990	380.42	363.97	1.65	0.1
5	39746_6862503	Confined	5,128	1/14/1993	380.10	365.25	1.49	0.1
5	39746_6862503	Confined	5,483	1/4/1994	377.85	365.00	1.28	0.1
5	39746_6862503	Confined	5,854	1/10/1995	381.25	364.98	1.63	0.1
5	39746_6862503	Confined	6,221	1/12/1996	377.50	364.16	1.33	0.1
5	39746_6862503	Confined	6,655	3/21/1997	374.55	361.51	1.30	0.1
5	39746_6862503	Confined	6,969	1/29/1998	377.00	362.81	1.42	0.1
5	39746_6862503	Confined	7,325	1/20/1999	376.10	362.76	1.33	0.1
5	39746_6862503	Confined	8,073	2/6/2001	375.35	358.34	1.70	0.1
5	39746_6862503	Confined	8,424	1/23/2002	373.35	358.47	1.49	0.1
5	39746_6862503	Confined	8,790	1/24/2003	373.95	358.73	1.52	0.1
5	39746_6862503	Confined	9,152	1/21/2004	377.85	358.84	1.90	0.1
5	39746_6862503	Confined	9,564	3/8/2005	385.35	360.67	2.47	0.1
5	39746_6862503	Confined	9,887	1/25/2006	382.85	359.58	2.33	0.1
5	39746_6862503	Confined	10,293	3/7/2007	375.85	360.87	1.50	0.1
5	39746_6862503	Confined	10,645	2/22/2008	378.05	365.10	1.29	0.1
5	39746_6862503	Confined	10,993	2/4/2009	374.85	362.40	1.24	0.1
5	39746_6862503	Confined	11,442	4/29/2010	376.95	356.12	2.08	0.1
5	39826_7816601	Confined	731	12/31/1980	335.56	312.38	23.18	1
5	39826_7816601	Confined	1,082	12/17/1981	334.54	312.40	22.14	1
5	39826_7816601	Confined	1,807	12/12/1983	334.82	312.40	22.42	1
5	39826_7816601	Confined	3,676	1/23/1989	329.16	312.44	16.72	1
5	39826_7816601	Confined	4,002	12/15/1989	323.76	312.43	11.33	1
5	39826_7816601	Confined	4,356	12/4/1990	323.39	312.42	10.97	1
5	39826_7816601	Confined	5,525	2/15/1994	322.76	312.44	10.32	1
5	39826_7816601	Confined	5,853	1/9/1995	334.76	312.44	22.32	1
5	39826_7816601	Confined	6,261	2/21/1996	328.96	312.44	16.52	1
5	39826_7816601	Confined	6,619	2/13/1997	328.26	312.44	15.82	1
5	39826_7816601	Confined	7,138	7/17/1998	326.86	312.45	14.41	1
5	39826_7816601	Confined	7,330	1/25/1999	321.96	312.44	9.52	1
5	39826_7816601	Confined	8,080	2/13/2001	313.26	312.44	0.82	1
5	39826_7816601	Confined	8,443	2/11/2002	307.16	312.44	-5.28	1
5	39826_7816601	Confined	8,810	2/13/2003	308.76	312.44	-3.68	1
5	39826_7816601	Confined	9,179	2/17/2004	302.26	312.44	-10.18	1
5	39826_7816601	Confined	9,565	3/9/2005	317.36	312.44	4.92	1
5	39826_7816601	Confined	9,908	2/15/2006	310.16	312.44	-2.28	1
5	39826_7816601	Confined	10,278	2/20/2007	308.26	312.45	-4.19	1
5	39826_7816601	Confined	10,663	3/11/2008	309.56	312.47	-2.91	1
5	39826_7816601	Confined	11,028	3/11/2009	307.16	312.47	-5.31	1
5	39826_7816601	Confined	11,450	5/7/2010	307.96	312.44	-4.48	1
5	39826_7816601	Confined	12,057	1/4/2012	309.86	312.37	-2.51	1
5	42713_7813702	Confined	1,151	2/24/1982	354.73	288.59	66.14	1
5	42713_7813702	Confined	1,500	2/8/1983	350.55	289.12	61.43	1
5	48205_0	Confined	11,575	9/9/2010	345.81	347.88	-0.21	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	48226_6743606	Confined	9,023	9/14/2003	332.01	332.23	-0.22	1
5	48226_6743606	Confined	11,693	1/5/2011	332.10	332.14	-0.04	1
5	48226_6743606	Confined	11,840	6/1/2011	331.51	332.10	-0.59	1
5	48226_6743606	Confined	12,668	9/6/2013	327.15	331.69	-4.54	1
5	48226_6743606	Confined	12,786	1/2/2014	330.42	331.61	-1.19	1
5	48226_6743606	Confined	12,938	6/3/2014	329.73	331.49	-1.76	1
5	48226_6743606	Confined	13,029	9/2/2014	328.35	331.41	-3.06	1
5	48226_6743606	Confined	13,148	12/30/2014	327.83	331.31	-3.48	1
5	48226_6743606	Confined	13,301	6/1/2015	328.15	331.19	-3.04	1
5	48226_6743606	Confined	13,518	1/4/2016	327.57	331.03	-3.46	1
5	48226_6743606	Confined	13,667	6/1/2016	328.45	331.05	-2.60	1
5	48226_6743606	Confined	14,036	6/5/2017	328.27	331.03	-2.76	1
5	48228_6743303	Confined	9,021	9/12/2003	328.86	331.25	-2.39	1
5	48228_6743303	Confined	11,693	1/5/2011	329.64	331.17	-1.53	1
5	48228_6743303	Confined	11,840	6/1/2011	328.85	331.12	-2.27	1
5	48228_6743303	Confined	11,938	9/7/2011	328.85	331.09	-2.24	1
5	48228_6743303	Confined	12,668	9/6/2013	323.80	330.75	-6.95	1
5	48228_6743303	Confined	12,786	1/2/2014	328.70	330.68	-1.98	1
5	48228_6743303	Confined	12,938	6/3/2014	328.61	330.56	-1.95	1
5	48228_6743303	Confined	13,029	9/2/2014	325.78	330.49	-4.71	1
5	48228_6743303	Confined	13,148	12/30/2014	327.18	330.40	-3.22	1
5	48228_6743303	Confined	13,301	6/1/2015	328.19	330.29	-2.10	1
5	48228_6743303	Confined	13,518	1/4/2016	327.47	330.13	-2.66	1
5	48228_6743303	Confined	13,667	6/1/2016	328.55	330.15	-1.60	1
5	48237_6735804	Confined	9,023	9/14/2003	336.56	324.73	11.83	1
5	48237_6735804	Confined	11,693	1/5/2011	336.67	324.66	12.01	1
5	48237_6735804	Confined	11,840	6/1/2011	336.24	324.61	11.63	1
5	48237_6735804	Confined	11,938	9/7/2011	333.86	324.59	9.27	1
5	48237_6735804	Confined	12,668	9/6/2013	333.04	324.31	8.73	1
5	48237_6735804	Confined	12,786	1/2/2014	331.58	324.26	7.32	1
5	48237_6735804	Confined	12,938	6/3/2014	335.81	324.16	11.65	1
5	48237_6735804	Confined	13,029	9/2/2014	328.63	324.10	4.53	1
5	48237_6735804	Confined	13,148	12/30/2014	334.28	324.03	10.25	1
5	48237_6735804	Confined	13,301	6/1/2015	336.58	323.95	12.63	1
5	48237_6735804	Confined	13,518	1/4/2016	336.55	323.83	12.72	1
5	48237_6735804	Confined	13,667	6/1/2016	337.16	323.84	13.32	1
5	48239_6735907	Confined	9,047	10/8/2003	330.71	320.99	9.72	1
5	48239_6735907	Confined	11,693	1/5/2011	334.02	320.91	13.11	1
5	48239_6735907	Confined	11,840	6/1/2011	333.31	320.85	12.46	1
5	48239_6735907	Confined	11,938	9/7/2011	333.31	320.82	12.49	1
5	48239_6735907	Confined	12,668	9/6/2013	330.61	320.46	10.15	1
5	48239_6735907	Confined	12,786	1/2/2014	333.01	320.38	12.63	1
5	48239_6735907	Confined	12,938	6/3/2014	332.31	320.25	12.06	1
5	48239_6735907	Confined	13,029	9/2/2014	330.17	320.18	9.99	1
5	48239_6735907	Confined	13,148	12/30/2014	331.20	320.08	11.12	1
5	48239_6735907	Confined	13,301	6/1/2015	332.70	319.97	12.73	1
5	48239_6735907	Confined	13,667	6/1/2016	333.48	319.84	13.64	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	48239_6735907	Confined	14,036	6/5/2017	333.14	319.81	13.33	1
5	48259_6742206	Unconfined	11,693	1/5/2011	402.64	360.69	41.95	1
5	48259_6742206	Unconfined	11,840	6/1/2011	401.83	360.63	41.20	1
5	48259_6742206	Unconfined	11,937	9/6/2011	400.54	360.59	39.95	1
5	48259_6742206	Unconfined	12,668	9/6/2013	404.99	360.47	44.52	1
5	48259_6742206	Unconfined	12,786	1/2/2014	405.40	360.44	44.96	1
5	48259_6742206	Unconfined	12,938	6/3/2014	405.41	360.38	45.03	1
5	48259_6742206	Unconfined	13,029	9/2/2014	404.43	360.35	44.08	1
5	48262_6742503	Unconfined	11,693	1/5/2011	380.55	362.95	8.80	0.5
5	48262_6742503	Unconfined	11,840	6/1/2011	380.52	362.91	8.80	0.5
5	48262_6742503	Unconfined	11,937	9/6/2011	377.78	362.89	7.44	0.5
5	48262_6742503	Unconfined	12,070	1/17/2012	379.54	362.86	8.34	0.5
5	48262_6742503	Unconfined	12,210	6/5/2012	380.81	362.85	8.98	0.5
5	48262_6742503	Unconfined	12,302	9/5/2012	379.44	362.85	8.30	0.5
5	48262_6742503	Unconfined	12,668	9/6/2013	378.79	362.79	8.00	0.5
5	48262_6742503	Unconfined	12,786	1/2/2014	379.71	362.77	8.47	0.5
5	48262_6742503	Unconfined	12,938	6/3/2014	379.90	362.73	8.59	0.5
5	48262_6742503	Unconfined	13,884	1/4/2017	380.44	362.63	8.90	0.5
5	48264_6743409	Confined	11,840	6/1/2011	340.63	345.66	-5.03	1
5	48264_6743409	Confined	11,937	9/6/2011	336.22	345.63	-9.41	1
5	48264_6743409	Confined	12,070	1/17/2012	339.43	345.60	-6.17	1
5	48264_6743409	Confined	12,210	6/5/2012	339.24	345.56	-6.32	1
5	48264_6743409	Confined	12,302	9/5/2012	335.82	345.54	-9.72	1
5	48264_6743409	Confined	12,668	9/6/2013	336.06	345.40	-9.34	1
5	48264_6743409	Confined	12,786	1/2/2014	336.85	345.35	-8.50	1
5	48264_6743409	Confined	12,938	6/3/2014	337.91	345.26	-7.35	1
5	48264_6743409	Confined	13,029	9/2/2014	336.12	345.22	-9.10	1
5	48264_6743409	Confined	13,148	12/30/2014	337.27	345.15	-7.88	1
5	48264_6743409	Confined	13,305	6/5/2015	341.20	345.07	-3.87	1
5	48264_6743409	Confined	13,519	1/5/2016	338.42	344.97	-6.55	1
5	48264_6743409	Confined	13,668	6/2/2016	340.11	344.99	-4.88	1
5	48264_6743409	Confined	13,884	1/4/2017	338.18	345.01	-6.83	1
5	48264_6743409	Confined	14,036	6/5/2017	339.63	344.98	-5.35	1
5	48423_8519201	Unconfined	1,874	2/17/1984	460.19	438.15	22.04	1
5	48423_8519201	Unconfined	2,244	2/21/1985	453.24	438.13	15.11	1
5	48423_8519201	Unconfined	2,614	2/26/1986	478.56	438.22	40.34	1
5	48423_8519201	Unconfined	2,955	2/2/1987	496.88	438.22	58.66	1
5	48423_8519201	Unconfined	3,708	2/24/1989	484.97	438.08	46.89	1
5	48423_8519201	Unconfined	3,992	12/5/1989	484.12	438.10	46.02	1
5	48423_8519201	Unconfined	4,792	2/13/1992	482.39	438.24	44.15	1
5	48450_0	Confined	10,039	6/26/2006	359.64	388.89	-2.92	0.1
5	48468_0	Confined	10,370	5/23/2007	377.36	404.57	-2.72	0.1
5	48471_0	Confined	12,276	8/10/2012	328.89	315.88	13.01	1
5	48594_0	Unconfined	11,755	3/8/2011	391.08	427.30	-36.22	1
5	48601_0	Confined	11,791	4/13/2011	438.41	429.03	9.38	1
5	48608_0	Confined	11,908	8/8/2011	464.85	434.69	3.02	0.1
5	48610_0	Confined	11,937	9/6/2011	462.74	432.53	30.21	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	48611_0	Unconfined	11,738	2/19/2011	331.99	445.09	-113.10	1
5	48621_0	Confined	12,222	6/17/2012	619.98	436.11	18.39	0.1
5	48636_0	Confined	11,608	10/12/2010	462.42	440.85	21.57	1
5	48637_0	Confined	11,035	3/18/2009	463.70	443.16	2.05	0.1
5	48639_0	Confined	9,112	12/12/2003	408.07	445.90	-3.78	0.1
5	48640_0	Unconfined	11,839	5/31/2011	451.49	447.04	4.45	1
5	48644_0	Unconfined	11,908	8/8/2011	336.52	464.52	-12.80	0.1
5	48648_0	Unconfined	12,334	10/7/2012	460.51	458.76	1.75	1
5	48649_0	Confined	9,843	12/12/2005	539.58	447.12	9.25	0.1
5	48650_0	Confined	9,815	11/14/2005	503.46	443.64	59.82	1
5	48651_0	Confined	11,853	6/14/2011	445.23	440.74	0.45	0.1
5	48652_0	Confined	11,316	12/24/2009	465.12	440.88	2.42	0.1
5	48653_0	Confined	9,733	8/24/2005	526.19	444.22	8.20	0.1
5	48654_0	Confined	10,923	11/26/2008	489.31	442.98	4.63	0.1
5	48656_0	Confined	12,128	3/15/2012	457.31	441.43	1.59	0.1
5	48659_0	Confined	11,628	11/1/2010	448.08	439.53	0.86	0.1
5	48679_0	Confined	10,936	12/9/2008	465.74	449.89	1.58	0.1
5	48681_0	Confined	11,136	6/27/2009	471.32	452.11	19.21	1
5	48682_0	Confined	10,764	6/20/2008	510.48	456.91	5.36	0.1
5	48683_0	Confined	11,471	5/28/2010	536.87	458.91	7.80	0.1
5	48696_0	Unconfined	11,470	5/27/2010	410.07	524.51	-11.44	0.1
5	48700_0	Confined	11,068	4/20/2009	343.89	475.84	-13.20	0.1
5	48701_0	Confined	10,928	12/1/2008	488.58	479.87	0.87	0.1
5	48702_0	Confined	9,937	3/16/2006	441.61	475.77	-3.42	0.1
5	48703_0	Confined	11,366	2/12/2010	491.87	475.14	16.73	1
5	48704_0	Confined	10,754	6/10/2008	426.13	474.66	-4.85	0.1
5	48710_0	Confined	11,535	7/31/2010	599.97	461.97	138.00	1
5	48711_0	Confined	10,876	10/10/2008	417.66	447.96	-30.30	1
5	48731_0	Confined	10,824	8/19/2008	547.26	462.76	8.45	0.1
5	48735_0	Confined	10,508	10/8/2007	465.50	471.79	-0.63	0.1
5	48736_0	Confined	11,179	8/9/2009	472.20	482.05	-0.98	0.1
5	48740_0	Confined	10,986	1/28/2009	632.20	483.15	14.90	0.1
5	48742_0	Confined	11,772	3/25/2011	509.21	481.16	28.05	1
5	48750_0	Unconfined	11,041	3/24/2009	445.67	482.99	-3.73	0.1
5	48753_0	Confined	10,113	9/8/2006	540.97	505.35	3.56	0.1
5	48755_0	Confined	9,006	8/28/2003	476.80	479.81	-0.30	0.1
5	48757_0	Confined	10,875	10/9/2008	537.70	481.59	56.11	1
5	48759_0	Confined	12,770	12/17/2013	504.73	467.44	3.73	0.1
5	48761_0	Confined	12,454	2/4/2013	393.16	473.57	-80.41	1
5	48770_0	Confined	12,171	4/27/2012	480.91	454.16	2.68	0.1
5	48822_0	Confined	9,888	1/26/2006	567.54	504.31	63.23	1
5	48830_0	Confined	9,941	3/20/2006	491.10	479.14	1.20	0.1
5	48831_0	Confined	11,233	10/2/2009	506.32	484.94	2.14	0.1
5	48833_0	Confined	12,006	11/14/2011	551.09	493.49	5.76	0.1
5	48845_0	Unconfined	9,090	11/20/2003	621.46	564.32	5.71	0.1
5	48953_0	Confined	8,937	6/20/2003	336.03	395.66	-5.96	0.1
5	48988_0	Confined	8,254	8/6/2001	272.55	304.96	-32.41	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	49063_0	Unconfined	8,922	6/5/2003	267.88	354.59	-8.67	0.1
5	49080_0	Confined	10,678	3/26/2008	383.74	372.40	1.13	0.1
5	49098_0	Confined	10,783	7/9/2008	375.79	363.61	12.18	1
5	49456_0	Confined	12,378	11/20/2012	379.06	349.57	29.49	1
5	49457_0	Confined	12,890	4/16/2014	328.20	343.12	-14.92	1
5	49459_0	Confined	12,617	7/17/2013	399.20	367.73	31.47	1
5	49460_0	Unconfined	12,450	1/31/2013	395.75	422.14	-26.39	1
5	49461_0	Unconfined	10,205	12/9/2006	275.92	361.32	-42.70	0.5
5	50036_0	Unconfined	11,140	7/1/2009	530.83	450.64	80.19	1
5	50038_0	Unconfined	12,068	1/15/2012	364.60	377.54	-1.29	0.1
5	50056_0	Unconfined	9,336	7/23/2004	587.61	626.19	-38.58	1
5	50059_0	Unconfined	12,232	6/27/2012	403.52	597.00	-193.48	1
5	50063_0	Unconfined	11,790	4/12/2011	521.82	559.17	-3.74	0.1
5	50067_0	Unconfined	11,225	9/24/2009	615.52	500.51	115.01	1
5	50074_7801101	Unconfined	1,139	2/12/1982	475.19	515.54	-20.18	0.5
5	50074_7801101	Unconfined	1,516	2/24/1983	473.71	515.44	-20.86	0.5
5	50074_7801101	Unconfined	1,873	2/16/1984	477.08	516.03	-19.47	0.5
5	50074_7801101	Unconfined	2,237	2/14/1985	477.81	515.36	-18.78	0.5
5	50074_7801101	Unconfined	2,602	2/14/1986	469.36	517.51	-24.07	0.5
5	50074_7801101	Unconfined	3,342	2/24/1988	467.42	519.14	-25.86	0.5
5	50074_7801101	Unconfined	3,697	2/13/1989	465.06	517.43	-26.18	0.5
5	50074_7801101	Unconfined	4,063	2/14/1990	463.43	516.34	-26.45	0.5
5	50074_7801101	Unconfined	4,415	2/1/1991	477.01	516.30	-19.65	0.5
5	50074_7801101	Unconfined	4,777	1/29/1992	478.01	512.87	-17.43	0.5
5	50074_7801101	Unconfined	5,140	1/26/1993	479.01	510.65	-15.82	0.5
5	50074_7801101	Unconfined	5,506	1/27/1994	478.11	506.65	-14.27	0.5
5	50074_7801101	Unconfined	5,857	1/13/1995	480.61	503.40	-11.39	0.5
5	50074_7801101	Unconfined	6,224	1/15/1996	466.71	500.47	-16.88	0.5
5	50074_7801101	Unconfined	8,403	1/2/2002	463.81	488.59	-12.39	0.5
5	50074_7801101	Unconfined	8,773	1/7/2003	464.51	486.37	-10.93	0.5
5	50074_7801101	Unconfined	9,139	1/8/2004	464.11	484.73	-10.31	0.5
5	50074_7801101	Unconfined	9,504	1/7/2005	465.71	485.77	-10.03	0.5
5	50074_7801101	Unconfined	9,881	1/19/2006	464.01	484.68	-10.34	0.5
5	50074_7801101	Unconfined	10,271	2/13/2007	457.71	485.55	-13.92	0.5
5	50074_7801101	Unconfined	10,624	2/1/2008	461.11	487.25	-13.07	0.5
5	50074_7801101	Unconfined	11,007	2/18/2009	457.21	481.50	-12.15	0.5
5	50074_7801101	Unconfined	11,387	3/5/2010	459.01	472.25	-6.62	0.5
5	50079_0	Unconfined	9,900	2/7/2006	420.88	367.06	5.38	0.1
5	50081_0	Unconfined	8,998	8/20/2003	406.51	365.31	4.12	0.1
5	50083_0	Unconfined	9,630	5/13/2005	432.29	339.31	92.98	1
5	50086_0	Unconfined	10,614	1/22/2008	318.50	428.28	-10.98	0.1
5	50090_0	Unconfined	12,807	1/23/2014	281.10	305.94	-24.84	1
5	50091_0	Unconfined	10,841	9/5/2008	395.37	363.47	31.90	1
5	50092_0	Unconfined	12,636	8/5/2013	399.17	282.83	116.34	1
5	50093_0	Unconfined	11,713	1/25/2011	305.57	285.27	2.03	0.1
5	50096_0	Unconfined	10,111	9/6/2006	618.31	346.57	135.87	0.5
5	50097_0	Unconfined	10,949	12/22/2008	311.55	378.46	-6.69	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	50099_0	Unconfined	12,511	4/2/2013	503.94	490.65	13.29	1
5	50104_0	Unconfined	10,428	7/20/2007	422.75	544.54	-121.79	1
5	50106_0	Unconfined	9,882	1/20/2006	572.39	607.57	-35.18	1
5	50107_0	Confined	10,849	9/13/2008	579.30	559.91	1.94	0.1
5	50109_0	Confined	10,898	11/1/2008	548.32	543.75	0.46	0.1
5	50110_0	Confined	10,796	7/22/2008	440.50	533.60	-9.31	0.1
5	50116_0	Unconfined	10,644	2/21/2008	528.42	338.61	189.81	1
5	50117_0	Unconfined	10,113	9/8/2006	603.80	369.93	116.93	0.5
5	50120_0	Unconfined	9,121	12/21/2003	329.72	448.84	-119.12	1
5	50121_0	Unconfined	11,126	6/17/2009	447.61	470.01	-22.40	1
5	50122_0	Unconfined	12,849	3/6/2014	386.93	427.44	-40.51	1
5	50134_0	Unconfined	11,783	4/5/2011	428.67	416.08	6.29	0.5
5	50137_7809105	Unconfined	1,135	2/8/1982	514.26	454.53	59.73	1
5	50137_7809105	Unconfined	1,517	2/25/1983	513.96	453.99	59.97	1
5	50137_7809105	Unconfined	2,235	2/12/1985	511.61	453.77	57.84	1
5	50137_7809105	Unconfined	2,601	2/13/1986	510.07	455.66	54.41	1
5	50137_7809105	Unconfined	3,007	3/26/1987	511.32	456.44	54.88	1
5	50137_7809105	Unconfined	3,342	2/24/1988	511.06	456.61	54.45	1
5	50137_7809105	Unconfined	3,699	2/15/1989	509.65	454.83	54.82	1
5	50137_7809105	Unconfined	4,062	2/13/1990	508.26	454.10	54.16	1
5	50137_7809105	Unconfined	4,455	3/13/1991	508.56	454.30	54.26	1
5	50137_7809105	Unconfined	4,755	1/7/1992	507.41	452.92	54.49	1
5	50137_7809105	Unconfined	5,129	1/15/1993	508.56	451.50	57.06	1
5	50137_7809105	Unconfined	5,863	1/19/1995	507.46	446.14	61.32	1
5	50137_7809105	Unconfined	6,224	1/15/1996	506.46	443.89	62.57	1
5	50137_7809105	Unconfined	6,648	3/14/1997	505.61	442.47	63.14	1
5	50137_7809105	Unconfined	6,984	2/13/1998	504.61	444.21	60.40	1
5	50137_7809105	Unconfined	7,318	1/13/1999	505.86	443.22	62.64	1
5	50137_7809105	Unconfined	8,066	1/30/2001	503.61	437.24	66.37	1
5	50137_7809105	Unconfined	8,410	1/9/2002	502.51	435.67	66.84	1
5	50137_7809105	Unconfined	8,781	1/15/2003	509.11	435.04	74.07	1
5	50137_7809105	Unconfined	9,153	1/22/2004	508.81	433.41	75.40	1
5	50137_7809105	Unconfined	9,543	2/15/2005	509.41	433.93	75.48	1
5	50137_7809105	Unconfined	9,901	2/8/2006	509.31	432.24	77.07	1
5	50137_7809105	Unconfined	10,271	2/13/2007	508.51	432.37	76.14	1
5	50137_7809105	Unconfined	10,643	2/20/2008	509.11	434.16	74.95	1
5	50137_7809105	Unconfined	11,008	2/19/2009	506.71	429.60	77.11	1
5	50137_7809105	Unconfined	11,426	4/13/2010	508.31	422.81	85.50	1
5	50139_0	Unconfined	10,582	12/21/2007	587.96	428.23	159.73	1
5	50141_0	Unconfined	9,812	11/11/2005	498.31	435.11	63.20	1
5	50145_0	Confined	9,861	12/30/2005	460.50	432.55	2.79	0.1
5	50152_0	Confined	11,694	1/6/2011	495.69	537.15	-4.15	0.1
5	50154_0	Confined	10,846	9/10/2008	393.01	510.90	-117.89	1
5	50158_0	Confined	11,216	9/15/2009	503.39	457.12	4.63	0.1
5	50161_0	Confined	9,105	12/5/2003	481.30	456.86	2.44	0.1
5	50163_0	Confined	12,133	3/20/2012	252.26	442.28	-19.00	0.1
5	50165_0	Unconfined	12,372	11/14/2012	448.15	434.09	14.06	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	50172_0	Confined	12,104	2/20/2012	485.58	417.15	68.43	1
5	50173_0	Confined	10,001	5/19/2006	431.34	425.06	6.28	1
5	50174_0	Confined	10,682	3/30/2008	343.77	411.44	-67.67	1
5	50177_0	Confined	10,644	2/21/2008	390.47	417.09	-2.66	0.1
5	50178_0	Confined	12,700	10/8/2013	374.68	421.73	-47.05	1
5	50182_0	Confined	12,498	3/20/2013	387.34	443.04	-5.57	0.1
5	50183_0	Confined	12,654	8/23/2013	449.53	442.57	0.70	0.1
5	50184_0	Confined	10,838	9/2/2008	492.62	457.03	3.56	0.1
5	50187_0	Confined	9,191	2/29/2004	376.89	490.41	-113.52	1
5	50190_0	Confined	12,296	8/30/2012	358.95	455.89	-9.69	0.1
5	50191_0	Confined	10,782	7/8/2008	426.56	450.40	-2.38	0.1
5	50193_0	Confined	12,311	9/14/2012	398.91	447.35	-4.84	0.1
5	50209_0	Confined	9,388	9/13/2004	399.32	448.27	-4.90	0.1
5	50211_0	Confined	12,563	5/24/2013	347.89	450.48	-10.26	0.1
5	50213_0	Confined	12,298	9/1/2012	440.87	452.62	-11.75	1
5	50214_0	Confined	10,550	11/19/2007	498.36	454.98	4.34	0.1
5	50217_0	Confined	12,301	9/4/2012	396.41	449.96	-53.55	1
5	50220_0	Confined	12,094	2/10/2012	370.89	448.86	-77.97	1
5	50263_0	Unconfined	780	2/18/1981	482.31	514.70	-16.19	0.5
5	50263_0	Unconfined	1,139	2/12/1982	475.31	515.55	-20.12	0.5
5	50263_0	Unconfined	1,203	4/17/1982	482.31	515.50	-16.59	0.5
5	50263_0	Unconfined	1,516	2/24/1983	473.31	515.44	-21.06	0.5
5	50263_0	Unconfined	1,873	2/16/1984	477.31	516.03	-19.36	0.5
5	50263_0	Unconfined	2,237	2/14/1985	477.31	515.36	-19.03	0.5
5	50263_0	Unconfined	3,008	3/27/1987	475.31	518.61	-21.65	0.5
5	50263_0	Unconfined	3,342	2/24/1988	467.31	519.14	-25.92	0.5
5	50263_0	Unconfined	3,697	2/13/1989	465.31	517.43	-26.06	0.5
5	50520_0	Confined	8,357	11/17/2001	355.84	408.56	-5.27	0.1
5	50537_0	Unconfined	8,588	7/6/2002	361.21	383.43	-2.22	0.1
5	50549_0	Confined	8,745	12/10/2002	421.01	409.62	1.14	0.1
5	50553_0	Unconfined	8,846	3/21/2003	359.44	338.20	2.12	0.1
5	50556_0	Confined	8,879	4/23/2003	348.95	326.67	2.23	0.1
5	50564_0	Unconfined	8,970	7/23/2003	377.94	346.77	3.12	0.1
5	50591_0	Unconfined	9,210	3/19/2004	445.55	418.71	26.84	1
5	50594_0	Confined	9,218	3/27/2004	342.49	366.88	-24.39	1
5	50597_0	Confined	9,237	4/15/2004	393.53	408.10	-1.46	0.1
5	50598_0	Unconfined	9,311	6/28/2004	367.88	353.12	1.48	0.1
5	50604_0	Unconfined	9,313	6/30/2004	240.36	339.45	-99.09	1
5	50609_0	Unconfined	8,979	8/1/2003	403.17	407.51	-4.34	1
5	50610_0	Confined	9,393	9/18/2004	338.22	397.69	-5.95	0.1
5	50614_0	Confined	9,068	10/29/2003	371.71	364.15	7.56	1
5	50631_0	Confined	9,095	11/25/2003	362.32	339.22	23.10	1
5	50648_0	Confined	9,724	8/15/2005	241.50	299.51	-58.01	1
5	50652_0	Confined	9,773	10/3/2005	360.61	365.95	-5.34	1
5	50657_0	Confined	9,202	3/11/2004	346.25	356.03	-9.78	1
5	50661_0	Unconfined	9,212	3/21/2004	408.86	356.46	52.40	1
5	50669_0	Unconfined	9,959	4/7/2006	354.65	333.81	2.08	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	50673_0	Unconfined	9,200	3/9/2004	365.09	388.55	-23.46	1
5	50692_0	Confined	10,069	7/26/2006	348.22	369.41	-10.59	0.5
5	50702_0	Unconfined	10,171	11/5/2006	310.76	357.01	-23.13	0.5
5	50704_0	Unconfined	10,242	1/15/2007	346.56	377.85	-31.29	1
5	50706_0	Confined	10,266	2/8/2007	381.35	384.30	-1.47	0.5
5	50712_0	Confined	10,326	4/9/2007	429.03	403.21	25.82	1
5	50736_0	Confined	10,657	3/5/2008	302.92	306.42	-3.50	1
5	50738_0	Confined	10,635	2/12/2008	323.27	322.44	0.42	0.5
5	50755_0	Unconfined	10,783	7/9/2008	359.98	410.52	-25.27	0.5
5	50761_0	Unconfined	9,692	7/14/2005	393.17	394.85	-1.68	1
5	50773_0	Confined	10,921	11/24/2008	258.07	310.66	-52.59	1
5	50775_0	Confined	9,780	10/10/2005	364.20	393.77	-14.79	0.5
5	50782_0	Confined	9,983	5/1/2006	411.62	347.78	31.92	0.5
5	50789_0	Unconfined	10,117	9/12/2006	304.48	372.67	-68.19	1
5	50801_0	Confined	10,972	1/14/2009	311.41	343.72	-16.15	0.5
5	50806_0	Confined	9,333	7/20/2004	354.10	306.97	23.57	0.5
5	50809_0	Confined	9,341	7/28/2004	313.74	300.53	6.61	0.5
5	50811_0	Confined	11,064	4/16/2009	368.35	407.48	-19.56	0.5
5	50814_0	Confined	9,286	6/3/2004	360.09	359.24	0.08	0.1
5	50830_0	Confined	9,434	10/29/2004	360.00	349.51	5.25	0.5
5	50831_0	Confined	9,397	9/22/2004	351.15	357.53	-3.19	0.5
5	50861_0	Confined	9,803	11/2/2005	382.68	374.06	8.62	1
5	50862_0	Confined	9,808	11/7/2005	375.15	385.14	-5.00	0.5
5	50869_0	Confined	10,833	8/28/2008	268.53	297.90	-14.69	0.5
5	50870_0	Unconfined	11,085	5/7/2009	340.23	318.82	10.70	0.5
5	50872_0	Unconfined	10,923	11/26/2008	375.68	318.49	5.72	0.1
5	50878_0	Confined	10,013	5/31/2006	388.26	386.93	0.67	0.5
5	50895_0	Confined	10,460	8/21/2007	408.70	401.61	0.71	0.1
5	50896_0	Unconfined	10,426	7/18/2007	403.47	388.87	14.60	1
5	50897_0	Unconfined	10,421	7/13/2007	404.32	424.43	-20.11	1
5	50899_0	Confined	11,256	10/25/2009	339.40	386.97	-23.79	0.5
5	50916_0	Confined	11,386	3/4/2010	385.60	357.20	2.84	0.1
5	50930_0	Unconfined	11,427	4/14/2010	424.01	365.22	5.88	0.1
5	50934_0	Unconfined	11,490	6/16/2010	332.53	290.96	4.16	0.1
5	50938_0	Confined	10,644	2/21/2008	371.44	349.72	10.86	0.5
5	50946_0	Confined	10,574	12/13/2007	432.58	406.30	13.14	0.5
5	50949_0	Unconfined	10,021	6/8/2006	388.71	361.11	27.60	1
5	50954_0	Confined	10,706	4/23/2008	374.68	384.20	-9.52	1
5	50955_0	Unconfined	11,540	8/5/2010	445.00	372.04	36.48	0.5
5	50956_0	Confined	11,506	7/2/2010	370.46	355.37	1.51	0.1
5	50964_0	Unconfined	11,581	9/15/2010	268.34	278.73	-5.19	0.5
5	50970_0	Unconfined	11,619	10/23/2010	444.71	363.03	40.84	0.5
5	50994_0	Confined	11,751	3/4/2011	305.91	301.44	2.24	0.5
5	51014_0	Unconfined	9,923	3/2/2006	397.19	398.49	-1.30	1
5	51017_0	Unconfined	11,835	5/27/2011	344.95	297.93	4.70	0.1
5	51019_0	Confined	11,819	5/11/2011	290.63	301.95	-1.13	0.1
5	51027_0	Confined	11,533	7/29/2010	315.66	315.47	0.10	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	51028_0	Unconfined	11,882	7/13/2011	274.57	295.73	-21.16	1
5	51056_0	Confined	11,988	10/27/2011	364.00	406.07	-42.07	1
5	51060_0	Unconfined	11,995	11/3/2011	397.41	379.64	8.89	0.5
5	51062_0	Confined	12,009	11/17/2011	335.91	335.39	0.26	0.5
5	51064_0	Unconfined	12,022	11/30/2011	387.96	393.77	-5.81	1
5	51066_0	Unconfined	11,968	10/7/2011	397.72	410.35	-6.32	0.5
5	51069_0	Confined	11,989	10/28/2011	369.83	344.25	12.79	0.5
5	51072_0	Confined	12,052	12/30/2011	317.66	371.34	-26.84	0.5
5	51074_0	Confined	12,059	1/6/2012	258.03	345.27	-43.62	0.5
5	51082_0	Confined	12,097	2/13/2012	324.52	324.76	-0.12	0.5
5	51092_0	Unconfined	12,118	3/5/2012	370.28	376.74	-6.46	1
5	51112_0	Unconfined	12,197	5/23/2012	207.41	352.81	-72.70	0.5
5	51113_0	Confined	12,195	5/21/2012	366.19	329.25	18.47	0.5
5	51123_0	Confined	12,233	6/28/2012	314.02	333.04	-9.51	0.5
5	51127_0	Unconfined	12,268	8/2/2012	318.53	300.53	1.80	0.1
5	51144_0	Confined	12,272	8/6/2012	310.97	303.19	3.89	0.5
5	51146_0	Confined	12,304	9/7/2012	371.55	360.76	1.08	0.1
5	51147_0	Unconfined	12,306	9/9/2012	345.11	312.12	3.30	0.1
5	51172_0	Unconfined	12,387	11/29/2012	349.55	367.87	-9.16	0.5
5	51193_0	Confined	12,524	4/15/2013	309.08	300.57	8.51	1
5	51198_0	Unconfined	12,541	5/2/2013	342.94	351.98	-0.90	0.1
5	51203_0	Unconfined	12,497	3/19/2013	350.02	347.83	1.10	0.5
5	51213_0	Confined	12,508	3/30/2013	276.25	318.99	-21.37	0.5
5	51215_0	Unconfined	12,569	5/30/2013	393.59	402.40	-4.41	0.5
5	51216_0	Confined	12,562	5/23/2013	324.50	338.97	-7.24	0.5
5	51218_0	Confined	12,561	5/22/2013	333.08	355.20	-11.06	0.5
5	51235_0	Confined	12,068	1/15/2012	323.83	326.48	-1.33	0.5
5	51248_0	Confined	12,174	4/30/2012	274.34	327.90	-26.78	0.5
5	51252_0	Confined	11,820	5/12/2011	281.40	351.24	-34.92	0.5
5	51256_0	Unconfined	12,079	1/26/2012	341.31	357.66	-16.35	1
5	51257_0	Confined	12,037	12/15/2011	314.28	320.85	-3.28	0.5
5	51275_0	Unconfined	12,534	4/25/2013	393.96	400.42	-3.23	0.5
5	51284_0	Confined	12,642	8/11/2013	274.73	379.39	-52.33	0.5
5	51297_0	Unconfined	11,412	3/30/2010	404.40	459.59	-5.52	0.1
5	51299_0	Confined	12,629	7/29/2013	405.11	351.62	26.75	0.5
5	51317_0	Confined	12,701	10/9/2013	294.15	334.73	-40.58	1
5	51326_0	Confined	12,661	8/30/2013	287.14	303.22	-8.04	0.5
5	51329_0	Unconfined	12,685	9/23/2013	405.65	410.93	-0.53	0.1
5	51344_0	Confined	12,790	1/6/2014	320.98	322.77	-0.90	0.5
5	51349_0	Unconfined	12,779	12/26/2013	379.60	381.09	-0.74	0.5
5	51351_0	Confined	12,740	11/17/2013	332.56	341.23	-8.67	1
5	51362_0	Confined	12,812	1/28/2014	317.00	316.55	0.45	1
5	51368_0	Confined	12,871	3/28/2014	331.70	339.40	-3.85	0.5
5	51370_0	Confined	12,875	4/1/2014	308.65	328.68	-10.02	0.5
5	51373_0	Confined	12,916	5/12/2014	269.59	352.12	-82.53	1
5	56023_6744605	Confined	8,193	6/6/2001	205.35	311.78	-53.22	0.5
5	56023_6744605	Confined	8,592	7/10/2002	210.35	311.84	-50.74	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
5	56024_6744802	Confined	11,203	9/2/2009	336.07	311.71	24.36	1
5	56024_6744802	Confined	11,327	1/4/2010	336.06	311.70	24.36	1
5	56024_6744802	Confined	11,477	6/3/2010	346.36	311.61	34.75	1
5	56024_6744802	Confined	11,588	9/22/2010	330.29	311.54	18.75	1
5	56024_6744802	Confined	11,694	1/6/2011	336.07	311.48	24.59	1
5	56024_6744802	Confined	11,841	6/2/2011	323.36	311.34	12.02	1
5	56024_6744802	Confined	11,938	9/7/2011	334.34	311.26	23.08	1
5	56024_6744802	Confined	12,071	1/18/2012	325.02	311.12	13.90	1
5	56024_6744802	Confined	12,211	6/6/2012	301.42	310.91	-9.49	1
5	56024_6744802	Confined	12,316	9/19/2012	312.39	310.74	1.65	1
5	56024_6744802	Confined	12,674	9/12/2013	306.61	309.94	-3.33	1
5	56024_6744802	Confined	12,787	1/3/2014	306.61	309.65	-3.04	1
5	56024_6744802	Confined	12,940	6/5/2014	298.53	309.16	-10.63	1
5	56024_6744802	Confined	13,030	9/3/2014	311.81	308.87	2.94	1
5	56024_6744802	Confined	13,155	1/6/2015	289.86	308.47	-18.61	1
5	56024_6744802	Confined	13,311	6/11/2015	293.91	307.88	-13.97	1
5	56024_6744802	Confined	13,534	1/20/2016	287.56	307.09	-19.53	1
5	56024_6744802	Confined	13,689	6/23/2016	282.93	306.97	-24.04	1
5	56024_6744802	Confined	13,779	9/21/2016	289.28	306.89	-17.61	1
5	56024_6744802	Confined	13,897	1/17/2017	289.28	306.79	-17.51	1
5	56024_6744802	Confined	14,038	6/7/2017	296.79	306.59	-9.80	1
5	59577_0	Confined	12,557	5/18/2013	320.76	260.26	30.25	0.5
5	59586_0	Confined	12,812	1/28/2014	272.08	274.68	-1.30	0.5
5	59588_0	Confined	12,829	2/14/2014	302.03	267.36	17.34	0.5
5	59591_0	Confined	11,489	6/15/2010	264.06	312.68	-24.31	0.5
5	59599_0	Confined	12,260	7/25/2012	250.20	247.27	1.47	0.5
5	59605_0	Confined	11,822	5/14/2011	216.85	265.37	-24.26	0.5
7	0_6706501	Confined	3,127	7/24/1987	389.88	394.80	-4.92	1
7	0_6706501	Confined	3,239	11/13/1987	389.62	394.86	-5.24	1
7	0_6706501	Confined	3,721	3/9/1989	388.43	392.66	-4.23	1
7	0_6706501	Confined	3,972	11/15/1989	388.42	392.43	-4.01	1
7	0_6706501	Confined	4,331	11/9/1990	387.78	393.26	-5.48	1
7	0_6706501	Confined	4,699	11/12/1991	387.96	394.45	-6.49	1
7	0_6706501	Confined	5,093	12/10/1992	389.40	395.68	-6.28	1
7	0_6706501	Confined	5,504	1/25/1994	389.68	394.47	-4.79	1
7	0_6706501	Confined	5,891	2/16/1995	389.88	394.66	-4.78	1
7	0_6706501	Confined	6,268	2/28/1996	389.98	393.74	-3.76	1
7	0_6706501	Confined	6,550	12/6/1996	389.48	392.71	-3.23	1
7	0_6706501	Confined	6,991	2/20/1998	393.00	394.32	-1.32	1
7	0_6706501	Confined	7,347	2/11/1999	389.50	394.72	-5.22	1
7	0_6706501	Confined	7,725	2/24/2000	389.48	393.39	-3.91	1
7	0_6706501	Confined	7,925	9/11/2000	389.25	393.67	-4.42	1
7	0_6706501	Confined	8,068	2/1/2001	389.48	393.82	-4.34	1
7	0_6706501	Confined	8,439	2/7/2002	389.30	393.98	-4.68	1
7	0_6706501	Confined	8,837	3/12/2003	389.63	395.99	-6.36	1
7	0_6706501	Confined	9,181	2/19/2004	388.88	395.74	-6.86	1
7	0_6706501	Confined	9,900	2/7/2006	389.03	394.41	-5.38	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6706501	Confined	10,259	2/1/2007	390.26	393.58	-3.32	1
7	0_6706501	Confined	10,650	2/27/2008	389.03	396.06	-7.03	1
7	0_6706501	Confined	11,302	12/10/2009	388.53	393.77	-5.24	1
7	0_6706501	Confined	11,695	1/7/2011	386.90	394.24	-7.34	1
7	0_6706501	Confined	11,996	11/4/2011	386.68	392.46	-5.78	1
7	0_6706501	Confined	12,330	10/3/2012	386.49	391.53	-5.04	1
7	0_6706501	Confined	13,084	10/27/2014	384.87	390.70	-5.83	1
7	0_6713201	Confined	782	2/20/1981	436.92	407.14	2.98	0.1
7	0_6713201	Confined	1,144	2/17/1982	437.69	409.02	2.87	0.1
7	0_6713201	Confined	1,551	3/31/1983	436.07	406.90	2.92	0.1
7	0_6713201	Confined	1,870	2/13/1984	438.06	405.74	3.23	0.1
7	0_6713201	Confined	2,235	2/12/1985	437.93	404.35	3.36	0.1
7	0_6713201	Confined	2,619	3/3/1986	435.70	407.07	2.86	0.1
7	0_6713201	Confined	2,903	12/12/1986	438.06	408.01	3.00	0.1
7	0_6713201	Confined	3,125	7/22/1987	438.35	408.52	2.98	0.1
7	0_6713201	Confined	3,704	2/20/1989	435.60	403.66	3.19	0.1
7	0_6713201	Confined	4,051	2/2/1990	436.88	402.48	3.44	0.1
7	0_6713201	Confined	4,428	2/14/1991	439.35	404.71	3.46	0.1
7	0_6713201	Confined	4,793	2/14/1992	439.80	407.90	3.19	0.1
7	0_6713201	Confined	5,101	12/18/1992	440.13	410.59	2.95	0.1
7	0_6713201	Confined	5,484	1/5/1994	440.20	408.30	3.19	0.1
7	0_6713201	Confined	5,829	12/16/1994	441.13	408.73	3.24	0.1
7	0_6713201	Confined	6,273	3/4/1996	441.02	406.23	3.48	0.1
7	0_6713201	Confined	6,556	12/12/1996	441.57	403.49	3.81	0.1
7	0_6713204	Unconfined	10,207	12/11/2006	454.48	407.32	47.16	1
7	0_6713204	Unconfined	11,007	2/18/2009	454.75	408.86	45.89	1
7	0_6713310	Confined	10,207	12/11/2006	435.72	404.82	3.09	0.1
7	0_6713310	Confined	10,650	2/27/2008	434.99	410.37	2.46	0.1
7	0_6713310	Confined	11,007	2/18/2009	434.54	406.20	2.83	0.1
7	0_6713310	Confined	11,224	9/23/2009	435.54	405.63	2.99	0.1
7	0_6713310	Confined	11,330	1/7/2010	435.28	405.39	2.99	0.1
7	0_6713310	Confined	11,492	6/18/2010	435.06	405.80	2.93	0.1
7	0_6713310	Confined	11,581	9/15/2010	435.36	406.03	2.93	0.1
7	0_6713310	Confined	11,692	1/4/2011	435.33	406.26	2.91	0.1
7	0_6713310	Confined	11,952	9/21/2011	434.72	402.74	3.20	0.1
7	0_6713310	Confined	12,065	1/12/2012	434.93	401.37	3.36	0.1
7	0_6713310	Confined	12,793	1/9/2014	436.34	402.26	3.41	0.1
7	0_6713619	Confined	11,224	9/23/2009	419.33	401.80	8.76	0.5
7	0_6713619	Confined	11,330	1/7/2010	419.80	401.54	9.13	0.5
7	0_6713619	Confined	11,492	6/18/2010	419.93	401.78	9.08	0.5
7	0_6713619	Confined	11,581	9/15/2010	420.17	401.91	9.13	0.5
7	0_6713619	Confined	11,692	1/4/2011	419.35	402.02	8.66	0.5
7	0_6713619	Confined	11,848	6/9/2011	418.19	400.33	8.93	0.5
7	0_6713619	Confined	12,077	1/24/2012	421.05	398.10	11.47	0.5
7	0_6713619	Confined	12,225	6/20/2012	418.35	398.01	10.17	0.5
7	0_6713619	Confined	12,325	9/28/2012	418.20	397.95	10.12	0.5
7	0_6713619	Confined	12,679	9/17/2013	417.23	398.20	9.52	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6713619	Confined	12,793	1/9/2014	419.89	398.29	10.80	0.5
7	0_6713619	Confined	12,952	6/17/2014	417.68	397.65	10.02	0.5
7	0_6713619	Confined	13,042	9/15/2014	417.68	397.29	10.20	0.5
7	0_6713619	Confined	13,168	1/19/2015	415.94	397.00	9.47	0.5
7	0_6713619	Confined	13,330	6/30/2015	418.48	398.23	10.12	0.5
7	0_6713619	Confined	13,533	1/19/2016	417.98	399.72	9.13	0.5
7	0_6713619	Confined	13,682	6/16/2016	418.98	400.43	9.27	0.5
7	0_6713619	Confined	13,778	9/20/2016	418.93	400.89	9.02	0.5
7	0_6713619	Confined	13,889	1/9/2017	417.91	401.34	8.28	0.5
7	0_6713619	Confined	14,058	6/27/2017	417.75	400.73	8.51	0.5
7	0_6713702	Unconfined	11,224	9/23/2009	432.84	418.04	14.80	1
7	0_6713702	Unconfined	11,330	1/7/2010	433.21	417.85	15.36	1
7	0_6713702	Unconfined	11,496	6/22/2010	433.38	419.09	14.29	1
7	0_6713702	Unconfined	11,581	9/15/2010	433.77	419.73	14.04	1
7	0_6713702	Unconfined	11,692	1/4/2011	434.04	420.40	13.64	1
7	0_6713702	Unconfined	11,848	6/9/2011	433.81	415.41	18.40	1
7	0_6713702	Unconfined	11,945	9/14/2011	433.14	412.30	20.84	1
7	0_6713702	Unconfined	12,079	1/26/2012	433.24	408.99	24.25	1
7	0_6713702	Unconfined	12,227	6/22/2012	432.99	409.80	23.19	1
7	0_6713702	Unconfined	12,325	9/28/2012	432.76	410.34	22.42	1
7	0_6713702	Unconfined	12,679	9/17/2013	432.05	412.40	19.65	1
7	0_6713702	Unconfined	12,793	1/9/2014	432.05	412.96	19.09	1
7	0_6713702	Unconfined	12,952	6/17/2014	433.09	411.84	21.25	1
7	0_6713702	Unconfined	13,042	9/15/2014	432.99	411.21	21.78	1
7	0_6713801	Confined	782	2/20/1981	422.79	398.18	2.46	0.1
7	0_6713801	Confined	1,551	3/31/1983	422.87	398.24	2.46	0.1
7	0_6713801	Confined	1,870	2/13/1984	422.69	396.99	2.57	0.1
7	0_6713801	Confined	2,235	2/12/1985	422.05	395.48	2.66	0.1
7	0_6713801	Confined	2,616	2/28/1986	421.86	397.91	2.39	0.1
7	0_6713801	Confined	2,903	12/12/1986	421.73	398.99	2.27	0.1
7	0_6720603	Unconfined	782	2/20/1981	391.53	394.81	-1.64	0.5
7	0_6720603	Unconfined	1,144	2/17/1982	391.76	398.17	-3.20	0.5
7	0_6720603	Unconfined	1,551	3/31/1983	394.83	394.30	0.27	0.5
7	0_6720603	Unconfined	2,903	12/12/1986	390.70	396.21	-2.75	0.5
7	0_6720603	Unconfined	3,124	7/21/1987	389.90	397.12	-3.61	0.5
7	0_6720603	Unconfined	3,706	2/22/1989	391.90	388.25	1.82	0.5
7	0_6720603	Unconfined	4,072	2/23/1990	390.99	386.55	2.22	0.5
7	0_6720603	Unconfined	4,428	2/14/1991	390.48	390.40	0.04	0.5
7	0_6720603	Unconfined	4,796	2/17/1992	392.82	395.84	-1.51	0.5
7	0_6720603	Unconfined	5,101	12/18/1992	391.47	400.67	-4.60	0.5
7	0_6720603	Unconfined	5,484	1/5/1994	392.73	396.64	-1.95	0.5
7	0_6720603	Unconfined	5,829	12/16/1994	393.64	397.93	-2.14	0.5
7	0_6720603	Unconfined	6,270	3/1/1996	392.76	393.54	-0.39	0.5
7	0_6720603	Unconfined	6,556	12/12/1996	390.93	388.54	1.20	0.5
7	0_6720603	Unconfined	11,229	9/28/2009	391.49	394.61	-1.56	0.5
7	0_6720603	Unconfined	11,330	1/7/2010	391.28	394.26	-1.49	0.5
7	0_6720603	Unconfined	11,496	6/22/2010	391.53	394.97	-1.72	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6720603	Unconfined	11,581	9/15/2010	391.41	395.34	-1.96	0.5
7	0_6720603	Unconfined	11,692	1/4/2011	391.22	395.69	-2.24	0.5
7	0_6720603	Unconfined	11,848	6/9/2011	390.89	391.47	-0.29	0.5
7	0_6720603	Unconfined	11,945	9/14/2011	390.48	388.85	0.81	0.5
7	0_6720603	Unconfined	12,077	1/24/2012	390.28	386.00	2.14	0.5
7	0_6720603	Unconfined	12,225	6/20/2012	390.08	386.44	1.82	0.5
7	0_6720603	Unconfined	12,325	9/28/2012	389.82	386.74	1.54	0.5
7	0_6720603	Unconfined	12,679	9/17/2013	388.94	387.56	0.69	0.5
7	0_6720603	Unconfined	12,793	1/9/2014	388.54	387.68	0.43	0.5
7	0_6720603	Unconfined	12,952	6/17/2014	388.39	385.98	1.20	0.5
7	0_6720603	Unconfined	13,042	9/15/2014	387.86	385.02	1.42	0.5
7	0_6720603	Unconfined	13,168	1/19/2015	386.94	384.19	1.37	0.5
7	0_6720603	Unconfined	13,322	6/22/2015	388.59	386.75	0.92	0.5
7	0_6720603	Unconfined	13,533	1/19/2016	387.56	390.07	-1.26	0.5
7	0_6720603	Unconfined	13,682	6/16/2016	388.20	391.05	-1.42	0.5
7	0_6720603	Unconfined	13,774	9/16/2016	388.13	391.65	-1.76	0.5
7	0_6720603	Unconfined	13,903	1/23/2017	387.16	392.14	-2.49	0.5
7	0_6720603	Unconfined	14,045	6/14/2017	389.53	390.87	-0.67	0.5
7	0_6721101	Confined	11,224	9/23/2009	409.96	395.24	7.36	0.5
7	0_6721101	Confined	11,496	6/22/2010	413.53	394.76	9.38	0.5
7	0_6721101	Confined	11,581	9/15/2010	414.94	394.79	10.07	0.5
7	0_6721101	Confined	11,692	1/4/2011	413.19	394.77	9.21	0.5
7	0_6721101	Confined	12,227	6/22/2012	411.21	388.80	11.21	0.5
7	0_6721104	Confined	782	2/20/1981	417.32	398.82	1.85	0.1
7	0_6721104	Confined	1,144	2/17/1982	421.55	401.24	2.03	0.1
7	0_6721104	Confined	1,551	3/31/1983	422.37	399.00	2.34	0.1
7	0_6721104	Confined	1,870	2/13/1984	422.55	397.36	2.52	0.1
7	0_6721104	Confined	2,235	2/12/1985	413.68	395.30	1.84	0.1
7	0_6721104	Confined	2,616	2/28/1986	413.84	398.26	1.56	0.1
7	0_6721104	Confined	2,903	12/12/1986	413.31	399.71	1.36	0.1
7	0_6721104	Confined	3,706	2/22/1989	412.84	394.85	1.80	0.1
7	0_6721104	Confined	5,484	1/5/1994	405.07	400.76	0.43	0.1
7	0_6721106	Unconfined	13,533	1/19/2016	410.00	412.68	-2.68	1
7	0_6721106	Unconfined	13,667	6/1/2016	413.56	413.91	-0.35	1
7	0_6721106	Unconfined	13,777	9/19/2016	410.70	414.92	-4.22	1
7	0_6721106	Unconfined	14,050	6/19/2017	410.78	414.61	-3.83	1
7	0_6721607	Confined	11,223	9/22/2009	383.03	382.00	1.03	1
7	0_6721607	Confined	11,330	1/7/2010	386.19	381.65	4.54	1
7	0_6721607	Confined	11,491	6/17/2010	386.33	381.49	4.84	1
7	0_6721607	Confined	11,554	8/19/2010	385.79	381.43	4.36	1
7	0_6721607	Confined	11,692	1/4/2011	385.71	381.26	4.45	1
7	0_6721607	Confined	11,945	9/14/2011	381.56	379.14	2.42	1
7	0_6721607	Confined	12,077	1/24/2012	384.60	378.13	6.47	1
7	0_6721607	Confined	12,227	6/22/2012	384.18	377.42	6.76	1
7	0_6721607	Confined	12,325	9/28/2012	381.80	376.95	4.85	1
7	0_6721607	Confined	12,679	9/17/2013	380.05	374.74	5.31	1
7	0_6721607	Confined	12,793	1/9/2014	383.19	373.93	9.26	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6721607	Confined	12,952	6/17/2014	380.89	372.08	8.81	1
7	0_6721607	Confined	13,042	9/15/2014	379.36	371.03	8.33	1
7	0_6721607	Confined	13,168	1/19/2015	380.45	369.66	10.79	1
7	0_6721607	Confined	13,322	6/22/2015	380.59	368.62	11.97	1
7	0_6721607	Confined	13,518	1/4/2016	378.05	367.34	10.71	1
7	0_6721607	Confined	13,687	6/21/2016	379.40	367.76	11.64	1
7	0_6721607	Confined	13,781	9/23/2016	378.48	368.00	10.48	1
7	0_6721607	Confined	13,903	1/23/2017	379.38	368.14	11.24	1
7	0_6721701	Confined	780	2/18/1981	374.93	367.25	0.77	0.1
7	0_6721701	Confined	1,194	4/8/1982	375.93	368.58	0.73	0.1
7	0_6721701	Confined	1,510	2/18/1983	374.61	367.45	0.72	0.1
7	0_6721701	Confined	2,615	2/27/1986	372.93	366.95	0.60	0.1
7	0_6721701	Confined	11,223	9/22/2009	353.82	367.81	-1.40	0.1
7	0_6721701	Confined	11,330	1/7/2010	354.70	367.31	-1.26	0.1
7	0_6721701	Confined	11,488	6/14/2010	355.59	367.13	-1.15	0.1
7	0_6721701	Confined	11,581	9/15/2010	353.82	367.03	-1.32	0.1
7	0_6721701	Confined	11,692	1/4/2011	353.59	366.86	-1.33	0.1
7	0_6721701	Confined	11,848	6/9/2011	353.20	364.92	-1.17	0.1
7	0_6721701	Confined	11,945	9/14/2011	349.32	363.72	-1.44	0.1
7	0_6721701	Confined	12,077	1/24/2012	353.13	362.22	-0.91	0.1
7	0_6721701	Confined	12,310	9/13/2012	352.06	360.68	-0.86	0.1
7	0_6721701	Confined	12,793	1/9/2014	350.57	356.03	-0.55	0.1
7	0_6721701	Confined	12,952	6/17/2014	349.71	353.24	-0.35	0.1
7	0_6721701	Confined	13,042	9/15/2014	348.01	351.66	-0.37	0.1
7	0_6721701	Confined	13,322	6/22/2015	348.92	347.93	0.10	0.1
7	0_6721701	Confined	13,533	1/19/2016	347.84	345.93	0.19	0.1
7	0_6721701	Confined	13,672	6/6/2016	348.13	346.44	0.17	0.1
7	0_6721701	Confined	13,774	9/16/2016	346.97	346.81	0.02	0.1
7	0_6721701	Confined	13,889	1/9/2017	347.60	347.14	0.05	0.1
7	0_6721701	Confined	14,045	6/14/2017	347.56	345.99	0.16	0.1
7	0_6721703	Confined	780	2/18/1981	339.48	350.03	-1.05	0.1
7	0_6721703	Confined	1,194	4/8/1982	339.16	350.75	-1.16	0.1
7	0_6721703	Confined	1,510	2/18/1983	338.92	350.08	-1.12	0.1
7	0_6721703	Confined	1,866	2/9/1984	338.70	349.35	-1.06	0.1
7	0_6721703	Confined	2,230	2/7/1985	336.86	348.61	-1.18	0.1
7	0_6721703	Confined	2,615	2/27/1986	338.30	349.89	-1.16	0.1
7	0_6721703	Confined	2,892	12/1/1986	336.92	350.60	-1.37	0.1
7	0_6721703	Confined	3,123	7/20/1987	337.06	351.00	-1.39	0.1
7	0_6721703	Confined	3,333	2/15/1988	337.15	350.91	-1.38	0.1
7	0_6721703	Confined	3,701	2/17/1989	335.05	348.31	-1.33	0.1
7	0_6721703	Confined	4,427	2/13/1991	332.66	347.83	-1.52	0.1
7	0_6721703	Confined	4,807	2/28/1992	335.19	349.79	-1.46	0.1
7	0_6721703	Confined	5,164	2/19/1993	335.06	351.50	-1.64	0.1
7	0_6721703	Confined	5,528	2/18/1994	335.24	351.37	-1.61	0.1
7	0_6721703	Confined	6,626	2/20/1997	335.26	348.96	-1.37	0.1
7	0_6721703	Confined	6,990	2/19/1998	334.34	350.10	-1.58	0.1
7	0_6721703	Confined	7,925	9/11/2000	330.81	349.57	-1.88	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6721703	Confined	11,223	9/22/2009	328.54	350.83	-2.23	0.1
7	0_6721703	Confined	11,330	1/7/2010	330.77	350.42	-1.97	0.1
7	0_6721703	Confined	11,488	6/14/2010	331.85	350.08	-1.82	0.1
7	0_6721703	Confined	11,582	9/16/2010	330.20	349.88	-1.97	0.1
7	0_6721703	Confined	11,692	1/4/2011	328.66	349.62	-2.10	0.1
7	0_6721703	Confined	11,848	6/9/2011	326.21	348.29	-2.21	0.1
7	0_6721703	Confined	11,945	9/14/2011	321.29	347.46	-2.62	0.1
7	0_6721703	Confined	12,065	1/12/2012	328.81	346.43	-1.76	0.1
7	0_6721703	Confined	12,225	6/20/2012	328.57	344.94	-1.64	0.1
7	0_6721703	Confined	12,310	9/13/2012	326.42	344.15	-1.77	0.1
7	0_6721703	Confined	12,679	9/17/2013	323.68	339.13	-1.54	0.1
7	0_6721703	Confined	12,793	1/9/2014	326.08	337.32	-1.12	0.1
7	0_6721703	Confined	12,952	6/17/2014	324.52	333.95	-0.94	0.1
7	0_6721703	Confined	13,042	9/15/2014	321.85	332.05	-1.02	0.1
7	0_6721703	Confined	13,168	1/19/2015	323.20	329.39	-0.62	0.1
7	0_6721703	Confined	13,322	6/22/2015	323.42	326.16	-0.27	0.1
7	0_6721703	Confined	13,533	1/19/2016	321.77	322.14	-0.04	0.1
7	0_6721703	Confined	13,682	6/16/2016	319.41	322.16	-0.28	0.1
7	0_6721703	Confined	13,774	9/16/2016	320.20	322.18	-0.20	0.1
7	0_6721703	Confined	13,890	1/10/2017	318.92	322.12	-0.32	0.1
7	0_6721703	Confined	14,045	6/14/2017	316.73	320.95	-0.42	0.1
7	0_6721803	Confined	11,483	6/9/2010	354.52	362.54	-8.02	1
7	0_6721803	Confined	11,689	1/1/2011	356.33	362.08	-5.75	1
7	0_6721803	Confined	11,945	9/14/2011	350.83	360.27	-9.44	1
7	0_6721803	Confined	12,077	1/24/2012	354.96	359.29	-4.33	1
7	0_6721803	Confined	12,225	6/20/2012	354.72	358.00	-3.28	1
7	0_6721803	Confined	12,310	9/13/2012	352.81	357.25	-4.44	1
7	0_6721803	Confined	12,679	9/17/2013	349.83	352.69	-2.86	1
7	0_6721803	Confined	12,793	1/9/2014	352.15	351.07	1.08	1
7	0_6721803	Confined	12,950	6/15/2014	347.73	348.13	-0.40	1
7	0_6721803	Confined	12,952	6/17/2014	350.52	348.10	2.42	1
7	0_6721803	Confined	13,168	1/19/2015	349.23	344.06	5.17	1
7	0_6721803	Confined	13,322	6/22/2015	351.09	341.14	9.95	1
7	0_6721803	Confined	14,036	6/5/2017	347.61	336.56	11.05	1
7	0_6727502	Confined	781	2/19/1981	358.56	353.76	0.48	0.1
7	0_6727502	Confined	1,145	2/18/1982	358.76	355.04	0.37	0.1
7	0_6727502	Confined	1,509	2/17/1983	358.11	353.58	0.45	0.1
7	0_6727502	Confined	1,866	2/9/1984	357.64	352.53	0.51	0.1
7	0_6727502	Confined	2,230	2/7/1985	357.12	351.23	0.59	0.1
7	0_6727502	Confined	2,609	2/21/1986	359.36	353.18	0.62	0.1
7	0_6727502	Confined	2,892	12/1/1986	356.10	354.02	0.21	0.1
7	0_6727502	Confined	3,333	2/15/1988	355.76	354.42	0.13	0.1
7	0_6727502	Confined	3,705	2/21/1989	355.02	350.92	0.41	0.1
7	0_6727502	Confined	4,076	2/27/1990	355.99	349.72	0.63	0.1
7	0_6727502	Confined	4,426	2/12/1991	354.03	350.86	0.32	0.1
7	0_6727502	Confined	4,806	2/27/1992	354.18	353.38	0.08	0.1
7	0_6727502	Confined	5,161	2/16/1993	354.29	355.46	-0.12	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6727502	Confined	6,626	2/20/1997	354.38	351.27	0.31	0.1
7	0_6727502	Confined	6,977	2/6/1998	359.09	353.25	0.58	0.1
7	0_6727502	Confined	7,925	9/11/2000	359.66	352.36	0.73	0.1
7	0_6727502	Confined	11,203	9/2/2009	347.92	353.72	-0.58	0.1
7	0_6727502	Confined	11,327	1/4/2010	350.43	353.37	-0.29	0.1
7	0_6727502	Confined	11,476	6/2/2010	348.75	353.45	-0.47	0.1
7	0_6727502	Confined	11,587	9/21/2010	350.45	353.50	-0.30	0.1
7	0_6727502	Confined	11,693	1/5/2011	350.35	353.49	-0.31	0.1
7	0_6727502	Confined	11,840	6/1/2011	347.78	351.74	-0.40	0.1
7	0_6727502	Confined	11,937	9/6/2011	341.95	350.59	-0.86	0.1
7	0_6727502	Confined	12,070	1/17/2012	348.50	349.15	-0.07	0.1
7	0_6727502	Confined	12,210	6/5/2012	348.13	348.71	-0.06	0.1
7	0_6727502	Confined	12,302	9/5/2012	346.85	348.41	-0.16	0.1
7	0_6727502	Confined	12,668	9/6/2013	341.76	346.82	-0.51	0.1
7	0_6727502	Confined	12,786	1/2/2014	345.93	346.22	-0.03	0.1
7	0_6727502	Confined	12,938	6/3/2014	344.58	344.70	-0.01	0.1
7	0_6727502	Confined	13,029	9/2/2014	342.91	343.78	-0.09	0.1
7	0_6727502	Confined	13,148	12/30/2014	342.63	342.59	0.00	0.1
7	0_6727502	Confined	13,305	6/5/2015	341.94	342.14	-0.02	0.1
7	0_6727502	Confined	13,519	1/5/2016	341.20	341.57	-0.04	0.1
7	0_6727502	Confined	13,668	6/2/2016	341.55	341.83	-0.03	0.1
7	0_6727502	Confined	13,884	1/4/2017	340.24	342.18	-0.19	0.1
7	0_6727502	Confined	14,036	6/5/2017	340.85	341.38	-0.05	0.1
7	0_6727503	Confined	1,145	2/18/1982	358.48	355.04	0.34	0.1
7	0_6727503	Confined	1,509	2/17/1983	358.15	353.58	0.46	0.1
7	0_6727503	Confined	1,866	2/9/1984	357.43	352.53	0.49	0.1
7	0_6727503	Confined	2,230	2/7/1985	356.53	351.23	0.53	0.1
7	0_6727503	Confined	2,609	2/21/1986	351.18	353.18	-0.20	0.1
7	0_6727503	Confined	2,892	12/1/1986	355.85	354.02	0.18	0.1
7	0_6727503	Confined	3,333	2/15/1988	356.42	354.42	0.20	0.1
7	0_6727503	Confined	5,890	2/15/1995	355.20	354.84	0.04	0.1
7	0_6727503	Confined	6,260	2/20/1996	354.43	353.33	0.11	0.1
7	0_6727503	Confined	6,626	2/20/1997	354.03	351.27	0.28	0.1
7	0_6727503	Confined	6,977	2/6/1998	353.46	353.25	0.02	0.1
7	0_6727503	Confined	7,925	9/11/2000	352.23	352.36	-0.01	0.1
7	0_6727503	Confined	11,203	9/2/2009	356.55	353.72	0.28	0.1
7	0_6727503	Confined	11,324	1/1/2010	357.55	353.37	0.42	0.1
7	0_6727503	Confined	11,476	6/2/2010	356.69	353.45	0.32	0.1
7	0_6727503	Confined	11,587	9/21/2010	357.02	353.50	0.35	0.1
7	0_6727503	Confined	11,693	1/5/2011	354.47	353.49	0.10	0.1
7	0_6727503	Confined	11,840	6/1/2011	356.96	351.74	0.52	0.1
7	0_6727503	Confined	11,937	9/6/2011	355.99	350.59	0.54	0.1
7	0_6727503	Confined	12,070	1/17/2012	357.11	349.15	0.80	0.1
7	0_6727503	Confined	12,210	6/5/2012	356.06	348.71	0.74	0.1
7	0_6727503	Confined	12,302	9/5/2012	356.08	348.41	0.77	0.1
7	0_6727503	Confined	12,668	9/6/2013	355.34	346.82	0.85	0.1
7	0_6727503	Confined	12,786	1/2/2014	355.36	346.22	0.91	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6727503	Confined	12,938	6/3/2014	353.83	344.70	0.91	0.1
7	0_6727503	Confined	13,029	9/2/2014	353.44	343.78	0.97	0.1
7	0_6727503	Confined	13,148	12/30/2014	353.93	342.59	1.13	0.1
7	0_6727503	Confined	13,305	6/5/2015	350.90	342.14	0.88	0.1
7	0_6727503	Confined	13,519	1/5/2016	348.25	341.57	0.67	0.1
7	0_6727503	Confined	13,668	6/2/2016	353.43	341.83	1.16	0.1
7	0_6727503	Confined	13,884	1/4/2017	347.80	342.18	0.56	0.1
7	0_6727503	Confined	14,036	6/5/2017	351.81	341.38	1.04	0.1
7	0_6727801	Confined	837	4/16/1981	360.38	343.90	16.48	1
7	0_6727801	Confined	877	5/26/1981	360.34	344.00	16.34	1
7	0_6727801	Confined	899	6/17/1981	360.74	344.06	16.68	1
7	0_6727801	Confined	928	7/16/1981	360.72	344.13	16.59	1
7	0_6727801	Confined	990	9/16/1981	360.53	344.29	16.24	1
7	0_6727801	Confined	1,024	10/20/1981	360.38	344.37	16.01	1
7	0_6727801	Confined	1,054	11/19/1981	360.82	344.45	16.37	1
7	0_6727801	Confined	1,081	12/16/1981	360.69	344.52	16.17	1
7	0_6727801	Confined	1,116	1/20/1982	360.66	344.51	16.15	1
7	0_6727801	Confined	1,143	2/16/1982	360.41	344.46	15.95	1
7	0_6727801	Confined	1,167	3/12/1982	360.62	344.41	16.21	1
7	0_6727801	Confined	1,206	4/20/1982	360.44	344.33	16.11	1
7	0_6727801	Confined	1,230	5/14/1982	360.70	344.28	16.42	1
7	0_6727801	Confined	1,265	6/18/1982	360.59	344.20	16.39	1
7	0_6727801	Confined	1,359	9/20/1982	359.96	344.01	15.95	1
7	0_6727801	Confined	1,389	10/20/1982	359.56	343.94	15.62	1
7	0_6727801	Confined	1,419	11/19/1982	359.76	343.88	15.88	1
7	0_6727801	Confined	1,446	12/16/1982	359.67	343.83	15.84	1
7	0_6727801	Confined	1,478	1/17/1983	359.56	343.77	15.79	1
7	0_6727801	Confined	1,515	2/23/1983	359.64	343.71	15.93	1
7	0_6727801	Confined	1,542	3/22/1983	359.54	343.67	15.87	1
7	0_6727801	Confined	1,632	6/20/1983	357.02	343.53	13.49	1
7	0_6727801	Confined	1,732	9/28/1983	359.34	343.37	15.97	1
7	0_6727801	Confined	1,808	12/13/1983	359.20	343.25	15.95	1
7	0_6727801	Confined	1,901	3/15/1984	359.10	343.01	16.09	1
7	0_6727801	Confined	2,074	9/4/1984	358.20	342.53	15.67	1
7	0_6727801	Confined	2,178	12/17/1984	358.65	342.24	16.41	1
7	0_6727801	Confined	2,263	3/12/1985	358.45	342.40	16.05	1
7	0_6727801	Confined	2,357	6/14/1985	358.35	342.66	15.69	1
7	0_6727807	Confined	8,333	10/24/2001	355.20	339.86	15.34	1
7	0_6727807	Confined	8,635	8/22/2002	355.52	341.30	14.22	1
7	0_6727807	Confined	8,928	6/11/2003	354.97	342.17	12.80	1
7	0_6727807	Confined	9,033	9/24/2003	354.61	342.20	12.41	1
7	0_6727807	Confined	9,152	1/21/2004	354.33	342.32	12.01	1
7	0_6727807	Confined	9,398	9/23/2004	353.96	343.39	10.57	1
7	0_6727807	Confined	9,749	9/9/2005	352.65	342.52	10.13	1
7	0_6727807	Confined	9,878	1/16/2006	352.91	341.86	11.05	1
7	0_6727807	Confined	10,392	6/14/2007	354.74	341.77	12.97	1
7	0_6727809	Confined	8,635	8/22/2002	351.44	339.84	5.80	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6727809	Confined	8,928	6/11/2003	352.46	340.59	5.93	0.5
7	0_6727809	Confined	9,033	9/24/2003	352.18	340.63	5.77	0.5
7	0_6727809	Confined	9,152	1/21/2004	351.73	340.75	5.49	0.5
7	0_6727809	Confined	9,398	9/23/2004	351.56	341.62	4.97	0.5
7	0_6727809	Confined	9,513	1/16/2005	350.90	341.90	4.50	0.5
7	0_6727809	Confined	9,749	9/9/2005	350.78	340.94	4.92	0.5
7	0_6727809	Confined	9,878	1/16/2006	350.90	340.43	5.24	0.5
7	0_6727809	Confined	10,392	6/14/2007	353.59	340.19	6.70	0.5
7	0_6727809	Confined	10,488	9/18/2007	354.58	340.80	6.89	0.5
7	0_6727809	Confined	10,607	1/15/2008	353.53	341.39	6.07	0.5
7	0_6727809	Confined	10,774	6/30/2008	351.35	340.68	5.34	0.5
7	0_6727809	Confined	11,203	9/2/2009	348.00	339.50	4.25	0.5
7	0_6727809	Confined	11,327	1/4/2010	351.59	339.30	6.14	0.5
7	0_6727809	Confined	11,476	6/2/2010	351.91	339.28	6.31	0.5
7	0_6727809	Confined	11,587	9/21/2010	351.98	339.27	6.36	0.5
7	0_6727809	Confined	11,693	1/5/2011	351.71	339.22	6.24	0.5
7	0_6727809	Confined	11,840	6/1/2011	348.80	338.35	5.22	0.5
7	0_6727809	Confined	12,070	1/17/2012	349.49	337.07	6.21	0.5
7	0_6727809	Confined	12,210	6/5/2012	349.24	336.87	6.19	0.5
7	0_6727809	Confined	12,302	9/5/2012	347.39	336.74	5.33	0.5
7	0_6727809	Confined	12,668	9/6/2013	346.03	336.05	4.99	0.5
7	0_6727809	Confined	12,786	1/2/2014	347.50	335.79	5.86	0.5
7	0_6727809	Confined	12,938	6/3/2014	346.00	335.10	5.45	0.5
7	0_6727809	Confined	13,029	9/2/2014	344.21	334.69	4.76	0.5
7	0_6727809	Confined	13,148	12/30/2014	343.74	334.15	4.80	0.5
7	0_6727809	Confined	13,305	6/5/2015	344.16	333.98	5.09	0.5
7	0_6727809	Confined	13,519	1/5/2016	342.54	333.76	4.39	0.5
7	0_6727809	Confined	13,668	6/2/2016	343.73	333.93	4.90	0.5
7	0_6727909	Confined	838	4/17/1981	339.27	337.38	1.89	1
7	0_6727909	Confined	877	5/26/1981	337.34	337.46	-0.12	1
7	0_6727909	Confined	899	6/17/1981	336.94	337.50	-0.56	1
7	0_6727909	Confined	928	7/16/1981	339.46	337.55	1.91	1
7	0_6727909	Confined	990	9/16/1981	340.09	337.67	2.42	1
7	0_6727909	Confined	1,024	10/20/1981	331.19	337.73	-6.54	1
7	0_6727909	Confined	1,054	11/19/1981	340.23	337.79	2.44	1
7	0_6727909	Confined	1,081	12/16/1981	331.44	337.84	-6.40	1
7	0_6727909	Confined	1,116	1/20/1982	333.52	337.83	-4.31	1
7	0_6727909	Confined	1,143	2/16/1982	338.46	337.77	0.69	1
7	0_6727909	Confined	1,167	3/12/1982	340.29	337.73	2.56	1
7	0_6727909	Confined	1,206	4/20/1982	330.64	337.65	-7.01	1
7	0_6727909	Confined	1,230	5/14/1982	335.00	337.60	-2.60	1
7	0_6727909	Confined	1,265	6/18/1982	334.77	337.53	-2.76	1
7	0_6727909	Confined	1,292	7/15/1982	333.81	337.48	-3.67	1
7	0_6727909	Confined	1,334	8/26/1982	333.69	337.40	-3.71	1
7	0_6727909	Confined	1,359	9/20/1982	337.29	337.35	-0.06	1
7	0_6727909	Confined	1,389	10/20/1982	339.22	337.29	1.93	1
7	0_6727909	Confined	1,419	11/19/1982	339.33	337.23	2.10	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6727909	Confined	1,446	12/16/1982	338.83	337.18	1.65	1
7	0_6727909	Confined	1,478	1/17/1983	334.59	337.13	-2.54	1
7	0_6727909	Confined	1,515	2/23/1983	337.59	337.08	0.51	1
7	0_6727909	Confined	1,542	3/22/1983	338.46	337.05	1.41	1
7	0_6727909	Confined	1,571	4/20/1983	337.98	337.01	0.97	1
7	0_6727909	Confined	1,632	6/20/1983	337.69	336.94	0.75	1
7	0_6727909	Confined	1,732	9/28/1983	336.59	336.82	-0.23	1
7	0_6727909	Confined	1,901	3/15/1984	330.89	336.54	-5.65	1
7	0_6727909	Confined	1,997	6/19/1984	331.02	336.34	-5.32	1
7	0_6727909	Confined	2,074	9/4/1984	337.12	336.18	0.94	1
7	0_6727909	Confined	2,263	3/12/1985	328.23	336.13	-7.90	1
7	0_6727910	Confined	8,333	10/24/2001	333.93	334.80	-0.09	0.1
7	0_6727910	Confined	8,635	8/22/2002	334.04	335.78	-0.17	0.1
7	0_6727910	Confined	8,928	6/11/2003	334.68	336.41	-0.17	0.1
7	0_6727910	Confined	9,033	9/24/2003	329.74	336.47	-0.67	0.1
7	0_6728104	Confined	780	2/18/1981	317.54	331.37	-13.83	1
7	0_6728104	Confined	1,167	3/12/1982	318.00	331.95	-13.95	1
7	0_6728104	Confined	1,509	2/17/1983	316.85	331.22	-14.37	1
7	0_6728104	Confined	1,866	2/9/1984	316.59	330.70	-14.11	1
7	0_6728104	Confined	2,230	2/7/1985	316.55	330.08	-13.53	1
7	0_6728104	Confined	2,615	2/27/1986	317.96	331.15	-13.19	1
7	0_6728104	Confined	2,892	12/1/1986	316.31	331.59	-15.28	1
7	0_6728104	Confined	3,333	2/15/1988	316.85	331.75	-14.90	1
7	0_6728104	Confined	3,705	2/21/1989	315.60	329.82	-14.22	1
7	0_6728104	Confined	4,076	2/27/1990	315.05	329.19	-14.14	1
7	0_6728104	Confined	4,426	2/12/1991	317.60	329.77	-12.17	1
7	0_6728104	Confined	4,807	2/28/1992	319.05	331.25	-12.20	1
7	0_6728104	Confined	5,164	2/19/1993	317.90	332.38	-14.48	1
7	0_6728104	Confined	5,534	2/24/1994	318.10	331.98	-13.88	1
7	0_6728104	Confined	5,891	2/16/1995	318.27	332.22	-13.95	1
7	0_6728104	Confined	6,260	2/20/1996	316.25	331.42	-15.17	1
7	0_6728104	Confined	6,626	2/20/1997	316.55	330.33	-13.78	1
7	0_6728104	Confined	6,990	2/19/1998	318.03	331.42	-13.39	1
7	0_6728104	Confined	7,925	9/11/2000	314.75	330.90	-16.15	1
7	0_6728104	Confined	11,223	9/22/2009	312.99	331.60	-18.61	1
7	0_6728104	Confined	11,328	1/5/2010	314.23	331.42	-17.19	1
7	0_6728104	Confined	11,488	6/14/2010	316.86	331.39	-14.53	1
7	0_6728104	Confined	11,589	9/23/2010	315.54	331.36	-15.82	1
7	0_6728104	Confined	11,700	1/12/2011	315.81	331.26	-15.45	1
7	0_6728104	Confined	11,845	6/6/2011	313.23	330.33	-17.10	1
7	0_6728104	Confined	11,951	9/20/2011	312.22	329.65	-17.43	1
7	0_6728104	Confined	12,064	1/11/2012	313.67	328.95	-15.28	1
7	0_6728104	Confined	12,206	6/1/2012	314.61	328.45	-13.84	1
7	0_6728104	Confined	12,309	9/12/2012	311.20	328.08	-16.88	1
7	0_6728104	Confined	12,675	9/13/2013	311.13	326.08	-14.95	1
7	0_6728104	Confined	12,794	1/10/2014	313.90	325.30	-11.40	1
7	0_6728104	Confined	12,943	6/8/2014	312.84	323.84	-11.00	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6728104	Confined	13,039	9/12/2014	310.81	322.90	-12.09	1
7	0_6728104	Confined	13,170	1/21/2015	312.47	321.68	-9.21	1
7	0_6728104	Confined	13,312	6/12/2015	315.86	320.66	-4.80	1
7	0_6728104	Confined	13,529	1/15/2016	314.70	319.22	-4.52	1
7	0_6728104	Confined	13,689	6/23/2016	314.59	319.28	-4.69	1
7	0_6728104	Confined	13,774	9/16/2016	314.47	319.31	-4.84	1
7	0_6728104	Confined	13,891	1/11/2017	313.49	319.30	-5.81	1
7	0_6728104	Confined	14,058	6/27/2017	313.05	318.56	-5.51	1
7	0_6728507	Confined	11,713	1/25/2011	326.40	331.16	-2.38	0.5
7	0_6728507	Confined	11,848	6/9/2011	325.84	330.35	-2.25	0.5
7	0_6728507	Confined	11,950	9/19/2011	326.13	329.73	-1.80	0.5
7	0_6728507	Confined	12,064	1/11/2012	325.10	328.99	-1.95	0.5
7	0_6728507	Confined	12,212	6/7/2012	325.37	327.42	-1.03	0.5
7	0_6728507	Confined	12,309	9/12/2012	324.29	326.40	-1.05	0.5
7	0_6728507	Confined	12,673	9/11/2013	324.02	320.53	1.74	0.5
7	0_6728507	Confined	12,801	1/17/2014	324.49	318.09	3.20	0.5
7	0_6728507	Confined	13,039	9/12/2014	324.80	312.68	6.06	0.5
7	0_6728507	Confined	13,157	1/8/2015	324.64	309.97	7.33	0.5
7	0_6728507	Confined	13,312	6/12/2015	324.95	305.83	9.56	0.5
7	0_6728508	Confined	13,786	9/28/2016	304.16	300.26	3.90	1
7	0_6728508	Confined	13,903	1/23/2017	306.42	300.09	6.33	1
7	0_6728508	Confined	14,058	6/27/2017	302.97	298.93	4.04	1
7	0_6729201	Confined	857	5/6/1981	357.42	348.00	9.42	1
7	0_6729602	Confined	1,194	4/8/1982	346.71	335.44	1.13	0.1
7	0_6729602	Confined	1,867	2/10/1984	346.28	335.17	1.11	0.1
7	0_6729602	Confined	2,892	12/1/1986	343.88	335.64	0.82	0.1
7	0_6729602	Confined	3,333	2/15/1988	342.66	335.47	0.72	0.1
7	0_6729602	Confined	3,700	2/16/1989	344.98	332.94	1.20	0.1
7	0_6729602	Confined	4,076	2/27/1990	341.39	332.03	0.94	0.1
7	0_6729602	Confined	4,807	2/28/1992	338.88	331.86	0.70	0.1
7	0_6729602	Confined	5,164	2/19/1993	339.11	332.60	0.65	0.1
7	0_6729602	Confined	5,528	2/18/1994	338.49	333.28	0.52	0.1
7	0_6729602	Confined	5,890	2/15/1995	337.08	333.32	0.38	0.1
7	0_6729602	Confined	6,260	2/20/1996	338.83	332.80	0.60	0.1
7	0_6729602	Confined	6,626	2/20/1997	335.98	331.72	0.43	0.1
7	0_6729602	Confined	6,976	2/5/1998	336.29	331.94	0.43	0.1
7	0_6729602	Confined	7,925	9/11/2000	335.78	330.83	0.49	0.1
7	0_6729602	Confined	11,330	1/7/2010	329.26	330.73	-0.15	0.1
7	0_6729602	Confined	11,490	6/16/2010	330.06	329.04	0.10	0.1
7	0_6729602	Confined	11,581	9/15/2010	329.18	328.08	0.11	0.1
7	0_6729602	Confined	11,692	1/4/2011	328.08	326.93	0.11	0.1
7	0_6729602	Confined	11,848	6/9/2011	326.47	326.33	0.01	0.1
7	0_6729602	Confined	11,951	9/20/2011	322.61	325.93	-0.33	0.1
7	0_6729602	Confined	12,077	1/24/2012	325.40	324.56	0.08	0.1
7	0_6729602	Confined	12,225	6/20/2012	326.08	318.56	0.75	0.1
7	0_6729602	Confined	12,323	9/26/2012	323.71	314.59	0.91	0.1
7	0_6729602	Confined	12,679	9/17/2013	318.80	292.99	2.58	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6729602	Confined	12,793	1/9/2014	319.85	285.21	3.46	0.1
7	0_6729602	Confined	12,952	6/17/2014	318.47	274.08	4.44	0.1
7	0_6729602	Confined	13,037	9/10/2014	313.74	268.14	4.56	0.1
7	0_6729602	Confined	13,533	1/19/2016	312.77	224.89	8.79	0.1
7	0_6729602	Confined	13,682	6/16/2016	313.24	228.15	8.51	0.1
7	0_6729602	Confined	13,774	9/16/2016	313.03	230.17	8.29	0.1
7	0_6729602	Confined	13,884	1/4/2017	314.00	232.40	8.16	0.1
7	0_6729602	Confined	14,045	6/14/2017	313.73	228.79	8.49	0.1
7	0_6730509	Confined	11,201	8/31/2009	312.90	341.39	-28.49	1
7	0_6730509	Confined	11,330	1/7/2010	312.31	341.12	-28.81	1
7	0_6730509	Confined	11,490	6/16/2010	309.43	340.60	-31.17	1
7	0_6730509	Confined	11,581	9/15/2010	322.14	340.31	-18.17	1
7	0_6730509	Confined	11,692	1/4/2011	326.76	339.96	-13.20	1
7	0_6730509	Confined	11,848	6/9/2011	314.05	339.51	-25.46	1
7	0_6730509	Confined	11,951	9/20/2011	320.98	339.21	-18.23	1
7	0_6730509	Confined	12,077	1/24/2012	318.67	338.65	-19.98	1
7	0_6730509	Confined	12,207	6/2/2012	326.76	337.18	-10.42	1
7	0_6730509	Confined	12,323	9/26/2012	325.60	335.87	-10.27	1
7	0_6730509	Confined	12,678	9/16/2013	308.28	329.66	-21.38	1
7	0_6730509	Confined	12,793	1/9/2014	311.74	327.35	-15.61	1
7	0_6730509	Confined	12,952	6/17/2014	290.95	323.69	-32.74	1
7	0_6730509	Confined	13,042	9/15/2014	293.26	321.61	-28.35	1
7	0_6730509	Confined	13,168	1/19/2015	308.27	318.57	-10.30	1
7	0_6730509	Confined	13,322	6/22/2015	299.04	313.90	-14.86	1
7	0_6730509	Confined	13,533	1/19/2016	293.26	308.03	-14.77	1
7	0_6730509	Confined	13,682	6/16/2016	304.81	307.62	-2.81	1
7	0_6730509	Confined	13,778	9/20/2016	309.43	307.36	2.07	1
7	0_6730509	Confined	13,903	1/23/2017	309.43	306.89	2.54	1
7	0_6730509	Confined	14,045	6/14/2017	307.12	305.72	1.40	1
7	0_6733602	Unconfined	10,822	8/17/2008	435.02	437.79	-2.77	1
7	0_6733602	Unconfined	10,848	9/12/2008	434.69	437.19	-2.50	1
7	0_6733602	Unconfined	10,966	1/8/2009	434.79	434.58	0.21	1
7	0_6733602	Unconfined	11,120	6/11/2009	434.43	433.40	1.03	1
7	0_6733602	Unconfined	11,232	10/1/2009	433.99	432.55	1.44	1
7	0_6733602	Unconfined	11,343	1/20/2010	434.21	431.76	2.45	1
7	0_6733602	Unconfined	11,568	9/2/2010	433.49	430.79	2.70	1
7	0_6733602	Unconfined	11,700	1/12/2011	433.62	429.89	3.73	1
7	0_6733602	Unconfined	11,839	5/31/2011	432.24	425.53	6.71	1
7	0_6733602	Unconfined	11,952	9/21/2011	432.62	421.98	10.64	1
7	0_6733602	Unconfined	12,440	1/21/2013	431.57	422.64	8.93	1
7	0_6733602	Unconfined	12,589	6/19/2013	432.15	424.27	7.88	1
7	0_6733602	Unconfined	12,687	9/25/2013	430.77	425.33	5.44	1
7	0_6733602	Unconfined	12,806	1/22/2014	430.42	426.40	4.02	1
7	0_6733602	Unconfined	12,944	6/9/2014	429.71	426.46	3.25	1
7	0_6733602	Unconfined	13,038	9/11/2014	429.30	426.50	2.80	1
7	0_6733602	Unconfined	13,527	1/13/2016	427.52	434.70	-7.18	1
7	0_6733602	Unconfined	13,688	6/22/2016	427.29	436.51	-9.22	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6733602	Unconfined	13,778	9/20/2016	427.10	437.53	-10.43	1
7	0_6733602	Unconfined	13,911	1/31/2017	426.53	438.51	-11.98	1
7	0_6734303	Confined	8,333	10/24/2001	384.66	381.49	0.32	0.1
7	0_6734303	Confined	8,642	8/29/2002	390.11	384.85	0.53	0.1
7	0_6734303	Confined	8,928	6/11/2003	383.91	386.70	-0.28	0.1
7	0_6734303	Confined	9,035	9/26/2003	383.18	386.73	-0.36	0.1
7	0_6734303	Confined	9,878	1/16/2006	382.31	385.82	-0.35	0.1
7	0_6734303	Confined	10,392	6/14/2007	386.71	385.35	0.14	0.1
7	0_6734303	Confined	10,488	9/18/2007	386.71	387.14	-0.04	0.1
7	0_6734303	Confined	10,774	6/30/2008	380.96	386.90	-0.59	0.1
7	0_6734303	Confined	11,203	9/2/2009	379.02	383.57	-0.46	0.1
7	0_6734303	Confined	11,327	1/4/2010	378.60	383.02	-0.44	0.1
7	0_6734303	Confined	11,476	6/2/2010	379.37	382.87	-0.35	0.1
7	0_6734303	Confined	11,588	9/22/2010	378.97	382.76	-0.38	0.1
7	0_6734303	Confined	11,693	1/5/2011	378.03	382.57	-0.45	0.1
7	0_6734303	Confined	11,840	6/1/2011	376.97	380.00	-0.30	0.1
7	0_6734303	Confined	11,937	9/6/2011	375.91	378.30	-0.24	0.1
7	0_6734303	Confined	12,070	1/17/2012	375.57	376.28	-0.07	0.1
7	0_6734303	Confined	12,210	6/5/2012	375.26	376.33	-0.11	0.1
7	0_6734303	Confined	12,302	9/5/2012	374.54	376.36	-0.18	0.1
7	0_6734303	Confined	12,668	9/6/2013	378.14	376.89	0.13	0.1
7	0_6734303	Confined	12,786	1/2/2014	376.21	377.11	-0.09	0.1
7	0_6734303	Confined	12,938	6/3/2014	374.14	376.52	-0.24	0.1
7	0_6734303	Confined	13,029	9/2/2014	373.12	376.17	-0.31	0.1
7	0_6734303	Confined	13,330	6/30/2015	374.39	377.16	-0.28	0.1
7	0_6734303	Confined	13,520	1/6/2016	371.97	378.68	-0.67	0.1
7	0_6734303	Confined	13,673	6/7/2016	373.37	379.50	-0.61	0.1
7	0_6734303	Confined	13,884	1/4/2017	370.07	380.60	-1.05	0.1
7	0_6734303	Confined	14,036	6/5/2017	370.09	380.01	-0.99	0.1
7	0_6734709	Confined	13,163	1/14/2015	383.85	397.95	-14.10	1
7	0_6734709	Confined	13,311	6/11/2015	384.70	398.40	-13.70	1
7	0_6734709	Confined	13,527	1/13/2016	382.55	399.10	-16.55	1
7	0_6734709	Confined	13,688	6/22/2016	385.15	400.02	-14.87	1
7	0_6734709	Confined	13,778	9/20/2016	384.55	400.53	-15.98	1
7	0_6734709	Confined	13,911	1/31/2017	383.88	400.97	-17.09	1
7	0_6734709	Confined	14,050	6/19/2017	383.74	400.33	-16.59	1
7	0_6734710	Confined	10,822	8/17/2008	398.35	410.05	-11.70	1
7	0_6734710	Confined	10,847	9/11/2008	397.29	409.77	-12.48	1
7	0_6734710	Confined	10,966	1/8/2009	398.49	408.45	-9.96	1
7	0_6734710	Confined	11,120	6/11/2009	397.09	407.15	-10.06	1
7	0_6734710	Confined	11,232	10/1/2009	395.49	406.20	-10.71	1
7	0_6734710	Confined	11,343	1/20/2010	397.97	405.26	-7.29	1
7	0_6734710	Confined	11,568	9/2/2010	396.24	403.24	-7.00	1
7	0_6734710	Confined	11,700	1/12/2011	398.77	401.95	-3.18	1
7	0_6734710	Confined	11,855	6/16/2011	396.76	399.16	-2.40	1
7	0_6734710	Confined	11,952	9/21/2011	392.00	397.42	-5.42	1
7	0_6734710	Confined	12,085	2/1/2012	396.01	395.87	0.14	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6734710	Confined	12,205	5/31/2012	392.02	396.85	-4.83	1
7	0_6734710	Confined	12,440	1/21/2013	394.26	398.69	-4.43	1
7	0_6734710	Confined	12,589	6/19/2013	392.70	399.41	-6.71	1
7	0_6734710	Confined	12,687	9/25/2013	389.94	399.89	-9.95	1
7	0_6734710	Confined	12,806	1/22/2014	389.99	400.31	-10.32	1
7	0_6734710	Confined	12,944	6/9/2014	391.69	399.97	-8.28	1
7	0_6734710	Confined	13,038	9/11/2014	385.49	399.74	-14.25	1
7	0_6734710	Confined	13,163	1/14/2015	385.40	399.54	-14.14	1
7	0_6734710	Confined	13,311	6/11/2015	385.87	400.39	-14.52	1
7	0_6734710	Confined	13,409	9/17/2015	385.44	400.96	-15.52	1
7	0_6734710	Confined	13,527	1/13/2016	385.32	401.65	-16.33	1
7	0_6734710	Confined	13,688	6/22/2016	384.57	402.76	-18.19	1
7	0_6734710	Confined	13,778	9/20/2016	384.61	403.39	-18.78	1
7	0_6734710	Confined	13,911	1/31/2017	384.37	403.98	-19.61	1
7	0_6734710	Confined	14,050	6/19/2017	382.85	403.45	-20.60	1
7	0_6734710	Confined	14,141	9/18/2017	380.56	403.11	-22.55	1
7	0_6735109	Confined	8,333	10/24/2001	357.25	358.80	-1.55	1
7	0_6735109	Confined	8,635	8/22/2002	357.95	360.36	-2.41	1
7	0_6735109	Confined	8,928	6/11/2003	359.97	361.26	-1.29	1
7	0_6735109	Confined	9,033	9/24/2003	357.66	361.27	-3.61	1
7	0_6735109	Confined	9,152	1/21/2004	356.50	361.38	-4.88	1
7	0_6735109	Confined	9,523	1/26/2005	358.57	362.87	-4.30	1
7	0_6735109	Confined	9,749	9/9/2005	357.43	361.58	-4.15	1
7	0_6735109	Confined	9,878	1/16/2006	355.30	360.87	-5.57	1
7	0_6735109	Confined	10,392	6/14/2007	355.33	360.78	-5.45	1
7	0_6735109	Confined	10,488	9/18/2007	355.78	361.64	-5.86	1
7	0_6735109	Confined	10,607	1/15/2008	356.60	362.49	-5.89	1
7	0_6735109	Confined	10,774	6/30/2008	354.84	361.45	-6.61	1
7	0_6735109	Confined	11,203	9/2/2009	352.10	359.83	-7.73	1
7	0_6735109	Confined	11,327	1/4/2010	354.04	359.60	-5.56	1
7	0_6735109	Confined	11,476	6/2/2010	355.87	359.55	-3.68	1
7	0_6735109	Confined	11,587	9/21/2010	355.26	359.51	-4.25	1
7	0_6735109	Confined	11,693	1/5/2011	352.98	359.43	-6.45	1
7	0_6735109	Confined	11,840	6/1/2011	353.07	358.22	-5.15	1
7	0_6735109	Confined	11,937	9/6/2011	351.70	357.42	-5.72	1
7	0_6735109	Confined	12,070	1/17/2012	351.32	356.45	-5.13	1
7	0_6735109	Confined	12,210	6/5/2012	352.07	356.35	-4.28	1
7	0_6735109	Confined	12,302	9/5/2012	351.01	356.28	-5.27	1
7	0_6735109	Confined	12,668	9/6/2013	349.23	355.87	-6.64	1
7	0_6735109	Confined	12,786	1/2/2014	349.07	355.71	-6.64	1
7	0_6735109	Confined	12,938	6/3/2014	348.82	355.05	-6.23	1
7	0_6735109	Confined	13,029	9/2/2014	346.77	354.66	-7.89	1
7	0_6735109	Confined	13,148	12/30/2014	347.47	354.14	-6.67	1
7	0_6735109	Confined	13,305	6/5/2015	348.31	354.27	-5.96	1
7	0_6735109	Confined	13,519	1/5/2016	346.94	354.46	-7.52	1
7	0_6735109	Confined	13,668	6/2/2016	346.66	354.73	-8.07	1
7	0_6735109	Confined	13,884	1/4/2017	347.72	355.10	-7.38	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6735109	Confined	14,036	6/5/2017	346.37	354.69	-8.32	1
7	0_6735110	Confined	8,333	10/24/2001	374.88	369.85	0.50	0.1
7	0_6735110	Confined	8,642	8/29/2002	361.66	372.32	-1.07	0.1
7	0_6735110	Confined	8,928	6/11/2003	373.09	373.74	-0.07	0.1
7	0_6735110	Confined	9,035	9/26/2003	372.44	373.82	-0.14	0.1
7	0_6735110	Confined	9,878	1/16/2006	371.51	373.36	-0.19	0.1
7	0_6735110	Confined	10,392	6/14/2007	371.21	372.92	-0.17	0.1
7	0_6735110	Confined	10,488	9/18/2007	371.33	374.22	-0.29	0.1
7	0_6735110	Confined	10,607	1/15/2008	371.21	375.51	-0.43	0.1
7	0_6735110	Confined	11,203	9/2/2009	366.35	371.59	-0.52	0.1
7	0_6735110	Confined	11,327	1/4/2010	368.36	371.14	-0.28	0.1
7	0_6735110	Confined	11,476	6/2/2010	370.31	370.95	-0.06	0.1
7	0_6735110	Confined	11,587	9/21/2010	367.21	370.82	-0.36	0.1
7	0_6735110	Confined	11,693	1/5/2011	367.58	370.63	-0.30	0.1
7	0_6735110	Confined	11,840	6/1/2011	364.23	368.67	-0.44	0.1
7	0_6735110	Confined	11,937	9/6/2011	363.15	367.38	-0.42	0.1
7	0_6735110	Confined	12,070	1/17/2012	364.69	365.82	-0.11	0.1
7	0_6735110	Confined	12,210	6/5/2012	364.41	365.59	-0.12	0.1
7	0_6735110	Confined	12,302	9/5/2012	362.04	365.44	-0.34	0.1
7	0_6735110	Confined	12,668	9/6/2013	358.86	364.97	-0.61	0.1
7	0_6735110	Confined	12,786	1/2/2014	359.22	364.83	-0.56	0.1
7	0_6735110	Confined	12,938	6/3/2014	357.12	363.94	-0.68	0.1
7	0_6735110	Confined	13,029	9/2/2014	356.25	363.41	-0.72	0.1
7	0_6735110	Confined	13,148	12/30/2014	353.75	362.72	-0.90	0.1
7	0_6735110	Confined	13,330	6/30/2015	347.83	363.07	-1.52	0.1
7	0_6735110	Confined	13,520	1/6/2016	346.83	363.45	-1.66	0.1
7	0_6735110	Confined	13,673	6/7/2016	347.15	363.96	-1.68	0.1
7	0_6735110	Confined	13,897	1/17/2017	345.05	364.59	-1.95	0.1
7	0_6735110	Confined	14,036	6/5/2017	343.82	364.08	-2.03	0.1
7	0_6735113	Confined	12,351	10/24/2012	370.96	365.59	0.54	0.1
7	0_6736105	Confined	10,393	6/15/2007	334.12	334.15	-0.03	1
7	0_6736105	Confined	10,489	9/19/2007	338.37	334.55	3.82	1
7	0_6736105	Confined	10,608	1/16/2008	337.66	334.94	2.72	1
7	0_6736105	Confined	10,775	7/1/2008	330.93	334.55	-3.62	1
7	0_6736105	Confined	11,204	9/3/2009	326.43	333.23	-6.80	1
7	0_6736105	Confined	11,477	6/3/2010	334.30	332.03	2.27	1
7	0_6736105	Confined	11,588	9/22/2010	329.86	331.47	-1.61	1
7	0_6736105	Confined	11,694	1/6/2011	331.02	330.94	0.08	1
7	0_6736105	Confined	11,841	6/2/2011	327.17	330.25	-3.08	1
7	0_6736105	Confined	11,938	9/7/2011	315.10	329.80	-14.70	1
7	0_6736105	Confined	12,071	1/18/2012	330.38	329.04	1.34	1
7	0_6736105	Confined	12,787	1/3/2014	324.53	316.82	7.71	1
7	0_6736105	Confined	12,940	6/5/2014	317.98	313.08	4.90	1
7	0_6736105	Confined	13,030	9/3/2014	315.47	310.88	4.59	1
7	0_6736105	Confined	13,192	2/12/2015	312.48	306.60	5.88	1
7	0_6736105	Confined	13,323	6/23/2015	312.50	302.44	10.06	1
7	0_6736105	Confined	13,534	1/20/2016	309.29	296.42	12.87	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6736105	Confined	13,669	6/3/2016	309.11	296.82	12.29	1
7	0_6736105	Confined	13,760	9/2/2016	309.96	297.10	12.86	1
7	0_6736105	Confined	13,899	1/19/2017	309.81	297.31	12.50	1
7	0_6736105	Confined	14,038	6/7/2017	306.98	296.25	10.73	1
7	0_6741102	Confined	778	2/16/1981	418.36	430.45	-1.21	0.1
7	0_6741102	Confined	1,195	4/9/1982	418.25	431.52	-1.33	0.1
7	0_6741102	Confined	1,508	2/16/1983	418.56	430.18	-1.16	0.1
7	0_6741102	Confined	1,865	2/8/1984	418.28	429.27	-1.10	0.1
7	0_6741102	Confined	2,227	2/4/1985	417.72	428.02	-1.03	0.1
7	0_6741102	Confined	2,606	2/18/1986	417.71	430.09	-1.24	0.1
7	0_6741102	Confined	2,893	12/2/1986	417.09	430.75	-1.37	0.1
7	0_6741102	Confined	3,334	2/16/1988	414.72	430.83	-1.61	0.1
7	0_6741102	Confined	3,700	2/16/1989	399.88	427.29	-2.74	0.1
7	0_6741102	Confined	3,999	12/12/1989	415.88	426.28	-1.04	0.1
7	0_6741102	Confined	4,363	12/11/1990	415.65	427.32	-1.17	0.1
7	0_6741102	Confined	5,119	1/5/1993	414.76	431.31	-1.66	0.1
7	0_6741102	Confined	5,450	12/2/1993	415.71	429.81	-1.41	0.1
7	0_6741102	Confined	5,483	1/4/1994	414.76	429.68	-1.49	0.1
7	0_6741102	Confined	5,512	2/2/1994	414.96	429.71	-1.48	0.1
7	0_6741102	Confined	5,539	3/1/1994	415.26	429.74	-1.45	0.1
7	0_6741102	Confined	5,573	4/4/1994	415.36	429.78	-1.44	0.1
7	0_6741102	Confined	5,601	5/2/1994	415.56	429.81	-1.43	0.1
7	0_6741102	Confined	5,640	6/10/1994	415.16	429.86	-1.47	0.1
7	0_6741102	Confined	5,661	7/1/1994	415.26	429.88	-1.46	0.1
7	0_6741102	Confined	5,847	1/3/1995	414.96	430.08	-1.51	0.1
7	0_6741102	Confined	6,211	1/2/1996	415.36	428.69	-1.33	0.1
7	0_6741102	Confined	6,637	3/3/1997	414.76	426.19	-1.14	0.1
7	0_6741102	Confined	6,973	2/2/1998	414.16	428.25	-1.41	0.1
7	0_6741102	Confined	7,324	1/19/1999	413.46	429.20	-1.57	0.1
7	0_6741102	Confined	7,927	9/13/2000	412.83	426.44	-1.36	0.1
7	0_6741102	Confined	8,069	2/2/2001	412.46	426.39	-1.39	0.1
7	0_6741102	Confined	8,429	1/28/2002	412.66	426.47	-1.38	0.1
7	0_6741102	Confined	8,774	1/8/2003	412.06	429.66	-1.76	0.1
7	0_6741102	Confined	9,143	1/12/2004	413.26	429.34	-1.61	0.1
7	0_6741102	Confined	9,558	3/2/2005	411.06	431.26	-2.02	0.1
7	0_6741102	Confined	9,873	1/11/2006	410.66	428.43	-1.78	0.1
7	0_6741102	Confined	10,230	1/3/2007	409.96	426.60	-1.66	0.1
7	0_6741102	Confined	10,600	1/8/2008	410.26	432.31	-2.20	0.1
7	0_6741102	Confined	10,992	2/3/2009	411.76	428.34	-1.66	0.1
7	0_6741102	Confined	11,343	1/20/2010	409.36	426.70	-1.73	0.1
7	0_6741102	Confined	12,059	1/6/2012	406.96	420.07	-1.31	0.1
7	0_6741102	Confined	12,090	2/6/2012	406.66	420.20	-1.35	0.1
7	0_6741102	Confined	12,114	3/1/2012	407.06	420.31	-1.32	0.1
7	0_6741102	Confined	12,149	4/5/2012	405.56	420.45	-1.49	0.1
7	0_6741102	Confined	12,176	5/2/2012	406.96	420.57	-1.36	0.1
7	0_6741102	Confined	12,211	6/6/2012	406.26	420.72	-1.45	0.1
7	0_6741102	Confined	12,236	7/1/2012	406.16	420.82	-1.47	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6741102	Confined	12,267	8/1/2012	406.36	420.95	-1.46	0.1
7	0_6741102	Confined	12,298	9/1/2012	405.86	421.08	-1.52	0.1
7	0_6741102	Confined	12,328	10/1/2012	406.46	421.21	-1.47	0.1
7	0_6741102	Confined	12,359	11/1/2012	406.76	421.34	-1.46	0.1
7	0_6741102	Confined	12,393	12/5/2012	407.06	421.48	-1.44	0.1
7	0_6741102	Confined	12,425	1/6/2013	406.56	421.61	-1.51	0.1
7	0_6741102	Confined	12,456	2/6/2013	402.26	421.71	-1.95	0.1
7	0_6741102	Confined	12,479	3/1/2013	406.06	421.79	-1.57	0.1
7	0_6741102	Confined	12,514	4/5/2013	406.26	421.90	-1.56	0.1
7	0_6741102	Confined	12,541	5/2/2013	406.06	421.99	-1.59	0.1
7	0_6741102	Confined	12,601	7/1/2013	406.66	422.18	-1.55	0.1
7	0_6741102	Confined	12,632	8/1/2013	406.76	422.28	-1.55	0.1
7	0_6741102	Confined	12,663	9/1/2013	406.46	422.38	-1.59	0.1
7	0_6741102	Confined	12,693	10/1/2013	406.86	422.48	-1.56	0.1
7	0_6741102	Confined	12,724	11/1/2013	406.76	422.58	-1.58	0.1
7	0_6741102	Confined	12,758	12/5/2013	406.46	422.69	-1.62	0.1
7	0_6741102	Confined	12,785	1/1/2014	404.96	422.77	-1.78	0.1
7	0_6741102	Confined	12,816	2/1/2014	405.96	422.69	-1.67	0.1
7	0_6741102	Confined	12,844	3/1/2014	411.16	422.62	-1.15	0.1
7	0_6741102	Confined	12,875	4/1/2014	404.26	422.54	-1.83	0.1
7	0_6741102	Confined	12,905	5/1/2014	405.16	422.47	-1.73	0.1
7	0_6741102	Confined	12,936	6/1/2014	406.56	422.39	-1.58	0.1
7	0_6741102	Confined	12,966	7/1/2014	406.46	422.32	-1.59	0.1
7	0_6741102	Confined	12,997	8/1/2014	405.26	422.24	-1.70	0.1
7	0_6741102	Confined	13,058	10/1/2014	405.26	422.09	-1.68	0.1
7	0_6741102	Confined	13,089	11/1/2014	404.46	422.01	-1.75	0.1
7	0_6741102	Confined	13,119	12/1/2014	403.96	421.93	-1.80	0.1
7	0_6741102	Confined	13,150	1/1/2015	403.86	421.87	-1.80	0.1
7	0_6741102	Confined	13,181	2/1/2015	403.76	422.08	-1.83	0.1
7	0_6741102	Confined	13,209	3/1/2015	404.46	422.27	-1.78	0.1
7	0_6741102	Confined	13,240	4/1/2015	403.86	422.49	-1.86	0.1
7	0_6741102	Confined	13,270	5/1/2015	403.96	422.69	-1.87	0.1
7	0_6741102	Confined	13,301	6/1/2015	404.06	422.91	-1.88	0.1
7	0_6741102	Confined	13,331	7/1/2015	404.16	423.11	-1.90	0.1
7	0_6741102	Confined	13,362	8/1/2015	404.16	423.33	-1.92	0.1
7	0_6741102	Confined	13,454	11/1/2015	403.56	423.96	-2.04	0.1
7	0_6741102	Confined	13,484	12/1/2015	403.26	424.17	-2.09	0.1
7	0_6741102	Confined	13,515	1/1/2016	403.46	424.38	-2.09	0.1
7	0_6741102	Confined	13,546	2/1/2016	403.06	424.49	-2.14	0.1
7	0_6741102	Confined	13,575	3/1/2016	403.26	424.60	-2.13	0.1
7	0_6741102	Confined	13,606	4/1/2016	402.96	424.71	-2.18	0.1
7	0_6741102	Confined	13,636	5/1/2016	403.56	424.83	-2.13	0.1
7	0_6741102	Confined	13,667	6/1/2016	404.16	424.94	-2.08	0.1
7	0_6741102	Confined	13,697	7/1/2016	402.86	425.05	-2.22	0.1
7	0_6741102	Confined	13,728	8/1/2016	402.76	425.16	-2.24	0.1
7	0_6741102	Confined	13,759	9/1/2016	402.86	425.28	-2.24	0.1
7	0_6741102	Confined	13,789	10/1/2016	402.96	425.39	-2.24	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6741102	Confined	13,820	11/1/2016	402.56	425.50	-2.29	0.1
7	0_6741102	Confined	13,850	12/1/2016	401.66	425.61	-2.40	0.1
7	0_6741102	Confined	13,881	1/1/2017	402.06	425.72	-2.37	0.1
7	0_6741102	Confined	13,912	2/1/2017	401.96	425.60	-2.36	0.1
7	0_6741102	Confined	13,940	3/1/2017	401.26	425.49	-2.42	0.1
7	0_6741102	Confined	14,124	9/1/2017	400.36	424.77	-2.44	0.1
7	0_6741102	Confined	14,154	10/1/2017	399.96	424.65	-2.47	0.1
7	0_6741102	Confined	14,185	11/1/2017	400.66	424.53	-2.39	0.1
7	0_6741102	Confined	14,215	12/1/2017	400.56	424.42	-2.39	0.1
7	0_6741305	Confined	8,443	2/11/2002	436.97	413.25	23.72	1
7	0_6741305	Confined	8,774	1/8/2003	436.77	416.14	20.63	1
7	0_6741305	Confined	9,143	1/12/2004	434.67	416.27	18.40	1
7	0_6741305	Confined	9,558	3/2/2005	434.47	418.47	16.00	1
7	0_6741305	Confined	9,873	1/11/2006	432.57	415.91	16.66	1
7	0_6741305	Confined	10,230	1/3/2007	431.37	413.95	17.42	1
7	0_6741305	Confined	10,600	1/8/2008	431.67	419.51	12.16	1
7	0_6741305	Confined	10,992	2/3/2009	430.57	415.82	14.75	1
7	0_6741305	Confined	11,343	1/20/2010	429.88	413.70	16.18	1
7	0_6741305	Confined	12,059	1/6/2012	424.97	406.08	18.89	1
7	0_6741305	Confined	12,090	2/6/2012	425.17	406.17	19.00	1
7	0_6741305	Confined	12,114	3/1/2012	425.67	406.24	19.43	1
7	0_6741305	Confined	12,176	5/2/2012	425.97	406.43	19.54	1
7	0_6741305	Confined	12,236	7/1/2012	424.37	406.61	17.76	1
7	0_6741305	Confined	12,425	1/6/2013	424.27	407.17	17.10	1
7	0_6741305	Confined	12,601	7/1/2013	424.37	407.31	17.06	1
7	0_6741305	Confined	12,816	2/1/2014	427.37	407.30	20.07	1
7	0_6741305	Confined	12,844	3/1/2014	428.97	407.16	21.81	1
7	0_6741305	Confined	12,875	4/1/2014	427.17	407.00	20.17	1
7	0_6741305	Confined	12,997	8/1/2014	427.77	406.38	21.39	1
7	0_6741305	Confined	13,058	10/1/2014	427.67	406.07	21.60	1
7	0_6741305	Confined	13,119	12/1/2014	427.37	405.76	21.61	1
7	0_6741305	Confined	13,150	1/1/2015	427.37	405.61	21.76	1
7	0_6741305	Confined	13,181	2/1/2015	427.57	405.69	21.88	1
7	0_6741305	Confined	13,209	3/1/2015	427.07	405.75	21.32	1
7	0_6741305	Confined	13,240	4/1/2015	427.67	405.82	21.85	1
7	0_6741305	Confined	13,270	5/1/2015	427.17	405.89	21.28	1
7	0_6741305	Confined	13,362	8/1/2015	427.77	406.11	21.66	1
7	0_6741305	Confined	13,454	11/1/2015	427.47	406.33	21.14	1
7	0_6741305	Confined	13,484	12/1/2015	427.37	406.40	20.97	1
7	0_6741305	Confined	13,515	1/1/2016	427.27	406.47	20.80	1
7	0_6741305	Confined	13,546	2/1/2016	427.57	406.62	20.95	1
7	0_6741305	Confined	13,606	4/1/2016	427.47	406.90	20.57	1
7	0_6741305	Confined	13,636	5/1/2016	427.17	407.04	20.13	1
7	0_6741305	Confined	13,667	6/1/2016	426.97	407.19	19.78	1
7	0_6741305	Confined	13,697	7/1/2016	427.57	407.33	20.24	1
7	0_6741305	Confined	13,728	8/1/2016	427.47	407.48	19.99	1
7	0_6741305	Confined	13,759	9/1/2016	427.47	407.62	19.85	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6741305	Confined	13,820	11/1/2016	428.37	407.91	20.46	1
7	0_6741305	Confined	13,850	12/1/2016	427.27	408.05	19.22	1
7	0_6741305	Confined	13,881	1/1/2017	427.17	408.19	18.98	1
7	0_6741305	Confined	13,912	2/1/2017	428.37	408.06	20.31	1
7	0_6741305	Confined	13,940	3/1/2017	428.47	407.95	20.52	1
7	0_6741801	Confined	778	2/16/1981	400.66	387.83	12.83	1
7	0_6741801	Confined	1,145	2/18/1982	401.54	388.46	13.08	1
7	0_6741801	Confined	1,508	2/16/1983	399.34	387.89	11.45	1
7	0_6741801	Confined	1,865	2/8/1984	399.39	387.59	11.80	1
7	0_6741801	Confined	2,606	2/18/1986	409.41	387.86	21.55	1
7	0_6741801	Confined	2,893	12/2/1986	403.99	388.27	15.72	1
7	0_6741801	Confined	3,333	2/15/1988	405.41	388.16	17.25	1
7	0_6741801	Confined	3,700	2/16/1989	396.41	386.18	10.23	1
7	0_6741801	Confined	3,999	12/12/1989	404.58	385.50	19.08	1
7	0_6741801	Confined	4,363	12/11/1990	400.67	384.81	15.86	1
7	0_6742104	Confined	11,476	6/2/2010	374.21	385.25	-11.04	1
7	0_6742104	Confined	11,587	9/21/2010	372.52	384.51	-11.99	1
7	0_6742104	Confined	11,693	1/5/2011	374.76	383.79	-9.03	1
7	0_6742104	Confined	11,961	9/30/2011	367.06	381.25	-14.19	1
7	0_6742104	Confined	12,078	1/25/2012	370.51	380.34	-9.83	1
7	0_6742104	Confined	12,210	6/5/2012	367.92	380.11	-12.19	1
7	0_6742104	Confined	12,815	1/31/2014	366.56	376.96	-10.40	1
7	0_6742104	Confined	13,029	9/2/2014	360.97	374.64	-13.67	1
7	0_6742104	Confined	13,157	1/8/2015	358.90	373.26	-14.36	1
7	0_6742104	Confined	13,312	6/12/2015	356.34	371.72	-15.38	1
7	0_6742104	Confined	13,534	1/20/2016	352.91	369.79	-16.88	1
7	0_6742104	Confined	13,680	6/14/2016	356.22	370.42	-14.20	1
7	0_6742104	Confined	13,773	9/15/2016	352.07	370.83	-18.76	1
7	0_6742104	Confined	13,884	1/4/2017	356.50	371.28	-14.78	1
7	0_6742104	Confined	14,036	6/5/2017	351.91	370.58	-18.67	1
7	0_6742204	Confined	8,164	5/8/2001	381.58	368.25	1.33	0.1
7	0_6742204	Confined	8,451	2/19/2002	384.92	368.41	1.65	0.1
7	0_6742204	Confined	8,531	5/10/2002	384.73	368.65	1.61	0.1
7	0_6742204	Confined	8,635	8/22/2002	379.25	368.96	1.03	0.1
7	0_6742204	Confined	8,928	6/11/2003	354.50	369.43	-1.49	0.1
7	0_6742204	Confined	9,033	9/24/2003	371.85	369.48	0.24	0.1
7	0_6742204	Confined	9,152	1/21/2004	369.40	369.60	-0.02	0.1
7	0_6742204	Confined	9,398	9/23/2004	371.42	370.51	0.09	0.1
7	0_6742204	Confined	9,523	1/26/2005	372.85	370.79	0.21	0.1
7	0_6742204	Confined	9,879	1/17/2006	371.77	369.72	0.20	0.1
7	0_6742204	Confined	10,392	6/14/2007	376.53	370.26	0.63	0.1
7	0_6742204	Confined	10,488	9/18/2007	376.40	370.95	0.54	0.1
7	0_6742204	Confined	10,607	1/15/2008	375.87	371.63	0.42	0.1
7	0_6742204	Confined	10,774	6/30/2008	369.90	370.90	-0.10	0.1
7	0_6742204	Confined	11,204	9/3/2009	367.02	369.12	-0.21	0.1
7	0_6742204	Confined	11,328	1/5/2010	371.83	368.61	0.32	0.1
7	0_6742204	Confined	11,476	6/2/2010	374.72	367.86	0.69	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6742204	Confined	11,587	9/21/2010	372.60	367.29	0.53	0.1
7	0_6742204	Confined	11,693	1/5/2011	374.61	366.74	0.79	0.1
7	0_6742204	Confined	11,840	6/1/2011	370.83	365.67	0.52	0.1
7	0_6742204	Confined	11,937	9/6/2011	363.28	364.97	-0.17	0.1
7	0_6742204	Confined	12,070	1/17/2012	368.56	364.07	0.45	0.1
7	0_6742204	Confined	12,210	6/5/2012	361.94	363.54	-0.16	0.1
7	0_6742204	Confined	12,302	9/5/2012	357.88	363.20	-0.53	0.1
7	0_6742204	Confined	12,668	9/6/2013	357.72	360.56	-0.28	0.1
7	0_6742204	Confined	12,786	1/2/2014	362.73	359.51	0.32	0.1
7	0_6742204	Confined	12,938	6/3/2014	362.18	357.69	0.45	0.1
7	0_6742204	Confined	13,029	9/2/2014	355.93	356.60	-0.07	0.1
7	0_6742204	Confined	13,148	12/30/2014	356.88	355.18	0.17	0.1
7	0_6742204	Confined	13,305	6/5/2015	357.78	353.14	0.46	0.1
7	0_6742204	Confined	13,519	1/5/2016	351.00	350.45	0.05	0.1
7	0_6742204	Confined	13,668	6/2/2016	358.52	351.10	0.74	0.1
7	0_6742204	Confined	13,884	1/4/2017	358.63	351.99	0.66	0.1
7	0_6742304	Confined	8,263	8/15/2001	354.21	351.07	3.14	1
7	0_6742304	Confined	8,663	9/19/2002	348.39	351.35	-2.96	1
7	0_6742304	Confined	8,928	6/11/2003	332.38	351.56	-19.18	1
7	0_6742304	Confined	9,033	9/24/2003	337.74	351.63	-13.89	1
7	0_6742304	Confined	9,152	1/21/2004	342.94	351.74	-8.80	1
7	0_6742304	Confined	9,398	9/23/2004	338.77	352.31	-13.54	1
7	0_6742304	Confined	9,523	1/26/2005	343.23	352.51	-9.28	1
7	0_6742304	Confined	9,749	9/9/2005	330.03	352.23	-22.20	1
7	0_6742304	Confined	9,878	1/16/2006	338.86	352.08	-13.22	1
7	0_6742304	Confined	10,392	6/14/2007	335.94	352.56	-16.62	1
7	0_6742304	Confined	10,488	9/18/2007	337.99	352.96	-14.97	1
7	0_6742304	Confined	10,607	1/15/2008	339.22	353.35	-14.13	1
7	0_6742304	Confined	10,774	6/30/2008	326.21	352.95	-26.74	1
7	0_6742304	Confined	11,203	9/2/2009	321.14	351.70	-30.56	1
7	0_6742304	Confined	11,327	1/4/2010	337.89	351.28	-13.39	1
7	0_6742304	Confined	11,476	6/2/2010	336.14	350.58	-14.44	1
7	0_6742304	Confined	11,587	9/21/2010	332.66	350.05	-17.39	1
7	0_6742304	Confined	11,693	1/5/2011	339.04	349.55	-10.51	1
7	0_6742304	Confined	11,840	6/1/2011	328.34	348.90	-20.56	1
7	0_6742304	Confined	11,937	9/6/2011	317.16	348.47	-31.31	1
7	0_6742304	Confined	12,070	1/17/2012	332.79	347.83	-15.04	1
7	0_6742304	Confined	12,210	6/5/2012	329.34	346.81	-17.47	1
7	0_6742304	Confined	12,302	9/5/2012	317.91	346.15	-28.24	1
7	0_6742304	Confined	12,668	9/6/2013	312.76	341.98	-29.22	1
7	0_6742304	Confined	12,786	1/2/2014	319.54	340.40	-20.86	1
7	0_6742304	Confined	12,938	6/3/2014	305.67	338.08	-32.41	1
7	0_6742304	Confined	13,029	9/2/2014	291.32	336.69	-45.37	1
7	0_6742304	Confined	13,148	12/30/2014	293.69	334.87	-41.18	1
7	0_6742304	Confined	13,305	6/5/2015	305.30	331.79	-26.49	1
7	0_6742304	Confined	13,519	1/5/2016	294.29	327.70	-33.41	1
7	0_6742304	Confined	13,668	6/2/2016	303.60	328.39	-24.79	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6742304	Confined	13,889	1/9/2017	303.10	329.32	-26.22	1
7	0_6742304	Confined	14,036	6/5/2017	290.58	328.59	-38.01	1
7	0_6742608	Confined	8,263	8/15/2001	337.40	350.61	-6.61	0.5
7	0_6742608	Confined	8,451	2/19/2002	353.10	350.78	1.16	0.5
7	0_6742608	Confined	8,656	9/12/2002	356.80	350.50	3.15	0.5
7	0_6742608	Confined	8,928	6/11/2003	342.27	350.64	-4.18	0.5
7	0_6742608	Confined	9,033	9/24/2003	345.70	350.83	-2.56	0.5
7	0_6742608	Confined	9,152	1/21/2004	347.70	351.07	-1.69	0.5
7	0_6742608	Confined	9,398	9/23/2004	345.27	351.95	-3.34	0.5
7	0_6742608	Confined	9,523	1/26/2005	349.15	352.29	-1.57	0.5
7	0_6742608	Confined	9,749	9/9/2005	337.80	352.16	-7.18	0.5
7	0_6742608	Confined	9,879	1/17/2006	344.74	352.11	-3.69	0.5
7	0_6742608	Confined	10,392	6/14/2007	342.10	353.50	-5.70	0.5
7	0_6742608	Confined	10,488	9/18/2007	343.47	354.07	-5.30	0.5
7	0_6742608	Confined	10,607	1/15/2008	345.18	354.63	-4.72	0.5
7	0_6742608	Confined	10,774	6/30/2008	333.74	353.99	-10.12	0.5
7	0_6742608	Confined	11,203	9/2/2009	327.51	351.45	-11.97	0.5
7	0_6742608	Confined	11,327	1/4/2010	342.69	350.51	-3.91	0.5
7	0_6742608	Confined	11,476	6/2/2010	341.03	348.78	-3.88	0.5
7	0_6742608	Confined	11,587	9/21/2010	339.67	347.50	-3.91	0.5
7	0_6742608	Confined	11,693	1/5/2011	343.17	346.30	-1.57	0.5
7	0_6742608	Confined	11,937	9/6/2011	316.38	344.84	-14.23	0.5
7	0_6742608	Confined	12,070	1/17/2012	335.91	343.79	-3.94	0.5
7	0_6742608	Confined	12,210	6/5/2012	329.12	340.86	-5.87	0.5
7	0_6742608	Confined	12,302	9/5/2012	314.88	338.93	-12.02	0.5
7	0_6742608	Confined	12,786	1/2/2014	315.09	322.75	-3.83	0.5
7	0_6742608	Confined	12,938	6/3/2014	309.70	316.75	-3.53	0.5
7	0_6742608	Confined	13,148	12/30/2014	311.97	308.47	1.75	0.5
7	0_6742608	Confined	13,305	6/5/2015	308.43	299.95	4.24	0.5
7	0_6742608	Confined	13,519	1/5/2016	307.95	288.67	9.64	0.5
7	0_6742608	Confined	13,668	6/2/2016	310.69	291.08	9.81	0.5
7	0_6742608	Confined	13,884	1/4/2017	307.38	294.45	6.46	0.5
7	0_6742608	Confined	14,036	6/5/2017	292.45	292.48	-0.01	0.5
7	0_6749207	Confined	7,751	3/21/2000	413.11	371.49	41.62	1
7	0_6750203	Confined	775	2/13/1981	378.32	360.29	18.03	1
7	0_6848502	Unconfined	1,146	2/19/1982	396.08	404.31	-8.23	1
7	0_6848502	Unconfined	1,508	2/16/1983	398.71	403.96	-5.25	1
7	0_6848502	Unconfined	2,229	2/6/1985	397.86	403.64	-5.78	1
7	0_6848502	Unconfined	2,894	12/3/1986	397.71	404.19	-6.48	1
7	0_6848502	Unconfined	3,334	2/16/1988	398.19	404.14	-5.95	1
7	0_6848502	Unconfined	3,699	2/15/1989	396.93	403.39	-6.46	1
7	0_6848502	Unconfined	4,000	12/13/1989	396.58	403.30	-6.72	1
7	0_6848502	Unconfined	4,363	12/11/1990	396.43	403.48	-7.05	1
7	0_6848502	Unconfined	5,120	1/6/1993	398.71	404.10	-5.39	1
7	0_6848502	Unconfined	5,484	1/5/1994	398.91	403.79	-4.88	1
7	0_6848502	Unconfined	5,850	1/6/1995	400.81	403.89	-3.08	1
7	0_6848502	Unconfined	6,637	3/3/1997	397.91	403.11	-5.20	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6848502	Unconfined	6,975	2/4/1998	398.31	403.63	-5.32	1
7	0_6848502	Unconfined	7,324	1/19/1999	398.11	403.71	-5.60	1
7	0_6848502	Unconfined	8,081	2/14/2001	396.51	403.07	-6.56	1
7	0_6848502	Unconfined	8,430	1/29/2002	392.91	403.16	-10.25	1
7	0_6848502	Unconfined	8,793	1/27/2003	394.91	403.69	-8.78	1
7	0_6848502	Unconfined	9,159	1/28/2004	392.01	403.56	-11.55	1
7	0_6848502	Unconfined	9,564	3/8/2005	393.21	403.95	-10.74	1
7	0_6848502	Unconfined	9,895	2/2/2006	390.91	403.33	-12.42	1
7	0_6848502	Unconfined	10,001	5/19/2006	392.05	403.28	-11.23	1
7	0_6848502	Unconfined	10,237	1/10/2007	391.61	403.21	-11.60	1
7	0_6848502	Unconfined	10,278	2/20/2007	395.95	403.36	-7.41	1
7	0_6848502	Unconfined	10,292	3/6/2007	395.76	403.42	-7.66	1
7	0_6848502	Unconfined	10,337	4/20/2007	396.87	403.58	-6.71	1
7	0_6848502	Unconfined	10,420	7/12/2007	397.53	403.89	-6.36	1
7	0_6848502	Unconfined	10,474	9/4/2007	399.09	404.09	-5.00	1
7	0_6848502	Unconfined	10,531	10/31/2007	397.72	404.31	-6.59	1
7	0_6848502	Unconfined	10,589	12/28/2007	397.05	404.52	-7.47	1
7	0_6848502	Unconfined	10,601	1/9/2008	397.01	404.51	-7.50	1
7	0_6848502	Unconfined	10,621	1/29/2008	396.91	404.45	-7.54	1
7	0_6848502	Unconfined	10,649	2/26/2008	396.69	404.36	-7.67	1
7	0_6848502	Unconfined	10,740	5/27/2008	396.20	404.09	-7.89	1
7	0_6848502	Unconfined	10,869	10/3/2008	395.68	403.71	-8.03	1
7	0_6848502	Unconfined	10,909	11/12/2008	395.58	403.59	-8.01	1
7	0_6848502	Unconfined	10,910	11/13/2008	395.58	403.59	-8.01	1
7	0_6848502	Unconfined	10,958	12/31/2008	395.61	403.45	-7.84	1
7	0_6848502	Unconfined	11,370	2/16/2010	397.31	402.96	-5.65	1
7	0_6848907	Confined	779	2/17/1981	404.84	407.61	-0.28	0.1
7	0_6848907	Confined	1,146	2/19/1982	403.83	408.34	-0.45	0.1
7	0_6848907	Confined	1,508	2/16/1983	402.99	407.47	-0.45	0.1
7	0_6848907	Confined	2,229	2/6/1985	402.08	406.47	-0.44	0.1
7	0_6848907	Confined	2,605	2/17/1986	400.86	407.72	-0.69	0.1
7	0_6848907	Confined	3,334	2/16/1988	400.78	407.90	-0.71	0.1
7	0_6848907	Confined	3,699	2/15/1989	386.22	405.86	-1.96	0.1
7	0_6848907	Confined	4,000	12/13/1989	390.61	405.44	-1.48	0.1
7	0_6848907	Confined	4,363	12/11/1990	398.43	405.75	-0.73	0.1
7	0_6848907	Confined	7,324	1/19/1999	385.21	406.38	-2.12	0.1
7	0_6848907	Confined	8,081	2/14/2001	391.41	404.42	-1.30	0.1
7	0_6848907	Confined	8,430	1/29/2002	396.81	404.69	-0.79	0.1
7	0_6848907	Confined	8,793	1/27/2003	392.51	405.97	-1.35	0.1
7	0_6848907	Confined	9,159	1/28/2004	403.51	405.86	-0.24	0.1
7	0_6848907	Confined	9,564	3/8/2005	405.41	406.99	-0.16	0.1
7	0_6848907	Confined	9,895	2/2/2006	405.81	405.47	0.03	0.1
7	0_6848907	Confined	10,293	3/7/2007	404.01	405.68	-0.17	0.1
7	0_6848907	Confined	10,644	2/21/2008	404.81	408.28	-0.35	0.1
7	0_6848907	Confined	11,040	3/23/2009	404.21	405.62	-0.14	0.1
7	0_6848907	Confined	11,420	4/7/2010	403.41	403.89	-0.05	0.1
7	0_6850406	Unconfined	3,057	5/15/1987	697.85	656.86	20.49	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6850702	Unconfined	1,144	2/17/1982	566.55	590.20	-23.65	1
7	0_6850702	Unconfined	1,507	2/15/1983	565.72	591.34	-25.62	1
7	0_6850702	Unconfined	1,880	2/23/1984	565.80	589.04	-23.24	1
7	0_6850702	Unconfined	2,234	2/11/1985	564.10	572.51	-8.41	1
7	0_6851701	Unconfined	773	2/11/1981	587.03	581.92	5.11	1
7	0_6851701	Unconfined	2,231	2/8/1985	587.63	582.04	5.59	1
7	0_6851701	Unconfined	2,595	2/7/1986	587.28	587.14	0.14	1
7	0_6851701	Unconfined	2,999	3/18/1987	583.60	588.38	-4.78	1
7	0_6851701	Unconfined	3,335	2/17/1988	585.88	588.72	-2.84	1
7	0_6851701	Unconfined	3,705	2/21/1989	586.86	583.45	3.41	1
7	0_6851701	Unconfined	4,082	3/5/1990	586.46	583.55	2.91	1
7	0_6851701	Unconfined	4,408	1/25/1991	586.03	586.65	-0.62	1
7	0_6851701	Unconfined	4,777	1/29/1992	586.03	588.61	-2.58	1
7	0_6851701	Unconfined	5,122	1/8/1993	587.83	590.34	-2.51	1
7	0_6851701	Unconfined	5,867	1/23/1995	586.58	588.42	-1.84	1
7	0_6851701	Unconfined	6,262	2/22/1996	581.68	585.20	-3.52	1
7	0_6851701	Unconfined	6,660	3/26/1997	584.28	582.26	2.02	1
7	0_6851701	Unconfined	6,966	1/26/1998	582.18	586.47	-4.29	1
7	0_6851701	Unconfined	7,313	1/8/1999	583.33	586.89	-3.56	1
7	0_6851701	Unconfined	8,044	1/8/2001	580.58	582.98	-2.40	1
7	0_6851701	Unconfined	8,408	1/7/2002	580.88	581.53	-0.65	1
7	0_6851701	Unconfined	8,796	1/30/2003	584.08	585.73	-1.65	1
7	0_6851701	Unconfined	9,150	1/19/2004	582.88	585.01	-2.13	1
7	0_6851701	Unconfined	9,542	2/14/2005	583.48	586.25	-2.77	1
7	0_6851701	Unconfined	9,873	1/11/2006	580.78	582.02	-1.24	1
7	0_6851701	Unconfined	10,266	2/8/2007	582.38	579.33	3.05	1
7	0_6851701	Unconfined	10,613	1/21/2008	583.28	586.18	-2.90	1
7	0_6851701	Unconfined	10,998	2/9/2009	581.38	580.66	0.72	1
7	0_6851701	Unconfined	11,378	2/24/2010	581.98	579.56	2.42	1
7	0_6852718	Unconfined	773	2/11/1981	457.88	461.51	-1.82	0.5
7	0_6852718	Unconfined	1,166	3/11/1982	473.91	469.52	2.20	0.5
7	0_6852718	Unconfined	1,502	2/10/1983	467.75	470.84	-1.54	0.5
7	0_6852718	Unconfined	2,235	2/12/1985	470.33	475.78	-2.72	0.5
7	0_6852718	Unconfined	2,600	2/12/1986	467.46	484.96	-8.75	0.5
7	0_6852718	Unconfined	2,999	3/18/1987	469.04	490.88	-10.92	0.5
7	0_6852718	Unconfined	3,335	2/17/1988	465.73	495.14	-14.71	0.5
7	0_6852718	Unconfined	3,705	2/21/1989	453.01	488.63	-17.81	0.5
7	0_6852718	Unconfined	4,083	3/6/1990	447.93	484.52	-18.29	0.5
7	0_6852718	Unconfined	4,409	1/26/1991	459.34	486.21	-13.43	0.5
7	0_6852718	Unconfined	5,450	12/2/1993	463.68	495.08	-15.70	0.5
7	0_6852718	Unconfined	5,482	1/3/1994	462.43	494.82	-16.20	0.5
7	0_6852718	Unconfined	5,512	2/2/1994	463.78	494.92	-15.57	0.5
7	0_6852718	Unconfined	5,675	7/15/1994	459.88	495.47	-17.79	0.5
7	0_6852718	Unconfined	5,847	1/3/1995	464.08	496.00	-15.96	0.5
7	0_6852718	Unconfined	6,211	1/2/1996	463.78	491.62	-13.92	0.5
7	0_6852718	Unconfined	6,637	3/3/1997	462.28	483.97	-10.84	0.5
7	0_6852718	Unconfined	6,973	2/2/1998	459.93	488.74	-14.40	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6852718	Unconfined	7,312	1/7/1999	459.78	490.86	-15.54	0.5
7	0_6852718	Unconfined	8,044	1/8/2001	457.78	479.47	-10.85	0.5
7	0_6852718	Unconfined	8,408	1/7/2002	457.28	476.56	-9.64	0.5
7	0_6852718	Unconfined	8,773	1/7/2003	456.88	482.98	-13.05	0.5
7	0_6852718	Unconfined	9,165	2/3/2004	458.98	482.37	-11.70	0.5
7	0_6852718	Unconfined	9,521	1/24/2005	459.08	488.37	-14.65	0.5
7	0_6852718	Unconfined	9,865	1/3/2006	460.08	481.40	-10.66	0.5
7	0_6852718	Unconfined	10,229	1/2/2007	459.68	476.22	-8.27	0.5
7	0_6852718	Unconfined	10,594	1/2/2008	459.58	492.23	-16.33	0.5
7	0_6852718	Unconfined	10,988	1/30/2009	459.48	484.32	-12.42	0.5
7	0_6852718	Unconfined	11,323	12/31/2009	459.88	478.38	-9.25	0.5
7	0_6852718	Unconfined	12,059	1/6/2012	462.88	446.57	8.15	0.5
7	0_6852718	Unconfined	12,090	2/6/2012	463.08	446.80	8.14	0.5
7	0_6852718	Unconfined	12,114	3/1/2012	462.48	446.98	7.75	0.5
7	0_6852718	Unconfined	12,149	4/5/2012	463.28	447.25	8.02	0.5
7	0_6852718	Unconfined	12,206	6/1/2012	462.78	447.68	7.55	0.5
7	0_6852718	Unconfined	12,241	7/6/2012	460.28	447.94	6.17	0.5
7	0_6852718	Unconfined	12,269	8/3/2012	461.98	448.15	6.91	0.5
7	0_6852718	Unconfined	12,308	9/11/2012	458.88	448.44	5.22	0.5
7	0_6852718	Unconfined	12,347	10/20/2012	460.28	448.74	5.77	0.5
7	0_6852718	Unconfined	12,386	11/28/2012	458.78	449.03	4.87	0.5
7	0_6852718	Unconfined	12,394	12/6/2012	458.78	449.09	4.84	0.5
7	0_6852722	Unconfined	8,408	1/7/2002	458.42	476.97	-18.55	1
7	0_6852722	Unconfined	8,773	1/7/2003	468.02	483.09	-15.07	1
7	0_6852722	Unconfined	9,138	1/7/2004	461.02	481.83	-20.81	1
7	0_6852722	Unconfined	9,528	1/31/2005	473.12	488.15	-15.03	1
7	0_6852722	Unconfined	9,865	1/3/2006	474.82	481.40	-6.58	1
7	0_6852722	Unconfined	10,229	1/2/2007	473.32	476.43	-3.11	1
7	0_6852722	Unconfined	10,594	1/2/2008	472.42	492.55	-20.13	1
7	0_6852722	Unconfined	10,988	1/30/2009	474.02	484.68	-10.66	1
7	0_6852722	Unconfined	11,323	12/31/2009	471.32	478.50	-7.18	1
7	0_6852722	Unconfined	12,059	1/6/2012	470.32	445.72	24.60	1
7	0_6852722	Unconfined	12,090	2/6/2012	470.52	445.98	24.54	1
7	0_6852722	Unconfined	12,114	3/1/2012	469.62	446.18	23.44	1
7	0_6852722	Unconfined	12,149	4/5/2012	469.92	446.48	23.44	1
7	0_6852722	Unconfined	12,176	5/2/2012	468.62	446.70	21.92	1
7	0_6852722	Unconfined	12,206	6/1/2012	468.52	446.95	21.57	1
7	0_6852722	Unconfined	12,241	7/6/2012	468.72	447.25	21.47	1
7	0_6852722	Unconfined	12,269	8/3/2012	468.52	447.48	21.04	1
7	0_6852722	Unconfined	12,308	9/11/2012	467.92	447.81	20.11	1
7	0_6852722	Unconfined	12,347	10/20/2012	468.02	448.14	19.88	1
7	0_6852722	Unconfined	12,386	11/28/2012	467.72	448.46	19.26	1
7	0_6852722	Unconfined	12,394	12/6/2012	467.92	448.53	19.39	1
7	0_6852722	Unconfined	12,425	1/6/2013	467.52	448.84	18.68	1
7	0_6852722	Unconfined	12,456	2/6/2013	468.52	449.39	19.13	1
7	0_6852722	Unconfined	12,479	3/1/2013	468.12	449.79	18.33	1
7	0_6852722	Unconfined	12,514	4/5/2013	468.52	450.41	18.11	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6852722	Unconfined	12,541	5/2/2013	468.72	450.88	17.84	1
7	0_6852722	Unconfined	12,571	6/1/2013	468.52	451.41	17.11	1
7	0_6852722	Unconfined	12,606	7/6/2013	468.92	452.02	16.90	1
7	0_6852722	Unconfined	12,634	8/3/2013	469.32	452.51	16.81	1
7	0_6852722	Unconfined	12,673	9/11/2013	468.42	453.20	15.22	1
7	0_6852722	Unconfined	12,693	10/1/2013	469.52	453.55	15.97	1
7	0_6852722	Unconfined	12,744	11/21/2013	469.32	454.44	14.88	1
7	0_6852722	Unconfined	12,754	12/1/2013	469.12	454.62	14.50	1
7	0_6852722	Unconfined	12,785	1/1/2014	468.62	455.16	13.46	1
7	0_6852722	Unconfined	12,816	2/1/2014	468.72	455.60	13.12	1
7	0_6852722	Unconfined	12,844	3/1/2014	472.52	456.00	16.52	1
7	0_6852722	Unconfined	12,875	4/1/2014	468.22	456.44	11.78	1
7	0_6852722	Unconfined	12,905	5/1/2014	468.52	456.86	11.66	1
7	0_6852722	Unconfined	12,936	6/1/2014	466.62	457.30	9.32	1
7	0_6852722	Unconfined	12,997	8/1/2014	465.82	458.16	7.66	1
7	0_6852722	Unconfined	13,028	9/1/2014	468.32	458.60	9.72	1
7	0_6852722	Unconfined	13,119	12/1/2014	468.42	459.89	8.53	1
7	0_6852722	Unconfined	13,150	1/1/2015	468.12	460.37	7.75	1
7	0_6852906	Unconfined	3,383	4/5/1988	430.05	463.93	-33.88	1
7	0_6853703	Unconfined	781	2/19/1981	478.30	446.56	31.74	1
7	0_6853703	Unconfined	1,135	2/8/1982	475.21	452.64	22.57	1
7	0_6853703	Unconfined	2,235	2/12/1985	475.29	451.86	23.43	1
7	0_6853703	Unconfined	2,600	2/12/1986	470.80	459.67	11.13	1
7	0_6853703	Unconfined	2,896	12/5/1986	472.48	463.68	8.80	1
7	0_6853703	Unconfined	3,363	3/16/1988	469.83	467.96	1.87	1
7	0_6853703	Unconfined	3,676	1/23/1989	473.65	461.77	11.88	1
7	0_6853703	Unconfined	4,041	1/23/1990	459.45	457.86	1.59	1
7	0_6853703	Unconfined	4,405	1/22/1991	463.45	459.96	3.49	1
7	0_6853703	Unconfined	4,777	1/29/1992	467.05	465.07	1.98	1
7	0_6853703	Unconfined	5,176	3/3/1993	487.57	471.74	15.83	1
7	0_6853703	Unconfined	6,287	3/18/1996	464.72	465.01	-0.29	1
7	0_6853707	Unconfined	1,868	2/11/1984	456.36	446.84	9.52	1
7	0_6853805	Confined	781	2/19/1981	416.07	370.40	4.57	0.1
7	0_6853805	Confined	1,135	2/8/1982	414.12	381.07	3.30	0.1
7	0_6853805	Confined	2,235	2/12/1985	409.85	394.26	1.56	0.1
7	0_6853810	Unconfined	12,347	10/20/2012	374.27	320.17	54.10	1
7	0_6853810	Unconfined	12,386	11/28/2012	381.67	322.66	59.01	1
7	0_6853810	Unconfined	12,394	12/6/2012	367.27	323.17	44.10	1
7	0_6853810	Unconfined	12,425	1/6/2013	360.97	325.05	35.92	1
7	0_6853810	Unconfined	12,456	2/6/2013	361.37	326.50	34.87	1
7	0_6853810	Unconfined	12,479	3/1/2013	356.67	327.58	29.09	1
7	0_6853810	Unconfined	12,514	4/5/2013	352.77	329.21	23.56	1
7	0_6853810	Unconfined	12,541	5/2/2013	352.37	330.47	21.90	1
7	0_6853810	Unconfined	12,571	6/1/2013	352.27	331.88	20.39	1
7	0_6853810	Unconfined	12,606	7/6/2013	352.37	333.51	18.86	1
7	0_6853810	Unconfined	12,634	8/3/2013	349.57	334.82	14.75	1
7	0_6853810	Unconfined	12,673	9/11/2013	347.57	336.64	10.93	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853810	Unconfined	12,693	10/1/2013	357.97	337.58	20.39	1
7	0_6853810	Unconfined	12,724	11/1/2013	363.57	339.03	24.54	1
7	0_6853810	Unconfined	12,754	12/1/2013	372.57	340.43	32.14	1
7	0_6853810	Unconfined	12,785	1/1/2014	372.27	341.87	30.40	1
7	0_6853810	Unconfined	12,816	2/1/2014	361.77	342.98	18.79	1
7	0_6853810	Unconfined	12,844	3/1/2014	359.67	343.98	15.69	1
7	0_6853810	Unconfined	12,875	4/1/2014	347.77	345.08	2.69	1
7	0_6853810	Unconfined	12,905	5/1/2014	343.17	346.15	-2.98	1
7	0_6853810	Unconfined	12,936	6/1/2014	341.27	347.26	-5.99	1
7	0_6853810	Unconfined	12,966	7/1/2014	339.87	348.33	-8.46	1
7	0_6853810	Unconfined	12,997	8/1/2014	336.07	349.44	-13.37	1
7	0_6853810	Unconfined	13,028	9/1/2014	324.67	350.55	-25.88	1
7	0_6853810	Unconfined	13,058	10/1/2014	326.67	351.62	-24.95	1
7	0_6853810	Unconfined	13,089	11/1/2014	343.17	352.73	-9.56	1
7	0_6853810	Unconfined	13,119	12/1/2014	350.47	353.80	-3.33	1
7	0_6853810	Unconfined	13,150	1/1/2015	362.07	354.93	7.14	1
7	0_6853810	Unconfined	13,181	2/1/2015	347.07	356.85	-9.78	1
7	0_6853810	Unconfined	13,209	3/1/2015	346.67	358.58	-11.91	1
7	0_6853810	Unconfined	13,240	4/1/2015	343.97	360.50	-16.53	1
7	0_6853810	Unconfined	13,270	5/1/2015	355.17	362.36	-7.19	1
7	0_6853810	Unconfined	13,301	6/1/2015	360.57	364.28	-3.71	1
7	0_6853810	Unconfined	13,331	7/1/2015	361.87	366.14	-4.27	1
7	0_6853810	Unconfined	13,362	8/1/2015	360.17	368.06	-7.89	1
7	0_6853810	Unconfined	13,393	9/1/2015	365.37	369.98	-4.61	1
7	0_6853810	Unconfined	13,423	10/1/2015	361.57	371.84	-10.27	1
7	0_6853810	Unconfined	13,454	11/1/2015	371.67	373.76	-2.09	1
7	0_6853810	Unconfined	13,484	12/1/2015	374.27	375.61	-1.34	1
7	0_6853810	Unconfined	13,515	1/1/2016	376.47	377.52	-1.05	1
7	0_6853810	Unconfined	13,546	2/1/2016	376.97	378.91	-1.94	1
7	0_6853810	Unconfined	13,575	3/1/2016	378.61	380.22	-1.61	1
7	0_6853810	Unconfined	13,606	4/1/2016	376.27	381.62	-5.35	1
7	0_6853810	Unconfined	13,636	5/1/2016	376.97	382.97	-6.00	1
7	0_6853810	Unconfined	13,667	6/1/2016	382.87	384.37	-1.50	1
7	0_6853810	Unconfined	13,697	7/1/2016	387.17	385.72	1.45	1
7	0_6853810	Unconfined	13,728	8/1/2016	388.07	387.12	0.95	1
7	0_6853810	Unconfined	13,759	9/1/2016	390.77	388.52	2.25	1
7	0_6853810	Unconfined	13,789	10/1/2016	389.37	389.87	-0.50	1
7	0_6853810	Unconfined	13,820	11/1/2016	387.87	391.27	-3.40	1
7	0_6853810	Unconfined	13,850	12/1/2016	375.47	392.62	-17.15	1
7	0_6853810	Unconfined	13,881	1/1/2017	374.47	393.98	-19.51	1
7	0_6853810	Unconfined	13,912	2/1/2017	374.17	394.43	-20.26	1
7	0_6853810	Unconfined	13,940	3/1/2017	372.67	394.83	-22.16	1
7	0_6853810	Unconfined	13,971	4/1/2017	376.87	395.28	-18.41	1
7	0_6853810	Unconfined	14,001	5/1/2017	376.67	395.71	-19.04	1
7	0_6853810	Unconfined	14,032	6/1/2017	375.27	396.16	-20.89	1
7	0_6853810	Unconfined	14,124	9/1/2017	379.37	397.48	-18.11	1
7	0_6853810	Unconfined	14,154	10/1/2017	382.17	397.91	-15.74	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853810	Unconfined	14,185	11/1/2017	386.87	398.36	-11.49	1
7	0_6853810	Unconfined	14,215	12/1/2017	391.77	398.79	-7.02	1
7	0_6853907	Confined	7,402	4/7/1999	350.03	386.05	-3.60	0.1
7	0_6853928	Confined	11,238	10/7/2009	416.01	372.31	4.37	0.1
7	0_6853928	Confined	11,307	12/15/2009	416.60	370.62	4.60	0.1
7	0_6853928	Confined	11,372	2/18/2010	422.04	368.19	5.38	0.1
7	0_6853928	Confined	11,378	2/24/2010	385.18	367.94	1.72	0.1
7	0_6853928	Confined	11,420	4/7/2010	414.15	366.20	4.79	0.1
7	0_6853928	Confined	11,456	5/13/2010	405.69	364.71	4.10	0.1
7	0_6853928	Confined	11,524	7/20/2010	433.68	361.89	7.18	0.1
7	0_6853928	Confined	11,559	8/24/2010	350.16	360.44	-1.03	0.1
7	0_6853928	Confined	11,583	9/17/2010	370.77	359.44	1.13	0.1
7	0_6853928	Confined	11,614	10/18/2010	409.90	358.16	5.17	0.1
7	0_6853928	Confined	11,635	11/8/2010	414.35	357.29	5.71	0.1
7	0_6853928	Confined	11,810	5/2/2011	359.14	351.27	0.79	0.1
7	0_6853928	Confined	11,860	6/21/2011	331.88	349.71	-1.78	0.1
7	0_6853928	Confined	11,910	8/10/2011	311.67	348.15	-3.65	0.1
7	0_6853928	Confined	11,953	9/22/2011	312.27	346.80	-3.45	0.1
7	0_6853928	Confined	11,961	9/30/2011	333.22	346.55	-1.33	0.1
7	0_6853928	Confined	12,021	11/29/2011	391.72	344.68	4.70	0.1
7	0_6853928	Confined	12,057	1/4/2012	406.94	343.86	6.31	0.1
7	0_6853928	Confined	12,099	2/15/2012	383.78	345.73	3.81	0.1
7	0_6853928	Confined	12,143	3/30/2012	386.23	347.69	3.85	0.1
7	0_6853928	Confined	12,197	5/23/2012	378.73	350.10	2.86	0.1
7	0_6853928	Confined	12,217	6/12/2012	344.83	350.99	-0.62	0.1
7	0_6853928	Confined	12,281	8/15/2012	335.18	353.85	-1.87	0.1
7	0_6853928	Confined	12,346	10/19/2012	422.73	356.74	6.60	0.1
7	0_6853928	Confined	12,372	11/14/2012	390.07	357.90	3.22	0.1
7	0_6853928	Confined	12,386	11/28/2012	374.26	358.53	1.57	0.1
7	0_6853928	Confined	12,448	1/29/2013	352.27	360.72	-0.84	0.1
7	0_6853928	Confined	12,477	2/27/2013	337.92	361.43	-2.35	0.1
7	0_6853928	Confined	12,525	4/16/2013	312.38	362.62	-5.02	0.1
7	0_6853928	Confined	12,527	4/18/2013	308.73	362.67	-5.39	0.1
7	0_6853928	Confined	12,562	5/23/2013	310.91	363.53	-5.26	0.1
7	0_6853928	Confined	12,583	6/13/2013	333.76	364.05	-3.03	0.1
7	0_6853928	Confined	12,629	7/29/2013	315.81	365.18	-4.94	0.1
7	0_6853928	Confined	12,668	9/6/2013	315.77	366.15	-5.04	0.1
7	0_6853928	Confined	12,707	10/15/2013	363.43	367.11	-0.37	0.1
7	0_6853928	Confined	12,712	10/20/2013	380.76	367.23	1.35	0.1
7	0_6853928	Confined	12,717	10/25/2013	374.46	367.36	0.71	0.1
7	0_6853928	Confined	12,722	10/30/2013	381.53	367.48	1.41	0.1
7	0_6853928	Confined	12,728	11/5/2013	389.60	367.63	2.20	0.1
7	0_6853928	Confined	12,733	11/10/2013	391.44	367.75	2.37	0.1
7	0_6853928	Confined	12,738	11/15/2013	392.82	367.87	2.49	0.1
7	0_6853928	Confined	12,743	11/20/2013	393.97	368.00	2.60	0.1
7	0_6853928	Confined	12,748	11/25/2013	394.94	368.12	2.68	0.1
7	0_6853928	Confined	12,753	11/30/2013	395.78	368.24	2.75	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	12,758	12/5/2013	400.10	368.37	3.17	0.1
7	0_6853928	Confined	12,763	12/10/2013	405.55	368.49	3.71	0.1
7	0_6853928	Confined	12,768	12/15/2013	407.47	368.61	3.89	0.1
7	0_6853928	Confined	12,773	12/20/2013	405.52	368.74	3.68	0.1
7	0_6853928	Confined	12,778	12/25/2013	408.16	368.86	3.93	0.1
7	0_6853928	Confined	12,783	12/30/2013	409.36	368.98	4.04	0.1
7	0_6853928	Confined	12,786	1/2/2014	375.48	369.03	0.64	0.1
7	0_6853928	Confined	12,791	1/7/2014	338.95	369.09	-3.01	0.1
7	0_6853928	Confined	12,794	1/10/2014	330.52	369.12	-3.86	0.1
7	0_6853928	Confined	12,799	1/15/2014	325.69	369.18	-4.35	0.1
7	0_6853928	Confined	12,804	1/20/2014	321.83	369.24	-4.74	0.1
7	0_6853928	Confined	12,809	1/25/2014	327.84	369.30	-4.15	0.1
7	0_6853928	Confined	12,814	1/30/2014	337.29	369.36	-3.21	0.1
7	0_6853928	Confined	12,821	2/6/2014	315.33	369.44	-5.41	0.1
7	0_6853928	Confined	12,825	2/10/2014	318.89	369.48	-5.06	0.1
7	0_6853928	Confined	12,830	2/15/2014	317.43	369.54	-5.21	0.1
7	0_6853928	Confined	12,835	2/20/2014	313.81	369.60	-5.58	0.1
7	0_6853928	Confined	12,840	2/25/2014	318.75	369.66	-5.09	0.1
7	0_6853928	Confined	12,843	2/28/2014	318.84	369.69	-5.09	0.1
7	0_6853928	Confined	12,848	3/5/2014	321.42	369.75	-4.83	0.1
7	0_6853928	Confined	12,848	3/5/2014	326.45	369.75	-4.33	0.1
7	0_6853928	Confined	12,853	3/10/2014	314.47	369.81	-5.53	0.1
7	0_6853928	Confined	12,858	3/15/2014	299.73	369.86	-7.01	0.1
7	0_6853928	Confined	12,863	3/20/2014	298.46	369.92	-7.15	0.1
7	0_6853928	Confined	12,868	3/25/2014	302.22	369.98	-6.78	0.1
7	0_6853928	Confined	12,871	3/28/2014	296.75	370.02	-7.33	0.1
7	0_6853928	Confined	12,873	3/30/2014	297.10	370.04	-7.29	0.1
7	0_6853928	Confined	12,879	4/5/2014	293.57	370.11	-7.65	0.1
7	0_6853928	Confined	12,884	4/10/2014	292.15	370.17	-7.80	0.1
7	0_6853928	Confined	12,889	4/15/2014	290.71	370.22	-7.95	0.1
7	0_6853928	Confined	12,894	4/20/2014	295.08	370.28	-7.52	0.1
7	0_6853928	Confined	12,899	4/25/2014	290.23	370.34	-8.01	0.1
7	0_6853928	Confined	12,904	4/30/2014	286.61	370.40	-8.38	0.1
7	0_6853928	Confined	12,909	5/5/2014	286.14	370.45	-8.43	0.1
7	0_6853928	Confined	12,914	5/10/2014	285.83	370.51	-8.47	0.1
7	0_6853928	Confined	12,916	5/12/2014	286.03	370.54	-8.45	0.1
7	0_6853928	Confined	12,919	5/15/2014	297.18	370.57	-7.34	0.1
7	0_6853928	Confined	12,924	5/20/2014	290.46	370.63	-8.02	0.1
7	0_6853928	Confined	12,929	5/25/2014	288.19	370.69	-8.25	0.1
7	0_6853928	Confined	12,934	5/30/2014	291.59	370.74	-7.92	0.1
7	0_6853928	Confined	12,940	6/5/2014	289.23	370.81	-8.16	0.1
7	0_6853928	Confined	12,945	6/10/2014	287.75	370.87	-8.31	0.1
7	0_6853928	Confined	12,950	6/15/2014	291.17	370.93	-7.98	0.1
7	0_6853928	Confined	12,953	6/18/2014	288.60	370.96	-8.24	0.1
7	0_6853928	Confined	12,955	6/20/2014	288.25	370.99	-8.27	0.1
7	0_6853928	Confined	12,960	6/25/2014	287.37	371.04	-8.37	0.1
7	0_6853928	Confined	12,965	6/30/2014	287.34	371.10	-8.38	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	12,970	7/5/2014	284.08	371.16	-8.71	0.1
7	0_6853928	Confined	12,975	7/10/2014	283.00	371.22	-8.82	0.1
7	0_6853928	Confined	12,980	7/15/2014	282.56	371.28	-8.87	0.1
7	0_6853928	Confined	12,985	7/20/2014	292.60	371.33	-7.87	0.1
7	0_6853928	Confined	12,990	7/25/2014	320.73	371.39	-5.07	0.1
7	0_6853928	Confined	12,995	7/30/2014	288.76	371.45	-8.27	0.1
7	0_6853928	Confined	13,001	8/5/2014	326.56	371.52	-4.50	0.1
7	0_6853928	Confined	13,006	8/10/2014	325.48	371.58	-4.61	0.1
7	0_6853928	Confined	13,011	8/15/2014	321.98	371.63	-4.97	0.1
7	0_6853928	Confined	13,016	8/20/2014	321.30	371.69	-5.04	0.1
7	0_6853928	Confined	13,021	8/25/2014	325.17	371.75	-4.66	0.1
7	0_6853928	Confined	13,026	8/30/2014	322.92	371.81	-4.89	0.1
7	0_6853928	Confined	13,032	9/5/2014	327.76	371.88	-4.41	0.1
7	0_6853928	Confined	13,037	9/10/2014	327.88	371.93	-4.41	0.1
7	0_6853928	Confined	13,042	9/15/2014	330.96	371.99	-4.10	0.1
7	0_6853928	Confined	13,047	9/20/2014	328.10	372.05	-4.40	0.1
7	0_6853928	Confined	13,052	9/25/2014	331.62	372.11	-4.05	0.1
7	0_6853928	Confined	13,057	9/30/2014	332.48	372.17	-3.97	0.1
7	0_6853928	Confined	13,062	10/5/2014	333.66	372.22	-3.86	0.1
7	0_6853928	Confined	13,123	12/5/2014	371.57	372.93	-0.14	0.1
7	0_6853928	Confined	13,128	12/10/2014	375.54	372.99	0.26	0.1
7	0_6853928	Confined	13,133	12/15/2014	377.67	373.05	0.46	0.1
7	0_6853928	Confined	13,138	12/20/2014	379.15	373.10	0.60	0.1
7	0_6853928	Confined	13,143	12/25/2014	380.69	373.16	0.75	0.1
7	0_6853928	Confined	13,148	12/30/2014	382.34	373.22	0.91	0.1
7	0_6853928	Confined	13,154	1/5/2015	383.51	373.35	1.02	0.1
7	0_6853928	Confined	13,159	1/10/2015	325.57	373.47	-4.79	0.1
7	0_6853928	Confined	13,164	1/15/2015	307.53	373.59	-6.61	0.1
7	0_6853928	Confined	13,169	1/20/2015	305.14	373.71	-6.86	0.1
7	0_6853928	Confined	13,174	1/25/2015	303.72	373.83	-7.01	0.1
7	0_6853928	Confined	13,179	1/30/2015	302.32	373.95	-7.16	0.1
7	0_6853928	Confined	13,185	2/5/2015	301.52	374.09	-7.26	0.1
7	0_6853928	Confined	13,190	2/10/2015	300.54	374.21	-7.37	0.1
7	0_6853928	Confined	13,195	2/15/2015	299.64	374.33	-7.47	0.1
7	0_6853928	Confined	13,200	2/20/2015	316.23	374.45	-5.82	0.1
7	0_6853928	Confined	13,205	2/25/2015	317.65	374.57	-5.69	0.1
7	0_6853928	Confined	13,208	2/28/2015	318.58	374.64	-5.61	0.1
7	0_6853928	Confined	13,213	3/5/2015	319.58	374.76	-5.52	0.1
7	0_6853928	Confined	13,218	3/10/2015	319.08	374.88	-5.58	0.1
7	0_6853928	Confined	13,223	3/15/2015	318.82	375.00	-5.62	0.1
7	0_6853928	Confined	13,228	3/20/2015	318.00	375.12	-5.71	0.1
7	0_6853928	Confined	13,233	3/25/2015	318.74	375.24	-5.65	0.1
7	0_6853928	Confined	13,238	3/30/2015	318.63	375.36	-5.67	0.1
7	0_6853928	Confined	13,244	4/5/2015	316.96	375.50	-5.85	0.1
7	0_6853928	Confined	13,249	4/10/2015	323.01	375.62	-5.26	0.1
7	0_6853928	Confined	13,254	4/15/2015	316.67	375.74	-5.91	0.1
7	0_6853928	Confined	13,259	4/20/2015	338.44	375.86	-3.74	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	13,264	4/25/2015	328.95	375.98	-4.70	0.1
7	0_6853928	Confined	13,269	4/30/2015	352.46	376.10	-2.36	0.1
7	0_6853928	Confined	13,274	5/5/2015	358.90	376.22	-1.73	0.1
7	0_6853928	Confined	13,279	5/10/2015	371.57	376.34	-0.48	0.1
7	0_6853928	Confined	13,284	5/15/2015	378.48	376.46	0.20	0.1
7	0_6853928	Confined	13,289	5/20/2015	379.80	376.58	0.32	0.1
7	0_6853928	Confined	13,294	5/25/2015	381.20	376.70	0.45	0.1
7	0_6853928	Confined	13,299	5/30/2015	382.09	376.82	0.53	0.1
7	0_6853928	Confined	13,305	6/5/2015	392.78	376.96	1.58	0.1
7	0_6853928	Confined	13,310	6/10/2015	366.87	377.08	-1.02	0.1
7	0_6853928	Confined	13,315	6/15/2015	354.87	377.20	-2.23	0.1
7	0_6853928	Confined	13,320	6/20/2015	352.69	377.32	-2.46	0.1
7	0_6853928	Confined	13,325	6/25/2015	365.95	377.44	-1.15	0.1
7	0_6853928	Confined	13,330	6/30/2015	389.08	377.56	1.15	0.1
7	0_6853928	Confined	13,335	7/5/2015	393.83	377.68	1.62	0.1
7	0_6853928	Confined	13,340	7/10/2015	381.02	377.80	0.32	0.1
7	0_6853928	Confined	13,345	7/15/2015	347.82	377.92	-3.01	0.1
7	0_6853928	Confined	13,350	7/20/2015	348.46	378.04	-2.96	0.1
7	0_6853928	Confined	13,355	7/25/2015	346.51	378.16	-3.16	0.1
7	0_6853928	Confined	13,360	7/30/2015	345.04	378.28	-3.32	0.1
7	0_6853928	Confined	13,366	8/5/2015	370.84	378.42	-0.76	0.1
7	0_6853928	Confined	13,371	8/10/2015	371.99	378.54	-0.66	0.1
7	0_6853928	Confined	13,375	8/14/2015	371.58	378.64	-0.71	0.1
7	0_6853928	Confined	13,376	8/15/2015	373.64	378.66	-0.50	0.1
7	0_6853928	Confined	13,381	8/20/2015	374.97	378.78	-0.38	0.1
7	0_6853928	Confined	13,386	8/25/2015	376.11	378.90	-0.28	0.1
7	0_6853928	Confined	13,391	8/30/2015	375.92	379.02	-0.31	0.1
7	0_6853928	Confined	13,397	9/5/2015	376.58	379.16	-0.26	0.1
7	0_6853928	Confined	13,402	9/10/2015	376.13	379.28	-0.32	0.1
7	0_6853928	Confined	13,407	9/15/2015	377.58	379.40	-0.18	0.1
7	0_6853928	Confined	13,412	9/20/2015	377.98	379.52	-0.15	0.1
7	0_6853928	Confined	13,417	9/25/2015	358.68	379.64	-2.10	0.1
7	0_6853928	Confined	13,422	9/30/2015	359.61	379.76	-2.02	0.1
7	0_6853928	Confined	13,427	10/5/2015	376.83	379.88	-0.30	0.1
7	0_6853928	Confined	13,432	10/10/2015	378.12	380.00	-0.19	0.1
7	0_6853928	Confined	13,437	10/15/2015	378.13	380.12	-0.20	0.1
7	0_6853928	Confined	13,442	10/20/2015	385.77	380.24	0.55	0.1
7	0_6853928	Confined	13,447	10/25/2015	388.99	380.36	0.86	0.1
7	0_6853928	Confined	13,452	10/30/2015	391.15	380.48	1.07	0.1
7	0_6853928	Confined	13,458	11/5/2015	392.25	380.62	1.16	0.1
7	0_6853928	Confined	13,463	11/10/2015	393.04	380.74	1.23	0.1
7	0_6853928	Confined	13,468	11/15/2015	399.15	380.86	1.83	0.1
7	0_6853928	Confined	13,473	11/20/2015	405.16	380.98	2.42	0.1
7	0_6853928	Confined	13,478	11/25/2015	406.11	381.10	2.50	0.1
7	0_6853928	Confined	13,483	11/30/2015	407.13	381.22	2.59	0.1
7	0_6853928	Confined	13,488	12/5/2015	408.67	381.34	2.73	0.1
7	0_6853928	Confined	13,491	12/8/2015	409.59	381.41	2.82	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	13,493	12/10/2015	410.36	381.46	2.89	0.1
7	0_6853928	Confined	13,498	12/15/2015	408.09	381.58	2.65	0.1
7	0_6853928	Confined	13,503	12/20/2015	408.89	381.70	2.72	0.1
7	0_6853928	Confined	13,508	12/25/2015	409.99	381.82	2.82	0.1
7	0_6853928	Confined	13,513	12/30/2015	410.59	381.94	2.87	0.1
7	0_6853928	Confined	13,519	1/5/2016	411.36	382.03	2.93	0.1
7	0_6853928	Confined	13,524	1/10/2016	411.94	382.10	2.98	0.1
7	0_6853928	Confined	13,529	1/15/2016	417.12	382.17	3.50	0.1
7	0_6853928	Confined	13,534	1/20/2016	417.64	382.24	3.54	0.1
7	0_6853928	Confined	13,539	1/25/2016	419.83	382.31	3.75	0.1
7	0_6853928	Confined	13,544	1/30/2016	421.01	382.38	3.86	0.1
7	0_6853928	Confined	13,547	2/2/2016	421.41	382.42	3.90	0.1
7	0_6853928	Confined	13,550	2/5/2016	420.81	382.46	3.84	0.1
7	0_6853928	Confined	13,555	2/10/2016	421.39	382.53	3.89	0.1
7	0_6853928	Confined	13,560	2/15/2016	421.27	382.60	3.87	0.1
7	0_6853928	Confined	13,565	2/20/2016	421.59	382.67	3.89	0.1
7	0_6853928	Confined	13,570	2/25/2016	422.16	382.74	3.94	0.1
7	0_6853928	Confined	13,579	3/5/2016	420.61	382.86	3.77	0.1
7	0_6853928	Confined	13,584	3/10/2016	421.03	382.93	3.81	0.1
7	0_6853928	Confined	13,589	3/15/2016	421.83	383.00	3.88	0.1
7	0_6853928	Confined	13,594	3/20/2016	417.39	383.07	3.43	0.1
7	0_6853928	Confined	13,598	3/24/2016	419.48	383.12	3.64	0.1
7	0_6853928	Confined	13,599	3/25/2016	419.94	383.14	3.68	0.1
7	0_6853928	Confined	13,604	3/30/2016	420.25	383.21	3.70	0.1
7	0_6853928	Confined	13,610	4/5/2016	420.54	383.29	3.72	0.1
7	0_6853928	Confined	13,615	4/10/2016	420.09	383.36	3.67	0.1
7	0_6853928	Confined	13,620	4/15/2016	420.33	383.43	3.69	0.1
7	0_6853928	Confined	13,625	4/20/2016	420.48	383.50	3.70	0.1
7	0_6853928	Confined	13,630	4/25/2016	421.56	383.57	3.80	0.1
7	0_6853928	Confined	13,633	4/28/2016	421.73	383.61	3.81	0.1
7	0_6853928	Confined	13,635	4/30/2016	421.66	383.64	3.80	0.1
7	0_6853928	Confined	13,640	5/5/2016	421.62	383.71	3.79	0.1
7	0_6853928	Confined	13,645	5/10/2016	424.26	383.77	4.05	0.1
7	0_6853928	Confined	13,648	5/13/2016	385.06	383.82	0.12	0.1
7	0_6853928	Confined	13,653	5/18/2016	378.26	383.89	-0.56	0.1
7	0_6853928	Confined	13,658	5/23/2016	413.04	383.95	2.91	0.1
7	0_6853928	Confined	13,665	5/30/2016	415.64	384.05	3.16	0.1
7	0_6853928	Confined	13,671	6/5/2016	416.69	384.13	3.26	0.1
7	0_6853928	Confined	13,674	6/8/2016	421.78	384.18	3.76	0.1
7	0_6853928	Confined	13,676	6/10/2016	422.65	384.20	3.84	0.1
7	0_6853928	Confined	13,681	6/15/2016	423.09	384.27	3.88	0.1
7	0_6853928	Confined	13,686	6/20/2016	422.26	384.34	3.79	0.1
7	0_6853928	Confined	13,691	6/25/2016	422.01	384.41	3.76	0.1
7	0_6853928	Confined	13,696	6/30/2016	424.83	384.48	4.03	0.1
7	0_6853928	Confined	13,701	7/5/2016	424.86	384.55	4.03	0.1
7	0_6853928	Confined	13,706	7/10/2016	426.02	384.62	4.14	0.1
7	0_6853928	Confined	13,711	7/15/2016	424.40	384.69	3.97	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	13,716	7/20/2016	424.11	384.76	3.94	0.1
7	0_6853928	Confined	13,721	7/25/2016	424.45	384.83	3.96	0.1
7	0_6853928	Confined	13,726	7/30/2016	423.40	384.90	3.85	0.1
7	0_6853928	Confined	13,732	8/5/2016	420.04	384.98	3.51	0.1
7	0_6853928	Confined	13,737	8/10/2016	417.31	385.05	3.23	0.1
7	0_6853928	Confined	13,742	8/15/2016	420.76	385.12	3.56	0.1
7	0_6853928	Confined	13,747	8/20/2016	421.77	385.19	3.66	0.1
7	0_6853928	Confined	13,752	8/25/2016	420.57	385.26	3.53	0.1
7	0_6853928	Confined	13,763	9/5/2016	424.18	385.41	3.88	0.1
7	0_6853928	Confined	13,766	9/8/2016	424.25	385.45	3.88	0.1
7	0_6853928	Confined	13,768	9/10/2016	424.69	385.48	3.92	0.1
7	0_6853928	Confined	13,773	9/15/2016	394.48	385.55	0.89	0.1
7	0_6853928	Confined	13,778	9/20/2016	391.54	385.62	0.59	0.1
7	0_6853928	Confined	13,783	9/25/2016	380.46	385.69	-0.52	0.1
7	0_6853928	Confined	13,784	9/26/2016	378.69	385.70	-0.70	0.1
7	0_6853928	Confined	13,788	9/30/2016	397.38	385.75	1.16	0.1
7	0_6853928	Confined	13,793	10/5/2016	421.64	385.82	3.58	0.1
7	0_6853928	Confined	13,798	10/10/2016	428.82	385.89	4.29	0.1
7	0_6853928	Confined	13,803	10/15/2016	423.83	385.96	3.79	0.1
7	0_6853928	Confined	13,808	10/20/2016	424.58	386.03	3.85	0.1
7	0_6853928	Confined	13,813	10/25/2016	423.13	386.10	3.70	0.1
7	0_6853928	Confined	13,818	10/30/2016	421.81	386.17	3.56	0.1
7	0_6853928	Confined	13,820	11/1/2016	409.08	386.20	2.29	0.1
7	0_6853928	Confined	13,822	11/3/2016	368.81	386.23	-1.74	0.1
7	0_6853928	Confined	13,824	11/5/2016	381.81	386.25	-0.44	0.1
7	0_6853928	Confined	13,829	11/10/2016	368.47	386.32	-1.79	0.1
7	0_6853928	Confined	13,834	11/15/2016	353.31	386.39	-3.31	0.1
7	0_6853928	Confined	13,839	11/20/2016	351.40	386.46	-3.51	0.1
7	0_6853928	Confined	13,844	11/25/2016	342.60	386.53	-4.39	0.1
7	0_6853928	Confined	13,849	11/30/2016	345.60	386.60	-4.10	0.1
7	0_6853928	Confined	13,854	12/5/2016	343.25	386.67	-4.34	0.1
7	0_6853928	Confined	13,859	12/10/2016	340.09	386.74	-4.66	0.1
7	0_6853928	Confined	13,864	12/15/2016	352.50	386.81	-3.43	0.1
7	0_6853928	Confined	13,869	12/20/2016	348.82	386.88	-3.81	0.1
7	0_6853928	Confined	13,872	12/23/2016	349.16	386.92	-3.78	0.1
7	0_6853928	Confined	13,874	12/25/2016	349.53	386.94	-3.74	0.1
7	0_6853928	Confined	13,879	12/30/2016	353.09	387.01	-3.39	0.1
7	0_6853928	Confined	13,885	1/5/2017	352.64	387.02	-3.44	0.1
7	0_6853928	Confined	13,890	1/10/2017	361.56	387.02	-2.55	0.1
7	0_6853928	Confined	13,895	1/15/2017	367.93	387.01	-1.91	0.1
7	0_6853928	Confined	13,900	1/20/2017	362.63	387.01	-2.44	0.1
7	0_6853928	Confined	13,905	1/25/2017	368.18	387.00	-1.88	0.1
7	0_6853928	Confined	13,910	1/30/2017	361.83	387.00	-2.52	0.1
7	0_6853928	Confined	13,916	2/5/2017	362.01	386.99	-2.50	0.1
7	0_6853928	Confined	13,921	2/10/2017	363.94	386.99	-2.30	0.1
7	0_6853928	Confined	13,926	2/15/2017	366.69	386.98	-2.03	0.1
7	0_6853928	Confined	13,931	2/20/2017	372.93	386.98	-1.40	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	13,933	2/22/2017	367.89	386.97	-1.91	0.1
7	0_6853928	Confined	13,936	2/25/2017	368.22	386.97	-1.88	0.1
7	0_6853928	Confined	13,944	3/5/2017	370.67	386.96	-1.63	0.1
7	0_6853928	Confined	13,949	3/10/2017	380.78	386.96	-0.62	0.1
7	0_6853928	Confined	13,954	3/15/2017	384.63	386.95	-0.23	0.1
7	0_6853928	Confined	13,959	3/20/2017	373.36	386.95	-1.36	0.1
7	0_6853928	Confined	13,964	3/25/2017	401.52	386.94	1.46	0.1
7	0_6853928	Confined	13,969	3/30/2017	409.01	386.94	2.21	0.1
7	0_6853928	Confined	13,975	4/5/2017	417.10	386.93	3.02	0.1
7	0_6853928	Confined	13,980	4/10/2017	417.71	386.92	3.08	0.1
7	0_6853928	Confined	13,985	4/15/2017	418.05	386.92	3.11	0.1
7	0_6853928	Confined	13,990	4/20/2017	418.49	386.91	3.16	0.1
7	0_6853928	Confined	13,995	4/25/2017	419.99	386.91	3.31	0.1
7	0_6853928	Confined	14,000	4/30/2017	415.97	386.90	2.91	0.1
7	0_6853928	Confined	14,005	5/5/2017	415.35	386.90	2.85	0.1
7	0_6853928	Confined	14,010	5/10/2017	416.59	386.89	2.97	0.1
7	0_6853928	Confined	14,015	5/15/2017	415.23	386.89	2.83	0.1
7	0_6853928	Confined	14,020	5/20/2017	415.53	386.88	2.86	0.1
7	0_6853928	Confined	14,025	5/25/2017	417.82	386.88	3.09	0.1
7	0_6853928	Confined	14,030	5/30/2017	418.64	386.87	3.18	0.1
7	0_6853928	Confined	14,036	6/5/2017	421.48	386.87	3.46	0.1
7	0_6853928	Confined	14,041	6/10/2017	420.76	386.86	3.39	0.1
7	0_6853928	Confined	14,046	6/15/2017	420.02	386.86	3.32	0.1
7	0_6853928	Confined	14,051	6/20/2017	419.72	386.85	3.29	0.1
7	0_6853928	Confined	14,056	6/25/2017	421.45	386.85	3.46	0.1
7	0_6853928	Confined	14,061	6/30/2017	423.79	386.84	3.69	0.1
7	0_6853928	Confined	14,066	7/5/2017	423.87	386.84	3.70	0.1
7	0_6853928	Confined	14,071	7/10/2017	425.22	386.83	3.84	0.1
7	0_6853928	Confined	14,076	7/15/2017	424.10	386.83	3.73	0.1
7	0_6853928	Confined	14,081	7/20/2017	424.10	386.82	3.73	0.1
7	0_6853928	Confined	14,086	7/25/2017	425.07	386.82	3.83	0.1
7	0_6853928	Confined	14,091	7/30/2017	425.18	386.81	3.84	0.1
7	0_6853928	Confined	14,097	8/5/2017	425.19	386.80	3.84	0.1
7	0_6853928	Confined	14,102	8/10/2017	427.56	386.80	4.08	0.1
7	0_6853928	Confined	14,107	8/15/2017	428.22	386.79	4.14	0.1
7	0_6853928	Confined	14,112	8/20/2017	427.78	386.79	4.10	0.1
7	0_6853928	Confined	14,117	8/25/2017	427.40	386.78	4.06	0.1
7	0_6853928	Confined	14,122	8/30/2017	391.63	386.78	0.49	0.1
7	0_6853928	Confined	14,128	9/5/2017	424.41	386.77	3.76	0.1
7	0_6853928	Confined	14,133	9/10/2017	426.11	386.77	3.93	0.1
7	0_6853928	Confined	14,138	9/15/2017	425.01	386.76	3.82	0.1
7	0_6853928	Confined	14,143	9/20/2017	426.06	386.76	3.93	0.1
7	0_6853928	Confined	14,148	9/25/2017	426.11	386.75	3.94	0.1
7	0_6853928	Confined	14,153	9/30/2017	425.40	386.75	3.87	0.1
7	0_6853928	Confined	14,158	10/5/2017	425.64	386.74	3.89	0.1
7	0_6853928	Confined	14,163	10/10/2017	422.05	386.74	3.53	0.1
7	0_6853928	Confined	14,168	10/15/2017	427.47	386.73	4.07	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6853928	Confined	14,173	10/20/2017	427.70	386.73	4.10	0.1
7	0_6853928	Confined	14,178	10/25/2017	428.45	386.72	4.17	0.1
7	0_6853928	Confined	14,183	10/30/2017	429.08	386.72	4.24	0.1
7	0_6853928	Confined	14,189	11/5/2017	429.48	386.71	4.28	0.1
7	0_6853928	Confined	14,194	11/10/2017	429.45	386.70	4.27	0.1
7	0_6853928	Confined	14,199	11/15/2017	430.25	386.70	4.36	0.1
7	0_6853928	Confined	14,204	11/20/2017	429.26	386.69	4.26	0.1
7	0_6853928	Confined	14,209	11/25/2017	429.83	386.69	4.31	0.1
7	0_6853928	Confined	14,214	11/30/2017	429.43	386.68	4.27	0.1
7	0_6853928	Confined	14,219	12/5/2017	429.80	386.68	4.31	0.1
7	0_6853928	Confined	14,224	12/10/2017	429.98	386.67	4.33	0.1
7	0_6853928	Confined	14,229	12/15/2017	430.88	386.67	4.42	0.1
7	0_6853928	Confined	14,234	12/20/2017	431.77	386.66	4.51	0.1
7	0_6853928	Confined	14,239	12/25/2017	434.66	386.66	4.80	0.1
7	0_6853928	Confined	14,244	12/30/2017	435.29	386.65	4.86	0.1
7	0_6854506	Unconfined	779	2/17/1981	387.01	381.88	5.13	1
7	0_6854506	Unconfined	1,144	2/17/1982	387.47	382.47	5.00	1
7	0_6854506	Unconfined	1,503	2/11/1983	385.92	382.17	3.75	1
7	0_6854506	Unconfined	1,864	2/7/1984	385.95	382.18	3.77	1
7	0_6854506	Unconfined	2,228	2/5/1985	383.41	382.04	1.37	1
7	0_6854506	Unconfined	2,601	2/13/1986	383.29	382.80	0.49	1
7	0_6854506	Unconfined	2,895	12/4/1986	382.97	382.85	0.12	1
7	0_6854506	Unconfined	3,334	2/16/1988	385.59	382.87	2.72	1
7	0_6854506	Unconfined	3,697	2/13/1989	382.51	381.89	0.62	1
7	0_6854506	Unconfined	4,001	12/14/1989	380.19	381.66	-1.47	1
7	0_6854506	Unconfined	4,364	12/12/1990	380.31	381.78	-1.47	1
7	0_6854506	Unconfined	5,119	1/5/1993	383.39	382.25	1.14	1
7	0_6854506	Unconfined	5,358	9/1/1993	384.59	381.96	2.63	1
7	0_6854506	Unconfined	5,388	10/1/1993	384.14	381.92	2.22	1
7	0_6854506	Unconfined	5,419	11/1/1993	383.79	381.88	1.91	1
7	0_6854506	Unconfined	5,450	12/2/1993	383.54	381.85	1.69	1
7	0_6854506	Unconfined	5,482	1/3/1994	383.49	381.81	1.68	1
7	0_6854506	Unconfined	5,512	2/2/1994	383.39	381.83	1.56	1
7	0_6854506	Unconfined	5,539	3/1/1994	383.79	381.84	1.95	1
7	0_6854506	Unconfined	5,573	4/4/1994	383.59	381.86	1.73	1
7	0_6854506	Unconfined	5,643	6/13/1994	383.34	381.89	1.45	1
7	0_6854506	Unconfined	5,661	7/1/1994	382.09	381.90	0.19	1
7	0_6854506	Unconfined	5,863	1/19/1995	382.49	381.97	0.52	1
7	0_6854506	Unconfined	6,211	1/2/1996	380.59	381.61	-1.02	1
7	0_6854506	Unconfined	6,637	3/3/1997	376.14	380.85	-4.71	1
7	0_6854506	Unconfined	6,973	2/2/1998	376.24	381.60	-5.36	1
7	0_6854506	Unconfined	7,325	1/20/1999	376.19	381.63	-5.44	1
7	0_6854506	Unconfined	7,928	9/14/2000	375.69	380.57	-4.88	1
7	0_6854506	Unconfined	8,069	2/2/2001	374.39	380.48	-6.09	1
7	0_6854506	Unconfined	8,424	1/23/2002	373.99	380.62	-6.63	1
7	0_6854506	Unconfined	8,774	1/8/2003	373.89	381.11	-7.22	1
7	0_6854506	Unconfined	9,144	1/13/2004	375.49	380.92	-5.43	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6854506	Unconfined	9,558	3/2/2005	376.89	381.58	-4.69	1
7	0_6854506	Unconfined	9,872	1/10/2006	376.69	380.81	-4.12	1
7	0_6854506	Unconfined	10,230	1/3/2007	373.69	380.84	-7.15	1
7	0_6854506	Unconfined	10,600	1/8/2008	375.69	382.83	-7.14	1
7	0_6854506	Unconfined	10,992	2/3/2009	377.69	381.22	-3.53	1
7	0_6854506	Unconfined	11,343	1/20/2010	376.99	380.31	-3.32	1
7	0_6854506	Unconfined	12,059	1/6/2012	374.69	377.15	-2.46	1
7	0_6854506	Unconfined	12,090	2/6/2012	374.99	377.32	-2.33	1
7	0_6854506	Unconfined	12,114	3/1/2012	374.49	377.45	-2.96	1
7	0_6854506	Unconfined	12,149	4/5/2012	374.49	377.64	-3.15	1
7	0_6854506	Unconfined	12,176	5/2/2012	374.69	377.79	-3.10	1
7	0_6854506	Unconfined	12,211	6/6/2012	374.99	377.98	-2.99	1
7	0_6854506	Unconfined	12,236	7/1/2012	374.49	378.12	-3.63	1
7	0_6854506	Unconfined	12,267	8/1/2012	373.89	378.29	-4.40	1
7	0_6854506	Unconfined	12,298	9/1/2012	373.89	378.46	-4.57	1
7	0_6854506	Unconfined	12,328	10/1/2012	373.29	378.62	-5.33	1
7	0_6854506	Unconfined	12,359	11/1/2012	373.99	378.79	-4.80	1
7	0_6854506	Unconfined	12,393	12/5/2012	373.69	378.98	-5.29	1
7	0_6854506	Unconfined	12,425	1/6/2013	373.19	379.14	-5.95	1
7	0_6854506	Unconfined	12,456	2/6/2013	373.29	379.22	-5.93	1
7	0_6854506	Unconfined	12,479	3/1/2013	373.19	379.27	-6.08	1
7	0_6854506	Unconfined	12,514	4/5/2013	372.99	379.36	-6.37	1
7	0_6854506	Unconfined	12,541	5/2/2013	372.79	379.43	-6.64	1
7	0_6854506	Unconfined	12,576	6/6/2013	372.89	379.52	-6.63	1
7	0_6854506	Unconfined	12,601	7/1/2013	372.69	379.58	-6.89	1
7	0_6854506	Unconfined	12,632	8/1/2013	372.19	379.65	-7.46	1
7	0_6854506	Unconfined	12,663	9/1/2013	371.99	379.73	-7.74	1
7	0_6854506	Unconfined	12,693	10/1/2013	371.79	379.81	-8.02	1
7	0_6854506	Unconfined	12,724	11/1/2013	371.29	379.88	-8.59	1
7	0_6854506	Unconfined	12,758	12/5/2013	371.09	379.97	-8.88	1
7	0_6854506	Unconfined	13,362	8/1/2015	368.39	380.91	-12.52	1
7	0_6854506	Unconfined	13,454	11/1/2015	367.69	381.25	-13.56	1
7	0_6854506	Unconfined	13,484	12/1/2015	367.29	381.36	-14.07	1
7	0_6854506	Unconfined	13,515	1/1/2016	366.89	381.47	-14.58	1
7	0_6854506	Unconfined	13,546	2/1/2016	366.99	381.50	-14.51	1
7	0_6854506	Unconfined	13,575	3/1/2016	367.89	381.53	-13.64	1
7	0_6854506	Unconfined	13,789	10/1/2016	370.69	381.73	-11.04	1
7	0_6854506	Unconfined	13,820	11/1/2016	370.49	381.76	-11.27	1
7	0_6854506	Unconfined	13,850	12/1/2016	370.89	381.79	-10.90	1
7	0_6854506	Unconfined	13,881	1/1/2017	369.89	381.82	-11.93	1
7	0_6854506	Unconfined	13,912	2/1/2017	370.49	381.78	-11.29	1
7	0_6854506	Unconfined	13,940	3/1/2017	370.59	381.74	-11.15	1
7	0_6854506	Unconfined	14,124	9/1/2017	371.09	381.51	-10.42	1
7	0_6854506	Unconfined	14,154	10/1/2017	370.99	381.47	-10.48	1
7	0_6854506	Unconfined	14,185	11/1/2017	371.09	381.43	-10.34	1
7	0_6854506	Unconfined	14,215	12/1/2017	371.09	381.39	-10.30	1
7	0_6854602	Confined	779	2/17/1981	388.76	375.22	1.35	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6854602	Confined	1,144	2/17/1982	386.39	375.83	1.06	0.1
7	0_6854602	Confined	1,503	2/11/1983	383.32	375.61	0.77	0.1
7	0_6854602	Confined	1,864	2/7/1984	384.06	375.59	0.85	0.1
7	0_6854602	Confined	2,228	2/5/1985	382.99	375.41	0.76	0.1
7	0_6854602	Confined	2,601	2/13/1986	383.26	376.14	0.71	0.1
7	0_6854602	Confined	2,895	12/4/1986	381.09	376.22	0.49	0.1
7	0_6854602	Confined	3,334	2/16/1988	382.82	376.25	0.66	0.1
7	0_6854602	Confined	3,697	2/13/1989	370.20	375.23	-0.50	0.1
7	0_6854602	Confined	4,364	12/12/1990	382.81	374.78	0.80	0.1
7	0_6854602	Confined	5,141	1/27/1993	376.38	375.27	0.11	0.1
7	0_6854602	Confined	5,485	1/6/1994	371.88	375.13	-0.32	0.1
7	0_6854602	Confined	6,655	3/21/1997	371.98	373.96	-0.20	0.1
7	0_6854602	Confined	6,975	2/4/1998	372.58	374.61	-0.20	0.1
7	0_6854602	Confined	7,325	1/20/1999	369.43	374.61	-0.52	0.1
7	0_6854602	Confined	8,073	2/6/2001	368.58	373.20	-0.46	0.1
7	0_6854602	Confined	8,431	1/30/2002	366.28	373.45	-0.72	0.1
7	0_6854602	Confined	8,790	1/24/2003	368.08	373.69	-0.56	0.1
7	0_6854602	Confined	9,157	1/26/2004	367.88	373.73	-0.59	0.1
7	0_6854602	Confined	9,558	3/2/2005	370.08	374.45	-0.44	0.1
7	0_6854602	Confined	9,879	1/17/2006	368.48	373.82	-0.53	0.1
7	0_6854602	Confined	10,237	1/10/2007	368.88	373.97	-0.51	0.1
7	0_6854602	Confined	10,617	1/25/2008	376.28	375.89	0.04	0.1
7	0_6854602	Confined	10,999	2/10/2009	379.38	374.34	0.50	0.1
7	0_6854602	Confined	11,420	4/7/2010	377.08	372.54	0.45	0.1
7	0_6854809	Confined	9,272	5/20/2004	379.48	371.34	8.14	1
7	0_6854809	Confined	9,532	2/4/2005	373.68	372.70	0.98	1
7	0_6854809	Confined	9,872	1/10/2006	364.28	371.28	-7.00	1
7	0_6854809	Confined	10,229	1/2/2007	357.28	371.81	-14.53	1
7	0_6854809	Confined	10,595	1/3/2008	381.88	377.63	4.25	1
7	0_6854809	Confined	10,987	1/29/2009	364.38	373.72	-9.34	1
7	0_6854809	Confined	11,334	1/11/2010	378.08	369.15	8.93	1
7	0_6854809	Confined	12,059	1/6/2012	366.48	355.67	10.81	1
7	0_6854809	Confined	12,114	3/1/2012	365.28	356.79	8.49	1
7	0_6854809	Confined	12,149	4/5/2012	364.88	357.50	7.38	1
7	0_6854809	Confined	12,176	5/2/2012	358.98	358.05	0.93	1
7	0_6854809	Confined	12,211	6/6/2012	356.88	358.77	-1.89	1
7	0_6854809	Confined	12,236	7/1/2012	353.48	359.28	-5.80	1
7	0_6854809	Confined	12,267	8/1/2012	350.38	359.91	-9.53	1
7	0_6854809	Confined	12,298	9/1/2012	351.28	360.54	-9.26	1
7	0_6854809	Confined	12,328	10/1/2012	358.68	361.15	-2.47	1
7	0_6854809	Confined	12,359	11/1/2012	366.88	361.78	5.10	1
7	0_6854809	Confined	12,393	12/5/2012	355.48	362.47	-6.99	1
7	0_6854809	Confined	12,425	1/6/2013	351.88	363.07	-11.19	1
7	0_6854809	Confined	12,456	2/6/2013	354.37	363.39	-9.02	1
7	0_6854809	Confined	12,479	3/1/2013	350.28	363.63	-13.35	1
7	0_6854809	Confined	12,514	4/5/2013	347.28	364.00	-16.72	1
7	0_6854809	Confined	12,541	5/2/2013	342.68	364.28	-21.60	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6854809	Confined	12,576	6/6/2013	341.48	364.65	-23.17	1
7	0_6854809	Confined	12,601	7/1/2013	344.18	364.91	-20.73	1
7	0_6854809	Confined	12,632	8/1/2013	342.48	365.23	-22.75	1
7	0_6854809	Confined	12,663	9/1/2013	338.28	365.56	-27.28	1
7	0_6854809	Confined	12,693	10/1/2013	345.98	365.87	-19.89	1
7	0_6854809	Confined	12,724	11/1/2013	351.98	366.19	-14.21	1
7	0_6854809	Confined	12,816	2/1/2014	353.68	366.94	-13.26	1
7	0_6854809	Confined	12,905	5/1/2014	332.68	367.26	-34.58	1
7	0_6854809	Confined	12,936	6/1/2014	333.88	367.37	-33.49	1
7	0_6854809	Confined	12,966	7/1/2014	332.48	367.48	-35.00	1
7	0_6854809	Confined	12,997	8/1/2014	330.68	367.59	-36.91	1
7	0_6854809	Confined	13,028	9/1/2014	325.98	367.70	-41.72	1
7	0_6854809	Confined	13,089	11/1/2014	338.28	367.92	-29.64	1
7	0_6854809	Confined	13,119	12/1/2014	345.18	368.03	-22.85	1
7	0_6854809	Confined	13,150	1/1/2015	351.98	368.15	-16.17	1
7	0_6854809	Confined	13,181	2/1/2015	340.18	368.53	-28.35	1
7	0_6854809	Confined	13,209	3/1/2015	339.48	368.87	-29.39	1
7	0_6854809	Confined	13,240	4/1/2015	339.38	369.26	-29.88	1
7	0_6854809	Confined	13,270	5/1/2015	345.28	369.63	-24.35	1
7	0_6854809	Confined	13,301	6/1/2015	351.68	370.01	-18.33	1
7	0_6854809	Confined	13,331	7/1/2015	350.18	370.38	-20.20	1
7	0_6854809	Confined	13,362	8/1/2015	341.28	370.76	-29.48	1
7	0_6854809	Confined	13,393	9/1/2015	349.58	371.14	-21.56	1
7	0_6854809	Confined	13,454	11/1/2015	353.08	371.89	-18.81	1
7	0_6854809	Confined	13,484	12/1/2015	357.08	372.26	-15.18	1
7	0_6854809	Confined	13,515	1/1/2016	365.98	372.64	-6.66	1
7	0_6854809	Confined	13,546	2/1/2016	366.08	372.81	-6.73	1
7	0_6854809	Confined	13,575	3/1/2016	364.98	372.96	-7.98	1
7	0_6854809	Confined	13,606	4/1/2016	365.28	373.13	-7.85	1
7	0_6854809	Confined	13,636	5/1/2016	361.38	373.30	-11.92	1
7	0_6854809	Confined	13,667	6/1/2016	363.28	373.47	-10.19	1
7	0_6854809	Confined	13,697	7/1/2016	362.68	373.63	-10.95	1
7	0_6854809	Confined	13,728	8/1/2016	357.08	373.80	-16.72	1
7	0_6854809	Confined	13,759	9/1/2016	360.58	373.97	-13.39	1
7	0_6854809	Confined	13,789	10/1/2016	363.48	374.14	-10.66	1
7	0_6854809	Confined	13,820	11/1/2016	364.88	374.31	-9.43	1
7	0_6854809	Confined	13,850	12/1/2016	350.68	374.47	-23.79	1
7	0_6854809	Confined	13,881	1/1/2017	353.48	374.63	-21.15	1
7	0_6854809	Confined	13,912	2/1/2017	352.08	374.55	-22.47	1
7	0_6854809	Confined	13,940	3/1/2017	350.78	374.48	-23.70	1
7	0_6854809	Confined	13,971	4/1/2017	356.98	374.40	-17.42	1
7	0_6854809	Confined	14,001	5/1/2017	357.38	374.32	-16.94	1
7	0_6854809	Confined	14,032	6/1/2017	355.98	374.24	-18.26	1
7	0_6854809	Confined	14,124	9/1/2017	354.08	374.00	-19.92	1
7	0_6854809	Confined	14,154	10/1/2017	358.38	373.92	-15.54	1
7	0_6854809	Confined	14,185	11/1/2017	360.58	373.84	-13.26	1
7	0_6854809	Confined	14,215	12/1/2017	361.88	373.76	-11.88	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6855111	Unconfined	5,484	1/5/1994	375.89	386.59	-10.70	1
7	0_6855111	Unconfined	5,856	1/12/1995	391.09	386.74	4.35	1
7	0_6855111	Unconfined	6,220	1/11/1996	389.79	386.43	3.36	1
7	0_6855111	Unconfined	6,681	4/16/1997	379.39	386.05	-6.66	1
7	0_6855111	Unconfined	6,976	2/5/1998	368.89	386.57	-17.68	1
7	0_6855111	Unconfined	7,198	9/15/1998	388.86	386.62	2.24	1
7	0_6855111	Unconfined	7,334	1/29/1999	370.89	386.59	-15.70	1
7	0_6855111	Unconfined	7,719	2/18/2000	379.39	385.95	-6.56	1
7	0_6855111	Unconfined	8,089	2/22/2001	378.29	385.95	-7.66	1
7	0_6855111	Unconfined	8,430	1/29/2002	385.89	386.05	-0.16	1
7	0_6855111	Unconfined	8,794	1/28/2003	390.89	386.60	4.29	1
7	0_6855111	Unconfined	9,181	2/19/2004	390.39	386.42	3.97	1
7	0_6855111	Unconfined	9,565	3/9/2005	383.89	386.78	-2.89	1
7	0_6855111	Unconfined	9,907	2/14/2006	381.69	386.08	-4.39	1
7	0_6855111	Unconfined	10,294	3/8/2007	367.39	386.27	-18.88	1
7	0_6855111	Unconfined	10,658	3/6/2008	378.69	387.26	-8.57	1
7	0_6855111	Unconfined	11,020	3/3/2009	376.39	386.15	-9.76	1
7	0_6855111	Unconfined	11,453	5/10/2010	375.09	385.64	-10.55	1
7	0_6855112	Unconfined	11,118	6/9/2009	399.44	398.73	0.71	1
7	0_6855112	Unconfined	11,826	5/18/2011	405.84	396.56	9.28	1
7	0_6855112	Unconfined	12,190	5/16/2012	408.63	395.96	12.67	1
7	0_6855601	Confined	779	2/17/1981	382.20	395.26	-13.06	1
7	0_6855601	Confined	1,145	2/18/1982	383.10	395.90	-12.80	1
7	0_6855601	Confined	2,228	2/5/1985	387.79	394.62	-6.83	1
7	0_6855601	Confined	2,894	12/3/1986	387.56	395.83	-8.27	1
7	0_6856101	Confined	778	2/16/1981	404.82	403.11	1.71	1
7	0_6856101	Confined	1,195	4/9/1982	405.06	403.64	1.42	1
7	0_6856101	Confined	1,508	2/16/1983	404.18	403.03	1.15	1
7	0_6856101	Confined	1,864	2/7/1984	403.65	402.76	0.89	1
7	0_6856101	Confined	2,228	2/5/1985	401.74	402.29	-0.55	1
7	0_6856101	Confined	2,894	12/3/1986	400.99	403.57	-2.58	1
7	0_6856101	Confined	3,334	2/16/1988	401.85	403.44	-1.59	1
7	0_6856101	Confined	3,699	2/15/1989	395.55	401.73	-6.18	1
7	0_6856101	Confined	5,120	1/6/1993	400.19	402.89	-2.70	1
7	0_6856101	Confined	5,484	1/5/1994	400.89	402.41	-1.52	1
7	0_6856101	Confined	5,854	1/10/1995	402.19	402.55	-0.36	1
7	0_6856101	Confined	6,219	1/10/1996	400.64	401.99	-1.35	1
7	0_6856101	Confined	6,675	4/10/1997	397.04	400.81	-3.77	1
7	0_6856101	Confined	6,969	1/29/1998	397.29	401.83	-4.54	1
7	0_6856101	Confined	7,325	1/20/1999	396.99	401.98	-4.99	1
7	0_6856101	Confined	7,927	9/13/2000	395.44	400.33	-4.89	1
7	0_6856101	Confined	8,076	2/9/2001	396.69	400.22	-3.53	1
7	0_6856101	Confined	8,429	1/28/2002	392.09	400.55	-8.46	1
7	0_6856101	Confined	8,793	1/27/2003	393.39	401.46	-8.07	1
7	0_6856101	Confined	9,157	1/26/2004	393.09	401.34	-8.25	1
7	0_6856101	Confined	9,564	3/8/2005	395.29	402.33	-7.04	1
7	0_6856101	Confined	9,895	2/2/2006	394.49	401.05	-6.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6856101	Confined	10,293	3/7/2007	393.59	401.45	-7.86	1
7	0_6856101	Confined	10,617	1/25/2008	396.09	403.88	-7.79	1
7	0_6856101	Confined	11,021	3/4/2009	394.79	401.29	-6.50	1
7	0_6856101	Confined	11,442	4/29/2010	396.49	399.42	-2.93	1
7	0_6856302	Confined	779	2/17/1981	398.18	402.26	-4.08	1
7	0_6856302	Confined	1,145	2/18/1982	398.03	402.90	-4.87	1
7	0_6856302	Confined	1,508	2/16/1983	397.23	402.20	-4.97	1
7	0_6856302	Confined	1,865	2/8/1984	396.89	401.90	-5.01	1
7	0_6856302	Confined	2,229	2/6/1985	394.58	401.40	-6.82	1
7	0_6856302	Confined	2,605	2/17/1986	393.89	402.48	-8.59	1
7	0_6856302	Confined	2,894	12/3/1986	394.01	402.68	-8.67	1
7	0_6856302	Confined	3,334	2/16/1988	394.90	402.56	-7.66	1
7	0_6856302	Confined	3,699	2/15/1989	389.39	400.83	-11.44	1
7	0_6856302	Confined	3,999	12/12/1989	390.03	400.49	-10.46	1
7	0_6856302	Confined	4,364	12/12/1990	390.32	400.58	-10.26	1
7	0_6856302	Confined	5,120	1/6/1993	393.35	401.84	-8.49	1
7	0_6856302	Confined	5,484	1/5/1994	393.95	401.51	-7.56	1
7	0_6856302	Confined	5,854	1/10/1995	394.15	401.61	-7.46	1
7	0_6856302	Confined	6,219	1/10/1996	392.15	401.07	-8.92	1
7	0_6856302	Confined	6,641	3/7/1997	391.15	399.65	-8.50	1
7	0_6856302	Confined	6,969	1/29/1998	389.45	400.75	-11.30	1
7	0_6856302	Confined	7,324	1/19/1999	388.70	400.90	-12.20	1
7	0_6856302	Confined	7,927	9/13/2000	386.49	399.16	-12.67	1
7	0_6856302	Confined	8,074	2/7/2001	388.45	399.01	-10.56	1
7	0_6856302	Confined	8,429	1/28/2002	388.45	399.37	-10.92	1
7	0_6856302	Confined	8,793	1/27/2003	388.95	400.19	-11.24	1
7	0_6856302	Confined	9,159	1/28/2004	388.75	400.19	-11.44	1
7	0_6856302	Confined	9,564	3/8/2005	390.75	401.23	-10.48	1
7	0_6856302	Confined	9,895	2/2/2006	388.95	400.03	-11.08	1
7	0_6856302	Confined	10,293	3/7/2007	388.20	400.45	-12.25	1
7	0_6856302	Confined	10,644	2/21/2008	389.05	402.72	-13.67	1
7	0_6856302	Confined	11,040	3/23/2009	388.35	400.24	-11.89	1
7	0_6856302	Confined	11,442	4/29/2010	388.15	398.16	-10.01	1
7	0_6857210	Unconfined	771	2/9/1981	511.47	492.58	18.89	1
7	0_6857210	Unconfined	1,144	2/17/1982	509.86	497.96	11.90	1
7	0_6857210	Unconfined	1,507	2/15/1983	506.29	498.04	8.25	1
7	0_6857210	Unconfined	1,880	2/23/1984	506.09	498.62	7.47	1
7	0_6857210	Unconfined	2,234	2/11/1985	504.78	491.14	13.64	1
7	0_6857210	Unconfined	2,607	2/19/1986	503.85	502.24	1.61	1
7	0_6857210	Unconfined	3,008	3/27/1987	502.35	508.85	-6.50	1
7	0_6857210	Unconfined	3,363	3/16/1988	501.60	511.83	-10.23	1
7	0_6857210	Unconfined	3,687	2/3/1989	510.57	506.81	3.76	1
7	0_6857210	Unconfined	4,056	2/7/1990	489.32	503.71	-14.39	1
7	0_6857316	Unconfined	9,964	4/12/2006	535.84	485.61	25.11	0.5
7	0_6857402	Confined	1,139	2/12/1982	476.84	469.34	0.75	0.1
7	0_6857402	Confined	1,516	2/24/1983	468.19	469.99	-0.18	0.1
7	0_6857402	Confined	1,873	2/16/1984	470.99	471.98	-0.10	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6857402	Confined	2,235	2/12/1985	481.89	468.04	1.38	0.1
7	0_6857402	Confined	2,601	2/13/1986	479.44	475.74	0.37	0.1
7	0_6857402	Confined	3,342	2/24/1988	475.29	481.31	-0.60	0.1
7	0_6857402	Confined	3,697	2/13/1989	472.62	476.25	-0.36	0.1
7	0_6857402	Confined	4,061	2/12/1990	449.60	472.38	-2.28	0.1
7	0_6857402	Confined	4,415	2/1/1991	460.39	472.48	-1.21	0.1
7	0_6857402	Confined	4,755	1/7/1992	487.24	459.85	2.74	0.1
7	0_6857505	Unconfined	780	2/18/1981	486.46	469.76	8.35	0.5
7	0_6857505	Unconfined	1,516	2/24/1983	479.35	474.32	2.51	0.5
7	0_6857616	Confined	2,235	2/12/1985	474.19	465.72	0.85	0.1
7	0_6857622	Confined	8,542	5/21/2002	431.43	380.01	5.14	0.1
7	0_6857701	Confined	1,139	2/12/1982	479.67	452.04	13.82	0.5
7	0_6857701	Confined	1,873	2/16/1984	477.10	455.16	10.97	0.5
7	0_6857701	Confined	2,602	2/14/1986	469.82	459.32	5.25	0.5
7	0_6857701	Confined	3,342	2/24/1988	466.82	463.12	1.85	0.5
7	0_6857701	Confined	3,697	2/13/1989	463.33	458.23	2.55	0.5
7	0_6857701	Confined	4,063	2/14/1990	459.86	454.63	2.62	0.5
7	0_6857701	Confined	4,385	1/2/1991	458.54	455.43	1.56	0.5
7	0_6857701	Confined	4,777	1/29/1992	458.57	439.30	9.63	0.5
7	0_6857701	Confined	5,140	1/26/1993	458.72	433.64	12.54	0.5
7	0_6857701	Confined	5,506	1/27/1994	456.92	422.66	17.13	0.5
7	0_6857701	Confined	5,857	1/13/1995	452.02	412.72	19.65	0.5
7	0_6857701	Confined	6,224	1/15/1996	451.42	406.20	22.61	0.5
7	0_6857701	Confined	6,653	3/19/1997	448.87	403.87	22.50	0.5
7	0_6857701	Confined	6,982	2/11/1998	454.77	410.90	21.93	0.5
7	0_6857701	Confined	7,318	1/13/1999	450.97	400.29	25.34	0.5
7	0_6857701	Confined	8,061	1/25/2001	448.62	374.23	37.20	0.5
7	0_6857701	Confined	8,411	1/10/2002	447.82	371.62	38.10	0.5
7	0_6857701	Confined	8,773	1/7/2003	450.42	361.60	44.41	0.5
7	0_6857701	Confined	9,139	1/8/2004	449.62	359.82	44.90	0.5
7	0_6857701	Confined	9,504	1/7/2005	453.42	364.43	44.50	0.5
7	0_6857701	Confined	9,881	1/19/2006	451.02	363.16	43.93	0.5
7	0_6857701	Confined	10,270	2/12/2007	448.92	367.66	40.63	0.5
7	0_6857701	Confined	10,624	2/1/2008	450.42	369.59	40.41	0.5
7	0_6857701	Confined	11,007	2/18/2009	448.62	348.75	49.94	0.5
7	0_6857701	Confined	11,358	2/4/2010	446.72	316.37	65.18	0.5
7	0_6857704	Confined	4,618	8/23/1991	555.18	452.11	51.53	0.5
7	0_6857901	Confined	780	2/18/1981	499.91	444.68	27.61	0.5
7	0_6857919	Confined	12,475	2/25/2013	370.12	285.78	84.34	1
7	0_6858101	Unconfined	1,144	2/17/1982	517.31	526.38	-9.07	1
7	0_6858101	Unconfined	1,506	2/14/1983	516.22	528.61	-12.39	1
7	0_6858101	Unconfined	2,234	2/11/1985	513.36	501.81	11.55	1
7	0_6858101	Unconfined	2,607	2/19/1986	512.66	530.18	-17.52	1
7	0_6858101	Unconfined	3,008	3/27/1987	511.27	543.62	-32.35	1
7	0_6858101	Unconfined	3,363	3/16/1988	510.33	549.18	-38.85	1
7	0_6858101	Unconfined	3,687	2/3/1989	509.10	546.13	-37.03	1
7	0_6858101	Unconfined	4,056	2/7/1990	507.96	544.73	-36.77	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6858101	Unconfined	4,408	1/25/1991	507.76	548.07	-40.31	1
7	0_6858101	Unconfined	4,785	2/6/1992	506.96	549.69	-42.73	1
7	0_6858101	Unconfined	5,176	3/3/1993	501.73	550.55	-48.82	1
7	0_6858101	Unconfined	5,619	5/20/1994	503.69	540.11	-36.42	1
7	0_6858101	Unconfined	6,282	3/13/1996	499.42	515.80	-16.38	1
7	0_6858101	Unconfined	6,619	2/13/1997	500.11	506.45	-6.34	1
7	0_6858101	Unconfined	6,998	2/27/1998	495.64	513.33	-17.69	1
7	0_6858101	Unconfined	7,379	3/15/1999	496.86	513.72	-16.86	1
7	0_6858110	Unconfined	771	2/9/1981	487.33	483.50	3.83	1
7	0_6858110	Unconfined	1,144	2/17/1982	487.36	491.54	-4.18	1
7	0_6858110	Unconfined	1,506	2/14/1983	486.53	493.46	-6.93	1
7	0_6858110	Unconfined	1,880	2/23/1984	484.77	493.80	-9.03	1
7	0_6858110	Unconfined	2,234	2/11/1985	480.63	481.50	-0.87	1
7	0_6858110	Unconfined	2,607	2/19/1986	480.44	498.46	-18.02	1
7	0_6858110	Unconfined	3,008	3/27/1987	478.62	507.87	-29.25	1
7	0_6858110	Unconfined	3,363	3/16/1988	477.78	512.38	-34.60	1
7	0_6858410	Confined	8,500	4/9/2002	411.75	366.98	44.77	1
7	0_6858602	Confined	1,166	3/11/1982	446.18	438.54	0.76	0.1
7	0_6858602	Confined	1,506	2/14/1983	445.93	442.22	0.37	0.1
7	0_6858602	Confined	1,879	2/22/1984	442.65	447.29	-0.46	0.1
7	0_6858602	Confined	2,599	2/11/1986	438.66	455.79	-1.71	0.1
7	0_6858602	Confined	2,999	3/18/1987	440.12	459.77	-1.97	0.1
7	0_6858602	Confined	3,336	2/18/1988	435.24	465.13	-2.99	0.1
7	0_6858602	Confined	4,082	3/5/1990	424.59	454.98	-3.04	0.1
7	0_6858602	Confined	4,411	1/28/1991	426.94	455.51	-2.86	0.1
7	0_6858602	Confined	5,122	1/8/1993	425.72	450.00	-2.43	0.1
7	0_6858602	Confined	5,491	1/12/1994	420.62	442.09	-2.15	0.1
7	0_6858602	Confined	6,965	1/25/1998	497.02	425.62	7.14	0.1
7	0_6858602	Confined	7,313	1/8/1999	495.82	419.84	7.60	0.1
7	0_6858602	Confined	8,045	1/9/2001	502.42	398.35	10.41	0.1
7	0_6858602	Confined	8,416	1/15/2002	502.32	393.41	10.89	0.1
7	0_6858602	Confined	8,788	1/22/2003	503.42	387.70	11.57	0.1
7	0_6858602	Confined	9,150	1/19/2004	504.02	384.95	11.91	0.1
7	0_6858602	Confined	9,538	2/10/2005	502.62	388.11	11.45	0.1
7	0_6858602	Confined	9,874	1/12/2006	501.42	385.61	11.58	0.1
7	0_6858602	Confined	10,266	2/8/2007	499.32	387.03	11.23	0.1
7	0_6858602	Confined	10,643	2/20/2008	501.22	393.52	10.77	0.1
7	0_6858602	Confined	11,007	2/18/2009	499.32	382.09	11.72	0.1
7	0_6858602	Confined	11,433	4/20/2010	498.02	356.16	14.19	0.1
7	0_6859213	Unconfined	11,189	8/19/2009	444.40	494.56	-25.08	0.5
7	0_6859213	Unconfined	11,832	5/24/2011	442.50	472.91	-15.21	0.5
7	0_6859213	Unconfined	12,190	5/16/2012	441.41	461.72	-10.15	0.5
7	0_6859303	Unconfined	773	2/11/1981	463.15	443.72	19.43	1
7	0_6859303	Unconfined	1,166	3/11/1982	462.45	455.92	6.53	1
7	0_6859303	Unconfined	1,506	2/14/1983	459.94	460.29	-0.35	1
7	0_6859303	Unconfined	1,879	2/22/1984	462.51	466.91	-4.40	1
7	0_6859312	Unconfined	2,231	2/8/1985	456.15	472.21	-16.06	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6859312	Unconfined	2,600	2/12/1986	459.16	482.93	-23.77	1
7	0_6859312	Unconfined	2,999	3/18/1987	458.70	488.58	-29.88	1
7	0_6859312	Unconfined	3,335	2/17/1988	457.71	494.64	-36.93	1
7	0_6859312	Unconfined	5,496	1/17/1994	451.93	490.88	-38.95	1
7	0_6859312	Unconfined	5,867	1/23/1995	451.63	491.00	-39.37	1
7	0_6859312	Unconfined	6,262	2/22/1996	445.98	484.86	-38.88	1
7	0_6859312	Unconfined	6,966	1/26/1998	447.83	483.60	-35.77	1
7	0_6859312	Unconfined	7,312	1/7/1999	447.48	483.83	-36.35	1
7	0_6859312	Unconfined	8,044	1/8/2001	443.43	468.83	-25.40	1
7	0_6859312	Unconfined	8,416	1/15/2002	445.93	465.62	-19.69	1
7	0_6859312	Unconfined	8,796	1/30/2003	444.93	469.15	-24.22	1
7	0_6859312	Unconfined	9,150	1/19/2004	445.43	467.81	-22.38	1
7	0_6859312	Unconfined	9,521	1/24/2005	445.43	474.21	-28.78	1
7	0_6859312	Unconfined	9,885	1/23/2006	443.03	467.59	-24.56	1
7	0_6859312	Unconfined	10,266	2/8/2007	443.13	466.03	-22.90	1
7	0_6859312	Unconfined	10,614	1/22/2008	444.03	481.13	-37.10	1
7	0_6859312	Unconfined	10,988	1/30/2009	442.73	472.95	-30.22	1
7	0_6859312	Unconfined	11,378	2/24/2010	444.43	461.31	-16.88	1
7	0_6859501	Confined	773	2/11/1981	446.92	412.16	3.48	0.1
7	0_6859501	Confined	1,166	3/11/1982	448.59	424.55	2.40	0.1
7	0_6859501	Confined	1,506	2/14/1983	447.21	430.26	1.70	0.1
7	0_6859501	Confined	1,879	2/22/1984	445.94	437.59	0.83	0.1
7	0_6859501	Confined	2,231	2/8/1985	440.41	441.57	-0.12	0.1
7	0_6859501	Confined	2,599	2/11/1986	441.04	449.13	-0.81	0.1
7	0_6859501	Confined	3,336	2/18/1988	439.53	459.01	-1.95	0.1
7	0_6859501	Confined	4,082	3/5/1990	429.10	447.62	-1.85	0.1
7	0_6859501	Confined	4,411	1/28/1991	426.98	447.71	-2.07	0.1
7	0_6859501	Confined	5,117	1/3/1993	440.28	452.97	-1.27	0.1
7	0_6859501	Confined	5,491	1/12/1994	434.68	448.55	-1.39	0.1
7	0_6859501	Confined	5,867	1/23/1995	428.88	445.72	-1.68	0.1
7	0_6859501	Confined	6,262	2/22/1996	421.08	439.60	-1.85	0.1
7	0_6859501	Confined	6,665	3/31/1997	418.48	434.75	-1.63	0.1
7	0_6859501	Confined	6,966	1/26/1998	424.28	438.15	-1.39	0.1
7	0_6859501	Confined	7,313	1/8/1999	422.38	434.72	-1.23	0.1
7	0_6859501	Confined	8,045	1/9/2001	417.08	418.15	-0.11	0.1
7	0_6859501	Confined	8,415	1/14/2002	415.48	415.34	0.01	0.1
7	0_6859501	Confined	8,774	1/8/2003	416.08	411.90	0.42	0.1
7	0_6859501	Confined	9,150	1/19/2004	417.98	410.72	0.73	0.1
7	0_6859501	Confined	9,521	1/24/2005	417.38	414.59	0.28	0.1
7	0_6859501	Confined	9,874	1/12/2006	416.48	411.90	0.46	0.1
7	0_6859501	Confined	10,257	1/30/2007	414.48	412.96	0.15	0.1
7	0_6859501	Confined	10,613	1/21/2008	415.18	423.13	-0.79	0.1
7	0_6859501	Confined	10,998	2/9/2009	413.08	415.73	-0.26	0.1
7	0_6859501	Confined	11,425	4/12/2010	414.48	396.69	1.78	0.1
7	0_6859509	Confined	8,408	1/7/2002	398.88	411.90	-1.30	0.1
7	0_6859509	Confined	8,772	1/6/2003	390.78	408.64	-1.79	0.1
7	0_6859509	Confined	9,136	1/5/2004	397.78	407.64	-0.99	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6859509	Confined	9,528	1/31/2005	398.18	412.63	-1.44	0.1
7	0_6859509	Confined	9,865	1/3/2006	397.38	409.77	-1.24	0.1
7	0_6859509	Confined	10,229	1/2/2007	392.88	410.30	-1.74	0.1
7	0_6859509	Confined	10,594	1/2/2008	392.88	423.66	-3.08	0.1
7	0_6859509	Confined	10,988	1/30/2009	389.88	415.75	-2.59	0.1
7	0_6859509	Confined	11,323	12/31/2009	387.78	401.71	-1.39	0.1
7	0_6859509	Confined	12,059	1/6/2012	382.48	356.24	2.62	0.1
7	0_6859509	Confined	12,090	2/6/2012	383.68	357.28	2.64	0.1
7	0_6859509	Confined	12,114	3/1/2012	384.08	358.09	2.60	0.1
7	0_6859509	Confined	12,149	4/5/2012	385.68	359.27	2.64	0.1
7	0_6859509	Confined	12,176	5/2/2012	375.78	360.18	1.56	0.1
7	0_6859509	Confined	12,206	6/1/2012	377.88	361.19	1.67	0.1
7	0_6859509	Confined	12,241	7/6/2012	375.78	362.37	1.34	0.1
7	0_6859509	Confined	12,269	8/3/2012	374.58	363.31	1.13	0.1
7	0_6859509	Confined	12,308	9/11/2012	375.68	364.63	1.11	0.1
7	0_6859509	Confined	12,347	10/20/2012	378.28	365.94	1.23	0.1
7	0_6859509	Confined	12,386	11/28/2012	377.38	367.26	1.01	0.1
7	0_6859509	Confined	12,394	12/6/2012	378.48	367.53	1.10	0.1
7	0_6859509	Confined	12,425	1/6/2013	378.38	368.51	0.99	0.1
7	0_6859509	Confined	12,456	2/6/2013	381.38	369.22	1.22	0.1
7	0_6859509	Confined	12,479	3/1/2013	378.98	369.74	0.92	0.1
7	0_6859509	Confined	12,514	4/5/2013	377.98	370.54	0.74	0.1
7	0_6859509	Confined	12,541	5/2/2013	381.68	371.16	1.05	0.1
7	0_6859509	Confined	12,606	7/6/2013	381.28	372.65	0.86	0.1
7	0_6859509	Confined	12,673	9/11/2013	372.98	374.18	-0.12	0.1
7	0_6859509	Confined	12,693	10/1/2013	374.48	374.63	-0.02	0.1
7	0_6859509	Confined	12,754	12/1/2013	377.78	376.03	0.18	0.1
7	0_6859509	Confined	12,816	2/1/2014	377.18	377.37	-0.02	0.1
7	0_6859509	Confined	12,844	3/1/2014	382.38	377.94	0.44	0.1
7	0_6859509	Confined	12,905	5/1/2014	373.28	379.19	-0.59	0.1
7	0_6859509	Confined	12,936	6/1/2014	373.78	379.83	-0.60	0.1
7	0_6859509	Confined	12,966	7/1/2014	374.08	380.44	-0.64	0.1
7	0_6859509	Confined	13,028	9/1/2014	366.78	381.71	-1.49	0.1
7	0_6859509	Confined	13,058	10/1/2014	368.88	382.33	-1.34	0.1
7	0_6859509	Confined	13,089	11/1/2014	370.18	382.96	-1.28	0.1
7	0_6859509	Confined	13,209	3/1/2015	372.68	386.81	-1.41	0.1
7	0_6859509	Confined	13,240	4/1/2015	373.08	388.17	-1.51	0.1
7	0_6859509	Confined	13,270	5/1/2015	373.48	389.48	-1.60	0.1
7	0_6859509	Confined	13,331	7/1/2015	377.28	392.14	-1.49	0.1
7	0_6859509	Confined	13,362	8/1/2015	375.58	393.50	-1.79	0.1
7	0_6859509	Confined	13,393	9/1/2015	373.88	394.85	-2.10	0.1
7	0_6859509	Confined	13,423	10/1/2015	374.08	396.16	-2.21	0.1
7	0_6859509	Confined	13,454	11/1/2015	376.48	397.52	-2.10	0.1
7	0_6859509	Confined	13,484	12/1/2015	376.18	398.83	-2.26	0.1
7	0_6859509	Confined	13,515	1/1/2016	379.78	400.18	-2.04	0.1
7	0_6859509	Confined	13,546	2/1/2016	378.98	401.34	-2.24	0.1
7	0_6859509	Confined	13,575	3/1/2016	377.58	402.42	-2.48	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6859509	Confined	13,606	4/1/2016	377.98	403.58	-2.56	0.1
7	0_6859509	Confined	13,636	5/1/2016	376.28	404.70	-2.84	0.1
7	0_6859509	Confined	13,667	6/1/2016	376.78	405.86	-2.91	0.1
7	0_6859509	Confined	13,697	7/1/2016	375.58	406.99	-3.14	0.1
7	0_6859509	Confined	13,728	8/1/2016	373.78	408.15	-3.44	0.1
7	0_6859509	Confined	13,759	9/1/2016	370.18	409.31	-3.91	0.1
7	0_6859509	Confined	13,789	10/1/2016	371.78	410.43	-3.86	0.1
7	0_6859509	Confined	13,820	11/1/2016	370.68	411.59	-4.09	0.1
7	0_6859509	Confined	13,850	12/1/2016	371.08	412.71	-4.16	0.1
7	0_6859509	Confined	13,881	1/1/2017	370.58	413.85	-4.33	0.1
7	0_6859509	Confined	13,912	2/1/2017	369.28	414.28	-4.50	0.1
7	0_6859509	Confined	13,940	3/1/2017	369.58	414.68	-4.51	0.1
7	0_6859509	Confined	13,971	4/1/2017	370.48	415.11	-4.46	0.1
7	0_6859509	Confined	14,001	5/1/2017	369.08	415.54	-4.65	0.1
7	0_6859509	Confined	14,032	6/1/2017	370.78	415.97	-4.52	0.1
7	0_6859509	Confined	14,124	9/1/2017	370.98	417.27	-4.63	0.1
7	0_6859509	Confined	14,154	10/1/2017	371.28	417.69	-4.64	0.1
7	0_6859509	Confined	14,185	11/1/2017	371.48	418.13	-4.66	0.1
7	0_6859509	Confined	14,215	12/1/2017	371.68	418.55	-4.69	0.1
7	0_6859517	Confined	4,646	9/20/1991	397.21	435.44	-3.82	0.1
7	0_6859517	Confined	5,491	1/12/1994	416.01	440.76	-2.47	0.1
7	0_6859517	Confined	7,313	1/8/1999	422.21	428.88	-0.67	0.1
7	0_6859517	Confined	7,683	1/13/2000	409.46	421.32	-1.19	0.1
7	0_6859517	Confined	8,044	1/8/2001	412.01	410.04	0.20	0.1
7	0_6859517	Confined	8,415	1/14/2002	407.81	407.48	0.03	0.1
7	0_6859517	Confined	8,775	1/9/2003	410.01	404.31	0.57	0.1
7	0_6859517	Confined	9,139	1/8/2004	409.51	403.61	0.59	0.1
7	0_6859517	Confined	9,521	1/24/2005	407.71	409.79	-0.21	0.1
7	0_6859517	Confined	9,865	1/3/2006	408.41	407.18	0.12	0.1
7	0_6859517	Confined	10,257	1/30/2007	406.01	409.19	-0.32	0.1
7	0_6859517	Confined	10,609	1/17/2008	407.91	423.12	-1.52	0.1
7	0_6859517	Confined	10,998	2/9/2009	405.41	415.28	-0.99	0.1
7	0_6859517	Confined	11,386	3/4/2010	408.01	395.63	1.24	0.1
7	0_6859518	Confined	8,422	1/21/2002	406.67	421.46	-1.48	0.1
7	0_6859518	Confined	8,772	1/6/2003	405.87	419.13	-1.33	0.1
7	0_6859518	Confined	9,136	1/5/2004	406.07	417.84	-1.18	0.1
7	0_6859518	Confined	9,528	1/31/2005	407.17	422.41	-1.52	0.1
7	0_6859518	Confined	9,865	1/3/2006	403.47	419.53	-1.61	0.1
7	0_6859518	Confined	10,229	1/2/2007	397.17	419.46	-2.23	0.1
7	0_6859518	Confined	10,594	1/2/2008	399.57	432.03	-3.25	0.1
7	0_6859518	Confined	10,988	1/30/2009	398.37	425.13	-2.68	0.1
7	0_6859518	Confined	11,323	12/31/2009	396.07	412.64	-1.66	0.1
7	0_6859518	Confined	12,059	1/6/2012	390.07	369.69	2.04	0.1
7	0_6859518	Confined	12,090	2/6/2012	390.87	370.51	2.04	0.1
7	0_6859518	Confined	12,114	3/1/2012	391.67	371.15	2.05	0.1
7	0_6859518	Confined	12,149	4/5/2012	394.27	372.08	2.22	0.1
7	0_6859518	Confined	12,176	5/2/2012	387.27	372.80	1.45	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6859518	Confined	12,206	6/1/2012	387.37	373.60	1.38	0.1
7	0_6859518	Confined	12,241	7/6/2012	386.27	374.53	1.17	0.1
7	0_6859518	Confined	12,269	8/3/2012	386.67	375.28	1.14	0.1
7	0_6859518	Confined	12,308	9/11/2012	384.67	376.31	0.84	0.1
7	0_6859518	Confined	12,347	10/20/2012	387.47	377.35	1.01	0.1
7	0_6859518	Confined	12,386	11/28/2012	386.07	378.39	0.77	0.1
7	0_6859518	Confined	12,394	12/6/2012	386.67	378.60	0.81	0.1
7	0_6859518	Confined	12,425	1/6/2013	391.67	379.39	1.23	0.1
7	0_6859518	Confined	12,456	2/6/2013	388.57	380.04	0.85	0.1
7	0_6859518	Confined	12,479	3/1/2013	386.87	380.53	0.63	0.1
7	0_6859518	Confined	12,514	4/5/2013	385.87	381.27	0.46	0.1
7	0_6859518	Confined	12,541	5/2/2013	390.67	381.83	0.88	0.1
7	0_6859518	Confined	12,571	6/1/2013	387.67	382.46	0.52	0.1
7	0_6859518	Confined	12,606	7/6/2013	389.67	383.20	0.65	0.1
7	0_6859518	Confined	12,634	8/3/2013	384.67	383.79	0.09	0.1
7	0_6859518	Confined	12,673	9/11/2013	381.67	384.61	-0.29	0.1
7	0_6859518	Confined	12,693	10/1/2013	383.87	385.03	-0.12	0.1
7	0_6859518	Confined	12,744	11/21/2013	384.17	386.11	-0.19	0.1
7	0_6859518	Confined	12,754	12/1/2013	384.87	386.32	-0.14	0.1
7	0_6859518	Confined	12,785	1/1/2014	383.87	386.97	-0.31	0.1
7	0_6859518	Confined	12,816	2/1/2014	385.07	387.55	-0.25	0.1
7	0_6859518	Confined	12,844	3/1/2014	389.47	388.08	0.14	0.1
7	0_6859518	Confined	12,875	4/1/2014	388.27	388.67	-0.04	0.1
7	0_6859518	Confined	12,936	6/1/2014	384.07	389.82	-0.58	0.1
7	0_6859518	Confined	12,997	8/1/2014	380.57	390.98	-1.04	0.1
7	0_6859518	Confined	13,028	9/1/2014	377.17	391.56	-1.44	0.1
7	0_6859518	Confined	13,058	10/1/2014	379.37	392.13	-1.28	0.1
7	0_6859518	Confined	13,089	11/1/2014	379.17	392.72	-1.35	0.1
7	0_6859518	Confined	13,119	12/1/2014	379.87	393.29	-1.34	0.1
7	0_6859518	Confined	13,150	1/1/2015	381.57	393.89	-1.23	0.1
7	0_6859518	Confined	13,209	3/1/2015	381.47	396.33	-1.49	0.1
7	0_6859518	Confined	13,240	4/1/2015	381.67	397.61	-1.59	0.1
7	0_6859518	Confined	13,270	5/1/2015	381.87	398.85	-1.70	0.1
7	0_6859518	Confined	13,301	6/1/2015	381.77	400.13	-1.84	0.1
7	0_6859518	Confined	13,331	7/1/2015	380.97	401.37	-2.04	0.1
7	0_6859518	Confined	13,362	8/1/2015	380.77	402.65	-2.19	0.1
7	0_6859518	Confined	13,393	9/1/2015	378.67	403.93	-2.53	0.1
7	0_6859518	Confined	13,454	11/1/2015	379.67	406.45	-2.68	0.1
7	0_6859518	Confined	13,484	12/1/2015	379.47	407.69	-2.82	0.1
7	0_6859518	Confined	13,515	1/1/2016	380.57	408.97	-2.84	0.1
7	0_6859518	Confined	13,546	2/1/2016	379.67	410.08	-3.04	0.1
7	0_6859518	Confined	13,575	3/1/2016	379.47	411.12	-3.16	0.1
7	0_6859518	Confined	13,606	4/1/2016	379.77	412.23	-3.25	0.1
7	0_6859518	Confined	13,636	5/1/2016	379.77	413.31	-3.35	0.1
7	0_6859518	Confined	13,667	6/1/2016	378.27	414.42	-3.62	0.1
7	0_6859518	Confined	13,697	7/1/2016	379.77	415.50	-3.57	0.1
7	0_6859518	Confined	13,728	8/1/2016	377.47	416.61	-3.91	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6859518	Confined	13,759	9/1/2016	379.57	417.72	-3.82	0.1
7	0_6859518	Confined	13,789	10/1/2016	377.27	418.80	-4.15	0.1
7	0_6859518	Confined	13,820	11/1/2016	377.87	419.91	-4.20	0.1
7	0_6859518	Confined	13,850	12/1/2016	373.77	420.99	-4.72	0.1
7	0_6859518	Confined	13,881	1/1/2017	370.87	422.08	-5.12	0.1
7	0_6859518	Confined	13,912	2/1/2017	373.37	422.54	-4.92	0.1
7	0_6859518	Confined	13,940	3/1/2017	369.97	422.95	-5.30	0.1
7	0_6859518	Confined	13,971	4/1/2017	372.07	423.41	-5.13	0.1
7	0_6859518	Confined	14,001	5/1/2017	371.07	423.85	-5.28	0.1
7	0_6859518	Confined	14,032	6/1/2017	370.77	424.30	-5.35	0.1
7	0_6859518	Confined	14,124	9/1/2017	369.57	425.66	-5.61	0.1
7	0_6859518	Confined	14,154	10/1/2017	369.17	426.10	-5.69	0.1
7	0_6859518	Confined	14,185	11/1/2017	370.77	426.56	-5.58	0.1
7	0_6859518	Confined	14,215	12/1/2017	371.17	427.00	-5.58	0.1
7	0_6859621	Confined	773	2/11/1981	436.55	348.79	43.88	0.5
7	0_6859621	Confined	1,166	3/11/1982	436.30	366.39	34.95	0.5
7	0_6859621	Confined	1,506	2/14/1983	433.39	373.35	30.02	0.5
7	0_6860312	Confined	773	2/11/1981	424.40	356.02	6.84	0.1
7	0_6860312	Confined	1,153	2/26/1982	424.13	370.07	5.41	0.1
7	0_6860312	Confined	1,501	2/9/1983	423.49	378.11	4.54	0.1
7	0_6860312	Confined	1,878	2/21/1984	416.69	387.91	2.88	0.1
7	0_6860312	Confined	2,229	2/6/1985	418.31	393.67	2.46	0.1
7	0_6860312	Confined	2,598	2/10/1986	417.67	402.19	1.55	0.1
7	0_6860312	Confined	2,997	3/16/1987	415.08	405.30	0.98	0.1
7	0_6860312	Confined	3,335	2/17/1988	415.66	412.85	0.28	0.1
7	0_6860312	Confined	3,705	2/21/1989	404.89	409.18	-0.43	0.1
7	0_6860312	Confined	4,391	1/8/1991	408.85	398.00	1.09	0.1
7	0_6860610	Confined	773	2/11/1981	395.32	342.10	53.22	1
7	0_6860610	Confined	1,153	2/26/1982	395.28	355.89	39.39	1
7	0_6860610	Confined	1,501	2/9/1983	394.93	361.85	33.08	1
7	0_6860610	Confined	1,878	2/21/1984	388.98	369.77	19.21	1
7	0_6860853	Confined	13,273	5/4/2015	342.60	344.27	-1.67	1
7	0_6861201	Confined	9,532	2/4/2005	402.15	336.77	6.54	0.1
7	0_6861201	Confined	9,872	1/10/2006	391.65	336.26	5.54	0.1
7	0_6861201	Confined	10,231	1/4/2007	368.05	341.90	2.62	0.1
7	0_6861201	Confined	10,595	1/3/2008	407.05	359.48	4.76	0.1
7	0_6861201	Confined	10,987	1/29/2009	372.65	348.96	2.37	0.1
7	0_6861201	Confined	11,334	1/11/2010	415.05	328.42	8.66	0.1
7	0_6861201	Confined	12,114	3/1/2012	380.45	277.68	10.28	0.1
7	0_6861201	Confined	12,149	4/5/2012	380.45	281.99	9.85	0.1
7	0_6861201	Confined	12,176	5/2/2012	373.75	285.32	8.84	0.1
7	0_6861201	Confined	12,206	6/1/2012	371.05	289.02	8.20	0.1
7	0_6861201	Confined	12,241	7/6/2012	323.85	293.33	3.05	0.1
7	0_6861201	Confined	12,269	8/3/2012	327.65	296.78	3.09	0.1
7	0_6861201	Confined	12,347	10/20/2012	373.25	306.39	6.69	0.1
7	0_6861201	Confined	12,386	11/28/2012	389.25	311.19	7.81	0.1
7	0_6861201	Confined	12,394	12/6/2012	350.05	312.18	3.79	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861201	Confined	12,456	2/6/2013	342.35	316.87	2.55	0.1
7	0_6861201	Confined	12,479	3/1/2013	331.95	317.88	1.41	0.1
7	0_6861201	Confined	12,514	4/5/2013	327.25	319.41	0.78	0.1
7	0_6861201	Confined	12,541	5/2/2013	331.75	320.58	1.12	0.1
7	0_6861201	Confined	12,571	6/1/2013	331.35	321.89	0.95	0.1
7	0_6861201	Confined	12,606	7/6/2013	334.45	323.42	1.10	0.1
7	0_6861201	Confined	12,634	8/3/2013	329.65	324.64	0.50	0.1
7	0_6861201	Confined	12,693	10/1/2013	326.85	327.22	-0.04	0.1
7	0_6861201	Confined	12,744	11/21/2013	358.45	329.45	2.90	0.1
7	0_6861201	Confined	12,844	3/1/2014	335.35	333.05	0.23	0.1
7	0_6861201	Confined	12,875	4/1/2014	320.35	334.01	-1.37	0.1
7	0_6861201	Confined	12,905	5/1/2014	315.05	334.95	-1.99	0.1
7	0_6861201	Confined	12,966	7/1/2014	313.65	336.84	-2.32	0.1
7	0_6861201	Confined	13,058	10/1/2014	317.55	339.69	-2.21	0.1
7	0_6861201	Confined	13,089	11/1/2014	332.45	340.65	-0.82	0.1
7	0_6861201	Confined	13,119	12/1/2014	339.55	341.59	-0.20	0.1
7	0_6861201	Confined	13,150	1/1/2015	368.55	342.56	2.60	0.1
7	0_6861201	Confined	13,181	2/1/2015	331.25	344.04	-1.28	0.1
7	0_6861201	Confined	13,301	6/1/2015	371.05	349.77	2.13	0.1
7	0_6861201	Confined	13,362	8/1/2015	353.85	352.69	0.12	0.1
7	0_6861201	Confined	13,393	9/1/2015	372.85	354.17	1.87	0.1
7	0_6861201	Confined	13,423	10/1/2015	359.05	355.60	0.35	0.1
7	0_6861201	Confined	13,454	11/1/2015	367.15	357.08	1.01	0.1
7	0_6861201	Confined	13,484	12/1/2015	369.75	358.51	1.12	0.1
7	0_6861201	Confined	13,515	1/1/2016	372.65	359.97	1.27	0.1
7	0_6861201	Confined	13,546	2/1/2016	374.35	360.92	1.34	0.1
7	0_6861201	Confined	13,575	3/1/2016	374.95	361.81	1.31	0.1
7	0_6861201	Confined	13,606	4/1/2016	372.05	362.76	0.93	0.1
7	0_6861201	Confined	13,636	5/1/2016	369.85	363.68	0.62	0.1
7	0_6861201	Confined	13,667	6/1/2016	368.45	364.63	0.38	0.1
7	0_6861201	Confined	13,697	7/1/2016	365.75	365.54	0.02	0.1
7	0_6861201	Confined	13,728	8/1/2016	368.05	366.49	0.16	0.1
7	0_6861201	Confined	13,759	9/1/2016	369.45	367.44	0.20	0.1
7	0_6861201	Confined	13,789	10/1/2016	371.55	368.36	0.32	0.1
7	0_6861201	Confined	13,820	11/1/2016	370.25	369.31	0.09	0.1
7	0_6861201	Confined	13,850	12/1/2016	368.45	370.23	-0.18	0.1
7	0_6861201	Confined	13,881	1/1/2017	366.65	371.15	-0.45	0.1
7	0_6861201	Confined	13,912	2/1/2017	366.15	371.21	-0.51	0.1
7	0_6861201	Confined	13,940	3/1/2017	366.75	371.26	-0.45	0.1
7	0_6861201	Confined	13,971	4/1/2017	366.65	371.33	-0.47	0.1
7	0_6861201	Confined	14,001	5/1/2017	365.35	371.38	-0.60	0.1
7	0_6861201	Confined	14,032	6/1/2017	364.55	371.44	-0.69	0.1
7	0_6861201	Confined	14,124	9/1/2017	365.05	371.63	-0.66	0.1
7	0_6861201	Confined	14,154	10/1/2017	377.85	371.68	0.62	0.1
7	0_6861201	Confined	14,185	11/1/2017	383.75	371.75	1.20	0.1
7	0_6861201	Confined	14,215	12/1/2017	397.85	371.80	2.60	0.1
7	0_6861203	Confined	8,773	1/7/2003	345.05	317.81	2.72	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861203	Confined	9,140	1/9/2004	353.55	320.14	3.34	0.1
7	0_6861203	Confined	9,532	2/4/2005	384.05	329.20	5.49	0.1
7	0_6861203	Confined	9,875	1/13/2006	370.05	329.87	4.02	0.1
7	0_6861203	Confined	10,231	1/4/2007	352.95	335.83	1.71	0.1
7	0_6861203	Confined	10,595	1/3/2008	391.55	353.97	3.76	0.1
7	0_6861203	Confined	10,987	1/29/2009	369.45	345.40	2.41	0.1
7	0_6861203	Confined	11,334	1/11/2010	397.85	323.68	7.42	0.1
7	0_6861203	Confined	12,059	1/6/2012	379.45	258.26	12.12	0.1
7	0_6861203	Confined	12,114	3/1/2012	374.65	264.70	10.99	0.1
7	0_6861203	Confined	12,149	4/5/2012	373.05	268.81	10.42	0.1
7	0_6861203	Confined	12,176	5/2/2012	372.05	271.97	10.01	0.1
7	0_6861203	Confined	12,206	6/1/2012	370.85	275.49	9.54	0.1
7	0_6861203	Confined	12,241	7/6/2012	346.35	279.59	6.68	0.1
7	0_6861203	Confined	12,269	8/3/2012	351.15	282.88	6.83	0.1
7	0_6861203	Confined	12,308	9/11/2012	350.15	287.45	6.27	0.1
7	0_6861203	Confined	12,347	10/20/2012	361.45	292.02	6.94	0.1
7	0_6861203	Confined	12,386	11/28/2012	379.45	296.59	8.29	0.1
7	0_6861203	Confined	12,394	12/6/2012	359.65	297.53	6.21	0.1
7	0_6861203	Confined	12,425	1/6/2013	352.65	300.79	5.19	0.1
7	0_6861203	Confined	12,456	2/6/2013	389.65	302.50	8.71	0.1
7	0_6861203	Confined	12,479	3/1/2013	380.65	303.77	7.69	0.1
7	0_6861203	Confined	12,514	4/5/2013	361.85	305.70	5.61	0.1
7	0_6861203	Confined	12,541	5/2/2013	391.85	307.19	8.47	0.1
7	0_6861203	Confined	12,571	6/1/2013	389.05	308.85	8.02	0.1
7	0_6861203	Confined	12,606	7/6/2013	391.85	310.78	8.11	0.1
7	0_6861203	Confined	12,634	8/3/2013	385.85	312.32	7.35	0.1
7	0_6861203	Confined	12,673	9/11/2013	385.05	314.48	7.06	0.1
7	0_6861203	Confined	12,693	10/1/2013	382.25	315.58	6.67	0.1
7	0_6861203	Confined	12,744	11/21/2013	387.75	318.39	6.94	0.1
7	0_6861203	Confined	12,754	12/1/2013	389.65	318.95	7.07	0.1
7	0_6861203	Confined	12,785	1/1/2014	387.55	320.64	6.69	0.1
7	0_6861203	Confined	12,816	2/1/2014	381.65	321.82	5.98	0.1
7	0_6861203	Confined	12,844	3/1/2014	399.65	322.89	7.68	0.1
7	0_6861203	Confined	12,875	4/1/2014	393.75	324.08	6.97	0.1
7	0_6861203	Confined	12,905	5/1/2014	397.05	325.22	7.18	0.1
7	0_6861203	Confined	12,936	6/1/2014	392.35	326.40	6.59	0.1
7	0_6861203	Confined	12,966	7/1/2014	392.15	327.55	6.46	0.1
7	0_6861203	Confined	12,997	8/1/2014	391.75	328.73	6.30	0.1
7	0_6861203	Confined	13,150	1/1/2015	363.35	334.59	2.88	0.1
7	0_6861203	Confined	13,181	2/1/2015	379.25	336.23	4.30	0.1
7	0_6861219	Confined	9,348	8/4/2004	384.58	339.46	45.12	1
7	0_6861401	Confined	12,241	7/6/2012	325.58	349.15	-23.57	1
7	0_6861401	Confined	12,269	8/3/2012	327.68	350.64	-22.96	1
7	0_6861401	Confined	12,347	10/20/2012	329.18	354.81	-25.63	1
7	0_6861401	Confined	12,386	11/28/2012	338.98	356.89	-17.91	1
7	0_6861401	Confined	12,394	12/6/2012	340.18	357.32	-17.14	1
7	0_6861401	Confined	12,425	1/6/2013	335.88	358.72	-22.84	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861401	Confined	12,456	2/6/2013	337.48	359.09	-21.61	1
7	0_6861401	Confined	12,479	3/1/2013	334.18	359.37	-25.19	1
7	0_6861401	Confined	12,514	4/5/2013	324.58	359.79	-35.21	1
7	0_6861401	Confined	12,541	5/2/2013	323.28	360.11	-36.83	1
7	0_6861401	Confined	12,571	6/1/2013	320.38	360.47	-40.09	1
7	0_6861401	Confined	12,606	7/6/2013	320.18	360.88	-40.70	1
7	0_6861401	Confined	12,634	8/3/2013	314.58	361.22	-46.64	1
7	0_6861401	Confined	12,673	9/11/2013	309.28	361.68	-52.40	1
7	0_6861401	Confined	12,693	10/1/2013	317.58	361.92	-44.34	1
7	0_6861401	Confined	12,744	11/21/2013	328.18	362.53	-34.35	1
7	0_6861401	Confined	12,754	12/1/2013	336.98	362.65	-25.67	1
7	0_6861401	Confined	12,785	1/1/2014	343.88	363.02	-19.14	1
7	0_6861401	Confined	12,816	2/1/2014	332.18	363.33	-31.15	1
7	0_6861401	Confined	12,844	3/1/2014	330.38	363.61	-33.23	1
7	0_6861401	Confined	12,875	4/1/2014	323.38	363.93	-40.55	1
7	0_6861401	Confined	12,905	5/1/2014	310.98	364.23	-53.25	1
7	0_6861401	Confined	12,936	6/1/2014	313.98	364.54	-50.56	1
7	0_6861401	Confined	12,966	7/1/2014	311.18	364.85	-53.67	1
7	0_6861401	Confined	13,028	9/1/2014	295.98	365.47	-69.49	1
7	0_6861401	Confined	13,058	10/1/2014	306.78	365.78	-59.00	1
7	0_6861401	Confined	13,089	11/1/2014	308.78	366.09	-57.31	1
7	0_6861401	Confined	13,119	12/1/2014	319.68	366.39	-46.71	1
7	0_6861401	Confined	13,150	1/1/2015	330.98	366.72	-35.74	1
7	0_6861401	Confined	13,181	2/1/2015	319.38	367.31	-47.93	1
7	0_6861401	Confined	13,209	3/1/2015	321.38	367.85	-46.47	1
7	0_6861401	Confined	13,240	4/1/2015	322.18	368.45	-46.27	1
7	0_6861401	Confined	13,270	5/1/2015	326.58	369.03	-42.45	1
7	0_6861401	Confined	13,301	6/1/2015	334.38	369.62	-35.24	1
7	0_6861401	Confined	13,331	7/1/2015	331.88	370.20	-38.32	1
7	0_6861401	Confined	13,362	8/1/2015	329.18	370.80	-41.62	1
7	0_6861401	Confined	13,393	9/1/2015	320.68	371.40	-50.72	1
7	0_6861401	Confined	13,423	10/1/2015	319.88	371.97	-52.09	1
7	0_6861401	Confined	13,454	11/1/2015	329.58	372.57	-42.99	1
7	0_6861401	Confined	13,484	12/1/2015	331.48	373.15	-41.67	1
7	0_6861401	Confined	13,515	1/1/2016	340.98	373.74	-32.76	1
7	0_6861401	Confined	13,546	2/1/2016	347.28	374.08	-26.80	1
7	0_6861401	Confined	13,575	3/1/2016	347.18	374.40	-27.22	1
7	0_6861401	Confined	13,606	4/1/2016	346.28	374.74	-28.46	1
7	0_6861401	Confined	13,636	5/1/2016	346.98	375.08	-28.10	1
7	0_6861401	Confined	13,667	6/1/2016	345.68	375.42	-29.74	1
7	0_6861401	Confined	13,697	7/1/2016	344.48	375.75	-31.27	1
7	0_6861401	Confined	13,728	8/1/2016	339.48	376.09	-36.61	1
7	0_6861401	Confined	13,759	9/1/2016	344.38	376.44	-32.06	1
7	0_6861401	Confined	13,789	10/1/2016	344.88	376.77	-31.89	1
7	0_6861401	Confined	13,820	11/1/2016	344.28	377.11	-32.83	1
7	0_6861401	Confined	13,850	12/1/2016	341.18	377.44	-36.26	1
7	0_6861401	Confined	13,881	1/1/2017	341.88	377.77	-35.89	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861401	Confined	13,912	2/1/2017	342.28	377.73	-35.45	1
7	0_6861401	Confined	13,940	3/1/2017	340.48	377.69	-37.21	1
7	0_6861401	Confined	13,971	4/1/2017	344.08	377.64	-33.56	1
7	0_6861401	Confined	14,001	5/1/2017	343.28	377.60	-34.32	1
7	0_6861401	Confined	14,032	6/1/2017	342.88	377.56	-34.68	1
7	0_6861401	Confined	14,124	9/1/2017	341.38	377.42	-36.04	1
7	0_6861401	Confined	14,154	10/1/2017	343.08	377.38	-34.30	1
7	0_6861401	Confined	14,185	11/1/2017	347.58	377.34	-29.76	1
7	0_6861401	Confined	14,215	12/1/2017	350.38	377.29	-26.91	1
7	0_6861415	Confined	9,532	2/4/2005	377.15	361.05	16.10	1
7	0_6861415	Confined	9,872	1/10/2006	368.65	359.81	8.84	1
7	0_6861415	Confined	10,229	1/2/2007	353.85	364.25	-10.40	1
7	0_6861415	Confined	10,595	1/3/2008	380.95	378.05	2.90	1
7	0_6861415	Confined	10,987	1/29/2009	365.55	367.46	-1.91	1
7	0_6861415	Confined	11,334	1/11/2010	379.05	350.88	28.17	1
7	0_6861415	Confined	12,059	1/6/2012	362.45	310.84	51.61	1
7	0_6861415	Confined	12,114	3/1/2012	364.05	316.49	47.56	1
7	0_6861415	Confined	12,149	4/5/2012	366.85	320.08	46.77	1
7	0_6861415	Confined	12,176	5/2/2012	357.25	322.85	34.40	1
7	0_6861415	Confined	12,206	6/1/2012	354.15	325.93	28.22	1
7	0_6861415	Confined	12,241	7/6/2012	350.65	329.52	21.13	1
7	0_6861415	Confined	12,269	8/3/2012	341.85	332.39	9.46	1
7	0_6861415	Confined	12,308	9/11/2012	334.55	336.39	-1.84	1
7	0_6861415	Confined	12,347	10/20/2012	346.15	340.40	5.75	1
7	0_6861415	Confined	12,386	11/28/2012	359.25	344.40	14.85	1
7	0_6861415	Confined	12,394	12/6/2012	352.05	345.22	6.83	1
7	0_6861415	Confined	12,425	1/6/2013	348.25	347.91	0.34	1
7	0_6861415	Confined	12,456	2/6/2013	348.95	348.56	0.39	1
7	0_6861415	Confined	12,479	3/1/2013	345.15	349.04	-3.89	1
7	0_6861415	Confined	12,514	4/5/2013	337.45	349.78	-12.33	1
7	0_6861415	Confined	12,541	5/2/2013	337.15	350.35	-13.20	1
7	0_6861415	Confined	12,571	6/1/2013	336.65	350.98	-14.33	1
7	0_6861415	Confined	12,606	7/6/2013	333.85	351.71	-17.86	1
7	0_6861415	Confined	12,634	8/3/2013	332.65	352.30	-19.65	1
7	0_6861415	Confined	12,673	9/11/2013	325.45	353.12	-27.67	1
7	0_6861415	Confined	12,693	10/1/2013	335.65	353.54	-17.89	1
7	0_6861415	Confined	12,744	11/21/2013	343.65	354.61	-10.96	1
7	0_6861415	Confined	12,754	12/1/2013	351.85	354.82	-2.97	1
7	0_6861415	Confined	12,785	1/1/2014	357.15	355.47	1.68	1
7	0_6861415	Confined	12,816	2/1/2014	344.55	356.10	-11.55	1
7	0_6861415	Confined	12,844	3/1/2014	344.25	356.68	-12.43	1
7	0_6861415	Confined	12,875	4/1/2014	332.35	357.32	-24.97	1
7	0_6861415	Confined	12,905	5/1/2014	325.25	357.93	-32.68	1
7	0_6861415	Confined	12,936	6/1/2014	327.85	358.57	-30.72	1
7	0_6861415	Confined	12,966	7/1/2014	325.35	359.18	-33.83	1
7	0_6861415	Confined	12,997	8/1/2014	318.85	359.82	-40.97	1
7	0_6861415	Confined	13,028	9/1/2014	314.55	360.46	-45.91	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861415	Confined	13,058	10/1/2014	323.95	361.07	-37.12	1
7	0_6861415	Confined	13,089	11/1/2014	325.95	361.71	-35.76	1
7	0_6861415	Confined	13,119	12/1/2014	336.55	362.32	-25.77	1
7	0_6861415	Confined	13,150	1/1/2015	343.25	362.98	-19.73	1
7	0_6861415	Confined	13,181	2/1/2015	332.35	364.12	-31.77	1
7	0_6861415	Confined	13,209	3/1/2015	331.75	365.15	-33.40	1
7	0_6861415	Confined	13,240	4/1/2015	332.95	366.28	-33.33	1
7	0_6861415	Confined	13,270	5/1/2015	337.95	367.39	-29.44	1
7	0_6861415	Confined	13,301	6/1/2015	346.85	368.53	-21.68	1
7	0_6861415	Confined	13,331	7/1/2015	344.55	369.63	-25.08	1
7	0_6861415	Confined	13,362	8/1/2015	336.85	370.77	-33.92	1
7	0_6861415	Confined	13,393	9/1/2015	339.35	371.91	-32.56	1
7	0_6861415	Confined	13,423	10/1/2015	334.85	373.01	-38.16	1
7	0_6861415	Confined	13,454	11/1/2015	337.25	374.15	-36.90	1
7	0_6861415	Confined	13,484	12/1/2015	339.45	375.25	-35.80	1
7	0_6861415	Confined	13,515	1/1/2016	343.15	376.38	-33.23	1
7	0_6861415	Confined	13,546	2/1/2016	346.85	377.03	-30.18	1
7	0_6861415	Confined	13,575	3/1/2016	350.25	377.64	-27.39	1
7	0_6861415	Confined	13,606	4/1/2016	348.35	378.30	-29.95	1
7	0_6861415	Confined	13,636	5/1/2016	346.75	378.93	-32.18	1
7	0_6861415	Confined	13,667	6/1/2016	348.25	379.59	-31.34	1
7	0_6861415	Confined	13,697	7/1/2016	348.05	380.22	-32.17	1
7	0_6861415	Confined	13,728	8/1/2016	343.45	380.88	-37.43	1
7	0_6861415	Confined	13,759	9/1/2016	344.95	381.53	-36.58	1
7	0_6861415	Confined	13,789	10/1/2016	344.55	382.17	-37.62	1
7	0_6861415	Confined	13,820	11/1/2016	347.35	382.82	-35.47	1
7	0_6861415	Confined	13,850	12/1/2016	348.75	383.45	-34.70	1
7	0_6861415	Confined	13,881	1/1/2017	350.95	384.09	-33.14	1
7	0_6861415	Confined	13,912	2/1/2017	353.05	384.00	-30.95	1
7	0_6861415	Confined	13,940	3/1/2017	352.25	383.93	-31.68	1
7	0_6861415	Confined	13,971	4/1/2017	354.55	383.85	-29.30	1
7	0_6861415	Confined	14,001	5/1/2017	352.05	383.77	-31.72	1
7	0_6861415	Confined	14,032	6/1/2017	351.45	383.69	-32.24	1
7	0_6861415	Confined	14,124	9/1/2017	347.05	383.45	-36.40	1
7	0_6861415	Confined	14,154	10/1/2017	349.15	383.37	-34.22	1
7	0_6861415	Confined	14,185	11/1/2017	356.75	383.29	-26.54	1
7	0_6861415	Confined	14,215	12/1/2017	363.05	383.22	-20.17	1
7	0_6861505	Confined	9,532	2/4/2005	376.91	361.66	15.25	1
7	0_6861505	Confined	9,867	1/5/2006	364.91	360.01	4.90	1
7	0_6861505	Confined	10,229	1/2/2007	341.61	362.83	-21.22	1
7	0_6861505	Confined	10,595	1/3/2008	384.71	373.67	11.04	1
7	0_6861505	Confined	10,987	1/29/2009	361.21	365.79	-4.58	1
7	0_6861505	Confined	11,334	1/11/2010	382.01	354.79	27.22	1
7	0_6861505	Confined	12,059	1/6/2012	359.81	325.33	34.48	1
7	0_6861505	Confined	12,114	3/1/2012	361.81	329.43	32.38	1
7	0_6861505	Confined	12,149	4/5/2012	361.81	332.03	29.78	1
7	0_6861505	Confined	12,176	5/2/2012	355.61	334.04	21.57	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861505	Confined	12,206	6/1/2012	354.81	336.28	18.53	1
7	0_6861505	Confined	12,241	7/6/2012	353.61	338.88	14.73	1
7	0_6861505	Confined	12,269	8/3/2012	337.21	340.97	-3.76	1
7	0_6861505	Confined	12,308	9/11/2012	330.01	343.87	-13.86	1
7	0_6861505	Confined	12,347	10/20/2012	337.41	346.77	-9.36	1
7	0_6861505	Confined	12,386	11/28/2012	359.61	349.68	9.93	1
7	0_6861505	Confined	12,394	12/6/2012	354.21	350.27	3.94	1
7	0_6861505	Confined	12,425	1/6/2013	353.01	352.24	0.77	1
7	0_6861505	Confined	12,456	2/6/2013	341.21	352.78	-11.57	1
7	0_6861505	Confined	12,479	3/1/2013	338.61	353.18	-14.57	1
7	0_6861505	Confined	12,514	4/5/2013	335.31	353.79	-18.48	1
7	0_6861505	Confined	12,541	5/2/2013	324.41	354.26	-29.85	1
7	0_6861505	Confined	12,571	6/1/2013	323.61	354.78	-31.17	1
7	0_6861505	Confined	12,606	7/6/2013	325.01	355.39	-30.38	1
7	0_6861505	Confined	12,634	8/3/2013	323.81	355.88	-32.07	1
7	0_6861505	Confined	12,673	9/11/2013	316.81	356.56	-39.75	1
7	0_6861505	Confined	12,693	10/1/2013	314.01	356.91	-42.90	1
7	0_6861505	Confined	12,744	11/21/2013	335.61	357.80	-22.19	1
7	0_6861505	Confined	12,754	12/1/2013	347.11	357.98	-10.87	1
7	0_6861505	Confined	12,785	1/1/2014	357.61	358.51	-0.90	1
7	0_6861505	Confined	12,816	2/1/2014	343.81	358.94	-15.13	1
7	0_6861505	Confined	12,844	3/1/2014	343.61	359.33	-15.72	1
7	0_6861505	Confined	12,875	4/1/2014	325.21	359.76	-34.55	1
7	0_6861505	Confined	12,905	5/1/2014	314.81	360.18	-45.37	1
7	0_6861505	Confined	12,936	6/1/2014	308.11	360.61	-52.50	1
7	0_6861505	Confined	12,966	7/1/2014	307.01	361.02	-54.01	1
7	0_6861505	Confined	12,997	8/1/2014	306.91	361.45	-54.54	1
7	0_6861505	Confined	13,058	10/1/2014	313.01	362.30	-49.29	1
7	0_6861505	Confined	13,089	11/1/2014	315.81	362.73	-46.92	1
7	0_6861505	Confined	13,119	12/1/2014	321.91	363.14	-41.23	1
7	0_6861505	Confined	13,150	1/1/2015	323.41	363.59	-40.18	1
7	0_6861505	Confined	13,181	2/1/2015	329.51	364.39	-34.88	1
7	0_6861505	Confined	13,209	3/1/2015	322.01	365.12	-43.11	1
7	0_6861505	Confined	13,240	4/1/2015	318.51	365.93	-47.42	1
7	0_6861505	Confined	13,270	5/1/2015	324.41	366.71	-42.30	1
7	0_6861505	Confined	13,301	6/1/2015	339.01	367.52	-28.51	1
7	0_6861505	Confined	13,331	7/1/2015	339.81	368.30	-28.49	1
7	0_6861505	Confined	13,362	8/1/2015	340.61	369.10	-28.49	1
7	0_6861505	Confined	13,393	9/1/2015	338.41	369.91	-31.50	1
7	0_6861505	Confined	13,423	10/1/2015	340.01	370.69	-30.68	1
7	0_6861505	Confined	13,454	11/1/2015	342.31	371.50	-29.19	1
7	0_6861505	Confined	13,484	12/1/2015	352.01	372.28	-20.27	1
7	0_6861505	Confined	13,515	1/1/2016	358.51	373.07	-14.56	1
7	0_6861505	Confined	13,546	2/1/2016	361.91	373.52	-11.61	1
7	0_6861505	Confined	13,575	3/1/2016	365.31	373.93	-8.62	1
7	0_6861505	Confined	13,606	4/1/2016	364.41	374.37	-9.96	1
7	0_6861505	Confined	13,636	5/1/2016	364.21	374.80	-10.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861505	Confined	13,667	6/1/2016	364.11	375.24	-11.13	1
7	0_6861505	Confined	13,697	7/1/2016	363.41	375.67	-12.26	1
7	0_6861505	Confined	13,728	8/1/2016	362.71	376.11	-13.40	1
7	0_6861505	Confined	13,759	9/1/2016	362.01	376.55	-14.54	1
7	0_6861505	Confined	13,881	1/1/2017	341.81	378.28	-36.47	1
7	0_6861505	Confined	13,912	2/1/2017	340.51	378.17	-37.66	1
7	0_6861505	Confined	13,940	3/1/2017	339.41	378.08	-38.67	1
7	0_6861505	Confined	13,971	4/1/2017	353.21	377.97	-24.76	1
7	0_6861505	Confined	14,001	5/1/2017	354.51	377.87	-23.36	1
7	0_6861505	Confined	14,032	6/1/2017	352.21	377.77	-25.56	1
7	0_6861505	Confined	14,124	9/1/2017	347.91	377.46	-29.55	1
7	0_6861505	Confined	14,154	10/1/2017	346.31	377.36	-31.05	1
7	0_6861505	Confined	14,185	11/1/2017	350.71	377.25	-26.54	1
7	0_6861505	Confined	14,215	12/1/2017	358.21	377.15	-18.94	1
7	0_6861905	Confined	1,167	3/12/1982	376.52	363.19	13.33	1
7	0_6861905	Confined	1,501	2/9/1983	377.83	365.17	12.66	1
7	0_6861905	Confined	1,878	2/21/1984	376.27	368.44	7.83	1
7	0_6861905	Confined	2,229	2/6/1985	366.55	369.58	-3.03	1
7	0_6861905	Confined	2,598	2/10/1986	372.67	371.63	1.04	1
7	0_6861905	Confined	2,997	3/16/1987	376.18	370.46	5.72	1
7	0_6861905	Confined	3,335	2/17/1988	371.15	373.54	-2.39	1
7	0_6861905	Confined	3,701	2/17/1989	363.55	370.01	-6.46	1
7	0_6861905	Confined	4,035	1/17/1990	357.15	365.21	-8.06	1
7	0_6861905	Confined	4,399	1/16/1991	358.65	365.25	-6.60	1
7	0_6861905	Confined	5,121	1/7/1993	365.95	368.90	-2.95	1
7	0_6861905	Confined	5,486	1/7/1994	359.85	366.82	-6.97	1
7	0_6861905	Confined	6,254	2/14/1996	354.65	364.91	-10.26	1
7	0_6861905	Confined	6,660	3/26/1997	348.20	363.85	-15.65	1
7	0_6861905	Confined	6,967	1/27/1998	355.05	366.82	-11.77	1
7	0_6861905	Confined	7,316	1/11/1999	344.75	363.93	-19.18	1
7	0_6861905	Confined	8,060	1/24/2001	349.25	357.12	-7.87	1
7	0_6861905	Confined	8,417	1/16/2002	335.15	359.03	-23.88	1
7	0_6861905	Confined	8,789	1/23/2003	347.55	356.95	-9.40	1
7	0_6861905	Confined	9,152	1/21/2004	348.05	358.09	-10.04	1
7	0_6861905	Confined	9,539	2/11/2005	369.55	360.18	9.37	1
7	0_6861905	Confined	9,885	1/23/2006	352.55	358.96	-6.41	1
7	0_6861905	Confined	10,267	2/9/2007	355.55	361.60	-6.05	1
7	0_6861905	Confined	10,663	3/11/2008	353.95	367.29	-13.34	1
7	0_6861905	Confined	11,007	2/18/2009	348.55	362.04	-13.49	1
7	0_6861905	Confined	11,425	4/12/2010	371.75	352.29	19.46	1
7	0_6861905	Confined	12,059	1/6/2012	352.75	336.88	15.87	1
7	0_6861905	Confined	12,114	3/1/2012	353.35	339.64	13.71	1
7	0_6861905	Confined	12,149	4/5/2012	353.25	341.40	11.85	1
7	0_6861905	Confined	12,269	8/3/2012	323.35	347.42	-24.07	1
7	0_6861905	Confined	12,347	10/20/2012	335.75	351.34	-15.59	1
7	0_6861905	Confined	12,386	11/28/2012	350.15	353.29	-3.14	1
7	0_6861905	Confined	12,394	12/6/2012	339.95	353.70	-13.75	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6861905	Confined	12,456	2/6/2013	335.25	355.32	-20.07	1
7	0_6861905	Confined	12,479	3/1/2013	325.55	355.56	-30.01	1
7	0_6861905	Confined	12,571	6/1/2013	324.05	356.49	-32.44	1
7	0_6861905	Confined	12,606	7/6/2013	322.55	356.84	-34.29	1
7	0_6861905	Confined	12,693	10/1/2013	314.55	357.72	-43.17	1
7	0_6861905	Confined	12,744	11/21/2013	325.05	358.24	-33.19	1
7	0_6861905	Confined	12,754	12/1/2013	326.35	358.34	-31.99	1
7	0_6862101	Confined	5,128	1/14/1993	464.23	370.77	93.46	1
7	0_6863101	Confined	779	2/17/1981	381.94	362.04	19.90	1
7	0_6863101	Confined	1,144	2/17/1982	381.57	363.57	18.00	1
7	0_6863101	Confined	1,506	2/14/1983	381.59	363.62	17.97	1
7	0_6863101	Confined	1,863	2/6/1984	382.75	363.69	19.06	1
7	0_6863101	Confined	2,601	2/13/1986	371.00	364.68	6.32	1
7	0_6863101	Confined	2,895	12/4/1986	371.66	364.82	6.84	1
7	0_6863101	Confined	3,335	2/17/1988	376.51	364.98	11.53	1
7	0_6863101	Confined	3,699	2/15/1989	370.62	362.91	7.71	1
7	0_6863101	Confined	3,998	12/11/1989	374.11	361.45	12.66	1
7	0_6863101	Confined	4,365	12/13/1990	380.67	360.33	20.34	1
7	0_6863101	Confined	5,485	1/6/1994	397.26	361.72	35.54	1
7	0_6863101	Confined	5,854	1/10/1995	392.81	361.41	31.40	1
7	0_6863101	Confined	6,221	1/12/1996	392.51	361.11	31.40	1
7	0_6863101	Confined	6,675	4/10/1997	392.46	358.58	33.88	1
7	0_6863101	Confined	6,969	1/29/1998	393.11	359.57	33.54	1
7	0_6863101	Confined	7,325	1/20/1999	392.76	359.18	33.58	1
7	0_6863101	Confined	7,927	9/13/2000	393.49	355.81	37.68	1
7	0_6863101	Confined	8,074	2/7/2001	392.61	355.04	37.57	1
7	0_6863101	Confined	8,431	1/30/2002	389.66	355.98	33.68	1
7	0_6863101	Confined	8,795	1/29/2003	391.06	355.04	36.02	1
7	0_6863101	Confined	9,145	1/14/2004	390.66	355.81	34.85	1
7	0_6863101	Confined	9,530	2/2/2005	391.46	357.86	33.60	1
7	0_6863101	Confined	9,879	1/17/2006	390.26	357.38	32.88	1
7	0_6863101	Confined	10,238	1/11/2007	389.66	358.63	31.03	1
7	0_6863101	Confined	10,596	1/4/2008	390.76	362.86	27.90	1
7	0_6863101	Confined	10,999	2/10/2009	389.06	359.43	29.63	1
7	0_6863101	Confined	11,441	4/28/2010	388.36	352.36	36.00	1
7	0_6863302	Confined	1,144	2/17/1982	362.58	358.78	3.80	1
7	0_6958701	Confined	772	2/10/1981	648.91	575.49	7.34	0.1
7	0_6958701	Confined	1,501	2/9/1983	651.11	575.81	7.53	0.1
7	0_6958701	Confined	2,229	2/6/1985	649.73	573.62	7.61	0.1
7	0_6958701	Confined	2,594	2/6/1986	649.54	575.94	7.36	0.1
7	0_6958701	Confined	2,965	2/12/1987	649.07	583.04	6.60	0.1
7	0_6958701	Confined	3,354	3/7/1988	647.29	588.51	5.88	0.1
7	0_6958701	Confined	3,698	2/14/1989	650.08	580.29	6.98	0.1
7	0_6958701	Confined	4,069	2/20/1990	650.16	577.09	7.31	0.1
7	0_6958701	Confined	4,434	2/20/1991	648.77	578.07	7.07	0.1
7	0_6958701	Confined	4,800	2/21/1992	648.33	574.88	7.34	0.1
7	0_6958701	Confined	5,161	2/16/1993	651.31	574.82	7.65	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6958701	Confined	5,534	2/24/1994	649.50	573.10	7.64	0.1
7	0_6958701	Confined	5,801	11/18/1994	648.41	573.50	7.49	0.1
7	0_6958701	Confined	6,246	2/6/1996	648.36	570.88	7.75	0.1
7	0_6958701	Confined	6,632	2/26/1997	649.18	568.40	8.08	0.1
7	0_6958701	Confined	6,996	2/25/1998	643.89	573.20	7.07	0.1
7	0_6958701	Confined	7,345	2/9/1999	642.71	573.70	6.90	0.1
7	0_6958701	Confined	7,753	3/23/2000	640.36	571.08	6.93	0.1
7	0_6958701	Confined	8,082	2/15/2001	649.31	571.96	7.74	0.1
7	0_6958701	Confined	8,445	2/13/2002	649.16	572.00	7.72	0.1
7	0_6958701	Confined	8,810	2/13/2003	643.76	574.36	6.94	0.1
7	0_6958701	Confined	9,178	2/16/2004	648.91	573.36	7.55	0.1
7	0_6958701	Confined	9,533	2/5/2005	648.89	575.39	7.35	0.1
7	0_6958701	Confined	9,937	3/16/2006	648.79	572.06	7.67	0.1
7	0_6958701	Confined	10,270	2/12/2007	648.37	572.76	7.56	0.1
7	0_6958701	Confined	10,650	2/27/2008	647.21	577.34	6.99	0.1
7	0_6958701	Confined	11,001	2/12/2009	645.64	570.72	7.49	0.1
7	0_6958701	Confined	11,349	1/26/2010	646.44	567.71	7.87	0.1
7	0_6958701	Confined	11,720	2/1/2011	645.49	565.52	8.00	0.1
7	0_6958701	Confined	12,078	1/25/2012	644.70	557.16	8.75	0.1
7	0_6958701	Confined	12,447	1/28/2013	643.99	559.58	8.44	0.1
7	0_6958701	Confined	12,819	2/4/2014	643.36	560.80	8.26	0.1
7	0_6958701	Confined	13,112	11/24/2014	641.98	560.29	8.17	0.1
7	0_6958701	Confined	13,436	10/14/2015	641.78	566.57	7.52	0.1
7	0_6958701	Confined	13,814	10/26/2016	640.91	569.84	7.11	0.1
7	0_6958701	Confined	14,177	10/24/2017	642.78	569.16	7.36	0.1
7	0_6958704	Confined	772	2/10/1981	617.90	570.50	4.74	0.1
7	0_6958704	Confined	1,501	2/9/1983	618.66	570.92	4.77	0.1
7	0_6958704	Confined	2,594	2/6/1986	625.44	570.68	5.48	0.1
7	0_6958715	Unconfined	772	2/10/1981	683.09	629.11	53.98	1
7	0_6958715	Unconfined	1,501	2/9/1983	682.68	628.22	54.46	1
7	0_6958715	Unconfined	1,878	2/21/1984	683.02	627.69	55.33	1
7	0_6958715	Unconfined	2,229	2/6/1985	683.23	624.89	58.34	1
7	0_6958715	Unconfined	2,594	2/6/1986	683.81	631.45	52.36	1
7	0_6958715	Unconfined	2,965	2/12/1987	683.65	634.49	49.16	1
7	0_6958715	Unconfined	3,354	3/7/1988	684.28	637.00	47.28	1
7	0_6958715	Unconfined	3,698	2/14/1989	683.91	629.60	54.31	1
7	0_6958715	Unconfined	4,069	2/20/1990	684.27	630.25	54.02	1
7	0_6958715	Unconfined	4,434	2/20/1991	685.26	634.15	51.11	1
7	0_6958715	Unconfined	4,800	2/21/1992	684.55	634.57	49.98	1
7	0_6958715	Unconfined	5,161	2/16/1993	683.82	634.53	49.29	1
7	0_6958715	Unconfined	5,534	2/24/1994	682.75	628.13	54.62	1
7	0_6958715	Unconfined	5,791	11/8/1994	682.07	629.85	52.22	1
7	0_6958715	Unconfined	6,246	2/6/1996	683.67	623.00	60.67	1
7	0_6958715	Unconfined	6,632	2/26/1997	682.79	615.97	66.82	1
7	0_6958715	Unconfined	6,996	2/25/1998	681.19	629.09	52.10	1
7	0_6958717	Unconfined	9,969	4/17/2006	625.62	559.18	6.64	0.1
7	0_6958717	Unconfined	10,041	6/28/2006	623.20	559.04	6.42	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6958801	Confined	772	2/10/1981	693.08	551.39	14.17	0.1
7	0_6958801	Confined	1,501	2/9/1983	691.23	555.04	13.62	0.1
7	0_6958801	Confined	2,229	2/6/1985	692.35	550.56	14.18	0.1
7	0_6958801	Confined	2,594	2/6/1986	691.27	549.76	14.15	0.1
7	0_6958801	Confined	2,965	2/12/1987	692.60	566.93	12.57	0.1
7	0_6958801	Confined	3,354	3/7/1988	692.29	578.36	11.39	0.1
7	0_6958801	Confined	3,698	2/14/1989	692.42	572.24	12.02	0.1
7	0_6958801	Confined	4,069	2/20/1990	689.81	563.92	12.59	0.1
7	0_6958801	Confined	4,434	2/20/1991	690.22	561.23	12.90	0.1
7	0_6958801	Confined	4,800	2/21/1992	693.26	543.18	15.01	0.1
7	0_6958801	Confined	5,161	2/16/1993	691.85	539.76	15.21	0.1
7	0_6958801	Confined	5,534	2/24/1994	691.05	539.70	15.13	0.1
7	0_6958801	Confined	5,801	11/18/1994	691.15	538.37	15.28	0.1
7	0_6958801	Confined	6,247	2/7/1996	691.30	534.70	15.66	0.1
7	0_6958801	Confined	6,996	2/25/1998	691.36	535.36	15.60	0.1
7	0_6958801	Confined	7,345	2/9/1999	691.85	538.61	15.32	0.1
7	0_6958801	Confined	7,753	3/23/2000	690.25	539.07	15.12	0.1
7	0_6958801	Confined	8,082	2/15/2001	691.15	534.61	15.65	0.1
7	0_6958801	Confined	8,445	2/13/2002	691.05	536.02	15.50	0.1
7	0_6958801	Confined	8,544	5/23/2002	690.65	534.83	15.58	0.1
7	0_6958801	Confined	8,810	2/13/2003	693.80	532.26	16.15	0.1
7	0_6958801	Confined	9,178	2/16/2004	690.45	533.63	15.68	0.1
7	0_6958801	Confined	9,532	2/4/2005	691.55	538.06	15.35	0.1
7	0_6958801	Confined	9,937	3/16/2006	689.82	540.67	14.92	0.1
7	0_6958801	Confined	10,270	2/12/2007	688.65	545.64	14.30	0.1
7	0_6958801	Confined	10,650	2/27/2008	688.53	546.92	14.16	0.1
7	0_6958801	Confined	11,001	2/12/2009	688.99	534.69	15.43	0.1
7	0_6958801	Confined	11,189	8/19/2009	686.21	522.36	16.39	0.1
7	0_6958801	Confined	11,349	1/26/2010	685.40	512.54	17.29	0.1
7	0_6958801	Confined	12,078	1/25/2012	681.69	489.05	19.26	0.1
7	0_6958801	Confined	12,192	5/18/2012	680.30	491.13	18.92	0.1
7	0_6958801	Confined	12,447	1/28/2013	678.97	495.66	18.33	0.1
7	0_6958801	Confined	12,819	2/4/2014	678.34	500.56	17.78	0.1
7	0_6958801	Confined	13,112	11/24/2014	671.03	501.96	16.91	0.1
7	0_6958807	Confined	13,436	10/14/2015	680.47	509.43	85.52	0.5
7	0_6958807	Confined	13,814	10/26/2016	686.62	517.20	84.71	0.5
7	0_6958807	Confined	14,177	10/24/2017	685.57	520.15	82.71	0.5
7	0_6959606	Unconfined	8,332	10/23/2001	742.36	741.96	0.40	1
7	0_6959606	Unconfined	8,664	9/20/2002	743.36	741.78	1.58	1
7	0_6959606	Unconfined	8,669	9/25/2002	743.36	741.77	1.59	1
7	0_6959606	Unconfined	8,674	9/30/2002	743.46	741.77	1.69	1
7	0_6959606	Unconfined	8,679	10/5/2002	743.61	741.76	1.85	1
7	0_6959606	Unconfined	8,684	10/10/2002	743.71	741.75	1.96	1
7	0_6959606	Unconfined	8,689	10/15/2002	744.36	741.75	2.61	1
7	0_6959606	Unconfined	8,694	10/20/2002	744.41	741.74	2.67	1
7	0_6959606	Unconfined	8,699	10/25/2002	744.76	741.73	3.03	1
7	0_6959606	Unconfined	8,704	10/30/2002	746.11	741.73	4.38	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	8,715	11/10/2002	745.71	741.71	4.00	1
7	0_6959606	Unconfined	8,720	11/15/2002	745.66	741.71	3.95	1
7	0_6959606	Unconfined	8,725	11/20/2002	745.61	741.70	3.91	1
7	0_6959606	Unconfined	8,730	11/25/2002	745.66	741.69	3.97	1
7	0_6959606	Unconfined	8,735	11/30/2002	745.66	741.69	3.97	1
7	0_6959606	Unconfined	8,740	12/5/2002	745.26	741.68	3.58	1
7	0_6959606	Unconfined	8,745	12/10/2002	745.36	741.67	3.69	1
7	0_6959606	Unconfined	8,765	12/30/2002	745.71	741.65	4.06	1
7	0_6959606	Unconfined	8,771	1/5/2003	745.66	741.65	4.01	1
7	0_6959606	Unconfined	8,776	1/10/2003	745.56	741.66	3.90	1
7	0_6959606	Unconfined	8,781	1/15/2003	745.51	741.66	3.85	1
7	0_6959606	Unconfined	8,786	1/20/2003	745.56	741.66	3.90	1
7	0_6959606	Unconfined	8,802	2/5/2003	745.61	741.68	3.93	1
7	0_6959606	Unconfined	8,807	2/10/2003	744.66	741.68	2.98	1
7	0_6959606	Unconfined	8,812	2/15/2003	745.26	741.69	3.57	1
7	0_6959606	Unconfined	8,817	2/20/2003	745.41	741.69	3.72	1
7	0_6959606	Unconfined	8,822	2/25/2003	745.51	741.70	3.81	1
7	0_6959606	Unconfined	8,826	3/1/2003	745.61	741.70	3.91	1
7	0_6959606	Unconfined	8,830	3/5/2003	745.66	741.70	3.96	1
7	0_6959606	Unconfined	8,835	3/10/2003	745.58	741.71	3.87	1
7	0_6959606	Unconfined	8,840	3/15/2003	744.66	741.71	2.95	1
7	0_6959606	Unconfined	8,887	5/1/2003	738.71	741.75	-3.04	1
7	0_6959606	Unconfined	8,891	5/5/2003	739.26	741.76	-2.50	1
7	0_6959606	Unconfined	8,896	5/10/2003	738.66	741.76	-3.10	1
7	0_6959606	Unconfined	8,901	5/15/2003	738.36	741.77	-3.41	1
7	0_6959606	Unconfined	8,906	5/20/2003	736.86	741.77	-4.91	1
7	0_6959606	Unconfined	8,911	5/25/2003	735.81	741.77	-5.96	1
7	0_6959606	Unconfined	8,916	5/30/2003	736.71	741.78	-5.07	1
7	0_6959606	Unconfined	8,918	6/1/2003	737.26	741.78	-4.52	1
7	0_6959606	Unconfined	8,922	6/5/2003	737.26	741.78	-4.52	1
7	0_6959606	Unconfined	8,927	6/10/2003	735.56	741.79	-6.23	1
7	0_6959606	Unconfined	8,932	6/15/2003	736.06	741.79	-5.73	1
7	0_6959606	Unconfined	8,937	6/20/2003	738.36	741.80	-3.44	1
7	0_6959606	Unconfined	8,942	6/25/2003	737.51	741.80	-4.29	1
7	0_6959606	Unconfined	8,947	6/30/2003	738.41	741.81	-3.40	1
7	0_6959606	Unconfined	8,952	7/5/2003	739.26	741.81	-2.55	1
7	0_6959606	Unconfined	8,957	7/10/2003	739.56	741.81	-2.25	1
7	0_6959606	Unconfined	8,962	7/15/2003	740.46	741.82	-1.36	1
7	0_6959606	Unconfined	8,967	7/20/2003	741.46	741.82	-0.36	1
7	0_6959606	Unconfined	8,972	7/25/2003	742.31	741.83	0.48	1
7	0_6959606	Unconfined	8,977	7/30/2003	742.51	741.83	0.68	1
7	0_6959606	Unconfined	8,979	8/1/2003	742.16	741.83	0.33	1
7	0_6959606	Unconfined	8,983	8/5/2003	741.76	741.84	-0.08	1
7	0_6959606	Unconfined	8,988	8/10/2003	741.86	741.84	0.02	1
7	0_6959606	Unconfined	8,993	8/15/2003	741.96	741.85	0.11	1
7	0_6959606	Unconfined	8,998	8/20/2003	743.06	741.85	1.21	1
7	0_6959606	Unconfined	9,003	8/25/2003	743.36	741.86	1.50	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	9,008	8/30/2003	742.91	741.86	1.05	1
7	0_6959606	Unconfined	9,010	9/1/2003	743.06	741.86	1.20	1
7	0_6959606	Unconfined	9,014	9/5/2003	743.06	741.86	1.20	1
7	0_6959606	Unconfined	9,019	9/10/2003	743.91	741.87	2.04	1
7	0_6959606	Unconfined	9,024	9/15/2003	744.06	741.87	2.19	1
7	0_6959606	Unconfined	9,029	9/20/2003	744.31	741.88	2.43	1
7	0_6959606	Unconfined	9,034	9/25/2003	744.46	741.88	2.58	1
7	0_6959606	Unconfined	9,039	9/30/2003	744.56	741.89	2.67	1
7	0_6959606	Unconfined	9,040	10/1/2003	744.76	741.89	2.87	1
7	0_6959606	Unconfined	9,044	10/5/2003	744.86	741.89	2.97	1
7	0_6959606	Unconfined	9,049	10/10/2003	744.66	741.90	2.76	1
7	0_6959606	Unconfined	9,054	10/15/2003	745.11	741.90	3.21	1
7	0_6959606	Unconfined	9,059	10/20/2003	745.16	741.90	3.26	1
7	0_6959606	Unconfined	9,064	10/25/2003	745.26	741.91	3.35	1
7	0_6959606	Unconfined	9,069	10/30/2003	745.31	741.91	3.40	1
7	0_6959606	Unconfined	9,095	11/25/2003	745.06	741.94	3.12	1
7	0_6959606	Unconfined	9,100	11/30/2003	745.06	741.94	3.12	1
7	0_6959606	Unconfined	9,105	12/5/2003	744.26	741.94	2.32	1
7	0_6959606	Unconfined	9,110	12/10/2003	744.56	741.95	2.61	1
7	0_6959606	Unconfined	9,115	12/15/2003	744.76	741.95	2.81	1
7	0_6959606	Unconfined	9,120	12/20/2003	744.76	741.96	2.80	1
7	0_6959606	Unconfined	9,125	12/25/2003	744.66	741.96	2.70	1
7	0_6959606	Unconfined	9,136	1/5/2004	744.56	741.99	2.57	1
7	0_6959606	Unconfined	9,141	1/10/2004	744.86	742.01	2.85	1
7	0_6959606	Unconfined	9,146	1/15/2004	745.06	742.03	3.03	1
7	0_6959606	Unconfined	9,151	1/20/2004	745.16	742.05	3.11	1
7	0_6959606	Unconfined	9,156	1/25/2004	745.26	742.07	3.19	1
7	0_6959606	Unconfined	9,161	1/30/2004	745.26	742.09	3.17	1
7	0_6959606	Unconfined	9,167	2/5/2004	745.31	742.12	3.19	1
7	0_6959606	Unconfined	9,172	2/10/2004	742.16	742.14	0.02	1
7	0_6959606	Unconfined	9,177	2/15/2004	741.96	742.16	-0.20	1
7	0_6959606	Unconfined	9,182	2/20/2004	741.66	742.18	-0.52	1
7	0_6959606	Unconfined	9,187	2/25/2004	742.26	742.20	0.06	1
7	0_6959606	Unconfined	9,192	3/1/2004	742.41	742.22	0.19	1
7	0_6959606	Unconfined	9,196	3/5/2004	742.06	742.24	-0.18	1
7	0_6959606	Unconfined	9,201	3/10/2004	741.46	742.26	-0.80	1
7	0_6959606	Unconfined	9,206	3/15/2004	742.16	742.28	-0.12	1
7	0_6959606	Unconfined	9,211	3/20/2004	742.81	742.30	0.51	1
7	0_6959606	Unconfined	9,216	3/25/2004	743.11	742.32	0.79	1
7	0_6959606	Unconfined	9,221	3/30/2004	742.46	742.35	0.11	1
7	0_6959606	Unconfined	9,227	4/5/2004	742.76	742.37	0.39	1
7	0_6959606	Unconfined	9,232	4/10/2004	743.91	742.39	1.52	1
7	0_6959606	Unconfined	9,237	4/15/2004	744.16	742.41	1.75	1
7	0_6959606	Unconfined	9,242	4/20/2004	744.46	742.43	2.03	1
7	0_6959606	Unconfined	9,247	4/25/2004	743.61	742.45	1.16	1
7	0_6959606	Unconfined	9,252	4/30/2004	744.41	742.48	1.93	1
7	0_6959606	Unconfined	9,257	5/5/2004	743.71	742.50	1.21	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	9,262	5/10/2004	744.71	742.52	2.19	1
7	0_6959606	Unconfined	9,267	5/15/2004	744.91	742.54	2.37	1
7	0_6959606	Unconfined	9,272	5/20/2004	744.71	742.56	2.15	1
7	0_6959606	Unconfined	9,277	5/25/2004	744.31	742.58	1.73	1
7	0_6959606	Unconfined	9,282	5/30/2004	742.21	742.60	-0.39	1
7	0_6959606	Unconfined	9,323	7/10/2004	743.26	742.77	0.49	1
7	0_6959606	Unconfined	9,328	7/15/2004	743.46	742.79	0.67	1
7	0_6959606	Unconfined	9,333	7/20/2004	741.06	742.82	-1.76	1
7	0_6959606	Unconfined	9,338	7/25/2004	741.16	742.84	-1.68	1
7	0_6959606	Unconfined	9,343	7/30/2004	742.06	742.86	-0.80	1
7	0_6959606	Unconfined	9,349	8/5/2004	742.41	742.88	-0.47	1
7	0_6959606	Unconfined	9,354	8/10/2004	742.11	742.90	-0.79	1
7	0_6959606	Unconfined	9,359	8/15/2004	742.81	742.92	-0.11	1
7	0_6959606	Unconfined	9,364	8/20/2004	742.31	742.95	-0.64	1
7	0_6959606	Unconfined	9,369	8/25/2004	742.66	742.97	-0.31	1
7	0_6959606	Unconfined	9,374	8/30/2004	743.31	742.99	0.32	1
7	0_6959606	Unconfined	9,380	9/5/2004	743.46	743.01	0.45	1
7	0_6959606	Unconfined	9,385	9/10/2004	743.46	743.03	0.43	1
7	0_6959606	Unconfined	9,390	9/15/2004	744.36	743.06	1.30	1
7	0_6959606	Unconfined	9,395	9/20/2004	744.26	743.08	1.18	1
7	0_6959606	Unconfined	9,400	9/25/2004	744.46	743.10	1.36	1
7	0_6959606	Unconfined	9,405	9/30/2004	744.71	743.12	1.59	1
7	0_6959606	Unconfined	9,425	10/20/2004	745.06	743.20	1.86	1
7	0_6959606	Unconfined	9,430	10/25/2004	745.11	743.22	1.89	1
7	0_6959606	Unconfined	9,456	11/20/2004	745.81	743.33	2.48	1
7	0_6959606	Unconfined	9,461	11/25/2004	745.81	743.35	2.46	1
7	0_6959606	Unconfined	9,466	11/30/2004	745.76	743.37	2.39	1
7	0_6959606	Unconfined	9,471	12/5/2004	745.76	743.40	2.36	1
7	0_6959606	Unconfined	9,476	12/10/2004	745.76	743.42	2.34	1
7	0_6959606	Unconfined	9,481	12/15/2004	745.71	743.44	2.27	1
7	0_6959606	Unconfined	9,486	12/20/2004	745.81	743.46	2.35	1
7	0_6959606	Unconfined	9,491	12/25/2004	745.81	743.48	2.33	1
7	0_6959606	Unconfined	9,496	12/30/2004	745.86	743.50	2.36	1
7	0_6959606	Unconfined	9,502	1/5/2005	745.91	743.50	2.41	1
7	0_6959606	Unconfined	9,507	1/10/2005	745.96	743.49	2.47	1
7	0_6959606	Unconfined	9,512	1/15/2005	745.86	743.48	2.38	1
7	0_6959606	Unconfined	9,517	1/20/2005	745.91	743.47	2.44	1
7	0_6959606	Unconfined	9,522	1/25/2005	745.56	743.46	2.10	1
7	0_6959606	Unconfined	9,527	1/30/2005	745.51	743.45	2.06	1
7	0_6959606	Unconfined	9,529	2/1/2005	745.56	743.45	2.11	1
7	0_6959606	Unconfined	9,533	2/5/2005	745.61	743.44	2.17	1
7	0_6959606	Unconfined	9,538	2/10/2005	745.76	743.43	2.33	1
7	0_6959606	Unconfined	9,543	2/15/2005	745.91	743.42	2.49	1
7	0_6959606	Unconfined	9,548	2/20/2005	746.01	743.41	2.60	1
7	0_6959606	Unconfined	9,553	2/25/2005	745.96	743.41	2.55	1
7	0_6959606	Unconfined	9,557	3/1/2005	745.96	743.40	2.56	1
7	0_6959606	Unconfined	9,561	3/5/2005	745.96	743.39	2.57	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	9,566	3/10/2005	746.06	743.38	2.68	1
7	0_6959606	Unconfined	9,571	3/15/2005	746.31	743.37	2.94	1
7	0_6959606	Unconfined	9,576	3/20/2005	746.21	743.37	2.84	1
7	0_6959606	Unconfined	9,581	3/25/2005	745.96	743.36	2.60	1
7	0_6959606	Unconfined	9,586	3/30/2005	745.96	743.35	2.61	1
7	0_6959606	Unconfined	9,592	4/5/2005	746.16	743.34	2.82	1
7	0_6959606	Unconfined	9,597	4/10/2005	743.66	743.33	0.33	1
7	0_6959606	Unconfined	9,602	4/15/2005	743.36	743.32	0.04	1
7	0_6959606	Unconfined	9,607	4/20/2005	744.21	743.31	0.90	1
7	0_6959606	Unconfined	9,612	4/25/2005	743.16	743.30	-0.14	1
7	0_6959606	Unconfined	9,617	4/30/2005	741.56	743.29	-1.73	1
7	0_6959606	Unconfined	9,622	5/5/2005	742.06	743.28	-1.22	1
7	0_6959606	Unconfined	9,627	5/10/2005	740.76	743.28	-2.52	1
7	0_6959606	Unconfined	9,632	5/15/2005	740.56	743.27	-2.71	1
7	0_6959606	Unconfined	9,637	5/20/2005	741.56	743.26	-1.70	1
7	0_6959606	Unconfined	9,642	5/25/2005	740.66	743.25	-2.59	1
7	0_6959606	Unconfined	9,647	5/30/2005	739.21	743.24	-4.03	1
7	0_6959606	Unconfined	9,649	6/1/2005	738.76	743.24	-4.48	1
7	0_6959606	Unconfined	9,653	6/5/2005	739.61	743.23	-3.62	1
7	0_6959606	Unconfined	9,658	6/10/2005	738.21	743.22	-5.01	1
7	0_6959606	Unconfined	9,663	6/15/2005	736.86	743.21	-6.35	1
7	0_6959606	Unconfined	9,668	6/20/2005	736.21	743.20	-6.99	1
7	0_6959606	Unconfined	9,673	6/25/2005	735.96	743.20	-7.24	1
7	0_6959606	Unconfined	9,678	6/30/2005	735.96	743.19	-7.23	1
7	0_6959606	Unconfined	9,683	7/5/2005	736.16	743.18	-7.02	1
7	0_6959606	Unconfined	9,688	7/10/2005	736.26	743.17	-6.91	1
7	0_6959606	Unconfined	9,693	7/15/2005	736.66	743.16	-6.50	1
7	0_6959606	Unconfined	9,698	7/20/2005	737.01	743.15	-6.14	1
7	0_6959606	Unconfined	9,703	7/25/2005	737.81	743.14	-5.33	1
7	0_6959606	Unconfined	9,708	7/30/2005	736.66	743.13	-6.47	1
7	0_6959606	Unconfined	9,714	8/5/2005	737.96	743.12	-5.16	1
7	0_6959606	Unconfined	9,719	8/10/2005	739.01	743.11	-4.10	1
7	0_6959606	Unconfined	9,724	8/15/2005	740.01	743.11	-3.10	1
7	0_6959606	Unconfined	9,729	8/20/2005	740.46	743.10	-2.64	1
7	0_6959606	Unconfined	9,734	8/25/2005	739.96	743.09	-3.13	1
7	0_6959606	Unconfined	9,739	8/30/2005	740.66	743.08	-2.42	1
7	0_6959606	Unconfined	9,745	9/5/2005	740.01	743.07	-3.06	1
7	0_6959606	Unconfined	9,750	9/10/2005	740.76	743.06	-2.30	1
7	0_6959606	Unconfined	9,755	9/15/2005	741.36	743.05	-1.69	1
7	0_6959606	Unconfined	9,760	9/20/2005	741.86	743.04	-1.18	1
7	0_6959606	Unconfined	9,765	9/25/2005	741.46	743.03	-1.57	1
7	0_6959606	Unconfined	9,770	9/30/2005	742.11	743.02	-0.91	1
7	0_6959606	Unconfined	9,775	10/5/2005	742.21	743.02	-0.81	1
7	0_6959606	Unconfined	9,780	10/10/2005	742.76	743.01	-0.25	1
7	0_6959606	Unconfined	9,785	10/15/2005	743.06	743.00	0.06	1
7	0_6959606	Unconfined	9,790	10/20/2005	743.66	742.99	0.67	1
7	0_6959606	Unconfined	9,795	10/25/2005	743.51	742.98	0.53	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	9,800	10/30/2005	743.56	742.97	0.59	1
7	0_6959606	Unconfined	9,802	11/1/2005	743.66	742.97	0.69	1
7	0_6959606	Unconfined	9,806	11/5/2005	743.81	742.96	0.85	1
7	0_6959606	Unconfined	9,811	11/10/2005	743.91	742.95	0.96	1
7	0_6959606	Unconfined	9,816	11/15/2005	744.06	742.94	1.12	1
7	0_6959606	Unconfined	9,821	11/20/2005	744.11	742.94	1.17	1
7	0_6959606	Unconfined	9,826	11/25/2005	744.26	742.93	1.33	1
7	0_6959606	Unconfined	9,831	11/30/2005	744.16	742.92	1.24	1
7	0_6959606	Unconfined	9,836	12/5/2005	744.26	742.91	1.35	1
7	0_6959606	Unconfined	9,841	12/10/2005	744.36	742.90	1.46	1
7	0_6959606	Unconfined	9,846	12/15/2005	744.41	742.89	1.52	1
7	0_6959606	Unconfined	9,851	12/20/2005	744.41	742.88	1.53	1
7	0_6959606	Unconfined	9,856	12/25/2005	744.46	742.87	1.59	1
7	0_6959606	Unconfined	9,861	12/30/2005	744.56	742.86	1.70	1
7	0_6959606	Unconfined	9,867	1/5/2006	744.46	742.87	1.59	1
7	0_6959606	Unconfined	9,872	1/10/2006	744.36	742.88	1.48	1
7	0_6959606	Unconfined	9,877	1/15/2006	742.66	742.90	-0.24	1
7	0_6959606	Unconfined	9,882	1/20/2006	742.96	742.91	0.05	1
7	0_6959606	Unconfined	9,887	1/25/2006	743.21	742.92	0.29	1
7	0_6959606	Unconfined	9,892	1/30/2006	741.56	742.93	-1.37	1
7	0_6959606	Unconfined	9,898	2/5/2006	740.61	742.94	-2.33	1
7	0_6959606	Unconfined	9,903	2/10/2006	739.56	742.95	-3.39	1
7	0_6959606	Unconfined	9,908	2/15/2006	739.06	742.96	-3.90	1
7	0_6959606	Unconfined	9,913	2/20/2006	739.06	742.97	-3.91	1
7	0_6959606	Unconfined	9,922	3/1/2006	740.16	742.99	-2.83	1
7	0_6959606	Unconfined	9,926	3/5/2006	739.21	743.00	-3.79	1
7	0_6959606	Unconfined	9,931	3/10/2006	738.81	743.01	-4.20	1
7	0_6959606	Unconfined	9,936	3/15/2006	739.36	743.03	-3.67	1
7	0_6959606	Unconfined	9,941	3/20/2006	738.76	743.04	-4.28	1
7	0_6959606	Unconfined	9,946	3/25/2006	738.76	743.05	-4.29	1
7	0_6959606	Unconfined	9,951	3/30/2006	739.46	743.06	-3.60	1
7	0_6959606	Unconfined	9,957	4/5/2006	739.44	743.07	-3.63	1
7	0_6959606	Unconfined	9,962	4/10/2006	738.11	743.08	-4.97	1
7	0_6959606	Unconfined	9,967	4/15/2006	737.16	743.09	-5.93	1
7	0_6959606	Unconfined	9,972	4/20/2006	736.36	743.10	-6.74	1
7	0_6959606	Unconfined	9,977	4/25/2006	737.91	743.12	-5.21	1
7	0_6959606	Unconfined	9,982	4/30/2006	736.96	743.13	-6.17	1
7	0_6959606	Unconfined	9,987	5/5/2006	735.46	743.14	-7.68	1
7	0_6959606	Unconfined	9,992	5/10/2006	733.76	743.15	-9.39	1
7	0_6959606	Unconfined	9,997	5/15/2006	732.96	743.16	-10.20	1
7	0_6959606	Unconfined	10,002	5/20/2006	732.26	743.17	-10.91	1
7	0_6959606	Unconfined	10,007	5/25/2006	731.56	743.18	-11.62	1
7	0_6959606	Unconfined	10,012	5/30/2006	731.26	743.19	-11.93	1
7	0_6959606	Unconfined	10,018	6/5/2006	730.26	743.21	-12.95	1
7	0_6959606	Unconfined	10,023	6/10/2006	729.66	743.22	-13.56	1
7	0_6959606	Unconfined	10,028	6/15/2006	729.26	743.23	-13.97	1
7	0_6959606	Unconfined	10,038	6/25/2006	728.66	743.25	-14.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	10,043	6/30/2006	728.86	743.26	-14.40	1
7	0_6959606	Unconfined	10,048	7/5/2006	728.76	743.27	-14.51	1
7	0_6959606	Unconfined	10,053	7/10/2006	728.81	743.28	-14.47	1
7	0_6959606	Unconfined	10,058	7/15/2006	730.01	743.29	-13.28	1
7	0_6959606	Unconfined	10,063	7/20/2006	730.71	743.30	-12.59	1
7	0_6959606	Unconfined	10,068	7/25/2006	731.46	743.31	-11.85	1
7	0_6959606	Unconfined	10,073	7/30/2006	730.96	743.33	-12.37	1
7	0_6959606	Unconfined	10,075	8/1/2006	730.96	743.33	-12.37	1
7	0_6959606	Unconfined	10,079	8/5/2006	731.61	743.34	-11.73	1
7	0_6959606	Unconfined	10,084	8/10/2006	732.46	743.35	-10.89	1
7	0_6959606	Unconfined	10,089	8/15/2006	732.91	743.36	-10.45	1
7	0_6959606	Unconfined	10,094	8/20/2006	733.76	743.37	-9.61	1
7	0_6959606	Unconfined	10,106	9/1/2006	734.36	743.40	-9.04	1
7	0_6959606	Unconfined	10,110	9/5/2006	734.41	743.41	-9.00	1
7	0_6959606	Unconfined	10,115	9/10/2006	735.26	743.42	-8.16	1
7	0_6959606	Unconfined	10,120	9/15/2006	736.26	743.43	-7.17	1
7	0_6959606	Unconfined	10,125	9/20/2006	737.16	743.44	-6.28	1
7	0_6959606	Unconfined	10,130	9/25/2006	737.86	743.45	-5.59	1
7	0_6959606	Unconfined	10,135	9/30/2006	738.76	743.46	-4.70	1
7	0_6959606	Unconfined	10,140	10/5/2006	739.11	743.47	-4.36	1
7	0_6959606	Unconfined	10,145	10/10/2006	739.61	743.48	-3.87	1
7	0_6959606	Unconfined	10,150	10/15/2006	740.06	743.49	-3.43	1
7	0_6959606	Unconfined	10,155	10/20/2006	740.41	743.51	-3.10	1
7	0_6959606	Unconfined	10,160	10/25/2006	740.76	743.52	-2.76	1
7	0_6959606	Unconfined	10,165	10/30/2006	741.06	743.53	-2.47	1
7	0_6959606	Unconfined	10,171	11/5/2006	741.31	743.54	-2.23	1
7	0_6959606	Unconfined	10,176	11/10/2006	741.51	743.55	-2.04	1
7	0_6959606	Unconfined	10,181	11/15/2006	741.66	743.56	-1.90	1
7	0_6959606	Unconfined	10,186	11/20/2006	741.71	743.57	-1.86	1
7	0_6959606	Unconfined	10,191	11/25/2006	741.86	743.58	-1.72	1
7	0_6959606	Unconfined	10,196	11/30/2006	742.01	743.60	-1.59	1
7	0_6959606	Unconfined	10,201	12/5/2006	742.21	743.61	-1.40	1
7	0_6959606	Unconfined	10,206	12/10/2006	742.41	743.62	-1.21	1
7	0_6959606	Unconfined	10,211	12/15/2006	742.51	743.63	-1.12	1
7	0_6959606	Unconfined	10,216	12/20/2006	742.66	743.64	-0.98	1
7	0_6959606	Unconfined	10,221	12/25/2006	742.71	743.65	-0.94	1
7	0_6959606	Unconfined	10,226	12/30/2006	742.81	743.66	-0.85	1
7	0_6959606	Unconfined	10,232	1/5/2007	742.76	743.68	-0.92	1
7	0_6959606	Unconfined	10,237	1/10/2007	740.71	743.70	-2.99	1
7	0_6959606	Unconfined	10,242	1/15/2007	738.86	743.72	-4.86	1
7	0_6959606	Unconfined	10,247	1/20/2007	736.76	743.74	-6.98	1
7	0_6959606	Unconfined	10,252	1/25/2007	736.66	743.75	-7.09	1
7	0_6959606	Unconfined	10,257	1/30/2007	738.26	743.77	-5.51	1
7	0_6959606	Unconfined	10,263	2/5/2007	737.86	743.79	-5.93	1
7	0_6959606	Unconfined	10,268	2/10/2007	736.86	743.81	-6.95	1
7	0_6959606	Unconfined	10,273	2/15/2007	741.01	743.83	-2.82	1
7	0_6959606	Unconfined	10,278	2/20/2007	740.51	743.85	-3.34	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	10,283	2/25/2007	738.96	743.86	-4.90	1
7	0_6959606	Unconfined	10,286	2/28/2007	739.26	743.87	-4.61	1
7	0_6959606	Unconfined	10,287	3/1/2007	739.46	743.88	-4.42	1
7	0_6959606	Unconfined	10,291	3/5/2007	739.66	743.89	-4.23	1
7	0_6959606	Unconfined	10,296	3/10/2007	739.06	743.91	-4.85	1
7	0_6959606	Unconfined	10,301	3/15/2007	739.56	743.93	-4.37	1
7	0_6959606	Unconfined	10,306	3/20/2007	740.26	743.95	-3.69	1
7	0_6959606	Unconfined	10,311	3/25/2007	740.86	743.96	-3.10	1
7	0_6959606	Unconfined	10,316	3/30/2007	741.36	743.98	-2.62	1
7	0_6959606	Unconfined	10,322	4/5/2007	741.71	744.00	-2.29	1
7	0_6959606	Unconfined	10,327	4/10/2007	742.16	744.02	-1.86	1
7	0_6959606	Unconfined	10,332	4/15/2007	741.61	744.04	-2.43	1
7	0_6959606	Unconfined	10,337	4/20/2007	740.61	744.06	-3.45	1
7	0_6959606	Unconfined	10,342	4/25/2007	739.66	744.08	-4.42	1
7	0_6959606	Unconfined	10,347	4/30/2007	740.66	744.09	-3.43	1
7	0_6959606	Unconfined	10,352	5/5/2007	739.91	744.11	-4.20	1
7	0_6959606	Unconfined	10,357	5/10/2007	739.16	744.13	-4.97	1
7	0_6959606	Unconfined	10,362	5/15/2007	740.26	744.15	-3.89	1
7	0_6959606	Unconfined	10,367	5/20/2007	738.06	744.17	-6.11	1
7	0_6959606	Unconfined	10,372	5/25/2007	738.96	744.18	-5.22	1
7	0_6959606	Unconfined	10,379	6/1/2007	740.66	744.21	-3.55	1
7	0_6959606	Unconfined	10,383	6/5/2007	741.06	744.22	-3.16	1
7	0_6959606	Unconfined	10,388	6/10/2007	741.56	744.24	-2.68	1
7	0_6959606	Unconfined	10,393	6/15/2007	739.61	744.26	-4.65	1
7	0_6959606	Unconfined	10,398	6/20/2007	739.76	744.28	-4.52	1
7	0_6959606	Unconfined	10,403	6/25/2007	740.96	744.29	-3.33	1
7	0_6959606	Unconfined	10,408	6/30/2007	741.66	744.31	-2.65	1
7	0_6959606	Unconfined	10,413	7/5/2007	742.16	744.33	-2.17	1
7	0_6959606	Unconfined	10,418	7/10/2007	742.56	744.35	-1.79	1
7	0_6959606	Unconfined	10,423	7/15/2007	742.91	744.37	-1.46	1
7	0_6959606	Unconfined	10,428	7/20/2007	743.01	744.38	-1.37	1
7	0_6959606	Unconfined	10,433	7/25/2007	743.01	744.40	-1.39	1
7	0_6959606	Unconfined	10,438	7/30/2007	743.56	744.42	-0.86	1
7	0_6959606	Unconfined	10,444	8/5/2007	743.76	744.44	-0.68	1
7	0_6959606	Unconfined	10,449	8/10/2007	743.76	744.46	-0.70	1
7	0_6959606	Unconfined	10,454	8/15/2007	743.86	744.48	-0.62	1
7	0_6959606	Unconfined	10,459	8/20/2007	744.56	744.49	0.07	1
7	0_6959606	Unconfined	10,464	8/25/2007	743.96	744.51	-0.55	1
7	0_6959606	Unconfined	10,469	8/30/2007	743.96	744.53	-0.57	1
7	0_6959606	Unconfined	10,475	9/5/2007	744.11	744.55	-0.44	1
7	0_6959606	Unconfined	10,480	9/10/2007	744.26	744.57	-0.31	1
7	0_6959606	Unconfined	10,485	9/15/2007	743.96	744.59	-0.63	1
7	0_6959606	Unconfined	10,490	9/20/2007	743.51	744.61	-1.10	1
7	0_6959606	Unconfined	10,495	9/25/2007	743.96	744.62	-0.66	1
7	0_6959606	Unconfined	10,500	9/30/2007	744.21	744.64	-0.43	1
7	0_6959606	Unconfined	10,505	10/5/2007	744.51	744.66	-0.15	1
7	0_6959606	Unconfined	10,510	10/10/2007	744.66	744.68	-0.02	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	10,515	10/15/2007	744.46	744.70	-0.24	1
7	0_6959606	Unconfined	10,520	10/20/2007	744.46	744.71	-0.25	1
7	0_6959606	Unconfined	10,525	10/25/2007	744.41	744.73	-0.32	1
7	0_6959606	Unconfined	10,530	10/30/2007	744.51	744.75	-0.24	1
7	0_6959606	Unconfined	10,536	11/5/2007	744.61	744.77	-0.16	1
7	0_6959606	Unconfined	10,541	11/10/2007	744.46	744.79	-0.33	1
7	0_6959606	Unconfined	10,546	11/15/2007	744.46	744.81	-0.35	1
7	0_6959606	Unconfined	10,551	11/20/2007	744.66	744.82	-0.16	1
7	0_6959606	Unconfined	10,556	11/25/2007	744.71	744.84	-0.13	1
7	0_6959606	Unconfined	10,561	11/30/2007	744.66	744.86	-0.20	1
7	0_6959606	Unconfined	10,566	12/5/2007	744.76	744.88	-0.12	1
7	0_6959606	Unconfined	10,571	12/10/2007	744.36	744.90	-0.54	1
7	0_6959606	Unconfined	10,576	12/15/2007	744.46	744.91	-0.45	1
7	0_6959606	Unconfined	10,581	12/20/2007	744.46	744.93	-0.47	1
7	0_6959606	Unconfined	10,586	12/25/2007	743.56	744.95	-1.39	1
7	0_6959606	Unconfined	10,591	12/30/2007	743.96	744.97	-1.01	1
7	0_6959606	Unconfined	10,597	1/5/2008	743.76	744.92	-1.16	1
7	0_6959606	Unconfined	10,602	1/10/2008	743.91	744.87	-0.96	1
7	0_6959606	Unconfined	10,607	1/15/2008	743.86	744.82	-0.96	1
7	0_6959606	Unconfined	10,612	1/20/2008	744.21	744.77	-0.56	1
7	0_6959606	Unconfined	10,617	1/25/2008	744.96	744.73	0.23	1
7	0_6959606	Unconfined	10,622	1/30/2008	744.46	744.68	-0.22	1
7	0_6959606	Unconfined	10,628	2/5/2008	743.46	744.62	-1.16	1
7	0_6959606	Unconfined	10,633	2/10/2008	741.36	744.57	-3.21	1
7	0_6959606	Unconfined	10,638	2/15/2008	740.46	744.52	-4.06	1
7	0_6959606	Unconfined	10,643	2/20/2008	739.16	744.47	-5.31	1
7	0_6959606	Unconfined	10,648	2/25/2008	737.56	744.42	-6.86	1
7	0_6959606	Unconfined	10,653	3/1/2008	737.76	744.37	-6.61	1
7	0_6959606	Unconfined	10,657	3/5/2008	737.96	744.33	-6.37	1
7	0_6959606	Unconfined	10,662	3/10/2008	738.01	744.28	-6.27	1
7	0_6959606	Unconfined	10,667	3/15/2008	738.36	744.23	-5.87	1
7	0_6959606	Unconfined	10,672	3/20/2008	737.46	744.18	-6.72	1
7	0_6959606	Unconfined	10,677	3/25/2008	737.96	744.14	-6.18	1
7	0_6959606	Unconfined	10,682	3/30/2008	738.61	744.09	-5.48	1
7	0_6959606	Unconfined	10,688	4/5/2008	738.86	744.03	-5.17	1
7	0_6959606	Unconfined	10,693	4/10/2008	739.16	743.98	-4.82	1
7	0_6959606	Unconfined	10,698	4/15/2008	737.46	743.93	-6.47	1
7	0_6959606	Unconfined	10,703	4/20/2008	736.91	743.88	-6.97	1
7	0_6959606	Unconfined	10,708	4/25/2008	736.61	743.83	-7.22	1
7	0_6959606	Unconfined	10,713	4/30/2008	735.76	743.78	-8.02	1
7	0_6959606	Unconfined	10,718	5/5/2008	735.06	743.73	-8.67	1
7	0_6959606	Unconfined	10,723	5/10/2008	734.46	743.68	-9.22	1
7	0_6959606	Unconfined	10,728	5/15/2008	733.81	743.63	-9.82	1
7	0_6959606	Unconfined	10,733	5/20/2008	734.81	743.59	-8.78	1
7	0_6959606	Unconfined	10,738	5/25/2008	733.96	743.54	-9.58	1
7	0_6959606	Unconfined	10,743	5/30/2008	733.21	743.49	-10.28	1
7	0_6959606	Unconfined	10,749	6/5/2008	732.61	743.43	-10.82	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	10,754	6/10/2008	732.26	743.38	-11.12	1
7	0_6959606	Unconfined	10,759	6/15/2008	731.81	743.33	-11.52	1
7	0_6959606	Unconfined	10,764	6/20/2008	731.36	743.28	-11.92	1
7	0_6959606	Unconfined	10,769	6/25/2008	730.96	743.23	-12.27	1
7	0_6959606	Unconfined	10,774	6/30/2008	731.31	743.18	-11.87	1
7	0_6959606	Unconfined	10,779	7/5/2008	731.46	743.13	-11.67	1
7	0_6959606	Unconfined	10,784	7/10/2008	734.01	743.08	-9.07	1
7	0_6959606	Unconfined	10,789	7/15/2008	735.16	743.03	-7.87	1
7	0_6959606	Unconfined	10,794	7/20/2008	736.16	742.99	-6.83	1
7	0_6959606	Unconfined	10,799	7/25/2008	736.96	742.94	-5.98	1
7	0_6959606	Unconfined	10,804	7/30/2008	737.86	742.89	-5.03	1
7	0_6959606	Unconfined	10,810	8/5/2008	738.26	742.83	-4.57	1
7	0_6959606	Unconfined	10,815	8/10/2008	738.96	742.78	-3.82	1
7	0_6959606	Unconfined	10,820	8/15/2008	739.36	742.73	-3.37	1
7	0_6959606	Unconfined	10,825	8/20/2008	739.81	742.68	-2.87	1
7	0_6959606	Unconfined	10,830	8/25/2008	740.21	742.63	-2.42	1
7	0_6959606	Unconfined	10,835	8/30/2008	740.46	742.58	-2.12	1
7	0_6959606	Unconfined	10,841	9/5/2008	741.21	742.52	-1.31	1
7	0_6959606	Unconfined	10,846	9/10/2008	741.26	742.47	-1.21	1
7	0_6959606	Unconfined	10,851	9/15/2008	741.46	742.43	-0.97	1
7	0_6959606	Unconfined	10,856	9/20/2008	741.76	742.38	-0.62	1
7	0_6959606	Unconfined	10,861	9/25/2008	741.66	742.33	-0.67	1
7	0_6959606	Unconfined	10,866	9/30/2008	741.66	742.28	-0.62	1
7	0_6959606	Unconfined	10,867	10/1/2008	741.71	742.27	-0.56	1
7	0_6959606	Unconfined	10,871	10/5/2008	741.81	742.23	-0.42	1
7	0_6959606	Unconfined	10,876	10/10/2008	741.91	742.18	-0.27	1
7	0_6959606	Unconfined	10,881	10/15/2008	742.01	742.13	-0.12	1
7	0_6959606	Unconfined	10,886	10/20/2008	742.16	742.08	0.08	1
7	0_6959606	Unconfined	10,891	10/25/2008	741.66	742.03	-0.37	1
7	0_6959606	Unconfined	10,896	10/30/2008	741.86	741.98	-0.12	1
7	0_6959606	Unconfined	10,902	11/5/2008	742.16	741.92	0.24	1
7	0_6959606	Unconfined	10,907	11/10/2008	742.01	741.88	0.13	1
7	0_6959606	Unconfined	10,912	11/15/2008	742.11	741.83	0.28	1
7	0_6959606	Unconfined	10,917	11/20/2008	742.31	741.78	0.53	1
7	0_6959606	Unconfined	10,922	11/25/2008	742.31	741.73	0.58	1
7	0_6959606	Unconfined	10,927	11/30/2008	742.51	741.68	0.83	1
7	0_6959606	Unconfined	10,932	12/5/2008	742.46	741.63	0.83	1
7	0_6959606	Unconfined	10,937	12/10/2008	742.51	741.58	0.93	1
7	0_6959606	Unconfined	10,942	12/15/2008	742.66	741.53	1.13	1
7	0_6959606	Unconfined	10,947	12/20/2008	742.76	741.48	1.28	1
7	0_6959606	Unconfined	10,952	12/25/2008	742.76	741.43	1.33	1
7	0_6959606	Unconfined	10,957	12/30/2008	742.86	741.38	1.48	1
7	0_6959606	Unconfined	10,959	1/1/2009	742.91	741.36	1.55	1
7	0_6959606	Unconfined	10,963	1/5/2009	742.21	741.30	0.91	1
7	0_6959606	Unconfined	10,968	1/10/2009	741.46	741.24	0.22	1
7	0_6959606	Unconfined	10,973	1/15/2009	741.96	741.17	0.79	1
7	0_6959606	Unconfined	10,978	1/20/2009	742.16	741.10	1.06	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	10,983	1/25/2009	742.21	741.03	1.18	1
7	0_6959606	Unconfined	10,988	1/30/2009	742.16	740.96	1.20	1
7	0_6959606	Unconfined	10,990	2/1/2009	741.51	740.93	0.58	1
7	0_6959606	Unconfined	10,994	2/5/2009	739.56	740.88	-1.32	1
7	0_6959606	Unconfined	10,999	2/10/2009	739.11	740.81	-1.70	1
7	0_6959606	Unconfined	11,004	2/15/2009	739.31	740.74	-1.43	1
7	0_6959606	Unconfined	11,009	2/20/2009	738.61	740.67	-2.06	1
7	0_6959606	Unconfined	11,014	2/25/2009	739.76	740.60	-0.84	1
7	0_6959606	Unconfined	11,018	3/1/2009	739.21	740.54	-1.33	1
7	0_6959606	Unconfined	11,022	3/5/2009	739.61	740.49	-0.88	1
7	0_6959606	Unconfined	11,027	3/10/2009	739.71	740.42	-0.71	1
7	0_6959606	Unconfined	11,032	3/15/2009	738.96	740.35	-1.39	1
7	0_6959606	Unconfined	11,037	3/20/2009	738.61	740.28	-1.67	1
7	0_6959606	Unconfined	11,042	3/25/2009	732.96	740.21	-7.25	1
7	0_6959606	Unconfined	11,047	3/30/2009	731.96	740.14	-8.18	1
7	0_6959606	Unconfined	11,049	4/1/2009	732.46	740.12	-7.66	1
7	0_6959606	Unconfined	11,053	4/5/2009	733.16	740.06	-6.90	1
7	0_6959606	Unconfined	11,063	4/15/2009	733.46	739.92	-6.46	1
7	0_6959606	Unconfined	11,068	4/20/2009	733.86	739.85	-5.99	1
7	0_6959606	Unconfined	11,073	4/25/2009	734.36	739.79	-5.43	1
7	0_6959606	Unconfined	11,078	4/30/2009	735.16	739.72	-4.56	1
7	0_6959606	Unconfined	11,083	5/5/2009	736.66	739.65	-2.99	1
7	0_6959606	Unconfined	11,088	5/10/2009	736.26	739.58	-3.32	1
7	0_6959606	Unconfined	11,093	5/15/2009	735.26	739.51	-4.25	1
7	0_6959606	Unconfined	11,098	5/20/2009	734.61	739.44	-4.83	1
7	0_6959606	Unconfined	11,103	5/25/2009	733.86	739.37	-5.51	1
7	0_6959606	Unconfined	11,108	5/30/2009	733.26	739.30	-6.04	1
7	0_6959606	Unconfined	11,110	6/1/2009	733.66	739.27	-5.61	1
7	0_6959606	Unconfined	11,114	6/5/2009	733.26	739.22	-5.96	1
7	0_6959606	Unconfined	11,119	6/10/2009	732.56	739.15	-6.59	1
7	0_6959606	Unconfined	11,124	6/15/2009	732.11	739.08	-6.97	1
7	0_6959606	Unconfined	11,129	6/20/2009	731.36	739.01	-7.65	1
7	0_6959606	Unconfined	11,134	6/25/2009	730.81	738.94	-8.13	1
7	0_6959606	Unconfined	11,139	6/30/2009	730.56	738.87	-8.31	1
7	0_6959606	Unconfined	11,144	7/5/2009	730.36	738.80	-8.44	1
7	0_6959606	Unconfined	11,149	7/10/2009	730.01	738.74	-8.73	1
7	0_6959606	Unconfined	11,154	7/15/2009	730.56	738.67	-8.11	1
7	0_6959606	Unconfined	11,159	7/20/2009	731.76	738.60	-6.84	1
7	0_6959606	Unconfined	11,164	7/25/2009	732.71	738.53	-5.82	1
7	0_6959606	Unconfined	11,169	7/30/2009	733.61	738.46	-4.85	1
7	0_6959606	Unconfined	11,175	8/5/2009	734.26	738.38	-4.12	1
7	0_6959606	Unconfined	11,180	8/10/2009	736.76	738.31	-1.55	1
7	0_6959606	Unconfined	11,185	8/15/2009	733.86	738.24	-4.38	1
7	0_6959606	Unconfined	11,190	8/20/2009	734.51	738.17	-3.66	1
7	0_6959606	Unconfined	11,195	8/25/2009	734.51	738.10	-3.59	1
7	0_6959606	Unconfined	11,200	8/30/2009	734.16	738.03	-3.87	1
7	0_6959606	Unconfined	11,202	9/1/2009	734.41	738.00	-3.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	11,206	9/5/2009	734.76	737.95	-3.19	1
7	0_6959606	Unconfined	11,211	9/10/2009	734.86	737.88	-3.02	1
7	0_6959606	Unconfined	11,216	9/15/2009	736.46	737.81	-1.35	1
7	0_6959606	Unconfined	11,221	9/20/2009	737.26	737.74	-0.48	1
7	0_6959606	Unconfined	11,226	9/25/2009	737.76	737.67	0.09	1
7	0_6959606	Unconfined	11,231	9/30/2009	738.36	737.60	0.76	1
7	0_6959606	Unconfined	11,236	10/5/2009	739.21	737.53	1.68	1
7	0_6959606	Unconfined	11,241	10/10/2009	739.36	737.46	1.90	1
7	0_6959606	Unconfined	11,246	10/15/2009	739.51	737.40	2.11	1
7	0_6959606	Unconfined	11,251	10/20/2009	739.76	737.33	2.43	1
7	0_6959606	Unconfined	11,256	10/25/2009	740.06	737.26	2.80	1
7	0_6959606	Unconfined	11,261	10/30/2009	739.76	737.19	2.57	1
7	0_6959606	Unconfined	11,267	11/5/2009	740.46	737.10	3.36	1
7	0_6959606	Unconfined	11,272	11/10/2009	740.81	737.04	3.77	1
7	0_6959606	Unconfined	11,277	11/15/2009	740.91	736.97	3.94	1
7	0_6959606	Unconfined	11,282	11/20/2009	741.11	736.90	4.21	1
7	0_6959606	Unconfined	11,287	11/25/2009	741.61	736.83	4.78	1
7	0_6959606	Unconfined	11,292	11/30/2009	741.76	736.76	5.00	1
7	0_6959606	Unconfined	11,297	12/5/2009	742.26	736.69	5.57	1
7	0_6959606	Unconfined	11,302	12/10/2009	742.86	736.62	6.24	1
7	0_6959606	Unconfined	11,307	12/15/2009	743.66	736.55	7.11	1
7	0_6959606	Unconfined	11,312	12/20/2009	744.36	736.48	7.88	1
7	0_6959606	Unconfined	11,317	12/25/2009	745.06	736.41	8.65	1
7	0_6959606	Unconfined	11,322	12/30/2009	745.96	736.35	9.61	1
7	0_6959606	Unconfined	11,328	1/5/2010	746.36	736.31	10.05	1
7	0_6959606	Unconfined	11,333	1/10/2010	746.76	736.28	10.48	1
7	0_6959606	Unconfined	11,338	1/15/2010	747.16	736.25	10.91	1
7	0_6959606	Unconfined	11,343	1/20/2010	747.36	736.23	11.13	1
7	0_6959606	Unconfined	11,348	1/25/2010	747.76	736.20	11.56	1
7	0_6959606	Unconfined	11,353	1/30/2010	748.16	736.18	11.98	1
7	0_6959606	Unconfined	11,359	2/5/2010	748.56	736.14	12.42	1
7	0_6959606	Unconfined	11,364	2/10/2010	748.86	736.12	12.74	1
7	0_6959606	Unconfined	11,369	2/15/2010	748.86	736.09	12.77	1
7	0_6959606	Unconfined	11,374	2/20/2010	749.01	736.07	12.94	1
7	0_6959606	Unconfined	11,379	2/25/2010	749.16	736.04	13.12	1
7	0_6959606	Unconfined	11,383	3/1/2010	749.26	736.02	13.24	1
7	0_6959606	Unconfined	11,387	3/5/2010	749.26	736.00	13.26	1
7	0_6959606	Unconfined	11,392	3/10/2010	749.46	735.97	13.49	1
7	0_6959606	Unconfined	11,397	3/15/2010	749.61	735.95	13.66	1
7	0_6959606	Unconfined	11,402	3/20/2010	749.66	735.92	13.74	1
7	0_6959606	Unconfined	11,407	3/25/2010	749.26	735.90	13.36	1
7	0_6959606	Unconfined	11,412	3/30/2010	749.46	735.87	13.59	1
7	0_6959606	Unconfined	11,414	4/1/2010	749.51	735.86	13.65	1
7	0_6959606	Unconfined	11,418	4/5/2010	748.96	735.84	13.12	1
7	0_6959606	Unconfined	11,423	4/10/2010	748.86	735.81	13.05	1
7	0_6959606	Unconfined	11,428	4/15/2010	749.06	735.79	13.27	1
7	0_6959606	Unconfined	11,433	4/20/2010	749.26	735.76	13.50	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	11,438	4/25/2010	749.46	735.73	13.73	1
7	0_6959606	Unconfined	11,443	4/30/2010	748.06	735.71	12.35	1
7	0_6959606	Unconfined	11,448	5/5/2010	748.06	735.68	12.38	1
7	0_6959606	Unconfined	11,453	5/10/2010	748.11	735.66	12.45	1
7	0_6959606	Unconfined	11,458	5/15/2010	748.11	735.63	12.48	1
7	0_6959606	Unconfined	11,463	5/20/2010	747.31	735.60	11.71	1
7	0_6959606	Unconfined	11,468	5/25/2010	747.06	735.58	11.48	1
7	0_6959606	Unconfined	11,473	5/30/2010	746.96	735.55	11.41	1
7	0_6959606	Unconfined	11,479	6/5/2010	746.76	735.52	11.24	1
7	0_6959606	Unconfined	11,484	6/10/2010	746.46	735.50	10.96	1
7	0_6959606	Unconfined	11,489	6/15/2010	743.96	735.47	8.49	1
7	0_6959606	Unconfined	11,494	6/20/2010	739.86	735.44	4.42	1
7	0_6959606	Unconfined	11,499	6/25/2010	746.26	735.42	10.84	1
7	0_6959606	Unconfined	11,504	6/30/2010	745.96	735.39	10.57	1
7	0_6959606	Unconfined	11,505	7/1/2010	738.76	735.39	3.37	1
7	0_6959606	Unconfined	11,509	7/5/2010	745.66	735.37	10.29	1
7	0_6959606	Unconfined	11,514	7/10/2010	745.06	735.34	9.72	1
7	0_6959606	Unconfined	11,519	7/15/2010	744.46	735.31	9.15	1
7	0_6959606	Unconfined	11,524	7/20/2010	742.36	735.29	7.07	1
7	0_6959606	Unconfined	11,529	7/25/2010	741.46	735.26	6.20	1
7	0_6959606	Unconfined	11,534	7/30/2010	741.26	735.24	6.02	1
7	0_6959606	Unconfined	11,540	8/5/2010	740.96	735.20	5.76	1
7	0_6959606	Unconfined	11,545	8/10/2010	740.76	735.18	5.58	1
7	0_6959606	Unconfined	11,550	8/15/2010	740.46	735.15	5.31	1
7	0_6959606	Unconfined	11,555	8/20/2010	740.06	735.13	4.93	1
7	0_6959606	Unconfined	11,560	8/25/2010	739.71	735.10	4.61	1
7	0_6959606	Unconfined	11,565	8/30/2010	728.28	735.07	-6.79	1
7	0_6959606	Unconfined	11,571	9/5/2010	742.46	735.04	7.42	1
7	0_6959606	Unconfined	11,576	9/10/2010	741.73	735.02	6.71	1
7	0_6959606	Unconfined	11,581	9/15/2010	740.74	734.99	5.75	1
7	0_6959606	Unconfined	11,586	9/20/2010	745.13	734.97	10.16	1
7	0_6959606	Unconfined	11,591	9/25/2010	745.69	734.94	10.75	1
7	0_6959606	Unconfined	11,596	9/30/2010	746.00	734.91	11.09	1
7	0_6959606	Unconfined	11,597	10/1/2010	746.15	734.91	11.24	1
7	0_6959606	Unconfined	11,601	10/5/2010	746.58	734.89	11.69	1
7	0_6959606	Unconfined	11,606	10/10/2010	746.47	734.86	11.61	1
7	0_6959606	Unconfined	11,611	10/15/2010	746.86	734.84	12.02	1
7	0_6959606	Unconfined	11,616	10/20/2010	745.69	734.81	10.88	1
7	0_6959606	Unconfined	11,621	10/25/2010	746.13	734.78	11.35	1
7	0_6959606	Unconfined	11,626	10/30/2010	746.55	734.76	11.79	1
7	0_6959606	Unconfined	11,628	11/1/2010	746.62	734.75	11.87	1
7	0_6959606	Unconfined	11,632	11/5/2010	746.88	734.73	12.15	1
7	0_6959606	Unconfined	11,637	11/10/2010	746.73	734.70	12.03	1
7	0_6959606	Unconfined	11,642	11/15/2010	746.64	734.67	11.97	1
7	0_6959606	Unconfined	11,647	11/20/2010	746.94	734.65	12.29	1
7	0_6959606	Unconfined	11,652	11/25/2010	746.76	734.62	12.14	1
7	0_6959606	Unconfined	11,657	11/30/2010	747.24	734.60	12.64	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	11,658	12/1/2010	747.20	734.59	12.61	1
7	0_6959606	Unconfined	11,662	12/5/2010	747.32	734.57	12.75	1
7	0_6959606	Unconfined	11,667	12/10/2010	747.04	734.55	12.49	1
7	0_6959606	Unconfined	11,672	12/15/2010	746.84	734.52	12.32	1
7	0_6959606	Unconfined	11,677	12/20/2010	746.96	734.49	12.47	1
7	0_6959606	Unconfined	11,682	12/25/2010	747.41	734.47	12.94	1
7	0_6959606	Unconfined	11,687	12/30/2010	746.67	734.44	12.23	1
7	0_6959606	Unconfined	11,689	1/1/2011	746.89	734.43	12.46	1
7	0_6959606	Unconfined	11,693	1/5/2011	747.00	734.40	12.60	1
7	0_6959606	Unconfined	11,698	1/10/2011	746.94	734.37	12.57	1
7	0_6959606	Unconfined	11,703	1/15/2011	746.65	734.33	12.32	1
7	0_6959606	Unconfined	11,708	1/20/2011	747.17	734.30	12.87	1
7	0_6959606	Unconfined	11,713	1/25/2011	747.28	734.27	13.01	1
7	0_6959606	Unconfined	11,718	1/30/2011	746.86	734.23	12.63	1
7	0_6959606	Unconfined	11,720	2/1/2011	747.18	734.22	12.96	1
7	0_6959606	Unconfined	11,724	2/5/2011	747.16	734.19	12.97	1
7	0_6959606	Unconfined	11,729	2/10/2011	746.61	734.16	12.45	1
7	0_6959606	Unconfined	11,734	2/15/2011	744.57	734.12	10.45	1
7	0_6959606	Unconfined	11,739	2/20/2011	742.74	734.09	8.65	1
7	0_6959606	Unconfined	11,744	2/25/2011	743.38	734.06	9.32	1
7	0_6959606	Unconfined	11,747	2/28/2011	742.48	734.04	8.44	1
7	0_6959606	Unconfined	11,748	3/1/2011	741.99	734.03	7.96	1
7	0_6959606	Unconfined	11,752	3/5/2011	741.09	734.00	7.09	1
7	0_6959606	Unconfined	11,757	3/10/2011	740.92	733.97	6.95	1
7	0_6959606	Unconfined	11,762	3/15/2011	741.04	733.93	7.11	1
7	0_6959606	Unconfined	11,767	3/20/2011	739.10	733.90	5.20	1
7	0_6959606	Unconfined	11,772	3/25/2011	739.39	733.87	5.52	1
7	0_6959606	Unconfined	11,777	3/30/2011	740.85	733.83	7.02	1
7	0_6959606	Unconfined	11,779	4/1/2011	740.29	733.82	6.47	1
7	0_6959606	Unconfined	11,783	4/5/2011	739.59	733.79	5.80	1
7	0_6959606	Unconfined	11,788	4/10/2011	737.75	733.76	3.99	1
7	0_6959606	Unconfined	11,793	4/15/2011	737.04	733.72	3.32	1
7	0_6959606	Unconfined	11,798	4/20/2011	736.15	733.69	2.46	1
7	0_6959606	Unconfined	11,803	4/25/2011	735.72	733.66	2.06	1
7	0_6959606	Unconfined	11,808	4/30/2011	734.66	733.62	1.04	1
7	0_6959606	Unconfined	11,809	5/1/2011	734.49	733.61	0.88	1
7	0_6959606	Unconfined	11,813	5/5/2011	734.76	733.59	1.17	1
7	0_6959606	Unconfined	11,818	5/10/2011	733.44	733.55	-0.11	1
7	0_6959606	Unconfined	11,823	5/15/2011	734.13	733.52	0.61	1
7	0_6959606	Unconfined	11,828	5/20/2011	734.08	733.49	0.59	1
7	0_6959606	Unconfined	11,833	5/25/2011	733.09	733.45	-0.36	1
7	0_6959606	Unconfined	11,838	5/30/2011	732.36	733.42	-1.06	1
7	0_6959606	Unconfined	11,840	6/1/2011	732.24	733.40	-1.16	1
7	0_6959606	Unconfined	11,844	6/5/2011	731.57	733.38	-1.81	1
7	0_6959606	Unconfined	11,849	6/10/2011	730.61	733.34	-2.73	1
7	0_6959606	Unconfined	11,854	6/15/2011	729.84	733.31	-3.47	1
7	0_6959606	Unconfined	11,859	6/20/2011	729.08	733.27	-4.19	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	11,864	6/25/2011	728.89	733.24	-4.35	1
7	0_6959606	Unconfined	11,869	6/30/2011	728.87	733.21	-4.34	1
7	0_6959606	Unconfined	11,870	7/1/2011	728.75	733.20	-4.45	1
7	0_6959606	Unconfined	11,874	7/5/2011	728.32	733.17	-4.85	1
7	0_6959606	Unconfined	11,879	7/10/2011	727.91	733.14	-5.23	1
7	0_6959606	Unconfined	11,884	7/15/2011	727.59	733.11	-5.52	1
7	0_6959606	Unconfined	11,889	7/20/2011	727.65	733.07	-5.42	1
7	0_6959606	Unconfined	11,894	7/25/2011	727.85	733.04	-5.19	1
7	0_6959606	Unconfined	11,899	7/30/2011	728.27	733.00	-4.73	1
7	0_6959606	Unconfined	11,901	8/1/2011	728.85	732.99	-4.14	1
7	0_6959606	Unconfined	11,905	8/5/2011	729.76	732.96	-3.20	1
7	0_6959606	Unconfined	11,910	8/10/2011	730.88	732.93	-2.05	1
7	0_6959606	Unconfined	11,915	8/15/2011	731.93	732.89	-0.96	1
7	0_6959606	Unconfined	11,920	8/20/2011	732.83	732.86	-0.03	1
7	0_6959606	Unconfined	11,925	8/25/2011	733.66	732.83	0.83	1
7	0_6959606	Unconfined	11,932	9/1/2011	733.83	732.78	1.05	1
7	0_6959606	Unconfined	11,936	9/5/2011	734.33	732.75	1.58	1
7	0_6959606	Unconfined	11,941	9/10/2011	734.97	732.72	2.25	1
7	0_6959606	Unconfined	11,946	9/15/2011	735.36	732.68	2.68	1
7	0_6959606	Unconfined	11,951	9/20/2011	735.47	732.65	2.82	1
7	0_6959606	Unconfined	11,956	9/25/2011	735.73	732.62	3.11	1
7	0_6959606	Unconfined	11,961	9/30/2011	736.35	732.58	3.77	1
7	0_6959606	Unconfined	11,962	10/1/2011	736.46	732.58	3.88	1
7	0_6959606	Unconfined	11,966	10/5/2011	736.59	732.55	4.04	1
7	0_6959606	Unconfined	11,971	10/10/2011	737.23	732.51	4.72	1
7	0_6959606	Unconfined	11,976	10/15/2011	738.18	732.48	5.70	1
7	0_6959606	Unconfined	11,981	10/20/2011	738.47	732.45	6.02	1
7	0_6959606	Unconfined	11,986	10/25/2011	738.63	732.41	6.22	1
7	0_6959606	Unconfined	11,991	10/30/2011	738.89	732.38	6.51	1
7	0_6959606	Unconfined	11,993	11/1/2011	738.78	732.37	6.41	1
7	0_6959606	Unconfined	11,997	11/5/2011	738.77	732.34	6.43	1
7	0_6959606	Unconfined	12,002	11/10/2011	739.40	732.30	7.10	1
7	0_6959606	Unconfined	12,007	11/15/2011	738.92	732.27	6.65	1
7	0_6959606	Unconfined	12,012	11/20/2011	740.16	732.24	7.92	1
7	0_6959606	Unconfined	12,017	11/25/2011	740.33	732.20	8.13	1
7	0_6959606	Unconfined	12,022	11/30/2011	740.60	732.17	8.43	1
7	0_6959606	Unconfined	12,023	12/1/2011	740.47	732.16	8.31	1
7	0_6959606	Unconfined	12,027	12/5/2011	740.58	732.13	8.45	1
7	0_6959606	Unconfined	12,032	12/10/2011	740.91	732.10	8.81	1
7	0_6959606	Unconfined	12,037	12/15/2011	740.60	732.07	8.53	1
7	0_6959606	Unconfined	12,042	12/20/2011	740.64	732.03	8.61	1
7	0_6959606	Unconfined	12,047	12/25/2011	741.10	732.00	9.10	1
7	0_6959606	Unconfined	12,052	12/30/2011	740.84	731.96	8.88	1
7	0_6959606	Unconfined	12,054	1/1/2012	741.23	731.97	9.26	1
7	0_6959606	Unconfined	12,058	1/5/2012	741.14	732.00	9.14	1
7	0_6959606	Unconfined	12,063	1/10/2012	740.96	732.04	8.92	1
7	0_6959606	Unconfined	12,068	1/15/2012	741.22	732.08	9.14	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	12,073	1/20/2012	740.08	732.12	7.96	1
7	0_6959606	Unconfined	12,078	1/25/2012	740.08	732.16	7.92	1
7	0_6959606	Unconfined	12,083	1/30/2012	740.63	732.20	8.43	1
7	0_6959606	Unconfined	12,085	2/1/2012	740.69	732.21	8.48	1
7	0_6959606	Unconfined	12,089	2/5/2012	741.05	732.24	8.81	1
7	0_6959606	Unconfined	12,094	2/10/2012	741.06	732.28	8.78	1
7	0_6959606	Unconfined	12,099	2/15/2012	740.94	732.32	8.62	1
7	0_6959606	Unconfined	12,104	2/20/2012	741.14	732.36	8.78	1
7	0_6959606	Unconfined	12,109	2/25/2012	741.44	732.40	9.04	1
7	0_6959606	Unconfined	12,112	2/28/2012	741.25	732.42	8.83	1
7	0_6959606	Unconfined	12,114	3/1/2012	741.12	732.44	8.68	1
7	0_6959606	Unconfined	12,118	3/5/2012	740.63	732.47	8.16	1
7	0_6959606	Unconfined	12,123	3/10/2012	740.19	732.51	7.68	1
7	0_6959606	Unconfined	12,128	3/15/2012	740.57	732.55	8.02	1
7	0_6959606	Unconfined	12,133	3/20/2012	739.35	732.59	6.76	1
7	0_6959606	Unconfined	12,138	3/25/2012	740.22	732.63	7.59	1
7	0_6959606	Unconfined	12,143	3/30/2012	740.47	732.67	7.80	1
7	0_6959606	Unconfined	12,145	4/1/2012	740.43	732.69	7.74	1
7	0_6959606	Unconfined	12,149	4/5/2012	740.57	732.72	7.85	1
7	0_6959606	Unconfined	12,154	4/10/2012	740.55	732.76	7.79	1
7	0_6959606	Unconfined	12,159	4/15/2012	739.22	732.80	6.42	1
7	0_6959606	Unconfined	12,164	4/20/2012	737.80	732.84	4.96	1
7	0_6959606	Unconfined	12,169	4/25/2012	736.70	732.88	3.82	1
7	0_6959606	Unconfined	12,174	4/30/2012	735.21	732.91	2.30	1
7	0_6959606	Unconfined	12,175	5/1/2012	734.96	732.92	2.04	1
7	0_6959606	Unconfined	12,179	5/5/2012	735.15	732.95	2.20	1
7	0_6959606	Unconfined	12,184	5/10/2012	734.76	732.99	1.77	1
7	0_6959606	Unconfined	12,189	5/15/2012	735.98	733.03	2.95	1
7	0_6959606	Unconfined	12,194	5/20/2012	736.70	733.07	3.63	1
7	0_6959606	Unconfined	12,199	5/25/2012	734.98	733.11	1.87	1
7	0_6959606	Unconfined	12,204	5/30/2012	733.60	733.15	0.45	1
7	0_6959606	Unconfined	12,206	6/1/2012	733.54	733.17	0.37	1
7	0_6959606	Unconfined	12,210	6/5/2012	732.61	733.20	-0.59	1
7	0_6959606	Unconfined	12,215	6/10/2012	731.93	733.24	-1.31	1
7	0_6959606	Unconfined	12,220	6/15/2012	731.53	733.28	-1.75	1
7	0_6959606	Unconfined	12,225	6/20/2012	730.96	733.32	-2.36	1
7	0_6959606	Unconfined	12,230	6/25/2012	730.80	733.36	-2.56	1
7	0_6959606	Unconfined	12,235	6/30/2012	730.44	733.40	-2.96	1
7	0_6959606	Unconfined	12,236	7/1/2012	730.44	733.41	-2.97	1
7	0_6959606	Unconfined	12,240	7/5/2012	730.19	733.44	-3.25	1
7	0_6959606	Unconfined	12,245	7/10/2012	729.96	733.48	-3.52	1
7	0_6959606	Unconfined	12,250	7/15/2012	730.04	733.52	-3.48	1
7	0_6959606	Unconfined	12,255	7/20/2012	730.39	733.56	-3.17	1
7	0_6959606	Unconfined	12,260	7/25/2012	730.28	733.60	-3.32	1
7	0_6959606	Unconfined	12,265	7/30/2012	730.64	733.63	-2.99	1
7	0_6959606	Unconfined	12,267	8/1/2012	730.65	733.65	-3.00	1
7	0_6959606	Unconfined	12,271	8/5/2012	730.74	733.68	-2.94	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	12,276	8/10/2012	730.68	733.72	-3.04	1
7	0_6959606	Unconfined	12,281	8/15/2012	731.17	733.76	-2.59	1
7	0_6959606	Unconfined	12,286	8/20/2012	731.68	733.80	-2.12	1
7	0_6959606	Unconfined	12,291	8/25/2012	732.49	733.84	-1.35	1
7	0_6959606	Unconfined	12,296	8/30/2012	733.61	733.88	-0.27	1
7	0_6959606	Unconfined	12,298	9/1/2012	733.85	733.90	-0.05	1
7	0_6959606	Unconfined	12,302	9/5/2012	734.28	733.93	0.35	1
7	0_6959606	Unconfined	12,307	9/10/2012	735.13	733.97	1.16	1
7	0_6959606	Unconfined	12,312	9/15/2012	735.81	734.01	1.80	1
7	0_6959606	Unconfined	12,317	9/20/2012	736.16	734.05	2.11	1
7	0_6959606	Unconfined	12,322	9/25/2012	736.48	734.09	2.39	1
7	0_6959606	Unconfined	12,327	9/30/2012	737.34	734.13	3.21	1
7	0_6959606	Unconfined	12,328	10/1/2012	737.78	734.13	3.65	1
7	0_6959606	Unconfined	12,332	10/5/2012	738.69	734.16	4.53	1
7	0_6959606	Unconfined	12,337	10/10/2012	739.06	734.20	4.86	1
7	0_6959606	Unconfined	12,342	10/15/2012	739.16	734.24	4.92	1
7	0_6959606	Unconfined	12,347	10/20/2012	739.05	734.28	4.77	1
7	0_6959606	Unconfined	12,352	10/25/2012	739.18	734.32	4.86	1
7	0_6959606	Unconfined	12,357	10/30/2012	739.48	734.36	5.12	1
7	0_6959606	Unconfined	12,359	11/1/2012	739.52	734.38	5.14	1
7	0_6959606	Unconfined	12,363	11/5/2012	739.60	734.41	5.19	1
7	0_6959606	Unconfined	12,368	11/10/2012	739.62	734.45	5.17	1
7	0_6959606	Unconfined	12,373	11/15/2012	740.02	734.49	5.53	1
7	0_6959606	Unconfined	12,378	11/20/2012	740.03	734.53	5.50	1
7	0_6959606	Unconfined	12,383	11/25/2012	739.95	734.57	5.38	1
7	0_6959606	Unconfined	12,388	11/30/2012	739.81	734.61	5.20	1
7	0_6959606	Unconfined	12,389	12/1/2012	739.17	734.62	4.55	1
7	0_6959606	Unconfined	12,393	12/5/2012	738.72	734.65	4.07	1
7	0_6959606	Unconfined	12,398	12/10/2012	739.05	734.69	4.36	1
7	0_6959606	Unconfined	12,403	12/15/2012	739.30	734.73	4.57	1
7	0_6959606	Unconfined	12,408	12/20/2012	739.74	734.77	4.97	1
7	0_6959606	Unconfined	12,413	12/25/2012	739.52	734.81	4.71	1
7	0_6959606	Unconfined	12,418	12/30/2012	739.90	734.85	5.05	1
7	0_6959606	Unconfined	12,420	1/1/2013	740.04	734.86	5.18	1
7	0_6959606	Unconfined	12,424	1/5/2013	740.31	734.87	5.44	1
7	0_6959606	Unconfined	12,429	1/10/2013	740.17	734.88	5.29	1
7	0_6959606	Unconfined	12,434	1/15/2013	740.34	734.90	5.44	1
7	0_6959606	Unconfined	12,439	1/20/2013	740.43	734.92	5.51	1
7	0_6959606	Unconfined	12,444	1/25/2013	740.44	734.93	5.51	1
7	0_6959606	Unconfined	12,449	1/30/2013	739.27	734.95	4.32	1
7	0_6959606	Unconfined	12,451	2/1/2013	739.36	734.95	4.41	1
7	0_6959606	Unconfined	12,455	2/5/2013	738.79	734.96	3.83	1
7	0_6959606	Unconfined	12,460	2/10/2013	737.45	734.98	2.47	1
7	0_6959606	Unconfined	12,465	2/15/2013	738.43	735.00	3.43	1
7	0_6959606	Unconfined	12,470	2/20/2013	738.98	735.01	3.97	1
7	0_6959606	Unconfined	12,475	2/25/2013	737.49	735.03	2.46	1
7	0_6959606	Unconfined	12,478	2/28/2013	737.52	735.04	2.48	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	12,479	3/1/2013	737.38	735.04	2.34	1
7	0_6959606	Unconfined	12,483	3/5/2013	735.72	735.05	0.67	1
7	0_6959606	Unconfined	12,488	3/10/2013	734.85	735.07	-0.22	1
7	0_6959606	Unconfined	12,493	3/15/2013	735.44	735.08	0.36	1
7	0_6959606	Unconfined	12,498	3/20/2013	733.83	735.10	-1.27	1
7	0_6959606	Unconfined	12,503	3/25/2013	733.00	735.11	-2.11	1
7	0_6959606	Unconfined	12,508	3/30/2013	732.88	735.13	-2.25	1
7	0_6959606	Unconfined	12,510	4/1/2013	733.04	735.13	-2.09	1
7	0_6959606	Unconfined	12,514	4/5/2013	733.54	735.15	-1.61	1
7	0_6959606	Unconfined	12,519	4/10/2013	732.95	735.16	-2.21	1
7	0_6959606	Unconfined	12,524	4/15/2013	731.94	735.18	-3.24	1
7	0_6959606	Unconfined	12,529	4/20/2013	731.97	735.19	-3.22	1
7	0_6959606	Unconfined	12,534	4/25/2013	731.67	735.21	-3.54	1
7	0_6959606	Unconfined	12,539	4/30/2013	730.89	735.22	-4.33	1
7	0_6959606	Unconfined	12,540	5/1/2013	730.71	735.23	-4.52	1
7	0_6959606	Unconfined	12,544	5/5/2013	730.33	735.24	-4.91	1
7	0_6959606	Unconfined	12,549	5/10/2013	729.70	735.26	-5.56	1
7	0_6959606	Unconfined	12,554	5/15/2013	729.78	735.27	-5.49	1
7	0_6959606	Unconfined	12,559	5/20/2013	728.91	735.29	-6.38	1
7	0_6959606	Unconfined	12,564	5/25/2013	728.60	735.30	-6.70	1
7	0_6959606	Unconfined	12,569	5/30/2013	728.46	735.32	-6.86	1
7	0_6959606	Unconfined	12,571	6/1/2013	728.33	735.32	-6.99	1
7	0_6959606	Unconfined	12,575	6/5/2013	728.03	735.34	-7.31	1
7	0_6959606	Unconfined	12,580	6/10/2013	727.68	735.35	-7.67	1
7	0_6959606	Unconfined	12,585	6/15/2013	728.01	735.37	-7.36	1
7	0_6959606	Unconfined	12,590	6/20/2013	729.98	735.38	-5.40	1
7	0_6959606	Unconfined	12,595	6/25/2013	730.90	735.40	-4.50	1
7	0_6959606	Unconfined	12,600	6/30/2013	731.02	735.41	-4.39	1
7	0_6959606	Unconfined	12,601	7/1/2013	731.14	735.42	-4.28	1
7	0_6959606	Unconfined	12,605	7/5/2013	730.93	735.43	-4.50	1
7	0_6959606	Unconfined	12,610	7/10/2013	730.66	735.44	-4.78	1
7	0_6959606	Unconfined	12,615	7/15/2013	730.73	735.46	-4.73	1
7	0_6959606	Unconfined	12,620	7/20/2013	730.42	735.48	-5.06	1
7	0_6959606	Unconfined	12,625	7/25/2013	730.71	735.49	-4.78	1
7	0_6959606	Unconfined	12,630	7/30/2013	730.44	735.51	-5.07	1
7	0_6959606	Unconfined	12,632	8/1/2013	730.32	735.51	-5.19	1
7	0_6959606	Unconfined	12,636	8/5/2013	729.81	735.52	-5.71	1
7	0_6959606	Unconfined	12,641	8/10/2013	729.26	735.54	-6.28	1
7	0_6959606	Unconfined	12,646	8/15/2013	728.73	735.56	-6.83	1
7	0_6959606	Unconfined	12,651	8/20/2013	728.50	735.57	-7.07	1
7	0_6959606	Unconfined	12,656	8/25/2013	728.86	735.59	-6.73	1
7	0_6959606	Unconfined	12,661	8/30/2013	729.45	735.60	-6.15	1
7	0_6959606	Unconfined	12,663	9/1/2013	729.56	735.61	-6.05	1
7	0_6959606	Unconfined	12,667	9/5/2013	730.22	735.62	-5.40	1
7	0_6959606	Unconfined	12,672	9/10/2013	730.73	735.64	-4.91	1
7	0_6959606	Unconfined	12,677	9/15/2013	731.24	735.65	-4.41	1
7	0_6959606	Unconfined	12,682	9/20/2013	731.63	735.67	-4.04	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	12,687	9/25/2013	732.03	735.68	-3.65	1
7	0_6959606	Unconfined	12,692	9/30/2013	732.29	735.70	-3.41	1
7	0_6959606	Unconfined	12,693	10/1/2013	732.54	735.70	-3.16	1
7	0_6959606	Unconfined	12,697	10/5/2013	732.89	735.71	-2.82	1
7	0_6959606	Unconfined	12,702	10/10/2013	733.29	735.73	-2.44	1
7	0_6959606	Unconfined	12,707	10/15/2013	733.91	735.74	-1.83	1
7	0_6959606	Unconfined	12,712	10/20/2013	735.25	735.76	-0.51	1
7	0_6959606	Unconfined	12,717	10/25/2013	735.96	735.78	0.18	1
7	0_6959606	Unconfined	12,722	10/30/2013	735.84	735.79	0.05	1
7	0_6959606	Unconfined	12,724	11/1/2013	735.93	735.80	0.13	1
7	0_6959606	Unconfined	12,728	11/5/2013	736.12	735.81	0.31	1
7	0_6959606	Unconfined	12,733	11/10/2013	736.46	735.83	0.63	1
7	0_6959606	Unconfined	12,738	11/15/2013	736.55	735.84	0.71	1
7	0_6959606	Unconfined	12,743	11/20/2013	736.62	735.86	0.76	1
7	0_6959606	Unconfined	12,748	11/25/2013	737.10	735.87	1.23	1
7	0_6959606	Unconfined	12,753	11/30/2013	737.32	735.89	1.43	1
7	0_6959606	Unconfined	12,754	12/1/2013	737.20	735.89	1.31	1
7	0_6959606	Unconfined	12,758	12/5/2013	736.89	735.90	0.99	1
7	0_6959606	Unconfined	12,763	12/10/2013	737.54	735.92	1.62	1
7	0_6959606	Unconfined	12,768	12/15/2013	737.68	735.93	1.75	1
7	0_6959606	Unconfined	12,773	12/20/2013	737.30	735.95	1.35	1
7	0_6959606	Unconfined	12,778	12/25/2013	737.86	735.96	1.90	1
7	0_6959606	Unconfined	12,783	12/30/2013	738.09	735.98	2.11	1
7	0_6959606	Unconfined	12,785	1/1/2014	738.00	735.98	2.02	1
7	0_6959606	Unconfined	12,789	1/5/2014	737.67	735.98	1.69	1
7	0_6959606	Unconfined	12,794	1/10/2014	737.86	735.98	1.88	1
7	0_6959606	Unconfined	12,799	1/15/2014	737.37	735.98	1.39	1
7	0_6959606	Unconfined	12,804	1/20/2014	736.57	735.98	0.59	1
7	0_6959606	Unconfined	12,809	1/25/2014	735.94	735.98	-0.04	1
7	0_6959606	Unconfined	12,814	1/30/2014	735.68	735.98	-0.30	1
7	0_6959606	Unconfined	12,816	2/1/2014	735.06	735.98	-0.92	1
7	0_6959606	Unconfined	12,820	2/5/2014	735.42	735.98	-0.56	1
7	0_6959606	Unconfined	12,825	2/10/2014	735.56	735.97	-0.41	1
7	0_6959606	Unconfined	12,830	2/15/2014	734.91	735.97	-1.06	1
7	0_6959606	Unconfined	12,835	2/20/2014	733.25	735.97	-2.72	1
7	0_6959606	Unconfined	12,840	2/25/2014	732.97	735.97	-3.00	1
7	0_6959606	Unconfined	12,843	2/28/2014	732.79	735.97	-3.18	1
7	0_6959606	Unconfined	12,844	3/1/2014	732.76	735.97	-3.21	1
7	0_6959606	Unconfined	12,848	3/5/2014	733.04	735.97	-2.93	1
7	0_6959606	Unconfined	12,853	3/10/2014	733.69	735.97	-2.28	1
7	0_6959606	Unconfined	12,858	3/15/2014	733.86	735.97	-2.11	1
7	0_6959606	Unconfined	12,863	3/20/2014	734.44	735.97	-1.53	1
7	0_6959606	Unconfined	12,868	3/25/2014	733.66	735.96	-2.30	1
7	0_6959606	Unconfined	12,873	3/30/2014	733.59	735.96	-2.37	1
7	0_6959606	Unconfined	12,875	4/1/2014	733.47	735.96	-2.49	1
7	0_6959606	Unconfined	12,879	4/5/2014	732.82	735.96	-3.14	1
7	0_6959606	Unconfined	12,884	4/10/2014	733.40	735.96	-2.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	12,889	4/15/2014	732.93	735.96	-3.03	1
7	0_6959606	Unconfined	12,894	4/20/2014	732.86	735.96	-3.10	1
7	0_6959606	Unconfined	12,899	4/25/2014	732.74	735.96	-3.22	1
7	0_6959606	Unconfined	12,904	4/30/2014	731.94	735.96	-4.02	1
7	0_6959606	Unconfined	12,905	5/1/2014	731.94	735.96	-4.02	1
7	0_6959606	Unconfined	12,909	5/5/2014	731.45	735.96	-4.51	1
7	0_6959606	Unconfined	12,914	5/10/2014	731.08	735.95	-4.87	1
7	0_6959606	Unconfined	12,919	5/15/2014	731.77	735.95	-4.18	1
7	0_6959606	Unconfined	12,924	5/20/2014	732.01	735.95	-3.94	1
7	0_6959606	Unconfined	12,929	5/25/2014	731.71	735.95	-4.24	1
7	0_6959606	Unconfined	12,934	5/30/2014	733.28	735.95	-2.67	1
7	0_6959606	Unconfined	12,936	6/1/2014	733.54	735.95	-2.41	1
7	0_6959606	Unconfined	12,940	6/5/2014	733.27	735.95	-2.68	1
7	0_6959606	Unconfined	12,945	6/10/2014	732.75	735.95	-3.20	1
7	0_6959606	Unconfined	12,950	6/15/2014	732.05	735.95	-3.90	1
7	0_6959606	Unconfined	12,955	6/20/2014	732.65	735.95	-3.30	1
7	0_6959606	Unconfined	12,960	6/25/2014	732.83	735.94	-3.11	1
7	0_6959606	Unconfined	12,965	6/30/2014	733.26	735.94	-2.68	1
7	0_6959606	Unconfined	12,966	7/1/2014	733.28	735.94	-2.66	1
7	0_6959606	Unconfined	12,970	7/5/2014	732.79	735.94	-3.15	1
7	0_6959606	Unconfined	12,975	7/10/2014	732.90	735.94	-3.04	1
7	0_6959606	Unconfined	12,980	7/15/2014	733.26	735.94	-2.68	1
7	0_6959606	Unconfined	12,985	7/20/2014	733.15	735.94	-2.79	1
7	0_6959606	Unconfined	12,990	7/25/2014	732.76	735.94	-3.18	1
7	0_6959606	Unconfined	12,997	8/1/2014	731.78	735.94	-4.16	1
7	0_6959606	Unconfined	13,001	8/5/2014	731.29	735.94	-4.65	1
7	0_6959606	Unconfined	13,006	8/10/2014	730.90	735.93	-5.03	1
7	0_6959606	Unconfined	13,011	8/15/2014	730.52	735.93	-5.41	1
7	0_6959606	Unconfined	13,016	8/20/2014	729.93	735.93	-6.00	1
7	0_6959606	Unconfined	13,021	8/25/2014	729.85	735.93	-6.08	1
7	0_6959606	Unconfined	13,026	8/30/2014	729.84	735.93	-6.09	1
7	0_6959606	Unconfined	13,028	9/1/2014	729.91	735.93	-6.02	1
7	0_6959606	Unconfined	13,032	9/5/2014	730.15	735.93	-5.78	1
7	0_6959606	Unconfined	13,037	9/10/2014	730.63	735.93	-5.30	1
7	0_6959606	Unconfined	13,042	9/15/2014	731.56	735.93	-4.37	1
7	0_6959606	Unconfined	13,047	9/20/2014	731.87	735.93	-4.06	1
7	0_6959606	Unconfined	13,052	9/25/2014	732.54	735.92	-3.38	1
7	0_6959606	Unconfined	13,057	9/30/2014	732.78	735.92	-3.14	1
7	0_6959606	Unconfined	13,058	10/1/2014	732.75	735.92	-3.17	1
7	0_6959606	Unconfined	13,062	10/5/2014	733.26	735.92	-2.66	1
7	0_6959606	Unconfined	13,067	10/10/2014	733.48	735.92	-2.44	1
7	0_6959606	Unconfined	13,072	10/15/2014	734.01	735.92	-1.91	1
7	0_6959606	Unconfined	13,077	10/20/2014	734.20	735.92	-1.72	1
7	0_6959606	Unconfined	13,082	10/25/2014	734.51	735.92	-1.41	1
7	0_6959606	Unconfined	13,087	10/30/2014	734.71	735.92	-1.21	1
7	0_6959606	Unconfined	13,089	11/1/2014	734.96	735.92	-0.96	1
7	0_6959606	Unconfined	13,093	11/5/2014	734.91	735.92	-1.01	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	13,098	11/10/2014	734.96	735.91	-0.95	1
7	0_6959606	Unconfined	13,103	11/15/2014	735.45	735.91	-0.46	1
7	0_6959606	Unconfined	13,108	11/20/2014	735.51	735.91	-0.40	1
7	0_6959606	Unconfined	13,113	11/25/2014	735.61	735.91	-0.30	1
7	0_6959606	Unconfined	13,118	11/30/2014	735.62	735.91	-0.29	1
7	0_6959606	Unconfined	13,119	12/1/2014	735.73	735.91	-0.18	1
7	0_6959606	Unconfined	13,123	12/5/2014	735.76	735.91	-0.15	1
7	0_6959606	Unconfined	13,128	12/10/2014	736.08	735.91	0.17	1
7	0_6959606	Unconfined	13,133	12/15/2014	735.85	735.91	-0.06	1
7	0_6959606	Unconfined	13,138	12/20/2014	736.20	735.91	0.29	1
7	0_6959606	Unconfined	13,143	12/25/2014	736.22	735.90	0.32	1
7	0_6959606	Unconfined	13,148	12/30/2014	736.62	735.90	0.72	1
7	0_6959606	Unconfined	13,150	1/1/2015	736.61	735.91	0.70	1
7	0_6959606	Unconfined	13,154	1/5/2015	736.86	735.95	0.91	1
7	0_6959606	Unconfined	13,159	1/10/2015	736.76	735.99	0.77	1
7	0_6959606	Unconfined	13,164	1/15/2015	736.67	736.03	0.64	1
7	0_6959606	Unconfined	13,169	1/20/2015	736.40	736.08	0.32	1
7	0_6959606	Unconfined	13,174	1/25/2015	736.60	736.12	0.48	1
7	0_6959606	Unconfined	13,179	1/30/2015	736.75	736.16	0.59	1
7	0_6959606	Unconfined	13,181	2/1/2015	736.43	736.18	0.25	1
7	0_6959606	Unconfined	13,185	2/5/2015	736.70	736.21	0.49	1
7	0_6959606	Unconfined	13,190	2/10/2015	736.63	736.26	0.37	1
7	0_6959606	Unconfined	13,195	2/15/2015	736.78	736.30	0.48	1
7	0_6959606	Unconfined	13,200	2/20/2015	736.52	736.35	0.17	1
7	0_6959606	Unconfined	13,205	2/25/2015	736.05	736.39	-0.34	1
7	0_6959606	Unconfined	13,208	2/28/2015	736.44	736.41	0.03	1
7	0_6959606	Unconfined	13,209	3/1/2015	736.43	736.42	0.01	1
7	0_6959606	Unconfined	13,213	3/5/2015	736.47	736.46	0.01	1
7	0_6959606	Unconfined	13,218	3/10/2015	736.39	736.50	-0.11	1
7	0_6959606	Unconfined	13,223	3/15/2015	736.25	736.54	-0.29	1
7	0_6959606	Unconfined	13,228	3/20/2015	735.56	736.59	-1.03	1
7	0_6959606	Unconfined	13,233	3/25/2015	735.73	736.63	-0.90	1
7	0_6959606	Unconfined	13,238	3/30/2015	735.95	736.67	-0.72	1
7	0_6959606	Unconfined	13,240	4/1/2015	735.88	736.69	-0.81	1
7	0_6959606	Unconfined	13,244	4/5/2015	736.05	736.73	-0.68	1
7	0_6959606	Unconfined	13,249	4/10/2015	737.95	736.77	1.18	1
7	0_6959606	Unconfined	13,254	4/15/2015	735.20	736.81	-1.61	1
7	0_6959606	Unconfined	13,259	4/20/2015	735.22	736.86	-1.64	1
7	0_6959606	Unconfined	13,264	4/25/2015	734.40	736.90	-2.50	1
7	0_6959606	Unconfined	13,269	4/30/2015	734.97	736.94	-1.97	1
7	0_6959606	Unconfined	13,270	5/1/2015	735.01	736.95	-1.94	1
7	0_6959606	Unconfined	13,274	5/5/2015	734.34	736.99	-2.65	1
7	0_6959606	Unconfined	13,279	5/10/2015	734.21	737.03	-2.82	1
7	0_6959606	Unconfined	13,284	5/15/2015	734.60	737.07	-2.47	1
7	0_6959606	Unconfined	13,289	5/20/2015	737.00	737.12	-0.12	1
7	0_6959606	Unconfined	13,294	5/25/2015	739.93	737.16	2.77	1
7	0_6959606	Unconfined	13,299	5/30/2015	741.16	737.20	3.96	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	13,301	6/1/2015	741.21	737.22	3.99	1
7	0_6959606	Unconfined	13,305	6/5/2015	741.88	737.26	4.62	1
7	0_6959606	Unconfined	13,310	6/10/2015	740.84	737.30	3.54	1
7	0_6959606	Unconfined	13,315	6/15/2015	740.14	737.34	2.80	1
7	0_6959606	Unconfined	13,320	6/20/2015	739.90	737.39	2.51	1
7	0_6959606	Unconfined	13,325	6/25/2015	739.79	737.43	2.36	1
7	0_6959606	Unconfined	13,330	6/30/2015	739.54	737.47	2.07	1
7	0_6959606	Unconfined	13,331	7/1/2015	739.50	737.48	2.02	1
7	0_6959606	Unconfined	13,335	7/5/2015	739.39	737.52	1.87	1
7	0_6959606	Unconfined	13,340	7/10/2015	737.82	737.56	0.26	1
7	0_6959606	Unconfined	13,345	7/15/2015	738.09	737.60	0.49	1
7	0_6959606	Unconfined	13,350	7/20/2015	737.09	737.65	-0.56	1
7	0_6959606	Unconfined	13,355	7/25/2015	735.59	737.69	-2.10	1
7	0_6959606	Unconfined	13,360	7/30/2015	735.20	737.73	-2.53	1
7	0_6959606	Unconfined	13,362	8/1/2015	734.97	737.75	-2.78	1
7	0_6959606	Unconfined	13,366	8/5/2015	734.12	737.78	-3.66	1
7	0_6959606	Unconfined	13,371	8/10/2015	733.58	737.83	-4.25	1
7	0_6959606	Unconfined	13,376	8/15/2015	732.81	737.87	-5.06	1
7	0_6959606	Unconfined	13,381	8/20/2015	731.91	737.91	-6.00	1
7	0_6959606	Unconfined	13,386	8/25/2015	731.37	737.96	-6.59	1
7	0_6959606	Unconfined	13,391	8/30/2015	730.52	738.00	-7.48	1
7	0_6959606	Unconfined	13,393	9/1/2015	730.48	738.02	-7.54	1
7	0_6959606	Unconfined	13,397	9/5/2015	730.48	738.05	-7.57	1
7	0_6959606	Unconfined	13,402	9/10/2015	730.86	738.10	-7.24	1
7	0_6959606	Unconfined	13,407	9/15/2015	731.51	738.14	-6.63	1
7	0_6959606	Unconfined	13,412	9/20/2015	732.04	738.18	-6.14	1
7	0_6959606	Unconfined	13,417	9/25/2015	732.52	738.23	-5.71	1
7	0_6959606	Unconfined	13,422	9/30/2015	733.02	738.27	-5.25	1
7	0_6959606	Unconfined	13,423	10/1/2015	733.18	738.28	-5.10	1
7	0_6959606	Unconfined	13,427	10/5/2015	733.46	738.31	-4.85	1
7	0_6959606	Unconfined	13,432	10/10/2015	734.55	738.36	-3.81	1
7	0_6959606	Unconfined	13,437	10/15/2015	735.65	738.40	-2.75	1
7	0_6959606	Unconfined	13,442	10/20/2015	736.41	738.44	-2.03	1
7	0_6959606	Unconfined	13,447	10/25/2015	736.72	738.49	-1.77	1
7	0_6959606	Unconfined	13,452	10/30/2015	736.55	738.53	-1.98	1
7	0_6959606	Unconfined	13,454	11/1/2015	736.87	738.55	-1.68	1
7	0_6959606	Unconfined	13,458	11/5/2015	737.07	738.58	-1.51	1
7	0_6959606	Unconfined	13,463	11/10/2015	738.51	738.63	-0.12	1
7	0_6959606	Unconfined	13,468	11/15/2015	739.38	738.67	0.71	1
7	0_6959606	Unconfined	13,473	11/20/2015	739.47	738.71	0.76	1
7	0_6959606	Unconfined	13,478	11/25/2015	739.50	738.76	0.74	1
7	0_6959606	Unconfined	13,483	11/30/2015	739.59	738.80	0.79	1
7	0_6959606	Unconfined	13,484	12/1/2015	739.38	738.81	0.57	1
7	0_6959606	Unconfined	13,488	12/5/2015	739.80	738.84	0.96	1
7	0_6959606	Unconfined	13,493	12/10/2015	739.42	738.89	0.53	1
7	0_6959606	Unconfined	13,498	12/15/2015	739.29	738.93	0.36	1
7	0_6959606	Unconfined	13,503	12/20/2015	739.87	738.97	0.90	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	13,508	12/25/2015	739.57	739.02	0.55	1
7	0_6959606	Unconfined	13,513	12/30/2015	739.98	739.06	0.92	1
7	0_6959606	Unconfined	13,515	1/1/2016	740.05	739.07	0.98	1
7	0_6959606	Unconfined	13,519	1/5/2016	740.12	739.08	1.04	1
7	0_6959606	Unconfined	13,524	1/10/2016	740.08	739.10	0.98	1
7	0_6959606	Unconfined	13,529	1/15/2016	739.84	739.11	0.73	1
7	0_6959606	Unconfined	13,534	1/20/2016	739.77	739.12	0.65	1
7	0_6959606	Unconfined	13,539	1/25/2016	739.87	739.14	0.73	1
7	0_6959606	Unconfined	13,544	1/30/2016	739.96	739.15	0.81	1
7	0_6959606	Unconfined	13,546	2/1/2016	739.94	739.16	0.78	1
7	0_6959606	Unconfined	13,550	2/5/2016	740.48	739.17	1.31	1
7	0_6959606	Unconfined	13,555	2/10/2016	740.53	739.18	1.35	1
7	0_6959606	Unconfined	13,560	2/15/2016	738.60	739.19	-0.59	1
7	0_6959606	Unconfined	13,565	2/20/2016	737.62	739.21	-1.59	1
7	0_6959606	Unconfined	13,570	2/25/2016	738.35	739.22	-0.87	1
7	0_6959606	Unconfined	13,574	2/29/2016	738.65	739.23	-0.58	1
7	0_6959606	Unconfined	13,575	3/1/2016	738.74	739.23	-0.49	1
7	0_6959606	Unconfined	13,579	3/5/2016	739.16	739.25	-0.09	1
7	0_6959606	Unconfined	13,584	3/10/2016	739.09	739.26	-0.17	1
7	0_6959606	Unconfined	13,589	3/15/2016	739.36	739.27	0.09	1
7	0_6959606	Unconfined	13,594	3/20/2016	740.03	739.29	0.74	1
7	0_6959606	Unconfined	13,599	3/25/2016	740.00	739.30	0.70	1
7	0_6959606	Unconfined	13,604	3/30/2016	739.85	739.31	0.54	1
7	0_6959606	Unconfined	13,606	4/1/2016	739.92	739.32	0.60	1
7	0_6959606	Unconfined	13,610	4/5/2016	740.34	739.33	1.01	1
7	0_6959606	Unconfined	13,615	4/10/2016	738.82	739.34	-0.52	1
7	0_6959606	Unconfined	13,620	4/15/2016	738.98	739.36	-0.38	1
7	0_6959606	Unconfined	13,625	4/20/2016	739.46	739.37	0.09	1
7	0_6959606	Unconfined	13,630	4/25/2016	739.72	739.38	0.34	1
7	0_6959606	Unconfined	13,635	4/30/2016	739.30	739.40	-0.10	1
7	0_6959606	Unconfined	13,636	5/1/2016	739.50	739.40	0.10	1
7	0_6959606	Unconfined	13,640	5/5/2016	739.54	739.41	0.13	1
7	0_6959606	Unconfined	13,645	5/10/2016	739.45	739.43	0.02	1
7	0_6959606	Unconfined	13,650	5/15/2016	738.63	739.44	-0.81	1
7	0_6959606	Unconfined	13,655	5/20/2016	739.41	739.45	-0.04	1
7	0_6959606	Unconfined	13,660	5/25/2016	741.79	739.47	2.32	1
7	0_6959606	Unconfined	13,665	5/30/2016	742.83	739.48	3.35	1
7	0_6959606	Unconfined	13,667	6/1/2016	743.16	739.49	3.67	1
7	0_6959606	Unconfined	13,671	6/5/2016	744.94	739.50	5.44	1
7	0_6959606	Unconfined	13,676	6/10/2016	745.45	739.51	5.94	1
7	0_6959606	Unconfined	13,681	6/15/2016	745.79	739.52	6.27	1
7	0_6959606	Unconfined	13,686	6/20/2016	743.97	739.54	4.43	1
7	0_6959606	Unconfined	13,691	6/25/2016	743.54	739.55	3.99	1
7	0_6959606	Unconfined	13,696	6/30/2016	742.50	739.56	2.94	1
7	0_6959606	Unconfined	13,697	7/1/2016	742.33	739.57	2.76	1
7	0_6959606	Unconfined	13,701	7/5/2016	741.13	739.58	1.55	1
7	0_6959606	Unconfined	13,706	7/10/2016	740.53	739.59	0.94	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	13,711	7/15/2016	739.77	739.61	0.16	1
7	0_6959606	Unconfined	13,716	7/20/2016	739.37	739.62	-0.25	1
7	0_6959606	Unconfined	13,721	7/25/2016	738.88	739.63	-0.75	1
7	0_6959606	Unconfined	13,728	8/1/2016	740.46	739.65	0.81	1
7	0_6959606	Unconfined	13,732	8/5/2016	740.89	739.66	1.23	1
7	0_6959606	Unconfined	13,737	8/10/2016	740.25	739.68	0.57	1
7	0_6959606	Unconfined	13,742	8/15/2016	740.44	739.69	0.75	1
7	0_6959606	Unconfined	13,747	8/20/2016	741.56	739.70	1.86	1
7	0_6959606	Unconfined	13,752	8/25/2016	744.04	739.72	4.32	1
7	0_6959606	Unconfined	13,757	8/30/2016	745.82	739.73	6.09	1
7	0_6959606	Unconfined	13,759	9/1/2016	746.05	739.74	6.31	1
7	0_6959606	Unconfined	13,763	9/5/2016	746.93	739.75	7.18	1
7	0_6959606	Unconfined	13,768	9/10/2016	747.91	739.76	8.15	1
7	0_6959606	Unconfined	13,773	9/15/2016	748.95	739.77	9.18	1
7	0_6959606	Unconfined	13,778	9/20/2016	749.90	739.79	10.11	1
7	0_6959606	Unconfined	13,783	9/25/2016	750.15	739.80	10.35	1
7	0_6959606	Unconfined	13,788	9/30/2016	750.70	739.82	10.88	1
7	0_6959606	Unconfined	13,789	10/1/2016	751.18	739.82	11.36	1
7	0_6959606	Unconfined	13,793	10/5/2016	751.20	739.83	11.37	1
7	0_6959606	Unconfined	13,798	10/10/2016	751.99	739.84	12.15	1
7	0_6959606	Unconfined	13,803	10/15/2016	752.06	739.86	12.20	1
7	0_6959606	Unconfined	13,808	10/20/2016	752.34	739.87	12.47	1
7	0_6959606	Unconfined	13,813	10/25/2016	752.68	739.88	12.80	1
7	0_6959606	Unconfined	13,818	10/30/2016	752.73	739.90	12.83	1
7	0_6959606	Unconfined	13,820	11/1/2016	752.69	739.90	12.79	1
7	0_6959606	Unconfined	13,824	11/5/2016	753.03	739.91	13.12	1
7	0_6959606	Unconfined	13,829	11/10/2016	753.21	739.93	13.28	1
7	0_6959606	Unconfined	13,834	11/15/2016	753.18	739.94	13.24	1
7	0_6959606	Unconfined	13,839	11/20/2016	753.53	739.95	13.58	1
7	0_6959606	Unconfined	13,844	11/25/2016	753.26	739.97	13.29	1
7	0_6959606	Unconfined	13,849	11/30/2016	752.96	739.98	12.98	1
7	0_6959606	Unconfined	13,850	12/1/2016	753.18	739.98	13.20	1
7	0_6959606	Unconfined	13,854	12/5/2016	753.36	740.00	13.36	1
7	0_6959606	Unconfined	13,859	12/10/2016	753.52	740.01	13.51	1
7	0_6959606	Unconfined	13,864	12/15/2016	753.19	740.02	13.17	1
7	0_6959606	Unconfined	13,869	12/20/2016	753.58	740.04	13.54	1
7	0_6959606	Unconfined	13,874	12/25/2016	753.09	740.05	13.04	1
7	0_6959606	Unconfined	13,879	12/30/2016	753.50	740.06	13.44	1
7	0_6959606	Unconfined	13,881	1/1/2017	753.23	740.07	13.16	1
7	0_6959606	Unconfined	13,885	1/5/2017	753.31	740.06	13.25	1
7	0_6959606	Unconfined	13,890	1/10/2017	753.30	740.06	13.24	1
7	0_6959606	Unconfined	13,895	1/15/2017	753.42	740.06	13.36	1
7	0_6959606	Unconfined	13,900	1/20/2017	753.20	740.06	13.14	1
7	0_6959606	Unconfined	13,905	1/25/2017	753.00	740.05	12.95	1
7	0_6959606	Unconfined	13,910	1/30/2017	753.30	740.05	13.25	1
7	0_6959606	Unconfined	13,912	2/1/2017	753.16	740.05	13.11	1
7	0_6959606	Unconfined	13,916	2/5/2017	752.77	740.05	12.72	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	13,921	2/10/2017	752.80	740.04	12.76	1
7	0_6959606	Unconfined	13,926	2/15/2017	752.74	740.04	12.70	1
7	0_6959606	Unconfined	13,931	2/20/2017	752.62	740.04	12.58	1
7	0_6959606	Unconfined	13,936	2/25/2017	752.72	740.04	12.68	1
7	0_6959606	Unconfined	13,939	2/28/2017	752.73	740.04	12.69	1
7	0_6959606	Unconfined	13,940	3/1/2017	752.70	740.04	12.66	1
7	0_6959606	Unconfined	13,944	3/5/2017	752.97	740.03	12.94	1
7	0_6959606	Unconfined	13,949	3/10/2017	752.90	740.03	12.87	1
7	0_6959606	Unconfined	13,954	3/15/2017	752.90	740.03	12.87	1
7	0_6959606	Unconfined	13,959	3/20/2017	752.78	740.03	12.75	1
7	0_6959606	Unconfined	13,964	3/25/2017	752.55	740.02	12.53	1
7	0_6959606	Unconfined	13,969	3/30/2017	752.35	740.02	12.33	1
7	0_6959606	Unconfined	13,971	4/1/2017	751.74	740.02	11.72	1
7	0_6959606	Unconfined	13,975	4/5/2017	751.85	740.02	11.83	1
7	0_6959606	Unconfined	13,980	4/10/2017	751.11	740.01	11.10	1
7	0_6959606	Unconfined	13,985	4/15/2017	751.39	740.01	11.38	1
7	0_6959606	Unconfined	13,990	4/20/2017	751.68	740.01	11.67	1
7	0_6959606	Unconfined	13,995	4/25/2017	750.52	740.01	10.51	1
7	0_6959606	Unconfined	14,000	4/30/2017	749.95	740.00	9.95	1
7	0_6959606	Unconfined	14,001	5/1/2017	749.58	740.00	9.58	1
7	0_6959606	Unconfined	14,005	5/5/2017	749.42	740.00	9.42	1
7	0_6959606	Unconfined	14,010	5/10/2017	747.21	740.00	7.21	1
7	0_6959606	Unconfined	14,015	5/15/2017	747.95	740.00	7.95	1
7	0_6959606	Unconfined	14,020	5/20/2017	746.82	739.99	6.83	1
7	0_6959606	Unconfined	14,025	5/25/2017	748.41	739.99	8.42	1
7	0_6959606	Unconfined	14,030	5/30/2017	748.55	739.99	8.56	1
7	0_6959606	Unconfined	14,032	6/1/2017	749.33	739.99	9.34	1
7	0_6959606	Unconfined	14,036	6/5/2017	749.37	739.99	9.38	1
7	0_6959606	Unconfined	14,041	6/10/2017	749.57	739.98	9.59	1
7	0_6959606	Unconfined	14,046	6/15/2017	749.49	739.98	9.51	1
7	0_6959606	Unconfined	14,051	6/20/2017	747.23	739.98	7.25	1
7	0_6959606	Unconfined	14,056	6/25/2017	747.03	739.97	7.06	1
7	0_6959606	Unconfined	14,061	6/30/2017	747.15	739.97	7.18	1
7	0_6959606	Unconfined	14,062	7/1/2017	747.21	739.97	7.24	1
7	0_6959606	Unconfined	14,066	7/5/2017	747.05	739.97	7.08	1
7	0_6959606	Unconfined	14,071	7/10/2017	746.67	739.97	6.70	1
7	0_6959606	Unconfined	14,076	7/15/2017	746.25	739.96	6.29	1
7	0_6959606	Unconfined	14,081	7/20/2017	746.06	739.96	6.10	1
7	0_6959606	Unconfined	14,086	7/25/2017	745.72	739.96	5.76	1
7	0_6959606	Unconfined	14,117	8/25/2017	747.26	739.94	7.32	1
7	0_6959606	Unconfined	14,122	8/30/2017	746.85	739.94	6.91	1
7	0_6959606	Unconfined	14,124	9/1/2017	746.92	739.94	6.98	1
7	0_6959606	Unconfined	14,128	9/5/2017	747.07	739.94	7.13	1
7	0_6959606	Unconfined	14,133	9/10/2017	747.00	739.94	7.06	1
7	0_6959606	Unconfined	14,138	9/15/2017	746.85	739.93	6.92	1
7	0_6959606	Unconfined	14,143	9/20/2017	746.78	739.93	6.85	1
7	0_6959606	Unconfined	14,148	9/25/2017	746.76	739.93	6.83	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6959606	Unconfined	14,153	9/30/2017	746.26	739.92	6.34	1
7	0_6959606	Unconfined	14,158	10/5/2017	746.36	739.92	6.44	1
7	0_6959606	Unconfined	14,163	10/10/2017	746.46	739.92	6.54	1
7	0_6959606	Unconfined	14,168	10/15/2017	746.86	739.92	6.94	1
7	0_6959606	Unconfined	14,173	10/20/2017	747.46	739.91	7.55	1
7	0_6959606	Unconfined	14,183	10/30/2017	748.26	739.91	8.35	1
7	0_6959606	Unconfined	14,214	11/30/2017	747.70	739.89	7.81	1
7	0_6959606	Unconfined	14,215	12/1/2017	747.75	739.89	7.86	1
7	0_6959606	Unconfined	14,219	12/5/2017	747.61	739.89	7.72	1
7	0_6959606	Unconfined	14,224	12/10/2017	748.08	739.89	8.19	1
7	0_6959606	Unconfined	14,229	12/15/2017	747.82	739.89	7.93	1
7	0_6959606	Unconfined	14,234	12/20/2017	747.79	739.88	7.91	1
7	0_6959606	Unconfined	14,239	12/25/2017	748.06	739.88	8.18	1
7	0_6959606	Unconfined	14,244	12/30/2017	747.64	739.88	7.76	1
7	0_6959904	Confined	1,878	2/21/1984	485.62	481.40	0.42	0.1
7	0_6959904	Confined	2,593	2/5/1986	471.80	474.88	-0.31	0.1
7	0_6959904	Confined	2,966	2/13/1987	470.19	497.63	-2.74	0.1
7	0_6959904	Confined	3,693	2/9/1989	480.56	506.15	-2.56	0.1
7	0_6959904	Confined	4,435	2/21/1991	472.91	492.35	-1.94	0.1
7	0_6959904	Confined	5,792	11/9/1994	461.21	457.82	0.34	0.1
7	0_6959904	Confined	6,996	2/25/1998	463.93	450.25	1.37	0.1
7	0_6959904	Confined	7,344	2/8/1999	453.81	453.77	0.00	0.1
7	0_6959904	Confined	9,174	2/12/2004	440.51	442.81	-0.23	0.1
7	0_6959904	Confined	9,533	2/5/2005	454.73	448.12	0.66	0.1
7	0_6959904	Confined	10,270	2/12/2007	451.66	459.97	-0.83	0.1
7	0_6959913	Confined	777	2/15/1981	526.16	568.89	-4.27	0.1
7	0_6960802	Confined	9,090	11/20/2003	499.63	456.12	4.35	0.1
7	0_6960803	Confined	9,188	2/26/2004	483.03	428.22	5.48	0.1
7	0_6961502	Unconfined	1,503	2/11/1983	522.58	522.59	-0.01	1
7	0_6961502	Unconfined	1,878	2/21/1984	518.71	521.04	-2.33	1
7	0_6961502	Unconfined	2,227	2/4/1985	519.74	515.88	3.86	1
7	0_6961502	Unconfined	2,593	2/5/1986	488.74	517.84	-29.10	1
7	0_6961502	Unconfined	2,966	2/13/1987	503.73	535.36	-31.63	1
7	0_6961502	Unconfined	3,355	3/8/1988	501.71	544.30	-42.59	1
7	0_6961502	Unconfined	3,693	2/9/1989	522.27	534.15	-11.88	1
7	0_6961502	Unconfined	4,069	2/20/1990	519.24	524.73	-5.49	1
7	0_6961502	Unconfined	5,157	2/12/1993	512.41	515.97	-3.56	1
7	0_6961502	Unconfined	5,534	2/24/1994	511.56	513.83	-2.27	1
7	0_6961502	Unconfined	5,792	11/9/1994	510.01	511.39	-1.38	1
7	0_6961502	Unconfined	6,245	2/5/1996	504.16	502.79	1.37	1
7	0_6961502	Unconfined	6,634	2/28/1997	502.91	495.82	7.09	1
7	0_6961502	Unconfined	6,996	2/25/1998	501.54	499.48	2.06	1
7	0_6961502	Unconfined	7,100	6/9/1998	492.81	500.11	-7.30	1
7	0_6961525	Unconfined	772	2/10/1981	539.27	523.85	15.42	1
7	0_6961525	Unconfined	1,503	2/11/1983	535.94	528.01	7.93	1
7	0_6961525	Unconfined	1,878	2/21/1984	532.70	525.04	7.66	1
7	0_6961525	Unconfined	2,227	2/4/1985	533.80	517.18	16.62	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6961525	Unconfined	2,592	2/4/1986	528.42	519.17	9.25	1
7	0_6961525	Unconfined	3,355	3/8/1988	539.18	558.53	-19.35	1
7	0_6961525	Unconfined	3,693	2/9/1989	538.71	541.21	-2.50	1
7	0_6961525	Unconfined	4,069	2/20/1990	533.52	526.83	6.69	1
7	0_6961525	Unconfined	4,436	2/22/1991	529.29	528.25	1.04	1
7	0_6961525	Unconfined	4,801	2/22/1992	526.30	519.23	7.07	1
7	0_6961525	Unconfined	5,157	2/12/1993	525.78	525.10	0.68	1
7	0_6961525	Unconfined	5,534	2/24/1994	525.38	526.17	-0.79	1
7	0_6961525	Unconfined	5,792	11/9/1994	522.98	524.85	-1.87	1
7	0_6961525	Unconfined	6,245	2/5/1996	518.48	516.73	1.75	1
7	0_6961525	Unconfined	6,634	2/28/1997	516.21	509.82	6.39	1
7	0_6961525	Unconfined	6,996	2/25/1998	515.81	516.00	-0.19	1
7	0_6961525	Unconfined	7,344	2/8/1999	513.48	519.78	-6.30	1
7	0_6961525	Unconfined	7,753	3/23/2000	512.28	514.30	-2.02	1
7	0_6961525	Unconfined	8,079	2/12/2001	510.78	506.23	4.55	1
7	0_6961525	Unconfined	8,438	2/6/2002	506.28	507.29	-1.01	1
7	0_6961525	Unconfined	8,810	2/13/2003	502.88	505.16	-2.28	1
7	0_6961525	Unconfined	9,174	2/12/2004	509.38	506.69	2.69	1
7	0_6961525	Unconfined	9,532	2/4/2005	511.38	514.19	-2.81	1
7	0_6961525	Unconfined	9,937	3/16/2006	512.84	510.58	2.26	1
7	0_6961525	Unconfined	10,267	2/9/2007	510.55	513.39	-2.84	1
7	0_6961525	Unconfined	10,650	2/27/2008	507.68	521.41	-13.73	1
7	0_6961525	Unconfined	11,000	2/11/2009	504.38	503.20	1.18	1
7	0_6961525	Unconfined	11,349	1/26/2010	504.28	475.90	28.38	1
7	0_6961525	Unconfined	11,723	2/4/2011	504.51	453.11	51.40	1
7	0_6961525	Unconfined	12,078	1/25/2012	500.41	438.91	61.50	1
7	0_6961525	Unconfined	12,447	1/28/2013	499.42	455.61	43.81	1
7	0_6961525	Unconfined	12,819	2/4/2014	497.30	466.36	30.94	1
7	0_6961525	Unconfined	13,112	11/24/2014	492.60	468.86	23.74	1
7	0_6961525	Unconfined	13,437	10/15/2015	495.00	485.54	9.46	1
7	0_6961525	Unconfined	13,813	10/25/2016	491.74	498.42	-6.68	1
7	0_6961606	Confined	1,516	2/24/1983	468.16	423.43	4.47	0.1
7	0_6961606	Confined	2,237	2/14/1985	451.76	420.66	3.11	0.1
7	0_6961606	Confined	2,607	2/19/1986	449.86	430.28	1.96	0.1
7	0_6961606	Confined	3,698	2/14/1989	444.06	431.41	1.26	0.1
7	0_6961606	Confined	4,483	4/10/1991	399.96	420.30	-2.03	0.1
7	0_6961606	Confined	8,065	1/29/2001	390.56	298.08	9.25	0.1
7	0_6961606	Confined	8,409	1/8/2002	385.46	292.19	9.33	0.1
7	0_6961606	Confined	8,788	1/22/2003	400.06	279.82	12.02	0.1
7	0_6961606	Confined	9,160	1/29/2004	397.56	277.28	12.03	0.1
7	0_6961606	Confined	9,543	2/15/2005	401.06	281.47	11.96	0.1
7	0_6961606	Confined	9,882	1/20/2006	392.26	281.47	11.08	0.1
7	0_6961606	Confined	10,280	2/22/2007	381.06	288.01	9.31	0.1
7	0_6961606	Confined	10,656	3/4/2008	391.46	295.62	9.58	0.1
7	0_6961606	Confined	11,021	3/4/2009	391.46	282.82	10.86	0.1
7	0_6961606	Confined	11,426	4/13/2010	418.26	250.65	16.76	0.1
7	0_6961608	Confined	7,186	9/3/1998	428.95	382.44	4.65	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_6962601	Unconfined	780	2/18/1981	488.03	665.68	-88.82	0.5
7	0_6964405	Confined	8,544	5/23/2002	459.88	432.64	2.72	0.1
7	0_7607901	Unconfined	774	2/12/1981	628.37	664.92	-18.27	0.5
7	0_7607901	Unconfined	1,501	2/9/1983	633.87	663.69	-14.91	0.5
7	0_7607901	Unconfined	1,878	2/21/1984	628.27	663.08	-17.41	0.5
7	0_7607901	Unconfined	2,229	2/6/1985	629.53	663.48	-16.97	0.5
7	0_7607901	Unconfined	2,596	2/8/1986	618.59	664.86	-23.13	0.5
7	0_7607901	Unconfined	3,358	3/11/1988	630.51	670.58	-20.03	0.5
7	0_7607901	Unconfined	3,698	2/14/1989	632.96	659.03	-13.04	0.5
7	0_7607901	Unconfined	4,068	2/19/1990	638.76	663.12	-12.18	0.5
7	0_7607901	Unconfined	4,434	2/20/1991	638.66	656.57	-8.96	0.5
7	0_7607901	Unconfined	4,799	2/20/1992	639.06	653.84	-7.39	0.5
7	0_7607901	Unconfined	5,154	2/9/1993	632.06	653.91	-10.92	0.5
7	0_7607901	Unconfined	5,535	2/25/1994	639.86	664.00	-12.07	0.5
7	0_7607901	Unconfined	6,981	2/10/1998	638.26	669.02	-15.38	0.5
7	0_7607901	Unconfined	7,351	2/15/1999	630.11	666.28	-18.08	0.5
7	0_7607901	Unconfined	7,726	2/25/2000	632.76	663.43	-15.34	0.5
7	0_7607901	Unconfined	8,439	2/7/2002	640.49	669.99	-14.75	0.5
7	0_7607901	Unconfined	8,809	2/12/2003	640.01	673.89	-16.94	0.5
7	0_7607901	Unconfined	9,199	3/8/2004	639.21	673.90	-17.34	0.5
7	0_7607901	Unconfined	9,507	1/10/2005	635.30	675.38	-20.04	0.5
7	0_7607901	Unconfined	9,872	1/10/2006	634.34	672.25	-18.95	0.5
7	0_7607901	Unconfined	10,235	1/8/2007	635.81	670.59	-17.39	0.5
7	0_7607901	Unconfined	10,651	2/28/2008	637.46	674.65	-18.60	0.5
7	0_7607901	Unconfined	11,001	2/12/2009	634.08	671.70	-18.81	0.5
7	0_7607901	Unconfined	11,349	1/26/2010	633.83	671.16	-18.66	0.5
7	0_7607901	Unconfined	12,078	1/25/2012	640.10	666.98	-13.44	0.5
7	0_7607901	Unconfined	12,447	1/28/2013	639.34	666.62	-13.64	0.5
7	0_7607901	Unconfined	12,819	2/4/2014	636.48	666.54	-15.03	0.5
7	0_7607901	Unconfined	13,078	10/21/2014	640.53	665.90	-12.69	0.5
7	0_7607901	Unconfined	13,436	10/14/2015	642.50	668.11	-12.80	0.5
7	0_7607901	Unconfined	13,814	10/26/2016	634.14	669.73	-17.79	0.5
7	0_7607901	Unconfined	14,177	10/24/2017	641.07	669.35	-14.14	0.5
7	0_7607904	Unconfined	12,447	1/28/2013	640.82	663.10	-11.14	0.5
7	0_7607904	Unconfined	13,078	10/21/2014	640.45	662.22	-10.88	0.5
7	0_7607904	Unconfined	13,436	10/14/2015	640.89	664.47	-11.79	0.5
7	0_7607904	Unconfined	13,814	10/26/2016	641.37	666.16	-12.39	0.5
7	0_7607904	Unconfined	14,177	10/24/2017	641.33	665.82	-12.24	0.5
7	0_7607907	Unconfined	12,442	1/23/2013	640.38	663.44	-11.53	0.5
7	0_7607907	Unconfined	13,078	10/21/2014	640.44	662.57	-11.07	0.5
7	0_7607907	Unconfined	13,436	10/14/2015	641.02	664.77	-11.87	0.5
7	0_7607907	Unconfined	13,814	10/26/2016	641.78	666.41	-12.31	0.5
7	0_7607907	Unconfined	14,177	10/24/2017	641.55	666.07	-12.26	0.5
7	0_7607919	Unconfined	774	2/12/1981	632.09	650.30	-18.21	1
7	0_7607919	Unconfined	1,501	2/9/1983	635.96	646.45	-10.49	1
7	0_7607919	Unconfined	1,878	2/21/1984	635.93	646.45	-10.52	1
7	0_7607919	Unconfined	2,229	2/6/1985	634.79	650.20	-15.41	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7607919	Unconfined	2,596	2/8/1986	634.80	649.20	-14.40	1
7	0_7607919	Unconfined	3,358	3/11/1988	636.25	662.25	-26.00	1
7	0_7607919	Unconfined	3,698	2/14/1989	637.38	624.91	12.47	1
7	0_7607919	Unconfined	4,434	2/20/1991	638.03	615.89	22.14	1
7	0_7607919	Unconfined	4,799	2/20/1992	638.93	605.64	33.29	1
7	0_7607919	Unconfined	5,154	2/9/1993	639.40	606.92	32.48	1
7	0_7607919	Unconfined	5,535	2/25/1994	639.55	654.22	-14.67	1
7	0_7607919	Unconfined	6,268	2/28/1996	640.55	656.22	-15.67	1
7	0_7607919	Unconfined	6,981	2/10/1998	639.35	665.36	-26.01	1
7	0_7607919	Unconfined	7,351	2/15/1999	637.35	651.97	-14.62	1
7	0_7607919	Unconfined	8,440	2/8/2002	639.75	669.51	-29.76	1
7	0_7607919	Unconfined	8,809	2/12/2003	639.20	673.34	-34.14	1
7	0_7607919	Unconfined	9,199	3/8/2004	639.79	673.52	-33.73	1
7	0_7607919	Unconfined	9,507	1/10/2005	640.20	674.78	-34.58	1
7	0_7607919	Unconfined	9,872	1/10/2006	639.20	672.32	-33.12	1
7	0_7607919	Unconfined	10,235	1/8/2007	639.55	671.08	-31.53	1
7	0_7607919	Unconfined	10,651	2/28/2008	638.37	674.35	-35.98	1
7	0_7607919	Unconfined	11,001	2/12/2009	637.64	671.92	-34.28	1
7	0_7607919	Unconfined	11,349	1/26/2010	637.45	671.52	-34.07	1
7	0_7607919	Unconfined	11,723	2/4/2011	637.88	671.34	-33.46	1
7	0_7607919	Unconfined	12,078	1/25/2012	638.54	668.14	-29.60	1
7	0_7607919	Unconfined	12,447	1/28/2013	638.48	667.64	-29.16	1
7	0_7607919	Unconfined	12,819	2/4/2014	636.87	667.48	-30.61	1
7	0_7607919	Unconfined	13,078	10/21/2014	636.67	666.92	-30.25	1
7	0_7607919	Unconfined	13,436	10/14/2015	639.52	668.68	-29.16	1
7	0_7607919	Unconfined	13,814	10/26/2016	639.32	669.93	-30.61	1
7	0_7607919	Unconfined	14,177	10/24/2017	639.47	669.63	-30.16	1
7	0_7607923	Unconfined	731	12/31/1980	655.19	668.72	-13.53	1
7	0_7607923	Unconfined	5,197	3/24/1993	640.53	652.51	-11.98	1
7	0_7608401	Unconfined	774	2/12/1981	627.79	659.66	-31.87	1
7	0_7608401	Unconfined	1,501	2/9/1983	625.77	657.66	-31.89	1
7	0_7608401	Unconfined	2,229	2/6/1985	625.51	658.35	-32.84	1
7	0_7608401	Unconfined	2,596	2/8/1986	623.82	658.97	-35.15	1
7	0_7608401	Unconfined	4,068	2/19/1990	617.72	656.66	-38.94	1
7	0_7608406	Unconfined	2,592	2/4/1986	644.33	649.65	-5.32	1
7	0_7608406	Unconfined	2,965	2/12/1987	643.71	656.46	-12.75	1
7	0_7608406	Unconfined	3,358	3/11/1988	643.55	659.40	-15.85	1
7	0_7608406	Unconfined	3,698	2/14/1989	643.38	649.47	-6.09	1
7	0_7608406	Unconfined	4,068	2/19/1990	643.11	647.82	-4.71	1
7	0_7608406	Unconfined	4,434	2/20/1991	642.39	643.89	-1.50	1
7	0_7608406	Unconfined	4,799	2/20/1992	636.84	640.21	-3.37	1
7	0_7608406	Unconfined	5,161	2/16/1993	640.68	641.04	-0.36	1
7	0_7608406	Unconfined	5,535	2/25/1994	642.58	645.33	-2.75	1
7	0_7608406	Unconfined	6,632	2/26/1997	637.53	646.10	-8.57	1
7	0_7608406	Unconfined	6,996	2/25/1998	640.04	651.04	-11.00	1
7	0_7608406	Unconfined	7,345	2/9/1999	641.63	650.86	-9.23	1
7	0_7608406	Unconfined	7,754	3/24/2000	642.08	648.09	-6.01	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7608406	Unconfined	8,082	2/15/2001	636.98	654.27	-17.29	1
7	0_7608406	Unconfined	8,445	2/13/2002	641.08	658.67	-17.59	1
7	0_7608406	Unconfined	8,810	2/13/2003	640.18	665.78	-25.60	1
7	0_7608406	Unconfined	9,179	2/17/2004	641.03	667.54	-26.51	1
7	0_7608406	Unconfined	10,270	2/12/2007	640.43	665.67	-25.24	1
7	0_7608406	Unconfined	10,651	2/28/2008	635.53	670.06	-34.53	1
7	0_7608406	Unconfined	11,349	1/26/2010	627.50	665.87	-38.37	1
7	0_7608406	Unconfined	12,077	1/24/2012	633.18	660.30	-27.12	1
7	0_7608503	Unconfined	1,501	2/9/1983	623.44	663.04	-19.80	0.5
7	0_7608503	Unconfined	1,877	2/20/1984	646.27	661.67	-7.70	0.5
7	0_7608503	Unconfined	3,358	3/11/1988	637.48	666.37	-14.44	0.5
7	0_7608704	Unconfined	2,596	2/8/1986	659.39	630.74	14.32	0.5
7	0_7648803	Confined	7,044	4/14/1998	657.46	623.86	3.36	0.1
7	0_7701101	Unconfined	773	2/11/1981	651.09	659.41	-8.32	1
7	0_7701101	Unconfined	2,229	2/6/1985	649.27	657.86	-8.59	1
7	0_7701101	Unconfined	2,592	2/4/1986	647.39	659.74	-12.35	1
7	0_7701101	Unconfined	7,318	1/13/1999	667.87	659.41	8.46	1
7	0_7701311	Confined	773	2/11/1981	686.57	601.56	8.50	0.1
7	0_7701311	Confined	1,501	2/9/1983	687.11	601.83	8.53	0.1
7	0_7701311	Confined	2,229	2/6/1985	687.28	599.23	8.81	0.1
7	0_7701311	Confined	2,594	2/6/1986	685.88	602.53	8.33	0.1
7	0_7701311	Confined	3,354	3/7/1988	684.77	609.16	7.56	0.1
7	0_7701311	Confined	4,434	2/20/1991	690.51	606.28	8.42	0.1
7	0_7701311	Confined	4,800	2/21/1992	690.03	606.82	8.32	0.1
7	0_7701311	Confined	5,160	2/15/1993	690.45	606.57	8.39	0.1
7	0_7701311	Confined	5,535	2/25/1994	689.80	602.66	8.71	0.1
7	0_7701311	Confined	6,247	2/7/1996	688.10	599.42	8.87	0.1
7	0_7701311	Confined	6,633	2/27/1997	688.40	596.62	9.18	0.1
7	0_7701311	Confined	6,996	2/25/1998	687.61	601.66	8.59	0.1
7	0_7701311	Confined	7,345	2/9/1999	688.40	602.57	8.58	0.1
7	0_7701311	Confined	7,724	2/23/2000	687.10	598.97	8.81	0.1
7	0_7701311	Confined	8,082	2/15/2001	686.65	600.18	8.65	0.1
7	0_7701311	Confined	8,810	2/13/2003	679.40	605.17	7.42	0.1
7	0_7701311	Confined	9,178	2/16/2004	689.60	603.86	8.57	0.1
7	0_7701311	Confined	9,533	2/5/2005	692.30	606.29	8.60	0.1
7	0_7701311	Confined	9,937	3/16/2006	694.17	600.95	9.32	0.1
7	0_7701311	Confined	11,349	1/26/2010	686.32	596.96	8.94	0.1
7	0_7701311	Confined	11,720	2/1/2011	688.49	594.11	9.44	0.1
7	0_7701311	Confined	12,078	1/25/2012	690.31	585.09	10.52	0.1
7	0_7701311	Confined	12,447	1/28/2013	689.25	587.06	10.22	0.1
7	0_7701311	Confined	12,819	2/4/2014	687.54	587.96	9.96	0.1
7	0_7701404	Confined	773	2/11/1981	620.49	579.45	41.04	1
7	0_7701404	Confined	1,877	2/20/1984	615.17	580.70	34.47	1
7	0_7701404	Confined	2,229	2/6/1985	618.70	580.17	38.53	1
7	0_7701404	Confined	2,592	2/4/1986	614.08	579.94	34.14	1
7	0_7701404	Confined	2,965	2/12/1987	617.39	582.13	35.26	1
7	0_7701404	Confined	3,358	3/11/1988	610.80	586.46	24.34	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7701404	Confined	3,698	2/14/1989	617.97	587.81	30.16	1
7	0_7701404	Confined	4,068	2/19/1990	614.77	587.36	27.41	1
7	0_7701404	Confined	4,434	2/20/1991	617.90	587.04	30.86	1
7	0_7701404	Confined	5,170	2/25/1993	641.02	582.47	58.55	1
7	0_7701404	Confined	5,555	3/17/1994	618.07	580.48	37.59	1
7	0_7701404	Confined	6,632	2/26/1997	615.12	575.28	39.84	1
7	0_7701404	Confined	6,863	10/15/1997	616.02	574.75	41.27	1
7	0_7701404	Confined	6,996	2/25/1998	616.79	574.58	42.21	1
7	0_7701404	Confined	7,345	2/9/1999	614.97	574.57	40.40	1
7	0_7701404	Confined	8,810	2/13/2003	627.92	573.47	54.45	1
7	0_7701605	Confined	773	2/11/1981	447.00	409.30	37.70	1
7	0_7701605	Confined	1,501	2/9/1983	440.25	416.68	23.57	1
7	0_7701701	Confined	12,192	5/18/2012	481.83	392.97	8.89	0.1
7	0_7701702	Confined	773	2/11/1981	591.75	530.26	61.49	1
7	0_7701702	Confined	2,230	2/7/1985	588.06	531.62	56.44	1
7	0_7701702	Confined	2,965	2/12/1987	585.94	535.29	50.65	1
7	0_7701702	Confined	3,358	3/11/1988	568.27	542.77	25.50	1
7	0_7701702	Confined	3,698	2/14/1989	574.96	544.51	30.45	1
7	0_7701702	Confined	4,068	2/19/1990	581.49	543.02	38.47	1
7	0_7701702	Confined	5,161	2/16/1993	593.51	532.52	60.99	1
7	0_7701702	Confined	5,555	3/17/1994	586.59	529.90	56.69	1
7	0_7701702	Confined	5,801	11/18/1994	578.71	528.49	50.22	1
7	0_7701702	Confined	6,633	2/27/1997	577.99	523.22	54.77	1
7	0_7701702	Confined	6,996	2/25/1998	588.43	522.30	66.13	1
7	0_7701702	Confined	7,753	3/23/2000	585.96	522.47	63.49	1
7	0_7701702	Confined	8,082	2/15/2001	587.81	521.45	66.36	1
7	0_7701702	Confined	8,809	2/12/2003	574.11	519.63	54.48	1
7	0_7701702	Confined	9,179	2/17/2004	585.31	519.02	66.29	1
7	0_7701702	Confined	9,532	2/4/2005	587.25	519.60	67.65	1
7	0_7701702	Confined	9,937	3/16/2006	576.32	520.65	55.67	1
7	0_7701702	Confined	10,270	2/12/2007	584.09	522.35	61.74	1
7	0_7701702	Confined	11,001	2/12/2009	573.41	522.73	50.68	1
7	0_7701702	Confined	12,444	1/25/2013	578.59	496.36	82.23	1
7	0_7701702	Confined	12,819	2/4/2014	567.97	493.08	74.89	1
7	0_7701702	Confined	13,438	10/16/2015	577.16	491.48	85.68	1
7	0_7701702	Confined	14,177	10/24/2017	576.40	494.94	81.46	1
7	0_7702103	Confined	773	2/11/1981	464.03	415.65	4.84	0.1
7	0_7702103	Confined	1,501	2/9/1983	464.88	423.17	4.17	0.1
7	0_7702103	Confined	2,229	2/6/1985	462.35	413.08	4.93	0.1
7	0_7702103	Confined	2,594	2/6/1986	459.72	409.44	5.03	0.1
7	0_7702103	Confined	2,965	2/12/1987	458.48	447.91	1.06	0.1
7	0_7702103	Confined	3,698	2/14/1989	457.00	458.89	-0.19	0.1
7	0_7702103	Confined	4,069	2/20/1990	454.66	439.90	1.48	0.1
7	0_7702114	Confined	773	2/11/1981	610.96	473.35	137.61	1
7	0_7702114	Confined	1,501	2/9/1983	614.27	479.04	135.23	1
7	0_7702114	Confined	1,878	2/21/1984	613.81	478.01	135.80	1
7	0_7702114	Confined	2,229	2/6/1985	612.06	471.76	140.30	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702114	Confined	2,594	2/6/1986	612.02	469.54	142.48	1
7	0_7702114	Confined	2,965	2/12/1987	607.59	497.85	109.74	1
7	0_7702403	Confined	772	2/10/1981	396.50	423.30	-2.68	0.1
7	0_7702403	Confined	10,267	2/9/2007	395.90	410.50	-1.46	0.1
7	0_7702412	Confined	773	2/11/1981	454.99	418.32	3.67	0.1
7	0_7702412	Confined	1,501	2/9/1983	461.57	425.81	3.58	0.1
7	0_7702414	Confined	2,592	2/4/1986	389.04	420.76	-31.72	1
7	0_7702414	Confined	3,698	2/14/1989	407.79	459.32	-51.53	1
7	0_7702414	Confined	4,069	2/20/1990	410.03	443.41	-33.38	1
7	0_7702414	Confined	4,434	2/20/1991	400.58	441.08	-40.50	1
7	0_7702414	Confined	4,800	2/21/1992	403.35	395.06	8.29	1
7	0_7702414	Confined	5,160	2/15/1993	400.82	395.04	5.78	1
7	0_7702414	Confined	6,247	2/7/1996	400.47	388.55	11.92	1
7	0_7702414	Confined	7,753	3/23/2000	400.32	398.93	1.39	1
7	0_7702414	Confined	8,810	2/13/2003	391.57	379.29	12.28	1
7	0_7702414	Confined	9,179	2/17/2004	401.87	384.08	17.79	1
7	0_7702509	Confined	8,649	9/5/2002	358.62	383.42	-24.80	1
7	0_7702509	Confined	8,654	9/10/2002	367.38	383.23	-15.85	1
7	0_7702509	Confined	8,659	9/15/2002	370.38	383.04	-12.66	1
7	0_7702509	Confined	8,664	9/20/2002	372.40	382.85	-10.45	1
7	0_7702509	Confined	8,669	9/25/2002	371.53	382.66	-11.13	1
7	0_7702509	Confined	8,674	9/30/2002	368.15	382.47	-14.32	1
7	0_7702509	Confined	8,679	10/5/2002	365.64	382.27	-16.63	1
7	0_7702509	Confined	8,684	10/10/2002	372.04	382.08	-10.04	1
7	0_7702509	Confined	8,689	10/15/2002	375.27	381.89	-6.62	1
7	0_7702509	Confined	8,694	10/20/2002	377.38	381.70	-4.32	1
7	0_7702509	Confined	8,699	10/25/2002	379.18	381.51	-2.33	1
7	0_7702509	Confined	8,704	10/30/2002	380.37	381.31	-0.94	1
7	0_7702509	Confined	8,725	11/20/2002	383.81	380.51	3.30	1
7	0_7702509	Confined	8,730	11/25/2002	382.73	380.32	2.41	1
7	0_7702509	Confined	8,822	2/25/2003	372.25	379.52	-7.27	1
7	0_7702509	Confined	8,825	2/28/2003	373.17	379.56	-6.39	1
7	0_7702509	Confined	8,830	3/5/2003	373.77	379.61	-5.84	1
7	0_7702509	Confined	8,835	3/10/2003	373.11	379.66	-6.55	1
7	0_7702509	Confined	8,840	3/15/2003	373.14	379.71	-6.57	1
7	0_7702509	Confined	8,845	3/20/2003	373.86	379.77	-5.91	1
7	0_7702509	Confined	8,850	3/25/2003	370.56	379.82	-9.26	1
7	0_7702509	Confined	8,855	3/30/2003	369.28	379.87	-10.59	1
7	0_7702509	Confined	8,861	4/5/2003	366.01	379.93	-13.92	1
7	0_7702509	Confined	8,866	4/10/2003	363.31	379.99	-16.68	1
7	0_7702509	Confined	8,871	4/15/2003	366.86	380.04	-13.18	1
7	0_7702509	Confined	8,876	4/20/2003	366.62	380.09	-13.47	1
7	0_7702509	Confined	8,881	4/25/2003	368.84	380.14	-11.30	1
7	0_7702509	Confined	8,886	4/30/2003	367.13	380.20	-13.07	1
7	0_7702509	Confined	8,891	5/5/2003	358.34	380.25	-21.91	1
7	0_7702509	Confined	8,896	5/10/2003	355.51	380.30	-24.79	1
7	0_7702509	Confined	8,901	5/15/2003	356.82	380.35	-23.53	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	8,906	5/20/2003	352.92	380.41	-27.49	1
7	0_7702509	Confined	8,911	5/25/2003	358.92	380.46	-21.54	1
7	0_7702509	Confined	8,916	5/30/2003	361.70	380.51	-18.81	1
7	0_7702509	Confined	8,922	6/5/2003	359.02	380.57	-21.55	1
7	0_7702509	Confined	8,927	6/10/2003	362.37	380.63	-18.26	1
7	0_7702509	Confined	8,932	6/15/2003	364.66	380.68	-16.02	1
7	0_7702509	Confined	8,937	6/20/2003	365.89	380.73	-14.84	1
7	0_7702509	Confined	8,942	6/25/2003	361.55	380.78	-19.23	1
7	0_7702509	Confined	8,947	6/30/2003	362.51	380.84	-18.33	1
7	0_7702509	Confined	8,952	7/5/2003	364.43	380.89	-16.46	1
7	0_7702509	Confined	8,957	7/10/2003	367.22	380.94	-13.72	1
7	0_7702509	Confined	8,962	7/15/2003	368.29	380.99	-12.70	1
7	0_7702509	Confined	8,967	7/20/2003	369.24	381.04	-11.80	1
7	0_7702509	Confined	8,972	7/25/2003	369.80	381.10	-11.30	1
7	0_7702509	Confined	8,977	7/30/2003	369.36	381.15	-11.79	1
7	0_7702509	Confined	8,983	8/5/2003	368.15	381.21	-13.06	1
7	0_7702509	Confined	8,988	8/10/2003	361.36	381.27	-19.91	1
7	0_7702509	Confined	8,993	8/15/2003	363.97	381.32	-17.35	1
7	0_7702509	Confined	8,998	8/20/2003	360.76	381.37	-20.61	1
7	0_7702509	Confined	9,003	8/25/2003	361.42	381.42	-20.00	1
7	0_7702509	Confined	9,008	8/30/2003	363.07	381.47	-18.40	1
7	0_7702509	Confined	9,014	9/5/2003	368.04	381.54	-13.50	1
7	0_7702509	Confined	9,019	9/10/2003	368.63	381.59	-12.96	1
7	0_7702509	Confined	9,024	9/15/2003	371.26	381.64	-10.38	1
7	0_7702509	Confined	9,029	9/20/2003	369.17	381.70	-12.53	1
7	0_7702509	Confined	9,034	9/25/2003	367.72	381.75	-14.03	1
7	0_7702509	Confined	9,039	9/30/2003	369.84	381.80	-11.96	1
7	0_7702509	Confined	9,044	10/5/2003	367.71	381.85	-14.14	1
7	0_7702509	Confined	9,049	10/10/2003	366.37	381.90	-15.53	1
7	0_7702509	Confined	9,054	10/15/2003	366.41	381.96	-15.55	1
7	0_7702509	Confined	9,059	10/20/2003	366.15	382.01	-15.86	1
7	0_7702509	Confined	9,064	10/25/2003	366.13	382.06	-15.93	1
7	0_7702509	Confined	9,069	10/30/2003	367.60	382.11	-14.51	1
7	0_7702509	Confined	9,075	11/5/2003	365.88	382.18	-16.30	1
7	0_7702509	Confined	9,085	11/15/2003	377.78	382.28	-4.50	1
7	0_7702509	Confined	9,090	11/20/2003	374.85	382.33	-7.48	1
7	0_7702509	Confined	9,095	11/25/2003	373.79	382.39	-8.60	1
7	0_7702509	Confined	9,100	11/30/2003	375.49	382.44	-6.95	1
7	0_7702509	Confined	9,105	12/5/2003	374.63	382.49	-7.86	1
7	0_7702509	Confined	9,110	12/10/2003	375.78	382.54	-6.76	1
7	0_7702509	Confined	9,115	12/15/2003	370.59	382.60	-12.01	1
7	0_7702509	Confined	9,120	12/20/2003	373.27	382.65	-9.38	1
7	0_7702509	Confined	9,125	12/25/2003	372.68	382.70	-10.02	1
7	0_7702509	Confined	9,130	12/30/2003	374.28	382.75	-8.47	1
7	0_7702509	Confined	9,136	1/5/2004	367.54	382.90	-15.36	1
7	0_7702509	Confined	9,141	1/10/2004	367.94	383.03	-15.09	1
7	0_7702509	Confined	9,146	1/15/2004	374.96	383.16	-8.20	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	9,151	1/20/2004	378.15	383.29	-5.14	1
7	0_7702509	Confined	9,156	1/25/2004	379.53	383.42	-3.89	1
7	0_7702509	Confined	9,161	1/30/2004	380.75	383.56	-2.81	1
7	0_7702509	Confined	9,167	2/5/2004	379.81	383.72	-3.91	1
7	0_7702509	Confined	9,172	2/10/2004	380.65	383.85	-3.20	1
7	0_7702509	Confined	9,177	2/15/2004	380.52	383.98	-3.46	1
7	0_7702509	Confined	9,182	2/20/2004	371.89	384.11	-12.22	1
7	0_7702509	Confined	9,187	2/25/2004	377.97	384.24	-6.27	1
7	0_7702509	Confined	9,190	2/28/2004	376.78	384.32	-7.54	1
7	0_7702509	Confined	9,191	2/29/2004	380.47	384.35	-3.88	1
7	0_7702509	Confined	9,196	3/5/2004	377.15	384.48	-7.33	1
7	0_7702509	Confined	9,201	3/10/2004	375.98	384.61	-8.63	1
7	0_7702509	Confined	9,206	3/15/2004	378.10	384.74	-6.64	1
7	0_7702509	Confined	9,211	3/20/2004	380.49	384.88	-4.39	1
7	0_7702509	Confined	9,216	3/25/2004	381.87	385.01	-3.14	1
7	0_7702509	Confined	9,221	3/30/2004	382.65	385.14	-2.49	1
7	0_7702509	Confined	9,227	4/5/2004	384.12	385.30	-1.18	1
7	0_7702509	Confined	9,232	4/10/2004	384.96	385.43	-0.47	1
7	0_7702509	Confined	9,237	4/15/2004	385.68	385.56	0.12	1
7	0_7702509	Confined	9,242	4/20/2004	386.44	385.70	0.74	1
7	0_7702509	Confined	9,247	4/25/2004	387.16	385.83	1.33	1
7	0_7702509	Confined	9,252	4/30/2004	387.22	385.96	1.26	1
7	0_7702509	Confined	9,257	5/5/2004	387.23	386.09	1.14	1
7	0_7702509	Confined	9,262	5/10/2004	387.23	386.22	1.01	1
7	0_7702509	Confined	9,267	5/15/2004	387.62	386.36	1.26	1
7	0_7702509	Confined	9,272	5/20/2004	387.63	386.49	1.14	1
7	0_7702509	Confined	9,277	5/25/2004	387.60	386.62	0.98	1
7	0_7702509	Confined	9,282	5/30/2004	387.35	386.75	0.60	1
7	0_7702509	Confined	9,288	6/5/2004	387.30	386.91	0.39	1
7	0_7702509	Confined	9,293	6/10/2004	387.29	387.04	0.25	1
7	0_7702509	Confined	9,298	6/15/2004	384.06	387.17	-3.11	1
7	0_7702509	Confined	9,303	6/20/2004	384.39	387.31	-2.92	1
7	0_7702509	Confined	9,308	6/25/2004	384.39	387.44	-3.05	1
7	0_7702509	Confined	9,313	6/30/2004	384.39	387.57	-3.18	1
7	0_7702509	Confined	9,318	7/5/2004	384.24	387.70	-3.46	1
7	0_7702509	Confined	9,323	7/10/2004	384.24	387.83	-3.59	1
7	0_7702509	Confined	9,328	7/15/2004	384.54	387.97	-3.43	1
7	0_7702509	Confined	9,333	7/20/2004	384.56	388.10	-3.54	1
7	0_7702509	Confined	9,338	7/25/2004	384.56	388.23	-3.67	1
7	0_7702509	Confined	9,343	7/30/2004	384.56	388.36	-3.80	1
7	0_7702509	Confined	9,349	8/5/2004	384.56	388.52	-3.96	1
7	0_7702509	Confined	9,354	8/10/2004	384.57	388.65	-4.08	1
7	0_7702509	Confined	9,359	8/15/2004	384.57	388.78	-4.21	1
7	0_7702509	Confined	9,364	8/20/2004	384.57	388.92	-4.35	1
7	0_7702509	Confined	9,369	8/25/2004	384.57	389.05	-4.48	1
7	0_7702509	Confined	9,374	8/30/2004	384.57	389.18	-4.61	1
7	0_7702509	Confined	9,380	9/5/2004	384.58	389.34	-4.76	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	9,385	9/10/2004	384.58	389.47	-4.89	1
7	0_7702509	Confined	9,390	9/15/2004	384.58	389.60	-5.02	1
7	0_7702509	Confined	9,395	9/20/2004	384.58	389.73	-5.15	1
7	0_7702509	Confined	9,400	9/25/2004	378.10	389.87	-11.77	1
7	0_7702509	Confined	9,405	9/30/2004	373.15	390.00	-16.85	1
7	0_7702509	Confined	9,410	10/5/2004	376.50	390.13	-13.63	1
7	0_7702509	Confined	9,415	10/10/2004	378.08	390.26	-12.18	1
7	0_7702509	Confined	9,566	3/10/2005	399.45	393.13	6.32	1
7	0_7702509	Confined	9,571	3/15/2005	400.38	393.18	7.20	1
7	0_7702509	Confined	9,576	3/20/2005	400.80	393.23	7.57	1
7	0_7702509	Confined	9,581	3/25/2005	397.96	393.28	4.68	1
7	0_7702509	Confined	9,586	3/30/2005	398.56	393.33	5.23	1
7	0_7702509	Confined	9,592	4/5/2005	398.38	393.39	4.99	1
7	0_7702509	Confined	9,597	4/10/2005	398.27	393.44	4.83	1
7	0_7702509	Confined	9,602	4/15/2005	388.64	393.49	-4.85	1
7	0_7702509	Confined	9,607	4/20/2005	394.60	393.54	1.06	1
7	0_7702509	Confined	9,612	4/25/2005	394.60	393.59	1.01	1
7	0_7702509	Confined	9,617	4/30/2005	387.73	393.64	-5.91	1
7	0_7702509	Confined	9,622	5/5/2005	387.58	393.69	-6.11	1
7	0_7702509	Confined	9,627	5/10/2005	387.57	393.75	-6.18	1
7	0_7702509	Confined	9,632	5/15/2005	388.60	393.80	-5.20	1
7	0_7702509	Confined	9,637	5/20/2005	388.90	393.85	-4.95	1
7	0_7702509	Confined	9,642	5/25/2005	384.65	393.90	-9.25	1
7	0_7702509	Confined	9,647	5/30/2005	387.69	393.95	-6.26	1
7	0_7702509	Confined	9,653	6/5/2005	386.00	394.01	-8.01	1
7	0_7702509	Confined	9,658	6/10/2005	386.47	394.06	-7.59	1
7	0_7702509	Confined	9,663	6/15/2005	387.85	394.11	-6.26	1
7	0_7702509	Confined	9,668	6/20/2005	379.39	394.16	-14.77	1
7	0_7702509	Confined	9,673	6/25/2005	372.22	394.21	-21.99	1
7	0_7702509	Confined	9,678	6/30/2005	373.43	394.26	-20.83	1
7	0_7702509	Confined	9,683	7/5/2005	369.36	394.31	-24.95	1
7	0_7702509	Confined	9,688	7/10/2005	370.61	394.36	-23.75	1
7	0_7702509	Confined	9,693	7/15/2005	369.86	394.41	-24.55	1
7	0_7702509	Confined	9,698	7/20/2005	378.51	394.47	-15.96	1
7	0_7702509	Confined	9,703	7/25/2005	377.40	394.52	-17.12	1
7	0_7702509	Confined	9,708	7/30/2005	378.29	394.57	-16.28	1
7	0_7702509	Confined	9,714	8/5/2005	374.91	394.63	-19.72	1
7	0_7702509	Confined	9,719	8/10/2005	376.01	394.68	-18.67	1
7	0_7702509	Confined	9,724	8/15/2005	381.16	394.73	-13.57	1
7	0_7702509	Confined	9,729	8/20/2005	374.60	394.78	-20.18	1
7	0_7702509	Confined	9,734	8/25/2005	370.05	394.83	-24.78	1
7	0_7702509	Confined	9,739	8/30/2005	375.50	394.88	-19.38	1
7	0_7702509	Confined	9,745	9/5/2005	373.91	394.94	-21.03	1
7	0_7702509	Confined	9,750	9/10/2005	375.45	394.99	-19.54	1
7	0_7702509	Confined	9,755	9/15/2005	381.02	395.04	-14.02	1
7	0_7702509	Confined	9,760	9/20/2005	374.65	395.09	-20.44	1
7	0_7702509	Confined	9,765	9/25/2005	375.77	395.14	-19.37	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	9,770	9/30/2005	370.13	395.20	-25.07	1
7	0_7702509	Confined	9,775	10/5/2005	375.19	395.25	-20.06	1
7	0_7702509	Confined	9,780	10/10/2005	379.82	395.30	-15.48	1
7	0_7702509	Confined	9,785	10/15/2005	382.27	395.35	-13.08	1
7	0_7702509	Confined	9,790	10/20/2005	383.96	395.40	-11.44	1
7	0_7702509	Confined	9,795	10/25/2005	383.86	395.45	-11.59	1
7	0_7702509	Confined	9,800	10/30/2005	381.35	395.50	-14.15	1
7	0_7702509	Confined	9,806	11/5/2005	381.56	395.56	-14.00	1
7	0_7702509	Confined	9,811	11/10/2005	378.30	395.61	-17.31	1
7	0_7702509	Confined	9,816	11/15/2005	384.68	395.66	-10.98	1
7	0_7702509	Confined	9,821	11/20/2005	381.94	395.71	-13.77	1
7	0_7702509	Confined	9,826	11/25/2005	382.03	395.76	-13.73	1
7	0_7702509	Confined	9,831	11/30/2005	384.71	395.81	-11.10	1
7	0_7702509	Confined	9,836	12/5/2005	376.53	395.86	-19.33	1
7	0_7702509	Confined	9,841	12/10/2005	381.14	395.92	-14.78	1
7	0_7702509	Confined	9,846	12/15/2005	381.27	395.97	-14.70	1
7	0_7702509	Confined	9,851	12/20/2005	381.94	396.02	-14.08	1
7	0_7702509	Confined	9,856	12/25/2005	382.87	396.07	-13.20	1
7	0_7702509	Confined	9,861	12/30/2005	376.70	396.12	-19.42	1
7	0_7702509	Confined	9,867	1/5/2006	379.95	396.32	-16.37	1
7	0_7702509	Confined	9,872	1/10/2006	382.12	396.51	-14.39	1
7	0_7702509	Confined	9,877	1/15/2006	380.76	396.70	-15.94	1
7	0_7702509	Confined	9,882	1/20/2006	380.02	396.89	-16.87	1
7	0_7702509	Confined	9,887	1/25/2006	379.04	397.08	-18.04	1
7	0_7702509	Confined	9,892	1/30/2006	378.84	397.27	-18.43	1
7	0_7702509	Confined	9,898	2/5/2006	377.37	397.50	-20.13	1
7	0_7702509	Confined	9,903	2/10/2006	375.77	397.69	-21.92	1
7	0_7702509	Confined	9,908	2/15/2006	379.97	397.88	-17.91	1
7	0_7702509	Confined	9,913	2/20/2006	380.69	398.07	-17.38	1
7	0_7702509	Confined	9,918	2/25/2006	376.38	398.26	-21.88	1
7	0_7702509	Confined	9,921	2/28/2006	376.38	398.38	-22.00	1
7	0_7702509	Confined	9,926	3/5/2006	368.30	398.57	-30.27	1
7	0_7702509	Confined	9,931	3/10/2006	372.13	398.76	-26.63	1
7	0_7702509	Confined	9,936	3/15/2006	371.19	398.95	-27.76	1
7	0_7702509	Confined	9,941	3/20/2006	367.76	399.14	-31.38	1
7	0_7702509	Confined	9,946	3/25/2006	370.77	399.33	-28.56	1
7	0_7702509	Confined	9,951	3/30/2006	370.77	399.52	-28.75	1
7	0_7702509	Confined	9,957	4/5/2006	370.77	399.75	-28.98	1
7	0_7702509	Confined	9,962	4/10/2006	362.23	399.94	-37.71	1
7	0_7702509	Confined	9,967	4/15/2006	360.97	400.13	-39.16	1
7	0_7702509	Confined	9,972	4/20/2006	360.98	400.32	-39.34	1
7	0_7702509	Confined	9,977	4/25/2006	360.99	400.51	-39.52	1
7	0_7702509	Confined	9,982	4/30/2006	360.99	400.70	-39.71	1
7	0_7702509	Confined	9,987	5/5/2006	360.99	400.89	-39.90	1
7	0_7702509	Confined	9,992	5/10/2006	360.99	401.09	-40.10	1
7	0_7702509	Confined	9,997	5/15/2006	360.99	401.28	-40.29	1
7	0_7702509	Confined	10,002	5/20/2006	364.40	401.47	-37.07	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	10,007	5/25/2006	355.01	401.66	-46.65	1
7	0_7702509	Confined	10,012	5/30/2006	364.85	401.85	-37.00	1
7	0_7702509	Confined	10,018	6/5/2006	365.23	402.08	-36.85	1
7	0_7702509	Confined	10,023	6/10/2006	352.14	402.27	-50.13	1
7	0_7702509	Confined	10,028	6/15/2006	350.18	402.46	-52.28	1
7	0_7702509	Confined	10,033	6/20/2006	346.89	402.65	-55.76	1
7	0_7702509	Confined	10,038	6/25/2006	349.03	402.84	-53.81	1
7	0_7702509	Confined	10,043	6/30/2006	344.75	403.03	-58.28	1
7	0_7702509	Confined	10,048	7/5/2006	348.57	403.22	-54.65	1
7	0_7702509	Confined	10,053	7/10/2006	346.80	403.41	-56.61	1
7	0_7702509	Confined	10,058	7/15/2006	342.10	403.60	-61.50	1
7	0_7702509	Confined	10,063	7/20/2006	342.50	403.79	-61.29	1
7	0_7702509	Confined	10,068	7/25/2006	341.26	403.98	-62.72	1
7	0_7702509	Confined	10,073	7/30/2006	340.29	404.17	-63.88	1
7	0_7702509	Confined	10,079	8/5/2006	340.05	404.40	-64.35	1
7	0_7702509	Confined	10,084	8/10/2006	341.77	404.59	-62.82	1
7	0_7702509	Confined	10,089	8/15/2006	338.61	404.78	-66.17	1
7	0_7702509	Confined	10,094	8/20/2006	338.73	404.97	-66.24	1
7	0_7702509	Confined	10,099	8/25/2006	340.45	405.17	-64.72	1
7	0_7702509	Confined	10,104	8/30/2006	346.61	405.36	-58.75	1
7	0_7702509	Confined	10,110	9/5/2006	347.97	405.58	-57.61	1
7	0_7702509	Confined	10,115	9/10/2006	345.93	405.78	-59.85	1
7	0_7702509	Confined	10,120	9/15/2006	353.94	405.97	-52.03	1
7	0_7702509	Confined	10,125	9/20/2006	358.48	406.16	-47.68	1
7	0_7702509	Confined	10,130	9/25/2006	360.67	406.35	-45.68	1
7	0_7702509	Confined	10,135	9/30/2006	362.93	406.54	-43.61	1
7	0_7702509	Confined	10,140	10/5/2006	363.60	406.73	-43.13	1
7	0_7702509	Confined	10,145	10/10/2006	362.91	406.92	-44.01	1
7	0_7702509	Confined	10,150	10/15/2006	364.76	407.11	-42.35	1
7	0_7702509	Confined	10,155	10/20/2006	362.90	407.30	-44.40	1
7	0_7702509	Confined	10,160	10/25/2006	361.06	407.49	-46.43	1
7	0_7702509	Confined	10,165	10/30/2006	363.68	407.68	-44.00	1
7	0_7702509	Confined	10,171	11/5/2006	359.72	407.91	-48.19	1
7	0_7702509	Confined	10,176	11/10/2006	360.11	408.10	-47.99	1
7	0_7702509	Confined	10,181	11/15/2006	356.91	408.29	-51.38	1
7	0_7702509	Confined	10,186	11/20/2006	358.68	408.48	-49.80	1
7	0_7702509	Confined	10,191	11/25/2006	356.09	408.67	-52.58	1
7	0_7702509	Confined	10,196	11/30/2006	356.93	408.86	-51.93	1
7	0_7702509	Confined	10,201	12/5/2006	360.11	409.05	-48.94	1
7	0_7702509	Confined	10,206	12/10/2006	360.23	409.25	-49.02	1
7	0_7702509	Confined	10,211	12/15/2006	359.19	409.44	-50.25	1
7	0_7702509	Confined	10,216	12/20/2006	355.82	409.63	-53.81	1
7	0_7702509	Confined	10,221	12/25/2006	359.77	409.82	-50.05	1
7	0_7702509	Confined	10,226	12/30/2006	361.93	410.01	-48.08	1
7	0_7702509	Confined	10,232	1/5/2007	364.49	410.08	-45.59	1
7	0_7702509	Confined	10,237	1/10/2007	365.72	410.11	-44.39	1
7	0_7702509	Confined	10,242	1/15/2007	367.29	410.15	-42.86	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	10,247	1/20/2007	368.56	410.18	-41.62	1
7	0_7702509	Confined	10,252	1/25/2007	369.96	410.21	-40.25	1
7	0_7702509	Confined	10,257	1/30/2007	370.69	410.25	-39.56	1
7	0_7702509	Confined	10,263	2/5/2007	372.41	410.29	-37.88	1
7	0_7702509	Confined	10,268	2/10/2007	373.84	410.32	-36.48	1
7	0_7702509	Confined	10,273	2/15/2007	374.44	410.35	-35.91	1
7	0_7702509	Confined	10,278	2/20/2007	373.21	410.39	-37.18	1
7	0_7702509	Confined	10,283	2/25/2007	373.07	410.42	-37.35	1
7	0_7702509	Confined	10,286	2/28/2007	372.44	410.44	-38.00	1
7	0_7702509	Confined	10,291	3/5/2007	368.32	410.47	-42.15	1
7	0_7702509	Confined	10,296	3/10/2007	367.98	410.51	-42.53	1
7	0_7702509	Confined	10,301	3/15/2007	370.66	410.54	-39.88	1
7	0_7702509	Confined	10,306	3/20/2007	371.30	410.57	-39.27	1
7	0_7702509	Confined	10,311	3/25/2007	371.13	410.61	-39.48	1
7	0_7702509	Confined	10,316	3/30/2007	372.17	410.64	-38.47	1
7	0_7702509	Confined	10,322	4/5/2007	374.11	410.68	-36.57	1
7	0_7702509	Confined	10,327	4/10/2007	375.35	410.71	-35.36	1
7	0_7702509	Confined	10,332	4/15/2007	374.99	410.75	-35.76	1
7	0_7702509	Confined	10,337	4/20/2007	373.60	410.78	-37.18	1
7	0_7702509	Confined	10,342	4/25/2007	370.67	410.81	-40.14	1
7	0_7702509	Confined	10,347	4/30/2007	374.27	410.85	-36.58	1
7	0_7702509	Confined	10,352	5/5/2007	372.64	410.88	-38.24	1
7	0_7702509	Confined	10,357	5/10/2007	374.11	410.91	-36.80	1
7	0_7702509	Confined	10,362	5/15/2007	374.51	410.95	-36.44	1
7	0_7702509	Confined	10,367	5/20/2007	372.63	410.98	-38.35	1
7	0_7702509	Confined	10,372	5/25/2007	373.75	411.01	-37.26	1
7	0_7702509	Confined	10,377	5/30/2007	375.14	411.05	-35.91	1
7	0_7702509	Confined	10,383	6/5/2007	375.33	411.09	-35.76	1
7	0_7702509	Confined	10,388	6/10/2007	375.96	411.12	-35.16	1
7	0_7702509	Confined	10,393	6/15/2007	374.12	411.15	-37.03	1
7	0_7702509	Confined	10,398	6/20/2007	375.91	411.19	-35.28	1
7	0_7702509	Confined	10,403	6/25/2007	378.13	411.22	-33.09	1
7	0_7702509	Confined	10,408	6/30/2007	379.28	411.25	-31.97	1
7	0_7702509	Confined	10,413	7/5/2007	379.77	411.29	-31.52	1
7	0_7702509	Confined	10,418	7/10/2007	379.95	411.32	-31.37	1
7	0_7702509	Confined	10,423	7/15/2007	379.75	411.36	-31.61	1
7	0_7702509	Confined	10,428	7/20/2007	380.72	411.39	-30.67	1
7	0_7702509	Confined	10,433	7/25/2007	381.56	411.42	-29.86	1
7	0_7702509	Confined	10,438	7/30/2007	382.46	411.46	-29.00	1
7	0_7702509	Confined	10,444	8/5/2007	380.63	411.50	-30.87	1
7	0_7702509	Confined	10,449	8/10/2007	379.86	411.53	-31.67	1
7	0_7702509	Confined	10,454	8/15/2007	382.99	411.56	-28.57	1
7	0_7702509	Confined	10,459	8/20/2007	382.58	411.60	-29.02	1
7	0_7702509	Confined	10,464	8/25/2007	384.13	411.63	-27.50	1
7	0_7702509	Confined	10,469	8/30/2007	385.05	411.66	-26.61	1
7	0_7702509	Confined	10,475	9/5/2007	379.08	411.70	-32.62	1
7	0_7702509	Confined	10,480	9/10/2007	385.68	411.74	-26.06	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	10,485	9/15/2007	385.10	411.77	-26.67	1
7	0_7702509	Confined	10,490	9/20/2007	385.62	411.80	-26.18	1
7	0_7702509	Confined	10,495	9/25/2007	385.60	411.84	-26.24	1
7	0_7702509	Confined	10,500	9/30/2007	385.37	411.87	-26.50	1
7	0_7702509	Confined	10,505	10/5/2007	380.13	411.90	-31.77	1
7	0_7702509	Confined	10,510	10/10/2007	383.00	411.94	-28.94	1
7	0_7702509	Confined	10,515	10/15/2007	383.32	411.97	-28.65	1
7	0_7702509	Confined	10,520	10/20/2007	384.40	412.00	-27.60	1
7	0_7702509	Confined	10,525	10/25/2007	383.67	412.04	-28.37	1
7	0_7702509	Confined	10,530	10/30/2007	381.90	412.07	-30.17	1
7	0_7702509	Confined	10,536	11/5/2007	380.73	412.11	-31.38	1
7	0_7702509	Confined	10,541	11/10/2007	381.09	412.14	-31.05	1
7	0_7702509	Confined	10,546	11/15/2007	381.24	412.18	-30.94	1
7	0_7702509	Confined	10,551	11/20/2007	379.58	412.21	-32.63	1
7	0_7702509	Confined	10,556	11/25/2007	380.69	412.24	-31.55	1
7	0_7702509	Confined	10,561	11/30/2007	381.22	412.28	-31.06	1
7	0_7702509	Confined	10,566	12/5/2007	380.69	412.31	-31.62	1
7	0_7702509	Confined	10,571	12/10/2007	379.15	412.34	-33.19	1
7	0_7702509	Confined	10,576	12/15/2007	380.64	412.38	-31.74	1
7	0_7702509	Confined	10,581	12/20/2007	379.31	412.41	-33.10	1
7	0_7702509	Confined	10,586	12/25/2007	380.88	412.44	-31.56	1
7	0_7702509	Confined	10,591	12/30/2007	380.35	412.48	-32.13	1
7	0_7702509	Confined	10,597	1/5/2008	380.64	412.13	-31.49	1
7	0_7702509	Confined	10,602	1/10/2008	378.29	411.78	-33.49	1
7	0_7702509	Confined	10,607	1/15/2008	380.55	411.44	-30.89	1
7	0_7702509	Confined	10,612	1/20/2008	377.19	411.09	-33.90	1
7	0_7702509	Confined	10,617	1/25/2008	379.71	410.74	-31.03	1
7	0_7702509	Confined	10,622	1/30/2008	379.80	410.39	-30.59	1
7	0_7702509	Confined	10,628	2/5/2008	378.89	409.97	-31.08	1
7	0_7702509	Confined	10,633	2/10/2008	378.11	409.62	-31.51	1
7	0_7702509	Confined	10,638	2/15/2008	378.38	409.27	-30.89	1
7	0_7702509	Confined	10,643	2/20/2008	379.11	408.92	-29.81	1
7	0_7702509	Confined	10,648	2/25/2008	372.90	408.57	-35.67	1
7	0_7702509	Confined	10,651	2/28/2008	372.90	408.36	-35.46	1
7	0_7702509	Confined	10,652	2/29/2008	375.84	408.29	-32.45	1
7	0_7702509	Confined	10,657	3/5/2008	373.38	407.94	-34.56	1
7	0_7702509	Confined	10,662	3/10/2008	372.60	407.59	-34.99	1
7	0_7702509	Confined	10,667	3/15/2008	373.86	407.24	-33.38	1
7	0_7702509	Confined	10,672	3/20/2008	371.60	406.89	-35.29	1
7	0_7702509	Confined	10,677	3/25/2008	366.10	406.54	-40.44	1
7	0_7702509	Confined	10,682	3/30/2008	363.11	406.19	-43.08	1
7	0_7702509	Confined	10,688	4/5/2008	364.10	405.78	-41.68	1
7	0_7702509	Confined	10,693	4/10/2008	363.05	405.43	-42.38	1
7	0_7702509	Confined	10,698	4/15/2008	363.48	405.08	-41.60	1
7	0_7702509	Confined	10,703	4/20/2008	358.10	404.73	-46.63	1
7	0_7702509	Confined	10,708	4/25/2008	360.41	404.38	-43.97	1
7	0_7702509	Confined	10,713	4/30/2008	362.10	404.03	-41.93	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	10,718	5/5/2008	358.38	403.68	-45.30	1
7	0_7702509	Confined	10,723	5/10/2008	359.10	403.33	-44.23	1
7	0_7702509	Confined	10,728	5/15/2008	363.51	402.98	-39.47	1
7	0_7702509	Confined	10,733	5/20/2008	366.93	402.63	-35.70	1
7	0_7702509	Confined	10,738	5/25/2008	366.59	402.28	-35.69	1
7	0_7702509	Confined	10,743	5/30/2008	362.60	401.93	-39.33	1
7	0_7702509	Confined	10,749	6/5/2008	362.34	401.51	-39.17	1
7	0_7702509	Confined	10,754	6/10/2008	360.88	401.16	-40.28	1
7	0_7702509	Confined	10,759	6/15/2008	356.84	400.81	-43.97	1
7	0_7702509	Confined	10,764	6/20/2008	355.65	400.47	-44.82	1
7	0_7702509	Confined	10,769	6/25/2008	355.75	400.12	-44.37	1
7	0_7702509	Confined	10,774	6/30/2008	356.58	399.77	-43.19	1
7	0_7702509	Confined	10,779	7/5/2008	356.96	399.42	-42.46	1
7	0_7702509	Confined	10,784	7/10/2008	361.02	399.07	-38.05	1
7	0_7702509	Confined	10,789	7/15/2008	362.23	398.72	-36.49	1
7	0_7702509	Confined	10,794	7/20/2008	354.16	398.37	-44.21	1
7	0_7702509	Confined	10,799	7/25/2008	360.87	398.02	-37.15	1
7	0_7702509	Confined	10,804	7/30/2008	356.86	397.67	-40.81	1
7	0_7702509	Confined	10,810	8/5/2008	357.14	397.25	-40.11	1
7	0_7702509	Confined	10,815	8/10/2008	359.37	396.90	-37.53	1
7	0_7702509	Confined	10,820	8/15/2008	362.79	396.55	-33.76	1
7	0_7702509	Confined	10,825	8/20/2008	364.11	396.20	-32.09	1
7	0_7702509	Confined	10,830	8/25/2008	365.17	395.85	-30.68	1
7	0_7702509	Confined	10,835	8/30/2008	367.81	395.50	-27.69	1
7	0_7702509	Confined	10,841	9/5/2008	369.49	395.08	-25.59	1
7	0_7702509	Confined	10,846	9/10/2008	370.33	394.74	-24.41	1
7	0_7702509	Confined	10,851	9/15/2008	371.33	394.39	-23.06	1
7	0_7702509	Confined	10,856	9/20/2008	372.09	394.04	-21.95	1
7	0_7702509	Confined	10,861	9/25/2008	371.54	393.69	-22.15	1
7	0_7702509	Confined	10,866	9/30/2008	371.75	393.34	-21.59	1
7	0_7702509	Confined	10,871	10/5/2008	369.59	392.99	-23.40	1
7	0_7702509	Confined	10,876	10/10/2008	373.09	392.64	-19.55	1
7	0_7702509	Confined	10,881	10/15/2008	373.43	392.29	-18.86	1
7	0_7702509	Confined	10,886	10/20/2008	371.31	391.94	-20.63	1
7	0_7702509	Confined	10,891	10/25/2008	369.75	391.59	-21.84	1
7	0_7702509	Confined	10,896	10/30/2008	368.92	391.24	-22.32	1
7	0_7702509	Confined	10,902	11/5/2008	368.91	390.82	-21.91	1
7	0_7702509	Confined	10,907	11/10/2008	368.52	390.47	-21.95	1
7	0_7702509	Confined	10,912	11/15/2008	365.87	390.12	-24.25	1
7	0_7702509	Confined	10,917	11/20/2008	364.96	389.77	-24.81	1
7	0_7702509	Confined	10,922	11/25/2008	364.59	389.42	-24.83	1
7	0_7702509	Confined	10,927	11/30/2008	364.01	389.08	-25.07	1
7	0_7702509	Confined	10,932	12/5/2008	364.07	388.73	-24.66	1
7	0_7702509	Confined	10,937	12/10/2008	363.37	388.38	-25.01	1
7	0_7702509	Confined	10,942	12/15/2008	359.85	388.03	-28.18	1
7	0_7702509	Confined	10,947	12/20/2008	359.68	387.68	-28.00	1
7	0_7702509	Confined	10,952	12/25/2008	361.75	387.33	-25.58	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	10,957	12/30/2008	362.62	386.98	-24.36	1
7	0_7702509	Confined	10,963	1/5/2009	364.68	386.22	-21.54	1
7	0_7702509	Confined	10,968	1/10/2009	363.55	385.53	-21.98	1
7	0_7702509	Confined	10,973	1/15/2009	363.97	384.84	-20.87	1
7	0_7702509	Confined	10,978	1/20/2009	360.46	384.15	-23.69	1
7	0_7702509	Confined	10,983	1/25/2009	357.03	383.46	-26.43	1
7	0_7702509	Confined	10,988	1/30/2009	357.05	382.77	-25.72	1
7	0_7702509	Confined	10,994	2/5/2009	357.05	381.94	-24.89	1
7	0_7702509	Confined	10,999	2/10/2009	357.06	381.25	-24.19	1
7	0_7702509	Confined	11,004	2/15/2009	357.06	380.56	-23.50	1
7	0_7702509	Confined	11,009	2/20/2009	355.70	379.87	-24.17	1
7	0_7702509	Confined	11,014	2/25/2009	355.70	379.19	-23.49	1
7	0_7702509	Confined	11,017	2/28/2009	355.70	378.77	-23.07	1
7	0_7702509	Confined	11,022	3/5/2009	349.46	378.08	-28.62	1
7	0_7702509	Confined	11,027	3/10/2009	354.67	377.39	-22.72	1
7	0_7702509	Confined	11,032	3/15/2009	356.90	376.70	-19.80	1
7	0_7702509	Confined	11,037	3/20/2009	354.62	376.01	-21.39	1
7	0_7702509	Confined	11,042	3/25/2009	356.58	375.32	-18.74	1
7	0_7702509	Confined	11,047	3/30/2009	356.02	374.63	-18.61	1
7	0_7702509	Confined	11,053	4/5/2009	351.88	373.81	-21.93	1
7	0_7702509	Confined	11,058	4/10/2009	347.55	373.12	-25.57	1
7	0_7702509	Confined	11,063	4/15/2009	347.97	372.43	-24.46	1
7	0_7702509	Confined	11,068	4/20/2009	348.10	371.74	-23.64	1
7	0_7702509	Confined	11,073	4/25/2009	349.85	371.05	-21.20	1
7	0_7702509	Confined	11,078	4/30/2009	351.74	370.36	-18.62	1
7	0_7702509	Confined	11,083	5/5/2009	348.12	369.67	-21.55	1
7	0_7702509	Confined	11,088	5/10/2009	341.84	368.98	-27.14	1
7	0_7702509	Confined	11,093	5/15/2009	343.55	368.29	-24.74	1
7	0_7702509	Confined	11,098	5/20/2009	346.75	367.60	-20.85	1
7	0_7702509	Confined	11,103	5/25/2009	338.99	366.91	-27.92	1
7	0_7702509	Confined	11,108	5/30/2009	347.91	366.22	-18.31	1
7	0_7702509	Confined	11,114	6/5/2009	343.72	365.39	-21.67	1
7	0_7702509	Confined	11,119	6/10/2009	342.47	364.70	-22.23	1
7	0_7702509	Confined	11,124	6/15/2009	342.77	364.01	-21.24	1
7	0_7702509	Confined	11,129	6/20/2009	338.43	363.32	-24.89	1
7	0_7702509	Confined	11,134	6/25/2009	337.82	362.63	-24.81	1
7	0_7702509	Confined	11,139	6/30/2009	335.84	361.94	-26.10	1
7	0_7702509	Confined	11,144	7/5/2009	337.30	361.25	-23.95	1
7	0_7702509	Confined	11,149	7/10/2009	341.55	360.56	-19.01	1
7	0_7702509	Confined	11,154	7/15/2009	339.80	359.87	-20.07	1
7	0_7702509	Confined	11,159	7/20/2009	335.48	359.19	-23.71	1
7	0_7702509	Confined	11,164	7/25/2009	332.60	358.50	-25.90	1
7	0_7702509	Confined	11,169	7/30/2009	331.53	357.81	-26.28	1
7	0_7702509	Confined	11,175	8/5/2009	343.31	356.98	-13.67	1
7	0_7702509	Confined	11,180	8/10/2009	340.66	356.29	-15.63	1
7	0_7702509	Confined	11,185	8/15/2009	333.73	355.60	-21.87	1
7	0_7702509	Confined	11,190	8/20/2009	336.92	354.91	-17.99	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	11,195	8/25/2009	338.32	354.22	-15.90	1
7	0_7702509	Confined	11,200	8/30/2009	336.59	353.53	-16.94	1
7	0_7702509	Confined	11,206	9/5/2009	336.95	352.70	-15.75	1
7	0_7702509	Confined	11,211	9/10/2009	339.15	352.01	-12.86	1
7	0_7702509	Confined	11,216	9/15/2009	346.20	351.32	-5.12	1
7	0_7702509	Confined	11,221	9/20/2009	344.70	350.63	-5.93	1
7	0_7702509	Confined	11,226	9/25/2009	345.23	349.94	-4.71	1
7	0_7702509	Confined	11,231	9/30/2009	349.61	349.25	0.36	1
7	0_7702509	Confined	11,236	10/5/2009	352.02	348.56	3.46	1
7	0_7702509	Confined	11,241	10/10/2009	353.06	347.87	5.19	1
7	0_7702509	Confined	11,246	10/15/2009	355.08	347.18	7.90	1
7	0_7702509	Confined	11,251	10/20/2009	353.08	346.50	6.58	1
7	0_7702509	Confined	11,256	10/25/2009	355.25	345.81	9.44	1
7	0_7702509	Confined	11,261	10/30/2009	357.03	345.12	11.91	1
7	0_7702509	Confined	11,267	11/5/2009	356.10	344.29	11.81	1
7	0_7702509	Confined	11,272	11/10/2009	358.70	343.60	15.10	1
7	0_7702509	Confined	11,277	11/15/2009	359.77	342.91	16.86	1
7	0_7702509	Confined	11,282	11/20/2009	357.28	342.22	15.06	1
7	0_7702509	Confined	11,287	11/25/2009	360.95	341.53	19.42	1
7	0_7702509	Confined	11,292	11/30/2009	362.03	340.84	21.19	1
7	0_7702509	Confined	11,297	12/5/2009	362.75	340.15	22.60	1
7	0_7702509	Confined	11,302	12/10/2009	364.39	339.46	24.93	1
7	0_7702509	Confined	11,307	12/15/2009	365.46	338.77	26.69	1
7	0_7702509	Confined	11,312	12/20/2009	365.40	338.08	27.32	1
7	0_7702509	Confined	11,317	12/25/2009	363.11	337.39	25.72	1
7	0_7702509	Confined	11,322	12/30/2009	365.87	336.70	29.17	1
7	0_7702509	Confined	11,328	1/5/2010	365.58	336.23	29.35	1
7	0_7702509	Confined	11,333	1/10/2010	365.81	335.89	29.92	1
7	0_7702509	Confined	11,338	1/15/2010	367.35	335.55	31.80	1
7	0_7702509	Confined	11,343	1/20/2010	367.90	335.21	32.69	1
7	0_7702509	Confined	11,348	1/25/2010	368.32	334.87	33.45	1
7	0_7702509	Confined	11,353	1/30/2010	367.76	334.54	33.22	1
7	0_7702509	Confined	11,359	2/5/2010	369.49	334.13	35.36	1
7	0_7702509	Confined	11,364	2/10/2010	369.38	333.79	35.59	1
7	0_7702509	Confined	11,369	2/15/2010	370.72	333.46	37.26	1
7	0_7702509	Confined	11,374	2/20/2010	371.36	333.12	38.24	1
7	0_7702509	Confined	11,379	2/25/2010	371.63	332.78	38.85	1
7	0_7702509	Confined	11,382	2/28/2010	371.63	332.58	39.05	1
7	0_7702509	Confined	11,387	3/5/2010	372.48	332.24	40.24	1
7	0_7702509	Confined	11,392	3/10/2010	373.23	331.90	41.33	1
7	0_7702509	Confined	11,397	3/15/2010	368.78	331.56	37.22	1
7	0_7702509	Confined	11,402	3/20/2010	368.96	331.23	37.73	1
7	0_7702509	Confined	11,407	3/25/2010	367.38	330.89	36.49	1
7	0_7702509	Confined	11,412	3/30/2010	364.70	330.55	34.15	1
7	0_7702509	Confined	11,418	4/5/2010	364.71	330.14	34.57	1
7	0_7702509	Confined	11,423	4/10/2010	362.12	329.81	32.31	1
7	0_7702509	Confined	11,428	4/15/2010	363.60	329.47	34.13	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	11,433	4/20/2010	363.61	329.13	34.48	1
7	0_7702509	Confined	11,438	4/25/2010	366.18	328.79	37.39	1
7	0_7702509	Confined	11,443	4/30/2010	363.83	328.45	35.38	1
7	0_7702509	Confined	11,448	5/5/2010	363.48	328.12	35.36	1
7	0_7702509	Confined	11,453	5/10/2010	363.63	327.78	35.85	1
7	0_7702509	Confined	11,458	5/15/2010	360.45	327.44	33.01	1
7	0_7702509	Confined	11,463	5/20/2010	363.52	327.10	36.42	1
7	0_7702509	Confined	11,468	5/25/2010	365.19	326.77	38.42	1
7	0_7702509	Confined	11,473	5/30/2010	366.18	326.43	39.75	1
7	0_7702509	Confined	11,479	6/5/2010	363.61	326.02	37.59	1
7	0_7702509	Confined	11,484	6/10/2010	363.94	325.68	38.26	1
7	0_7702509	Confined	11,489	6/15/2010	361.78	325.35	36.43	1
7	0_7702509	Confined	11,494	6/20/2010	357.77	325.01	32.76	1
7	0_7702509	Confined	11,499	6/25/2010	351.71	324.67	27.04	1
7	0_7702509	Confined	11,504	6/30/2010	354.23	324.33	29.90	1
7	0_7702509	Confined	11,509	7/5/2010	360.77	323.99	36.78	1
7	0_7702509	Confined	11,514	7/10/2010	361.72	323.66	38.06	1
7	0_7702509	Confined	11,519	7/15/2010	362.84	323.32	39.52	1
7	0_7702509	Confined	11,524	7/20/2010	363.76	322.98	40.78	1
7	0_7702509	Confined	11,529	7/25/2010	363.47	322.64	40.83	1
7	0_7702509	Confined	11,534	7/30/2010	364.77	322.31	42.46	1
7	0_7702509	Confined	11,540	8/5/2010	363.11	321.90	41.21	1
7	0_7702509	Confined	11,545	8/10/2010	358.36	321.56	36.80	1
7	0_7702509	Confined	11,550	8/15/2010	355.73	321.22	34.51	1
7	0_7702509	Confined	11,555	8/20/2010	354.25	320.89	33.36	1
7	0_7702509	Confined	11,560	8/25/2010	358.10	320.55	37.55	1
7	0_7702509	Confined	11,565	8/30/2010	353.17	320.21	32.96	1
7	0_7702509	Confined	11,571	9/5/2010	356.01	319.81	36.20	1
7	0_7702509	Confined	11,576	9/10/2010	358.79	319.47	39.32	1
7	0_7702509	Confined	11,581	9/15/2010	361.57	319.13	42.44	1
7	0_7702509	Confined	11,586	9/20/2010	363.00	318.79	44.21	1
7	0_7702509	Confined	11,591	9/25/2010	364.38	318.45	45.93	1
7	0_7702509	Confined	11,596	9/30/2010	365.42	318.12	47.30	1
7	0_7702509	Confined	11,601	10/5/2010	363.43	317.78	45.65	1
7	0_7702509	Confined	11,606	10/10/2010	361.94	317.44	44.50	1
7	0_7702509	Confined	11,621	10/25/2010	358.92	316.43	42.49	1
7	0_7702509	Confined	11,626	10/30/2010	352.76	316.09	36.67	1
7	0_7702509	Confined	11,637	11/10/2010	356.77	315.34	41.43	1
7	0_7702509	Confined	11,642	11/15/2010	357.83	315.01	42.82	1
7	0_7702509	Confined	11,647	11/20/2010	348.82	314.67	34.15	1
7	0_7702509	Confined	11,652	11/25/2010	353.51	314.33	39.18	1
7	0_7702509	Confined	11,657	11/30/2010	353.37	313.99	39.38	1
7	0_7702509	Confined	11,662	12/5/2010	353.92	313.66	40.26	1
7	0_7702509	Confined	11,667	12/10/2010	352.94	313.32	39.62	1
7	0_7702509	Confined	11,672	12/15/2010	349.61	312.98	36.63	1
7	0_7702509	Confined	11,677	12/20/2010	350.71	312.64	38.07	1
7	0_7702509	Confined	11,682	12/25/2010	352.88	312.30	40.58	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	11,687	12/30/2010	351.11	311.97	39.14	1
7	0_7702509	Confined	11,693	1/5/2011	355.62	311.65	43.97	1
7	0_7702509	Confined	11,698	1/10/2011	355.10	311.41	43.69	1
7	0_7702509	Confined	11,703	1/15/2011	356.95	311.17	45.78	1
7	0_7702509	Confined	11,708	1/20/2011	357.42	310.92	46.50	1
7	0_7702509	Confined	11,713	1/25/2011	358.27	310.68	47.59	1
7	0_7702509	Confined	11,718	1/30/2011	358.22	310.44	47.78	1
7	0_7702509	Confined	11,739	2/20/2011	359.19	309.41	49.78	1
7	0_7702509	Confined	11,744	2/25/2011	356.73	309.17	47.56	1
7	0_7702509	Confined	11,752	3/5/2011	355.97	308.78	47.19	1
7	0_7702509	Confined	11,757	3/10/2011	355.40	308.53	46.87	1
7	0_7702509	Confined	11,762	3/15/2011	349.13	308.29	40.84	1
7	0_7702509	Confined	11,767	3/20/2011	343.70	308.05	35.65	1
7	0_7702509	Confined	11,803	4/25/2011	352.30	306.29	46.01	1
7	0_7702509	Confined	11,808	4/30/2011	349.91	306.05	43.86	1
7	0_7702509	Confined	11,813	5/5/2011	352.31	305.80	46.51	1
7	0_7702509	Confined	11,818	5/10/2011	351.16	305.56	45.60	1
7	0_7702509	Confined	11,823	5/15/2011	356.57	305.31	51.26	1
7	0_7702509	Confined	11,828	5/20/2011	358.17	305.07	53.10	1
7	0_7702509	Confined	11,833	5/25/2011	355.30	304.83	50.47	1
7	0_7702509	Confined	11,838	5/30/2011	350.15	304.58	45.57	1
7	0_7702509	Confined	11,844	6/5/2011	348.74	304.29	44.45	1
7	0_7702509	Confined	11,849	6/10/2011	343.97	304.05	39.92	1
7	0_7702509	Confined	11,854	6/15/2011	343.97	303.80	40.17	1
7	0_7702509	Confined	11,859	6/20/2011	343.97	303.56	40.41	1
7	0_7702509	Confined	11,864	6/25/2011	345.92	303.32	42.60	1
7	0_7702509	Confined	11,869	6/30/2011	343.97	303.07	40.90	1
7	0_7702509	Confined	11,874	7/5/2011	346.70	302.83	43.87	1
7	0_7702509	Confined	11,879	7/10/2011	344.36	302.58	41.78	1
7	0_7702509	Confined	11,899	7/30/2011	355.17	301.61	53.56	1
7	0_7702509	Confined	11,905	8/5/2011	355.47	301.32	54.15	1
7	0_7702509	Confined	11,910	8/10/2011	352.07	301.07	51.00	1
7	0_7702509	Confined	11,915	8/15/2011	361.10	300.83	60.27	1
7	0_7702509	Confined	11,920	8/20/2011	359.96	300.58	59.38	1
7	0_7702509	Confined	11,925	8/25/2011	359.81	300.34	59.47	1
7	0_7702509	Confined	11,930	8/30/2011	357.12	300.10	57.02	1
7	0_7702509	Confined	11,936	9/5/2011	364.14	299.80	64.34	1
7	0_7702509	Confined	11,941	9/10/2011	364.40	299.56	64.84	1
7	0_7702509	Confined	11,946	9/15/2011	364.40	299.32	65.08	1
7	0_7702509	Confined	11,951	9/20/2011	364.89	299.07	65.82	1
7	0_7702509	Confined	11,956	9/25/2011	369.55	298.83	70.72	1
7	0_7702509	Confined	11,961	9/30/2011	369.55	298.58	70.97	1
7	0_7702509	Confined	11,966	10/5/2011	369.01	298.34	70.67	1
7	0_7702509	Confined	11,991	10/30/2011	354.32	297.12	57.20	1
7	0_7702509	Confined	11,997	11/5/2011	354.26	296.83	57.43	1
7	0_7702509	Confined	12,002	11/10/2011	354.99	296.58	58.41	1
7	0_7702509	Confined	12,007	11/15/2011	353.99	296.34	57.65	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	12,012	11/20/2011	358.69	296.10	62.59	1
7	0_7702509	Confined	12,017	11/25/2011	356.74	295.85	60.89	1
7	0_7702509	Confined	12,022	11/30/2011	358.75	295.61	63.14	1
7	0_7702509	Confined	12,027	12/5/2011	360.43	295.37	65.06	1
7	0_7702509	Confined	12,032	12/10/2011	358.77	295.12	63.65	1
7	0_7702509	Confined	12,073	1/20/2012	347.79	294.96	52.83	1
7	0_7702509	Confined	12,078	1/25/2012	350.60	295.18	55.42	1
7	0_7702509	Confined	12,083	1/30/2012	352.55	295.39	57.16	1
7	0_7702509	Confined	12,089	2/5/2012	353.44	295.65	57.79	1
7	0_7702509	Confined	12,094	2/10/2012	353.79	295.87	57.92	1
7	0_7702509	Confined	12,099	2/15/2012	353.98	296.08	57.90	1
7	0_7702509	Confined	12,104	2/20/2012	354.67	296.30	58.37	1
7	0_7702509	Confined	12,109	2/25/2012	355.53	296.51	59.02	1
7	0_7702509	Confined	12,112	2/28/2012	355.53	296.64	58.89	1
7	0_7702509	Confined	12,123	3/10/2012	354.95	297.12	57.83	1
7	0_7702509	Confined	12,128	3/15/2012	355.01	297.33	57.68	1
7	0_7702509	Confined	12,133	3/20/2012	354.95	297.55	57.40	1
7	0_7702509	Confined	12,138	3/25/2012	356.11	297.76	58.35	1
7	0_7702509	Confined	12,143	3/30/2012	356.80	297.98	58.82	1
7	0_7702509	Confined	12,149	4/5/2012	357.93	298.24	59.69	1
7	0_7702509	Confined	12,154	4/10/2012	357.70	298.45	59.25	1
7	0_7702509	Confined	12,159	4/15/2012	357.22	298.67	58.55	1
7	0_7702509	Confined	12,164	4/20/2012	350.63	298.89	51.74	1
7	0_7702509	Confined	12,169	4/25/2012	351.84	299.10	52.74	1
7	0_7702509	Confined	12,174	4/30/2012	347.55	299.32	48.23	1
7	0_7702509	Confined	12,179	5/5/2012	343.65	299.53	44.12	1
7	0_7702509	Confined	12,184	5/10/2012	348.30	299.75	48.55	1
7	0_7702509	Confined	12,189	5/15/2012	351.16	299.96	51.20	1
7	0_7702509	Confined	12,194	5/20/2012	352.42	300.18	52.24	1
7	0_7702509	Confined	12,215	6/10/2012	353.27	301.08	52.19	1
7	0_7702509	Confined	12,220	6/15/2012	344.53	301.30	43.23	1
7	0_7702509	Confined	12,225	6/20/2012	345.86	301.52	44.34	1
7	0_7702509	Confined	12,230	6/25/2012	341.50	301.73	39.77	1
7	0_7702509	Confined	12,235	6/30/2012	341.16	301.95	39.21	1
7	0_7702509	Confined	12,240	7/5/2012	341.67	302.16	39.51	1
7	0_7702509	Confined	12,245	7/10/2012	337.75	302.38	35.37	1
7	0_7702509	Confined	12,255	7/20/2012	346.09	302.81	43.28	1
7	0_7702509	Confined	12,260	7/25/2012	344.81	303.03	41.78	1
7	0_7702509	Confined	12,265	7/30/2012	346.19	303.24	42.95	1
7	0_7702509	Confined	12,271	8/5/2012	342.74	303.50	39.24	1
7	0_7702509	Confined	12,276	8/10/2012	346.84	303.72	43.12	1
7	0_7702509	Confined	12,281	8/15/2012	348.63	303.93	44.70	1
7	0_7702509	Confined	12,286	8/20/2012	351.54	304.15	47.39	1
7	0_7702509	Confined	12,291	8/25/2012	354.18	304.36	49.82	1
7	0_7702509	Confined	12,296	8/30/2012	355.57	304.58	50.99	1
7	0_7702509	Confined	12,302	9/5/2012	355.12	304.84	50.28	1
7	0_7702509	Confined	12,307	9/10/2012	355.76	305.05	50.71	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	12,312	9/15/2012	355.10	305.27	49.83	1
7	0_7702509	Confined	12,317	9/20/2012	359.00	305.48	53.52	1
7	0_7702509	Confined	12,322	9/25/2012	359.81	305.70	54.11	1
7	0_7702509	Confined	12,327	9/30/2012	362.00	305.92	56.08	1
7	0_7702509	Confined	12,332	10/5/2012	363.55	306.13	57.42	1
7	0_7702509	Confined	12,337	10/10/2012	365.10	306.35	58.75	1
7	0_7702509	Confined	12,342	10/15/2012	365.84	306.56	59.28	1
7	0_7702509	Confined	12,347	10/20/2012	363.94	306.78	57.16	1
7	0_7702509	Confined	12,352	10/25/2012	363.39	306.99	56.40	1
7	0_7702509	Confined	12,357	10/30/2012	363.77	307.21	56.56	1
7	0_7702509	Confined	12,363	11/5/2012	364.10	307.47	56.63	1
7	0_7702509	Confined	12,368	11/10/2012	365.63	307.68	57.95	1
7	0_7702509	Confined	12,385	11/27/2012	355.08	308.42	46.66	1
7	0_7702509	Confined	12,388	11/30/2012	353.54	308.55	44.99	1
7	0_7702509	Confined	12,393	12/5/2012	354.63	308.76	45.87	1
7	0_7702509	Confined	12,398	12/10/2012	355.18	308.98	46.20	1
7	0_7702509	Confined	12,403	12/15/2012	353.28	309.19	44.09	1
7	0_7702509	Confined	12,408	12/20/2012	355.57	309.41	46.16	1
7	0_7702509	Confined	12,413	12/25/2012	356.51	309.62	46.89	1
7	0_7702509	Confined	12,418	12/30/2012	355.90	309.84	46.06	1
7	0_7702509	Confined	12,424	1/5/2013	343.07	310.01	33.06	1
7	0_7702509	Confined	12,429	1/10/2013	345.09	310.13	34.96	1
7	0_7702509	Confined	12,434	1/15/2013	345.74	310.26	35.48	1
7	0_7702509	Confined	12,439	1/20/2013	345.65	310.38	35.27	1
7	0_7702509	Confined	12,444	1/25/2013	354.80	310.50	44.30	1
7	0_7702509	Confined	12,449	1/30/2013	342.32	310.63	31.69	1
7	0_7702509	Confined	12,455	2/5/2013	340.91	310.78	30.13	1
7	0_7702509	Confined	12,460	2/10/2013	339.20	310.90	28.30	1
7	0_7702509	Confined	12,465	2/15/2013	341.23	311.03	30.20	1
7	0_7702509	Confined	12,470	2/20/2013	334.17	311.15	23.02	1
7	0_7702509	Confined	12,475	2/25/2013	336.99	311.27	25.72	1
7	0_7702509	Confined	12,478	2/28/2013	336.99	311.35	25.64	1
7	0_7702509	Confined	12,483	3/5/2013	331.85	311.47	20.38	1
7	0_7702509	Confined	12,488	3/10/2013	328.14	311.60	16.54	1
7	0_7702509	Confined	12,493	3/15/2013	324.71	311.72	12.99	1
7	0_7702509	Confined	12,498	3/20/2013	323.14	311.84	11.30	1
7	0_7702509	Confined	12,503	3/25/2013	321.61	311.97	9.64	1
7	0_7702509	Confined	12,508	3/30/2013	318.02	312.09	5.93	1
7	0_7702509	Confined	12,514	4/5/2013	325.64	312.24	13.40	1
7	0_7702509	Confined	12,519	4/10/2013	317.82	312.37	5.45	1
7	0_7702509	Confined	12,524	4/15/2013	320.31	312.49	7.82	1
7	0_7702509	Confined	12,529	4/20/2013	323.03	312.61	10.42	1
7	0_7702509	Confined	12,534	4/25/2013	323.14	312.74	10.40	1
7	0_7702509	Confined	12,539	4/30/2013	317.23	312.86	4.37	1
7	0_7702509	Confined	12,544	5/5/2013	320.42	312.99	7.43	1
7	0_7702509	Confined	12,549	5/10/2013	317.20	313.11	4.09	1
7	0_7702509	Confined	12,554	5/15/2013	317.22	313.24	3.98	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	12,559	5/20/2013	317.25	313.36	3.89	1
7	0_7702509	Confined	12,564	5/25/2013	317.21	313.48	3.73	1
7	0_7702509	Confined	12,569	5/30/2013	320.19	313.61	6.58	1
7	0_7702509	Confined	12,575	6/5/2013	314.10	313.76	0.34	1
7	0_7702509	Confined	12,580	6/10/2013	319.64	313.88	5.76	1
7	0_7702509	Confined	12,585	6/15/2013	322.41	314.00	8.41	1
7	0_7702509	Confined	12,590	6/20/2013	327.22	314.13	13.09	1
7	0_7702509	Confined	12,595	6/25/2013	327.03	314.25	12.78	1
7	0_7702509	Confined	12,600	6/30/2013	324.23	314.38	9.85	1
7	0_7702509	Confined	12,605	7/5/2013	322.42	314.50	7.92	1
7	0_7702509	Confined	12,610	7/10/2013	319.38	314.63	4.75	1
7	0_7702509	Confined	12,615	7/15/2013	317.22	314.75	2.47	1
7	0_7702509	Confined	12,620	7/20/2013	316.93	314.87	2.06	1
7	0_7702509	Confined	12,625	7/25/2013	317.43	315.00	2.43	1
7	0_7702509	Confined	12,630	7/30/2013	314.87	315.12	-0.25	1
7	0_7702509	Confined	12,636	8/5/2013	312.14	315.27	-3.13	1
7	0_7702509	Confined	12,641	8/10/2013	311.81	315.40	-3.59	1
7	0_7702509	Confined	12,646	8/15/2013	310.12	315.52	-5.40	1
7	0_7702509	Confined	12,651	8/20/2013	312.67	315.64	-2.97	1
7	0_7702509	Confined	12,656	8/25/2013	312.36	315.77	-3.41	1
7	0_7702509	Confined	12,661	8/30/2013	316.16	315.89	0.27	1
7	0_7702509	Confined	12,667	9/5/2013	317.19	316.04	1.15	1
7	0_7702509	Confined	12,672	9/10/2013	319.10	316.16	2.94	1
7	0_7702509	Confined	12,677	9/15/2013	322.32	316.29	6.03	1
7	0_7702509	Confined	12,682	9/20/2013	324.46	316.41	8.05	1
7	0_7702509	Confined	12,687	9/25/2013	324.81	316.54	8.27	1
7	0_7702509	Confined	12,692	9/30/2013	325.68	316.66	9.02	1
7	0_7702509	Confined	12,697	10/5/2013	326.71	316.79	9.92	1
7	0_7702509	Confined	12,702	10/10/2013	324.75	316.91	7.84	1
7	0_7702509	Confined	12,707	10/15/2013	326.40	317.03	9.37	1
7	0_7702509	Confined	12,712	10/20/2013	331.71	317.16	14.55	1
7	0_7702509	Confined	12,715	10/23/2013	332.86	317.23	15.63	1
7	0_7702509	Confined	12,717	10/25/2013	332.57	317.28	15.29	1
7	0_7702509	Confined	12,721	10/29/2013	332.15	317.38	14.77	1
7	0_7702509	Confined	12,722	10/30/2013	333.03	317.41	15.62	1
7	0_7702509	Confined	12,728	11/5/2013	332.71	317.56	15.15	1
7	0_7702509	Confined	12,733	11/10/2013	331.94	317.68	14.26	1
7	0_7702509	Confined	12,738	11/15/2013	332.49	317.80	14.69	1
7	0_7702509	Confined	12,743	11/20/2013	333.28	317.93	15.35	1
7	0_7702509	Confined	12,748	11/25/2013	336.04	318.05	17.99	1
7	0_7702509	Confined	12,753	11/30/2013	337.55	318.18	19.37	1
7	0_7702509	Confined	12,758	12/5/2013	339.44	318.30	21.14	1
7	0_7702509	Confined	12,763	12/10/2013	340.65	318.42	22.23	1
7	0_7702509	Confined	12,768	12/15/2013	340.65	318.55	22.10	1
7	0_7702509	Confined	12,773	12/20/2013	340.51	318.67	21.84	1
7	0_7702509	Confined	12,778	12/25/2013	340.55	318.80	21.75	1
7	0_7702509	Confined	12,783	12/30/2013	341.13	318.92	22.21	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	12,789	1/5/2014	342.32	318.98	23.34	1
7	0_7702509	Confined	12,794	1/10/2014	341.75	319.01	22.74	1
7	0_7702509	Confined	12,799	1/15/2014	341.74	319.04	22.70	1
7	0_7702509	Confined	12,804	1/20/2014	341.74	319.08	22.66	1
7	0_7702509	Confined	12,809	1/25/2014	341.74	319.11	22.63	1
7	0_7702509	Confined	12,814	1/30/2014	338.14	319.14	19.00	1
7	0_7702509	Confined	12,819	2/4/2014	339.25	319.17	20.08	1
7	0_7702509	Confined	12,820	2/5/2014	338.96	319.18	19.78	1
7	0_7702509	Confined	12,825	2/10/2014	339.75	319.21	20.54	1
7	0_7702509	Confined	12,830	2/15/2014	338.10	319.24	18.86	1
7	0_7702509	Confined	12,835	2/20/2014	336.78	319.28	17.50	1
7	0_7702509	Confined	12,840	2/25/2014	338.12	319.31	18.81	1
7	0_7702509	Confined	12,843	2/28/2014	339.77	319.33	20.44	1
7	0_7702509	Confined	12,848	3/5/2014	341.96	319.36	22.60	1
7	0_7702509	Confined	12,853	3/10/2014	339.34	319.39	19.95	1
7	0_7702509	Confined	12,858	3/15/2014	337.38	319.43	17.95	1
7	0_7702509	Confined	12,863	3/20/2014	329.93	319.46	10.47	1
7	0_7702509	Confined	12,868	3/25/2014	334.96	319.49	15.47	1
7	0_7702509	Confined	12,873	3/30/2014	337.02	319.52	17.50	1
7	0_7702509	Confined	12,879	4/5/2014	333.85	319.56	14.29	1
7	0_7702509	Confined	12,884	4/10/2014	330.70	319.59	11.11	1
7	0_7702509	Confined	12,889	4/15/2014	330.13	319.63	10.50	1
7	0_7702509	Confined	12,894	4/20/2014	328.86	319.66	9.20	1
7	0_7702509	Confined	12,899	4/25/2014	325.18	319.69	5.49	1
7	0_7702509	Confined	12,904	4/30/2014	324.61	319.72	4.89	1
7	0_7702509	Confined	12,909	5/5/2014	326.46	319.76	6.70	1
7	0_7702509	Confined	12,914	5/10/2014	324.07	319.79	4.28	1
7	0_7702509	Confined	12,919	5/15/2014	331.53	319.82	11.71	1
7	0_7702509	Confined	12,924	5/20/2014	331.37	319.85	11.52	1
7	0_7702509	Confined	12,929	5/25/2014	330.49	319.89	10.60	1
7	0_7702509	Confined	12,934	5/30/2014	331.84	319.92	11.92	1
7	0_7702509	Confined	12,940	6/5/2014	328.26	319.96	8.30	1
7	0_7702509	Confined	12,945	6/10/2014	328.30	319.99	8.31	1
7	0_7702509	Confined	12,950	6/15/2014	325.70	320.02	5.68	1
7	0_7702509	Confined	12,955	6/20/2014	319.01	320.05	-1.04	1
7	0_7702509	Confined	12,960	6/25/2014	322.94	320.09	2.85	1
7	0_7702509	Confined	12,965	6/30/2014	327.79	320.12	7.67	1
7	0_7702509	Confined	12,970	7/5/2014	321.57	320.15	1.42	1
7	0_7702509	Confined	12,975	7/10/2014	318.25	320.18	-1.93	1
7	0_7702509	Confined	12,980	7/15/2014	322.46	320.22	2.24	1
7	0_7702509	Confined	12,985	7/20/2014	319.05	320.25	-1.20	1
7	0_7702509	Confined	12,990	7/25/2014	312.79	320.28	-7.49	1
7	0_7702509	Confined	12,995	7/30/2014	308.07	320.31	-12.24	1
7	0_7702509	Confined	13,001	8/5/2014	306.96	320.35	-13.39	1
7	0_7702509	Confined	13,006	8/10/2014	304.32	320.39	-16.07	1
7	0_7702509	Confined	13,011	8/15/2014	304.32	320.42	-16.10	1
7	0_7702509	Confined	13,016	8/20/2014	303.36	320.45	-17.09	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	13,021	8/25/2014	303.36	320.48	-17.12	1
7	0_7702509	Confined	13,026	8/30/2014	311.97	320.52	-8.55	1
7	0_7702509	Confined	13,032	9/5/2014	311.97	320.55	-8.58	1
7	0_7702509	Confined	13,037	9/10/2014	311.97	320.59	-8.62	1
7	0_7702509	Confined	13,042	9/15/2014	311.97	320.62	-8.65	1
7	0_7702509	Confined	13,047	9/20/2014	311.97	320.65	-8.68	1
7	0_7702509	Confined	13,052	9/25/2014	311.97	320.68	-8.71	1
7	0_7702509	Confined	13,057	9/30/2014	311.99	320.72	-8.73	1
7	0_7702509	Confined	13,062	10/5/2014	311.99	320.75	-8.76	1
7	0_7702509	Confined	13,067	10/10/2014	325.90	320.78	5.12	1
7	0_7702509	Confined	13,072	10/15/2014	324.77	320.81	3.96	1
7	0_7702509	Confined	13,077	10/20/2014	321.74	320.85	0.89	1
7	0_7702509	Confined	13,082	10/25/2014	319.54	320.88	-1.34	1
7	0_7702509	Confined	13,087	10/30/2014	317.37	320.91	-3.54	1
7	0_7702509	Confined	13,093	11/5/2014	324.37	320.95	3.42	1
7	0_7702509	Confined	13,098	11/10/2014	328.58	320.98	7.60	1
7	0_7702509	Confined	13,103	11/15/2014	328.96	321.02	7.94	1
7	0_7702509	Confined	13,108	11/20/2014	333.32	321.05	12.27	1
7	0_7702509	Confined	13,113	11/25/2014	336.88	321.08	15.80	1
7	0_7702509	Confined	13,118	11/30/2014	336.39	321.11	15.28	1
7	0_7702509	Confined	13,123	12/5/2014	332.52	321.15	11.37	1
7	0_7702509	Confined	13,128	12/10/2014	335.99	321.18	14.81	1
7	0_7702509	Confined	13,133	12/15/2014	338.00	321.21	16.79	1
7	0_7702509	Confined	13,138	12/20/2014	344.31	321.24	23.07	1
7	0_7702509	Confined	13,143	12/25/2014	335.42	321.27	14.15	1
7	0_7702509	Confined	13,148	12/30/2014	338.76	321.31	17.45	1
7	0_7702509	Confined	13,154	1/5/2015	341.88	321.59	20.29	1
7	0_7702509	Confined	13,159	1/10/2015	343.30	321.87	21.43	1
7	0_7702509	Confined	13,164	1/15/2015	341.87	322.15	19.72	1
7	0_7702509	Confined	13,169	1/20/2015	339.55	322.43	17.12	1
7	0_7702509	Confined	13,174	1/25/2015	344.79	322.71	22.08	1
7	0_7702509	Confined	13,179	1/30/2015	346.49	322.99	23.50	1
7	0_7702509	Confined	13,185	2/5/2015	347.79	323.32	24.47	1
7	0_7702509	Confined	13,190	2/10/2015	348.77	323.60	25.17	1
7	0_7702509	Confined	13,195	2/15/2015	346.81	323.88	22.93	1
7	0_7702509	Confined	13,200	2/20/2015	343.15	324.16	18.99	1
7	0_7702509	Confined	13,205	2/25/2015	349.04	324.44	24.60	1
7	0_7702509	Confined	13,208	2/28/2015	348.16	324.61	23.55	1
7	0_7702509	Confined	13,213	3/5/2015	348.94	324.88	24.06	1
7	0_7702509	Confined	13,218	3/10/2015	351.89	325.16	26.73	1
7	0_7702509	Confined	13,223	3/15/2015	348.29	325.44	22.85	1
7	0_7702509	Confined	13,228	3/20/2015	352.62	325.72	26.90	1
7	0_7702509	Confined	13,233	3/25/2015	354.73	326.00	28.73	1
7	0_7702509	Confined	13,238	3/30/2015	353.81	326.28	27.53	1
7	0_7702509	Confined	13,244	4/5/2015	350.24	326.61	23.63	1
7	0_7702509	Confined	13,249	4/10/2015	350.24	326.89	23.35	1
7	0_7702509	Confined	13,254	4/15/2015	352.27	327.17	25.10	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	13,259	4/20/2015	352.49	327.45	25.04	1
7	0_7702509	Confined	13,264	4/25/2015	351.78	327.73	24.05	1
7	0_7702509	Confined	13,269	4/30/2015	350.78	328.01	22.77	1
7	0_7702509	Confined	13,274	5/5/2015	352.55	328.29	24.26	1
7	0_7702509	Confined	13,279	5/10/2015	351.81	328.57	23.24	1
7	0_7702509	Confined	13,284	5/15/2015	351.81	328.85	22.96	1
7	0_7702509	Confined	13,289	5/20/2015	351.81	329.12	22.69	1
7	0_7702509	Confined	13,294	5/25/2015	346.29	329.40	16.89	1
7	0_7702509	Confined	13,299	5/30/2015	346.97	329.68	17.29	1
7	0_7702509	Confined	13,305	6/5/2015	347.70	330.02	17.68	1
7	0_7702509	Confined	13,310	6/10/2015	347.47	330.30	17.17	1
7	0_7702509	Confined	13,315	6/15/2015	346.66	330.57	16.09	1
7	0_7702509	Confined	13,320	6/20/2015	348.45	330.85	17.60	1
7	0_7702509	Confined	13,325	6/25/2015	349.50	331.13	18.37	1
7	0_7702509	Confined	13,330	6/30/2015	349.91	331.41	18.50	1
7	0_7702509	Confined	13,345	7/15/2015	345.00	332.25	12.75	1
7	0_7702509	Confined	13,350	7/20/2015	347.12	332.53	14.59	1
7	0_7702509	Confined	13,355	7/25/2015	343.03	332.81	10.22	1
7	0_7702509	Confined	13,360	7/30/2015	338.25	333.09	5.16	1
7	0_7702509	Confined	13,366	8/5/2015	334.14	333.42	0.72	1
7	0_7702509	Confined	13,371	8/10/2015	338.28	333.70	4.58	1
7	0_7702509	Confined	13,376	8/15/2015	332.57	333.98	-1.41	1
7	0_7702509	Confined	13,381	8/20/2015	333.50	334.26	-0.76	1
7	0_7702509	Confined	13,386	8/25/2015	332.89	334.54	-1.65	1
7	0_7702509	Confined	13,391	8/30/2015	325.36	334.81	-9.45	1
7	0_7702509	Confined	13,397	9/5/2015	327.98	335.15	-7.17	1
7	0_7702509	Confined	13,402	9/10/2015	326.63	335.43	-8.80	1
7	0_7702509	Confined	13,407	9/15/2015	325.18	335.71	-10.53	1
7	0_7702509	Confined	13,412	9/20/2015	325.55	335.99	-10.44	1
7	0_7702509	Confined	13,417	9/25/2015	322.85	336.27	-13.42	1
7	0_7702509	Confined	13,422	9/30/2015	322.00	336.54	-14.54	1
7	0_7702509	Confined	13,427	10/5/2015	325.09	336.82	-11.73	1
7	0_7702509	Confined	13,432	10/10/2015	332.84	337.10	-4.26	1
7	0_7702509	Confined	13,437	10/15/2015	355.35	337.38	17.97	1
7	0_7702509	Confined	13,442	10/20/2015	336.00	337.66	-1.66	1
7	0_7702509	Confined	13,447	10/25/2015	339.73	337.94	1.79	1
7	0_7702509	Confined	13,452	10/30/2015	341.79	338.22	3.57	1
7	0_7702509	Confined	13,458	11/5/2015	343.21	338.55	4.66	1
7	0_7702509	Confined	13,463	11/10/2015	345.75	338.83	6.92	1
7	0_7702509	Confined	13,468	11/15/2015	347.33	339.11	8.22	1
7	0_7702509	Confined	13,473	11/20/2015	347.68	339.39	8.29	1
7	0_7702509	Confined	13,478	11/25/2015	349.00	339.67	9.33	1
7	0_7702509	Confined	13,483	11/30/2015	350.21	339.95	10.26	1
7	0_7702509	Confined	13,488	12/5/2015	350.96	340.23	10.73	1
7	0_7702509	Confined	13,493	12/10/2015	352.19	340.51	11.68	1
7	0_7702509	Confined	13,498	12/15/2015	354.94	340.78	14.16	1
7	0_7702509	Confined	13,503	12/20/2015	355.85	341.06	14.79	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	13,508	12/25/2015	356.78	341.34	15.44	1
7	0_7702509	Confined	13,513	12/30/2015	357.64	341.62	16.02	1
7	0_7702509	Confined	13,519	1/5/2016	358.43	341.83	16.60	1
7	0_7702509	Confined	13,524	1/10/2016	359.11	341.98	17.13	1
7	0_7702509	Confined	13,529	1/15/2016	358.19	342.13	16.06	1
7	0_7702509	Confined	13,534	1/20/2016	356.56	342.28	14.28	1
7	0_7702509	Confined	13,539	1/25/2016	356.90	342.44	14.46	1
7	0_7702509	Confined	13,544	1/30/2016	355.30	342.59	12.71	1
7	0_7702509	Confined	13,550	2/5/2016	357.24	342.77	14.47	1
7	0_7702509	Confined	13,555	2/10/2016	355.34	342.92	12.42	1
7	0_7702509	Confined	13,560	2/15/2016	351.86	343.08	8.78	1
7	0_7702509	Confined	13,565	2/20/2016	346.66	343.23	3.43	1
7	0_7702509	Confined	13,570	2/25/2016	353.33	343.38	9.95	1
7	0_7702509	Confined	13,579	3/5/2016	355.61	343.65	11.96	1
7	0_7702509	Confined	13,584	3/10/2016	355.61	343.80	11.81	1
7	0_7702509	Confined	13,589	3/15/2016	357.44	343.96	13.48	1
7	0_7702509	Confined	13,594	3/20/2016	356.32	344.11	12.21	1
7	0_7702509	Confined	13,599	3/25/2016	352.09	344.26	7.83	1
7	0_7702509	Confined	13,604	3/30/2016	352.16	344.41	7.75	1
7	0_7702509	Confined	13,610	4/5/2016	349.11	344.60	4.51	1
7	0_7702509	Confined	13,615	4/10/2016	350.15	344.75	5.40	1
7	0_7702509	Confined	13,620	4/15/2016	353.80	344.90	8.90	1
7	0_7702509	Confined	13,625	4/20/2016	351.71	345.05	6.66	1
7	0_7702509	Confined	13,630	4/25/2016	348.07	345.20	2.87	1
7	0_7702509	Confined	13,635	4/30/2016	347.55	345.36	2.19	1
7	0_7702509	Confined	13,640	5/5/2016	334.47	345.51	-11.04	1
7	0_7702509	Confined	13,645	5/10/2016	334.17	345.66	-11.49	1
7	0_7702509	Confined	13,650	5/15/2016	341.31	345.81	-4.50	1
7	0_7702509	Confined	13,655	5/20/2016	348.74	345.96	2.78	1
7	0_7702509	Confined	13,660	5/25/2016	351.94	346.12	5.82	1
7	0_7702509	Confined	13,665	5/30/2016	346.44	346.27	0.17	1
7	0_7702509	Confined	13,671	6/5/2016	353.50	346.45	7.05	1
7	0_7702509	Confined	13,676	6/10/2016	343.98	346.60	-2.62	1
7	0_7702509	Confined	13,681	6/15/2016	340.56	346.75	-6.19	1
7	0_7702509	Confined	13,686	6/20/2016	338.03	346.91	-8.88	1
7	0_7702509	Confined	13,691	6/25/2016	333.05	347.06	-14.01	1
7	0_7702509	Confined	13,696	6/30/2016	335.21	347.21	-12.00	1
7	0_7702509	Confined	13,701	7/5/2016	332.24	347.36	-15.12	1
7	0_7702509	Confined	13,706	7/10/2016	331.79	347.51	-15.72	1
7	0_7702509	Confined	13,711	7/15/2016	331.42	347.67	-16.25	1
7	0_7702509	Confined	13,716	7/20/2016	330.90	347.82	-16.92	1
7	0_7702509	Confined	13,721	7/25/2016	326.73	347.97	-21.24	1
7	0_7702509	Confined	13,726	7/30/2016	335.66	348.12	-12.46	1
7	0_7702509	Confined	13,732	8/5/2016	332.38	348.30	-15.92	1
7	0_7702509	Confined	13,737	8/10/2016	330.30	348.46	-18.16	1
7	0_7702509	Confined	13,742	8/15/2016	334.69	348.61	-13.92	1
7	0_7702509	Confined	13,747	8/20/2016	338.78	348.76	-9.98	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	13,752	8/25/2016	342.12	348.91	-6.79	1
7	0_7702509	Confined	13,763	9/5/2016	343.91	349.25	-5.34	1
7	0_7702509	Confined	13,768	9/10/2016	344.21	349.40	-5.19	1
7	0_7702509	Confined	13,773	9/15/2016	347.48	349.55	-2.07	1
7	0_7702509	Confined	13,778	9/20/2016	348.44	349.70	-1.26	1
7	0_7702509	Confined	13,783	9/25/2016	344.95	349.85	-4.90	1
7	0_7702509	Confined	13,788	9/30/2016	349.26	350.01	-0.75	1
7	0_7702509	Confined	13,793	10/5/2016	354.35	350.16	4.19	1
7	0_7702509	Confined	13,798	10/10/2016	348.37	350.31	-1.94	1
7	0_7702509	Confined	13,803	10/15/2016	344.28	350.46	-6.18	1
7	0_7702509	Confined	13,808	10/20/2016	341.83	350.61	-8.78	1
7	0_7702509	Confined	13,813	10/25/2016	346.06	350.77	-4.71	1
7	0_7702509	Confined	13,818	10/30/2016	343.31	350.92	-7.61	1
7	0_7702509	Confined	13,824	11/5/2016	347.03	351.10	-4.07	1
7	0_7702509	Confined	13,829	11/10/2016	349.26	351.25	-1.99	1
7	0_7702509	Confined	13,834	11/15/2016	350.45	351.41	-0.96	1
7	0_7702509	Confined	13,839	11/20/2016	350.23	351.56	-1.33	1
7	0_7702509	Confined	13,844	11/25/2016	349.86	351.71	-1.85	1
7	0_7702509	Confined	13,849	11/30/2016	349.93	351.86	-1.93	1
7	0_7702509	Confined	13,854	12/5/2016	351.94	352.01	-0.07	1
7	0_7702509	Confined	13,859	12/10/2016	353.42	352.17	1.25	1
7	0_7702509	Confined	13,864	12/15/2016	354.32	352.32	2.00	1
7	0_7702509	Confined	13,869	12/20/2016	355.66	352.47	3.19	1
7	0_7702509	Confined	13,874	12/25/2016	356.25	352.62	3.63	1
7	0_7702509	Confined	13,879	12/30/2016	356.18	352.77	3.41	1
7	0_7702509	Confined	13,885	1/5/2017	353.95	352.84	1.11	1
7	0_7702509	Confined	13,890	1/10/2017	355.95	352.88	3.07	1
7	0_7702509	Confined	13,895	1/15/2017	354.76	352.92	1.84	1
7	0_7702509	Confined	13,900	1/20/2017	356.62	352.96	3.66	1
7	0_7702509	Confined	13,905	1/25/2017	354.84	352.99	1.85	1
7	0_7702509	Confined	13,910	1/30/2017	355.66	353.03	2.63	1
7	0_7702509	Confined	13,916	2/5/2017	354.61	353.08	1.53	1
7	0_7702509	Confined	13,921	2/10/2017	353.42	353.12	0.30	1
7	0_7702509	Confined	13,926	2/15/2017	354.32	353.15	1.17	1
7	0_7702509	Confined	13,931	2/20/2017	356.55	353.19	3.36	1
7	0_7702509	Confined	13,936	2/25/2017	357.29	353.23	4.06	1
7	0_7702509	Confined	13,944	3/5/2017	356.99	353.29	3.70	1
7	0_7702509	Confined	13,949	3/10/2017	358.26	353.33	4.93	1
7	0_7702509	Confined	13,954	3/15/2017	358.41	353.37	5.04	1
7	0_7702509	Confined	13,959	3/20/2017	356.70	353.41	3.29	1
7	0_7702509	Confined	13,964	3/25/2017	354.76	353.44	1.32	1
7	0_7702509	Confined	13,969	3/30/2017	356.10	353.48	2.62	1
7	0_7702509	Confined	13,975	4/5/2017	357.44	353.53	3.91	1
7	0_7702509	Confined	13,980	4/10/2017	357.51	353.57	3.94	1
7	0_7702509	Confined	13,985	4/15/2017	355.51	353.60	1.91	1
7	0_7702509	Confined	13,990	4/20/2017	358.26	353.64	4.62	1
7	0_7702509	Confined	13,995	4/25/2017	357.66	353.68	3.98	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	14,000	4/30/2017	351.86	353.72	-1.86	1
7	0_7702509	Confined	14,005	5/5/2017	347.18	353.76	-6.58	1
7	0_7702509	Confined	14,010	5/10/2017	345.54	353.80	-8.26	1
7	0_7702509	Confined	14,015	5/15/2017	347.40	353.83	-6.43	1
7	0_7702509	Confined	14,020	5/20/2017	345.92	353.87	-7.95	1
7	0_7702509	Confined	14,025	5/25/2017	352.38	353.91	-1.53	1
7	0_7702509	Confined	14,030	5/30/2017	354.47	353.95	0.52	1
7	0_7702509	Confined	14,036	6/5/2017	356.10	353.99	2.11	1
7	0_7702509	Confined	14,041	6/10/2017	349.26	354.03	-4.77	1
7	0_7702509	Confined	14,046	6/15/2017	343.83	354.07	-10.24	1
7	0_7702509	Confined	14,051	6/20/2017	347.25	354.11	-6.86	1
7	0_7702509	Confined	14,056	6/25/2017	336.62	354.15	-17.53	1
7	0_7702509	Confined	14,061	6/30/2017	333.05	354.18	-21.13	1
7	0_7702509	Confined	14,066	7/5/2017	333.80	354.22	-20.42	1
7	0_7702509	Confined	14,071	7/10/2017	330.75	354.26	-23.51	1
7	0_7702509	Confined	14,076	7/15/2017	329.26	354.30	-25.04	1
7	0_7702509	Confined	14,081	7/20/2017	324.58	354.34	-29.76	1
7	0_7702509	Confined	14,086	7/25/2017	322.94	354.38	-31.44	1
7	0_7702509	Confined	14,091	7/30/2017	320.41	354.41	-34.00	1
7	0_7702509	Confined	14,097	8/5/2017	325.10	354.46	-29.36	1
7	0_7702509	Confined	14,102	8/10/2017	328.59	354.50	-25.91	1
7	0_7702509	Confined	14,107	8/15/2017	325.17	354.54	-29.37	1
7	0_7702509	Confined	14,112	8/20/2017	326.81	354.57	-27.76	1
7	0_7702509	Confined	14,117	8/25/2017	330.15	354.61	-24.46	1
7	0_7702509	Confined	14,122	8/30/2017	326.21	354.65	-28.44	1
7	0_7702509	Confined	14,128	9/5/2017	333.50	354.70	-21.20	1
7	0_7702509	Confined	14,133	9/10/2017	327.63	354.73	-27.10	1
7	0_7702509	Confined	14,138	9/15/2017	325.77	354.77	-29.00	1
7	0_7702509	Confined	14,143	9/20/2017	331.86	354.81	-22.95	1
7	0_7702509	Confined	14,148	9/25/2017	333.80	354.85	-21.05	1
7	0_7702509	Confined	14,153	9/30/2017	340.86	354.89	-14.03	1
7	0_7702509	Confined	14,158	10/5/2017	343.24	354.92	-11.68	1
7	0_7702509	Confined	14,163	10/10/2017	344.35	354.96	-10.61	1
7	0_7702509	Confined	14,168	10/15/2017	346.66	355.00	-8.34	1
7	0_7702509	Confined	14,173	10/20/2017	343.39	355.04	-11.65	1
7	0_7702509	Confined	14,177	10/24/2017	353.99	355.07	-1.08	1
7	0_7702509	Confined	14,178	10/25/2017	344.43	355.08	-10.65	1
7	0_7702509	Confined	14,183	10/30/2017	340.19	355.11	-14.92	1
7	0_7702509	Confined	14,189	11/5/2017	342.87	355.16	-12.29	1
7	0_7702509	Confined	14,194	11/10/2017	343.61	355.20	-11.59	1
7	0_7702509	Confined	14,199	11/15/2017	344.95	355.24	-10.29	1
7	0_7702509	Confined	14,204	11/20/2017	346.06	355.28	-9.22	1
7	0_7702509	Confined	14,209	11/25/2017	343.31	355.31	-12.00	1
7	0_7702509	Confined	14,214	11/30/2017	344.80	355.35	-10.55	1
7	0_7702509	Confined	14,219	12/5/2017	347.11	355.39	-8.28	1
7	0_7702509	Confined	14,224	12/10/2017	349.26	355.43	-6.17	1
7	0_7702509	Confined	14,229	12/15/2017	350.45	355.47	-5.02	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7702509	Confined	14,234	12/20/2017	351.64	355.50	-3.86	1
7	0_7702509	Confined	14,239	12/25/2017	352.68	355.54	-2.86	1
7	0_7702509	Confined	14,244	12/30/2017	353.50	355.58	-2.08	1
7	0_7702513	Confined	9,937	3/16/2006	370.70	397.91	-27.21	1
7	0_7702513	Confined	10,267	2/9/2007	375.30	408.83	-33.53	1
7	0_7702514	Confined	8,377	12/7/2001	379.90	394.26	-14.36	1
7	0_7702514	Confined	10,267	2/9/2007	381.60	412.23	-30.63	1
7	0_7702514	Confined	10,651	2/28/2008	363.40	410.21	-46.81	1
7	0_7702514	Confined	11,001	2/12/2009	365.96	382.64	-16.68	1
7	0_7702514	Confined	11,349	1/26/2010	377.25	336.22	41.03	1
7	0_7702514	Confined	11,720	2/1/2011	364.71	311.68	53.03	1
7	0_7702514	Confined	12,443	1/24/2013	346.90	312.09	34.81	1
7	0_7702514	Confined	13,112	11/24/2014	331.95	322.90	9.05	1
7	0_7702514	Confined	13,437	10/15/2015	347.60	339.43	8.17	1
7	0_7702514	Confined	14,177	10/24/2017	358.80	357.19	1.61	1
7	0_7702606	Confined	1,878	2/21/1984	385.63	414.15	-28.52	1
7	0_7702606	Confined	2,965	2/12/1987	410.92	438.03	-27.11	1
7	0_7702606	Confined	3,694	2/10/1989	406.75	443.07	-36.32	1
7	0_7702606	Confined	4,069	2/20/1990	392.23	430.06	-37.83	1
7	0_7702606	Confined	5,160	2/15/1993	405.62	392.23	13.39	1
7	0_7702606	Confined	6,246	2/6/1996	392.30	382.80	9.50	1
7	0_7702606	Confined	6,996	2/25/1998	386.02	384.28	1.74	1
7	0_7702706	Confined	772	2/10/1981	385.41	414.51	-29.10	1
7	0_7702706	Confined	1,877	2/20/1984	356.01	419.72	-63.71	1
7	0_7702706	Confined	2,228	2/5/1985	346.48	412.27	-65.79	1
7	0_7703401	Confined	1,878	2/21/1984	398.37	426.12	-27.75	1
7	0_7703401	Confined	2,228	2/5/1985	389.64	419.94	-30.30	1
7	0_7703401	Confined	2,591	2/3/1986	396.74	417.91	-21.17	1
7	0_7703401	Confined	2,965	2/12/1987	415.54	447.01	-31.47	1
7	0_7703401	Confined	4,069	2/20/1990	398.34	442.62	-44.28	1
7	0_7703401	Confined	4,435	2/21/1991	418.46	440.30	-21.84	1
7	0_7703401	Confined	5,160	2/15/1993	392.84	405.61	-12.77	1
7	0_7703401	Confined	5,792	11/9/1994	386.64	402.49	-15.85	1
7	0_7703401	Confined	6,996	2/25/1998	386.06	395.81	-9.75	1
7	0_7703404	Confined	10,209	12/13/2006	468.93	401.73	67.20	1
7	0_7703405	Confined	10,106	9/1/2006	391.42	380.42	11.00	1
7	0_7704202	Confined	2,593	2/5/1986	397.55	372.77	12.39	0.5
7	0_7704202	Confined	3,698	2/14/1989	444.25	411.38	16.43	0.5
7	0_7704431	Confined	772	2/10/1981	412.86	356.77	56.09	1
7	0_7704431	Confined	3,697	2/13/1989	425.03	393.25	31.78	1
7	0_7704431	Confined	4,069	2/20/1990	340.90	376.71	-35.81	1
7	0_7704431	Confined	4,800	2/21/1992	341.70	328.14	13.56	1
7	0_7704431	Confined	5,160	2/15/1993	324.40	327.62	-3.22	1
7	0_7704431	Confined	5,534	2/24/1994	341.70	329.74	11.96	1
7	0_7704431	Confined	5,792	11/9/1994	362.90	324.79	38.11	1
7	0_7704431	Confined	6,246	2/6/1996	336.60	315.20	21.40	1
7	0_7704431	Confined	6,633	2/27/1997	371.50	310.80	60.70	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7704431	Confined	6,996	2/25/1998	375.42	317.79	57.63	1
7	0_7704431	Confined	7,753	3/23/2000	333.40	323.47	9.93	1
7	0_7704431	Confined	8,439	2/7/2002	320.60	314.26	6.34	1
7	0_7704431	Confined	9,174	2/12/2004	382.30	303.50	78.80	1
7	0_7704431	Confined	10,267	2/9/2007	389.90	333.69	56.21	1
7	0_7704441	Confined	3,014	4/2/1987	431.28	396.95	34.33	1
7	0_7704718	Confined	772	2/10/1981	418.02	310.85	53.59	0.5
7	0_7704718	Confined	1,878	2/21/1984	422.89	317.74	52.57	0.5
7	0_7704718	Confined	2,227	2/4/1985	361.54	308.11	26.71	0.5
7	0_7704718	Confined	2,966	2/13/1987	393.32	351.70	20.81	0.5
7	0_7704718	Confined	3,697	2/13/1989	395.07	350.92	22.07	0.5
7	0_7704718	Confined	4,435	2/21/1991	389.07	332.56	28.25	0.5
7	0_7704718	Confined	4,800	2/21/1992	391.42	284.93	53.25	0.5
7	0_7704718	Confined	5,157	2/12/1993	379.12	284.93	47.10	0.5
7	0_7704718	Confined	5,549	3/11/1994	334.52	286.54	23.99	0.5
7	0_7705501	Confined	7,442	5/17/1999	339.20	302.20	37.00	1
7	0_7706308	Confined	8,700	10/26/2002	287.84	220.52	67.32	1
7	0_7706601	Confined	8,779	1/13/2003	326.44	296.74	14.85	0.5
7	0_7706601	Confined	9,145	1/14/2004	321.64	309.87	5.89	0.5
7	0_7706601	Confined	9,517	1/20/2005	348.74	329.05	9.85	0.5
7	0_7706601	Confined	9,882	1/20/2006	314.04	333.40	-9.68	0.5
7	0_7706601	Confined	10,280	2/22/2007	301.94	354.03	-26.04	0.5
7	0_7706601	Confined	10,609	1/17/2008	322.24	346.26	-12.01	0.5
7	0_7706601	Confined	10,962	1/4/2009	276.84	293.23	-8.20	0.5
7	0_7706601	Confined	11,446	5/3/2010	304.64	192.37	56.14	0.5
7	0_7706601	Confined	12,059	1/6/2012	205.54	167.19	19.18	0.5
7	0_7706601	Confined	12,114	3/1/2012	272.04	182.18	44.93	0.5
7	0_7707901	Confined	1,871	2/14/1984	351.18	407.68	-28.25	0.5
7	0_7707901	Confined	2,606	2/18/1986	357.67	416.00	-29.17	0.5
7	0_7707901	Confined	3,343	2/25/1988	351.93	413.16	-30.62	0.5
7	0_7707901	Confined	4,481	4/8/1991	300.92	380.61	-39.84	0.5
7	0_7707901	Confined	4,776	1/28/1992	321.12	335.48	-7.18	0.5
7	0_7707901	Confined	5,140	1/26/1993	343.32	331.23	6.04	0.5
7	0_7707901	Confined	6,262	2/22/1996	284.22	292.70	-4.24	0.5
7	0_7707901	Confined	6,653	3/19/1997	281.62	299.26	-8.82	0.5
7	0_7707901	Confined	6,983	2/12/1998	283.32	325.65	-21.17	0.5
7	0_7707901	Confined	7,319	1/14/1999	282.92	285.59	-1.33	0.5
7	0_7707901	Confined	8,411	1/10/2002	252.62	241.56	5.53	0.5
7	0_7707901	Confined	8,788	1/22/2003	270.32	208.41	30.95	0.5
7	0_7707901	Confined	9,158	1/27/2004	271.02	222.10	24.46	0.5
7	0_7707901	Confined	9,543	2/15/2005	273.22	242.02	15.60	0.5
7	0_7707901	Confined	9,901	2/8/2006	267.62	246.14	10.74	0.5
7	0_7707901	Confined	10,271	2/13/2007	206.22	267.25	-30.52	0.5
7	0_7707901	Confined	10,609	1/17/2008	271.62	262.82	4.40	0.5
7	0_7707901	Confined	10,993	2/4/2009	205.32	195.45	4.94	0.5
7	0_7707901	Confined	11,426	4/13/2010	243.72	87.78	77.97	0.5
7	0_7708409	Confined	1,139	2/12/1982	391.64	442.86	-51.22	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708409	Confined	1,515	2/23/1983	389.97	442.29	-52.32	1
7	0_7708409	Confined	1,873	2/16/1984	381.37	446.27	-64.90	1
7	0_7708409	Confined	2,237	2/14/1985	369.84	442.43	-72.59	1
7	0_7708409	Confined	3,344	2/26/1988	380.94	454.34	-73.40	1
7	0_7708409	Confined	4,061	2/12/1990	330.00	443.64	-113.64	1
7	0_7708409	Confined	6,653	3/19/1997	319.59	379.56	-59.97	1
7	0_7708409	Confined	6,984	2/13/1998	317.94	389.71	-71.77	1
7	0_7708409	Confined	7,319	1/14/1999	325.24	375.20	-49.96	1
7	0_7708409	Confined	8,411	1/10/2002	308.24	341.55	-33.31	1
7	0_7708409	Confined	8,795	1/29/2003	312.24	326.77	-14.53	1
7	0_7708409	Confined	9,165	2/3/2004	312.64	327.53	-14.89	1
7	0_7708409	Confined	9,543	2/15/2005	322.24	333.98	-11.74	1
7	0_7708409	Confined	9,916	2/23/2006	292.24	334.37	-42.13	1
7	0_7708409	Confined	10,284	2/26/2007	276.74	341.34	-64.60	1
7	0_7708409	Confined	10,656	3/4/2008	283.64	339.11	-55.47	1
7	0_7708409	Confined	11,029	3/12/2009	259.54	308.85	-49.31	1
7	0_7708409	Confined	11,446	5/3/2010	262.34	260.91	1.43	1
7	0_7708511	Confined	11,997	11/5/2011	267.01	210.52	28.24	0.5
7	0_7708511	Confined	12,002	11/10/2011	266.81	210.21	28.30	0.5
7	0_7708511	Confined	12,007	11/15/2011	267.23	209.89	28.67	0.5
7	0_7708511	Confined	12,012	11/20/2011	267.44	209.58	28.93	0.5
7	0_7708511	Confined	12,017	11/25/2011	267.68	209.26	29.21	0.5
7	0_7708511	Confined	12,022	11/30/2011	268.15	208.95	29.60	0.5
7	0_7708511	Confined	12,027	12/5/2011	268.90	208.64	30.13	0.5
7	0_7708511	Confined	12,032	12/10/2011	269.40	208.32	30.54	0.5
7	0_7708511	Confined	12,037	12/15/2011	270.37	208.01	31.18	0.5
7	0_7708511	Confined	12,042	12/20/2011	271.17	207.69	31.74	0.5
7	0_7708511	Confined	12,047	12/25/2011	271.76	207.38	32.19	0.5
7	0_7708511	Confined	12,052	12/30/2011	272.88	207.06	32.91	0.5
7	0_7708511	Confined	12,058	1/5/2012	273.79	207.53	33.13	0.5
7	0_7708511	Confined	12,063	1/10/2012	274.78	208.07	33.36	0.5
7	0_7708511	Confined	12,068	1/15/2012	275.59	208.60	33.49	0.5
7	0_7708511	Confined	12,073	1/20/2012	276.63	209.13	33.75	0.5
7	0_7708511	Confined	12,076	1/23/2012	277.27	209.45	33.91	0.5
7	0_7708511	Confined	12,078	1/25/2012	277.52	209.67	33.93	0.5
7	0_7708511	Confined	12,083	1/30/2012	277.93	210.20	33.87	0.5
7	0_7708511	Confined	12,089	2/5/2012	278.86	210.84	34.01	0.5
7	0_7708511	Confined	12,094	2/10/2012	279.69	211.37	34.16	0.5
7	0_7708511	Confined	12,099	2/15/2012	280.59	211.91	34.34	0.5
7	0_7708511	Confined	12,104	2/20/2012	281.28	212.44	34.42	0.5
7	0_7708511	Confined	12,109	2/25/2012	281.92	212.97	34.47	0.5
7	0_7708511	Confined	12,112	2/28/2012	281.92	213.29	34.31	0.5
7	0_7708511	Confined	12,118	3/5/2012	283.29	213.93	34.68	0.5
7	0_7708511	Confined	12,123	3/10/2012	283.85	214.46	34.69	0.5
7	0_7708511	Confined	12,128	3/15/2012	284.46	215.00	34.73	0.5
7	0_7708511	Confined	12,133	3/20/2012	285.13	215.53	34.80	0.5
7	0_7708511	Confined	12,138	3/25/2012	285.34	216.06	34.64	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	12,143	3/30/2012	285.73	216.60	34.57	0.5
7	0_7708511	Confined	12,149	4/5/2012	286.13	217.24	34.45	0.5
7	0_7708511	Confined	12,154	4/10/2012	286.16	217.77	34.20	0.5
7	0_7708511	Confined	12,159	4/15/2012	286.29	218.30	33.99	0.5
7	0_7708511	Confined	12,164	4/20/2012	286.03	218.83	33.60	0.5
7	0_7708511	Confined	12,169	4/25/2012	285.26	219.37	32.95	0.5
7	0_7708511	Confined	12,174	4/30/2012	284.43	219.90	32.26	0.5
7	0_7708511	Confined	12,179	5/5/2012	283.48	220.43	31.52	0.5
7	0_7708511	Confined	12,184	5/10/2012	282.48	220.97	30.76	0.5
7	0_7708511	Confined	12,189	5/15/2012	281.45	221.50	29.97	0.5
7	0_7708511	Confined	12,194	5/20/2012	280.98	222.03	29.47	0.5
7	0_7708511	Confined	12,199	5/25/2012	280.67	222.57	29.05	0.5
7	0_7708511	Confined	12,204	5/30/2012	280.31	223.10	28.61	0.5
7	0_7708511	Confined	12,210	6/5/2012	279.77	223.74	28.02	0.5
7	0_7708511	Confined	12,215	6/10/2012	279.36	224.27	27.54	0.5
7	0_7708511	Confined	12,220	6/15/2012	278.61	224.80	26.90	0.5
7	0_7708511	Confined	12,225	6/20/2012	277.79	225.34	26.23	0.5
7	0_7708511	Confined	12,230	6/25/2012	276.98	225.87	25.55	0.5
7	0_7708511	Confined	12,235	6/30/2012	276.24	226.40	24.92	0.5
7	0_7708511	Confined	12,240	7/5/2012	275.44	226.94	24.25	0.5
7	0_7708511	Confined	12,245	7/10/2012	274.74	227.47	23.63	0.5
7	0_7708511	Confined	12,250	7/15/2012	274.23	228.00	23.11	0.5
7	0_7708511	Confined	12,255	7/20/2012	274.03	228.54	22.75	0.5
7	0_7708511	Confined	12,260	7/25/2012	274.02	229.07	22.48	0.5
7	0_7708511	Confined	12,265	7/30/2012	273.78	229.60	22.09	0.5
7	0_7708511	Confined	12,271	8/5/2012	273.35	230.24	21.55	0.5
7	0_7708511	Confined	12,276	8/10/2012	272.65	230.78	20.94	0.5
7	0_7708511	Confined	12,281	8/15/2012	271.82	231.31	20.26	0.5
7	0_7708511	Confined	12,286	8/20/2012	270.89	231.84	19.52	0.5
7	0_7708511	Confined	12,291	8/25/2012	270.01	232.37	18.82	0.5
7	0_7708511	Confined	12,296	8/30/2012	269.03	232.91	18.06	0.5
7	0_7708511	Confined	12,302	9/5/2012	267.74	233.55	17.10	0.5
7	0_7708511	Confined	12,307	9/10/2012	266.62	234.08	16.27	0.5
7	0_7708511	Confined	12,312	9/15/2012	265.61	234.61	15.50	0.5
7	0_7708511	Confined	12,317	9/20/2012	264.84	235.15	14.85	0.5
7	0_7708511	Confined	12,322	9/25/2012	264.31	235.68	14.32	0.5
7	0_7708511	Confined	12,327	9/30/2012	264.27	236.21	14.03	0.5
7	0_7708511	Confined	12,332	10/5/2012	264.13	236.75	13.69	0.5
7	0_7708511	Confined	12,337	10/10/2012	264.33	237.28	13.53	0.5
7	0_7708511	Confined	12,342	10/15/2012	264.59	237.81	13.39	0.5
7	0_7708511	Confined	12,347	10/20/2012	264.94	238.34	13.30	0.5
7	0_7708511	Confined	12,352	10/25/2012	265.19	238.88	13.16	0.5
7	0_7708511	Confined	12,357	10/30/2012	265.29	239.41	12.94	0.5
7	0_7708511	Confined	12,363	11/5/2012	265.66	240.05	12.80	0.5
7	0_7708511	Confined	12,368	11/10/2012	266.08	240.58	12.75	0.5
7	0_7708511	Confined	12,373	11/15/2012	266.31	241.12	12.60	0.5
7	0_7708511	Confined	12,383	11/25/2012	267.19	242.18	12.50	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	12,388	11/30/2012	267.98	242.72	12.63	0.5
7	0_7708511	Confined	12,393	12/5/2012	268.62	243.25	12.69	0.5
7	0_7708511	Confined	12,398	12/10/2012	269.42	243.78	12.82	0.5
7	0_7708511	Confined	12,403	12/15/2012	270.08	244.31	12.88	0.5
7	0_7708511	Confined	12,408	12/20/2012	270.80	244.85	12.98	0.5
7	0_7708511	Confined	12,413	12/25/2012	271.41	245.38	13.01	0.5
7	0_7708511	Confined	12,418	12/30/2012	271.83	245.91	12.96	0.5
7	0_7708511	Confined	12,424	1/5/2013	272.57	246.14	13.22	0.5
7	0_7708511	Confined	12,429	1/10/2013	273.40	246.25	13.57	0.5
7	0_7708511	Confined	12,434	1/15/2013	273.93	246.37	13.78	0.5
7	0_7708511	Confined	12,439	1/20/2013	274.57	246.48	14.04	0.5
7	0_7708511	Confined	12,444	1/25/2013	275.30	246.60	14.35	0.5
7	0_7708511	Confined	12,449	1/30/2013	276.21	246.72	14.75	0.5
7	0_7708511	Confined	12,455	2/5/2013	276.91	246.85	15.03	0.5
7	0_7708511	Confined	12,460	2/10/2013	277.57	246.97	15.30	0.5
7	0_7708511	Confined	12,465	2/15/2013	277.94	247.09	15.43	0.5
7	0_7708511	Confined	12,470	2/20/2013	278.48	247.20	15.64	0.5
7	0_7708511	Confined	12,475	2/25/2013	278.99	247.32	15.84	0.5
7	0_7708511	Confined	12,478	2/28/2013	278.99	247.39	15.80	0.5
7	0_7708511	Confined	12,483	3/5/2013	279.34	247.50	15.92	0.5
7	0_7708511	Confined	12,488	3/10/2013	279.54	247.62	15.96	0.5
7	0_7708511	Confined	12,493	3/15/2013	279.13	247.73	15.70	0.5
7	0_7708511	Confined	12,498	3/20/2013	279.10	247.85	15.62	0.5
7	0_7708511	Confined	12,503	3/25/2013	278.72	247.97	15.38	0.5
7	0_7708511	Confined	12,508	3/30/2013	278.22	248.08	15.07	0.5
7	0_7708511	Confined	12,514	4/5/2013	277.45	248.22	14.61	0.5
7	0_7708511	Confined	12,519	4/10/2013	277.18	248.34	14.42	0.5
7	0_7708511	Confined	12,524	4/15/2013	276.72	248.45	14.13	0.5
7	0_7708511	Confined	12,529	4/20/2013	276.04	248.57	13.74	0.5
7	0_7708511	Confined	12,534	4/25/2013	275.44	248.68	13.38	0.5
7	0_7708511	Confined	12,539	4/30/2013	275.06	248.80	13.13	0.5
7	0_7708511	Confined	12,544	5/5/2013	274.35	248.92	12.72	0.5
7	0_7708511	Confined	12,549	5/10/2013	273.70	249.03	12.33	0.5
7	0_7708511	Confined	12,554	5/15/2013	273.04	249.15	11.95	0.5
7	0_7708511	Confined	12,559	5/20/2013	272.43	249.26	11.58	0.5
7	0_7708511	Confined	12,564	5/25/2013	271.35	249.38	10.98	0.5
7	0_7708511	Confined	12,569	5/30/2013	270.64	249.50	10.57	0.5
7	0_7708511	Confined	12,575	6/5/2013	269.44	249.63	9.90	0.5
7	0_7708511	Confined	12,580	6/10/2013	268.79	249.75	9.52	0.5
7	0_7708511	Confined	12,585	6/15/2013	268.13	249.87	9.13	0.5
7	0_7708511	Confined	12,590	6/20/2013	267.58	249.98	8.80	0.5
7	0_7708511	Confined	12,595	6/25/2013	267.19	250.10	8.55	0.5
7	0_7708511	Confined	12,600	6/30/2013	266.46	250.21	8.12	0.5
7	0_7708511	Confined	12,605	7/5/2013	266.05	250.33	7.86	0.5
7	0_7708511	Confined	12,610	7/10/2013	265.64	250.45	7.60	0.5
7	0_7708511	Confined	12,615	7/15/2013	265.10	250.56	7.27	0.5
7	0_7708511	Confined	12,620	7/20/2013	264.49	250.68	6.91	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	12,625	7/25/2013	264.15	250.79	6.68	0.5
7	0_7708511	Confined	12,630	7/30/2013	263.80	250.91	6.45	0.5
7	0_7708511	Confined	12,636	8/5/2013	263.22	251.05	6.09	0.5
7	0_7708511	Confined	12,641	8/10/2013	262.55	251.16	5.69	0.5
7	0_7708511	Confined	12,646	8/15/2013	261.64	251.28	5.18	0.5
7	0_7708511	Confined	12,651	8/20/2013	260.55	251.40	4.58	0.5
7	0_7708511	Confined	12,656	8/25/2013	259.55	251.51	4.02	0.5
7	0_7708511	Confined	12,661	8/30/2013	258.77	251.63	3.57	0.5
7	0_7708511	Confined	12,667	9/5/2013	257.78	251.77	3.01	0.5
7	0_7708511	Confined	12,672	9/10/2013	257.04	251.88	2.58	0.5
7	0_7708511	Confined	12,677	9/15/2013	256.24	252.00	2.12	0.5
7	0_7708511	Confined	12,682	9/20/2013	255.71	252.11	1.80	0.5
7	0_7708511	Confined	12,687	9/25/2013	255.41	252.23	1.59	0.5
7	0_7708511	Confined	12,692	9/30/2013	255.27	252.35	1.46	0.5
7	0_7708511	Confined	12,697	10/5/2013	255.29	252.46	1.41	0.5
7	0_7708511	Confined	12,702	10/10/2013	255.43	252.58	1.43	0.5
7	0_7708511	Confined	12,707	10/15/2013	255.72	252.69	1.51	0.5
7	0_7708511	Confined	12,712	10/20/2013	255.80	252.81	1.50	0.5
7	0_7708511	Confined	12,714	10/22/2013	256.04	252.86	1.59	0.5
7	0_7708511	Confined	12,717	10/25/2013	256.34	252.93	1.71	0.5
7	0_7708511	Confined	12,722	10/30/2013	256.79	253.04	1.87	0.5
7	0_7708511	Confined	12,728	11/5/2013	257.39	253.18	2.10	0.5
7	0_7708511	Confined	12,733	11/10/2013	257.75	253.30	2.23	0.5
7	0_7708511	Confined	12,738	11/15/2013	258.43	253.41	2.51	0.5
7	0_7708511	Confined	12,743	11/20/2013	259.04	253.53	2.76	0.5
7	0_7708511	Confined	12,748	11/25/2013	259.56	253.64	2.96	0.5
7	0_7708511	Confined	12,753	11/30/2013	260.40	253.76	3.32	0.5
7	0_7708511	Confined	12,758	12/5/2013	261.44	253.88	3.78	0.5
7	0_7708511	Confined	12,763	12/10/2013	262.05	253.99	4.03	0.5
7	0_7708511	Confined	12,768	12/15/2013	262.86	254.11	4.38	0.5
7	0_7708511	Confined	12,773	12/20/2013	263.93	254.22	4.85	0.5
7	0_7708511	Confined	12,778	12/25/2013	264.53	254.34	5.10	0.5
7	0_7708511	Confined	12,783	12/30/2013	265.39	254.45	5.47	0.5
7	0_7708511	Confined	12,789	1/5/2014	266.54	254.65	5.94	0.5
7	0_7708511	Confined	12,794	1/10/2014	267.17	254.83	6.17	0.5
7	0_7708511	Confined	12,799	1/15/2014	267.72	255.01	6.36	0.5
7	0_7708511	Confined	12,804	1/20/2014	268.52	255.19	6.67	0.5
7	0_7708511	Confined	12,809	1/25/2014	268.86	255.36	6.75	0.5
7	0_7708511	Confined	12,814	1/30/2014	269.63	255.54	7.05	0.5
7	0_7708511	Confined	12,818	2/3/2014	270.34	255.68	7.33	0.5
7	0_7708511	Confined	12,820	2/5/2014	270.57	255.75	7.41	0.5
7	0_7708511	Confined	12,825	2/10/2014	271.04	255.93	7.56	0.5
7	0_7708511	Confined	12,830	2/15/2014	271.55	256.11	7.72	0.5
7	0_7708511	Confined	12,835	2/20/2014	272.13	256.28	7.92	0.5
7	0_7708511	Confined	12,840	2/25/2014	272.37	256.46	7.95	0.5
7	0_7708511	Confined	12,843	2/28/2014	272.69	256.57	8.06	0.5
7	0_7708511	Confined	12,848	3/5/2014	272.86	256.74	8.06	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	12,853	3/10/2014	273.12	256.92	8.10	0.5
7	0_7708511	Confined	12,858	3/15/2014	273.36	257.10	8.13	0.5
7	0_7708511	Confined	12,863	3/20/2014	273.27	257.27	8.00	0.5
7	0_7708511	Confined	12,868	3/25/2014	273.29	257.45	7.92	0.5
7	0_7708511	Confined	12,873	3/30/2014	273.18	257.63	7.78	0.5
7	0_7708511	Confined	12,879	4/5/2014	273.07	257.84	7.61	0.5
7	0_7708511	Confined	12,884	4/10/2014	272.86	258.02	7.42	0.5
7	0_7708511	Confined	12,889	4/15/2014	272.67	258.20	7.24	0.5
7	0_7708511	Confined	12,894	4/20/2014	272.23	258.37	6.93	0.5
7	0_7708511	Confined	12,899	4/25/2014	271.83	258.55	6.64	0.5
7	0_7708511	Confined	12,904	4/30/2014	271.23	258.73	6.25	0.5
7	0_7708511	Confined	12,909	5/5/2014	270.37	258.90	5.73	0.5
7	0_7708511	Confined	12,914	5/10/2014	269.56	259.08	5.24	0.5
7	0_7708511	Confined	12,919	5/15/2014	268.55	259.26	4.65	0.5
7	0_7708511	Confined	12,924	5/20/2014	268.02	259.43	4.29	0.5
7	0_7708511	Confined	12,929	5/25/2014	267.50	259.61	3.94	0.5
7	0_7708511	Confined	12,934	5/30/2014	267.63	259.79	3.92	0.5
7	0_7708511	Confined	12,940	6/5/2014	267.03	260.00	3.51	0.5
7	0_7708511	Confined	12,945	6/10/2014	266.59	260.18	3.21	0.5
7	0_7708511	Confined	12,950	6/15/2014	266.12	260.35	2.88	0.5
7	0_7708511	Confined	12,955	6/20/2014	265.55	260.53	2.51	0.5
7	0_7708511	Confined	12,960	6/25/2014	265.07	260.71	2.18	0.5
7	0_7708511	Confined	12,965	6/30/2014	264.57	260.89	1.84	0.5
7	0_7708511	Confined	12,970	7/5/2014	263.95	261.06	1.44	0.5
7	0_7708511	Confined	12,975	7/10/2014	263.44	261.24	1.10	0.5
7	0_7708511	Confined	12,980	7/15/2014	262.81	261.42	0.70	0.5
7	0_7708511	Confined	12,985	7/20/2014	262.27	261.59	0.34	0.5
7	0_7708511	Confined	12,990	7/25/2014	261.60	261.77	-0.09	0.5
7	0_7708511	Confined	12,995	7/30/2014	261.26	261.95	-0.34	0.5
7	0_7708511	Confined	13,001	8/5/2014	260.36	262.16	-0.90	0.5
7	0_7708511	Confined	13,006	8/10/2014	260.03	262.34	-1.15	0.5
7	0_7708511	Confined	13,011	8/15/2014	259.33	262.51	-1.59	0.5
7	0_7708511	Confined	13,016	8/20/2014	258.40	262.69	-2.15	0.5
7	0_7708511	Confined	13,021	8/25/2014	257.32	262.87	-2.77	0.5
7	0_7708511	Confined	13,026	8/30/2014	256.11	263.05	-3.47	0.5
7	0_7708511	Confined	13,032	9/5/2014	254.72	263.26	-4.27	0.5
7	0_7708511	Confined	13,037	9/10/2014	253.82	263.43	-4.81	0.5
7	0_7708511	Confined	13,042	9/15/2014	252.84	263.61	-5.39	0.5
7	0_7708511	Confined	13,047	9/20/2014	252.13	263.79	-5.83	0.5
7	0_7708511	Confined	13,052	9/25/2014	251.40	263.97	-6.28	0.5
7	0_7708511	Confined	13,057	9/30/2014	250.96	264.14	-6.59	0.5
7	0_7708511	Confined	13,062	10/5/2014	250.48	264.32	-6.92	0.5
7	0_7708511	Confined	13,067	10/10/2014	250.16	264.50	-7.17	0.5
7	0_7708511	Confined	13,072	10/15/2014	249.77	264.67	-7.45	0.5
7	0_7708511	Confined	13,074	10/17/2014	249.93	264.74	-7.41	0.5
7	0_7708511	Confined	13,077	10/20/2014	249.61	264.85	-7.62	0.5
7	0_7708511	Confined	13,082	10/25/2014	249.41	265.03	-7.81	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	13,087	10/30/2014	249.26	265.20	-7.97	0.5
7	0_7708511	Confined	13,093	11/5/2014	249.17	265.42	-8.12	0.5
7	0_7708511	Confined	13,098	11/10/2014	249.49	265.59	-8.05	0.5
7	0_7708511	Confined	13,103	11/15/2014	249.61	265.77	-8.08	0.5
7	0_7708511	Confined	13,108	11/20/2014	250.00	265.95	-7.97	0.5
7	0_7708511	Confined	13,113	11/25/2014	250.30	266.13	-7.91	0.5
7	0_7708511	Confined	13,118	11/30/2014	250.97	266.30	-7.67	0.5
7	0_7708511	Confined	13,123	12/5/2014	251.50	266.48	-7.49	0.5
7	0_7708511	Confined	13,128	12/10/2014	252.05	266.66	-7.30	0.5
7	0_7708511	Confined	13,133	12/15/2014	252.75	266.83	-7.04	0.5
7	0_7708511	Confined	13,138	12/20/2014	253.32	267.01	-6.85	0.5
7	0_7708511	Confined	13,143	12/25/2014	254.04	267.19	-6.57	0.5
7	0_7708511	Confined	13,148	12/30/2014	254.49	267.36	-6.44	0.5
7	0_7708511	Confined	13,154	1/5/2015	255.16	267.69	-6.26	0.5
7	0_7708511	Confined	13,159	1/10/2015	256.02	267.97	-5.98	0.5
7	0_7708511	Confined	13,164	1/15/2015	256.66	268.26	-5.80	0.5
7	0_7708511	Confined	13,169	1/20/2015	257.66	268.55	-5.44	0.5
7	0_7708511	Confined	13,174	1/25/2015	258.26	268.83	-5.29	0.5
7	0_7708511	Confined	13,179	1/30/2015	258.96	269.12	-5.08	0.5
7	0_7708511	Confined	13,185	2/5/2015	259.77	269.46	-4.85	0.5
7	0_7708511	Confined	13,190	2/10/2015	260.70	269.75	-4.53	0.5
7	0_7708511	Confined	13,195	2/15/2015	261.31	270.04	-4.36	0.5
7	0_7708511	Confined	13,200	2/20/2015	262.19	270.32	-4.07	0.5
7	0_7708511	Confined	13,205	2/25/2015	262.75	270.61	-3.93	0.5
7	0_7708511	Confined	13,208	2/28/2015	262.93	270.78	-3.93	0.5
7	0_7708511	Confined	13,213	3/5/2015	263.31	271.07	-3.88	0.5
7	0_7708511	Confined	13,218	3/10/2015	263.97	271.36	-3.69	0.5
7	0_7708511	Confined	13,223	3/15/2015	264.33	271.64	-3.66	0.5
7	0_7708511	Confined	13,228	3/20/2015	265.00	271.93	-3.46	0.5
7	0_7708511	Confined	13,233	3/25/2015	265.53	272.22	-3.34	0.5
7	0_7708511	Confined	13,238	3/30/2015	266.17	272.50	-3.17	0.5
7	0_7708511	Confined	13,244	4/5/2015	266.84	272.85	-3.00	0.5
7	0_7708511	Confined	13,249	4/10/2015	267.06	273.13	-3.04	0.5
7	0_7708511	Confined	13,254	4/15/2015	267.30	273.42	-3.06	0.5
7	0_7708511	Confined	13,259	4/20/2015	267.66	273.71	-3.02	0.5
7	0_7708511	Confined	13,264	4/25/2015	268.14	273.99	-2.93	0.5
7	0_7708511	Confined	13,269	4/30/2015	268.41	274.28	-2.93	0.5
7	0_7708511	Confined	13,274	5/5/2015	268.85	274.57	-2.86	0.5
7	0_7708511	Confined	13,279	5/10/2015	269.18	274.85	-2.84	0.5
7	0_7708511	Confined	13,284	5/15/2015	269.64	275.14	-2.75	0.5
7	0_7708511	Confined	13,289	5/20/2015	269.96	275.43	-2.73	0.5
7	0_7708511	Confined	13,294	5/25/2015	270.59	275.71	-2.56	0.5
7	0_7708511	Confined	13,299	5/30/2015	270.96	276.00	-2.52	0.5
7	0_7708511	Confined	13,305	6/5/2015	271.52	276.34	-2.41	0.5
7	0_7708511	Confined	13,310	6/10/2015	272.07	276.63	-2.28	0.5
7	0_7708511	Confined	13,315	6/15/2015	272.45	276.92	-2.23	0.5
7	0_7708511	Confined	13,320	6/20/2015	272.50	277.20	-2.35	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	13,325	6/25/2015	272.87	277.49	-2.31	0.5
7	0_7708511	Confined	13,330	6/30/2015	273.07	277.78	-2.35	0.5
7	0_7708511	Confined	13,335	7/5/2015	273.27	278.06	-2.40	0.5
7	0_7708511	Confined	13,340	7/10/2015	273.96	278.35	-2.19	0.5
7	0_7708511	Confined	13,345	7/15/2015	274.03	278.64	-2.30	0.5
7	0_7708511	Confined	13,350	7/20/2015	273.95	278.92	-2.49	0.5
7	0_7708511	Confined	13,355	7/25/2015	273.75	279.21	-2.73	0.5
7	0_7708511	Confined	13,360	7/30/2015	273.45	279.50	-3.02	0.5
7	0_7708511	Confined	13,391	8/30/2015	268.26	281.27	-6.51	0.5
7	0_7708511	Confined	13,397	9/5/2015	268.26	281.62	-6.68	0.5
7	0_7708511	Confined	13,402	9/10/2015	267.46	281.90	-7.22	0.5
7	0_7708511	Confined	13,407	9/15/2015	266.32	282.19	-7.94	0.5
7	0_7708511	Confined	13,412	9/20/2015	265.42	282.48	-8.53	0.5
7	0_7708511	Confined	13,417	9/25/2015	264.27	282.76	-9.25	0.5
7	0_7708511	Confined	13,422	9/30/2015	263.12	283.05	-9.97	0.5
7	0_7708511	Confined	13,427	10/5/2015	261.92	283.34	-10.71	0.5
7	0_7708511	Confined	13,432	10/10/2015	260.52	283.62	-11.55	0.5
7	0_7708511	Confined	13,437	10/15/2015	260.43	283.91	-11.74	0.5
7	0_7708511	Confined	13,438	10/16/2015	257.09	283.97	-13.44	0.5
7	0_7708511	Confined	13,442	10/20/2015	259.26	284.20	-12.47	0.5
7	0_7708511	Confined	13,447	10/25/2015	259.13	284.48	-12.68	0.5
7	0_7708511	Confined	13,452	10/30/2015	258.95	284.77	-12.91	0.5
7	0_7708511	Confined	13,458	11/5/2015	258.92	285.11	-13.10	0.5
7	0_7708511	Confined	13,463	11/10/2015	258.91	285.40	-13.25	0.5
7	0_7708511	Confined	13,468	11/15/2015	258.89	285.69	-13.40	0.5
7	0_7708511	Confined	13,473	11/20/2015	258.96	285.97	-13.51	0.5
7	0_7708511	Confined	13,478	11/25/2015	258.97	286.26	-13.65	0.5
7	0_7708511	Confined	13,483	11/30/2015	259.34	286.55	-13.60	0.5
7	0_7708511	Confined	13,488	12/5/2015	259.64	286.83	-13.60	0.5
7	0_7708511	Confined	13,493	12/10/2015	260.59	287.12	-13.27	0.5
7	0_7708511	Confined	13,498	12/15/2015	261.15	287.41	-13.13	0.5
7	0_7708511	Confined	13,503	12/20/2015	261.66	287.69	-13.02	0.5
7	0_7708511	Confined	13,508	12/25/2015	262.20	287.98	-12.89	0.5
7	0_7708511	Confined	13,513	12/30/2015	262.53	288.27	-12.87	0.5
7	0_7708511	Confined	13,519	1/5/2016	263.60	288.47	-12.44	0.5
7	0_7708511	Confined	13,524	1/10/2016	264.20	288.62	-12.21	0.5
7	0_7708511	Confined	13,529	1/15/2016	265.13	288.76	-11.81	0.5
7	0_7708511	Confined	13,534	1/20/2016	265.65	288.90	-11.63	0.5
7	0_7708511	Confined	13,539	1/25/2016	266.37	289.05	-11.34	0.5
7	0_7708511	Confined	13,544	1/30/2016	267.00	289.19	-11.10	0.5
7	0_7708511	Confined	13,550	2/5/2016	267.68	289.37	-10.84	0.5
7	0_7708511	Confined	13,555	2/10/2016	268.02	289.51	-10.75	0.5
7	0_7708511	Confined	13,560	2/15/2016	268.70	289.66	-10.48	0.5
7	0_7708511	Confined	13,565	2/20/2016	269.16	289.80	-10.32	0.5
7	0_7708511	Confined	13,570	2/25/2016	269.88	289.95	-10.03	0.5
7	0_7708511	Confined	13,579	3/5/2016	270.48	290.21	-9.86	0.5
7	0_7708511	Confined	13,584	3/10/2016	270.98	290.35	-9.69	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	13,589	3/15/2016	271.17	290.50	-9.66	0.5
7	0_7708511	Confined	13,594	3/20/2016	271.50	290.64	-9.57	0.5
7	0_7708511	Confined	13,599	3/25/2016	272.15	290.79	-9.32	0.5
7	0_7708511	Confined	13,604	3/30/2016	272.55	290.93	-9.19	0.5
7	0_7708511	Confined	13,610	4/5/2016	272.67	291.11	-9.22	0.5
7	0_7708511	Confined	13,615	4/10/2016	272.75	291.25	-9.25	0.5
7	0_7708511	Confined	13,620	4/15/2016	272.84	291.40	-9.28	0.5
7	0_7708511	Confined	13,625	4/20/2016	272.97	291.54	-9.29	0.5
7	0_7708511	Confined	13,630	4/25/2016	273.16	291.69	-9.26	0.5
7	0_7708511	Confined	13,635	4/30/2016	273.21	291.83	-9.31	0.5
7	0_7708511	Confined	13,640	5/5/2016	273.22	291.98	-9.38	0.5
7	0_7708511	Confined	13,645	5/10/2016	273.22	292.12	-9.45	0.5
7	0_7708511	Confined	13,650	5/15/2016	273.16	292.27	-9.55	0.5
7	0_7708511	Confined	13,655	5/20/2016	273.10	292.41	-9.66	0.5
7	0_7708511	Confined	13,660	5/25/2016	273.00	292.56	-9.78	0.5
7	0_7708511	Confined	13,665	5/30/2016	272.93	292.70	-9.89	0.5
7	0_7708511	Confined	13,691	6/25/2016	270.23	293.46	-11.61	0.5
7	0_7708511	Confined	13,696	6/30/2016	270.10	293.60	-11.75	0.5
7	0_7708511	Confined	13,701	7/5/2016	269.95	293.75	-11.90	0.5
7	0_7708511	Confined	13,706	7/10/2016	269.56	293.89	-12.17	0.5
7	0_7708511	Confined	13,711	7/15/2016	268.67	294.04	-12.68	0.5
7	0_7708511	Confined	13,716	7/20/2016	267.98	294.18	-13.10	0.5
7	0_7708511	Confined	13,721	7/25/2016	266.99	294.33	-13.67	0.5
7	0_7708511	Confined	13,726	7/30/2016	266.37	294.47	-14.05	0.5
7	0_7708511	Confined	13,732	8/5/2016	266.18	294.65	-14.23	0.5
7	0_7708511	Confined	13,737	8/10/2016	265.29	294.79	-14.75	0.5
7	0_7708511	Confined	13,742	8/15/2016	264.39	294.94	-15.27	0.5
7	0_7708511	Confined	13,747	8/20/2016	263.77	295.08	-15.66	0.5
7	0_7708511	Confined	13,752	8/25/2016	263.67	295.23	-15.78	0.5
7	0_7708511	Confined	13,763	9/5/2016	263.28	295.54	-16.13	0.5
7	0_7708511	Confined	13,768	9/10/2016	263.26	295.69	-16.21	0.5
7	0_7708511	Confined	13,783	9/25/2016	261.41	296.12	-17.36	0.5
7	0_7708511	Confined	13,788	9/30/2016	261.26	296.27	-17.50	0.5
7	0_7708511	Confined	13,793	10/5/2016	261.10	296.41	-17.66	0.5
7	0_7708511	Confined	13,798	10/10/2016	261.03	296.56	-17.76	0.5
7	0_7708511	Confined	13,798	10/10/2016	260.52	296.56	-18.02	0.5
7	0_7708511	Confined	13,803	10/15/2016	260.62	296.70	-18.04	0.5
7	0_7708511	Confined	13,808	10/20/2016	260.54	296.85	-18.15	0.5
7	0_7708511	Confined	13,813	10/25/2016	260.51	296.99	-18.24	0.5
7	0_7708511	Confined	13,818	10/30/2016	260.50	297.14	-18.32	0.5
7	0_7708511	Confined	13,824	11/5/2016	260.43	297.31	-18.44	0.5
7	0_7708511	Confined	13,829	11/10/2016	260.34	297.46	-18.56	0.5
7	0_7708511	Confined	13,834	11/15/2016	260.25	297.60	-18.68	0.5
7	0_7708511	Confined	13,839	11/20/2016	260.31	297.75	-18.72	0.5
7	0_7708511	Confined	13,844	11/25/2016	260.30	297.89	-18.80	0.5
7	0_7708511	Confined	13,849	11/30/2016	260.30	298.04	-18.87	0.5
7	0_7708511	Confined	13,854	12/5/2016	260.30	298.18	-18.94	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	13,859	12/10/2016	260.30	298.33	-19.01	0.5
7	0_7708511	Confined	13,864	12/15/2016	260.30	298.47	-19.09	0.5
7	0_7708511	Confined	13,869	12/20/2016	260.30	298.62	-19.16	0.5
7	0_7708511	Confined	13,874	12/25/2016	260.30	298.76	-19.23	0.5
7	0_7708511	Confined	13,879	12/30/2016	264.05	298.91	-17.43	0.5
7	0_7708511	Confined	13,879	12/30/2016	264.04	298.91	-17.43	0.5
7	0_7708511	Confined	13,885	1/5/2017	264.69	299.01	-17.16	0.5
7	0_7708511	Confined	13,890	1/10/2017	265.09	299.09	-17.00	0.5
7	0_7708511	Confined	13,895	1/15/2017	266.11	299.17	-16.53	0.5
7	0_7708511	Confined	13,900	1/20/2017	267.01	299.25	-16.12	0.5
7	0_7708511	Confined	13,905	1/25/2017	267.40	299.33	-15.96	0.5
7	0_7708511	Confined	13,910	1/30/2017	267.57	299.40	-15.92	0.5
7	0_7708511	Confined	13,916	2/5/2017	268.57	299.50	-15.46	0.5
7	0_7708511	Confined	13,921	2/10/2017	269.12	299.58	-15.23	0.5
7	0_7708511	Confined	13,926	2/15/2017	269.56	299.65	-15.05	0.5
7	0_7708511	Confined	13,931	2/20/2017	270.08	299.73	-14.83	0.5
7	0_7708511	Confined	13,936	2/25/2017	270.59	299.81	-14.61	0.5
7	0_7708511	Confined	13,949	3/10/2017	270.84	300.01	-14.59	0.5
7	0_7708511	Confined	13,954	3/15/2017	270.85	300.09	-14.62	0.5
7	0_7708511	Confined	13,959	3/20/2017	270.43	300.17	-14.87	0.5
7	0_7708511	Confined	13,964	3/25/2017	270.80	300.25	-14.72	0.5
7	0_7708511	Confined	13,969	3/30/2017	271.08	300.32	-14.62	0.5
7	0_7708511	Confined	13,975	4/5/2017	271.15	300.42	-14.63	0.5
7	0_7708511	Confined	13,980	4/10/2017	271.23	300.50	-14.63	0.5
7	0_7708511	Confined	13,985	4/15/2017	271.24	300.57	-14.67	0.5
7	0_7708511	Confined	13,990	4/20/2017	272.15	300.65	-14.25	0.5
7	0_7708511	Confined	13,995	4/25/2017	272.09	300.73	-14.32	0.5
7	0_7708511	Confined	14,000	4/30/2017	272.06	300.81	-14.37	0.5
7	0_7708511	Confined	14,005	5/5/2017	271.81	300.89	-14.54	0.5
7	0_7708511	Confined	14,010	5/10/2017	270.91	300.96	-15.03	0.5
7	0_7708511	Confined	14,015	5/15/2017	270.16	301.04	-15.44	0.5
7	0_7708511	Confined	14,020	5/20/2017	269.57	301.12	-15.77	0.5
7	0_7708511	Confined	14,025	5/25/2017	268.78	301.20	-16.21	0.5
7	0_7708511	Confined	14,030	5/30/2017	267.88	301.28	-16.70	0.5
7	0_7708511	Confined	14,036	6/5/2017	267.55	301.37	-16.91	0.5
7	0_7708511	Confined	14,041	6/10/2017	267.19	301.45	-17.13	0.5
7	0_7708511	Confined	14,046	6/15/2017	266.82	301.52	-17.35	0.5
7	0_7708511	Confined	14,051	6/20/2017	266.24	301.60	-17.68	0.5
7	0_7708511	Confined	14,056	6/25/2017	265.69	301.68	-18.00	0.5
7	0_7708511	Confined	14,061	6/30/2017	265.20	301.76	-18.28	0.5
7	0_7708511	Confined	14,066	7/5/2017	264.51	301.84	-18.66	0.5
7	0_7708511	Confined	14,071	7/10/2017	263.85	301.91	-19.03	0.5
7	0_7708511	Confined	14,076	7/15/2017	262.80	301.99	-19.60	0.5
7	0_7708511	Confined	14,081	7/20/2017	262.44	302.07	-19.82	0.5
7	0_7708511	Confined	14,086	7/25/2017	262.17	302.15	-19.99	0.5
7	0_7708511	Confined	14,091	7/30/2017	261.20	302.23	-20.51	0.5
7	0_7708511	Confined	14,097	8/5/2017	259.80	302.32	-21.26	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708511	Confined	14,102	8/10/2017	259.21	302.40	-21.59	0.5
7	0_7708511	Confined	14,107	8/15/2017	258.72	302.48	-21.88	0.5
7	0_7708511	Confined	14,112	8/20/2017	258.14	302.55	-22.21	0.5
7	0_7708511	Confined	14,117	8/25/2017	257.52	302.63	-22.56	0.5
7	0_7708511	Confined	14,122	8/30/2017	257.21	302.71	-22.75	0.5
7	0_7708511	Confined	14,128	9/5/2017	256.19	302.80	-23.31	0.5
7	0_7708511	Confined	14,133	9/10/2017	255.24	302.88	-23.82	0.5
7	0_7708511	Confined	14,138	9/15/2017	255.20	302.96	-23.88	0.5
7	0_7708511	Confined	14,143	9/20/2017	254.27	303.04	-24.38	0.5
7	0_7708511	Confined	14,148	9/25/2017	253.41	303.12	-24.85	0.5
7	0_7708511	Confined	14,153	9/30/2017	252.87	303.19	-25.16	0.5
7	0_7708511	Confined	14,158	10/5/2017	252.26	303.27	-25.51	0.5
7	0_7708511	Confined	14,163	10/10/2017	252.22	303.35	-25.56	0.5
7	0_7708511	Confined	14,168	10/15/2017	251.88	303.43	-25.77	0.5
7	0_7708511	Confined	14,173	10/20/2017	251.82	303.50	-25.84	0.5
7	0_7708511	Confined	14,178	10/25/2017	253.83	303.58	-24.88	0.5
7	0_7708511	Confined	14,183	10/30/2017	253.85	303.66	-24.91	0.5
7	0_7708511	Confined	14,189	11/5/2017	253.86	303.75	-24.95	0.5
7	0_7708511	Confined	14,194	11/10/2017	253.87	303.83	-24.98	0.5
7	0_7708511	Confined	14,199	11/15/2017	253.84	303.91	-25.04	0.5
7	0_7708511	Confined	14,204	11/20/2017	253.83	303.99	-25.08	0.5
7	0_7708511	Confined	14,209	11/25/2017	254.04	304.07	-25.01	0.5
7	0_7708511	Confined	14,214	11/30/2017	254.21	304.14	-24.97	0.5
7	0_7708511	Confined	14,219	12/5/2017	254.66	304.22	-24.78	0.5
7	0_7708511	Confined	14,224	12/10/2017	254.81	304.30	-24.74	0.5
7	0_7708511	Confined	14,229	12/15/2017	255.45	304.38	-24.46	0.5
7	0_7708511	Confined	14,234	12/20/2017	256.12	304.46	-24.17	0.5
7	0_7708511	Confined	14,239	12/25/2017	256.57	304.53	-23.98	0.5
7	0_7708511	Confined	14,244	12/30/2017	257.18	304.61	-23.72	0.5
7	0_7708719	Confined	12,634	8/3/2013	140.08	210.94	-70.86	1
7	0_7708803	Confined	5,358	9/1/1993	246.47	344.88	-98.41	1
7	0_7708803	Confined	5,388	10/1/1993	244.17	343.89	-99.72	1
7	0_7708803	Confined	5,420	11/2/1993	275.07	342.82	-67.75	1
7	0_7708803	Confined	5,451	12/3/1993	297.12	341.79	-44.67	1
7	0_7708803	Confined	5,483	1/4/1994	304.97	340.73	-35.76	1
7	0_7708803	Confined	5,513	2/3/1994	310.27	339.78	-29.51	1
7	0_7708803	Confined	5,539	3/1/1994	313.27	338.95	-25.68	1
7	0_7708803	Confined	5,574	4/5/1994	324.87	337.83	-12.96	1
7	0_7708803	Confined	5,602	5/3/1994	314.37	336.94	-22.57	1
7	0_7708803	Confined	5,646	6/16/1994	297.17	335.54	-38.37	1
7	0_7708803	Confined	5,665	7/5/1994	288.27	334.93	-46.66	1
7	0_7708803	Confined	5,849	1/5/1995	322.27	329.15	-6.88	1
7	0_7708803	Confined	6,212	1/3/1996	283.02	323.80	-40.78	1
7	0_7708803	Confined	6,638	3/4/1997	295.17	324.52	-29.35	1
7	0_7708803	Confined	6,974	2/3/1998	314.37	334.71	-20.34	1
7	0_7708803	Confined	7,323	1/18/1999	292.47	316.18	-23.71	1
7	0_7708803	Confined	8,041	1/5/2001	296.41	285.65	10.76	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	8,082	2/15/2001	309.66	285.77	23.89	1
7	0_7708803	Confined	8,102	3/7/2001	311.17	285.83	25.34	1
7	0_7708803	Confined	8,130	4/4/2001	309.99	285.91	24.08	1
7	0_7708803	Confined	8,158	5/2/2001	291.65	285.99	5.66	1
7	0_7708803	Confined	8,170	5/14/2001	297.26	286.02	11.24	1
7	0_7708803	Confined	8,173	5/17/2001	292.98	286.03	6.95	1
7	0_7708803	Confined	8,194	6/7/2001	271.94	286.09	-14.15	1
7	0_7708803	Confined	8,227	7/10/2001	268.74	286.19	-17.45	1
7	0_7708803	Confined	8,257	8/9/2001	235.79	286.27	-50.48	1
7	0_7708803	Confined	8,285	9/6/2001	244.76	286.36	-41.60	1
7	0_7708803	Confined	8,294	9/15/2001	246.42	286.38	-39.96	1
7	0_7708803	Confined	8,309	9/30/2001	241.68	286.42	-44.74	1
7	0_7708803	Confined	8,311	10/2/2001	242.59	286.43	-43.84	1
7	0_7708803	Confined	8,321	10/12/2001	244.10	286.46	-42.36	1
7	0_7708803	Confined	8,324	10/15/2001	246.96	286.47	-39.51	1
7	0_7708803	Confined	8,339	10/30/2001	246.61	286.51	-39.90	1
7	0_7708803	Confined	8,347	11/7/2001	248.50	286.53	-38.03	1
7	0_7708803	Confined	8,355	11/15/2001	253.82	286.56	-32.74	1
7	0_7708803	Confined	8,370	11/30/2001	269.36	286.60	-17.24	1
7	0_7708803	Confined	8,374	12/4/2001	272.78	286.61	-13.83	1
7	0_7708803	Confined	8,385	12/15/2001	281.32	286.64	-5.32	1
7	0_7708803	Confined	8,400	12/30/2001	288.73	286.69	2.04	1
7	0_7708803	Confined	8,410	1/9/2002	289.57	286.30	3.27	1
7	0_7708803	Confined	8,411	1/10/2002	285.84	286.26	-0.42	1
7	0_7708803	Confined	8,417	1/16/2002	280.75	286.00	-5.25	1
7	0_7708803	Confined	8,431	1/30/2002	279.15	285.40	-6.25	1
7	0_7708803	Confined	8,438	2/6/2002	279.32	285.10	-5.78	1
7	0_7708803	Confined	8,447	2/15/2002	274.96	284.71	-9.75	1
7	0_7708803	Confined	8,465	3/5/2002	269.59	283.94	-14.35	1
7	0_7708803	Confined	8,475	3/15/2002	261.71	283.51	-21.80	1
7	0_7708803	Confined	8,490	3/30/2002	250.15	282.86	-32.71	1
7	0_7708803	Confined	8,493	4/2/2002	247.54	282.73	-35.19	1
7	0_7708803	Confined	8,506	4/15/2002	252.76	282.17	-29.41	1
7	0_7708803	Confined	8,521	4/30/2002	234.61	281.53	-46.92	1
7	0_7708803	Confined	8,523	5/2/2002	230.55	281.44	-50.89	1
7	0_7708803	Confined	8,536	5/15/2002	217.46	280.88	-63.42	1
7	0_7708803	Confined	8,551	5/30/2002	234.31	280.24	-45.93	1
7	0_7708803	Confined	8,562	6/10/2002	235.72	279.76	-44.04	1
7	0_7708803	Confined	8,567	6/15/2002	233.13	279.55	-46.42	1
7	0_7708803	Confined	8,582	6/30/2002	236.48	278.90	-42.42	1
7	0_7708803	Confined	8,592	7/10/2002	251.84	278.47	-26.63	1
7	0_7708803	Confined	8,597	7/15/2002	257.43	278.26	-20.83	1
7	0_7708803	Confined	8,612	7/30/2002	268.09	277.61	-9.52	1
7	0_7708803	Confined	8,621	8/8/2002	264.72	277.23	-12.51	1
7	0_7708803	Confined	8,628	8/15/2002	266.27	276.93	-10.66	1
7	0_7708803	Confined	8,643	8/30/2002	255.05	276.28	-21.23	1
7	0_7708803	Confined	8,653	9/9/2002	262.69	275.85	-13.16	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	8,740	12/5/2002	302.86	272.11	30.75	1
7	0_7708803	Confined	8,745	12/10/2002	305.01	271.89	33.12	1
7	0_7708803	Confined	8,750	12/15/2002	306.73	271.68	35.05	1
7	0_7708803	Confined	8,755	12/20/2002	308.24	271.46	36.78	1
7	0_7708803	Confined	8,760	12/25/2002	309.20	271.25	37.95	1
7	0_7708803	Confined	8,765	12/30/2002	309.51	271.03	38.48	1
7	0_7708803	Confined	8,771	1/5/2003	307.39	270.98	36.41	1
7	0_7708803	Confined	8,772	1/6/2003	307.67	270.98	36.69	1
7	0_7708803	Confined	8,776	1/10/2003	307.55	270.98	36.57	1
7	0_7708803	Confined	8,781	1/15/2003	309.29	270.98	38.31	1
7	0_7708803	Confined	8,786	1/20/2003	311.95	270.97	40.98	1
7	0_7708803	Confined	8,791	1/25/2003	312.50	270.97	41.53	1
7	0_7708803	Confined	8,796	1/30/2003	313.64	270.96	42.68	1
7	0_7708803	Confined	8,802	2/5/2003	313.13	270.96	42.17	1
7	0_7708803	Confined	8,812	2/15/2003	316.63	270.95	45.68	1
7	0_7708803	Confined	8,822	2/25/2003	319.15	270.94	48.21	1
7	0_7708803	Confined	8,826	3/1/2003	319.48	270.94	48.54	1
7	0_7708803	Confined	8,830	3/5/2003	320.66	270.93	49.73	1
7	0_7708803	Confined	8,835	3/10/2003	320.80	270.93	49.87	1
7	0_7708803	Confined	8,840	3/15/2003	319.25	270.92	48.33	1
7	0_7708803	Confined	8,845	3/20/2003	317.78	270.92	46.86	1
7	0_7708803	Confined	8,850	3/25/2003	313.25	270.92	42.33	1
7	0_7708803	Confined	8,855	3/30/2003	308.58	270.91	37.67	1
7	0_7708803	Confined	8,857	4/1/2003	306.58	270.91	35.67	1
7	0_7708803	Confined	8,861	4/5/2003	299.19	270.91	28.28	1
7	0_7708803	Confined	8,866	4/10/2003	293.76	270.90	22.86	1
7	0_7708803	Confined	8,871	4/15/2003	285.90	270.90	15.00	1
7	0_7708803	Confined	8,876	4/20/2003	281.30	270.89	10.41	1
7	0_7708803	Confined	8,881	4/25/2003	281.03	270.89	10.14	1
7	0_7708803	Confined	8,886	4/30/2003	277.78	270.88	6.90	1
7	0_7708803	Confined	8,887	5/1/2003	277.58	270.88	6.70	1
7	0_7708803	Confined	8,891	5/5/2003	273.58	270.88	2.70	1
7	0_7708803	Confined	8,901	5/15/2003	265.64	270.87	-5.23	1
7	0_7708803	Confined	8,906	5/20/2003	262.64	270.87	-8.23	1
7	0_7708803	Confined	8,911	5/25/2003	259.45	270.86	-11.41	1
7	0_7708803	Confined	8,916	5/30/2003	257.88	270.86	-12.98	1
7	0_7708803	Confined	8,922	6/5/2003	260.46	270.85	-10.39	1
7	0_7708803	Confined	8,927	6/10/2003	264.05	270.85	-6.80	1
7	0_7708803	Confined	8,937	6/20/2003	278.96	270.84	8.12	1
7	0_7708803	Confined	8,942	6/25/2003	279.92	270.83	9.09	1
7	0_7708803	Confined	8,947	6/30/2003	279.54	270.83	8.71	1
7	0_7708803	Confined	8,952	7/5/2003	277.23	270.83	6.40	1
7	0_7708803	Confined	8,957	7/10/2003	284.32	270.82	13.50	1
7	0_7708803	Confined	8,962	7/15/2003	288.22	270.82	17.40	1
7	0_7708803	Confined	8,967	7/20/2003	293.31	270.81	22.50	1
7	0_7708803	Confined	8,972	7/25/2003	296.15	270.81	25.34	1
7	0_7708803	Confined	8,977	7/30/2003	293.39	270.80	22.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	8,983	8/5/2003	284.48	270.80	13.68	1
7	0_7708803	Confined	8,988	8/10/2003	277.69	270.79	6.90	1
7	0_7708803	Confined	8,993	8/15/2003	278.02	270.79	7.23	1
7	0_7708803	Confined	8,998	8/20/2003	273.67	270.79	2.88	1
7	0_7708803	Confined	9,003	8/25/2003	268.06	270.78	-2.72	1
7	0_7708803	Confined	9,008	8/30/2003	261.43	270.78	-9.35	1
7	0_7708803	Confined	9,014	9/5/2003	270.51	270.77	-0.26	1
7	0_7708803	Confined	9,024	9/15/2003	282.56	270.76	11.80	1
7	0_7708803	Confined	9,029	9/20/2003	287.16	270.76	16.40	1
7	0_7708803	Confined	9,034	9/25/2003	291.12	270.75	20.37	1
7	0_7708803	Confined	9,039	9/30/2003	294.22	270.75	23.47	1
7	0_7708803	Confined	9,044	10/5/2003	296.32	270.75	25.57	1
7	0_7708803	Confined	9,049	10/10/2003	297.27	270.74	26.53	1
7	0_7708803	Confined	9,064	10/25/2003	299.82	270.73	29.09	1
7	0_7708803	Confined	9,069	10/30/2003	302.18	270.72	31.46	1
7	0_7708803	Confined	9,075	11/5/2003	304.93	270.72	34.21	1
7	0_7708803	Confined	9,080	11/10/2003	306.87	270.71	36.16	1
7	0_7708803	Confined	9,085	11/15/2003	309.33	270.71	38.62	1
7	0_7708803	Confined	9,100	11/30/2003	310.93	270.70	40.23	1
7	0_7708803	Confined	9,105	12/5/2003	309.94	270.69	39.25	1
7	0_7708803	Confined	9,110	12/10/2003	309.58	270.69	38.89	1
7	0_7708803	Confined	9,115	12/15/2003	308.39	270.68	37.71	1
7	0_7708803	Confined	9,120	12/20/2003	308.94	270.68	38.26	1
7	0_7708803	Confined	9,125	12/25/2003	307.20	270.67	36.53	1
7	0_7708803	Confined	9,130	12/30/2003	308.80	270.67	38.13	1
7	0_7708803	Confined	9,136	1/5/2004	310.97	270.74	40.23	1
7	0_7708803	Confined	9,141	1/10/2004	307.92	270.82	37.10	1
7	0_7708803	Confined	9,145	1/14/2004	308.77	270.87	37.90	1
7	0_7708803	Confined	9,146	1/15/2004	309.27	270.89	38.38	1
7	0_7708803	Confined	9,151	1/20/2004	312.96	270.96	42.00	1
7	0_7708803	Confined	9,156	1/25/2004	315.83	271.03	44.80	1
7	0_7708803	Confined	9,161	1/30/2004	318.04	271.11	46.93	1
7	0_7708803	Confined	9,167	2/5/2004	319.20	271.20	48.00	1
7	0_7708803	Confined	9,172	2/10/2004	319.39	271.27	48.12	1
7	0_7708803	Confined	9,177	2/15/2004	320.41	271.34	49.07	1
7	0_7708803	Confined	9,182	2/20/2004	318.58	271.41	47.17	1
7	0_7708803	Confined	9,187	2/25/2004	319.21	271.49	47.72	1
7	0_7708803	Confined	9,196	3/5/2004	321.93	271.62	50.31	1
7	0_7708803	Confined	9,201	3/10/2004	318.48	271.69	46.79	1
7	0_7708803	Confined	9,206	3/15/2004	317.50	271.77	45.73	1
7	0_7708803	Confined	9,211	3/20/2004	319.90	271.84	48.06	1
7	0_7708803	Confined	9,216	3/25/2004	315.37	271.91	43.46	1
7	0_7708803	Confined	9,221	3/30/2004	314.94	271.98	42.96	1
7	0_7708803	Confined	9,227	4/5/2004	318.71	272.07	46.64	1
7	0_7708803	Confined	9,232	4/10/2004	321.56	272.15	49.41	1
7	0_7708803	Confined	9,237	4/15/2004	323.22	272.22	51.00	1
7	0_7708803	Confined	9,242	4/20/2004	321.99	272.29	49.70	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	9,247	4/25/2004	317.70	272.36	45.34	1
7	0_7708803	Confined	9,252	4/30/2004	321.45	272.44	49.01	1
7	0_7708803	Confined	9,257	5/5/2004	323.11	272.51	50.60	1
7	0_7708803	Confined	9,262	5/10/2004	323.25	272.58	50.67	1
7	0_7708803	Confined	9,267	5/15/2004	325.91	272.66	53.25	1
7	0_7708803	Confined	9,272	5/20/2004	322.49	272.73	49.76	1
7	0_7708803	Confined	9,282	5/30/2004	308.96	272.88	36.08	1
7	0_7708803	Confined	9,288	6/5/2004	303.13	272.96	30.17	1
7	0_7708803	Confined	9,293	6/10/2004	306.42	273.04	33.38	1
7	0_7708803	Confined	9,298	6/15/2004	311.53	273.11	38.42	1
7	0_7708803	Confined	9,303	6/20/2004	307.29	273.18	34.11	1
7	0_7708803	Confined	9,308	6/25/2004	311.21	273.26	37.95	1
7	0_7708803	Confined	9,313	6/30/2004	316.17	273.33	42.84	1
7	0_7708803	Confined	9,318	7/5/2004	319.08	273.40	45.68	1
7	0_7708803	Confined	9,323	7/10/2004	320.58	273.47	47.11	1
7	0_7708803	Confined	9,328	7/15/2004	317.13	273.55	43.58	1
7	0_7708803	Confined	9,333	7/20/2004	309.61	273.62	35.99	1
7	0_7708803	Confined	9,338	7/25/2004	309.27	273.69	35.58	1
7	0_7708803	Confined	9,343	7/30/2004	307.20	273.77	33.43	1
7	0_7708803	Confined	9,349	8/5/2004	299.95	273.85	26.10	1
7	0_7708803	Confined	9,354	8/10/2004	292.64	273.93	18.71	1
7	0_7708803	Confined	9,359	8/15/2004	287.74	274.00	13.74	1
7	0_7708803	Confined	9,380	9/5/2004	297.52	274.31	23.21	1
7	0_7708803	Confined	9,395	9/20/2004	293.46	274.53	18.93	1
7	0_7708803	Confined	9,400	9/25/2004	289.48	274.60	14.88	1
7	0_7708803	Confined	9,405	9/30/2004	291.80	274.67	17.13	1
7	0_7708803	Confined	9,409	10/4/2004	291.21	274.73	16.48	1
7	0_7708803	Confined	9,410	10/5/2004	292.04	274.75	17.29	1
7	0_7708803	Confined	9,415	10/10/2004	298.16	274.82	23.34	1
7	0_7708803	Confined	9,420	10/15/2004	295.84	274.89	20.95	1
7	0_7708803	Confined	9,424	10/19/2004	295.03	274.95	20.08	1
7	0_7708803	Confined	9,425	10/20/2004	294.42	274.96	19.46	1
7	0_7708803	Confined	9,430	10/25/2004	295.05	275.04	20.01	1
7	0_7708803	Confined	9,437	11/1/2004	296.29	275.14	21.15	1
7	0_7708803	Confined	9,441	11/5/2004	301.80	275.20	26.60	1
7	0_7708803	Confined	9,446	11/10/2004	305.63	275.27	30.36	1
7	0_7708803	Confined	9,451	11/15/2004	308.48	275.34	33.14	1
7	0_7708803	Confined	9,456	11/20/2004	311.95	275.42	36.53	1
7	0_7708803	Confined	9,461	11/25/2004	314.76	275.49	39.27	1
7	0_7708803	Confined	9,466	11/30/2004	317.29	275.56	41.73	1
7	0_7708803	Confined	9,471	12/5/2004	319.53	275.64	43.89	1
7	0_7708803	Confined	9,473	12/7/2004	319.93	275.67	44.26	1
7	0_7708803	Confined	9,476	12/10/2004	320.87	275.71	45.16	1
7	0_7708803	Confined	9,481	12/15/2004	321.25	275.78	45.47	1
7	0_7708803	Confined	9,486	12/20/2004	319.16	275.86	43.30	1
7	0_7708803	Confined	9,491	12/25/2004	320.43	275.93	44.50	1
7	0_7708803	Confined	9,500	1/3/2005	319.51	276.00	43.51	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	9,502	1/5/2005	321.13	276.00	45.13	1
7	0_7708803	Confined	9,507	1/10/2005	320.76	275.98	44.78	1
7	0_7708803	Confined	9,511	1/14/2005	321.13	275.96	45.17	1
7	0_7708803	Confined	9,512	1/15/2005	321.01	275.96	45.05	1
7	0_7708803	Confined	9,517	1/20/2005	321.61	275.94	45.67	1
7	0_7708803	Confined	9,521	1/24/2005	320.72	275.93	44.79	1
7	0_7708803	Confined	9,522	1/25/2005	320.48	275.92	44.56	1
7	0_7708803	Confined	9,524	1/27/2005	320.62	275.92	44.70	1
7	0_7708803	Confined	9,527	1/30/2005	322.49	275.90	46.59	1
7	0_7708803	Confined	9,533	2/5/2005	326.82	275.88	50.94	1
7	0_7708803	Confined	9,542	2/14/2005	329.89	275.85	54.04	1
7	0_7708803	Confined	9,544	2/16/2005	330.07	275.84	54.23	1
7	0_7708803	Confined	9,548	2/20/2005	329.38	275.83	53.55	1
7	0_7708803	Confined	9,553	2/25/2005	332.14	275.81	56.33	1
7	0_7708803	Confined	9,558	3/2/2005	332.84	275.79	57.05	1
7	0_7708803	Confined	9,561	3/5/2005	334.50	275.78	58.72	1
7	0_7708803	Confined	9,566	3/10/2005	335.70	275.76	59.94	1
7	0_7708803	Confined	9,571	3/15/2005	335.42	275.74	59.68	1
7	0_7708803	Confined	9,576	3/20/2005	335.68	275.72	59.96	1
7	0_7708803	Confined	9,581	3/25/2005	330.78	275.70	55.08	1
7	0_7708803	Confined	9,586	3/30/2005	329.78	275.68	54.10	1
7	0_7708803	Confined	9,592	4/5/2005	319.63	275.66	43.97	1
7	0_7708803	Confined	9,597	4/10/2005	312.06	275.64	36.42	1
7	0_7708803	Confined	9,602	4/15/2005	303.32	275.62	27.70	1
7	0_7708803	Confined	9,607	4/20/2005	299.81	275.60	24.21	1
7	0_7708803	Confined	9,612	4/25/2005	295.55	275.59	19.96	1
7	0_7708803	Confined	9,615	4/28/2005	291.69	275.57	16.12	1
7	0_7708803	Confined	9,617	4/30/2005	288.52	275.57	12.95	1
7	0_7708803	Confined	9,622	5/5/2005	284.24	275.55	8.69	1
7	0_7708803	Confined	9,627	5/10/2005	283.07	275.53	7.54	1
7	0_7708803	Confined	9,632	5/15/2005	278.77	275.51	3.26	1
7	0_7708803	Confined	9,637	5/20/2005	287.62	275.49	12.13	1
7	0_7708803	Confined	9,642	5/25/2005	286.21	275.47	10.74	1
7	0_7708803	Confined	9,647	5/30/2005	289.11	275.46	13.65	1
7	0_7708803	Confined	9,653	6/5/2005	296.91	275.43	21.48	1
7	0_7708803	Confined	9,656	6/8/2005	300.19	275.42	24.77	1
7	0_7708803	Confined	9,658	6/10/2005	299.29	275.41	23.88	1
7	0_7708803	Confined	9,663	6/15/2005	297.79	275.40	22.39	1
7	0_7708803	Confined	9,668	6/20/2005	292.14	275.38	16.76	1
7	0_7708803	Confined	9,673	6/25/2005	288.83	275.36	13.47	1
7	0_7708803	Confined	9,678	6/30/2005	284.66	275.34	9.32	1
7	0_7708803	Confined	9,683	7/5/2005	280.20	275.32	4.88	1
7	0_7708803	Confined	9,688	7/10/2005	276.47	275.30	1.17	1
7	0_7708803	Confined	9,693	7/15/2005	273.18	275.28	-2.10	1
7	0_7708803	Confined	9,698	7/20/2005	281.90	275.26	6.64	1
7	0_7708803	Confined	9,703	7/25/2005	283.57	275.25	8.32	1
7	0_7708803	Confined	9,704	7/26/2005	282.01	275.24	6.77	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	9,708	7/30/2005	280.30	275.23	5.07	1
7	0_7708803	Confined	9,714	8/5/2005	274.90	275.20	-0.30	1
7	0_7708803	Confined	9,719	8/10/2005	271.30	275.19	-3.89	1
7	0_7708803	Confined	9,724	8/15/2005	268.25	275.17	-6.92	1
7	0_7708803	Confined	9,729	8/20/2005	262.81	275.15	-12.34	1
7	0_7708803	Confined	9,734	8/25/2005	257.03	275.13	-18.10	1
7	0_7708803	Confined	9,739	8/30/2005	252.24	275.11	-22.87	1
7	0_7708803	Confined	9,752	9/12/2005	250.60	275.06	-24.46	1
7	0_7708803	Confined	9,777	10/7/2005	243.39	274.97	-31.58	1
7	0_7708803	Confined	9,860	12/29/2005	281.94	274.66	7.28	1
7	0_7708803	Confined	9,865	1/3/2006	278.77	274.71	4.06	1
7	0_7708803	Confined	9,893	1/31/2006	282.22	275.27	6.95	1
7	0_7708803	Confined	9,942	3/21/2006	251.42	276.26	-24.84	1
7	0_7708803	Confined	9,963	4/11/2006	230.64	276.68	-46.04	1
7	0_7708803	Confined	9,965	4/13/2006	226.55	276.72	-50.17	1
7	0_7708803	Confined	9,990	5/8/2006	216.22	277.22	-61.00	1
7	0_7708803	Confined	10,018	6/5/2006	211.82	277.78	-65.96	1
7	0_7708803	Confined	10,039	6/26/2006	208.54	278.20	-69.66	1
7	0_7708803	Confined	10,076	8/2/2006	200.57	278.95	-78.38	1
7	0_7708803	Confined	10,095	8/21/2006	182.63	279.33	-96.70	1
7	0_7708803	Confined	10,126	9/21/2006	198.56	279.95	-81.39	1
7	0_7708803	Confined	10,131	9/26/2006	195.59	280.05	-84.46	1
7	0_7708803	Confined	10,138	10/3/2006	191.89	280.19	-88.30	1
7	0_7708803	Confined	10,186	11/20/2006	225.52	281.15	-55.63	1
7	0_7708803	Confined	10,191	11/25/2006	230.05	281.26	-51.21	1
7	0_7708803	Confined	10,196	11/30/2006	233.24	281.36	-48.12	1
7	0_7708803	Confined	10,201	12/5/2006	235.58	281.46	-45.88	1
7	0_7708803	Confined	10,206	12/10/2006	237.05	281.56	-44.51	1
7	0_7708803	Confined	10,211	12/15/2006	233.43	281.66	-48.23	1
7	0_7708803	Confined	10,216	12/20/2006	236.20	281.76	-45.56	1
7	0_7708803	Confined	10,221	12/25/2006	240.48	281.86	-41.38	1
7	0_7708803	Confined	10,226	12/30/2006	246.85	281.96	-35.11	1
7	0_7708803	Confined	10,232	1/5/2007	253.83	281.97	-28.14	1
7	0_7708803	Confined	10,237	1/10/2007	259.47	281.96	-22.49	1
7	0_7708803	Confined	10,242	1/15/2007	263.31	281.96	-18.65	1
7	0_7708803	Confined	10,247	1/20/2007	268.10	281.95	-13.85	1
7	0_7708803	Confined	10,252	1/25/2007	270.08	281.94	-11.86	1
7	0_7708803	Confined	10,264	2/6/2007	275.17	281.93	-6.76	1
7	0_7708803	Confined	10,291	3/5/2007	265.71	281.89	-16.18	1
7	0_7708803	Confined	10,301	3/15/2007	265.62	281.88	-16.26	1
7	0_7708803	Confined	10,388	6/10/2007	295.08	281.76	13.32	1
7	0_7708803	Confined	10,393	6/15/2007	287.60	281.75	5.85	1
7	0_7708803	Confined	10,398	6/20/2007	291.48	281.74	9.74	1
7	0_7708803	Confined	10,403	6/25/2007	296.01	281.73	14.28	1
7	0_7708803	Confined	10,408	6/30/2007	299.73	281.73	18.00	1
7	0_7708803	Confined	10,413	7/5/2007	302.44	281.72	20.72	1
7	0_7708803	Confined	10,418	7/10/2007	305.50	281.71	23.79	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	10,423	7/15/2007	306.14	281.71	24.43	1
7	0_7708803	Confined	10,428	7/20/2007	307.26	281.70	25.56	1
7	0_7708803	Confined	10,433	7/25/2007	309.31	281.69	27.62	1
7	0_7708803	Confined	10,438	7/30/2007	311.15	281.69	29.46	1
7	0_7708803	Confined	10,444	8/5/2007	312.59	281.68	30.91	1
7	0_7708803	Confined	10,449	8/10/2007	308.99	281.67	27.32	1
7	0_7708803	Confined	10,454	8/15/2007	300.98	281.66	19.32	1
7	0_7708803	Confined	10,459	8/20/2007	303.92	281.66	22.26	1
7	0_7708803	Confined	10,464	8/25/2007	305.65	281.65	24.00	1
7	0_7708803	Confined	10,469	8/30/2007	302.06	281.64	20.42	1
7	0_7708803	Confined	10,475	9/5/2007	304.04	281.64	22.40	1
7	0_7708803	Confined	10,480	9/10/2007	305.85	281.63	24.22	1
7	0_7708803	Confined	10,485	9/15/2007	301.76	281.62	20.14	1
7	0_7708803	Confined	10,490	9/20/2007	292.45	281.61	10.84	1
7	0_7708803	Confined	10,495	9/25/2007	287.77	281.61	6.16	1
7	0_7708803	Confined	10,500	9/30/2007	281.93	281.60	0.33	1
7	0_7708803	Confined	10,505	10/5/2007	283.85	281.59	2.26	1
7	0_7708803	Confined	10,510	10/10/2007	280.13	281.59	-1.46	1
7	0_7708803	Confined	10,515	10/15/2007	280.52	281.58	-1.06	1
7	0_7708803	Confined	10,520	10/20/2007	277.18	281.57	-4.39	1
7	0_7708803	Confined	10,525	10/25/2007	282.52	281.57	0.95	1
7	0_7708803	Confined	10,530	10/30/2007	282.74	281.56	1.18	1
7	0_7708803	Confined	10,536	11/5/2007	282.95	281.55	1.40	1
7	0_7708803	Confined	10,541	11/10/2007	283.79	281.54	2.25	1
7	0_7708803	Confined	10,546	11/15/2007	284.80	281.54	3.26	1
7	0_7708803	Confined	10,551	11/20/2007	286.31	281.53	4.78	1
7	0_7708803	Confined	10,556	11/25/2007	289.62	281.52	8.10	1
7	0_7708803	Confined	10,561	11/30/2007	290.59	281.52	9.07	1
7	0_7708803	Confined	10,566	12/5/2007	293.31	281.51	11.80	1
7	0_7708803	Confined	10,571	12/10/2007	292.44	281.50	10.94	1
7	0_7708803	Confined	10,576	12/15/2007	291.50	281.50	10.00	1
7	0_7708803	Confined	10,581	12/20/2007	293.80	281.49	12.31	1
7	0_7708803	Confined	10,586	12/25/2007	293.18	281.48	11.70	1
7	0_7708803	Confined	10,591	12/30/2007	290.82	281.47	9.35	1
7	0_7708803	Confined	10,595	1/3/2008	290.95	281.27	9.68	1
7	0_7708803	Confined	10,597	1/5/2008	293.96	281.14	12.82	1
7	0_7708803	Confined	10,602	1/10/2008	289.26	280.80	8.46	1
7	0_7708803	Confined	10,607	1/15/2008	287.47	280.46	7.01	1
7	0_7708803	Confined	10,612	1/20/2008	291.47	280.13	11.34	1
7	0_7708803	Confined	10,617	1/25/2008	295.42	279.79	15.63	1
7	0_7708803	Confined	10,622	1/30/2008	294.52	279.45	15.07	1
7	0_7708803	Confined	10,628	2/5/2008	288.02	279.05	8.97	1
7	0_7708803	Confined	10,633	2/10/2008	285.14	278.71	6.43	1
7	0_7708803	Confined	10,638	2/15/2008	281.33	278.37	2.96	1
7	0_7708803	Confined	10,643	2/20/2008	278.01	278.04	-0.03	1
7	0_7708803	Confined	10,648	2/25/2008	273.45	277.70	-4.25	1
7	0_7708803	Confined	10,652	2/29/2008	270.17	277.43	-7.26	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	10,657	3/5/2008	263.91	277.09	-13.18	1
7	0_7708803	Confined	10,662	3/10/2008	259.46	276.76	-17.30	1
7	0_7708803	Confined	10,667	3/15/2008	269.46	276.42	-6.96	1
7	0_7708803	Confined	10,672	3/20/2008	265.37	276.08	-10.71	1
7	0_7708803	Confined	10,677	3/25/2008	256.96	275.75	-18.79	1
7	0_7708803	Confined	10,682	3/30/2008	248.65	275.41	-26.76	1
7	0_7708803	Confined	10,688	4/5/2008	256.63	275.01	-18.38	1
7	0_7708803	Confined	10,693	4/10/2008	249.52	274.67	-25.15	1
7	0_7708803	Confined	10,698	4/15/2008	238.03	274.33	-36.30	1
7	0_7708803	Confined	10,703	4/20/2008	232.20	273.99	-41.79	1
7	0_7708803	Confined	10,708	4/25/2008	231.51	273.66	-42.15	1
7	0_7708803	Confined	10,713	4/30/2008	236.11	273.32	-37.21	1
7	0_7708803	Confined	10,718	5/5/2008	230.19	272.98	-42.79	1
7	0_7708803	Confined	10,723	5/10/2008	225.17	272.65	-47.48	1
7	0_7708803	Confined	10,728	5/15/2008	219.86	272.31	-52.45	1
7	0_7708803	Confined	10,733	5/20/2008	234.05	271.97	-37.92	1
7	0_7708803	Confined	10,738	5/25/2008	239.94	271.64	-31.70	1
7	0_7708803	Confined	10,743	5/30/2008	237.17	271.30	-34.13	1
7	0_7708803	Confined	10,749	6/5/2008	229.89	270.90	-41.01	1
7	0_7708803	Confined	10,754	6/10/2008	226.10	270.56	-44.46	1
7	0_7708803	Confined	10,759	6/15/2008	222.05	270.22	-48.17	1
7	0_7708803	Confined	10,764	6/20/2008	214.97	269.88	-54.91	1
7	0_7708803	Confined	10,769	6/25/2008	215.16	269.55	-54.39	1
7	0_7708803	Confined	10,774	6/30/2008	211.77	269.21	-57.44	1
7	0_7708803	Confined	10,779	7/5/2008	214.86	268.87	-54.01	1
7	0_7708803	Confined	10,784	7/10/2008	214.87	268.54	-53.67	1
7	0_7708803	Confined	10,789	7/15/2008	237.67	268.20	-30.53	1
7	0_7708803	Confined	10,794	7/20/2008	228.60	267.86	-39.26	1
7	0_7708803	Confined	10,799	7/25/2008	229.61	267.53	-37.92	1
7	0_7708803	Confined	10,804	7/30/2008	239.99	267.19	-27.20	1
7	0_7708803	Confined	10,810	8/5/2008	227.58	266.79	-39.21	1
7	0_7708803	Confined	10,815	8/10/2008	217.81	266.45	-48.64	1
7	0_7708803	Confined	10,820	8/15/2008	217.57	266.11	-48.54	1
7	0_7708803	Confined	10,825	8/20/2008	218.03	265.78	-47.75	1
7	0_7708803	Confined	10,830	8/25/2008	227.58	265.44	-37.86	1
7	0_7708803	Confined	10,835	8/30/2008	235.48	265.10	-29.62	1
7	0_7708803	Confined	10,841	9/5/2008	226.15	264.70	-38.55	1
7	0_7708803	Confined	10,846	9/10/2008	220.93	264.36	-43.43	1
7	0_7708803	Confined	10,851	9/15/2008	222.88	264.02	-41.14	1
7	0_7708803	Confined	10,856	9/20/2008	216.87	263.69	-46.82	1
7	0_7708803	Confined	10,861	9/25/2008	213.81	263.35	-49.54	1
7	0_7708803	Confined	10,866	9/30/2008	210.98	263.01	-52.03	1
7	0_7708803	Confined	10,871	10/5/2008	205.94	262.68	-56.74	1
7	0_7708803	Confined	10,881	10/15/2008	205.85	262.00	-56.15	1
7	0_7708803	Confined	10,886	10/20/2008	209.86	261.67	-51.81	1
7	0_7708803	Confined	10,891	10/25/2008	209.87	261.33	-51.46	1
7	0_7708803	Confined	10,896	10/30/2008	209.88	260.99	-51.11	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	10,902	11/5/2008	224.53	260.59	-36.06	1
7	0_7708803	Confined	10,907	11/10/2008	229.36	260.25	-30.89	1
7	0_7708803	Confined	10,912	11/15/2008	233.67	259.91	-26.24	1
7	0_7708803	Confined	10,917	11/20/2008	235.26	259.58	-24.32	1
7	0_7708803	Confined	10,922	11/25/2008	238.30	259.24	-20.94	1
7	0_7708803	Confined	10,927	11/30/2008	240.41	258.90	-18.49	1
7	0_7708803	Confined	10,932	12/5/2008	241.33	258.57	-17.24	1
7	0_7708803	Confined	10,937	12/10/2008	245.03	258.23	-13.20	1
7	0_7708803	Confined	10,942	12/15/2008	246.39	257.89	-11.50	1
7	0_7708803	Confined	10,947	12/20/2008	250.38	257.56	-7.18	1
7	0_7708803	Confined	10,952	12/25/2008	253.84	257.22	-3.38	1
7	0_7708803	Confined	10,957	12/30/2008	255.62	256.88	-1.26	1
7	0_7708803	Confined	10,963	1/5/2009	252.76	256.18	-3.42	1
7	0_7708803	Confined	10,968	1/10/2009	254.35	255.54	-1.19	1
7	0_7708803	Confined	10,973	1/15/2009	250.78	254.90	-4.12	1
7	0_7708803	Confined	10,978	1/20/2009	250.96	254.26	-3.30	1
7	0_7708803	Confined	10,983	1/25/2009	250.66	253.63	-2.97	1
7	0_7708803	Confined	10,988	1/30/2009	253.32	252.99	0.33	1
7	0_7708803	Confined	10,993	2/4/2009	253.07	252.35	0.72	1
7	0_7708803	Confined	10,994	2/5/2009	249.29	252.22	-2.93	1
7	0_7708803	Confined	10,999	2/10/2009	249.04	251.58	-2.54	1
7	0_7708803	Confined	11,004	2/15/2009	245.78	250.95	-5.17	1
7	0_7708803	Confined	11,009	2/20/2009	245.38	250.31	-4.93	1
7	0_7708803	Confined	11,014	2/25/2009	244.69	249.67	-4.98	1
7	0_7708803	Confined	11,017	2/28/2009	244.69	249.29	-4.60	1
7	0_7708803	Confined	11,022	3/5/2009	236.28	248.65	-12.37	1
7	0_7708803	Confined	11,027	3/10/2009	227.33	248.01	-20.68	1
7	0_7708803	Confined	11,032	3/15/2009	235.78	247.38	-11.60	1
7	0_7708803	Confined	11,037	3/20/2009	234.58	246.74	-12.16	1
7	0_7708803	Confined	11,042	3/25/2009	224.76	246.10	-21.34	1
7	0_7708803	Confined	11,047	3/30/2009	229.75	245.46	-15.71	1
7	0_7708803	Confined	11,053	4/5/2009	220.55	244.70	-24.15	1
7	0_7708803	Confined	11,058	4/10/2009	210.51	244.06	-33.55	1
7	0_7708803	Confined	11,063	4/15/2009	210.11	243.42	-33.31	1
7	0_7708803	Confined	11,068	4/20/2009	217.57	242.78	-25.21	1
7	0_7708803	Confined	11,073	4/25/2009	217.08	242.15	-25.07	1
7	0_7708803	Confined	11,078	4/30/2009	215.70	241.51	-25.81	1
7	0_7708803	Confined	11,083	5/5/2009	208.19	240.87	-32.68	1
7	0_7708803	Confined	11,088	5/10/2009	200.20	240.23	-40.03	1
7	0_7708803	Confined	11,093	5/15/2009	193.42	239.59	-46.17	1
7	0_7708803	Confined	11,098	5/20/2009	193.09	238.96	-45.87	1
7	0_7708803	Confined	11,114	6/5/2009	209.89	236.92	-27.03	1
7	0_7708803	Confined	11,119	6/10/2009	202.18	236.28	-34.10	1
7	0_7708803	Confined	11,124	6/15/2009	196.44	235.64	-39.20	1
7	0_7708803	Confined	11,129	6/20/2009	190.93	235.00	-44.07	1
7	0_7708803	Confined	11,134	6/25/2009	188.11	234.37	-46.26	1
7	0_7708803	Confined	11,139	6/30/2009	187.38	233.73	-46.35	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	11,144	7/5/2009	183.81	233.09	-49.28	1
7	0_7708803	Confined	11,149	7/10/2009	185.96	232.45	-46.49	1
7	0_7708803	Confined	11,154	7/15/2009	185.96	231.81	-45.85	1
7	0_7708803	Confined	11,159	7/20/2009	187.71	231.18	-43.47	1
7	0_7708803	Confined	11,164	7/25/2009	184.91	230.54	-45.63	1
7	0_7708803	Confined	11,169	7/30/2009	182.97	229.90	-46.93	1
7	0_7708803	Confined	11,175	8/5/2009	186.46	229.14	-42.68	1
7	0_7708803	Confined	11,180	8/10/2009	178.84	228.50	-49.66	1
7	0_7708803	Confined	11,185	8/15/2009	173.54	227.86	-54.32	1
7	0_7708803	Confined	11,206	9/5/2009	170.47	225.18	-54.71	1
7	0_7708803	Confined	11,211	9/10/2009	170.47	224.54	-54.07	1
7	0_7708803	Confined	11,216	9/15/2009	184.77	223.91	-39.14	1
7	0_7708803	Confined	11,221	9/20/2009	193.92	223.27	-29.35	1
7	0_7708803	Confined	11,226	9/25/2009	201.18	222.63	-21.45	1
7	0_7708803	Confined	11,231	9/30/2009	209.01	221.99	-12.98	1
7	0_7708803	Confined	11,236	10/5/2009	215.01	221.36	-6.35	1
7	0_7708803	Confined	11,241	10/10/2009	218.81	220.72	-1.91	1
7	0_7708803	Confined	11,246	10/15/2009	225.59	220.08	5.51	1
7	0_7708803	Confined	11,251	10/20/2009	228.83	219.44	9.39	1
7	0_7708803	Confined	11,256	10/25/2009	230.43	218.80	11.63	1
7	0_7708803	Confined	11,261	10/30/2009	236.32	218.17	18.15	1
7	0_7708803	Confined	11,267	11/5/2009	241.84	217.40	24.44	1
7	0_7708803	Confined	11,272	11/10/2009	245.42	216.76	28.66	1
7	0_7708803	Confined	11,277	11/15/2009	248.20	216.13	32.07	1
7	0_7708803	Confined	11,282	11/20/2009	250.43	215.49	34.94	1
7	0_7708803	Confined	11,287	11/25/2009	255.29	214.85	40.44	1
7	0_7708803	Confined	11,292	11/30/2009	258.84	214.21	44.63	1
7	0_7708803	Confined	11,297	12/5/2009	261.53	213.57	47.96	1
7	0_7708803	Confined	11,302	12/10/2009	263.74	212.94	50.80	1
7	0_7708803	Confined	11,307	12/15/2009	267.37	212.30	55.07	1
7	0_7708803	Confined	11,312	12/20/2009	269.62	211.66	57.96	1
7	0_7708803	Confined	11,317	12/25/2009	272.27	211.02	61.25	1
7	0_7708803	Confined	11,322	12/30/2009	274.19	210.39	63.80	1
7	0_7708803	Confined	11,328	1/5/2010	276.49	209.95	66.54	1
7	0_7708803	Confined	11,333	1/10/2010	278.03	209.64	68.39	1
7	0_7708803	Confined	11,338	1/15/2010	279.18	209.32	69.86	1
7	0_7708803	Confined	11,342	1/19/2010	281.57	209.07	72.50	1
7	0_7708803	Confined	11,343	1/20/2010	281.36	209.01	72.35	1
7	0_7708803	Confined	11,348	1/25/2010	284.01	208.70	75.31	1
7	0_7708803	Confined	11,353	1/30/2010	283.57	208.39	75.18	1
7	0_7708803	Confined	11,359	2/5/2010	286.75	208.02	78.73	1
7	0_7708803	Confined	11,364	2/10/2010	287.78	207.70	80.08	1
7	0_7708803	Confined	11,369	2/15/2010	289.99	207.39	82.60	1
7	0_7708803	Confined	11,374	2/20/2010	291.30	207.08	84.22	1
7	0_7708803	Confined	11,379	2/25/2010	292.77	206.77	86.00	1
7	0_7708803	Confined	11,387	3/5/2010	292.79	206.27	86.52	1
7	0_7708803	Confined	11,392	3/10/2010	291.99	205.96	86.03	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	11,397	3/15/2010	291.72	205.65	86.07	1
7	0_7708803	Confined	11,402	3/20/2010	291.59	205.34	86.25	1
7	0_7708803	Confined	11,412	3/30/2010	282.66	204.71	77.95	1
7	0_7708803	Confined	11,418	4/5/2010	264.21	204.34	59.87	1
7	0_7708803	Confined	11,423	4/10/2010	256.70	204.03	52.67	1
7	0_7708803	Confined	11,428	4/15/2010	257.67	203.72	53.95	1
7	0_7708803	Confined	11,433	4/20/2010	267.60	203.40	64.20	1
7	0_7708803	Confined	11,438	4/25/2010	271.14	203.09	68.05	1
7	0_7708803	Confined	11,443	4/30/2010	261.91	202.78	59.13	1
7	0_7708803	Confined	11,448	5/5/2010	254.34	202.47	51.87	1
7	0_7708803	Confined	11,453	5/10/2010	242.90	202.16	40.74	1
7	0_7708803	Confined	11,458	5/15/2010	241.33	201.85	39.48	1
7	0_7708803	Confined	11,463	5/20/2010	251.76	201.53	50.23	1
7	0_7708803	Confined	11,468	5/25/2010	249.87	201.22	48.65	1
7	0_7708803	Confined	11,473	5/30/2010	249.45	200.91	48.54	1
7	0_7708803	Confined	11,479	6/5/2010	249.42	200.54	48.88	1
7	0_7708803	Confined	11,484	6/10/2010	249.84	200.23	49.61	1
7	0_7708803	Confined	11,489	6/15/2010	241.89	199.91	41.98	1
7	0_7708803	Confined	11,494	6/20/2010	236.82	199.60	37.22	1
7	0_7708803	Confined	11,499	6/25/2010	233.30	199.29	34.01	1
7	0_7708803	Confined	11,504	6/30/2010	235.09	198.98	36.11	1
7	0_7708803	Confined	11,509	7/5/2010	246.97	198.67	48.30	1
7	0_7708803	Confined	11,514	7/10/2010	252.37	198.36	54.01	1
7	0_7708803	Confined	11,519	7/15/2010	255.49	198.05	57.44	1
7	0_7708803	Confined	11,524	7/20/2010	251.57	197.73	53.84	1
7	0_7708803	Confined	11,529	7/25/2010	245.42	197.42	48.00	1
7	0_7708803	Confined	11,534	7/30/2010	245.46	197.11	48.35	1
7	0_7708803	Confined	11,540	8/5/2010	240.86	196.74	44.12	1
7	0_7708803	Confined	11,545	8/10/2010	232.58	196.42	36.16	1
7	0_7708803	Confined	11,550	8/15/2010	223.77	196.11	27.66	1
7	0_7708803	Confined	11,555	8/20/2010	217.24	195.80	21.44	1
7	0_7708803	Confined	11,560	8/25/2010	211.97	195.49	16.48	1
7	0_7708803	Confined	11,565	8/30/2010	206.86	195.18	11.68	1
7	0_7708803	Confined	11,571	9/5/2010	204.06	194.80	9.26	1
7	0_7708803	Confined	11,576	9/10/2010	218.42	194.49	23.93	1
7	0_7708803	Confined	11,581	9/15/2010	226.17	194.18	31.99	1
7	0_7708803	Confined	11,586	9/20/2010	222.40	193.87	28.53	1
7	0_7708803	Confined	11,591	9/25/2010	231.95	193.56	38.39	1
7	0_7708803	Confined	11,596	9/30/2010	232.60	193.25	39.35	1
7	0_7708803	Confined	11,601	10/5/2010	226.22	192.94	33.28	1
7	0_7708803	Confined	11,606	10/10/2010	224.01	192.62	31.39	1
7	0_7708803	Confined	11,611	10/15/2010	223.02	192.31	30.71	1
7	0_7708803	Confined	11,616	10/20/2010	222.66	192.00	30.66	1
7	0_7708803	Confined	11,621	10/25/2010	219.08	191.69	27.39	1
7	0_7708803	Confined	11,626	10/30/2010	221.66	191.38	30.28	1
7	0_7708803	Confined	11,632	11/5/2010	229.25	191.00	38.25	1
7	0_7708803	Confined	11,637	11/10/2010	234.92	190.69	44.23	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	11,642	11/15/2010	237.93	190.38	47.55	1
7	0_7708803	Confined	11,647	11/20/2010	240.69	190.07	50.62	1
7	0_7708803	Confined	11,657	11/30/2010	248.12	189.45	58.67	1
7	0_7708803	Confined	11,662	12/5/2010	248.24	189.13	59.11	1
7	0_7708803	Confined	11,667	12/10/2010	250.49	188.82	61.67	1
7	0_7708803	Confined	11,672	12/15/2010	249.07	188.51	60.56	1
7	0_7708803	Confined	11,677	12/20/2010	248.84	188.20	60.64	1
7	0_7708803	Confined	11,682	12/25/2010	251.60	187.89	63.71	1
7	0_7708803	Confined	11,687	12/30/2010	255.78	187.58	68.20	1
7	0_7708803	Confined	11,693	1/5/2011	256.41	187.26	69.15	1
7	0_7708803	Confined	11,698	1/10/2011	258.05	187.00	71.05	1
7	0_7708803	Confined	11,703	1/15/2011	262.21	186.75	75.46	1
7	0_7708803	Confined	11,708	1/20/2011	266.66	186.49	80.17	1
7	0_7708803	Confined	11,713	1/25/2011	269.41	186.24	83.17	1
7	0_7708803	Confined	11,718	1/30/2011	270.07	185.98	84.09	1
7	0_7708803	Confined	11,724	2/5/2011	271.12	185.67	85.45	1
7	0_7708803	Confined	11,752	3/5/2011	252.34	184.24	68.10	1
7	0_7708803	Confined	11,757	3/10/2011	246.74	183.99	62.75	1
7	0_7708803	Confined	11,762	3/15/2011	236.26	183.73	52.53	1
7	0_7708803	Confined	11,767	3/20/2011	227.15	183.48	43.67	1
7	0_7708803	Confined	11,772	3/25/2011	219.90	183.22	36.68	1
7	0_7708803	Confined	11,777	3/30/2011	212.12	182.96	29.16	1
7	0_7708803	Confined	11,783	4/5/2011	204.26	182.66	21.60	1
7	0_7708803	Confined	11,788	4/10/2011	193.88	182.40	11.48	1
7	0_7708803	Confined	12,059	1/6/2012	228.17	169.45	58.72	1
7	0_7708803	Confined	12,090	2/6/2012	229.67	172.52	57.15	1
7	0_7708803	Confined	12,114	3/1/2012	235.97	174.90	61.07	1
7	0_7708803	Confined	12,149	4/5/2012	235.57	178.37	57.20	1
7	0_7708803	Confined	12,176	5/2/2012	182.87	181.05	1.82	1
7	0_7708803	Confined	12,210	6/5/2012	180.57	184.41	-3.84	1
7	0_7708803	Confined	12,237	7/2/2012	169.27	187.09	-17.82	1
7	0_7708803	Confined	12,265	7/30/2012	166.37	189.86	-23.49	1
7	0_7708803	Confined	12,307	9/10/2012	169.37	194.03	-24.66	1
7	0_7708803	Confined	12,346	10/19/2012	176.97	197.89	-20.92	1
7	0_7708803	Confined	12,367	11/9/2012	186.57	199.97	-13.40	1
7	0_7708803	Confined	12,391	12/3/2012	209.77	202.35	7.42	1
7	0_7708803	Confined	12,425	1/6/2013	225.77	205.23	20.54	1
7	0_7708803	Confined	12,456	2/6/2013	231.07	205.79	25.28	1
7	0_7708803	Confined	12,479	3/1/2013	216.77	206.20	10.57	1
7	0_7708803	Confined	12,514	4/5/2013	185.27	206.83	-21.56	1
7	0_7708803	Confined	12,541	5/2/2013	176.57	207.32	-30.75	1
7	0_7708803	Confined	12,575	6/5/2013	170.97	207.93	-36.96	1
7	0_7708803	Confined	12,602	7/2/2013	171.47	208.42	-36.95	1
7	0_7708803	Confined	12,632	8/1/2013	172.07	208.95	-36.88	1
7	0_7708803	Confined	12,672	9/10/2013	172.77	209.67	-36.90	1
7	0_7708803	Confined	12,711	10/19/2013	172.97	210.37	-37.40	1
7	0_7708803	Confined	12,732	11/9/2013	181.37	210.75	-29.38	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708803	Confined	12,756	12/3/2013	209.77	211.18	-1.41	1
7	0_7708803	Confined	12,785	1/1/2014	223.87	211.71	12.16	1
7	0_7708803	Confined	12,816	2/1/2014	225.97	212.55	13.42	1
7	0_7708803	Confined	12,844	3/1/2014	220.17	213.30	6.87	1
7	0_7708803	Confined	12,875	4/1/2014	193.77	214.14	-20.37	1
7	0_7708803	Confined	12,905	5/1/2014	170.77	214.95	-44.18	1
7	0_7708803	Confined	12,936	6/1/2014	167.67	215.78	-48.11	1
7	0_7708803	Confined	12,966	7/1/2014	172.27	216.59	-44.32	1
7	0_7708803	Confined	12,997	8/1/2014	170.37	217.42	-47.05	1
7	0_7708803	Confined	13,028	9/1/2014	167.17	218.26	-51.09	1
7	0_7708803	Confined	13,058	10/1/2014	172.77	219.07	-46.30	1
7	0_7708803	Confined	13,089	11/1/2014	172.37	219.90	-47.53	1
7	0_7708803	Confined	13,119	12/1/2014	182.57	220.71	-38.14	1
7	0_7708803	Confined	13,209	3/1/2015	157.57	224.14	-66.57	1
7	0_7708803	Confined	13,240	4/1/2015	157.67	225.49	-67.82	1
7	0_7708803	Confined	13,270	5/1/2015	193.67	226.80	-33.13	1
7	0_7708803	Confined	13,301	6/1/2015	234.17	228.15	6.02	1
7	0_7708803	Confined	13,331	7/1/2015	226.37	229.46	-3.09	1
7	0_7708803	Confined	13,362	8/1/2015	182.17	230.81	-48.64	1
7	0_7708803	Confined	13,393	9/1/2015	171.17	232.17	-61.00	1
7	0_7708803	Confined	13,423	10/1/2015	172.27	233.48	-61.21	1
7	0_7708803	Confined	13,454	11/1/2015	172.27	234.83	-62.56	1
7	0_7708803	Confined	13,484	12/1/2015	202.67	236.14	-33.47	1
7	0_7708803	Confined	13,515	1/1/2016	218.37	237.47	-19.10	1
7	0_7708803	Confined	13,546	2/1/2016	219.47	238.00	-18.53	1
7	0_7708803	Confined	13,575	3/1/2016	219.47	238.49	-19.02	1
7	0_7708803	Confined	13,606	4/1/2016	215.07	239.02	-23.95	1
7	0_7708803	Confined	13,636	5/1/2016	189.87	239.53	-49.66	1
7	0_7708803	Confined	13,667	6/1/2016	203.87	240.06	-36.19	1
7	0_7708803	Confined	13,697	7/1/2016	199.47	240.57	-41.10	1
7	0_7708803	Confined	13,728	8/1/2016	176.07	241.10	-65.03	1
7	0_7708803	Confined	13,759	9/1/2016	183.57	241.63	-58.06	1
7	0_7708803	Confined	13,789	10/1/2016	182.97	242.14	-59.17	1
7	0_7708803	Confined	13,820	11/1/2016	177.97	242.67	-64.70	1
7	0_7708803	Confined	13,850	12/1/2016	213.37	243.18	-29.81	1
7	0_7708803	Confined	13,881	1/1/2017	223.17	243.70	-20.53	1
7	0_7708803	Confined	13,912	2/1/2017	221.77	243.92	-22.15	1
7	0_7708803	Confined	13,940	3/1/2017	221.87	244.11	-22.24	1
7	0_7708803	Confined	13,971	4/1/2017	218.97	244.33	-25.36	1
7	0_7708803	Confined	14,001	5/1/2017	176.87	244.54	-67.67	1
7	0_7708803	Confined	14,032	6/1/2017	180.97	244.76	-63.79	1
7	0_7708803	Confined	14,124	9/1/2017	187.97	245.41	-57.44	1
7	0_7708803	Confined	14,154	10/1/2017	174.97	245.63	-70.66	1
7	0_7708803	Confined	14,185	11/1/2017	184.47	245.85	-61.38	1
7	0_7708803	Confined	14,215	12/1/2017	197.17	246.06	-48.89	1
7	0_7708812	Confined	1,873	2/16/1984	351.53	436.67	-85.14	1
7	0_7708812	Confined	2,236	2/13/1985	340.67	432.96	-92.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7708812	Confined	2,605	2/17/1986	362.90	441.24	-78.34	1
7	0_7708812	Confined	3,697	2/13/1989	315.59	437.44	-121.85	1
7	0_7708812	Confined	4,416	2/2/1991	334.99	429.76	-94.77	1
7	0_7708812	Confined	6,984	2/13/1998	394.72	376.54	18.18	1
7	0_7708812	Confined	7,318	1/13/1999	392.37	359.80	32.57	1
7	0_7708812	Confined	10,609	1/17/2008	297.27	326.56	-29.29	1
7	0_7708812	Confined	11,007	2/18/2009	256.17	293.86	-37.69	1
7	0_7709105	Confined	8,528	5/7/2002	361.92	399.42	-3.75	0.1
7	0_7709303	Confined	11,627	10/31/2010	325.86	322.33	3.53	1
7	0_7710101	Confined	773	2/11/1981	387.16	391.64	-4.48	1
7	0_7710101	Confined	1,501	2/9/1983	431.45	397.96	33.49	1
7	0_7710101	Confined	1,877	2/20/1984	434.27	397.14	37.13	1
7	0_7710101	Confined	2,228	2/5/1985	427.90	390.81	37.09	1
7	0_7710601	Confined	14,091	7/30/2017	221.51	268.81	-47.30	1
7	0_7710601	Confined	14,093	8/1/2017	217.12	268.83	-51.71	1
7	0_7710601	Confined	14,097	8/5/2017	220.59	268.87	-48.28	1
7	0_7710601	Confined	14,102	8/10/2017	231.89	268.92	-37.03	1
7	0_7710601	Confined	14,107	8/15/2017	228.04	268.97	-40.93	1
7	0_7710601	Confined	14,112	8/20/2017	227.45	269.02	-41.57	1
7	0_7710601	Confined	14,117	8/25/2017	234.68	269.07	-34.39	1
7	0_7710601	Confined	14,122	8/30/2017	223.65	269.12	-45.47	1
7	0_7710601	Confined	14,124	9/1/2017	221.03	269.14	-48.11	1
7	0_7710601	Confined	14,128	9/5/2017	217.66	269.18	-51.52	1
7	0_7710601	Confined	14,133	9/10/2017	225.05	269.23	-44.18	1
7	0_7710601	Confined	14,138	9/15/2017	215.98	269.28	-53.30	1
7	0_7710601	Confined	14,143	9/20/2017	225.38	269.33	-43.95	1
7	0_7710601	Confined	14,148	9/25/2017	218.97	269.38	-50.41	1
7	0_7710601	Confined	14,153	9/30/2017	238.44	269.43	-30.99	1
7	0_7710601	Confined	14,154	10/1/2017	239.89	269.44	-29.55	1
7	0_7710601	Confined	14,158	10/5/2017	244.75	269.48	-24.73	1
7	0_7710601	Confined	14,163	10/10/2017	249.25	269.53	-20.28	1
7	0_7710601	Confined	14,168	10/15/2017	253.07	269.59	-16.52	1
7	0_7710601	Confined	14,173	10/20/2017	242.71	269.64	-26.93	1
7	0_7710601	Confined	14,178	10/25/2017	239.02	269.69	-30.67	1
7	0_7710601	Confined	14,183	10/30/2017	245.53	269.74	-24.21	1
7	0_7710601	Confined	14,185	11/1/2017	244.51	269.76	-25.25	1
7	0_7710601	Confined	14,189	11/5/2017	240.67	269.80	-29.13	1
7	0_7710601	Confined	14,194	11/10/2017	249.07	269.85	-20.78	1
7	0_7710601	Confined	14,199	11/15/2017	255.49	269.90	-14.41	1
7	0_7710601	Confined	14,204	11/20/2017	251.86	269.95	-18.09	1
7	0_7710601	Confined	14,209	11/25/2017	245.26	270.00	-24.74	1
7	0_7710601	Confined	14,214	11/30/2017	245.81	270.05	-24.24	1
7	0_7710601	Confined	14,215	12/1/2017	239.80	270.06	-30.26	1
7	0_7710601	Confined	14,219	12/5/2017	249.47	270.10	-20.63	1
7	0_7710601	Confined	14,224	12/10/2017	254.79	270.15	-15.36	1
7	0_7710601	Confined	14,229	12/15/2017	259.33	270.20	-10.87	1
7	0_7710601	Confined	14,234	12/20/2017	262.69	270.25	-7.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710601	Confined	14,239	12/25/2017	265.78	270.30	-4.52	1
7	0_7710601	Confined	14,244	12/30/2017	268.49	270.35	-1.86	1
7	0_7710604	Confined	771	2/9/1981	324.87	352.53	-27.66	1
7	0_7710604	Confined	1,502	2/10/1983	308.37	359.90	-51.53	1
7	0_7710609	Confined	8,638	8/25/2002	223.21	314.69	-91.48	1
7	0_7710609	Confined	8,643	8/30/2002	223.16	314.50	-91.34	1
7	0_7710609	Confined	8,649	9/5/2002	225.91	314.28	-88.37	1
7	0_7710609	Confined	8,654	9/10/2002	252.01	314.09	-62.08	1
7	0_7710609	Confined	8,659	9/15/2002	259.61	313.91	-54.30	1
7	0_7710609	Confined	8,664	9/20/2002	273.51	313.72	-40.21	1
7	0_7710609	Confined	8,669	9/25/2002	269.01	313.53	-44.52	1
7	0_7710609	Confined	8,674	9/30/2002	265.81	313.35	-47.54	1
7	0_7710609	Confined	8,679	10/5/2002	273.91	313.16	-39.25	1
7	0_7710609	Confined	8,684	10/10/2002	274.31	312.97	-38.66	1
7	0_7710609	Confined	8,689	10/15/2002	279.31	312.79	-33.48	1
7	0_7710609	Confined	8,730	11/25/2002	327.81	311.26	16.55	1
7	0_7710609	Confined	8,735	11/30/2002	329.31	311.07	18.24	1
7	0_7710609	Confined	8,740	12/5/2002	325.41	310.88	14.53	1
7	0_7710609	Confined	8,745	12/10/2002	327.01	310.69	16.32	1
7	0_7710609	Confined	8,750	12/15/2002	331.21	310.51	20.70	1
7	0_7710609	Confined	8,771	1/5/2003	332.71	309.94	22.77	1
7	0_7710609	Confined	8,776	1/10/2003	333.41	309.96	23.45	1
7	0_7710609	Confined	8,781	1/15/2003	334.51	309.99	24.52	1
7	0_7710609	Confined	8,786	1/20/2003	335.81	310.01	25.80	1
7	0_7710609	Confined	8,802	2/5/2003	336.01	310.09	25.92	1
7	0_7710609	Confined	8,807	2/10/2003	337.61	310.12	27.49	1
7	0_7710609	Confined	8,812	2/15/2003	339.91	310.14	29.77	1
7	0_7710609	Confined	8,817	2/20/2003	340.86	310.17	30.69	1
7	0_7710609	Confined	8,822	2/25/2003	341.66	310.19	31.47	1
7	0_7710609	Confined	8,826	3/1/2003	342.61	310.21	32.40	1
7	0_7710609	Confined	8,830	3/5/2003	334.21	310.23	23.98	1
7	0_7710609	Confined	8,835	3/10/2003	333.21	310.26	22.95	1
7	0_7710609	Confined	8,840	3/15/2003	329.81	310.29	19.52	1
7	0_7710609	Confined	8,845	3/20/2003	352.41	310.31	42.10	1
7	0_7710609	Confined	8,881	4/25/2003	324.61	310.49	14.12	1
7	0_7710609	Confined	8,887	5/1/2003	322.41	310.52	11.89	1
7	0_7710609	Confined	8,891	5/5/2003	317.61	310.54	7.07	1
7	0_7710609	Confined	8,896	5/10/2003	313.71	310.57	3.14	1
7	0_7710609	Confined	8,901	5/15/2003	307.91	310.59	-2.68	1
7	0_7710609	Confined	8,906	5/20/2003	313.41	310.62	2.79	1
7	0_7710609	Confined	8,911	5/25/2003	316.31	310.65	5.66	1
7	0_7710609	Confined	8,918	6/1/2003	317.51	310.68	6.83	1
7	0_7710609	Confined	8,922	6/5/2003	314.21	310.70	3.51	1
7	0_7710609	Confined	8,927	6/10/2003	319.61	310.73	8.88	1
7	0_7710609	Confined	8,932	6/15/2003	322.51	310.75	11.76	1
7	0_7710609	Confined	8,937	6/20/2003	325.01	310.78	14.23	1
7	0_7710609	Confined	8,942	6/25/2003	326.46	310.80	15.66	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	8,947	6/30/2003	321.91	310.83	11.08	1
7	0_7710609	Confined	8,952	7/5/2003	315.41	310.85	4.56	1
7	0_7710609	Confined	8,957	7/10/2003	321.81	310.88	10.93	1
7	0_7710609	Confined	8,962	7/15/2003	327.41	310.90	16.51	1
7	0_7710609	Confined	8,967	7/20/2003	328.41	310.93	17.48	1
7	0_7710609	Confined	8,972	7/25/2003	330.41	310.95	19.46	1
7	0_7710609	Confined	8,977	7/30/2003	331.91	310.98	20.93	1
7	0_7710609	Confined	8,979	8/1/2003	332.91	310.99	21.92	1
7	0_7710609	Confined	8,983	8/5/2003	333.61	311.01	22.60	1
7	0_7710609	Confined	8,988	8/10/2003	334.21	311.04	23.17	1
7	0_7710609	Confined	8,993	8/15/2003	333.71	311.06	22.65	1
7	0_7710609	Confined	8,998	8/20/2003	335.21	311.09	24.12	1
7	0_7710609	Confined	9,003	8/25/2003	336.41	311.11	25.30	1
7	0_7710609	Confined	9,008	8/30/2003	336.61	311.14	25.47	1
7	0_7710609	Confined	9,010	9/1/2003	337.01	311.15	25.86	1
7	0_7710609	Confined	9,014	9/5/2003	330.61	311.17	19.44	1
7	0_7710609	Confined	9,019	9/10/2003	326.01	311.19	14.82	1
7	0_7710609	Confined	9,024	9/15/2003	332.81	311.22	21.59	1
7	0_7710609	Confined	9,029	9/20/2003	336.01	311.24	24.77	1
7	0_7710609	Confined	9,034	9/25/2003	338.41	311.27	27.14	1
7	0_7710609	Confined	9,039	9/30/2003	341.41	311.29	30.12	1
7	0_7710609	Confined	9,040	10/1/2003	340.71	311.30	29.41	1
7	0_7710609	Confined	9,044	10/5/2003	341.61	311.32	30.29	1
7	0_7710609	Confined	9,049	10/10/2003	343.51	311.34	32.17	1
7	0_7710609	Confined	9,054	10/15/2003	344.81	311.37	33.44	1
7	0_7710609	Confined	9,059	10/20/2003	346.31	311.40	34.91	1
7	0_7710609	Confined	9,064	10/25/2003	347.41	311.42	35.99	1
7	0_7710609	Confined	9,069	10/30/2003	348.51	311.45	37.06	1
7	0_7710609	Confined	9,071	11/1/2003	348.71	311.46	37.25	1
7	0_7710609	Confined	9,075	11/5/2003	349.41	311.48	37.93	1
7	0_7710609	Confined	9,080	11/10/2003	349.91	311.50	38.41	1
7	0_7710609	Confined	9,085	11/15/2003	351.21	311.53	39.68	1
7	0_7710609	Confined	9,090	11/20/2003	352.21	311.55	40.66	1
7	0_7710609	Confined	9,095	11/25/2003	352.01	311.58	40.43	1
7	0_7710609	Confined	9,100	11/30/2003	351.51	311.60	39.91	1
7	0_7710609	Confined	9,105	12/5/2003	351.91	311.63	40.28	1
7	0_7710609	Confined	9,110	12/10/2003	344.81	311.65	33.16	1
7	0_7710609	Confined	9,115	12/15/2003	350.66	311.68	38.98	1
7	0_7710609	Confined	9,120	12/20/2003	350.61	311.70	38.91	1
7	0_7710609	Confined	9,125	12/25/2003	350.11	311.73	38.38	1
7	0_7710609	Confined	9,136	1/5/2004	349.11	311.88	37.23	1
7	0_7710609	Confined	9,141	1/10/2004	347.51	312.00	35.51	1
7	0_7710609	Confined	9,146	1/15/2004	347.51	312.11	35.40	1
7	0_7710609	Confined	9,151	1/20/2004	347.61	312.23	35.38	1
7	0_7710609	Confined	9,156	1/25/2004	348.51	312.35	36.16	1
7	0_7710609	Confined	9,161	1/30/2004	350.11	312.47	37.64	1
7	0_7710609	Confined	9,167	2/5/2004	350.71	312.61	38.10	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	9,172	2/10/2004	351.41	312.73	38.68	1
7	0_7710609	Confined	9,177	2/15/2004	352.21	312.85	39.36	1
7	0_7710609	Confined	9,182	2/20/2004	351.01	312.97	38.04	1
7	0_7710609	Confined	9,187	2/25/2004	347.41	313.09	34.32	1
7	0_7710609	Confined	9,192	3/1/2004	343.41	313.20	30.21	1
7	0_7710609	Confined	9,196	3/5/2004	349.41	313.30	36.11	1
7	0_7710609	Confined	9,201	3/10/2004	336.41	313.42	22.99	1
7	0_7710609	Confined	9,206	3/15/2004	341.61	313.54	28.07	1
7	0_7710609	Confined	9,211	3/20/2004	344.41	313.65	30.76	1
7	0_7710609	Confined	9,216	3/25/2004	346.41	313.77	32.64	1
7	0_7710609	Confined	9,221	3/30/2004	348.41	313.89	34.52	1
7	0_7710609	Confined	9,227	4/5/2004	350.41	314.03	36.38	1
7	0_7710609	Confined	9,232	4/10/2004	352.41	314.15	38.26	1
7	0_7710609	Confined	9,237	4/15/2004	353.61	314.27	39.34	1
7	0_7710609	Confined	9,242	4/20/2004	352.81	314.39	38.42	1
7	0_7710609	Confined	9,247	4/25/2004	357.41	314.51	42.90	1
7	0_7710609	Confined	9,252	4/30/2004	361.81	314.62	47.19	1
7	0_7710609	Confined	9,257	5/5/2004	363.61	314.74	48.87	1
7	0_7710609	Confined	9,262	5/10/2004	364.61	314.86	49.75	1
7	0_7710609	Confined	9,267	5/15/2004	364.61	314.98	49.63	1
7	0_7710609	Confined	9,272	5/20/2004	365.96	315.10	50.86	1
7	0_7710609	Confined	9,277	5/25/2004	367.96	315.22	52.74	1
7	0_7710609	Confined	9,282	5/30/2004	367.51	315.33	52.18	1
7	0_7710609	Confined	9,288	6/5/2004	342.41	315.48	26.93	1
7	0_7710609	Confined	9,293	6/10/2004	345.41	315.60	29.81	1
7	0_7710609	Confined	9,298	6/15/2004	347.41	315.71	31.70	1
7	0_7710609	Confined	9,303	6/20/2004	352.41	315.83	36.58	1
7	0_7710609	Confined	9,308	6/25/2004	355.41	315.95	39.46	1
7	0_7710609	Confined	9,313	6/30/2004	355.91	316.07	39.84	1
7	0_7710609	Confined	9,318	7/5/2004	357.11	316.19	40.92	1
7	0_7710609	Confined	9,323	7/10/2004	358.41	316.31	42.10	1
7	0_7710609	Confined	9,328	7/15/2004	359.81	316.42	43.39	1
7	0_7710609	Confined	9,333	7/20/2004	359.51	316.54	42.97	1
7	0_7710609	Confined	9,338	7/25/2004	357.81	316.66	41.15	1
7	0_7710609	Confined	9,343	7/30/2004	357.81	316.78	41.03	1
7	0_7710609	Confined	9,349	8/5/2004	358.21	316.92	41.29	1
7	0_7710609	Confined	9,354	8/10/2004	369.11	317.04	52.07	1
7	0_7710609	Confined	9,359	8/15/2004	367.41	317.16	50.25	1
7	0_7710609	Confined	9,364	8/20/2004	362.41	317.28	45.13	1
7	0_7710609	Confined	9,369	8/25/2004	359.91	317.39	42.52	1
7	0_7710609	Confined	9,374	8/30/2004	338.51	317.51	21.00	1
7	0_7710609	Confined	9,376	9/1/2004	337.31	317.56	19.75	1
7	0_7710609	Confined	9,380	9/5/2004	336.31	317.66	18.65	1
7	0_7710609	Confined	9,385	9/10/2004	344.61	317.77	26.84	1
7	0_7710609	Confined	9,390	9/15/2004	342.81	317.89	24.92	1
7	0_7710609	Confined	9,395	9/20/2004	342.91	318.01	24.90	1
7	0_7710609	Confined	9,400	9/25/2004	339.51	318.13	21.38	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	9,425	10/20/2004	350.11	318.72	31.39	1
7	0_7710609	Confined	9,430	10/25/2004	341.41	318.84	22.57	1
7	0_7710609	Confined	9,456	11/20/2004	352.91	319.45	33.46	1
7	0_7710609	Confined	9,461	11/25/2004	353.81	319.57	34.24	1
7	0_7710609	Confined	9,466	11/30/2004	354.81	319.69	35.12	1
7	0_7710609	Confined	9,471	12/5/2004	357.01	319.81	37.20	1
7	0_7710609	Confined	9,476	12/10/2004	357.01	319.93	37.08	1
7	0_7710609	Confined	9,481	12/15/2004	357.81	320.05	37.76	1
7	0_7710609	Confined	9,486	12/20/2004	350.01	320.16	29.85	1
7	0_7710609	Confined	9,491	12/25/2004	354.51	320.28	34.23	1
7	0_7710609	Confined	9,496	12/30/2004	350.41	320.40	30.01	1
7	0_7710609	Confined	9,502	1/5/2005	356.91	320.48	36.43	1
7	0_7710609	Confined	9,507	1/10/2005	350.21	320.54	29.67	1
7	0_7710609	Confined	9,512	1/15/2005	354.61	320.59	34.02	1
7	0_7710609	Confined	9,517	1/20/2005	356.61	320.65	35.96	1
7	0_7710609	Confined	9,522	1/25/2005	351.61	320.70	30.91	1
7	0_7710609	Confined	9,527	1/30/2005	355.01	320.76	34.25	1
7	0_7710609	Confined	9,529	2/1/2005	355.81	320.78	35.03	1
7	0_7710609	Confined	9,533	2/5/2005	356.91	320.82	36.09	1
7	0_7710609	Confined	9,538	2/10/2005	357.61	320.88	36.73	1
7	0_7710609	Confined	9,543	2/15/2005	358.86	320.93	37.93	1
7	0_7710609	Confined	9,548	2/20/2005	359.81	320.99	38.82	1
7	0_7710609	Confined	9,553	2/25/2005	340.01	321.04	18.97	1
7	0_7710609	Confined	9,557	3/1/2005	361.81	321.09	40.72	1
7	0_7710609	Confined	9,561	3/5/2005	362.41	321.13	41.28	1
7	0_7710609	Confined	9,566	3/10/2005	363.51	321.19	42.32	1
7	0_7710609	Confined	9,571	3/15/2005	364.41	321.24	43.17	1
7	0_7710609	Confined	9,576	3/20/2005	365.21	321.30	43.91	1
7	0_7710609	Confined	9,581	3/25/2005	366.01	321.35	44.66	1
7	0_7710609	Confined	9,586	3/30/2005	365.21	321.41	43.80	1
7	0_7710609	Confined	9,592	4/5/2005	363.31	321.48	41.83	1
7	0_7710609	Confined	9,597	4/10/2005	357.71	321.53	36.18	1
7	0_7710609	Confined	9,602	4/15/2005	357.26	321.59	35.67	1
7	0_7710609	Confined	9,607	4/20/2005	357.21	321.64	35.57	1
7	0_7710609	Confined	9,612	4/25/2005	348.81	321.70	27.11	1
7	0_7710609	Confined	9,617	4/30/2005	349.91	321.75	28.16	1
7	0_7710609	Confined	9,622	5/5/2005	347.46	321.81	25.65	1
7	0_7710609	Confined	9,627	5/10/2005	341.01	321.86	19.15	1
7	0_7710609	Confined	9,632	5/15/2005	343.21	321.92	21.29	1
7	0_7710609	Confined	9,637	5/20/2005	345.71	321.97	23.74	1
7	0_7710609	Confined	9,642	5/25/2005	345.51	322.03	23.48	1
7	0_7710609	Confined	9,647	5/30/2005	344.66	322.08	22.58	1
7	0_7710609	Confined	9,649	6/1/2005	345.06	322.10	22.96	1
7	0_7710609	Confined	9,653	6/5/2005	343.71	322.15	21.56	1
7	0_7710609	Confined	9,658	6/10/2005	340.21	322.20	18.01	1
7	0_7710609	Confined	9,663	6/15/2005	332.81	322.26	10.55	1
7	0_7710609	Confined	9,668	6/20/2005	327.31	322.31	5.00	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	9,673	6/25/2005	333.26	322.37	10.89	1
7	0_7710609	Confined	9,678	6/30/2005	334.81	322.43	12.38	1
7	0_7710609	Confined	9,683	7/5/2005	333.91	322.48	11.43	1
7	0_7710609	Confined	9,688	7/10/2005	333.51	322.54	10.97	1
7	0_7710609	Confined	9,693	7/15/2005	333.21	322.59	10.62	1
7	0_7710609	Confined	9,698	7/20/2005	333.61	322.65	10.96	1
7	0_7710609	Confined	9,703	7/25/2005	333.51	322.70	10.81	1
7	0_7710609	Confined	9,708	7/30/2005	333.51	322.76	10.75	1
7	0_7710609	Confined	9,714	8/5/2005	333.41	322.82	10.59	1
7	0_7710609	Confined	9,719	8/10/2005	334.11	322.88	11.23	1
7	0_7710609	Confined	9,724	8/15/2005	334.01	322.93	11.08	1
7	0_7710609	Confined	9,729	8/20/2005	335.36	322.99	12.37	1
7	0_7710609	Confined	9,734	8/25/2005	335.01	323.04	11.97	1
7	0_7710609	Confined	9,739	8/30/2005	336.01	323.10	12.91	1
7	0_7710609	Confined	9,745	9/5/2005	335.71	323.17	12.54	1
7	0_7710609	Confined	9,750	9/10/2005	335.71	323.22	12.49	1
7	0_7710609	Confined	9,755	9/15/2005	337.21	323.28	13.93	1
7	0_7710609	Confined	9,760	9/20/2005	338.41	323.33	15.08	1
7	0_7710609	Confined	9,765	9/25/2005	339.31	323.39	15.92	1
7	0_7710609	Confined	9,770	9/30/2005	339.51	323.44	16.07	1
7	0_7710609	Confined	9,775	10/5/2005	339.41	323.50	15.91	1
7	0_7710609	Confined	9,780	10/10/2005	339.41	323.55	15.86	1
7	0_7710609	Confined	9,785	10/15/2005	340.21	323.61	16.60	1
7	0_7710609	Confined	9,790	10/20/2005	342.21	323.66	18.55	1
7	0_7710609	Confined	9,795	10/25/2005	342.41	323.72	18.69	1
7	0_7710609	Confined	9,800	10/30/2005	343.21	323.77	19.44	1
7	0_7710609	Confined	9,802	11/1/2005	343.41	323.80	19.61	1
7	0_7710609	Confined	9,806	11/5/2005	348.66	323.84	24.82	1
7	0_7710609	Confined	9,811	11/10/2005	343.41	323.89	19.52	1
7	0_7710609	Confined	9,816	11/15/2005	344.01	323.95	20.06	1
7	0_7710609	Confined	9,821	11/20/2005	344.71	324.01	20.70	1
7	0_7710609	Confined	9,826	11/25/2005	345.11	324.06	21.05	1
7	0_7710609	Confined	9,831	11/30/2005	345.41	324.12	21.29	1
7	0_7710609	Confined	9,836	12/5/2005	345.01	324.17	20.84	1
7	0_7710609	Confined	9,841	12/10/2005	344.96	324.23	20.73	1
7	0_7710609	Confined	9,846	12/15/2005	344.86	324.28	20.58	1
7	0_7710609	Confined	9,851	12/20/2005	344.81	324.34	20.47	1
7	0_7710609	Confined	9,856	12/25/2005	345.01	324.39	20.62	1
7	0_7710609	Confined	9,861	12/30/2005	345.21	324.45	20.76	1
7	0_7710609	Confined	9,867	1/5/2006	344.01	324.64	19.37	1
7	0_7710609	Confined	9,872	1/10/2006	342.61	324.82	17.79	1
7	0_7710609	Confined	9,877	1/15/2006	342.61	325.00	17.61	1
7	0_7710609	Confined	9,882	1/20/2006	342.71	325.18	17.53	1
7	0_7710609	Confined	9,887	1/25/2006	342.51	325.36	17.15	1
7	0_7710609	Confined	9,892	1/30/2006	342.21	325.54	16.67	1
7	0_7710609	Confined	9,898	2/5/2006	340.81	325.75	15.06	1
7	0_7710609	Confined	9,903	2/10/2006	340.51	325.93	14.58	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	9,908	2/15/2006	341.11	326.11	15.00	1
7	0_7710609	Confined	9,922	3/1/2006	340.11	326.62	13.49	1
7	0_7710609	Confined	9,926	3/5/2006	338.61	326.76	11.85	1
7	0_7710609	Confined	9,931	3/10/2006	334.91	326.94	7.97	1
7	0_7710609	Confined	9,936	3/15/2006	332.01	327.12	4.89	1
7	0_7710609	Confined	9,941	3/20/2006	330.01	327.30	2.71	1
7	0_7710609	Confined	9,946	3/25/2006	329.81	327.48	2.33	1
7	0_7710609	Confined	9,951	3/30/2006	329.71	327.66	2.05	1
7	0_7710609	Confined	9,957	4/5/2006	327.31	327.87	-0.56	1
7	0_7710609	Confined	9,962	4/10/2006	324.71	328.05	-3.34	1
7	0_7710609	Confined	9,967	4/15/2006	315.41	328.23	-12.82	1
7	0_7710609	Confined	9,972	4/20/2006	315.51	328.41	-12.90	1
7	0_7710609	Confined	9,977	4/25/2006	317.11	328.59	-11.48	1
7	0_7710609	Confined	9,982	4/30/2006	312.41	328.77	-16.36	1
7	0_7710609	Confined	9,987	5/5/2006	319.21	328.95	-9.74	1
7	0_7710609	Confined	9,992	5/10/2006	322.01	329.13	-7.12	1
7	0_7710609	Confined	9,997	5/15/2006	315.41	329.31	-13.90	1
7	0_7710609	Confined	10,002	5/20/2006	311.71	329.49	-17.78	1
7	0_7710609	Confined	10,007	5/25/2006	306.51	329.67	-23.16	1
7	0_7710609	Confined	10,012	5/30/2006	311.96	329.85	-17.89	1
7	0_7710609	Confined	10,018	6/5/2006	305.11	330.07	-24.96	1
7	0_7710609	Confined	10,023	6/10/2006	301.41	330.25	-28.84	1
7	0_7710609	Confined	10,028	6/15/2006	305.61	330.43	-24.82	1
7	0_7710609	Confined	10,033	6/20/2006	294.61	330.61	-36.00	1
7	0_7710609	Confined	10,038	6/25/2006	300.91	330.79	-29.88	1
7	0_7710609	Confined	10,043	6/30/2006	298.91	330.97	-32.06	1
7	0_7710609	Confined	10,048	7/5/2006	300.41	331.15	-30.74	1
7	0_7710609	Confined	10,053	7/10/2006	300.91	331.33	-30.42	1
7	0_7710609	Confined	10,058	7/15/2006	299.96	331.51	-31.55	1
7	0_7710609	Confined	10,063	7/20/2006	286.91	331.69	-44.78	1
7	0_7710609	Confined	10,068	7/25/2006	284.81	331.87	-47.06	1
7	0_7710609	Confined	10,073	7/30/2006	283.91	332.05	-48.14	1
7	0_7710609	Confined	10,075	8/1/2006	281.76	332.12	-50.36	1
7	0_7710609	Confined	10,079	8/5/2006	277.91	332.26	-54.35	1
7	0_7710609	Confined	10,084	8/10/2006	280.61	332.44	-51.83	1
7	0_7710609	Confined	10,089	8/15/2006	282.71	332.62	-49.91	1
7	0_7710609	Confined	10,094	8/20/2006	286.21	332.80	-46.59	1
7	0_7710609	Confined	10,106	9/1/2006	277.16	333.23	-56.07	1
7	0_7710609	Confined	10,110	9/5/2006	276.91	333.38	-56.47	1
7	0_7710609	Confined	10,115	9/10/2006	278.31	333.56	-55.25	1
7	0_7710609	Confined	10,120	9/15/2006	287.81	333.74	-45.93	1
7	0_7710609	Confined	10,125	9/20/2006	292.91	333.92	-41.01	1
7	0_7710609	Confined	10,130	9/25/2006	297.21	334.10	-36.89	1
7	0_7710609	Confined	10,135	9/30/2006	298.31	334.28	-35.97	1
7	0_7710609	Confined	10,140	10/5/2006	283.61	334.46	-50.85	1
7	0_7710609	Confined	10,145	10/10/2006	288.41	334.64	-46.23	1
7	0_7710609	Confined	10,150	10/15/2006	299.71	334.81	-35.10	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	10,155	10/20/2006	295.51	334.99	-39.48	1
7	0_7710609	Confined	10,160	10/25/2006	298.21	335.17	-36.96	1
7	0_7710609	Confined	10,165	10/30/2006	287.81	335.35	-47.54	1
7	0_7710609	Confined	10,171	11/5/2006	285.31	335.57	-50.26	1
7	0_7710609	Confined	10,176	11/10/2006	289.81	335.75	-45.94	1
7	0_7710609	Confined	10,181	11/15/2006	291.21	335.93	-44.72	1
7	0_7710609	Confined	10,186	11/20/2006	288.91	336.11	-47.20	1
7	0_7710609	Confined	10,191	11/25/2006	286.11	336.29	-50.18	1
7	0_7710609	Confined	10,196	11/30/2006	292.01	336.47	-44.46	1
7	0_7710609	Confined	10,201	12/5/2006	284.71	336.65	-51.94	1
7	0_7710609	Confined	10,206	12/10/2006	288.11	336.83	-48.72	1
7	0_7710609	Confined	10,211	12/15/2006	274.16	337.01	-62.85	1
7	0_7710609	Confined	10,216	12/20/2006	293.41	337.19	-43.78	1
7	0_7710609	Confined	10,221	12/25/2006	293.21	337.37	-44.16	1
7	0_7710609	Confined	10,226	12/30/2006	297.21	337.55	-40.34	1
7	0_7710609	Confined	10,232	1/5/2007	301.91	337.63	-35.72	1
7	0_7710609	Confined	10,237	1/10/2007	303.71	337.68	-33.97	1
7	0_7710609	Confined	10,242	1/15/2007	307.66	337.73	-30.07	1
7	0_7710609	Confined	10,247	1/20/2007	310.91	337.78	-26.87	1
7	0_7710609	Confined	10,252	1/25/2007	313.31	337.83	-24.52	1
7	0_7710609	Confined	10,257	1/30/2007	315.61	337.88	-22.27	1
7	0_7710609	Confined	10,259	2/1/2007	317.01	337.90	-20.89	1
7	0_7710609	Confined	10,263	2/5/2007	316.41	337.94	-21.53	1
7	0_7710609	Confined	10,268	2/10/2007	317.21	337.99	-20.78	1
7	0_7710609	Confined	10,273	2/15/2007	312.71	338.03	-25.32	1
7	0_7710609	Confined	10,278	2/20/2007	314.51	338.08	-23.57	1
7	0_7710609	Confined	10,283	2/25/2007	309.91	338.13	-28.22	1
7	0_7710609	Confined	10,287	3/1/2007	311.81	338.17	-26.36	1
7	0_7710609	Confined	10,291	3/5/2007	302.41	338.21	-35.80	1
7	0_7710609	Confined	10,296	3/10/2007	296.21	338.26	-42.05	1
7	0_7710609	Confined	10,301	3/15/2007	307.21	338.31	-31.10	1
7	0_7710609	Confined	10,306	3/20/2007	311.11	338.36	-27.25	1
7	0_7710609	Confined	10,311	3/25/2007	314.41	338.41	-24.00	1
7	0_7710609	Confined	10,316	3/30/2007	312.41	338.46	-26.05	1
7	0_7710609	Confined	10,322	4/5/2007	318.31	338.52	-20.21	1
7	0_7710609	Confined	10,327	4/10/2007	321.31	338.56	-17.25	1
7	0_7710609	Confined	10,332	4/15/2007	322.91	338.61	-15.70	1
7	0_7710609	Confined	10,337	4/20/2007	311.61	338.66	-27.05	1
7	0_7710609	Confined	10,342	4/25/2007	312.81	338.71	-25.90	1
7	0_7710609	Confined	10,347	4/30/2007	320.13	338.76	-18.63	1
7	0_7710609	Confined	10,352	5/5/2007	318.61	338.81	-20.20	1
7	0_7710609	Confined	10,357	5/10/2007	319.31	338.86	-19.55	1
7	0_7710609	Confined	10,362	5/15/2007	318.71	338.91	-20.20	1
7	0_7710609	Confined	10,367	5/20/2007	314.81	338.96	-24.15	1
7	0_7710609	Confined	10,372	5/25/2007	323.01	339.01	-16.00	1
7	0_7710609	Confined	10,379	6/1/2007	325.81	339.07	-13.26	1
7	0_7710609	Confined	10,383	6/5/2007	326.51	339.11	-12.60	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	10,388	6/10/2007	328.91	339.16	-10.25	1
7	0_7710609	Confined	10,393	6/15/2007	329.81	339.21	-9.40	1
7	0_7710609	Confined	10,398	6/20/2007	331.01	339.26	-8.25	1
7	0_7710609	Confined	10,403	6/25/2007	332.81	339.31	-6.50	1
7	0_7710609	Confined	10,408	6/30/2007	334.11	339.36	-5.25	1
7	0_7710609	Confined	10,413	7/5/2007	335.81	339.41	-3.60	1
7	0_7710609	Confined	10,418	7/10/2007	336.61	339.46	-2.85	1
7	0_7710609	Confined	10,423	7/15/2007	338.71	339.51	-0.80	1
7	0_7710609	Confined	10,428	7/20/2007	339.91	339.55	0.36	1
7	0_7710609	Confined	10,433	7/25/2007	340.91	339.60	1.31	1
7	0_7710609	Confined	10,438	7/30/2007	342.41	339.65	2.76	1
7	0_7710609	Confined	10,444	8/5/2007	343.41	339.71	3.70	1
7	0_7710609	Confined	10,449	8/10/2007	344.41	339.76	4.65	1
7	0_7710609	Confined	10,454	8/15/2007	345.31	339.81	5.50	1
7	0_7710609	Confined	10,459	8/20/2007	345.66	339.86	5.80	1
7	0_7710609	Confined	10,464	8/25/2007	346.06	339.91	6.15	1
7	0_7710609	Confined	10,469	8/30/2007	346.86	339.96	6.90	1
7	0_7710609	Confined	10,475	9/5/2007	348.16	340.02	8.14	1
7	0_7710609	Confined	10,480	9/10/2007	348.91	340.06	8.85	1
7	0_7710609	Confined	10,485	9/15/2007	343.71	340.11	3.60	1
7	0_7710609	Confined	10,490	9/20/2007	341.21	340.16	1.05	1
7	0_7710609	Confined	10,495	9/25/2007	337.61	340.21	-2.60	1
7	0_7710609	Confined	10,500	9/30/2007	331.61	340.26	-8.65	1
7	0_7710609	Confined	10,505	10/5/2007	334.21	340.31	-6.10	1
7	0_7710609	Confined	10,510	10/10/2007	338.61	340.36	-1.75	1
7	0_7710609	Confined	10,515	10/15/2007	314.61	340.41	-25.80	1
7	0_7710609	Confined	10,520	10/20/2007	314.91	340.46	-25.55	1
7	0_7710609	Confined	10,525	10/25/2007	320.21	340.51	-20.30	1
7	0_7710609	Confined	10,530	10/30/2007	323.61	340.55	-16.94	1
7	0_7710609	Confined	10,536	11/5/2007	323.41	340.61	-17.20	1
7	0_7710609	Confined	10,541	11/10/2007	323.31	340.66	-17.35	1
7	0_7710609	Confined	10,546	11/15/2007	316.61	340.71	-24.10	1
7	0_7710609	Confined	10,551	11/20/2007	310.41	340.76	-30.35	1
7	0_7710609	Confined	10,556	11/25/2007	328.31	340.81	-12.50	1
7	0_7710609	Confined	10,561	11/30/2007	333.41	340.86	-7.45	1
7	0_7710609	Confined	10,566	12/5/2007	355.41	340.91	14.50	1
7	0_7710609	Confined	10,571	12/10/2007	357.11	340.96	16.15	1
7	0_7710609	Confined	10,576	12/15/2007	357.71	341.01	16.70	1
7	0_7710609	Confined	10,581	12/20/2007	354.21	341.05	13.16	1
7	0_7710609	Confined	10,586	12/25/2007	332.11	341.10	-8.99	1
7	0_7710609	Confined	10,591	12/30/2007	312.91	341.15	-28.24	1
7	0_7710609	Confined	10,597	1/5/2008	332.01	340.85	-8.84	1
7	0_7710609	Confined	10,602	1/10/2008	329.11	340.54	-11.43	1
7	0_7710609	Confined	10,607	1/15/2008	334.01	340.23	-6.22	1
7	0_7710609	Confined	10,612	1/20/2008	323.41	339.91	-16.50	1
7	0_7710609	Confined	10,617	1/25/2008	333.41	339.60	-6.19	1
7	0_7710609	Confined	10,622	1/30/2008	325.81	339.29	-13.48	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	10,628	2/5/2008	331.81	338.92	-7.11	1
7	0_7710609	Confined	10,633	2/10/2008	322.71	338.60	-15.89	1
7	0_7710609	Confined	10,638	2/15/2008	330.91	338.29	-7.38	1
7	0_7710609	Confined	10,643	2/20/2008	333.41	337.98	-4.57	1
7	0_7710609	Confined	10,648	2/25/2008	313.01	337.67	-24.66	1
7	0_7710609	Confined	10,651	2/28/2008	322.21	337.48	-15.27	1
7	0_7710609	Confined	10,657	3/5/2008	313.81	337.11	-23.30	1
7	0_7710609	Confined	10,662	3/10/2008	305.41	336.80	-31.39	1
7	0_7710609	Confined	10,667	3/15/2008	319.41	336.48	-17.07	1
7	0_7710609	Confined	10,672	3/20/2008	323.11	336.17	-13.06	1
7	0_7710609	Confined	10,677	3/25/2008	316.81	335.86	-19.05	1
7	0_7710609	Confined	10,682	3/30/2008	313.21	335.55	-22.34	1
7	0_7710609	Confined	10,688	4/5/2008	311.41	335.17	-23.76	1
7	0_7710609	Confined	10,693	4/10/2008	313.41	334.86	-21.45	1
7	0_7710609	Confined	10,698	4/15/2008	309.41	334.55	-25.14	1
7	0_7710609	Confined	10,703	4/20/2008	304.71	334.24	-29.53	1
7	0_7710609	Confined	10,708	4/25/2008	300.61	333.93	-33.32	1
7	0_7710609	Confined	10,713	4/30/2008	292.41	333.61	-41.20	1
7	0_7710609	Confined	10,718	5/5/2008	287.21	333.30	-46.09	1
7	0_7710609	Confined	10,723	5/10/2008	286.61	332.99	-46.38	1
7	0_7710609	Confined	10,728	5/15/2008	283.91	332.68	-48.77	1
7	0_7710609	Confined	10,733	5/20/2008	311.31	332.37	-21.06	1
7	0_7710609	Confined	10,738	5/25/2008	312.41	332.05	-19.64	1
7	0_7710609	Confined	10,743	5/30/2008	300.41	331.74	-31.33	1
7	0_7710609	Confined	10,749	6/5/2008	291.41	331.37	-39.96	1
7	0_7710609	Confined	10,754	6/10/2008	286.61	331.06	-44.45	1
7	0_7710609	Confined	10,759	6/15/2008	283.41	330.74	-47.33	1
7	0_7710609	Confined	10,764	6/20/2008	279.71	330.43	-50.72	1
7	0_7710609	Confined	10,769	6/25/2008	276.71	330.12	-53.41	1
7	0_7710609	Confined	10,774	6/30/2008	270.91	329.81	-58.90	1
7	0_7710609	Confined	10,779	7/5/2008	274.61	329.50	-54.89	1
7	0_7710609	Confined	10,784	7/10/2008	285.91	329.19	-43.28	1
7	0_7710609	Confined	10,789	7/15/2008	295.81	328.87	-33.06	1
7	0_7710609	Confined	10,835	8/30/2008	310.31	326.00	-15.69	1
7	0_7710609	Confined	10,841	9/5/2008	313.81	325.63	-11.82	1
7	0_7710609	Confined	10,846	9/10/2008	316.82	325.32	-8.50	1
7	0_7710609	Confined	10,851	9/15/2008	319.41	325.01	-5.60	1
7	0_7710609	Confined	10,856	9/20/2008	320.67	324.69	-4.02	1
7	0_7710609	Confined	10,861	9/25/2008	323.03	324.38	-1.35	1
7	0_7710609	Confined	10,866	9/30/2008	314.63	324.07	-9.44	1
7	0_7710609	Confined	10,867	10/1/2008	322.03	324.01	-1.98	1
7	0_7710609	Confined	10,871	10/5/2008	321.55	323.76	-2.21	1
7	0_7710609	Confined	10,876	10/10/2008	316.13	323.45	-7.32	1
7	0_7710609	Confined	10,881	10/15/2008	300.80	323.13	-22.33	1
7	0_7710609	Confined	10,886	10/20/2008	304.81	322.82	-18.01	1
7	0_7710609	Confined	10,891	10/25/2008	312.72	322.51	-9.79	1
7	0_7710609	Confined	10,896	10/30/2008	301.05	322.20	-21.15	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	10,898	11/1/2008	310.42	322.07	-11.65	1
7	0_7710609	Confined	10,902	11/5/2008	311.70	321.82	-10.12	1
7	0_7710609	Confined	10,907	11/10/2008	304.66	321.51	-16.85	1
7	0_7710609	Confined	10,912	11/15/2008	298.56	321.20	-22.64	1
7	0_7710609	Confined	10,917	11/20/2008	301.61	320.89	-19.28	1
7	0_7710609	Confined	10,922	11/25/2008	290.02	320.58	-30.56	1
7	0_7710609	Confined	10,927	11/30/2008	302.66	320.27	-17.61	1
7	0_7710609	Confined	10,932	12/5/2008	293.12	319.95	-26.83	1
7	0_7710609	Confined	10,937	12/10/2008	304.06	319.64	-15.58	1
7	0_7710609	Confined	10,942	12/15/2008	307.53	319.33	-11.80	1
7	0_7710609	Confined	10,947	12/20/2008	293.87	319.02	-25.15	1
7	0_7710609	Confined	10,952	12/25/2008	306.77	318.71	-11.94	1
7	0_7710609	Confined	10,957	12/30/2008	299.26	318.39	-19.13	1
7	0_7710609	Confined	10,963	1/5/2009	299.88	317.64	-17.76	1
7	0_7710609	Confined	10,968	1/10/2009	305.43	316.94	-11.51	1
7	0_7710609	Confined	10,973	1/15/2009	300.92	316.25	-15.33	1
7	0_7710609	Confined	10,978	1/20/2009	305.60	315.56	-9.96	1
7	0_7710609	Confined	10,983	1/25/2009	297.34	314.87	-17.53	1
7	0_7710609	Confined	10,988	1/30/2009	296.95	314.17	-17.22	1
7	0_7710609	Confined	10,994	2/5/2009	292.89	313.34	-20.45	1
7	0_7710609	Confined	10,999	2/10/2009	280.18	312.65	-32.47	1
7	0_7710609	Confined	11,004	2/15/2009	276.60	311.95	-35.35	1
7	0_7710609	Confined	11,009	2/20/2009	288.97	311.26	-22.29	1
7	0_7710609	Confined	11,014	2/25/2009	287.26	310.57	-23.31	1
7	0_7710609	Confined	11,018	3/1/2009	286.70	310.01	-23.31	1
7	0_7710609	Confined	11,022	3/5/2009	276.13	309.46	-33.33	1
7	0_7710609	Confined	11,027	3/10/2009	274.83	308.77	-33.94	1
7	0_7710609	Confined	11,032	3/15/2009	286.74	308.07	-21.33	1
7	0_7710609	Confined	11,037	3/20/2009	291.01	307.38	-16.37	1
7	0_7710609	Confined	11,042	3/25/2009	280.83	306.69	-25.86	1
7	0_7710609	Confined	11,047	3/30/2009	271.65	305.99	-34.34	1
7	0_7710609	Confined	11,053	4/5/2009	277.98	305.16	-27.18	1
7	0_7710609	Confined	11,058	4/10/2009	280.53	304.47	-23.94	1
7	0_7710609	Confined	11,063	4/15/2009	274.78	303.78	-29.00	1
7	0_7710609	Confined	11,068	4/20/2009	268.54	303.08	-34.54	1
7	0_7710609	Confined	11,073	4/25/2009	265.04	302.39	-37.35	1
7	0_7710609	Confined	11,078	4/30/2009	276.58	301.70	-25.12	1
7	0_7710609	Confined	11,083	5/5/2009	267.28	301.00	-33.72	1
7	0_7710609	Confined	11,093	5/15/2009	273.89	299.62	-25.73	1
7	0_7710609	Confined	11,098	5/20/2009	275.40	298.92	-23.52	1
7	0_7710609	Confined	11,103	5/25/2009	274.81	298.23	-23.42	1
7	0_7710609	Confined	11,108	5/30/2009	276.78	297.54	-20.76	1
7	0_7710609	Confined	11,110	6/1/2009	277.51	297.26	-19.75	1
7	0_7710609	Confined	11,114	6/5/2009	279.66	296.71	-17.05	1
7	0_7710609	Confined	11,119	6/10/2009	275.59	296.01	-20.42	1
7	0_7710609	Confined	11,124	6/15/2009	273.77	295.32	-21.55	1
7	0_7710609	Confined	11,129	6/20/2009	268.82	294.63	-25.81	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	11,134	6/25/2009	266.67	293.93	-27.26	1
7	0_7710609	Confined	11,139	6/30/2009	268.23	293.24	-25.01	1
7	0_7710609	Confined	11,144	7/5/2009	268.58	292.55	-23.97	1
7	0_7710609	Confined	11,149	7/10/2009	268.39	291.85	-23.46	1
7	0_7710609	Confined	11,154	7/15/2009	268.26	291.16	-22.90	1
7	0_7710609	Confined	11,159	7/20/2009	263.48	290.47	-26.99	1
7	0_7710609	Confined	11,164	7/25/2009	261.12	289.77	-28.65	1
7	0_7710609	Confined	11,169	7/30/2009	260.26	289.08	-28.82	1
7	0_7710609	Confined	11,171	8/1/2009	262.30	288.80	-26.50	1
7	0_7710609	Confined	11,175	8/5/2009	265.00	288.25	-23.25	1
7	0_7710609	Confined	11,180	8/10/2009	260.44	287.56	-27.12	1
7	0_7710609	Confined	11,185	8/15/2009	257.77	286.86	-29.09	1
7	0_7710609	Confined	11,190	8/20/2009	255.99	286.17	-30.18	1
7	0_7710609	Confined	11,195	8/25/2009	252.44	285.48	-33.04	1
7	0_7710609	Confined	11,200	8/30/2009	252.48	284.78	-32.30	1
7	0_7710609	Confined	11,202	9/1/2009	252.53	284.51	-31.98	1
7	0_7710609	Confined	11,206	9/5/2009	252.46	283.95	-31.49	1
7	0_7710609	Confined	11,211	9/10/2009	252.44	283.26	-30.82	1
7	0_7710609	Confined	11,231	9/30/2009	263.61	280.49	-16.88	1
7	0_7710609	Confined	11,232	10/1/2009	262.96	280.35	-17.39	1
7	0_7710609	Confined	11,236	10/5/2009	270.26	279.79	-9.53	1
7	0_7710609	Confined	11,241	10/10/2009	274.04	279.10	-5.06	1
7	0_7710609	Confined	11,246	10/15/2009	268.67	278.41	-9.74	1
7	0_7710609	Confined	11,251	10/20/2009	271.90	277.71	-5.81	1
7	0_7710609	Confined	11,256	10/25/2009	282.20	277.02	5.18	1
7	0_7710609	Confined	11,261	10/30/2009	287.20	276.33	10.87	1
7	0_7710609	Confined	11,263	11/1/2009	287.96	276.05	11.91	1
7	0_7710609	Confined	11,267	11/5/2009	284.49	275.50	8.99	1
7	0_7710609	Confined	11,272	11/10/2009	288.59	274.80	13.79	1
7	0_7710609	Confined	11,277	11/15/2009	293.46	274.11	19.35	1
7	0_7710609	Confined	11,282	11/20/2009	296.87	273.42	23.45	1
7	0_7710609	Confined	11,287	11/25/2009	299.61	272.72	26.89	1
7	0_7710609	Confined	11,292	11/30/2009	301.96	272.03	29.93	1
7	0_7710609	Confined	11,293	12/1/2009	302.26	271.89	30.37	1
7	0_7710609	Confined	11,297	12/5/2009	304.42	271.34	33.08	1
7	0_7710609	Confined	11,322	12/30/2009	308.25	267.87	40.38	1
7	0_7710609	Confined	11,324	1/1/2010	309.06	267.65	41.41	1
7	0_7710609	Confined	11,328	1/5/2010	311.26	267.31	43.95	1
7	0_7710609	Confined	11,333	1/10/2010	310.62	266.89	43.73	1
7	0_7710609	Confined	11,338	1/15/2010	307.06	266.47	40.59	1
7	0_7710609	Confined	11,343	1/20/2010	310.76	266.05	44.71	1
7	0_7710609	Confined	11,348	1/25/2010	311.91	265.63	46.28	1
7	0_7710609	Confined	11,353	1/30/2010	307.73	265.21	42.52	1
7	0_7710609	Confined	11,355	2/1/2010	301.91	265.05	36.86	1
7	0_7710609	Confined	11,359	2/5/2010	312.53	264.71	47.82	1
7	0_7710609	Confined	11,364	2/10/2010	315.89	264.29	51.60	1
7	0_7710609	Confined	11,369	2/15/2010	318.19	263.87	54.32	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	11,374	2/20/2010	319.92	263.45	56.47	1
7	0_7710609	Confined	11,379	2/25/2010	320.10	263.03	57.07	1
7	0_7710609	Confined	11,382	2/28/2010	313.16	262.78	50.38	1
7	0_7710609	Confined	11,383	3/1/2010	313.12	262.70	50.42	1
7	0_7710609	Confined	11,387	3/5/2010	309.51	262.36	47.15	1
7	0_7710609	Confined	11,392	3/10/2010	304.78	261.94	42.84	1
7	0_7710609	Confined	11,397	3/15/2010	310.08	261.52	48.56	1
7	0_7710609	Confined	11,402	3/20/2010	311.17	261.10	50.07	1
7	0_7710609	Confined	11,407	3/25/2010	314.59	260.68	53.91	1
7	0_7710609	Confined	11,412	3/30/2010	307.22	260.26	46.96	1
7	0_7710609	Confined	11,414	4/1/2010	307.14	260.09	47.05	1
7	0_7710609	Confined	11,418	4/5/2010	296.08	259.76	36.32	1
7	0_7710609	Confined	11,423	4/10/2010	289.41	259.34	30.07	1
7	0_7710609	Confined	11,428	4/15/2010	298.11	258.92	39.19	1
7	0_7710609	Confined	11,433	4/20/2010	304.06	258.50	45.56	1
7	0_7710609	Confined	11,438	4/25/2010	299.28	258.08	41.20	1
7	0_7710609	Confined	11,443	4/30/2010	294.90	257.66	37.24	1
7	0_7710609	Confined	11,444	5/1/2010	297.06	257.58	39.48	1
7	0_7710609	Confined	11,448	5/5/2010	298.28	257.24	41.04	1
7	0_7710609	Confined	11,453	5/10/2010	305.40	256.82	48.58	1
7	0_7710609	Confined	11,458	5/15/2010	304.15	256.40	47.75	1
7	0_7710609	Confined	11,463	5/20/2010	301.32	255.98	45.34	1
7	0_7710609	Confined	11,468	5/25/2010	305.37	255.56	49.81	1
7	0_7710609	Confined	11,473	5/30/2010	308.36	255.14	53.22	1
7	0_7710609	Confined	11,475	6/1/2010	308.76	254.97	53.79	1
7	0_7710609	Confined	11,479	6/5/2010	308.36	254.64	53.72	1
7	0_7710609	Confined	11,484	6/10/2010	301.15	254.22	46.93	1
7	0_7710609	Confined	11,489	6/15/2010	300.43	253.80	46.63	1
7	0_7710609	Confined	11,494	6/20/2010	284.24	253.38	30.86	1
7	0_7710609	Confined	11,499	6/25/2010	282.54	252.96	29.58	1
7	0_7710609	Confined	11,504	6/30/2010	291.19	252.54	38.65	1
7	0_7710609	Confined	11,505	7/1/2010	292.09	252.46	39.63	1
7	0_7710609	Confined	11,509	7/5/2010	295.27	252.12	43.15	1
7	0_7710609	Confined	11,514	7/10/2010	298.69	251.70	46.99	1
7	0_7710609	Confined	11,519	7/15/2010	301.74	251.28	50.46	1
7	0_7710609	Confined	11,524	7/20/2010	294.84	250.86	43.98	1
7	0_7710609	Confined	11,529	7/25/2010	299.03	250.44	48.59	1
7	0_7710609	Confined	11,534	7/30/2010	302.79	250.02	52.77	1
7	0_7710609	Confined	11,536	8/1/2010	300.37	249.85	50.52	1
7	0_7710609	Confined	11,540	8/5/2010	292.19	249.52	42.67	1
7	0_7710609	Confined	11,545	8/10/2010	294.12	249.10	45.02	1
7	0_7710609	Confined	11,550	8/15/2010	287.04	248.68	38.36	1
7	0_7710609	Confined	11,555	8/20/2010	288.38	248.26	40.12	1
7	0_7710609	Confined	11,560	8/25/2010	290.68	247.84	42.84	1
7	0_7710609	Confined	11,565	8/30/2010	280.96	247.42	33.54	1
7	0_7710609	Confined	11,567	9/1/2010	288.84	247.25	41.59	1
7	0_7710609	Confined	11,571	9/5/2010	287.92	246.92	41.00	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	11,576	9/10/2010	293.89	246.50	47.39	1
7	0_7710609	Confined	11,581	9/15/2010	298.30	246.08	52.22	1
7	0_7710609	Confined	11,586	9/20/2010	299.99	245.66	54.33	1
7	0_7710609	Confined	11,591	9/25/2010	304.37	245.24	59.13	1
7	0_7710609	Confined	11,596	9/30/2010	307.49	244.82	62.67	1
7	0_7710609	Confined	11,597	10/1/2010	303.07	244.73	58.34	1
7	0_7710609	Confined	11,601	10/5/2010	286.07	244.40	41.67	1
7	0_7710609	Confined	11,606	10/10/2010	296.54	243.98	52.56	1
7	0_7710609	Confined	11,611	10/15/2010	296.91	243.56	53.35	1
7	0_7710609	Confined	11,616	10/20/2010	298.63	243.14	55.49	1
7	0_7710609	Confined	11,621	10/25/2010	299.50	242.72	56.78	1
7	0_7710609	Confined	11,626	10/30/2010	292.41	242.30	50.11	1
7	0_7710609	Confined	11,628	11/1/2010	284.97	242.13	42.84	1
7	0_7710609	Confined	11,632	11/5/2010	293.01	241.80	51.21	1
7	0_7710609	Confined	11,637	11/10/2010	287.37	241.38	45.99	1
7	0_7710609	Confined	11,642	11/15/2010	283.47	240.96	42.51	1
7	0_7710609	Confined	11,647	11/20/2010	282.41	240.54	41.87	1
7	0_7710609	Confined	11,652	11/25/2010	284.77	240.12	44.65	1
7	0_7710609	Confined	11,657	11/30/2010	279.92	239.70	40.22	1
7	0_7710609	Confined	11,658	12/1/2010	276.03	239.61	36.42	1
7	0_7710609	Confined	11,662	12/5/2010	286.85	239.28	47.57	1
7	0_7710609	Confined	11,667	12/10/2010	275.90	238.86	37.04	1
7	0_7710609	Confined	11,672	12/15/2010	276.71	238.44	38.27	1
7	0_7710609	Confined	11,677	12/20/2010	279.11	238.02	41.09	1
7	0_7710609	Confined	11,682	12/25/2010	280.63	237.60	43.03	1
7	0_7710609	Confined	11,687	12/30/2010	276.29	237.18	39.11	1
7	0_7710609	Confined	11,689	1/1/2011	277.10	237.04	40.06	1
7	0_7710609	Confined	11,693	1/5/2011	283.77	236.79	46.98	1
7	0_7710609	Confined	11,698	1/10/2011	285.89	236.49	49.40	1
7	0_7710609	Confined	11,703	1/15/2011	291.52	236.19	55.33	1
7	0_7710609	Confined	11,708	1/20/2011	293.99	235.89	58.10	1
7	0_7710609	Confined	11,713	1/25/2011	285.42	235.59	49.83	1
7	0_7710609	Confined	11,718	1/30/2011	285.69	235.29	50.40	1
7	0_7710609	Confined	11,720	2/1/2011	289.92	235.17	54.75	1
7	0_7710609	Confined	11,724	2/5/2011	294.64	234.93	59.71	1
7	0_7710609	Confined	11,729	2/10/2011	290.75	234.63	56.12	1
7	0_7710609	Confined	11,734	2/15/2011	273.78	234.33	39.45	1
7	0_7710609	Confined	11,739	2/20/2011	272.30	234.02	38.28	1
7	0_7710609	Confined	11,744	2/25/2011	273.58	233.72	39.86	1
7	0_7710609	Confined	11,747	2/28/2011	274.06	233.54	40.52	1
7	0_7710609	Confined	11,748	3/1/2011	268.52	233.48	35.04	1
7	0_7710609	Confined	11,752	3/5/2011	268.24	233.24	35.00	1
7	0_7710609	Confined	11,757	3/10/2011	259.11	232.94	26.17	1
7	0_7710609	Confined	11,762	3/15/2011	254.20	232.64	21.56	1
7	0_7710609	Confined	11,767	3/20/2011	261.42	232.34	29.08	1
7	0_7710609	Confined	11,772	3/25/2011	255.06	232.04	23.02	1
7	0_7710609	Confined	11,777	3/30/2011	263.00	231.74	31.26	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	11,779	4/1/2011	240.91	231.61	9.30	1
7	0_7710609	Confined	11,783	4/5/2011	237.61	231.37	6.24	1
7	0_7710609	Confined	11,788	4/10/2011	235.40	231.07	4.33	1
7	0_7710609	Confined	11,793	4/15/2011	227.64	230.77	-3.13	1
7	0_7710609	Confined	11,798	4/20/2011	229.30	230.47	-1.17	1
7	0_7710609	Confined	11,803	4/25/2011	227.10	230.17	-3.07	1
7	0_7710609	Confined	11,808	4/30/2011	224.97	229.87	-4.90	1
7	0_7710609	Confined	11,809	5/1/2011	223.01	229.81	-6.80	1
7	0_7710609	Confined	11,813	5/5/2011	229.78	229.57	0.21	1
7	0_7710609	Confined	11,818	5/10/2011	218.85	229.27	-10.42	1
7	0_7710609	Confined	11,823	5/15/2011	233.97	228.97	5.00	1
7	0_7710609	Confined	11,828	5/20/2011	229.98	228.66	1.32	1
7	0_7710609	Confined	11,833	5/25/2011	227.45	228.36	-0.91	1
7	0_7710609	Confined	11,838	5/30/2011	222.95	228.06	-5.11	1
7	0_7710609	Confined	11,840	6/1/2011	218.98	227.94	-8.96	1
7	0_7710609	Confined	11,844	6/5/2011	221.45	227.70	-6.25	1
7	0_7710609	Confined	11,849	6/10/2011	222.00	227.40	-5.40	1
7	0_7710609	Confined	11,854	6/15/2011	218.68	227.10	-8.42	1
7	0_7710609	Confined	11,859	6/20/2011	212.96	226.80	-13.84	1
7	0_7710609	Confined	11,864	6/25/2011	219.91	226.50	-6.59	1
7	0_7710609	Confined	11,869	6/30/2011	217.36	226.19	-8.83	1
7	0_7710609	Confined	11,870	7/1/2011	211.65	226.13	-14.48	1
7	0_7710609	Confined	11,874	7/5/2011	212.08	225.89	-13.81	1
7	0_7710609	Confined	11,879	7/10/2011	210.93	225.59	-14.66	1
7	0_7710609	Confined	11,884	7/15/2011	201.60	225.29	-23.69	1
7	0_7710609	Confined	11,889	7/20/2011	207.73	224.99	-17.26	1
7	0_7710609	Confined	11,894	7/25/2011	205.18	224.69	-19.51	1
7	0_7710609	Confined	11,899	7/30/2011	201.89	224.39	-22.50	1
7	0_7710609	Confined	11,901	8/1/2011	201.79	224.27	-22.48	1
7	0_7710609	Confined	11,905	8/5/2011	202.75	224.03	-21.28	1
7	0_7710609	Confined	11,910	8/10/2011	201.54	223.73	-22.19	1
7	0_7710609	Confined	11,915	8/15/2011	204.56	223.42	-18.86	1
7	0_7710609	Confined	11,920	8/20/2011	208.28	223.12	-14.84	1
7	0_7710609	Confined	11,925	8/25/2011	201.71	222.82	-21.11	1
7	0_7710609	Confined	11,930	8/30/2011	203.31	222.52	-19.21	1
7	0_7710609	Confined	11,932	9/1/2011	205.77	222.40	-16.63	1
7	0_7710609	Confined	11,936	9/5/2011	205.90	222.16	-16.26	1
7	0_7710609	Confined	11,941	9/10/2011	209.92	221.86	-11.94	1
7	0_7710609	Confined	11,946	9/15/2011	201.75	221.56	-19.81	1
7	0_7710609	Confined	11,951	9/20/2011	206.07	221.26	-15.19	1
7	0_7710609	Confined	11,956	9/25/2011	217.88	220.96	-3.08	1
7	0_7710609	Confined	11,961	9/30/2011	222.56	220.65	1.91	1
7	0_7710609	Confined	11,962	10/1/2011	221.02	220.59	0.43	1
7	0_7710609	Confined	11,966	10/5/2011	217.83	220.35	-2.52	1
7	0_7710609	Confined	11,971	10/10/2011	224.46	220.05	4.41	1
7	0_7710609	Confined	11,976	10/15/2011	227.83	219.75	8.08	1
7	0_7710609	Confined	11,981	10/20/2011	215.84	219.45	-3.61	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	11,986	10/25/2011	216.95	219.15	-2.20	1
7	0_7710609	Confined	11,991	10/30/2011	223.33	218.85	4.48	1
7	0_7710609	Confined	11,993	11/1/2011	227.37	218.73	8.64	1
7	0_7710609	Confined	11,997	11/5/2011	234.42	218.49	15.93	1
7	0_7710609	Confined	12,002	11/10/2011	223.99	218.19	5.80	1
7	0_7710609	Confined	12,007	11/15/2011	230.74	217.88	12.86	1
7	0_7710609	Confined	12,012	11/20/2011	240.88	217.58	23.30	1
7	0_7710609	Confined	12,017	11/25/2011	240.92	217.28	23.64	1
7	0_7710609	Confined	12,022	11/30/2011	233.08	216.98	16.10	1
7	0_7710609	Confined	12,023	12/1/2011	237.05	216.92	20.13	1
7	0_7710609	Confined	12,027	12/5/2011	244.71	216.68	28.03	1
7	0_7710609	Confined	12,032	12/10/2011	236.88	216.38	20.50	1
7	0_7710609	Confined	12,037	12/15/2011	251.25	216.08	35.17	1
7	0_7710609	Confined	12,042	12/20/2011	255.40	215.78	39.62	1
7	0_7710609	Confined	12,047	12/25/2011	258.67	215.48	43.19	1
7	0_7710609	Confined	12,052	12/30/2011	262.71	215.17	47.54	1
7	0_7710609	Confined	12,054	1/1/2012	263.64	215.15	48.49	1
7	0_7710609	Confined	12,058	1/5/2012	265.71	215.31	50.40	1
7	0_7710609	Confined	12,063	1/10/2012	259.48	215.50	43.98	1
7	0_7710609	Confined	12,068	1/15/2012	257.19	215.69	41.50	1
7	0_7710609	Confined	12,073	1/20/2012	265.14	215.88	49.26	1
7	0_7710609	Confined	12,078	1/25/2012	260.00	216.07	43.93	1
7	0_7710609	Confined	12,083	1/30/2012	266.39	216.26	50.13	1
7	0_7710609	Confined	12,085	2/1/2012	267.08	216.34	50.74	1
7	0_7710609	Confined	12,089	2/5/2012	261.52	216.50	45.02	1
7	0_7710609	Confined	12,094	2/10/2012	264.07	216.69	47.38	1
7	0_7710609	Confined	12,099	2/15/2012	268.50	216.88	51.62	1
7	0_7710609	Confined	12,104	2/20/2012	272.30	217.07	55.23	1
7	0_7710609	Confined	12,109	2/25/2012	275.36	217.26	58.10	1
7	0_7710609	Confined	12,112	2/28/2012	267.20	217.38	49.82	1
7	0_7710609	Confined	12,114	3/1/2012	268.98	217.45	51.53	1
7	0_7710609	Confined	12,118	3/5/2012	263.99	217.61	46.38	1
7	0_7710609	Confined	12,123	3/10/2012	270.06	217.80	52.26	1
7	0_7710609	Confined	12,128	3/15/2012	264.85	217.99	46.86	1
7	0_7710609	Confined	12,133	3/20/2012	262.62	218.18	44.44	1
7	0_7710609	Confined	12,138	3/25/2012	254.34	218.38	35.96	1
7	0_7710609	Confined	12,143	3/30/2012	269.51	218.57	50.94	1
7	0_7710609	Confined	12,145	4/1/2012	270.64	218.64	52.00	1
7	0_7710609	Confined	12,149	4/5/2012	274.04	218.80	55.24	1
7	0_7710609	Confined	12,154	4/10/2012	276.14	218.99	57.15	1
7	0_7710609	Confined	12,159	4/15/2012	267.33	219.18	48.15	1
7	0_7710609	Confined	12,164	4/20/2012	269.27	219.37	49.90	1
7	0_7710609	Confined	12,169	4/25/2012	254.66	219.56	35.10	1
7	0_7710609	Confined	12,174	4/30/2012	253.16	219.76	33.40	1
7	0_7710609	Confined	12,175	5/1/2012	247.98	219.80	28.18	1
7	0_7710609	Confined	12,179	5/5/2012	246.47	219.95	26.52	1
7	0_7710609	Confined	12,184	5/10/2012	250.96	220.14	30.82	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	12,189	5/15/2012	257.59	220.33	37.26	1
7	0_7710609	Confined	12,194	5/20/2012	261.69	220.52	41.17	1
7	0_7710609	Confined	12,199	5/25/2012	249.17	220.72	28.45	1
7	0_7710609	Confined	12,204	5/30/2012	256.18	220.91	35.27	1
7	0_7710609	Confined	12,206	6/1/2012	257.33	220.98	36.35	1
7	0_7710609	Confined	12,210	6/5/2012	255.87	221.14	34.73	1
7	0_7710609	Confined	12,215	6/10/2012	253.45	221.33	32.12	1
7	0_7710609	Confined	12,220	6/15/2012	246.34	221.52	24.82	1
7	0_7710609	Confined	12,225	6/20/2012	246.22	221.71	24.51	1
7	0_7710609	Confined	12,230	6/25/2012	236.74	221.91	14.83	1
7	0_7710609	Confined	12,235	6/30/2012	236.57	222.10	14.47	1
7	0_7710609	Confined	12,236	7/1/2012	237.84	222.14	15.70	1
7	0_7710609	Confined	12,240	7/5/2012	224.76	222.29	2.47	1
7	0_7710609	Confined	12,245	7/10/2012	224.47	222.48	1.99	1
7	0_7710609	Confined	12,250	7/15/2012	234.69	222.67	12.02	1
7	0_7710609	Confined	12,255	7/20/2012	237.36	222.86	14.50	1
7	0_7710609	Confined	12,260	7/25/2012	234.69	223.06	11.63	1
7	0_7710609	Confined	12,265	7/30/2012	222.89	223.25	-0.36	1
7	0_7710609	Confined	12,267	8/1/2012	228.63	223.33	5.30	1
7	0_7710609	Confined	12,271	8/5/2012	223.87	223.48	0.39	1
7	0_7710609	Confined	12,276	8/10/2012	225.77	223.67	2.10	1
7	0_7710609	Confined	12,281	8/15/2012	223.05	223.86	-0.81	1
7	0_7710609	Confined	12,286	8/20/2012	223.37	224.05	-0.68	1
7	0_7710609	Confined	12,291	8/25/2012	229.61	224.25	5.36	1
7	0_7710609	Confined	12,296	8/30/2012	227.65	224.44	3.21	1
7	0_7710609	Confined	12,298	9/1/2012	221.46	224.51	-3.05	1
7	0_7710609	Confined	12,302	9/5/2012	227.44	224.67	2.77	1
7	0_7710609	Confined	12,307	9/10/2012	222.62	224.86	-2.24	1
7	0_7710609	Confined	12,312	9/15/2012	228.65	225.05	3.60	1
7	0_7710609	Confined	12,317	9/20/2012	237.17	225.24	11.93	1
7	0_7710609	Confined	12,322	9/25/2012	242.02	225.44	16.58	1
7	0_7710609	Confined	12,327	9/30/2012	244.29	225.63	18.66	1
7	0_7710609	Confined	12,328	10/1/2012	245.65	225.67	19.98	1
7	0_7710609	Confined	12,332	10/5/2012	249.94	225.82	24.12	1
7	0_7710609	Confined	12,337	10/10/2012	245.12	226.01	19.11	1
7	0_7710609	Confined	12,342	10/15/2012	239.79	226.20	13.59	1
7	0_7710609	Confined	12,347	10/20/2012	246.30	226.40	19.90	1
7	0_7710609	Confined	12,352	10/25/2012	229.41	226.59	2.82	1
7	0_7710609	Confined	12,357	10/30/2012	247.11	226.78	20.33	1
7	0_7710609	Confined	12,359	11/1/2012	237.81	226.86	10.95	1
7	0_7710609	Confined	12,363	11/5/2012	239.42	227.01	12.41	1
7	0_7710609	Confined	12,368	11/10/2012	244.83	227.20	17.63	1
7	0_7710609	Confined	12,373	11/15/2012	248.47	227.39	21.08	1
7	0_7710609	Confined	12,378	11/20/2012	248.11	227.58	20.53	1
7	0_7710609	Confined	12,383	11/25/2012	247.24	227.78	19.46	1
7	0_7710609	Confined	12,388	11/30/2012	251.94	227.97	23.97	1
7	0_7710609	Confined	12,389	12/1/2012	244.27	228.01	16.26	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	12,393	12/5/2012	251.89	228.16	23.73	1
7	0_7710609	Confined	12,398	12/10/2012	234.89	228.35	6.54	1
7	0_7710609	Confined	12,403	12/15/2012	249.67	228.54	21.13	1
7	0_7710609	Confined	12,408	12/20/2012	238.39	228.74	9.65	1
7	0_7710609	Confined	12,413	12/25/2012	249.16	228.93	20.23	1
7	0_7710609	Confined	12,418	12/30/2012	244.66	229.12	15.54	1
7	0_7710609	Confined	12,420	1/1/2013	247.40	229.18	18.22	1
7	0_7710609	Confined	12,424	1/5/2013	251.60	229.27	22.33	1
7	0_7710609	Confined	12,429	1/10/2013	254.73	229.39	25.34	1
7	0_7710609	Confined	12,434	1/15/2013	258.42	229.51	28.91	1
7	0_7710609	Confined	12,439	1/20/2013	254.41	229.62	24.79	1
7	0_7710609	Confined	12,444	1/25/2013	252.15	229.74	22.41	1
7	0_7710609	Confined	12,449	1/30/2013	256.44	229.86	26.58	1
7	0_7710609	Confined	12,451	2/1/2013	257.38	229.90	27.48	1
7	0_7710609	Confined	12,455	2/5/2013	240.50	230.00	10.50	1
7	0_7710609	Confined	12,460	2/10/2013	242.02	230.11	11.91	1
7	0_7710609	Confined	12,465	2/15/2013	241.32	230.23	11.09	1
7	0_7710609	Confined	12,470	2/20/2013	249.52	230.35	19.17	1
7	0_7710609	Confined	12,475	2/25/2013	232.87	230.46	2.41	1
7	0_7710609	Confined	12,478	2/28/2013	234.41	230.53	3.88	1
7	0_7710609	Confined	12,479	3/1/2013	229.19	230.56	-1.37	1
7	0_7710609	Confined	12,483	3/5/2013	231.91	230.65	1.26	1
7	0_7710609	Confined	12,488	3/10/2013	235.71	230.77	4.94	1
7	0_7710609	Confined	12,493	3/15/2013	220.13	230.88	-10.75	1
7	0_7710609	Confined	12,498	3/20/2013	214.27	231.00	-16.73	1
7	0_7710609	Confined	12,503	3/25/2013	216.74	231.12	-14.38	1
7	0_7710609	Confined	12,508	3/30/2013	202.70	231.23	-28.53	1
7	0_7710609	Confined	12,510	4/1/2013	202.44	231.28	-28.84	1
7	0_7710609	Confined	12,514	4/5/2013	218.52	231.37	-12.85	1
7	0_7710609	Confined	12,519	4/10/2013	220.43	231.49	-11.06	1
7	0_7710609	Confined	12,524	4/15/2013	214.52	231.61	-17.09	1
7	0_7710609	Confined	12,529	4/20/2013	208.04	231.72	-23.68	1
7	0_7710609	Confined	12,534	4/25/2013	201.98	231.84	-29.86	1
7	0_7710609	Confined	12,539	4/30/2013	204.10	231.96	-27.86	1
7	0_7710609	Confined	12,540	5/1/2013	202.60	231.98	-29.38	1
7	0_7710609	Confined	12,544	5/5/2013	201.68	232.07	-30.39	1
7	0_7710609	Confined	12,549	5/10/2013	201.57	232.19	-30.62	1
7	0_7710609	Confined	12,554	5/15/2013	201.78	232.31	-30.53	1
7	0_7710609	Confined	12,559	5/20/2013	201.46	232.42	-30.96	1
7	0_7710609	Confined	12,564	5/25/2013	201.81	232.54	-30.73	1
7	0_7710609	Confined	12,569	5/30/2013	208.96	232.66	-23.70	1
7	0_7710609	Confined	12,571	6/1/2013	201.74	232.70	-30.96	1
7	0_7710609	Confined	12,575	6/5/2013	201.52	232.80	-31.28	1
7	0_7710609	Confined	12,580	6/10/2013	205.37	232.91	-27.54	1
7	0_7710609	Confined	12,585	6/15/2013	212.61	233.03	-20.42	1
7	0_7710609	Confined	12,590	6/20/2013	218.84	233.15	-14.31	1
7	0_7710609	Confined	12,595	6/25/2013	223.34	233.26	-9.92	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	12,600	6/30/2013	212.65	233.38	-20.73	1
7	0_7710609	Confined	12,601	7/1/2013	210.51	233.40	-22.89	1
7	0_7710609	Confined	12,605	7/5/2013	214.24	233.50	-19.26	1
7	0_7710609	Confined	12,610	7/10/2013	212.40	233.61	-21.21	1
7	0_7710609	Confined	12,615	7/15/2013	211.13	233.73	-22.60	1
7	0_7710609	Confined	12,620	7/20/2013	214.13	233.85	-19.72	1
7	0_7710609	Confined	12,625	7/25/2013	207.66	233.96	-26.30	1
7	0_7710609	Confined	12,630	7/30/2013	205.01	234.08	-29.07	1
7	0_7710609	Confined	12,632	8/1/2013	205.13	234.13	-29.00	1
7	0_7710609	Confined	12,636	8/5/2013	203.21	234.22	-31.01	1
7	0_7710609	Confined	12,641	8/10/2013	204.05	234.34	-30.29	1
7	0_7710609	Confined	12,646	8/15/2013	205.15	234.45	-29.30	1
7	0_7710609	Confined	12,651	8/20/2013	201.61	234.57	-32.96	1
7	0_7710609	Confined	12,656	8/25/2013	201.70	234.69	-32.99	1
7	0_7710609	Confined	12,661	8/30/2013	201.69	234.80	-33.11	1
7	0_7710609	Confined	12,663	9/1/2013	201.60	234.85	-33.25	1
7	0_7710609	Confined	12,667	9/5/2013	201.78	234.94	-33.16	1
7	0_7710609	Confined	12,672	9/10/2013	202.27	235.06	-32.79	1
7	0_7710609	Confined	12,677	9/15/2013	210.80	235.18	-24.38	1
7	0_7710609	Confined	12,682	9/20/2013	216.44	235.29	-18.85	1
7	0_7710609	Confined	12,687	9/25/2013	222.20	235.41	-13.21	1
7	0_7710609	Confined	12,692	9/30/2013	216.96	235.53	-18.57	1
7	0_7710609	Confined	12,693	10/1/2013	225.75	235.55	-9.80	1
7	0_7710609	Confined	12,697	10/5/2013	229.76	235.64	-5.88	1
7	0_7710609	Confined	12,702	10/10/2013	219.82	235.76	-15.94	1
7	0_7710609	Confined	12,707	10/15/2013	229.33	235.88	-6.55	1
7	0_7710609	Confined	12,712	10/20/2013	234.95	235.99	-1.04	1
7	0_7710609	Confined	12,717	10/25/2013	239.38	236.11	3.27	1
7	0_7710609	Confined	12,722	10/30/2013	243.05	236.23	6.82	1
7	0_7710609	Confined	12,724	11/1/2013	243.78	236.27	7.51	1
7	0_7710609	Confined	12,728	11/5/2013	243.18	236.37	6.81	1
7	0_7710609	Confined	12,733	11/10/2013	229.18	236.48	-7.30	1
7	0_7710609	Confined	12,738	11/15/2013	241.97	236.60	5.37	1
7	0_7710609	Confined	12,743	11/20/2013	241.48	236.72	4.76	1
7	0_7710609	Confined	12,748	11/25/2013	247.80	236.83	10.97	1
7	0_7710609	Confined	12,753	11/30/2013	251.55	236.95	14.60	1
7	0_7710609	Confined	12,754	12/1/2013	252.12	236.97	15.15	1
7	0_7710609	Confined	12,758	12/5/2013	254.48	237.07	17.41	1
7	0_7710609	Confined	12,763	12/10/2013	256.00	237.18	18.82	1
7	0_7710609	Confined	12,768	12/15/2013	251.62	237.30	14.32	1
7	0_7710609	Confined	12,773	12/20/2013	254.77	237.42	17.35	1
7	0_7710609	Confined	12,778	12/25/2013	259.06	237.53	21.53	1
7	0_7710609	Confined	12,783	12/30/2013	261.81	237.65	24.16	1
7	0_7710609	Confined	12,785	1/1/2014	262.26	237.68	24.58	1
7	0_7710609	Confined	12,789	1/5/2014	263.66	237.70	25.96	1
7	0_7710609	Confined	12,794	1/10/2014	265.77	237.73	28.04	1
7	0_7710609	Confined	12,799	1/15/2014	257.13	237.76	19.37	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	12,804	1/20/2014	258.13	237.79	20.34	1
7	0_7710609	Confined	12,809	1/25/2014	259.90	237.82	22.08	1
7	0_7710609	Confined	12,814	1/30/2014	258.09	237.85	20.24	1
7	0_7710609	Confined	12,816	2/1/2014	257.88	237.87	20.01	1
7	0_7710609	Confined	12,820	2/5/2014	261.62	237.89	23.73	1
7	0_7710609	Confined	12,825	2/10/2014	251.17	237.92	13.25	1
7	0_7710609	Confined	12,830	2/15/2014	257.91	237.95	19.96	1
7	0_7710609	Confined	12,835	2/20/2014	243.88	237.98	5.90	1
7	0_7710609	Confined	12,840	2/25/2014	239.84	238.01	1.83	1
7	0_7710609	Confined	12,843	2/28/2014	250.27	238.03	12.24	1
7	0_7710609	Confined	12,844	3/1/2014	252.26	238.03	14.23	1
7	0_7710609	Confined	12,848	3/5/2014	256.21	238.06	18.15	1
7	0_7710609	Confined	12,853	3/10/2014	244.55	238.09	6.46	1
7	0_7710609	Confined	12,858	3/15/2014	255.04	238.12	16.92	1
7	0_7710609	Confined	12,863	3/20/2014	240.67	238.15	2.52	1
7	0_7710609	Confined	12,868	3/25/2014	241.48	238.18	3.30	1
7	0_7710609	Confined	12,873	3/30/2014	244.32	238.21	6.11	1
7	0_7710609	Confined	12,875	4/1/2014	239.93	238.22	1.71	1
7	0_7710609	Confined	12,879	4/5/2014	240.33	238.25	2.08	1
7	0_7710609	Confined	12,884	4/10/2014	237.61	238.28	-0.67	1
7	0_7710609	Confined	12,889	4/15/2014	230.22	238.31	-8.09	1
7	0_7710609	Confined	12,894	4/20/2014	220.81	238.34	-17.53	1
7	0_7710609	Confined	12,899	4/25/2014	223.99	238.37	-14.38	1
7	0_7710609	Confined	12,904	4/30/2014	226.33	238.40	-12.07	1
7	0_7710609	Confined	12,905	5/1/2014	227.40	238.40	-11.00	1
7	0_7710609	Confined	12,909	5/5/2014	211.68	238.43	-26.75	1
7	0_7710609	Confined	12,914	5/10/2014	223.48	238.46	-14.98	1
7	0_7710609	Confined	12,919	5/15/2014	229.92	238.49	-8.57	1
7	0_7710609	Confined	12,924	5/20/2014	218.29	238.52	-20.23	1
7	0_7710609	Confined	12,929	5/25/2014	225.28	238.55	-13.27	1
7	0_7710609	Confined	12,934	5/30/2014	231.77	238.58	-6.81	1
7	0_7710609	Confined	12,936	6/1/2014	231.85	238.59	-6.74	1
7	0_7710609	Confined	12,940	6/5/2014	217.01	238.61	-21.60	1
7	0_7710609	Confined	12,945	6/10/2014	217.52	238.64	-21.12	1
7	0_7710609	Confined	12,950	6/15/2014	208.66	238.67	-30.01	1
7	0_7710609	Confined	12,955	6/20/2014	205.24	238.70	-33.46	1
7	0_7710609	Confined	12,960	6/25/2014	213.77	238.73	-24.96	1
7	0_7710609	Confined	12,965	6/30/2014	207.63	238.76	-31.13	1
7	0_7710609	Confined	12,966	7/1/2014	202.35	238.77	-36.42	1
7	0_7710609	Confined	12,970	7/5/2014	203.35	238.79	-35.44	1
7	0_7710609	Confined	12,975	7/10/2014	202.39	238.82	-36.43	1
7	0_7710609	Confined	12,980	7/15/2014	203.10	238.85	-35.75	1
7	0_7710609	Confined	12,985	7/20/2014	201.61	238.88	-37.27	1
7	0_7710609	Confined	12,990	7/25/2014	201.65	238.91	-37.26	1
7	0_7710609	Confined	12,995	7/30/2014	201.62	238.94	-37.32	1
7	0_7710609	Confined	12,997	8/1/2014	202.17	238.96	-36.79	1
7	0_7710609	Confined	13,001	8/5/2014	189.61	238.98	-49.37	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	13,006	8/10/2014	198.02	239.01	-40.99	1
7	0_7710609	Confined	13,011	8/15/2014	190.05	239.04	-48.99	1
7	0_7710609	Confined	13,016	8/20/2014	186.50	239.07	-52.57	1
7	0_7710609	Confined	13,021	8/25/2014	183.37	239.10	-55.73	1
7	0_7710609	Confined	13,026	8/30/2014	187.22	239.13	-51.91	1
7	0_7710609	Confined	13,028	9/1/2014	191.25	239.14	-47.89	1
7	0_7710609	Confined	13,032	9/5/2014	183.58	239.17	-55.59	1
7	0_7710609	Confined	13,037	9/10/2014	186.18	239.20	-53.02	1
7	0_7710609	Confined	13,042	9/15/2014	200.23	239.23	-39.00	1
7	0_7710609	Confined	13,047	9/20/2014	205.04	239.26	-34.22	1
7	0_7710609	Confined	13,052	9/25/2014	202.95	239.29	-36.34	1
7	0_7710609	Confined	13,057	9/30/2014	213.88	239.32	-25.44	1
7	0_7710609	Confined	13,058	10/1/2014	215.86	239.32	-23.46	1
7	0_7710609	Confined	13,062	10/5/2014	218.36	239.35	-20.99	1
7	0_7710609	Confined	13,067	10/10/2014	203.66	239.38	-35.72	1
7	0_7710609	Confined	13,072	10/15/2014	201.68	239.41	-37.73	1
7	0_7710609	Confined	13,077	10/20/2014	186.05	239.44	-53.39	1
7	0_7710609	Confined	13,082	10/25/2014	194.29	239.47	-45.18	1
7	0_7710609	Confined	13,087	10/30/2014	203.54	239.50	-35.96	1
7	0_7710609	Confined	13,089	11/1/2014	211.18	239.51	-28.33	1
7	0_7710609	Confined	13,093	11/5/2014	223.15	239.53	-16.38	1
7	0_7710609	Confined	13,098	11/10/2014	231.22	239.56	-8.34	1
7	0_7710609	Confined	13,103	11/15/2014	237.23	239.59	-2.36	1
7	0_7710609	Confined	13,108	11/20/2014	241.97	239.62	2.35	1
7	0_7710609	Confined	13,113	11/25/2014	239.07	239.65	-0.58	1
7	0_7710609	Confined	13,118	11/30/2014	231.71	239.69	-7.98	1
7	0_7710609	Confined	13,119	12/1/2014	236.23	239.69	-3.46	1
7	0_7710609	Confined	13,123	12/5/2014	245.20	239.72	5.48	1
7	0_7710609	Confined	13,128	12/10/2014	249.92	239.75	10.17	1
7	0_7710609	Confined	13,133	12/15/2014	252.58	239.78	12.80	1
7	0_7710609	Confined	13,138	12/20/2014	247.96	239.81	8.15	1
7	0_7710609	Confined	13,143	12/25/2014	244.93	239.84	5.09	1
7	0_7710609	Confined	13,148	12/30/2014	253.82	239.87	13.95	1
7	0_7710609	Confined	13,150	1/1/2015	254.83	239.93	14.90	1
7	0_7710609	Confined	13,154	1/5/2015	255.24	240.14	15.10	1
7	0_7710609	Confined	13,159	1/10/2015	257.37	240.41	16.96	1
7	0_7710609	Confined	13,164	1/15/2015	260.41	240.68	19.73	1
7	0_7710609	Confined	13,169	1/20/2015	261.61	240.95	20.66	1
7	0_7710609	Confined	13,174	1/25/2015	263.18	241.22	21.96	1
7	0_7710609	Confined	13,179	1/30/2015	266.03	241.50	24.53	1
7	0_7710609	Confined	13,181	2/1/2015	266.44	241.60	24.84	1
7	0_7710609	Confined	13,185	2/5/2015	268.48	241.82	26.66	1
7	0_7710609	Confined	13,190	2/10/2015	270.45	242.09	28.36	1
7	0_7710609	Confined	13,195	2/15/2015	271.88	242.36	29.52	1
7	0_7710609	Confined	13,200	2/20/2015	272.38	242.63	29.75	1
7	0_7710609	Confined	13,205	2/25/2015	257.17	242.90	14.27	1
7	0_7710609	Confined	13,208	2/28/2015	259.36	243.07	16.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	13,209	3/1/2015	261.23	243.12	18.11	1
7	0_7710609	Confined	13,213	3/5/2015	266.03	243.34	22.69	1
7	0_7710609	Confined	13,218	3/10/2015	268.76	243.61	25.15	1
7	0_7710609	Confined	13,223	3/15/2015	272.65	243.88	28.77	1
7	0_7710609	Confined	13,228	3/20/2015	274.08	244.15	29.93	1
7	0_7710609	Confined	13,233	3/25/2015	274.53	244.42	30.11	1
7	0_7710609	Confined	13,238	3/30/2015	271.01	244.69	26.32	1
7	0_7710609	Confined	13,240	4/1/2015	271.15	244.80	26.35	1
7	0_7710609	Confined	13,244	4/5/2015	270.30	245.01	25.29	1
7	0_7710609	Confined	13,249	4/10/2015	248.03	245.28	2.75	1
7	0_7710609	Confined	13,254	4/15/2015	256.80	245.55	11.25	1
7	0_7710609	Confined	13,259	4/20/2015	261.61	245.83	15.78	1
7	0_7710609	Confined	13,264	4/25/2015	266.12	246.10	20.02	1
7	0_7710609	Confined	13,269	4/30/2015	269.77	246.37	23.40	1
7	0_7710609	Confined	13,270	5/1/2015	270.46	246.42	24.04	1
7	0_7710609	Confined	13,274	5/5/2015	272.97	246.64	26.33	1
7	0_7710609	Confined	13,279	5/10/2015	275.10	246.91	28.19	1
7	0_7710609	Confined	13,284	5/15/2015	277.14	247.18	29.96	1
7	0_7710609	Confined	13,289	5/20/2015	279.25	247.45	31.80	1
7	0_7710609	Confined	13,294	5/25/2015	281.22	247.72	33.50	1
7	0_7710609	Confined	13,299	5/30/2015	283.51	247.99	35.52	1
7	0_7710609	Confined	13,301	6/1/2015	283.85	248.10	35.75	1
7	0_7710609	Confined	13,305	6/5/2015	285.10	248.32	36.78	1
7	0_7710609	Confined	13,310	6/10/2015	286.56	248.59	37.97	1
7	0_7710609	Confined	13,315	6/15/2015	287.12	248.86	38.26	1
7	0_7710609	Confined	13,320	6/20/2015	288.01	249.13	38.88	1
7	0_7710609	Confined	13,325	6/25/2015	288.85	249.40	39.45	1
7	0_7710609	Confined	13,330	6/30/2015	287.72	249.67	38.05	1
7	0_7710609	Confined	13,331	7/1/2015	288.03	249.72	38.31	1
7	0_7710609	Confined	13,360	7/30/2015	260.21	251.29	8.92	1
7	0_7710609	Confined	13,381	8/20/2015	247.11	252.43	-5.32	1
7	0_7710609	Confined	13,386	8/25/2015	239.81	252.70	-12.89	1
7	0_7710609	Confined	13,391	8/30/2015	240.68	252.97	-12.29	1
7	0_7710609	Confined	13,393	9/1/2015	238.01	253.08	-15.07	1
7	0_7710609	Confined	13,397	9/5/2015	233.28	253.29	-20.01	1
7	0_7710609	Confined	13,402	9/10/2015	231.57	253.57	-22.00	1
7	0_7710609	Confined	13,407	9/15/2015	240.19	253.84	-13.65	1
7	0_7710609	Confined	13,412	9/20/2015	237.65	254.11	-16.46	1
7	0_7710609	Confined	13,417	9/25/2015	233.75	254.38	-20.63	1
7	0_7710609	Confined	13,422	9/30/2015	224.36	254.65	-30.29	1
7	0_7710609	Confined	13,423	10/1/2015	220.09	254.70	-34.61	1
7	0_7710609	Confined	13,427	10/5/2015	222.25	254.92	-32.67	1
7	0_7710609	Confined	13,432	10/10/2015	226.29	255.19	-28.90	1
7	0_7710609	Confined	13,437	10/15/2015	231.40	255.46	-24.06	1
7	0_7710609	Confined	13,442	10/20/2015	223.62	255.73	-32.11	1
7	0_7710609	Confined	13,447	10/25/2015	240.90	256.00	-15.10	1
7	0_7710609	Confined	13,452	10/30/2015	247.12	256.27	-9.15	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	13,454	11/1/2015	249.17	256.38	-7.21	1
7	0_7710609	Confined	13,458	11/5/2015	252.75	256.60	-3.85	1
7	0_7710609	Confined	13,463	11/10/2015	256.78	256.87	-0.09	1
7	0_7710609	Confined	13,468	11/15/2015	260.26	257.14	3.12	1
7	0_7710609	Confined	13,473	11/20/2015	251.03	257.41	-6.38	1
7	0_7710609	Confined	13,478	11/25/2015	258.71	257.68	1.03	1
7	0_7710609	Confined	13,483	11/30/2015	264.30	257.95	6.35	1
7	0_7710609	Confined	13,484	12/1/2015	262.21	258.00	4.21	1
7	0_7710609	Confined	13,488	12/5/2015	263.17	258.22	4.95	1
7	0_7710609	Confined	13,493	12/10/2015	265.07	258.49	6.58	1
7	0_7710609	Confined	13,498	12/15/2015	267.44	258.76	8.68	1
7	0_7710609	Confined	13,503	12/20/2015	269.65	259.03	10.62	1
7	0_7710609	Confined	13,508	12/25/2015	271.08	259.30	11.78	1
7	0_7710609	Confined	13,513	12/30/2015	272.02	259.57	12.45	1
7	0_7710609	Confined	13,515	1/1/2016	273.74	259.66	14.08	1
7	0_7710609	Confined	13,519	1/5/2016	275.04	259.78	15.26	1
7	0_7710609	Confined	13,524	1/10/2016	276.22	259.92	16.30	1
7	0_7710609	Confined	13,529	1/15/2016	277.92	260.07	17.85	1
7	0_7710609	Confined	13,534	1/20/2016	278.49	260.22	18.27	1
7	0_7710609	Confined	13,539	1/25/2016	261.36	260.37	0.99	1
7	0_7710609	Confined	13,544	1/30/2016	269.76	260.52	9.24	1
7	0_7710609	Confined	13,546	2/1/2016	271.19	260.58	10.61	1
7	0_7710609	Confined	13,550	2/5/2016	264.49	260.69	3.80	1
7	0_7710609	Confined	13,555	2/10/2016	256.14	260.84	-4.70	1
7	0_7710609	Confined	13,560	2/15/2016	251.45	260.99	-9.54	1
7	0_7710609	Confined	13,565	2/20/2016	247.00	261.14	-14.14	1
7	0_7710609	Confined	13,570	2/25/2016	257.07	261.29	-4.22	1
7	0_7710609	Confined	13,574	2/29/2016	262.60	261.40	1.20	1
7	0_7710609	Confined	13,575	3/1/2016	264.16	261.43	2.73	1
7	0_7710609	Confined	13,579	3/5/2016	243.91	261.55	-17.64	1
7	0_7710609	Confined	13,584	3/10/2016	240.62	261.70	-21.08	1
7	0_7710609	Confined	13,589	3/15/2016	257.30	261.85	-4.55	1
7	0_7710609	Confined	13,594	3/20/2016	262.20	262.00	0.20	1
7	0_7710609	Confined	13,599	3/25/2016	265.27	262.14	3.13	1
7	0_7710609	Confined	13,604	3/30/2016	267.38	262.29	5.09	1
7	0_7710609	Confined	13,606	4/1/2016	267.64	262.35	5.29	1
7	0_7710609	Confined	13,610	4/5/2016	247.29	262.47	-15.18	1
7	0_7710609	Confined	13,615	4/10/2016	250.97	262.62	-11.65	1
7	0_7710609	Confined	13,620	4/15/2016	251.54	262.77	-11.23	1
7	0_7710609	Confined	13,625	4/20/2016	261.33	262.91	-1.58	1
7	0_7710609	Confined	13,630	4/25/2016	260.06	263.06	-3.00	1
7	0_7710609	Confined	13,635	4/30/2016	250.33	263.21	-12.88	1
7	0_7710609	Confined	13,636	5/1/2016	250.21	263.24	-13.03	1
7	0_7710609	Confined	13,640	5/5/2016	246.75	263.36	-16.61	1
7	0_7710609	Confined	13,645	5/10/2016	250.56	263.51	-12.95	1
7	0_7710609	Confined	13,650	5/15/2016	252.38	263.65	-11.27	1
7	0_7710609	Confined	13,655	5/20/2016	259.04	263.80	-4.76	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	13,660	5/25/2016	262.42	263.95	-1.53	1
7	0_7710609	Confined	13,665	5/30/2016	266.21	264.10	2.11	1
7	0_7710609	Confined	13,667	6/1/2016	266.59	264.16	2.43	1
7	0_7710609	Confined	13,671	6/5/2016	268.44	264.28	4.16	1
7	0_7710609	Confined	13,676	6/10/2016	270.73	264.42	6.31	1
7	0_7710609	Confined	13,681	6/15/2016	272.13	264.57	7.56	1
7	0_7710609	Confined	13,686	6/20/2016	251.38	264.72	-13.34	1
7	0_7710609	Confined	13,691	6/25/2016	264.12	264.87	-0.75	1
7	0_7710609	Confined	13,696	6/30/2016	256.50	265.02	-8.52	1
7	0_7710609	Confined	13,697	7/1/2016	250.11	265.05	-14.94	1
7	0_7710609	Confined	13,701	7/5/2016	257.02	265.16	-8.14	1
7	0_7710609	Confined	13,706	7/10/2016	243.85	265.31	-21.46	1
7	0_7710609	Confined	13,711	7/15/2016	236.01	265.46	-29.45	1
7	0_7710609	Confined	13,716	7/20/2016	235.14	265.61	-30.47	1
7	0_7710609	Confined	13,721	7/25/2016	228.64	265.76	-37.12	1
7	0_7710609	Confined	13,728	8/1/2016	239.95	265.96	-26.01	1
7	0_7710609	Confined	13,732	8/5/2016	225.95	266.08	-40.13	1
7	0_7710609	Confined	13,737	8/10/2016	236.64	266.23	-29.59	1
7	0_7710609	Confined	13,742	8/15/2016	226.11	266.38	-40.27	1
7	0_7710609	Confined	13,747	8/20/2016	238.53	266.53	-28.00	1
7	0_7710609	Confined	13,752	8/25/2016	244.87	266.67	-21.80	1
7	0_7710609	Confined	13,757	8/30/2016	259.66	266.82	-7.16	1
7	0_7710609	Confined	13,759	9/1/2016	257.03	266.88	-9.85	1
7	0_7710609	Confined	13,763	9/5/2016	261.22	267.00	-5.78	1
7	0_7710609	Confined	13,768	9/10/2016	261.86	267.15	-5.29	1
7	0_7710609	Confined	13,773	9/15/2016	261.86	267.30	-5.44	1
7	0_7710609	Confined	13,778	9/20/2016	259.51	267.44	-7.93	1
7	0_7710609	Confined	13,783	9/25/2016	259.47	267.59	-8.12	1
7	0_7710609	Confined	13,788	9/30/2016	260.32	267.74	-7.42	1
7	0_7710609	Confined	13,789	10/1/2016	259.98	267.77	-7.79	1
7	0_7710609	Confined	13,793	10/5/2016	255.85	267.89	-12.04	1
7	0_7710609	Confined	13,798	10/10/2016	255.87	268.04	-12.17	1
7	0_7710609	Confined	13,803	10/15/2016	251.79	268.18	-16.39	1
7	0_7710609	Confined	13,808	10/20/2016	250.76	268.33	-17.57	1
7	0_7710609	Confined	13,813	10/25/2016	251.44	268.48	-17.04	1
7	0_7710609	Confined	13,818	10/30/2016	248.25	268.63	-20.38	1
7	0_7710609	Confined	13,820	11/1/2016	248.84	268.69	-19.85	1
7	0_7710609	Confined	13,824	11/5/2016	252.91	268.81	-15.90	1
7	0_7710609	Confined	13,829	11/10/2016	258.29	268.95	-10.66	1
7	0_7710609	Confined	13,834	11/15/2016	260.76	269.10	-8.34	1
7	0_7710609	Confined	13,839	11/20/2016	261.73	269.25	-7.52	1
7	0_7710609	Confined	13,844	11/25/2016	257.01	269.40	-12.39	1
7	0_7710609	Confined	13,849	11/30/2016	259.57	269.55	-9.98	1
7	0_7710609	Confined	13,850	12/1/2016	259.70	269.58	-9.88	1
7	0_7710609	Confined	13,854	12/5/2016	262.25	269.69	-7.44	1
7	0_7710609	Confined	13,859	12/10/2016	265.47	269.84	-4.37	1
7	0_7710609	Confined	13,864	12/15/2016	268.46	269.99	-1.53	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	13,869	12/20/2016	271.27	270.14	1.13	1
7	0_7710609	Confined	13,874	12/25/2016	272.96	270.29	2.67	1
7	0_7710609	Confined	13,879	12/30/2016	261.98	270.43	-8.45	1
7	0_7710609	Confined	13,881	1/1/2017	262.93	270.47	-7.54	1
7	0_7710609	Confined	13,885	1/5/2017	269.63	270.51	-0.88	1
7	0_7710609	Confined	13,890	1/10/2017	268.77	270.56	-1.79	1
7	0_7710609	Confined	13,895	1/15/2017	259.83	270.61	-10.78	1
7	0_7710609	Confined	13,900	1/20/2017	263.37	270.66	-7.29	1
7	0_7710609	Confined	13,905	1/25/2017	262.91	270.71	-7.80	1
7	0_7710609	Confined	13,910	1/30/2017	261.56	270.76	-9.20	1
7	0_7710609	Confined	13,912	2/1/2017	260.07	270.78	-10.71	1
7	0_7710609	Confined	13,916	2/5/2017	264.55	270.82	-6.27	1
7	0_7710609	Confined	13,921	2/10/2017	263.28	270.87	-7.59	1
7	0_7710609	Confined	13,926	2/15/2017	268.79	270.91	-2.12	1
7	0_7710609	Confined	13,931	2/20/2017	273.23	270.96	2.27	1
7	0_7710609	Confined	13,936	2/25/2017	275.78	271.01	4.77	1
7	0_7710609	Confined	13,939	2/28/2017	275.06	271.04	4.02	1
7	0_7710609	Confined	13,940	3/1/2017	270.60	271.05	-0.45	1
7	0_7710609	Confined	13,944	3/5/2017	269.64	271.09	-1.45	1
7	0_7710609	Confined	13,949	3/10/2017	275.64	271.14	4.50	1
7	0_7710609	Confined	13,954	3/15/2017	278.07	271.19	6.88	1
7	0_7710609	Confined	13,959	3/20/2017	267.45	271.24	-3.79	1
7	0_7710609	Confined	13,964	3/25/2017	258.85	271.29	-12.44	1
7	0_7710609	Confined	13,969	3/30/2017	270.59	271.34	-0.75	1
7	0_7710609	Confined	13,971	4/1/2017	270.93	271.36	-0.43	1
7	0_7710609	Confined	13,975	4/5/2017	272.96	271.40	1.56	1
7	0_7710609	Confined	13,980	4/10/2017	275.50	271.44	4.06	1
7	0_7710609	Confined	13,985	4/15/2017	255.44	271.49	-16.05	1
7	0_7710609	Confined	13,990	4/20/2017	267.78	271.54	-3.76	1
7	0_7710609	Confined	13,995	4/25/2017	273.91	271.59	2.32	1
7	0_7710609	Confined	14,000	4/30/2017	249.96	271.64	-21.68	1
7	0_7710609	Confined	14,001	5/1/2017	247.28	271.65	-24.37	1
7	0_7710609	Confined	14,005	5/5/2017	244.72	271.69	-26.97	1
7	0_7710609	Confined	14,010	5/10/2017	256.51	271.74	-15.23	1
7	0_7710609	Confined	14,015	5/15/2017	244.79	271.79	-27.00	1
7	0_7710609	Confined	14,020	5/20/2017	255.37	271.84	-16.47	1
7	0_7710609	Confined	14,025	5/25/2017	262.41	271.89	-9.48	1
7	0_7710609	Confined	14,030	5/30/2017	267.43	271.93	-4.50	1
7	0_7710609	Confined	14,032	6/1/2017	268.12	271.95	-3.83	1
7	0_7710609	Confined	14,036	6/5/2017	270.67	271.99	-1.32	1
7	0_7710609	Confined	14,041	6/10/2017	272.57	272.04	0.53	1
7	0_7710609	Confined	14,046	6/15/2017	256.20	272.09	-15.89	1
7	0_7710609	Confined	14,051	6/20/2017	251.19	272.14	-20.95	1
7	0_7710609	Confined	14,056	6/25/2017	248.40	272.19	-23.79	1
7	0_7710609	Confined	14,061	6/30/2017	247.70	272.24	-24.54	1
7	0_7710609	Confined	14,062	7/1/2017	243.40	272.25	-28.85	1
7	0_7710609	Confined	14,066	7/5/2017	242.98	272.29	-29.31	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7710609	Confined	14,071	7/10/2017	245.29	272.34	-27.05	1
7	0_7710609	Confined	14,076	7/15/2017	235.59	272.39	-36.80	1
7	0_7710609	Confined	14,081	7/20/2017	232.45	272.44	-39.99	1
7	0_7710609	Confined	14,086	7/25/2017	234.35	272.48	-38.13	1
7	0_7710809	Confined	11,564	8/29/2010	288.09	262.44	25.65	1
7	0_7710809	Confined	11,862	6/23/2011	197.48	242.55	-45.07	1
7	0_7711703	Confined	771	2/9/1981	301.48	316.92	-15.44	1
7	0_7711703	Confined	1,502	2/10/1983	282.17	325.06	-42.89	1
7	0_7711703	Confined	1,875	2/18/1984	283.03	324.60	-41.57	1
7	0_7711703	Confined	2,228	2/5/1985	279.30	316.70	-37.40	1
7	0_7711703	Confined	2,965	2/12/1987	336.20	350.25	-14.05	1
7	0_7711703	Confined	3,355	3/8/1988	344.50	370.84	-26.34	1
7	0_7711703	Confined	3,697	2/13/1989	340.44	358.40	-17.96	1
7	0_7711703	Confined	4,064	2/15/1990	320.19	345.44	-25.25	1
7	0_7711703	Confined	4,435	2/21/1991	353.05	346.19	6.86	1
7	0_7711703	Confined	4,799	2/20/1992	356.38	311.35	45.03	1
7	0_7711703	Confined	5,157	2/12/1993	364.08	306.58	57.50	1
7	0_7711703	Confined	5,549	3/11/1994	350.08	305.87	44.21	1
7	0_7711715	Confined	771	2/9/1981	310.11	309.65	0.46	1
7	0_7711715	Confined	1,502	2/10/1983	293.91	318.04	-24.13	1
7	0_7711715	Confined	1,875	2/18/1984	296.12	317.40	-21.28	1
7	0_7711715	Confined	2,228	2/5/1985	288.65	309.11	-20.46	1
7	0_7713202	Confined	8,973	7/26/2003	307.39	268.18	39.21	1
7	0_7714504	Confined	8,544	5/23/2002	281.78	286.45	-4.67	1
7	0_7714904	Confined	1,515	2/23/1983	303.15	277.18	12.99	0.5
7	0_7714904	Confined	1,872	2/15/1984	302.58	281.55	10.51	0.5
7	0_7714904	Confined	2,238	2/15/1985	268.90	276.05	-3.57	0.5
7	0_7714904	Confined	2,606	2/18/1986	294.90	286.65	4.12	0.5
7	0_7714904	Confined	3,001	3/20/1987	302.75	286.58	8.09	0.5
7	0_7714904	Confined	3,699	2/15/1989	255.20	283.43	-14.12	0.5
7	0_7714904	Confined	4,058	2/9/1990	215.80	278.98	-31.59	0.5
7	0_7714904	Confined	4,461	3/19/1991	259.00	274.85	-7.92	0.5
7	0_7714904	Confined	4,806	2/27/1992	252.90	246.78	3.06	0.5
7	0_7714904	Confined	5,142	1/28/1993	275.25	234.62	20.31	0.5
7	0_7714904	Confined	6,654	3/20/1997	128.60	195.33	-33.36	0.5
7	0_7714904	Confined	6,988	2/17/1998	143.90	205.37	-30.73	0.5
7	0_7714904	Confined	7,323	1/18/1999	138.25	179.35	-20.55	0.5
7	0_7714904	Confined	8,409	1/8/2002	132.60	137.65	-2.52	0.5
7	0_7714904	Confined	8,782	1/16/2003	144.10	113.53	15.28	0.5
7	0_7714904	Confined	9,151	1/20/2004	149.90	112.09	18.90	0.5
7	0_7714904	Confined	9,517	1/20/2005	158.70	116.70	21.00	0.5
7	0_7714904	Confined	9,896	2/3/2006	156.30	116.17	20.06	0.5
7	0_7714904	Confined	10,264	2/6/2007	143.10	125.28	8.91	0.5
7	0_7714904	Confined	10,627	2/4/2008	159.90	118.76	20.57	0.5
7	0_7714904	Confined	11,007	2/18/2009	133.60	79.92	26.84	0.5
7	0_7714904	Confined	11,446	5/3/2010	139.60	12.19	63.71	0.5
7	0_7714910	Confined	9,674	6/26/2005	194.46	114.55	79.91	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7715907	Confined	1,136	2/9/1982	324.02	288.37	17.82	0.5
7	0_7715907	Confined	2,606	2/18/1986	314.69	296.83	8.93	0.5
7	0_7715907	Confined	3,343	2/25/1988	338.22	298.93	19.64	0.5
7	0_7715907	Confined	3,698	2/14/1989	323.32	296.26	13.53	0.5
7	0_7715907	Confined	4,069	2/20/1990	335.69	293.17	21.26	0.5
7	0_7715907	Confined	4,484	4/11/1991	346.32	288.39	28.97	0.5
7	0_7715907	Confined	4,770	1/22/1992	343.52	271.98	35.77	0.5
7	0_7715911	Confined	4,422	2/8/1991	258.79	292.97	-34.18	1
7	0_7716409	Confined	6,578	1/3/1997	234.41	245.49	-11.08	1
7	0_7716409	Confined	6,696	5/1/1997	276.41	250.85	25.56	1
7	0_7716409	Confined	6,791	8/4/1997	227.41	255.17	-27.76	1
7	0_7716409	Confined	7,021	3/22/1998	216.41	256.00	-39.59	1
7	0_7716409	Confined	7,110	6/19/1998	182.41	249.48	-67.07	1
7	0_7716409	Confined	7,151	7/30/1998	152.41	246.47	-94.06	1
7	0_7716409	Confined	7,162	8/10/1998	179.41	245.66	-66.25	1
7	0_7716409	Confined	7,668	12/29/1999	324.41	224.52	99.89	1
7	0_7716409	Confined	7,722	2/21/2000	267.41	220.60	46.81	1
7	0_7716409	Confined	7,759	3/29/2000	234.41	217.86	16.55	1
7	0_7716409	Confined	7,883	7/31/2000	188.41	208.66	-20.25	1
7	0_7716409	Confined	7,920	9/6/2000	152.41	205.91	-53.50	1
7	0_7716409	Confined	7,946	10/2/2000	188.41	203.98	-15.57	1
7	0_7716409	Confined	7,955	10/11/2000	211.41	203.31	8.10	1
7	0_7716409	Confined	8,004	11/29/2000	269.41	199.68	69.73	1
7	0_7716409	Confined	8,050	1/14/2001	267.41	197.36	70.05	1
7	0_7716409	Confined	8,419	1/18/2002	262.41	197.88	64.53	1
7	0_7716409	Confined	8,493	4/2/2002	205.41	193.53	11.88	1
7	0_7716409	Confined	9,963	4/11/2006	207.41	182.47	24.94	1
7	0_7716705	Confined	1,137	2/10/1982	333.24	293.78	39.46	1
7	0_7716705	Confined	1,514	2/22/1983	331.33	295.02	36.31	1
7	0_7716705	Confined	1,872	2/15/1984	316.38	298.28	18.10	1
7	0_7716705	Confined	2,606	2/18/1986	318.66	302.50	16.16	1
7	0_7716705	Confined	3,000	3/19/1987	326.04	303.11	22.93	1
7	0_7716705	Confined	3,699	2/15/1989	283.52	301.45	-17.93	1
7	0_7716705	Confined	4,069	2/20/1990	255.33	298.27	-42.94	1
7	0_7716705	Confined	5,141	1/27/1993	289.23	265.37	23.86	1
7	0_7716705	Confined	5,480	1/1/1994	230.13	252.71	-22.58	1
7	0_7716705	Confined	5,860	1/16/1995	303.33	238.79	64.54	1
7	0_7716705	Confined	6,228	1/19/1996	285.98	230.81	55.17	1
7	0_7716705	Confined	6,654	3/20/1997	259.78	228.37	31.41	1
7	0_7716705	Confined	6,988	2/17/1998	269.73	233.41	36.32	1
7	0_7716705	Confined	7,319	1/14/1999	266.48	215.09	51.39	1
7	0_7716705	Confined	8,409	1/8/2002	237.53	178.33	59.20	1
7	0_7716705	Confined	8,782	1/16/2003	261.23	159.37	101.86	1
7	0_7716705	Confined	9,158	1/27/2004	247.93	155.17	92.76	1
7	0_7716705	Confined	9,516	1/19/2005	256.03	155.83	100.20	1
7	0_7716705	Confined	9,882	1/20/2006	250.23	153.38	96.85	1
7	0_7716705	Confined	10,264	2/6/2007	234.93	158.36	76.57	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7716705	Confined	10,599	1/7/2008	243.33	155.34	87.99	1
7	0_7716705	Confined	11,015	2/26/2009	214.63	125.26	89.37	1
7	0_7716705	Confined	11,341	1/18/2010	235.93	84.64	151.29	1
7	0_7717201	Confined	774	2/12/1981	349.99	352.87	-2.88	1
7	0_7718207	Confined	5,429	11/11/1993	330.34	289.75	40.59	1
7	0_7718401	Confined	774	2/12/1981	242.14	266.11	-23.97	1
7	0_7718406	Confined	2,595	2/7/1986	304.87	299.38	5.49	1
7	0_7718407	Confined	6,842	9/24/1997	303.72	238.18	65.54	1
7	0_7718516	Confined	731	12/31/1980	216.29	256.12	-39.83	1
7	0_7718516	Confined	737	1/6/1981	258.46	256.29	2.17	1
7	0_7718516	Confined	741	1/10/1981	259.03	256.41	2.62	1
7	0_7718516	Confined	746	1/15/1981	259.44	256.55	2.89	1
7	0_7718516	Confined	751	1/20/1981	260.64	256.70	3.94	1
7	0_7718516	Confined	756	1/25/1981	262.65	256.84	5.81	1
7	0_7718516	Confined	761	1/30/1981	264.32	256.99	7.33	1
7	0_7718516	Confined	767	2/5/1981	265.12	257.16	7.96	1
7	0_7718516	Confined	771	2/9/1981	265.92	257.28	8.64	1
7	0_7718516	Confined	772	2/10/1981	266.17	257.31	8.86	1
7	0_7718516	Confined	864	5/13/1981	268.54	259.97	8.57	1
7	0_7718516	Confined	866	5/15/1981	267.26	260.03	7.23	1
7	0_7718516	Confined	871	5/20/1981	265.02	260.17	4.85	1
7	0_7718516	Confined	876	5/25/1981	258.93	260.32	-1.39	1
7	0_7718516	Confined	881	5/30/1981	256.44	260.46	-4.02	1
7	0_7718516	Confined	887	6/5/1981	259.25	260.63	-1.38	1
7	0_7718516	Confined	892	6/10/1981	254.86	260.78	-5.92	1
7	0_7718516	Confined	893	6/11/1981	253.74	260.81	-7.07	1
7	0_7718516	Confined	897	6/15/1981	253.93	260.92	-6.99	1
7	0_7718516	Confined	902	6/20/1981	258.62	261.07	-2.45	1
7	0_7718516	Confined	907	6/25/1981	261.42	261.21	0.21	1
7	0_7718516	Confined	912	6/30/1981	264.79	261.36	3.43	1
7	0_7718516	Confined	917	7/5/1981	261.85	261.50	0.35	1
7	0_7718516	Confined	922	7/10/1981	261.75	261.65	0.10	1
7	0_7718516	Confined	923	7/11/1981	261.60	261.68	-0.08	1
7	0_7718516	Confined	954	8/11/1981	249.91	262.57	-12.66	1
7	0_7718516	Confined	958	8/15/1981	247.24	262.69	-15.45	1
7	0_7718516	Confined	963	8/20/1981	246.36	262.83	-16.47	1
7	0_7718516	Confined	968	8/25/1981	246.46	262.98	-16.52	1
7	0_7718516	Confined	973	8/30/1981	247.92	263.12	-15.20	1
7	0_7718516	Confined	979	9/5/1981	248.53	263.30	-14.77	1
7	0_7718516	Confined	984	9/10/1981	249.04	263.44	-14.40	1
7	0_7718516	Confined	985	9/11/1981	249.44	263.47	-14.03	1
7	0_7718516	Confined	989	9/15/1981	251.20	263.59	-12.39	1
7	0_7718516	Confined	994	9/20/1981	254.24	263.73	-9.49	1
7	0_7718516	Confined	999	9/25/1981	256.17	263.87	-7.70	1
7	0_7718516	Confined	1,004	9/30/1981	255.28	264.02	-8.74	1
7	0_7718516	Confined	1,009	10/5/1981	257.41	264.16	-6.75	1
7	0_7718516	Confined	1,014	10/10/1981	259.97	264.31	-4.34	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7718516	Confined	1,015	10/11/1981	260.44	264.34	-3.90	1
7	0_7718516	Confined	1,019	10/15/1981	257.85	264.45	-6.60	1
7	0_7718516	Confined	1,024	10/20/1981	257.25	264.60	-7.35	1
7	0_7718516	Confined	1,029	10/25/1981	258.65	264.74	-6.09	1
7	0_7718516	Confined	1,034	10/30/1981	261.43	264.89	-3.46	1
7	0_7718516	Confined	1,040	11/5/1981	260.94	265.06	-4.12	1
7	0_7718516	Confined	1,045	11/10/1981	260.41	265.21	-4.80	1
7	0_7718516	Confined	1,046	11/11/1981	260.18	265.23	-5.05	1
7	0_7718516	Confined	1,050	11/15/1981	260.84	265.35	-4.51	1
7	0_7718516	Confined	1,052	11/17/1981	251.79	265.41	-13.62	1
7	0_7718516	Confined	1,055	11/20/1981	262.36	265.50	-3.14	1
7	0_7718516	Confined	1,060	11/25/1981	263.84	265.64	-1.80	1
7	0_7718516	Confined	1,065	11/30/1981	263.44	265.78	-2.34	1
7	0_7718516	Confined	1,070	12/5/1981	261.74	265.93	-4.19	1
7	0_7718516	Confined	1,075	12/10/1981	260.44	266.07	-5.63	1
7	0_7718516	Confined	1,076	12/11/1981	260.24	266.10	-5.86	1
7	0_7718516	Confined	1,080	12/15/1981	260.25	266.22	-5.97	1
7	0_7718516	Confined	1,085	12/20/1981	263.13	266.36	-3.23	1
7	0_7718516	Confined	1,090	12/25/1981	266.04	266.51	-0.47	1
7	0_7718516	Confined	1,095	12/30/1981	267.25	266.65	0.60	1
7	0_7718516	Confined	1,101	1/5/1982	265.92	266.68	-0.76	1
7	0_7718516	Confined	1,106	1/10/1982	261.70	266.69	-4.99	1
7	0_7718516	Confined	1,107	1/11/1982	261.20	266.69	-5.49	1
7	0_7718516	Confined	1,111	1/15/1982	260.32	266.69	-6.37	1
7	0_7718516	Confined	1,116	1/20/1982	256.56	266.69	-10.13	1
7	0_7718516	Confined	1,121	1/25/1982	251.74	266.70	-14.96	1
7	0_7718516	Confined	1,126	1/30/1982	249.77	266.70	-16.93	1
7	0_7718516	Confined	1,132	2/5/1982	248.44	266.70	-18.26	1
7	0_7718516	Confined	1,136	2/9/1982	245.07	266.70	-21.63	1
7	0_7718516	Confined	1,137	2/10/1982	242.72	266.70	-23.98	1
7	0_7718516	Confined	1,142	2/15/1982	239.32	266.71	-27.39	1
7	0_7718516	Confined	1,147	2/20/1982	233.00	266.71	-33.71	1
7	0_7718516	Confined	1,152	2/25/1982	236.87	266.71	-29.84	1
7	0_7718516	Confined	1,160	3/5/1982	231.29	266.72	-35.43	1
7	0_7718516	Confined	1,165	3/10/1982	229.37	266.72	-37.35	1
7	0_7718516	Confined	1,167	3/12/1982	230.00	266.72	-36.72	1
7	0_7718516	Confined	1,170	3/15/1982	229.33	266.72	-37.39	1
7	0_7718516	Confined	1,175	3/20/1982	233.04	266.73	-33.69	1
7	0_7718516	Confined	1,185	3/30/1982	235.72	266.73	-31.01	1
7	0_7718516	Confined	1,191	4/5/1982	232.70	266.74	-34.04	1
7	0_7718516	Confined	1,196	4/10/1982	229.15	266.74	-37.59	1
7	0_7718516	Confined	1,198	4/12/1982	226.94	266.74	-39.80	1
7	0_7718516	Confined	1,201	4/15/1982	224.24	266.74	-42.50	1
7	0_7718516	Confined	1,206	4/20/1982	222.84	266.74	-43.90	1
7	0_7718516	Confined	1,211	4/25/1982	219.18	266.75	-47.57	1
7	0_7718516	Confined	1,216	4/30/1982	220.64	266.75	-46.11	1
7	0_7718516	Confined	1,221	5/5/1982	230.92	266.75	-35.83	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7718516	Confined	1,226	5/10/1982	238.52	266.75	-28.23	1
7	0_7718516	Confined	1,231	5/15/1982	240.52	266.76	-26.24	1
7	0_7718516	Confined	1,236	5/20/1982	241.54	266.76	-25.22	1
7	0_7718516	Confined	1,241	5/25/1982	241.41	266.76	-25.35	1
7	0_7718516	Confined	1,242	5/26/1982	242.84	266.76	-23.92	1
7	0_7718516	Confined	1,246	5/30/1982	244.38	266.77	-22.39	1
7	0_7718516	Confined	1,248	6/1/1982	242.44	266.77	-24.33	1
7	0_7718516	Confined	1,252	6/5/1982	240.52	266.77	-26.25	1
7	0_7718516	Confined	1,257	6/10/1982	235.97	266.77	-30.80	1
7	0_7718516	Confined	1,262	6/15/1982	233.36	266.78	-33.42	1
7	0_7718516	Confined	1,267	6/20/1982	232.22	266.78	-34.56	1
7	0_7718516	Confined	1,272	6/25/1982	235.54	266.78	-31.24	1
7	0_7718516	Confined	1,277	6/30/1982	235.26	266.78	-31.52	1
7	0_7718516	Confined	1,278	7/1/1982	234.27	266.78	-32.51	1
7	0_7718516	Confined	1,282	7/5/1982	235.19	266.79	-31.60	1
7	0_7718516	Confined	1,287	7/10/1982	241.57	266.79	-25.22	1
7	0_7718516	Confined	1,292	7/15/1982	238.86	266.79	-27.93	1
7	0_7718516	Confined	1,297	7/20/1982	234.59	266.79	-32.20	1
7	0_7718516	Confined	1,302	7/25/1982	232.44	266.80	-34.36	1
7	0_7718516	Confined	1,307	7/30/1982	232.26	266.80	-34.54	1
7	0_7718516	Confined	1,309	8/1/1982	231.23	266.80	-35.57	1
7	0_7718516	Confined	1,313	8/5/1982	232.26	266.80	-34.54	1
7	0_7718516	Confined	1,318	8/10/1982	232.50	266.81	-34.31	1
7	0_7718516	Confined	1,323	8/15/1982	237.08	266.81	-29.73	1
7	0_7718516	Confined	1,328	8/20/1982	238.41	266.81	-28.40	1
7	0_7718516	Confined	1,333	8/25/1982	237.65	266.82	-29.17	1
7	0_7718516	Confined	1,338	8/30/1982	235.95	266.82	-30.87	1
7	0_7718516	Confined	1,340	9/1/1982	234.97	266.82	-31.85	1
7	0_7718516	Confined	1,341	9/2/1982	236.03	266.82	-30.79	1
7	0_7718516	Confined	1,344	9/5/1982	233.30	266.82	-33.52	1
7	0_7718516	Confined	1,349	9/10/1982	235.46	266.82	-31.36	1
7	0_7718516	Confined	1,354	9/15/1982	234.81	266.83	-32.02	1
7	0_7718516	Confined	1,359	9/20/1982	235.84	266.83	-30.99	1
7	0_7718516	Confined	1,364	9/25/1982	236.06	266.83	-30.77	1
7	0_7718516	Confined	1,369	9/30/1982	235.21	266.84	-31.63	1
7	0_7718516	Confined	1,370	10/1/1982	235.14	266.84	-31.70	1
7	0_7718516	Confined	1,374	10/5/1982	234.80	266.84	-32.04	1
7	0_7718516	Confined	1,379	10/10/1982	236.22	266.84	-30.62	1
7	0_7718516	Confined	1,384	10/15/1982	242.85	266.84	-23.99	1
7	0_7718516	Confined	1,389	10/20/1982	245.22	266.85	-21.63	1
7	0_7718516	Confined	1,394	10/25/1982	243.29	266.85	-23.56	1
7	0_7718516	Confined	1,399	10/30/1982	242.16	266.85	-24.69	1
7	0_7718516	Confined	1,401	11/1/1982	242.34	266.85	-24.51	1
7	0_7718516	Confined	1,405	11/5/1982	242.70	266.86	-24.16	1
7	0_7718516	Confined	1,410	11/10/1982	244.42	266.86	-22.44	1
7	0_7718516	Confined	1,415	11/15/1982	244.64	266.86	-22.22	1
7	0_7718516	Confined	1,420	11/20/1982	245.47	266.86	-21.39	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7718516	Confined	1,425	11/25/1982	246.29	266.87	-20.58	1
7	0_7718516	Confined	1,430	11/30/1982	253.20	266.87	-13.67	1
7	0_7718516	Confined	1,431	12/1/1982	254.34	266.87	-12.53	1
7	0_7718516	Confined	1,435	12/5/1982	257.40	266.87	-9.47	1
7	0_7718516	Confined	1,440	12/10/1982	258.89	266.88	-7.99	1
7	0_7718516	Confined	1,445	12/15/1982	263.48	266.88	-3.40	1
7	0_7718516	Confined	1,447	12/17/1982	264.38	266.88	-2.50	1
7	0_7718516	Confined	1,450	12/20/1982	264.94	266.88	-1.94	1
7	0_7718516	Confined	1,455	12/25/1982	266.11	266.88	-0.77	1
7	0_7718516	Confined	1,460	12/30/1982	269.79	266.89	2.90	1
7	0_7718516	Confined	1,466	1/5/1983	272.82	266.88	5.94	1
7	0_7718516	Confined	1,468	1/7/1983	273.62	266.88	6.74	1
7	0_7718516	Confined	1,503	2/11/1983	276.64	266.85	9.79	1
7	0_7718516	Confined	1,507	2/15/1983	277.44	266.85	10.59	1
7	0_7718516	Confined	1,512	2/20/1983	280.62	266.85	13.77	1
7	0_7718516	Confined	1,517	2/25/1983	280.56	266.84	13.72	1
7	0_7718516	Confined	1,525	3/5/1983	285.70	266.84	18.86	1
7	0_7718516	Confined	1,530	3/10/1983	286.74	266.83	19.91	1
7	0_7718516	Confined	1,535	3/15/1983	287.54	266.83	20.71	1
7	0_7718516	Confined	1,540	3/20/1983	288.60	266.83	21.77	1
7	0_7718516	Confined	1,545	3/25/1983	287.34	266.82	20.52	1
7	0_7718516	Confined	1,550	3/30/1983	286.02	266.82	19.20	1
7	0_7718516	Confined	1,555	4/4/1983	284.49	266.81	17.68	1
7	0_7718516	Confined	1,605	5/24/1983	265.32	266.78	-1.46	1
7	0_7718516	Confined	1,627	6/15/1983	271.03	266.76	4.27	1
7	0_7718516	Confined	1,691	8/18/1983	271.38	266.71	4.67	1
7	0_7718516	Confined	1,719	9/15/1983	267.50	266.69	0.81	1
7	0_7718516	Confined	1,749	10/15/1983	275.67	266.67	9.00	1
7	0_7718516	Confined	1,794	11/29/1983	272.83	266.63	6.20	1
7	0_7718516	Confined	1,810	12/15/1983	266.36	266.62	-0.26	1
7	0_7718516	Confined	1,841	1/15/1984	280.61	266.15	14.46	1
7	0_7718516	Confined	1,875	2/18/1984	286.37	265.13	21.24	1
7	0_7718516	Confined	1,901	3/15/1984	268.64	264.34	4.30	1
7	0_7718516	Confined	1,928	4/11/1984	261.64	263.53	-1.89	1
7	0_7718516	Confined	1,962	5/15/1984	220.76	262.50	-41.74	1
7	0_7718516	Confined	1,991	6/13/1984	204.07	261.63	-57.56	1
7	0_7718516	Confined	2,023	7/15/1984	181.34	260.66	-79.32	1
7	0_7718516	Confined	2,054	8/15/1984	191.21	259.73	-68.52	1
7	0_7718516	Confined	2,091	9/21/1984	206.79	258.61	-51.82	1
7	0_7718516	Confined	2,200	1/8/1985	270.54	255.40	15.14	1
7	0_7718516	Confined	2,207	1/15/1985	273.97	255.26	18.71	1
7	0_7718516	Confined	2,235	2/12/1985	285.33	254.68	30.65	1
7	0_7718516	Confined	2,238	2/15/1985	285.96	254.62	31.34	1
7	0_7718516	Confined	2,266	3/15/1985	285.07	254.05	31.02	1
7	0_7718516	Confined	2,293	4/11/1985	286.82	253.49	33.33	1
7	0_7718516	Confined	2,297	4/15/1985	287.84	253.41	34.43	1
7	0_7718516	Confined	2,327	5/15/1985	286.84	252.80	34.04	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7718516	Confined	2,358	6/15/1985	279.56	252.16	27.40	1
7	0_7718516	Confined	2,388	7/15/1985	277.94	251.55	26.39	1
7	0_7718516	Confined	2,389	7/16/1985	276.73	251.53	25.20	1
7	0_7718516	Confined	2,419	8/15/1985	275.75	250.91	24.84	1
7	0_7718516	Confined	2,450	9/15/1985	281.42	250.27	31.15	1
7	0_7718516	Confined	2,461	9/26/1985	280.64	250.05	30.59	1
7	0_7718516	Confined	2,480	10/15/1985	282.12	249.66	32.46	1
7	0_7718516	Confined	2,511	11/15/1985	289.73	249.02	40.71	1
7	0_7718516	Confined	2,541	12/15/1985	295.39	248.41	46.98	1
7	0_7718516	Confined	2,571	1/14/1986	302.70	249.95	52.75	1
7	0_7718516	Confined	2,572	1/15/1986	302.94	250.08	52.86	1
7	0_7718516	Confined	2,595	2/7/1986	304.54	253.15	51.39	1
7	0_7718516	Confined	2,603	2/15/1986	305.67	254.22	51.45	1
7	0_7718516	Confined	2,631	3/15/1986	294.53	257.96	36.57	1
7	0_7718516	Confined	2,662	4/15/1986	282.88	262.09	20.79	1
7	0_7718516	Confined	2,692	5/15/1986	288.04	266.10	21.94	1
7	0_7718516	Confined	2,723	6/15/1986	295.05	270.23	24.82	1
7	0_7718516	Confined	2,753	7/15/1986	291.50	274.24	17.26	1
7	0_7718516	Confined	2,784	8/15/1986	285.45	278.37	7.08	1
7	0_7718516	Confined	2,815	9/15/1986	289.16	282.51	6.65	1
7	0_7718516	Confined	2,845	10/15/1986	297.66	286.51	11.15	1
7	0_7718516	Confined	2,876	11/15/1986	303.24	290.65	12.59	1
7	0_7718516	Confined	2,906	12/15/1986	311.08	294.65	16.43	1
7	0_7718516	Confined	2,937	1/15/1987	319.84	298.05	21.79	1
7	0_7718516	Confined	2,964	2/11/1987	321.00	300.33	20.67	1
7	0_7718516	Confined	2,968	2/15/1987	320.64	300.67	19.97	1
7	0_7718516	Confined	3,355	3/8/1988	297.76	323.68	-25.92	1
7	0_7718516	Confined	3,693	2/9/1989	311.42	304.42	7.00	1
7	0_7718516	Confined	4,064	2/15/1990	284.54	288.88	-4.34	1
7	0_7718516	Confined	4,435	2/21/1991	303.89	289.76	14.13	1
7	0_7718516	Confined	4,799	2/20/1992	348.69	246.20	102.49	1
7	0_7718516	Confined	5,157	2/12/1993	338.39	245.32	93.07	1
7	0_7718516	Confined	5,549	3/11/1994	310.44	245.61	64.83	1
7	0_7718516	Confined	6,246	2/6/1996	286.34	233.31	53.03	1
7	0_7718516	Confined	6,632	2/26/1997	277.50	229.98	47.52	1
7	0_7718516	Confined	7,345	2/9/1999	309.94	246.91	63.03	1
7	0_7718516	Confined	7,724	2/23/2000	285.24	247.34	37.90	1
7	0_7718516	Confined	8,082	2/15/2001	298.04	227.32	70.72	1
7	0_7718516	Confined	8,439	2/7/2002	295.54	235.22	60.32	1
7	0_7718516	Confined	9,936	3/15/2006	297.05	243.80	53.25	1
7	0_7718516	Confined	11,349	1/26/2010	273.69	152.76	120.93	1
7	0_7718516	Confined	12,078	1/25/2012	193.42	92.63	100.79	1
7	0_7718704	Confined	2,234	2/11/1985	334.55	256.92	38.82	0.5
7	0_7718704	Confined	2,600	2/12/1986	317.64	254.12	31.76	0.5
7	0_7718704	Confined	2,964	2/11/1987	329.59	287.29	21.15	0.5
7	0_7718704	Confined	3,356	3/9/1988	327.64	310.92	8.36	0.5
7	0_7718704	Confined	3,693	2/9/1989	322.35	303.05	9.65	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7718704	Confined	4,063	2/14/1990	310.17	296.25	6.96	0.5
7	0_7718704	Confined	4,433	2/19/1991	323.62	299.02	12.30	0.5
7	0_7718704	Confined	4,798	2/19/1992	324.83	281.34	21.75	0.5
7	0_7718704	Confined	5,162	2/17/1993	327.34	276.88	25.23	0.5
7	0_7718704	Confined	5,532	2/22/1994	325.34	273.79	25.78	0.5
7	0_7718704	Confined	5,813	11/30/1994	334.11	272.45	30.83	0.5
7	0_7718704	Confined	6,234	1/25/1996	322.84	265.61	28.62	0.5
7	0_7718704	Confined	6,619	2/13/1997	309.04	261.93	23.55	0.5
7	0_7718704	Confined	7,346	2/10/1999	321.24	274.17	23.54	0.5
7	0_7718704	Confined	7,725	2/24/2000	319.04	275.11	21.97	0.5
7	0_7718704	Confined	8,082	2/15/2001	313.74	264.00	24.87	0.5
7	0_7718704	Confined	8,438	2/6/2002	297.72	266.74	15.49	0.5
7	0_7718704	Confined	9,153	1/22/2004	313.44	257.51	27.97	0.5
7	0_7718704	Confined	9,935	3/14/2006	290.04	270.70	9.67	0.5
7	0_7718704	Confined	9,998	5/16/2006	279.90	272.74	3.58	0.5
7	0_7718704	Confined	10,265	2/7/2007	296.47	280.93	7.77	0.5
7	0_7718704	Confined	10,649	2/26/2008	312.64	284.91	13.86	0.5
7	0_7718704	Confined	11,001	2/12/2009	294.14	265.78	14.18	0.5
7	0_7718704	Confined	11,350	1/27/2010	281.55	225.97	27.79	0.5
7	0_7718704	Confined	11,518	7/14/2010	284.01	209.72	37.14	0.5
7	0_7718704	Confined	12,080	1/27/2012	244.70	171.49	36.61	0.5
7	0_7718704	Confined	12,443	1/24/2013	236.21	180.86	27.67	0.5
7	0_7718704	Confined	12,820	2/5/2014	237.98	185.72	26.13	0.5
7	0_7718704	Confined	13,072	10/15/2014	203.28	185.86	8.71	0.5
7	0_7718704	Confined	13,450	10/28/2015	222.54	197.10	12.72	0.5
7	0_7718704	Confined	14,170	10/17/2017	239.37	210.65	14.36	0.5
7	0_7718807	Confined	6,191	12/13/1995	264.38	220.93	43.45	1
7	0_7718904	Confined	772	2/10/1981	252.77	236.50	16.27	1
7	0_7719102	Confined	771	2/9/1981	288.17	270.97	17.20	1
7	0_7719102	Confined	1,875	2/18/1984	284.70	280.44	4.26	1
7	0_7719102	Confined	2,228	2/5/1985	277.09	271.68	5.41	1
7	0_7719102	Confined	2,595	2/7/1986	275.18	268.78	6.40	1
7	0_7719102	Confined	2,964	2/11/1987	282.07	307.63	-25.56	1
7	0_7719102	Confined	3,355	3/8/1988	264.47	329.71	-65.24	1
7	0_7719102	Confined	3,697	2/13/1989	310.29	316.73	-6.44	1
7	0_7719102	Confined	4,064	2/15/1990	276.11	304.60	-28.49	1
7	0_7719102	Confined	4,433	2/19/1991	279.44	304.92	-25.48	1
7	0_7719102	Confined	4,799	2/20/1992	327.55	267.59	59.96	1
7	0_7719102	Confined	5,157	2/12/1993	224.04	263.75	-39.71	1
7	0_7719102	Confined	5,549	3/11/1994	300.94	261.96	38.98	1
7	0_7719102	Confined	5,793	11/10/1994	277.14	257.99	19.15	1
7	0_7719102	Confined	6,246	2/6/1996	234.34	248.23	-13.89	1
7	0_7719102	Confined	6,995	2/24/1998	305.26	252.91	52.35	1
7	0_7719102	Confined	7,345	2/9/1999	307.34	258.49	48.85	1
7	0_7719102	Confined	7,753	3/23/2000	303.54	258.56	44.98	1
7	0_7719503	Confined	9,584	3/28/2005	230.28	247.40	-17.12	1
7	0_7719703	Confined	772	2/10/1981	261.09	248.64	12.45	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7719703	Confined	2,235	2/12/1985	240.50	253.09	-12.59	1
7	0_7719703	Confined	2,599	2/11/1986	291.58	249.11	42.47	1
7	0_7722301	Confined	1,137	2/10/1982	423.37	275.97	73.70	0.5
7	0_7722301	Confined	1,515	2/23/1983	425.14	277.38	73.88	0.5
7	0_7722301	Confined	1,872	2/15/1984	425.19	281.04	72.07	0.5
7	0_7722301	Confined	2,238	2/15/1985	423.28	276.85	73.22	0.5
7	0_7722301	Confined	2,606	2/18/1986	424.38	285.55	69.41	0.5
7	0_7722301	Confined	3,001	3/20/1987	425.22	285.88	69.67	0.5
7	0_7722703	Confined	8,398	12/28/2001	133.18	156.83	-23.65	1
7	0_7722703	Confined	8,409	1/8/2002	168.68	156.37	12.31	1
7	0_7722703	Confined	8,782	1/16/2003	182.18	136.78	45.40	1
7	0_7722703	Confined	9,151	1/20/2004	180.68	132.25	48.43	1
7	0_7722703	Confined	9,521	1/24/2005	188.38	133.01	55.37	1
7	0_7722703	Confined	9,886	1/24/2006	164.28	131.14	33.14	1
7	0_7722703	Confined	10,266	2/8/2007	144.58	136.86	7.72	1
7	0_7722703	Confined	10,599	1/7/2008	152.38	134.17	18.21	1
7	0_7722703	Confined	11,015	2/26/2009	143.38	103.22	40.16	1
7	0_7722703	Confined	11,426	4/13/2010	134.58	53.25	81.33	1
7	0_7723301	Confined	1,136	2/9/1982	298.69	285.06	6.82	0.5
7	0_7723301	Confined	1,515	2/23/1983	293.63	286.22	3.71	0.5
7	0_7723301	Confined	2,606	2/18/1986	285.78	292.85	-3.54	0.5
7	0_7723301	Confined	3,343	2/25/1988	290.15	295.44	-2.65	0.5
7	0_7723301	Confined	3,699	2/15/1989	258.79	293.37	-17.29	0.5
7	0_7723301	Confined	4,069	2/20/1990	225.77	290.56	-32.40	0.5
7	0_7723301	Confined	4,484	4/11/1991	253.96	286.08	-16.06	0.5
7	0_7723301	Confined	4,770	1/22/1992	248.96	271.42	-11.23	0.5
7	0_7723301	Confined	6,654	3/20/1997	200.21	221.97	-10.88	0.5
7	0_7723301	Confined	6,988	2/17/1998	213.11	225.07	-5.98	0.5
7	0_7723301	Confined	7,319	1/14/1999	212.46	209.22	1.62	0.5
7	0_7723301	Confined	8,409	1/8/2002	172.46	172.77	-0.15	0.5
7	0_7723301	Confined	8,782	1/16/2003	226.26	154.89	35.68	0.5
7	0_7723301	Confined	9,158	1/27/2004	231.46	149.09	41.18	0.5
7	0_7723301	Confined	9,543	2/15/2005	261.96	147.84	57.06	0.5
7	0_7723301	Confined	9,901	2/8/2006	252.16	145.35	53.40	0.5
7	0_7723301	Confined	10,284	2/26/2007	203.96	148.56	27.70	0.5
7	0_7723301	Confined	10,643	2/20/2008	229.36	143.59	42.89	0.5
7	0_7723301	Confined	11,029	3/12/2009	203.16	118.28	42.44	0.5
7	0_7723301	Confined	11,428	4/15/2010	191.36	77.01	57.18	0.5
7	0_7723509	Confined	1,137	2/10/1982	290.20	282.28	7.92	1
7	0_7723509	Confined	1,515	2/23/1983	286.47	283.40	3.07	1
7	0_7723509	Confined	2,238	2/15/1985	247.30	283.76	-36.46	1
7	0_7723513	Confined	11,752	3/5/2011	48.44	52.94	-2.25	0.5
7	0_7723513	Confined	12,059	1/6/2012	60.44	33.07	13.69	0.5
7	0_7723513	Confined	12,090	2/6/2012	80.24	34.45	22.89	0.5
7	0_7723513	Confined	12,114	3/1/2012	64.44	35.52	14.46	0.5
7	0_7723513	Confined	12,149	4/5/2012	79.84	37.09	21.38	0.5
7	0_7723513	Confined	12,210	6/5/2012	26.24	39.81	-6.78	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7723513	Confined	12,237	7/2/2012	-3.15	41.01	-22.08	0.5
7	0_7723513	Confined	12,265	7/30/2012	-15.85	42.26	-29.06	0.5
7	0_7723513	Confined	12,346	10/19/2012	6.24	45.88	-19.82	0.5
7	0_7723513	Confined	12,367	11/9/2012	25.04	46.81	-10.89	0.5
7	0_7723513	Confined	12,391	12/3/2012	50.64	47.89	1.38	0.5
7	0_7723513	Confined	12,425	1/6/2013	71.04	49.15	10.94	0.5
7	0_7723513	Confined	12,456	2/6/2013	48.04	49.24	-0.60	0.5
7	0_7723513	Confined	12,479	3/1/2013	49.24	49.30	-0.03	0.5
7	0_7723513	Confined	12,514	4/5/2013	-6.55	49.40	-27.97	0.5
7	0_7723513	Confined	12,575	6/5/2013	-33.65	49.57	-41.61	0.5
7	0_7723513	Confined	12,602	7/2/2013	-35.65	49.64	-42.65	0.5
7	0_7723513	Confined	12,632	8/1/2013	-48.15	49.73	-48.94	0.5
7	0_7723513	Confined	12,672	9/10/2013	-73.15	49.84	-61.49	0.5
7	0_7723513	Confined	12,711	10/19/2013	-13.95	49.95	-31.95	0.5
7	0_7723513	Confined	12,732	11/9/2013	6.84	50.01	-21.58	0.5
7	0_7723513	Confined	12,756	12/3/2013	40.04	50.07	-5.02	0.5
7	0_7723513	Confined	12,785	1/1/2014	65.04	50.16	7.44	0.5
7	0_7723513	Confined	12,816	2/1/2014	69.24	50.61	9.31	0.5
7	0_7723513	Confined	12,844	3/1/2014	67.24	51.01	8.11	0.5
7	0_7723513	Confined	12,875	4/1/2014	16.04	51.46	-17.71	0.5
7	0_7723513	Confined	12,905	5/1/2014	-54.95	51.89	-53.42	0.5
7	0_7723513	Confined	13,028	9/1/2014	-85.25	53.67	-69.46	0.5
7	0_7723513	Confined	13,058	10/1/2014	-57.45	54.10	-55.78	0.5
7	0_7723513	Confined	13,089	11/1/2014	-30.45	54.55	-42.50	0.5
7	0_7723513	Confined	13,119	12/1/2014	5.44	54.98	-24.77	0.5
7	0_7723513	Confined	13,209	3/1/2015	28.04	57.24	-14.60	0.5
7	0_7723513	Confined	13,240	4/1/2015	28.14	58.19	-15.02	0.5
7	0_7723513	Confined	13,270	5/1/2015	64.14	59.10	2.52	0.5
7	0_7723513	Confined	13,301	6/1/2015	73.24	60.05	6.60	0.5
7	0_7723513	Confined	13,362	8/1/2015	-16.95	61.90	-39.43	0.5
7	0_7723513	Confined	13,393	9/1/2015	-65.85	62.85	-64.35	0.5
7	0_7723513	Confined	13,423	10/1/2015	-5.75	63.76	-34.76	0.5
7	0_7723513	Confined	13,454	11/1/2015	54.34	64.71	-5.18	0.5
7	0_7723513	Confined	13,484	12/1/2015	63.44	65.62	-1.09	0.5
7	0_7723513	Confined	13,515	1/1/2016	63.14	66.55	-1.71	0.5
7	0_7723513	Confined	13,546	2/1/2016	64.44	67.00	-1.28	0.5
7	0_7723513	Confined	13,575	3/1/2016	66.44	67.43	-0.49	0.5
7	0_7723513	Confined	13,606	4/1/2016	60.34	67.88	-3.77	0.5
7	0_7723513	Confined	13,636	5/1/2016	27.04	68.32	-20.64	0.5
7	0_7723513	Confined	13,667	6/1/2016	43.24	68.77	-12.76	0.5
7	0_7723513	Confined	13,697	7/1/2016	-41.45	69.20	-55.33	0.5
7	0_7723513	Confined	13,728	8/1/2016	-28.35	69.66	-49.00	0.5
7	0_7723513	Confined	13,759	9/1/2016	16.04	70.11	-27.03	0.5
7	0_7723513	Confined	13,789	10/1/2016	16.44	70.55	-27.05	0.5
7	0_7723513	Confined	13,820	11/1/2016	23.64	71.00	-23.68	0.5
7	0_7723513	Confined	13,850	12/1/2016	55.54	71.44	-7.95	0.5
7	0_7723513	Confined	13,881	1/1/2017	70.04	71.88	-0.92	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7723513	Confined	13,912	2/1/2017	54.54	72.16	-8.81	0.5
7	0_7723513	Confined	13,940	3/1/2017	66.54	72.41	-2.94	0.5
7	0_7723513	Confined	14,001	5/1/2017	62.64	72.96	-5.16	0.5
7	0_7723602	Confined	1,872	2/15/1984	228.05	287.92	-59.87	1
7	0_7723602	Confined	2,606	2/18/1986	274.20	291.37	-17.17	1
7	0_7723602	Confined	3,698	2/14/1989	252.19	292.66	-40.47	1
7	0_7723602	Confined	4,071	2/22/1990	221.65	290.03	-68.38	1
7	0_7723602	Confined	4,460	3/18/1991	242.10	286.92	-44.82	1
7	0_7723602	Confined	4,802	2/23/1992	240.85	271.46	-30.61	1
7	0_7723602	Confined	7,703	2/2/2000	175.75	198.96	-23.21	1
7	0_7723602	Confined	8,068	2/1/2001	156.85	180.18	-23.33	1
7	0_7723602	Confined	8,409	1/8/2002	150.05	174.51	-24.46	1
7	0_7723602	Confined	8,782	1/16/2003	156.45	157.43	-0.98	1
7	0_7723602	Confined	9,151	1/20/2004	152.05	150.93	1.12	1
7	0_7723602	Confined	9,521	1/24/2005	156.75	149.09	7.66	1
7	0_7723602	Confined	9,896	2/3/2006	152.45	146.11	6.34	1
7	0_7723602	Confined	10,263	2/5/2007	146.65	148.82	-2.17	1
7	0_7723602	Confined	10,627	2/4/2008	153.75	144.94	8.81	1
7	0_7723602	Confined	11,008	2/19/2009	137.25	123.15	14.10	1
7	0_7723602	Confined	11,426	4/13/2010	115.85	82.28	33.57	1
7	0_7723701	Confined	1,136	2/9/1982	253.93	282.29	-14.18	0.5
7	0_7723701	Confined	1,515	2/23/1983	261.50	283.38	-10.94	0.5
7	0_7723701	Confined	2,606	2/18/1986	252.42	289.41	-18.50	0.5
7	0_7723701	Confined	3,001	3/20/1987	268.23	290.93	-11.35	0.5
7	0_7723701	Confined	3,698	2/14/1989	236.13	291.07	-27.47	0.5
7	0_7723803	Confined	1,136	2/9/1982	277.29	283.23	-5.94	1
7	0_7723803	Confined	1,507	2/15/1983	273.54	284.22	-10.68	1
7	0_7723803	Confined	1,872	2/15/1984	271.87	286.97	-15.10	1
7	0_7723803	Confined	2,238	2/15/1985	236.29	284.81	-48.52	1
7	0_7723803	Confined	2,606	2/18/1986	262.09	290.32	-28.23	1
7	0_7723807	Confined	4,071	2/22/1990	117.70	289.36	-171.66	1
7	0_7723807	Confined	4,806	2/27/1992	72.10	271.27	-199.17	1
7	0_7723807	Confined	5,503	1/24/1994	260.20	248.82	11.38	1
7	0_7723807	Confined	6,236	1/27/1996	158.20	227.68	-69.48	1
7	0_7723807	Confined	6,988	2/17/1998	169.50	224.28	-54.78	1
7	0_7723807	Confined	7,323	1/18/1999	168.30	210.37	-42.07	1
7	0_7723807	Confined	8,409	1/8/2002	177.70	174.62	3.08	1
7	0_7723807	Confined	8,782	1/16/2003	203.70	157.83	45.87	1
7	0_7723807	Confined	9,151	1/20/2004	191.20	151.03	40.17	1
7	0_7723807	Confined	9,557	3/1/2005	201.10	148.50	52.60	1
7	0_7723807	Confined	9,901	2/8/2006	186.50	145.82	40.68	1
7	0_7723807	Confined	10,284	2/26/2007	186.50	148.07	38.43	1
7	0_7723807	Confined	10,656	3/4/2008	192.10	143.07	49.03	1
7	0_7723807	Confined	11,029	3/12/2009	169.30	121.34	47.96	1
7	0_7723807	Confined	11,446	5/3/2010	181.90	82.14	99.76	1
7	0_7723808	Confined	3,698	2/14/1989	225.03	291.93	-66.90	1
7	0_7723809	Confined	4,797	2/18/1992	294.38	271.19	23.19	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725201	Confined	772	2/10/1981	359.15	316.17	4.30	0.1
7	0_7725307	Confined	10,875	10/9/2008	342.07	319.26	2.28	0.1
7	0_7725307	Confined	11,267	11/5/2009	325.40	307.96	1.74	0.1
7	0_7725307	Confined	11,272	11/10/2009	326.47	307.79	1.87	0.1
7	0_7725307	Confined	11,277	11/15/2009	326.92	307.61	1.93	0.1
7	0_7725307	Confined	11,282	11/20/2009	327.25	307.44	1.98	0.1
7	0_7725307	Confined	11,287	11/25/2009	328.11	307.26	2.08	0.1
7	0_7725307	Confined	11,292	11/30/2009	328.47	307.09	2.14	0.1
7	0_7725307	Confined	11,293	12/1/2009	328.59	307.05	2.15	0.1
7	0_7725307	Confined	11,297	12/5/2009	328.91	306.91	2.20	0.1
7	0_7725307	Confined	11,302	12/10/2009	329.42	306.73	2.27	0.1
7	0_7725307	Confined	11,307	12/15/2009	329.88	306.56	2.33	0.1
7	0_7725307	Confined	11,312	12/20/2009	329.19	306.38	2.28	0.1
7	0_7725307	Confined	11,317	12/25/2009	330.44	306.21	2.42	0.1
7	0_7725307	Confined	11,322	12/30/2009	330.19	306.03	2.42	0.1
7	0_7725307	Confined	11,324	1/1/2010	330.35	305.95	2.44	0.1
7	0_7725307	Confined	11,328	1/5/2010	329.71	305.78	2.39	0.1
7	0_7725307	Confined	11,333	1/10/2010	323.40	305.55	1.78	0.1
7	0_7725307	Confined	11,338	1/15/2010	330.44	305.33	2.51	0.1
7	0_7725307	Confined	11,343	1/20/2010	330.97	305.11	2.59	0.1
7	0_7725307	Confined	11,348	1/25/2010	331.46	304.89	2.66	0.1
7	0_7725307	Confined	11,353	1/30/2010	331.78	304.67	2.71	0.1
7	0_7725307	Confined	11,355	2/1/2010	331.85	304.58	2.73	0.1
7	0_7725307	Confined	11,359	2/5/2010	332.13	304.40	2.77	0.1
7	0_7725307	Confined	11,364	2/10/2010	332.39	304.18	2.82	0.1
7	0_7725307	Confined	11,369	2/15/2010	332.69	303.96	2.87	0.1
7	0_7725307	Confined	11,374	2/20/2010	332.92	303.74	2.92	0.1
7	0_7725307	Confined	11,379	2/25/2010	333.13	303.52	2.96	0.1
7	0_7725307	Confined	11,382	2/28/2010	333.14	303.38	2.98	0.1
7	0_7725307	Confined	11,383	3/1/2010	333.12	303.34	2.98	0.1
7	0_7725307	Confined	11,387	3/5/2010	333.36	303.16	3.02	0.1
7	0_7725307	Confined	11,392	3/10/2010	333.35	302.94	3.04	0.1
7	0_7725307	Confined	11,397	3/15/2010	332.64	302.72	2.99	0.1
7	0_7725307	Confined	11,402	3/20/2010	332.89	302.50	3.04	0.1
7	0_7725307	Confined	11,407	3/25/2010	332.88	302.28	3.06	0.1
7	0_7725307	Confined	11,412	3/30/2010	332.62	302.06	3.06	0.1
7	0_7725307	Confined	11,414	4/1/2010	332.40	301.97	3.04	0.1
7	0_7725307	Confined	11,418	4/5/2010	332.31	301.79	3.05	0.1
7	0_7725307	Confined	11,423	4/10/2010	331.74	301.57	3.02	0.1
7	0_7725307	Confined	11,428	4/15/2010	329.68	301.35	2.83	0.1
7	0_7725307	Confined	11,433	4/20/2010	331.07	301.13	2.99	0.1
7	0_7725307	Confined	11,438	4/25/2010	331.35	300.91	3.04	0.1
7	0_7725307	Confined	11,443	4/30/2010	331.41	300.68	3.07	0.1
7	0_7725307	Confined	11,444	5/1/2010	331.33	300.64	3.07	0.1
7	0_7725307	Confined	11,448	5/5/2010	331.64	300.46	3.12	0.1
7	0_7725307	Confined	11,453	5/10/2010	331.27	300.24	3.10	0.1
7	0_7725307	Confined	11,458	5/15/2010	330.22	300.02	3.02	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	11,463	5/20/2010	330.39	299.80	3.06	0.1
7	0_7725307	Confined	11,468	5/25/2010	330.54	299.58	3.10	0.1
7	0_7725307	Confined	11,473	5/30/2010	330.81	299.36	3.15	0.1
7	0_7725307	Confined	11,475	6/1/2010	330.76	299.27	3.15	0.1
7	0_7725307	Confined	11,479	6/5/2010	330.65	299.09	3.16	0.1
7	0_7725307	Confined	11,484	6/10/2010	329.84	298.87	3.10	0.1
7	0_7725307	Confined	11,489	6/15/2010	329.63	298.65	3.10	0.1
7	0_7725307	Confined	11,494	6/20/2010	327.70	298.43	2.93	0.1
7	0_7725307	Confined	11,499	6/25/2010	326.81	298.20	2.86	0.1
7	0_7725307	Confined	11,504	6/30/2010	328.14	297.98	3.02	0.1
7	0_7725307	Confined	11,505	7/1/2010	328.50	297.94	3.06	0.1
7	0_7725307	Confined	11,509	7/5/2010	329.13	297.76	3.14	0.1
7	0_7725307	Confined	11,514	7/10/2010	329.67	297.54	3.21	0.1
7	0_7725307	Confined	11,519	7/15/2010	329.03	297.32	3.17	0.1
7	0_7725307	Confined	11,524	7/20/2010	329.46	297.10	3.24	0.1
7	0_7725307	Confined	11,529	7/25/2010	324.69	296.88	2.78	0.1
7	0_7725307	Confined	11,534	7/30/2010	329.01	296.65	3.24	0.1
7	0_7725307	Confined	11,536	8/1/2010	329.19	296.57	3.26	0.1
7	0_7725307	Confined	11,540	8/5/2010	329.05	296.39	3.27	0.1
7	0_7725307	Confined	11,545	8/10/2010	325.51	296.17	2.93	0.1
7	0_7725307	Confined	11,550	8/15/2010	325.87	295.95	2.99	0.1
7	0_7725307	Confined	11,555	8/20/2010	327.21	295.72	3.15	0.1
7	0_7725307	Confined	11,560	8/25/2010	326.88	295.50	3.14	0.1
7	0_7725307	Confined	11,565	8/30/2010	318.13	295.28	2.28	0.1
7	0_7725307	Confined	11,567	9/1/2010	322.17	295.19	2.70	0.1
7	0_7725307	Confined	11,571	9/5/2010	324.63	295.02	2.96	0.1
7	0_7725307	Confined	11,576	9/10/2010	325.45	294.79	3.07	0.1
7	0_7725307	Confined	11,581	9/15/2010	325.71	294.57	3.11	0.1
7	0_7725307	Confined	11,586	9/20/2010	325.78	294.35	3.14	0.1
7	0_7725307	Confined	11,591	9/25/2010	327.05	294.13	3.29	0.1
7	0_7725307	Confined	11,596	9/30/2010	328.03	293.91	3.41	0.1
7	0_7725307	Confined	11,597	10/1/2010	328.27	293.86	3.44	0.1
7	0_7725307	Confined	11,601	10/5/2010	328.83	293.69	3.51	0.1
7	0_7725307	Confined	11,606	10/10/2010	327.84	293.47	3.44	0.1
7	0_7725307	Confined	11,611	10/15/2010	328.18	293.24	3.49	0.1
7	0_7725307	Confined	11,616	10/20/2010	328.45	293.02	3.54	0.1
7	0_7725307	Confined	11,621	10/25/2010	328.45	292.80	3.56	0.1
7	0_7725307	Confined	11,626	10/30/2010	327.36	292.58	3.48	0.1
7	0_7725307	Confined	11,628	11/1/2010	327.79	292.49	3.53	0.1
7	0_7725307	Confined	11,632	11/5/2010	327.10	292.31	3.48	0.1
7	0_7725307	Confined	11,637	11/10/2010	325.84	292.09	3.37	0.1
7	0_7725307	Confined	11,642	11/15/2010	326.90	291.87	3.50	0.1
7	0_7725307	Confined	11,647	11/20/2010	326.52	291.65	3.49	0.1
7	0_7725307	Confined	11,652	11/25/2010	326.02	291.43	3.46	0.1
7	0_7725307	Confined	11,657	11/30/2010	327.31	291.21	3.61	0.1
7	0_7725307	Confined	11,658	12/1/2010	326.72	291.16	3.56	0.1
7	0_7725307	Confined	11,662	12/5/2010	326.52	290.99	3.55	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	11,667	12/10/2010	326.07	290.77	3.53	0.1
7	0_7725307	Confined	11,672	12/15/2010	326.49	290.54	3.59	0.1
7	0_7725307	Confined	11,677	12/20/2010	326.80	290.32	3.65	0.1
7	0_7725307	Confined	11,682	12/25/2010	326.67	290.10	3.66	0.1
7	0_7725307	Confined	11,687	12/30/2010	324.48	289.88	3.46	0.1
7	0_7725307	Confined	11,689	1/1/2011	325.16	289.79	3.54	0.1
7	0_7725307	Confined	11,693	1/5/2011	325.99	289.62	3.64	0.1
7	0_7725307	Confined	11,698	1/10/2011	326.57	289.40	3.72	0.1
7	0_7725307	Confined	11,703	1/15/2011	326.81	289.19	3.76	0.1
7	0_7725307	Confined	11,708	1/20/2011	326.59	288.97	3.76	0.1
7	0_7725307	Confined	11,713	1/25/2011	326.14	288.75	3.74	0.1
7	0_7725307	Confined	11,718	1/30/2011	325.80	288.54	3.73	0.1
7	0_7725307	Confined	11,720	2/1/2011	326.24	288.45	3.78	0.1
7	0_7725307	Confined	11,724	2/5/2011	326.74	288.28	3.85	0.1
7	0_7725307	Confined	11,729	2/10/2011	327.36	288.06	3.93	0.1
7	0_7725307	Confined	11,734	2/15/2011	326.25	287.85	3.84	0.1
7	0_7725307	Confined	11,739	2/20/2011	326.95	287.63	3.93	0.1
7	0_7725307	Confined	11,744	2/25/2011	326.90	287.41	3.95	0.1
7	0_7725307	Confined	11,747	2/28/2011	326.52	287.28	3.92	0.1
7	0_7725307	Confined	11,748	3/1/2011	326.49	287.24	3.92	0.1
7	0_7725307	Confined	11,752	3/5/2011	326.31	287.07	3.92	0.1
7	0_7725307	Confined	11,757	3/10/2011	326.07	286.85	3.92	0.1
7	0_7725307	Confined	11,762	3/15/2011	325.33	286.64	3.87	0.1
7	0_7725307	Confined	11,767	3/20/2011	318.93	286.42	3.25	0.1
7	0_7725307	Confined	11,772	3/25/2011	323.45	286.20	3.72	0.1
7	0_7725307	Confined	11,777	3/30/2011	321.35	285.99	3.54	0.1
7	0_7725307	Confined	11,779	4/1/2011	321.58	285.90	3.57	0.1
7	0_7725307	Confined	11,783	4/5/2011	321.01	285.73	3.53	0.1
7	0_7725307	Confined	11,788	4/10/2011	320.12	285.51	3.46	0.1
7	0_7725307	Confined	11,793	4/15/2011	318.55	285.30	3.33	0.1
7	0_7725307	Confined	11,798	4/20/2011	318.66	285.08	3.36	0.1
7	0_7725307	Confined	11,803	4/25/2011	317.06	284.86	3.22	0.1
7	0_7725307	Confined	11,808	4/30/2011	310.62	284.65	2.60	0.1
7	0_7725307	Confined	11,809	5/1/2011	308.91	284.60	2.43	0.1
7	0_7725307	Confined	11,813	5/5/2011	314.77	284.43	3.03	0.1
7	0_7725307	Confined	11,818	5/10/2011	315.02	284.22	3.08	0.1
7	0_7725307	Confined	11,823	5/15/2011	315.75	284.00	3.18	0.1
7	0_7725307	Confined	11,828	5/20/2011	315.04	283.78	3.13	0.1
7	0_7725307	Confined	11,833	5/25/2011	314.72	283.57	3.12	0.1
7	0_7725307	Confined	11,838	5/30/2011	314.29	283.35	3.09	0.1
7	0_7725307	Confined	11,840	6/1/2011	314.07	283.26	3.08	0.1
7	0_7725307	Confined	11,844	6/5/2011	313.42	283.09	3.03	0.1
7	0_7725307	Confined	11,849	6/10/2011	313.10	282.88	3.02	0.1
7	0_7725307	Confined	11,854	6/15/2011	312.68	282.66	3.00	0.1
7	0_7725307	Confined	11,859	6/20/2011	311.25	282.44	2.88	0.1
7	0_7725307	Confined	11,864	6/25/2011	310.52	282.23	2.83	0.1
7	0_7725307	Confined	11,869	6/30/2011	310.07	282.01	2.81	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	11,870	7/1/2011	310.08	281.97	2.81	0.1
7	0_7725307	Confined	11,874	7/5/2011	309.94	281.79	2.81	0.1
7	0_7725307	Confined	11,879	7/10/2011	301.84	281.58	2.03	0.1
7	0_7725307	Confined	11,884	7/15/2011	306.56	281.36	2.52	0.1
7	0_7725307	Confined	11,889	7/20/2011	307.68	281.15	2.65	0.1
7	0_7725307	Confined	11,894	7/25/2011	307.65	280.93	2.67	0.1
7	0_7725307	Confined	11,899	7/30/2011	307.27	280.71	2.66	0.1
7	0_7725307	Confined	11,901	8/1/2011	307.47	280.63	2.68	0.1
7	0_7725307	Confined	11,905	8/5/2011	302.09	280.45	2.16	0.1
7	0_7725307	Confined	11,910	8/10/2011	306.90	280.24	2.67	0.1
7	0_7725307	Confined	11,915	8/15/2011	306.87	280.02	2.68	0.1
7	0_7725307	Confined	11,920	8/20/2011	305.36	279.81	2.56	0.1
7	0_7725307	Confined	11,925	8/25/2011	305.02	279.59	2.54	0.1
7	0_7725307	Confined	11,930	8/30/2011	304.45	279.37	2.51	0.1
7	0_7725307	Confined	11,932	9/1/2011	304.06	279.29	2.48	0.1
7	0_7725307	Confined	11,936	9/5/2011	303.51	279.11	2.44	0.1
7	0_7725307	Confined	11,941	9/10/2011	304.20	278.90	2.53	0.1
7	0_7725307	Confined	11,945	9/14/2011	305.10	278.73	2.64	0.1
7	0_7725307	Confined	11,951	9/20/2011	305.98	278.47	2.75	0.1
7	0_7725307	Confined	11,956	9/25/2011	300.68	278.25	2.24	0.1
7	0_7725307	Confined	11,961	9/30/2011	305.65	278.03	2.76	0.1
7	0_7725307	Confined	11,962	10/1/2011	305.72	277.99	2.77	0.1
7	0_7725307	Confined	11,966	10/5/2011	305.91	277.82	2.81	0.1
7	0_7725307	Confined	11,971	10/10/2011	307.62	277.60	3.00	0.1
7	0_7725307	Confined	11,976	10/15/2011	308.64	277.39	3.13	0.1
7	0_7725307	Confined	11,981	10/20/2011	309.78	277.17	3.26	0.1
7	0_7725307	Confined	11,986	10/25/2011	309.46	276.95	3.25	0.1
7	0_7725307	Confined	11,991	10/30/2011	310.75	276.74	3.40	0.1
7	0_7725307	Confined	11,993	11/1/2011	312.72	276.65	3.61	0.1
7	0_7725307	Confined	11,997	11/5/2011	314.69	276.48	3.82	0.1
7	0_7725307	Confined	12,002	11/10/2011	313.91	276.26	3.76	0.1
7	0_7725307	Confined	12,007	11/15/2011	314.16	276.05	3.81	0.1
7	0_7725307	Confined	12,012	11/20/2011	314.97	275.83	3.91	0.1
7	0_7725307	Confined	12,017	11/25/2011	315.07	275.61	3.95	0.1
7	0_7725307	Confined	12,022	11/30/2011	314.70	275.40	3.93	0.1
7	0_7725307	Confined	12,023	12/1/2011	314.37	275.35	3.90	0.1
7	0_7725307	Confined	12,027	12/5/2011	316.91	275.18	4.17	0.1
7	0_7725307	Confined	12,032	12/10/2011	316.22	274.96	4.13	0.1
7	0_7725307	Confined	12,037	12/15/2011	317.89	274.75	4.31	0.1
7	0_7725307	Confined	12,042	12/20/2011	318.45	274.53	4.39	0.1
7	0_7725307	Confined	12,047	12/25/2011	318.92	274.32	4.46	0.1
7	0_7725307	Confined	12,052	12/30/2011	319.59	274.10	4.55	0.1
7	0_7725307	Confined	12,054	1/1/2012	319.62	274.03	4.56	0.1
7	0_7725307	Confined	12,058	1/5/2012	319.84	273.92	4.59	0.1
7	0_7725307	Confined	12,063	1/10/2012	319.67	273.78	4.59	0.1
7	0_7725307	Confined	12,068	1/15/2012	319.86	273.64	4.62	0.1
7	0_7725307	Confined	12,073	1/20/2012	319.55	273.50	4.61	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	12,078	1/25/2012	320.12	273.36	4.68	0.1
7	0_7725307	Confined	12,083	1/30/2012	320.69	273.22	4.75	0.1
7	0_7725307	Confined	12,085	2/1/2012	320.71	273.16	4.75	0.1
7	0_7725307	Confined	12,089	2/5/2012	321.03	273.05	4.80	0.1
7	0_7725307	Confined	12,094	2/10/2012	321.29	272.91	4.84	0.1
7	0_7725307	Confined	12,099	2/15/2012	321.60	272.77	4.88	0.1
7	0_7725307	Confined	12,104	2/20/2012	321.64	272.63	4.90	0.1
7	0_7725307	Confined	12,109	2/25/2012	322.00	272.49	4.95	0.1
7	0_7725307	Confined	12,112	2/28/2012	321.66	272.41	4.93	0.1
7	0_7725307	Confined	12,114	3/1/2012	321.77	272.35	4.94	0.1
7	0_7725307	Confined	12,118	3/5/2012	321.65	272.24	4.94	0.1
7	0_7725307	Confined	12,123	3/10/2012	322.05	272.10	5.00	0.1
7	0_7725307	Confined	12,128	3/15/2012	321.47	271.96	4.95	0.1
7	0_7725307	Confined	12,133	3/20/2012	321.20	271.82	4.94	0.1
7	0_7725307	Confined	12,138	3/25/2012	320.94	271.68	4.93	0.1
7	0_7725307	Confined	12,143	3/30/2012	321.01	271.54	4.95	0.1
7	0_7725307	Confined	12,145	4/1/2012	321.01	271.48	4.95	0.1
7	0_7725307	Confined	12,149	4/5/2012	320.81	271.37	4.94	0.1
7	0_7725307	Confined	12,154	4/10/2012	321.56	271.23	5.03	0.1
7	0_7725307	Confined	12,159	4/15/2012	318.06	271.09	4.70	0.1
7	0_7725307	Confined	12,164	4/20/2012	320.54	270.95	4.96	0.1
7	0_7725307	Confined	12,169	4/25/2012	319.73	270.81	4.89	0.1
7	0_7725307	Confined	12,174	4/30/2012	318.59	270.67	4.79	0.1
7	0_7725307	Confined	12,175	5/1/2012	318.55	270.65	4.79	0.1
7	0_7725307	Confined	12,179	5/5/2012	318.39	270.53	4.79	0.1
7	0_7725307	Confined	12,184	5/10/2012	318.06	270.39	4.77	0.1
7	0_7725307	Confined	12,189	5/15/2012	318.17	270.25	4.79	0.1
7	0_7725307	Confined	12,194	5/20/2012	318.30	270.11	4.82	0.1
7	0_7725307	Confined	12,199	5/25/2012	318.39	269.97	4.84	0.1
7	0_7725307	Confined	12,204	5/30/2012	318.10	269.83	4.83	0.1
7	0_7725307	Confined	12,206	6/1/2012	317.93	269.78	4.82	0.1
7	0_7725307	Confined	12,210	6/5/2012	317.48	269.67	4.78	0.1
7	0_7725307	Confined	12,215	6/10/2012	316.65	269.53	4.71	0.1
7	0_7725307	Confined	12,220	6/15/2012	315.60	269.39	4.62	0.1
7	0_7725307	Confined	12,225	6/20/2012	313.59	269.25	4.43	0.1
7	0_7725307	Confined	12,230	6/25/2012	313.81	269.11	4.47	0.1
7	0_7725307	Confined	12,235	6/30/2012	312.58	268.97	4.36	0.1
7	0_7725307	Confined	12,236	7/1/2012	311.99	268.94	4.30	0.1
7	0_7725307	Confined	12,240	7/5/2012	309.93	268.83	4.11	0.1
7	0_7725307	Confined	12,245	7/10/2012	311.13	268.69	4.24	0.1
7	0_7725307	Confined	12,250	7/15/2012	311.29	268.55	4.27	0.1
7	0_7725307	Confined	12,255	7/20/2012	305.83	268.41	3.74	0.1
7	0_7725307	Confined	12,260	7/25/2012	308.10	268.27	3.98	0.1
7	0_7725307	Confined	12,265	7/30/2012	308.38	268.13	4.03	0.1
7	0_7725307	Confined	12,267	8/1/2012	305.43	268.07	3.74	0.1
7	0_7725307	Confined	12,271	8/5/2012	308.64	267.96	4.07	0.1
7	0_7725307	Confined	12,276	8/10/2012	308.29	267.82	4.05	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	12,281	8/15/2012	308.31	267.68	4.06	0.1
7	0_7725307	Confined	12,286	8/20/2012	308.63	267.54	4.11	0.1
7	0_7725307	Confined	12,291	8/25/2012	307.40	267.40	4.00	0.1
7	0_7725307	Confined	12,296	8/30/2012	307.71	267.26	4.04	0.1
7	0_7725307	Confined	12,298	9/1/2012	307.86	267.21	4.07	0.1
7	0_7725307	Confined	12,302	9/5/2012	303.70	267.09	3.66	0.1
7	0_7725307	Confined	12,307	9/10/2012	306.86	266.95	3.99	0.1
7	0_7725307	Confined	12,312	9/15/2012	308.98	266.81	4.22	0.1
7	0_7725307	Confined	12,317	9/20/2012	309.75	266.68	4.31	0.1
7	0_7725307	Confined	12,322	9/25/2012	310.42	266.54	4.39	0.1
7	0_7725307	Confined	12,327	9/30/2012	311.19	266.40	4.48	0.1
7	0_7725307	Confined	12,328	10/1/2012	311.44	266.37	4.51	0.1
7	0_7725307	Confined	12,332	10/5/2012	312.35	266.26	4.61	0.1
7	0_7725307	Confined	12,337	10/10/2012	313.09	266.12	4.70	0.1
7	0_7725307	Confined	12,342	10/15/2012	313.17	265.98	4.72	0.1
7	0_7725307	Confined	12,347	10/20/2012	313.22	265.84	4.74	0.1
7	0_7725307	Confined	12,352	10/25/2012	312.98	265.70	4.73	0.1
7	0_7725307	Confined	12,357	10/30/2012	313.31	265.56	4.78	0.1
7	0_7725307	Confined	12,359	11/1/2012	312.90	265.50	4.74	0.1
7	0_7725307	Confined	12,363	11/5/2012	313.02	265.39	4.76	0.1
7	0_7725307	Confined	12,368	11/10/2012	312.48	265.25	4.72	0.1
7	0_7725307	Confined	12,373	11/15/2012	312.88	265.11	4.78	0.1
7	0_7725307	Confined	12,378	11/20/2012	311.79	264.97	4.68	0.1
7	0_7725307	Confined	12,383	11/25/2012	310.79	264.83	4.60	0.1
7	0_7725307	Confined	12,388	11/30/2012	313.53	264.69	4.88	0.1
7	0_7725307	Confined	12,389	12/1/2012	313.56	264.66	4.89	0.1
7	0_7725307	Confined	12,393	12/5/2012	312.98	264.55	4.84	0.1
7	0_7725307	Confined	12,398	12/10/2012	313.76	264.41	4.93	0.1
7	0_7725307	Confined	12,403	12/15/2012	313.63	264.27	4.94	0.1
7	0_7725307	Confined	12,408	12/20/2012	314.34	264.13	5.02	0.1
7	0_7725307	Confined	12,413	12/25/2012	313.93	263.99	4.99	0.1
7	0_7725307	Confined	12,418	12/30/2012	312.27	263.85	4.84	0.1
7	0_7725307	Confined	12,420	1/1/2013	313.47	263.81	4.97	0.1
7	0_7725307	Confined	12,424	1/5/2013	310.71	263.74	4.70	0.1
7	0_7725307	Confined	12,429	1/10/2013	314.73	263.66	5.11	0.1
7	0_7725307	Confined	12,434	1/15/2013	314.42	263.57	5.08	0.1
7	0_7725307	Confined	12,439	1/20/2013	314.20	263.49	5.07	0.1
7	0_7725307	Confined	12,444	1/25/2013	316.10	263.41	5.27	0.1
7	0_7725307	Confined	12,449	1/30/2013	316.03	263.33	5.27	0.1
7	0_7725307	Confined	12,451	2/1/2013	315.95	263.29	5.27	0.1
7	0_7725307	Confined	12,455	2/5/2013	315.56	263.23	5.23	0.1
7	0_7725307	Confined	12,460	2/10/2013	315.72	263.14	5.26	0.1
7	0_7725307	Confined	12,465	2/15/2013	314.29	263.06	5.12	0.1
7	0_7725307	Confined	12,470	2/20/2013	314.67	262.98	5.17	0.1
7	0_7725307	Confined	12,475	2/25/2013	312.66	262.89	4.98	0.1
7	0_7725307	Confined	12,478	2/28/2013	312.48	262.84	4.96	0.1
7	0_7725307	Confined	12,479	3/1/2013	310.81	262.83	4.80	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	12,483	3/5/2013	311.06	262.76	4.83	0.1
7	0_7725307	Confined	12,488	3/10/2013	311.36	262.68	4.87	0.1
7	0_7725307	Confined	12,493	3/15/2013	311.06	262.60	4.85	0.1
7	0_7725307	Confined	12,498	3/20/2013	310.89	262.51	4.84	0.1
7	0_7725307	Confined	12,503	3/25/2013	310.09	262.43	4.77	0.1
7	0_7725307	Confined	12,508	3/30/2013	309.14	262.35	4.68	0.1
7	0_7725307	Confined	12,510	4/1/2013	309.12	262.31	4.68	0.1
7	0_7725307	Confined	12,514	4/5/2013	309.20	262.25	4.70	0.1
7	0_7725307	Confined	12,519	4/10/2013	309.62	262.17	4.75	0.1
7	0_7725307	Confined	12,524	4/15/2013	309.51	262.08	4.74	0.1
7	0_7725307	Confined	12,529	4/20/2013	309.07	262.00	4.71	0.1
7	0_7725307	Confined	12,534	4/25/2013	307.56	261.92	4.56	0.1
7	0_7725307	Confined	12,539	4/30/2013	307.07	261.83	4.52	0.1
7	0_7725307	Confined	12,540	5/1/2013	306.97	261.82	4.52	0.1
7	0_7725307	Confined	12,544	5/5/2013	306.37	261.75	4.46	0.1
7	0_7725307	Confined	12,549	5/10/2013	306.01	261.67	4.43	0.1
7	0_7725307	Confined	12,554	5/15/2013	305.87	261.58	4.43	0.1
7	0_7725307	Confined	12,559	5/20/2013	305.98	261.50	4.45	0.1
7	0_7725307	Confined	12,564	5/25/2013	306.39	261.42	4.50	0.1
7	0_7725307	Confined	12,569	5/30/2013	306.01	261.34	4.47	0.1
7	0_7725307	Confined	12,571	6/1/2013	305.74	261.30	4.44	0.1
7	0_7725307	Confined	12,575	6/5/2013	304.47	261.24	4.32	0.1
7	0_7725307	Confined	12,580	6/10/2013	305.39	261.15	4.42	0.1
7	0_7725307	Confined	12,585	6/15/2013	306.26	261.07	4.52	0.1
7	0_7725307	Confined	12,590	6/20/2013	307.23	260.99	4.62	0.1
7	0_7725307	Confined	12,595	6/25/2013	307.44	260.91	4.65	0.1
7	0_7725307	Confined	12,600	6/30/2013	307.79	260.82	4.70	0.1
7	0_7725307	Confined	12,601	7/1/2013	307.94	260.81	4.71	0.1
7	0_7725307	Confined	12,605	7/5/2013	307.27	260.74	4.65	0.1
7	0_7725307	Confined	12,610	7/10/2013	306.56	260.66	4.59	0.1
7	0_7725307	Confined	12,615	7/15/2013	306.56	260.57	4.60	0.1
7	0_7725307	Confined	12,620	7/20/2013	306.30	260.49	4.58	0.1
7	0_7725307	Confined	12,625	7/25/2013	306.35	260.41	4.59	0.1
7	0_7725307	Confined	12,630	7/30/2013	306.02	260.32	4.57	0.1
7	0_7725307	Confined	12,632	8/1/2013	305.83	260.29	4.55	0.1
7	0_7725307	Confined	12,636	8/5/2013	305.32	260.23	4.51	0.1
7	0_7725307	Confined	12,641	8/10/2013	304.94	260.14	4.48	0.1
7	0_7725307	Confined	12,646	8/15/2013	304.76	260.06	4.47	0.1
7	0_7725307	Confined	12,651	8/20/2013	304.43	259.98	4.45	0.1
7	0_7725307	Confined	12,656	8/25/2013	303.56	259.89	4.37	0.1
7	0_7725307	Confined	12,661	8/30/2013	304.43	259.81	4.46	0.1
7	0_7725307	Confined	12,663	9/1/2013	303.86	259.78	4.41	0.1
7	0_7725307	Confined	12,667	9/5/2013	304.39	259.71	4.47	0.1
7	0_7725307	Confined	12,672	9/10/2013	304.38	259.63	4.48	0.1
7	0_7725307	Confined	12,677	9/15/2013	305.28	259.55	4.57	0.1
7	0_7725307	Confined	12,682	9/20/2013	305.99	259.46	4.65	0.1
7	0_7725307	Confined	12,687	9/25/2013	306.15	259.38	4.68	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	12,692	9/30/2013	306.84	259.30	4.75	0.1
7	0_7725307	Confined	12,693	10/1/2013	307.25	259.28	4.80	0.1
7	0_7725307	Confined	12,697	10/5/2013	307.81	259.21	4.86	0.1
7	0_7725307	Confined	12,702	10/10/2013	308.40	259.13	4.93	0.1
7	0_7725307	Confined	12,707	10/15/2013	308.70	259.05	4.97	0.1
7	0_7725307	Confined	12,712	10/20/2013	309.14	258.97	5.02	0.1
7	0_7725307	Confined	12,717	10/25/2013	309.70	258.88	5.08	0.1
7	0_7725307	Confined	12,722	10/30/2013	310.16	258.80	5.14	0.1
7	0_7725307	Confined	12,724	11/1/2013	310.55	258.77	5.18	0.1
7	0_7725307	Confined	12,728	11/5/2013	311.03	258.70	5.23	0.1
7	0_7725307	Confined	12,733	11/10/2013	310.97	258.62	5.24	0.1
7	0_7725307	Confined	12,738	11/15/2013	310.84	258.53	5.23	0.1
7	0_7725307	Confined	12,743	11/20/2013	311.35	258.45	5.29	0.1
7	0_7725307	Confined	12,748	11/25/2013	311.57	258.37	5.32	0.1
7	0_7725307	Confined	12,753	11/30/2013	312.13	258.29	5.38	0.1
7	0_7725307	Confined	12,754	12/1/2013	312.20	258.27	5.39	0.1
7	0_7725307	Confined	12,758	12/5/2013	312.27	258.20	5.41	0.1
7	0_7725307	Confined	12,763	12/10/2013	313.04	258.12	5.49	0.1
7	0_7725307	Confined	12,768	12/15/2013	313.30	258.04	5.53	0.1
7	0_7725307	Confined	12,773	12/20/2013	313.21	257.95	5.53	0.1
7	0_7725307	Confined	12,778	12/25/2013	313.31	257.87	5.54	0.1
7	0_7725307	Confined	12,783	12/30/2013	313.68	257.79	5.59	0.1
7	0_7725307	Confined	12,785	1/1/2014	313.71	257.76	5.60	0.1
7	0_7725307	Confined	12,789	1/5/2014	313.58	257.71	5.59	0.1
7	0_7725307	Confined	12,794	1/10/2014	313.86	257.65	5.62	0.1
7	0_7725307	Confined	12,799	1/15/2014	314.26	257.59	5.67	0.1
7	0_7725307	Confined	12,804	1/20/2014	313.89	257.53	5.64	0.1
7	0_7725307	Confined	12,809	1/25/2014	313.63	257.48	5.62	0.1
7	0_7725307	Confined	12,814	1/30/2014	313.79	257.42	5.64	0.1
7	0_7725307	Confined	12,816	2/1/2014	313.84	257.39	5.64	0.1
7	0_7725307	Confined	12,820	2/5/2014	314.17	257.35	5.68	0.1
7	0_7725307	Confined	12,825	2/10/2014	313.28	257.29	5.60	0.1
7	0_7725307	Confined	12,830	2/15/2014	313.83	257.23	5.66	0.1
7	0_7725307	Confined	12,835	2/20/2014	313.46	257.17	5.63	0.1
7	0_7725307	Confined	12,840	2/25/2014	313.60	257.11	5.65	0.1
7	0_7725307	Confined	12,843	2/28/2014	313.22	257.07	5.61	0.1
7	0_7725307	Confined	12,844	3/1/2014	313.03	257.06	5.60	0.1
7	0_7725307	Confined	12,848	3/5/2014	313.26	257.01	5.62	0.1
7	0_7725307	Confined	12,853	3/10/2014	313.66	256.95	5.67	0.1
7	0_7725307	Confined	12,858	3/15/2014	313.77	256.90	5.69	0.1
7	0_7725307	Confined	12,863	3/20/2014	313.69	256.84	5.69	0.1
7	0_7725307	Confined	12,868	3/25/2014	313.14	256.78	5.64	0.1
7	0_7725307	Confined	12,873	3/30/2014	312.80	256.72	5.61	0.1
7	0_7725307	Confined	12,884	4/10/2014	303.79	256.59	4.72	0.1
7	0_7725307	Confined	12,889	4/15/2014	303.28	256.53	4.68	0.1
7	0_7725307	Confined	12,894	4/20/2014	302.73	256.47	4.63	0.1
7	0_7725307	Confined	12,899	4/25/2014	301.69	256.41	4.53	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	12,904	4/30/2014	301.34	256.35	4.50	0.1
7	0_7725307	Confined	12,905	5/1/2014	301.52	256.34	4.52	0.1
7	0_7725307	Confined	12,909	5/5/2014	301.60	256.29	4.53	0.1
7	0_7725307	Confined	12,914	5/10/2014	300.68	256.23	4.44	0.1
7	0_7725307	Confined	12,919	5/15/2014	300.86	256.17	4.47	0.1
7	0_7725307	Confined	12,924	5/20/2014	300.33	256.11	4.42	0.1
7	0_7725307	Confined	12,929	5/25/2014	300.07	256.06	4.40	0.1
7	0_7725307	Confined	12,934	5/30/2014	299.58	256.00	4.36	0.1
7	0_7725307	Confined	12,936	6/1/2014	299.34	255.97	4.34	0.1
7	0_7725307	Confined	12,940	6/5/2014	299.14	255.93	4.32	0.1
7	0_7725307	Confined	12,945	6/10/2014	297.69	255.87	4.18	0.1
7	0_7725307	Confined	12,950	6/15/2014	297.22	255.81	4.14	0.1
7	0_7725307	Confined	12,955	6/20/2014	296.83	255.75	4.11	0.1
7	0_7725307	Confined	12,960	6/25/2014	298.14	255.69	4.25	0.1
7	0_7725307	Confined	12,965	6/30/2014	298.99	255.63	4.34	0.1
7	0_7725307	Confined	12,966	7/1/2014	298.98	255.62	4.34	0.1
7	0_7725307	Confined	12,970	7/5/2014	298.49	255.57	4.29	0.1
7	0_7725307	Confined	12,975	7/10/2014	296.93	255.51	4.14	0.1
7	0_7725307	Confined	12,980	7/15/2014	297.45	255.45	4.20	0.1
7	0_7725307	Confined	12,985	7/20/2014	297.39	255.39	4.20	0.1
7	0_7725307	Confined	12,990	7/25/2014	296.86	255.33	4.15	0.1
7	0_7725307	Confined	12,995	7/30/2014	297.17	255.27	4.19	0.1
7	0_7725307	Confined	12,997	8/1/2014	296.48	255.25	4.12	0.1
7	0_7725307	Confined	13,001	8/5/2014	295.35	255.20	4.01	0.1
7	0_7725307	Confined	13,006	8/10/2014	294.40	255.14	3.93	0.1
7	0_7725307	Confined	13,011	8/15/2014	294.84	255.08	3.98	0.1
7	0_7725307	Confined	13,016	8/20/2014	295.20	255.03	4.02	0.1
7	0_7725307	Confined	13,021	8/25/2014	295.94	254.97	4.10	0.1
7	0_7725307	Confined	13,026	8/30/2014	295.34	254.91	4.04	0.1
7	0_7725307	Confined	13,028	9/1/2014	295.44	254.88	4.06	0.1
7	0_7725307	Confined	13,032	9/5/2014	295.72	254.84	4.09	0.1
7	0_7725307	Confined	13,037	9/10/2014	295.80	254.78	4.10	0.1
7	0_7725307	Confined	13,042	9/15/2014	296.44	254.72	4.17	0.1
7	0_7725307	Confined	13,047	9/20/2014	296.39	254.66	4.17	0.1
7	0_7725307	Confined	13,052	9/25/2014	296.98	254.60	4.24	0.1
7	0_7725307	Confined	13,057	9/30/2014	297.70	254.54	4.32	0.1
7	0_7725307	Confined	13,058	10/1/2014	297.77	254.53	4.32	0.1
7	0_7725307	Confined	13,062	10/5/2014	298.22	254.48	4.37	0.1
7	0_7725307	Confined	13,067	10/10/2014	298.55	254.42	4.41	0.1
7	0_7725307	Confined	13,072	10/15/2014	298.30	254.36	4.39	0.1
7	0_7725307	Confined	13,077	10/20/2014	298.10	254.30	4.38	0.1
7	0_7725307	Confined	13,082	10/25/2014	296.63	254.24	4.24	0.1
7	0_7725307	Confined	13,087	10/30/2014	297.14	254.19	4.30	0.1
7	0_7725307	Confined	13,089	11/1/2014	297.14	254.16	4.30	0.1
7	0_7725307	Confined	13,093	11/5/2014	296.91	254.11	4.28	0.1
7	0_7725307	Confined	13,098	11/10/2014	297.29	254.06	4.32	0.1
7	0_7725307	Confined	13,103	11/15/2014	297.90	254.00	4.39	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	13,108	11/20/2014	297.74	253.94	4.38	0.1
7	0_7725307	Confined	13,113	11/25/2014	298.66	253.88	4.48	0.1
7	0_7725307	Confined	13,118	11/30/2014	299.11	253.82	4.53	0.1
7	0_7725307	Confined	13,119	12/1/2014	299.28	253.81	4.55	0.1
7	0_7725307	Confined	13,123	12/5/2014	299.66	253.76	4.59	0.1
7	0_7725307	Confined	13,128	12/10/2014	299.96	253.70	4.63	0.1
7	0_7725307	Confined	13,133	12/15/2014	299.76	253.64	4.61	0.1
7	0_7725307	Confined	13,138	12/20/2014	299.35	253.58	4.58	0.1
7	0_7725307	Confined	13,143	12/25/2014	300.09	253.52	4.66	0.1
7	0_7725307	Confined	13,148	12/30/2014	300.63	253.46	4.72	0.1
7	0_7725307	Confined	13,150	1/1/2015	300.53	253.45	4.71	0.1
7	0_7725307	Confined	13,154	1/5/2015	300.78	253.45	4.73	0.1
7	0_7725307	Confined	13,159	1/10/2015	300.93	253.45	4.75	0.1
7	0_7725307	Confined	13,164	1/15/2015	301.47	253.44	4.80	0.1
7	0_7725307	Confined	13,169	1/20/2015	301.60	253.44	4.82	0.1
7	0_7725307	Confined	13,174	1/25/2015	301.61	253.44	4.82	0.1
7	0_7725307	Confined	13,179	1/30/2015	301.98	253.44	4.85	0.1
7	0_7725307	Confined	13,181	2/1/2015	301.99	253.44	4.86	0.1
7	0_7725307	Confined	13,185	2/5/2015	302.33	253.43	4.89	0.1
7	0_7725307	Confined	13,190	2/10/2015	302.15	253.43	4.87	0.1
7	0_7725307	Confined	13,195	2/15/2015	301.98	253.43	4.86	0.1
7	0_7725307	Confined	13,200	2/20/2015	302.31	253.43	4.89	0.1
7	0_7725307	Confined	13,205	2/25/2015	302.87	253.42	4.94	0.1
7	0_7725307	Confined	13,208	2/28/2015	302.92	253.42	4.95	0.1
7	0_7725307	Confined	13,209	3/1/2015	302.82	253.42	4.94	0.1
7	0_7725307	Confined	13,213	3/5/2015	302.38	253.42	4.90	0.1
7	0_7725307	Confined	13,218	3/10/2015	302.84	253.42	4.94	0.1
7	0_7725307	Confined	13,223	3/15/2015	302.93	253.41	4.95	0.1
7	0_7725307	Confined	13,228	3/20/2015	303.09	253.41	4.97	0.1
7	0_7725307	Confined	13,233	3/25/2015	303.44	253.41	5.00	0.1
7	0_7725307	Confined	13,238	3/30/2015	303.62	253.41	5.02	0.1
7	0_7725307	Confined	13,240	4/1/2015	303.18	253.41	4.98	0.1
7	0_7725307	Confined	13,244	4/5/2015	303.47	253.40	5.01	0.1
7	0_7725307	Confined	13,249	4/10/2015	303.19	253.40	4.98	0.1
7	0_7725307	Confined	13,254	4/15/2015	302.90	253.40	4.95	0.1
7	0_7725307	Confined	13,259	4/20/2015	302.75	253.40	4.94	0.1
7	0_7725307	Confined	13,264	4/25/2015	302.94	253.39	4.95	0.1
7	0_7725307	Confined	13,269	4/30/2015	303.20	253.39	4.98	0.1
7	0_7725307	Confined	13,270	5/1/2015	302.77	253.39	4.94	0.1
7	0_7725307	Confined	13,274	5/5/2015	303.11	253.39	4.97	0.1
7	0_7725307	Confined	13,279	5/10/2015	303.14	253.39	4.98	0.1
7	0_7725307	Confined	13,284	5/15/2015	303.17	253.38	4.98	0.1
7	0_7725307	Confined	13,289	5/20/2015	303.66	253.38	5.03	0.1
7	0_7725307	Confined	13,294	5/25/2015	304.15	253.38	5.08	0.1
7	0_7725307	Confined	13,299	5/30/2015	304.55	253.38	5.12	0.1
7	0_7725307	Confined	13,301	6/1/2015	304.62	253.37	5.12	0.1
7	0_7725307	Confined	13,305	6/5/2015	304.84	253.37	5.15	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	13,310	6/10/2015	304.80	253.37	5.14	0.1
7	0_7725307	Confined	13,315	6/15/2015	304.26	253.37	5.09	0.1
7	0_7725307	Confined	13,320	6/20/2015	304.46	253.36	5.11	0.1
7	0_7725307	Confined	13,325	6/25/2015	304.57	253.36	5.12	0.1
7	0_7725307	Confined	13,330	6/30/2015	305.01	253.36	5.17	0.1
7	0_7725307	Confined	13,331	7/1/2015	304.95	253.36	5.16	0.1
7	0_7725307	Confined	13,335	7/5/2015	305.18	253.36	5.18	0.1
7	0_7725307	Confined	13,340	7/10/2015	304.74	253.35	5.14	0.1
7	0_7725307	Confined	13,345	7/15/2015	304.70	253.35	5.13	0.1
7	0_7725307	Confined	13,350	7/20/2015	304.82	253.35	5.15	0.1
7	0_7725307	Confined	13,355	7/25/2015	304.05	253.35	5.07	0.1
7	0_7725307	Confined	13,360	7/30/2015	303.81	253.34	5.05	0.1
7	0_7725307	Confined	13,366	8/5/2015	302.68	253.34	4.93	0.1
7	0_7725307	Confined	13,371	8/10/2015	301.35	253.34	4.80	0.1
7	0_7725307	Confined	13,376	8/15/2015	300.87	253.34	4.75	0.1
7	0_7725307	Confined	13,381	8/20/2015	301.32	253.33	4.80	0.1
7	0_7725307	Confined	13,386	8/25/2015	301.17	253.33	4.78	0.1
7	0_7725307	Confined	13,391	8/30/2015	300.86	253.33	4.75	0.1
7	0_7725307	Confined	13,393	9/1/2015	300.62	253.33	4.73	0.1
7	0_7725307	Confined	13,397	9/5/2015	300.56	253.33	4.72	0.1
7	0_7725307	Confined	13,402	9/10/2015	300.29	253.32	4.70	0.1
7	0_7725307	Confined	13,407	9/15/2015	299.63	253.32	4.63	0.1
7	0_7725307	Confined	13,412	9/20/2015	299.72	253.32	4.64	0.1
7	0_7725307	Confined	13,417	9/25/2015	299.46	253.32	4.61	0.1
7	0_7725307	Confined	13,422	9/30/2015	298.58	253.31	4.53	0.1
7	0_7725307	Confined	13,423	10/1/2015	298.61	253.31	4.53	0.1
7	0_7725307	Confined	13,427	10/5/2015	298.65	253.31	4.53	0.1
7	0_7725307	Confined	13,432	10/10/2015	298.32	253.31	4.50	0.1
7	0_7725307	Confined	13,437	10/15/2015	298.73	253.31	4.54	0.1
7	0_7725307	Confined	13,442	10/20/2015	299.30	253.30	4.60	0.1
7	0_7725307	Confined	13,447	10/25/2015	299.77	253.30	4.65	0.1
7	0_7725307	Confined	13,452	10/30/2015	299.76	253.30	4.65	0.1
7	0_7725307	Confined	13,478	11/25/2015	302.44	253.28	4.92	0.1
7	0_7725307	Confined	13,483	11/30/2015	302.72	253.28	4.94	0.1
7	0_7725307	Confined	13,484	12/1/2015	302.78	253.28	4.95	0.1
7	0_7725307	Confined	13,488	12/5/2015	303.12	253.28	4.98	0.1
7	0_7725307	Confined	13,493	12/10/2015	302.97	253.28	4.97	0.1
7	0_7725307	Confined	13,498	12/15/2015	303.34	253.27	5.01	0.1
7	0_7725307	Confined	13,503	12/20/2015	303.77	253.27	5.05	0.1
7	0_7725307	Confined	13,508	12/25/2015	303.76	253.27	5.05	0.1
7	0_7725307	Confined	13,513	12/30/2015	304.38	253.27	5.11	0.1
7	0_7725307	Confined	13,515	1/1/2016	304.47	253.27	5.12	0.1
7	0_7725307	Confined	13,519	1/5/2016	304.69	253.29	5.14	0.1
7	0_7725307	Confined	13,524	1/10/2016	304.91	253.32	5.16	0.1
7	0_7725307	Confined	13,529	1/15/2016	304.22	253.35	5.09	0.1
7	0_7725307	Confined	13,534	1/20/2016	304.90	253.37	5.15	0.1
7	0_7725307	Confined	13,539	1/25/2016	305.05	253.40	5.16	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	13,544	1/30/2016	305.04	253.43	5.16	0.1
7	0_7725307	Confined	13,546	2/1/2016	304.97	253.44	5.15	0.1
7	0_7725307	Confined	13,550	2/5/2016	304.85	253.46	5.14	0.1
7	0_7725307	Confined	13,555	2/10/2016	304.30	253.49	5.08	0.1
7	0_7725307	Confined	13,560	2/15/2016	302.70	253.52	4.92	0.1
7	0_7725307	Confined	13,565	2/20/2016	303.27	253.54	4.97	0.1
7	0_7725307	Confined	13,570	2/25/2016	303.62	253.57	5.01	0.1
7	0_7725307	Confined	13,574	2/29/2016	303.07	253.59	4.95	0.1
7	0_7725307	Confined	13,575	3/1/2016	303.07	253.60	4.95	0.1
7	0_7725307	Confined	13,579	3/5/2016	303.16	253.62	4.95	0.1
7	0_7725307	Confined	13,584	3/10/2016	302.75	253.64	4.91	0.1
7	0_7725307	Confined	13,589	3/15/2016	303.08	253.67	4.94	0.1
7	0_7725307	Confined	13,594	3/20/2016	303.56	253.70	4.99	0.1
7	0_7725307	Confined	13,599	3/25/2016	303.59	253.73	4.99	0.1
7	0_7725307	Confined	13,604	3/30/2016	303.63	253.75	4.99	0.1
7	0_7725307	Confined	13,606	4/1/2016	303.42	253.76	4.97	0.1
7	0_7725307	Confined	13,610	4/5/2016	303.42	253.79	4.96	0.1
7	0_7725307	Confined	13,615	4/10/2016	302.72	253.81	4.89	0.1
7	0_7725307	Confined	13,620	4/15/2016	302.34	253.84	4.85	0.1
7	0_7725307	Confined	13,625	4/20/2016	302.75	253.87	4.89	0.1
7	0_7725307	Confined	13,630	4/25/2016	303.26	253.89	4.94	0.1
7	0_7725307	Confined	13,635	4/30/2016	303.15	253.92	4.92	0.1
7	0_7725307	Confined	13,636	5/1/2016	302.94	253.93	4.90	0.1
7	0_7725307	Confined	13,640	5/5/2016	302.95	253.95	4.90	0.1
7	0_7725307	Confined	13,645	5/10/2016	302.63	253.97	4.87	0.1
7	0_7725307	Confined	13,650	5/15/2016	302.93	254.00	4.89	0.1
7	0_7725307	Confined	13,655	5/20/2016	303.36	254.03	4.93	0.1
7	0_7725307	Confined	13,660	5/25/2016	303.81	254.06	4.98	0.1
7	0_7725307	Confined	13,665	5/30/2016	304.25	254.08	5.02	0.1
7	0_7725307	Confined	13,667	6/1/2016	304.33	254.09	5.02	0.1
7	0_7725307	Confined	13,671	6/5/2016	304.75	254.12	5.06	0.1
7	0_7725307	Confined	13,676	6/10/2016	304.98	254.14	5.08	0.1
7	0_7725307	Confined	13,681	6/15/2016	305.14	254.17	5.10	0.1
7	0_7725307	Confined	13,686	6/20/2016	305.01	254.20	5.08	0.1
7	0_7725307	Confined	13,691	6/25/2016	304.24	254.22	5.00	0.1
7	0_7725307	Confined	13,696	6/30/2016	304.16	254.25	4.99	0.1
7	0_7725307	Confined	13,697	7/1/2016	304.30	254.26	5.00	0.1
7	0_7725307	Confined	13,701	7/5/2016	303.78	254.28	4.95	0.1
7	0_7725307	Confined	13,706	7/10/2016	302.24	254.30	4.79	0.1
7	0_7725307	Confined	13,711	7/15/2016	302.58	254.33	4.82	0.1
7	0_7725307	Confined	13,716	7/20/2016	301.50	254.36	4.71	0.1
7	0_7725307	Confined	13,721	7/25/2016	301.21	254.39	4.68	0.1
7	0_7725307	Confined	13,728	8/1/2016	300.82	254.42	4.64	0.1
7	0_7725307	Confined	13,732	8/5/2016	300.96	254.44	4.65	0.1
7	0_7725307	Confined	13,737	8/10/2016	299.88	254.47	4.54	0.1
7	0_7725307	Confined	13,742	8/15/2016	300.29	254.50	4.58	0.1
7	0_7725307	Confined	13,747	8/20/2016	300.67	254.53	4.61	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	13,752	8/25/2016	301.00	254.55	4.64	0.1
7	0_7725307	Confined	13,757	8/30/2016	301.67	254.58	4.71	0.1
7	0_7725307	Confined	13,759	9/1/2016	301.83	254.59	4.72	0.1
7	0_7725307	Confined	13,763	9/5/2016	302.02	254.61	4.74	0.1
7	0_7725307	Confined	13,768	9/10/2016	302.57	254.64	4.79	0.1
7	0_7725307	Confined	13,773	9/15/2016	302.42	254.67	4.78	0.1
7	0_7725307	Confined	13,778	9/20/2016	303.10	254.69	4.84	0.1
7	0_7725307	Confined	13,783	9/25/2016	302.22	254.72	4.75	0.1
7	0_7725307	Confined	13,788	9/30/2016	303.19	254.75	4.84	0.1
7	0_7725307	Confined	13,789	10/1/2016	303.26	254.75	4.85	0.1
7	0_7725307	Confined	13,793	10/5/2016	303.54	254.77	4.88	0.1
7	0_7725307	Confined	13,798	10/10/2016	303.46	254.80	4.87	0.1
7	0_7725307	Confined	13,803	10/15/2016	303.37	254.83	4.85	0.1
7	0_7725307	Confined	13,808	10/20/2016	302.84	254.86	4.80	0.1
7	0_7725307	Confined	13,813	10/25/2016	302.68	254.88	4.78	0.1
7	0_7725307	Confined	13,818	10/30/2016	301.77	254.91	4.69	0.1
7	0_7725307	Confined	13,820	11/1/2016	301.49	254.92	4.66	0.1
7	0_7725307	Confined	13,824	11/5/2016	302.13	254.94	4.72	0.1
7	0_7725307	Confined	13,829	11/10/2016	302.56	254.97	4.76	0.1
7	0_7725307	Confined	13,834	11/15/2016	302.89	255.00	4.79	0.1
7	0_7725307	Confined	13,839	11/20/2016	303.38	255.02	4.84	0.1
7	0_7725307	Confined	13,844	11/25/2016	302.99	255.05	4.79	0.1
7	0_7725307	Confined	13,849	11/30/2016	303.28	255.08	4.82	0.1
7	0_7725307	Confined	13,850	12/1/2016	303.44	255.08	4.84	0.1
7	0_7725307	Confined	13,854	12/5/2016	303.25	255.10	4.81	0.1
7	0_7725307	Confined	13,859	12/10/2016	303.80	255.13	4.87	0.1
7	0_7725307	Confined	13,864	12/15/2016	304.23	255.16	4.91	0.1
7	0_7725307	Confined	13,869	12/20/2016	304.63	255.19	4.94	0.1
7	0_7725307	Confined	13,874	12/25/2016	304.70	255.21	4.95	0.1
7	0_7725307	Confined	13,879	12/30/2016	304.31	255.24	4.91	0.1
7	0_7725307	Confined	13,881	1/1/2017	304.43	255.25	4.92	0.1
7	0_7725307	Confined	13,885	1/5/2017	304.74	255.28	4.95	0.1
7	0_7725307	Confined	13,890	1/10/2017	304.86	255.31	4.96	0.1
7	0_7725307	Confined	13,895	1/15/2017	304.82	255.34	4.95	0.1
7	0_7725307	Confined	13,900	1/20/2017	304.41	255.37	4.90	0.1
7	0_7725307	Confined	13,905	1/25/2017	304.81	255.40	4.94	0.1
7	0_7725307	Confined	13,910	1/30/2017	304.67	255.43	4.92	0.1
7	0_7725307	Confined	13,912	2/1/2017	304.69	255.45	4.92	0.1
7	0_7725307	Confined	13,916	2/5/2017	304.63	255.47	4.92	0.1
7	0_7725307	Confined	13,921	2/10/2017	304.80	255.50	4.93	0.1
7	0_7725307	Confined	13,926	2/15/2017	304.14	255.54	4.86	0.1
7	0_7725307	Confined	13,931	2/20/2017	304.41	255.57	4.88	0.1
7	0_7725307	Confined	13,936	2/25/2017	304.48	255.60	4.89	0.1
7	0_7725307	Confined	13,939	2/28/2017	304.46	255.62	4.88	0.1
7	0_7725307	Confined	13,940	3/1/2017	304.55	255.62	4.89	0.1
7	0_7725307	Confined	13,944	3/5/2017	304.33	255.65	4.87	0.1
7	0_7725307	Confined	13,949	3/10/2017	304.63	255.68	4.89	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	13,954	3/15/2017	305.02	255.71	4.93	0.1
7	0_7725307	Confined	13,959	3/20/2017	305.15	255.74	4.94	0.1
7	0_7725307	Confined	13,964	3/25/2017	304.93	255.78	4.92	0.1
7	0_7725307	Confined	13,969	3/30/2017	304.51	255.81	4.87	0.1
7	0_7725307	Confined	13,971	4/1/2017	304.54	255.82	4.87	0.1
7	0_7725307	Confined	13,975	4/5/2017	303.58	255.85	4.77	0.1
7	0_7725307	Confined	13,980	4/10/2017	304.17	255.88	4.83	0.1
7	0_7725307	Confined	13,985	4/15/2017	304.60	255.91	4.87	0.1
7	0_7725307	Confined	13,990	4/20/2017	305.11	255.94	4.92	0.1
7	0_7725307	Confined	13,995	4/25/2017	305.25	255.97	4.93	0.1
7	0_7725307	Confined	14,000	4/30/2017	305.20	256.00	4.92	0.1
7	0_7725307	Confined	14,001	5/1/2017	305.23	256.01	4.92	0.1
7	0_7725307	Confined	14,005	5/5/2017	305.03	256.04	4.90	0.1
7	0_7725307	Confined	14,010	5/10/2017	304.49	256.07	4.84	0.1
7	0_7725307	Confined	14,015	5/15/2017	303.69	256.10	4.76	0.1
7	0_7725307	Confined	14,020	5/20/2017	303.47	256.13	4.73	0.1
7	0_7725307	Confined	14,025	5/25/2017	303.47	256.16	4.73	0.1
7	0_7725307	Confined	14,030	5/30/2017	303.35	256.19	4.72	0.1
7	0_7725307	Confined	14,032	6/1/2017	303.54	256.21	4.73	0.1
7	0_7725307	Confined	14,036	6/5/2017	303.98	256.23	4.77	0.1
7	0_7725307	Confined	14,041	6/10/2017	304.34	256.26	4.81	0.1
7	0_7725307	Confined	14,046	6/15/2017	304.46	256.29	4.82	0.1
7	0_7725307	Confined	14,051	6/20/2017	303.64	256.33	4.73	0.1
7	0_7725307	Confined	14,056	6/25/2017	303.28	256.36	4.69	0.1
7	0_7725307	Confined	14,061	6/30/2017	302.84	256.39	4.65	0.1
7	0_7725307	Confined	14,062	7/1/2017	302.57	256.40	4.62	0.1
7	0_7725307	Confined	14,066	7/5/2017	302.23	256.42	4.58	0.1
7	0_7725307	Confined	14,071	7/10/2017	301.66	256.45	4.52	0.1
7	0_7725307	Confined	14,076	7/15/2017	301.73	256.48	4.52	0.1
7	0_7725307	Confined	14,081	7/20/2017	301.64	256.52	4.51	0.1
7	0_7725307	Confined	14,086	7/25/2017	300.70	256.55	4.42	0.1
7	0_7725307	Confined	14,091	7/30/2017	300.82	256.58	4.42	0.1
7	0_7725307	Confined	14,093	8/1/2017	300.37	256.59	4.38	0.1
7	0_7725307	Confined	14,097	8/5/2017	300.55	256.62	4.39	0.1
7	0_7725307	Confined	14,102	8/10/2017	300.06	256.65	4.34	0.1
7	0_7725307	Confined	14,107	8/15/2017	300.13	256.68	4.34	0.1
7	0_7725307	Confined	14,112	8/20/2017	299.83	256.71	4.31	0.1
7	0_7725307	Confined	14,117	8/25/2017	300.01	256.74	4.33	0.1
7	0_7725307	Confined	14,122	8/30/2017	299.48	256.78	4.27	0.1
7	0_7725307	Confined	14,124	9/1/2017	299.39	256.79	4.26	0.1
7	0_7725307	Confined	14,128	9/5/2017	298.60	256.81	4.18	0.1
7	0_7725307	Confined	14,133	9/10/2017	299.03	256.85	4.22	0.1
7	0_7725307	Confined	14,138	9/15/2017	299.35	256.88	4.25	0.1
7	0_7725307	Confined	14,143	9/20/2017	298.98	256.91	4.21	0.1
7	0_7725307	Confined	14,148	9/25/2017	299.56	256.94	4.26	0.1
7	0_7725307	Confined	14,153	9/30/2017	300.27	256.97	4.33	0.1
7	0_7725307	Confined	14,154	10/1/2017	300.33	256.98	4.34	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7725307	Confined	14,158	10/5/2017	300.75	257.00	4.37	0.1
7	0_7725307	Confined	14,163	10/10/2017	301.21	257.04	4.42	0.1
7	0_7725307	Confined	14,168	10/15/2017	301.67	257.07	4.46	0.1
7	0_7725307	Confined	14,173	10/20/2017	301.68	257.10	4.46	0.1
7	0_7725307	Confined	14,178	10/25/2017	302.48	257.13	4.54	0.1
7	0_7725307	Confined	14,183	10/30/2017	302.64	257.16	4.55	0.1
7	0_7725307	Confined	14,185	11/1/2017	302.37	257.17	4.52	0.1
7	0_7725307	Confined	14,189	11/5/2017	302.27	257.20	4.51	0.1
7	0_7725307	Confined	14,194	11/10/2017	302.47	257.23	4.52	0.1
7	0_7725307	Confined	14,199	11/15/2017	302.57	257.26	4.53	0.1
7	0_7725307	Confined	14,204	11/20/2017	302.67	257.29	4.54	0.1
7	0_7725307	Confined	14,209	11/25/2017	302.36	257.33	4.50	0.1
7	0_7725307	Confined	14,214	11/30/2017	302.51	257.36	4.52	0.1
7	0_7725307	Confined	14,215	12/1/2017	302.62	257.36	4.53	0.1
7	0_7725307	Confined	14,219	12/5/2017	302.64	257.39	4.53	0.1
7	0_7725307	Confined	14,224	12/10/2017	303.14	257.42	4.57	0.1
7	0_7725307	Confined	14,229	12/15/2017	303.08	257.45	4.56	0.1
7	0_7725307	Confined	14,234	12/20/2017	302.66	257.48	4.52	0.1
7	0_7725307	Confined	14,239	12/25/2017	303.79	257.52	4.63	0.1
7	0_7725307	Confined	14,244	12/30/2017	303.95	257.55	4.64	0.1
7	0_7725604	Confined	772	2/10/1981	383.20	322.90	6.03	0.1
7	0_7725604	Confined	2,963	2/10/1987	379.47	332.31	4.72	0.1
7	0_7725604	Confined	3,356	3/9/1988	380.29	340.74	3.96	0.1
7	0_7725604	Confined	4,064	2/15/1990	378.55	349.08	2.95	0.1
7	0_7726101	Confined	772	2/10/1981	331.37	269.08	6.23	0.1
7	0_7726101	Confined	1,874	2/17/1984	333.25	279.17	5.41	0.1
7	0_7726101	Confined	2,234	2/11/1985	316.24	276.51	3.97	0.1
7	0_7726101	Confined	2,614	2/26/1986	329.13	274.61	5.45	0.1
7	0_7726101	Confined	2,964	2/11/1987	343.27	287.66	5.56	0.1
7	0_7726101	Confined	3,356	3/9/1988	344.10	305.20	3.89	0.1
7	0_7726101	Confined	3,693	2/9/1989	340.71	308.66	3.20	0.1
7	0_7726101	Confined	4,063	2/14/1990	335.91	309.65	2.63	0.1
7	0_7726101	Confined	4,433	2/19/1991	335.35	312.49	2.29	0.1
7	0_7726101	Confined	6,234	1/25/1996	335.81	289.60	4.62	0.1
7	0_7726418	Confined	1,500	2/8/1983	341.80	267.65	7.41	0.1
7	0_7726418	Confined	2,964	2/11/1987	340.14	276.22	6.39	0.1
7	0_7726418	Confined	3,693	2/9/1989	351.86	293.18	5.87	0.1
7	0_7726418	Confined	4,063	2/14/1990	351.04	297.58	5.35	0.1
7	0_7726418	Confined	4,798	2/19/1992	360.14	299.24	6.09	0.1
7	0_7726418	Confined	6,234	1/25/1996	354.44	281.79	7.27	0.1
7	0_7726430	Confined	8,537	5/16/2002	329.52	296.11	3.34	0.1
7	0_7726431	Confined	11,106	5/28/2009	334.04	297.27	3.68	0.1
7	0_7726431	Confined	11,188	8/18/2009	325.21	294.79	3.04	0.1
7	0_7726431	Confined	12,192	5/18/2012	320.55	255.39	6.52	0.1
7	0_7726601	Confined	2,662	4/15/1986	251.91	229.95	21.96	1
7	0_7726601	Confined	2,692	5/15/1986	243.08	231.67	11.41	1
7	0_7726601	Confined	2,723	6/15/1986	251.09	233.44	17.65	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	731	12/31/1980	173.70	223.23	-49.53	1
7	0_7726605	Confined	736	1/5/1981	220.17	223.38	-3.21	1
7	0_7726605	Confined	737	1/6/1981	220.60	223.42	-2.82	1
7	0_7726605	Confined	772	2/10/1981	170.20	224.51	-54.31	1
7	0_7726605	Confined	777	2/15/1981	226.86	224.67	2.19	1
7	0_7726605	Confined	782	2/20/1981	230.32	224.82	5.50	1
7	0_7726605	Confined	787	2/25/1981	230.94	224.98	5.96	1
7	0_7726605	Confined	795	3/5/1981	233.76	225.23	8.53	1
7	0_7726605	Confined	800	3/10/1981	234.71	225.39	9.32	1
7	0_7726605	Confined	805	3/15/1981	237.15	225.54	11.61	1
7	0_7726605	Confined	810	3/20/1981	238.22	225.70	12.52	1
7	0_7726605	Confined	815	3/25/1981	236.17	225.86	10.31	1
7	0_7726605	Confined	820	3/30/1981	228.86	226.01	2.85	1
7	0_7726605	Confined	826	4/5/1981	216.72	226.20	-9.48	1
7	0_7726605	Confined	831	4/10/1981	209.63	226.36	-16.73	1
7	0_7726605	Confined	836	4/15/1981	204.39	226.51	-22.12	1
7	0_7726605	Confined	841	4/20/1981	208.85	226.67	-17.82	1
7	0_7726605	Confined	846	4/25/1981	212.50	226.83	-14.33	1
7	0_7726605	Confined	851	4/30/1981	216.35	226.98	-10.63	1
7	0_7726605	Confined	856	5/5/1981	218.85	227.14	-8.29	1
7	0_7726605	Confined	861	5/10/1981	223.91	227.29	-3.38	1
7	0_7726605	Confined	864	5/13/1981	224.69	227.39	-2.70	1
7	0_7726605	Confined	866	5/15/1981	225.94	227.45	-1.51	1
7	0_7726605	Confined	871	5/20/1981	215.82	227.61	-11.79	1
7	0_7726605	Confined	876	5/25/1981	205.58	227.76	-22.18	1
7	0_7726605	Confined	881	5/30/1981	199.54	227.92	-28.38	1
7	0_7726605	Confined	887	6/5/1981	205.78	228.11	-22.33	1
7	0_7726605	Confined	892	6/10/1981	207.09	228.26	-21.17	1
7	0_7726605	Confined	897	6/15/1981	205.04	228.42	-23.38	1
7	0_7726605	Confined	902	6/20/1981	211.81	228.58	-16.77	1
7	0_7726605	Confined	907	6/25/1981	217.10	228.73	-11.63	1
7	0_7726605	Confined	912	6/30/1981	221.01	228.89	-7.88	1
7	0_7726605	Confined	917	7/5/1981	221.22	229.05	-7.83	1
7	0_7726605	Confined	922	7/10/1981	218.03	229.20	-11.17	1
7	0_7726605	Confined	927	7/15/1981	216.83	229.36	-12.53	1
7	0_7726605	Confined	932	7/20/1981	211.86	229.52	-17.66	1
7	0_7726605	Confined	937	7/25/1981	206.78	229.67	-22.89	1
7	0_7726605	Confined	942	7/30/1981	207.36	229.83	-22.47	1
7	0_7726605	Confined	948	8/5/1981	207.57	230.02	-22.45	1
7	0_7726605	Confined	953	8/10/1981	205.37	230.17	-24.80	1
7	0_7726605	Confined	954	8/11/1981	204.59	230.20	-25.61	1
7	0_7726605	Confined	958	8/15/1981	202.77	230.33	-27.56	1
7	0_7726605	Confined	963	8/20/1981	202.95	230.49	-27.54	1
7	0_7726605	Confined	968	8/25/1981	204.57	230.64	-26.07	1
7	0_7726605	Confined	973	8/30/1981	207.77	230.80	-23.03	1
7	0_7726605	Confined	979	9/5/1981	214.54	230.99	-16.45	1
7	0_7726605	Confined	984	9/10/1981	219.75	231.14	-11.39	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	989	9/15/1981	223.27	231.30	-8.03	1
7	0_7726605	Confined	994	9/20/1981	225.05	231.45	-6.40	1
7	0_7726605	Confined	999	9/25/1981	225.88	231.61	-5.73	1
7	0_7726605	Confined	1,004	9/30/1981	226.57	231.77	-5.20	1
7	0_7726605	Confined	1,009	10/5/1981	226.72	231.92	-5.20	1
7	0_7726605	Confined	1,052	11/17/1981	229.62	233.27	-3.65	1
7	0_7726605	Confined	1,136	2/9/1982	217.01	235.02	-18.01	1
7	0_7726605	Confined	1,137	2/10/1982	217.18	235.03	-17.85	1
7	0_7726605	Confined	1,142	2/15/1982	218.69	235.08	-16.39	1
7	0_7726605	Confined	1,147	2/20/1982	219.83	235.13	-15.30	1
7	0_7726605	Confined	1,152	2/25/1982	221.83	235.17	-13.34	1
7	0_7726605	Confined	1,165	3/10/1982	228.63	235.30	-6.67	1
7	0_7726605	Confined	1,170	3/15/1982	226.44	235.34	-8.90	1
7	0_7726605	Confined	1,175	3/20/1982	225.90	235.39	-9.49	1
7	0_7726605	Confined	1,185	3/30/1982	224.77	235.49	-10.72	1
7	0_7726605	Confined	1,191	4/5/1982	226.98	235.54	-8.56	1
7	0_7726605	Confined	1,196	4/10/1982	224.46	235.59	-11.13	1
7	0_7726605	Confined	1,201	4/15/1982	223.07	235.64	-12.57	1
7	0_7726605	Confined	1,206	4/20/1982	217.67	235.68	-18.01	1
7	0_7726605	Confined	1,211	4/25/1982	218.01	235.73	-17.72	1
7	0_7726605	Confined	1,216	4/30/1982	217.73	235.78	-18.05	1
7	0_7726605	Confined	1,221	5/5/1982	220.62	235.83	-15.21	1
7	0_7726605	Confined	1,226	5/10/1982	224.22	235.87	-11.65	1
7	0_7726605	Confined	1,231	5/15/1982	225.25	235.92	-10.67	1
7	0_7726605	Confined	1,236	5/20/1982	227.22	235.97	-8.75	1
7	0_7726605	Confined	1,242	5/26/1982	230.66	236.02	-5.36	1
7	0_7726605	Confined	1,246	5/30/1982	232.23	236.06	-3.83	1
7	0_7726605	Confined	1,252	6/5/1982	231.57	236.12	-4.55	1
7	0_7726605	Confined	1,257	6/10/1982	224.31	236.17	-11.86	1
7	0_7726605	Confined	1,262	6/15/1982	220.97	236.21	-15.24	1
7	0_7726605	Confined	1,267	6/20/1982	217.28	236.26	-18.98	1
7	0_7726605	Confined	1,272	6/25/1982	217.44	236.31	-18.87	1
7	0_7726605	Confined	1,277	6/30/1982	217.61	236.35	-18.74	1
7	0_7726605	Confined	1,282	7/5/1982	216.60	236.40	-19.80	1
7	0_7726605	Confined	1,287	7/10/1982	220.29	236.45	-16.16	1
7	0_7726605	Confined	1,292	7/15/1982	218.74	236.50	-17.76	1
7	0_7726605	Confined	1,297	7/20/1982	213.02	236.54	-23.52	1
7	0_7726605	Confined	1,302	7/25/1982	207.09	236.59	-29.50	1
7	0_7726605	Confined	1,307	7/30/1982	203.91	236.64	-32.73	1
7	0_7726605	Confined	1,313	8/5/1982	201.00	236.69	-35.69	1
7	0_7726605	Confined	1,318	8/10/1982	198.73	236.74	-38.01	1
7	0_7726605	Confined	1,323	8/15/1982	200.97	236.79	-35.82	1
7	0_7726605	Confined	1,328	8/20/1982	201.32	236.84	-35.52	1
7	0_7726605	Confined	1,333	8/25/1982	201.95	236.88	-34.93	1
7	0_7726605	Confined	1,338	8/30/1982	202.36	236.93	-34.57	1
7	0_7726605	Confined	1,341	9/2/1982	202.44	236.96	-34.52	1
7	0_7726605	Confined	1,344	9/5/1982	202.34	236.99	-34.65	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	1,349	9/10/1982	203.15	237.03	-33.88	1
7	0_7726605	Confined	1,354	9/15/1982	203.98	237.08	-33.10	1
7	0_7726605	Confined	1,359	9/20/1982	208.01	237.13	-29.12	1
7	0_7726605	Confined	1,364	9/25/1982	208.53	237.18	-28.65	1
7	0_7726605	Confined	1,369	9/30/1982	207.40	237.22	-29.82	1
7	0_7726605	Confined	1,374	10/5/1982	205.42	237.27	-31.85	1
7	0_7726605	Confined	1,379	10/10/1982	204.16	237.32	-33.16	1
7	0_7726605	Confined	1,384	10/15/1982	209.19	237.37	-28.18	1
7	0_7726605	Confined	1,389	10/20/1982	209.60	237.41	-27.81	1
7	0_7726605	Confined	1,394	10/25/1982	209.46	237.46	-28.00	1
7	0_7726605	Confined	1,399	10/30/1982	209.97	237.51	-27.54	1
7	0_7726605	Confined	1,405	11/5/1982	212.89	237.56	-24.67	1
7	0_7726605	Confined	1,410	11/10/1982	216.64	237.61	-20.97	1
7	0_7726605	Confined	1,415	11/15/1982	218.02	237.66	-19.64	1
7	0_7726605	Confined	1,420	11/20/1982	218.56	237.71	-19.15	1
7	0_7726605	Confined	1,425	11/25/1982	220.18	237.75	-17.57	1
7	0_7726605	Confined	1,430	11/30/1982	224.92	237.80	-12.88	1
7	0_7726605	Confined	1,435	12/5/1982	228.91	237.85	-8.94	1
7	0_7726605	Confined	1,440	12/10/1982	232.32	237.89	-5.57	1
7	0_7726605	Confined	1,445	12/15/1982	236.53	237.94	-1.41	1
7	0_7726605	Confined	1,446	12/16/1982	237.32	237.95	-0.63	1
7	0_7726605	Confined	1,450	12/20/1982	239.27	237.99	1.28	1
7	0_7726605	Confined	1,455	12/25/1982	241.02	238.04	2.98	1
7	0_7726605	Confined	1,460	12/30/1982	243.92	238.08	5.84	1
7	0_7726605	Confined	1,466	1/5/1983	247.01	238.16	8.85	1
7	0_7726605	Confined	1,471	1/10/1983	249.90	238.22	11.68	1
7	0_7726605	Confined	1,476	1/15/1983	251.10	238.28	12.82	1
7	0_7726605	Confined	1,481	1/20/1983	252.01	238.35	13.66	1
7	0_7726605	Confined	1,486	1/25/1983	253.61	238.41	15.20	1
7	0_7726605	Confined	1,491	1/30/1983	255.44	238.48	16.96	1
7	0_7726605	Confined	1,496	2/4/1983	255.71	238.54	17.17	1
7	0_7726605	Confined	1,497	2/5/1983	255.71	238.55	17.16	1
7	0_7726605	Confined	1,502	2/10/1983	256.15	238.62	17.53	1
7	0_7726605	Confined	1,507	2/15/1983	257.95	238.68	19.27	1
7	0_7726605	Confined	1,512	2/20/1983	260.18	238.74	21.44	1
7	0_7726605	Confined	1,517	2/25/1983	261.34	238.81	22.53	1
7	0_7726605	Confined	1,525	3/5/1983	263.17	238.91	24.26	1
7	0_7726605	Confined	1,530	3/10/1983	263.39	238.97	24.42	1
7	0_7726605	Confined	1,535	3/15/1983	263.55	239.04	24.51	1
7	0_7726605	Confined	1,540	3/20/1983	262.17	239.10	23.07	1
7	0_7726605	Confined	1,545	3/25/1983	261.46	239.17	22.29	1
7	0_7726605	Confined	1,550	3/30/1983	258.37	239.23	19.14	1
7	0_7726605	Confined	1,556	4/5/1983	248.90	239.31	9.59	1
7	0_7726605	Confined	1,561	4/10/1983	244.14	239.37	4.77	1
7	0_7726605	Confined	1,566	4/15/1983	241.56	239.43	2.13	1
7	0_7726605	Confined	1,571	4/20/1983	239.67	239.50	0.17	1
7	0_7726605	Confined	1,576	4/25/1983	239.00	239.56	-0.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	1,581	4/30/1983	231.93	239.63	-7.70	1
7	0_7726605	Confined	1,586	5/5/1983	226.69	239.69	-13.00	1
7	0_7726605	Confined	1,591	5/10/1983	224.83	239.75	-14.92	1
7	0_7726605	Confined	1,596	5/15/1983	224.74	239.82	-15.08	1
7	0_7726605	Confined	1,601	5/20/1983	226.17	239.88	-13.71	1
7	0_7726605	Confined	1,605	5/24/1983	228.50	239.93	-11.43	1
7	0_7726605	Confined	1,606	5/25/1983	228.51	239.95	-11.44	1
7	0_7726605	Confined	1,611	5/30/1983	230.47	240.01	-9.54	1
7	0_7726605	Confined	1,617	6/5/1983	230.82	240.09	-9.27	1
7	0_7726605	Confined	1,622	6/10/1983	234.35	240.15	-5.80	1
7	0_7726605	Confined	1,627	6/15/1983	235.65	240.21	-4.56	1
7	0_7726605	Confined	1,632	6/20/1983	240.57	240.28	0.29	1
7	0_7726605	Confined	1,637	6/25/1983	241.41	240.34	1.07	1
7	0_7726605	Confined	1,642	6/30/1983	241.43	240.41	1.02	1
7	0_7726605	Confined	1,647	7/5/1983	232.35	240.47	-8.12	1
7	0_7726605	Confined	1,652	7/10/1983	226.76	240.53	-13.77	1
7	0_7726605	Confined	1,657	7/15/1983	221.57	240.60	-19.03	1
7	0_7726605	Confined	1,662	7/20/1983	220.72	240.66	-19.94	1
7	0_7726605	Confined	1,667	7/25/1983	218.04	240.72	-22.68	1
7	0_7726605	Confined	1,672	7/30/1983	214.73	240.79	-26.06	1
7	0_7726605	Confined	1,678	8/5/1983	209.47	240.87	-31.40	1
7	0_7726605	Confined	1,683	8/10/1983	210.32	240.93	-30.61	1
7	0_7726605	Confined	1,688	8/15/1983	212.10	240.99	-28.89	1
7	0_7726605	Confined	1,691	8/18/1983	213.09	241.03	-27.94	1
7	0_7726605	Confined	1,693	8/20/1983	214.42	241.06	-26.64	1
7	0_7726605	Confined	1,698	8/25/1983	213.64	241.12	-27.48	1
7	0_7726605	Confined	1,703	8/30/1983	211.10	241.18	-30.08	1
7	0_7726605	Confined	1,709	9/5/1983	211.94	241.26	-29.32	1
7	0_7726605	Confined	1,714	9/10/1983	212.31	241.33	-29.02	1
7	0_7726605	Confined	1,719	9/15/1983	212.99	241.39	-28.40	1
7	0_7726605	Confined	1,724	9/20/1983	214.05	241.45	-27.40	1
7	0_7726605	Confined	1,729	9/25/1983	218.54	241.52	-22.98	1
7	0_7726605	Confined	1,734	9/30/1983	219.85	241.58	-21.73	1
7	0_7726605	Confined	1,739	10/5/1983	222.19	241.64	-19.45	1
7	0_7726605	Confined	1,744	10/10/1983	223.01	241.71	-18.70	1
7	0_7726605	Confined	1,749	10/15/1983	226.92	241.77	-14.85	1
7	0_7726605	Confined	1,754	10/20/1983	228.51	241.84	-13.33	1
7	0_7726605	Confined	1,759	10/25/1983	230.69	241.90	-11.21	1
7	0_7726605	Confined	1,764	10/30/1983	233.03	241.96	-8.93	1
7	0_7726605	Confined	1,770	11/5/1983	234.52	242.04	-7.52	1
7	0_7726605	Confined	1,775	11/10/1983	236.91	242.10	-5.19	1
7	0_7726605	Confined	1,780	11/15/1983	239.68	242.17	-2.49	1
7	0_7726605	Confined	1,785	11/20/1983	241.60	242.23	-0.63	1
7	0_7726605	Confined	1,790	11/25/1983	242.87	242.30	0.57	1
7	0_7726605	Confined	1,794	11/29/1983	243.34	242.35	0.99	1
7	0_7726605	Confined	1,795	11/30/1983	243.22	242.36	0.86	1
7	0_7726605	Confined	1,800	12/5/1983	244.72	242.42	2.30	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	1,805	12/10/1983	244.72	242.49	2.23	1
7	0_7726605	Confined	1,810	12/15/1983	244.45	242.55	1.90	1
7	0_7726605	Confined	1,815	12/20/1983	245.52	242.62	2.90	1
7	0_7726605	Confined	1,820	12/25/1983	246.22	242.68	3.54	1
7	0_7726605	Confined	1,825	12/30/1983	246.97	242.74	4.23	1
7	0_7726605	Confined	1,831	1/5/1984	249.59	242.66	6.93	1
7	0_7726605	Confined	1,836	1/10/1984	250.50	242.56	7.94	1
7	0_7726605	Confined	1,841	1/15/1984	251.43	242.46	8.97	1
7	0_7726605	Confined	1,846	1/20/1984	251.02	242.36	8.66	1
7	0_7726605	Confined	1,851	1/25/1984	251.66	242.26	9.40	1
7	0_7726605	Confined	1,856	1/30/1984	252.51	242.16	10.35	1
7	0_7726605	Confined	1,862	2/5/1984	250.15	242.04	8.11	1
7	0_7726605	Confined	1,867	2/10/1984	250.29	241.94	8.35	1
7	0_7726605	Confined	1,872	2/15/1984	249.58	241.84	7.74	1
7	0_7726605	Confined	1,874	2/17/1984	247.64	241.81	5.83	1
7	0_7726605	Confined	1,877	2/20/1984	249.04	241.75	7.29	1
7	0_7726605	Confined	1,882	2/25/1984	249.82	241.65	8.17	1
7	0_7726605	Confined	1,891	3/5/1984	250.87	241.47	9.40	1
7	0_7726605	Confined	1,896	3/10/1984	250.77	241.37	9.40	1
7	0_7726605	Confined	1,901	3/15/1984	251.50	241.27	10.23	1
7	0_7726605	Confined	1,906	3/20/1984	250.22	241.17	9.05	1
7	0_7726605	Confined	1,911	3/25/1984	246.97	241.07	5.90	1
7	0_7726605	Confined	1,916	3/30/1984	244.30	240.97	3.33	1
7	0_7726605	Confined	1,922	4/5/1984	241.26	240.85	0.41	1
7	0_7726605	Confined	1,927	4/10/1984	240.25	240.75	-0.50	1
7	0_7726605	Confined	1,928	4/11/1984	239.63	240.73	-1.10	1
7	0_7726605	Confined	1,932	4/15/1984	236.08	240.66	-4.58	1
7	0_7726605	Confined	1,937	4/20/1984	231.22	240.56	-9.34	1
7	0_7726605	Confined	1,942	4/25/1984	227.82	240.46	-12.64	1
7	0_7726605	Confined	1,947	4/30/1984	223.68	240.36	-16.68	1
7	0_7726605	Confined	1,952	5/5/1984	220.17	240.26	-20.09	1
7	0_7726605	Confined	1,957	5/10/1984	215.93	240.16	-24.23	1
7	0_7726605	Confined	1,962	5/15/1984	212.43	240.06	-27.63	1
7	0_7726605	Confined	1,967	5/20/1984	212.10	239.96	-27.86	1
7	0_7726605	Confined	1,972	5/25/1984	211.59	239.86	-28.27	1
7	0_7726605	Confined	1,977	5/30/1984	210.63	239.76	-29.13	1
7	0_7726605	Confined	1,983	6/5/1984	212.12	239.64	-27.52	1
7	0_7726605	Confined	1,988	6/10/1984	213.30	239.55	-26.25	1
7	0_7726605	Confined	1,990	6/12/1984	213.02	239.51	-26.49	1
7	0_7726605	Confined	1,993	6/15/1984	212.05	239.45	-27.40	1
7	0_7726605	Confined	1,998	6/20/1984	207.69	239.35	-31.66	1
7	0_7726605	Confined	2,003	6/25/1984	198.60	239.25	-40.65	1
7	0_7726605	Confined	2,008	6/30/1984	191.66	239.15	-47.49	1
7	0_7726605	Confined	2,013	7/5/1984	185.99	239.05	-53.06	1
7	0_7726605	Confined	2,018	7/10/1984	181.92	238.95	-57.03	1
7	0_7726605	Confined	2,023	7/15/1984	176.47	238.85	-62.38	1
7	0_7726605	Confined	2,028	7/20/1984	168.77	238.75	-69.98	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	2,033	7/25/1984	188.90	238.65	-49.75	1
7	0_7726605	Confined	2,038	7/30/1984	158.41	238.55	-80.14	1
7	0_7726605	Confined	2,044	8/5/1984	157.14	238.44	-81.30	1
7	0_7726605	Confined	2,049	8/10/1984	154.52	238.34	-83.82	1
7	0_7726605	Confined	2,054	8/15/1984	153.11	238.24	-85.13	1
7	0_7726605	Confined	2,059	8/20/1984	155.57	238.14	-82.57	1
7	0_7726605	Confined	2,064	8/25/1984	157.39	238.04	-80.65	1
7	0_7726605	Confined	2,069	8/30/1984	157.89	237.94	-80.05	1
7	0_7726605	Confined	2,075	9/5/1984	157.77	237.82	-80.05	1
7	0_7726605	Confined	2,080	9/10/1984	163.63	237.72	-74.09	1
7	0_7726605	Confined	2,085	9/15/1984	168.64	237.62	-68.98	1
7	0_7726605	Confined	2,090	9/20/1984	171.62	237.52	-65.90	1
7	0_7726605	Confined	2,095	9/25/1984	175.10	237.42	-62.32	1
7	0_7726605	Confined	2,100	9/30/1984	179.24	237.33	-58.09	1
7	0_7726605	Confined	2,105	10/5/1984	185.19	237.23	-52.04	1
7	0_7726605	Confined	2,110	10/10/1984	189.95	237.13	-47.18	1
7	0_7726605	Confined	2,115	10/15/1984	195.84	237.03	-41.19	1
7	0_7726605	Confined	2,120	10/20/1984	201.02	236.93	-35.91	1
7	0_7726605	Confined	2,200	1/8/1985	244.97	235.32	9.65	1
7	0_7726605	Confined	2,202	1/10/1985	246.02	235.28	10.74	1
7	0_7726605	Confined	2,207	1/15/1985	247.43	235.17	12.26	1
7	0_7726605	Confined	2,212	1/20/1985	248.79	235.06	13.73	1
7	0_7726605	Confined	2,217	1/25/1985	249.93	234.95	14.98	1
7	0_7726605	Confined	2,222	1/30/1985	251.31	234.83	16.48	1
7	0_7726605	Confined	2,228	2/5/1985	252.84	234.70	18.14	1
7	0_7726605	Confined	2,231	2/8/1985	254.03	234.63	19.40	1
7	0_7726605	Confined	2,233	2/10/1985	254.96	234.59	20.37	1
7	0_7726605	Confined	2,238	2/15/1985	255.37	234.48	20.89	1
7	0_7726605	Confined	2,243	2/20/1985	257.97	234.37	23.60	1
7	0_7726605	Confined	2,248	2/25/1985	258.66	234.26	24.40	1
7	0_7726605	Confined	2,256	3/5/1985	261.51	234.08	27.43	1
7	0_7726605	Confined	2,261	3/10/1985	262.14	233.97	28.17	1
7	0_7726605	Confined	2,266	3/15/1985	263.14	233.85	29.29	1
7	0_7726605	Confined	2,271	3/20/1985	265.37	233.74	31.63	1
7	0_7726605	Confined	2,276	3/25/1985	265.80	233.63	32.17	1
7	0_7726605	Confined	2,281	3/30/1985	264.34	233.52	30.82	1
7	0_7726605	Confined	2,287	4/5/1985	263.55	233.39	30.16	1
7	0_7726605	Confined	2,292	4/10/1985	264.29	233.28	31.01	1
7	0_7726605	Confined	2,293	4/11/1985	264.74	233.25	31.49	1
7	0_7726605	Confined	2,327	5/15/1985	268.96	232.50	36.46	1
7	0_7726605	Confined	2,358	6/15/1985	264.48	231.81	32.67	1
7	0_7726605	Confined	2,382	7/9/1985	267.60	231.27	36.33	1
7	0_7726605	Confined	2,388	7/15/1985	264.86	231.14	33.72	1
7	0_7726605	Confined	2,419	8/15/1985	250.42	230.45	19.97	1
7	0_7726605	Confined	2,450	9/15/1985	257.85	229.76	28.09	1
7	0_7726605	Confined	2,461	9/26/1985	259.60	229.51	30.09	1
7	0_7726605	Confined	2,480	10/15/1985	263.04	229.09	33.95	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	2,511	11/15/1985	274.30	228.40	45.90	1
7	0_7726605	Confined	2,541	12/15/1985	280.05	227.73	52.32	1
7	0_7726605	Confined	2,570	1/13/1986	281.48	228.21	53.27	1
7	0_7726605	Confined	2,572	1/15/1986	281.97	228.34	53.63	1
7	0_7726605	Confined	2,598	2/10/1986	287.12	230.01	57.11	1
7	0_7726605	Confined	2,603	2/15/1986	286.61	230.33	56.28	1
7	0_7726605	Confined	2,631	3/15/1986	277.41	232.13	45.28	1
7	0_7726605	Confined	2,753	7/15/1986	259.60	239.97	19.63	1
7	0_7726605	Confined	2,784	8/15/1986	249.43	241.97	7.46	1
7	0_7726605	Confined	2,815	9/15/1986	261.60	243.96	17.64	1
7	0_7726605	Confined	2,845	10/15/1986	269.51	245.89	23.62	1
7	0_7726605	Confined	2,876	11/15/1986	278.80	247.88	30.92	1
7	0_7726605	Confined	2,906	12/15/1986	281.68	249.81	31.87	1
7	0_7726605	Confined	2,937	1/15/1987	288.99	251.96	37.03	1
7	0_7726605	Confined	2,952	1/30/1987	290.74	253.09	37.65	1
7	0_7726605	Confined	2,962	2/9/1987	291.88	253.84	38.04	1
7	0_7726605	Confined	2,968	2/15/1987	292.42	254.29	38.13	1
7	0_7726605	Confined	2,981	2/28/1987	294.11	255.27	38.84	1
7	0_7726605	Confined	2,996	3/15/1987	295.81	256.40	39.41	1
7	0_7726605	Confined	3,011	3/30/1987	296.32	257.52	38.80	1
7	0_7726605	Confined	3,042	4/30/1987	296.05	259.85	36.20	1
7	0_7726605	Confined	3,057	5/15/1987	298.55	260.98	37.57	1
7	0_7726605	Confined	3,072	5/30/1987	299.97	262.11	37.86	1
7	0_7726605	Confined	3,088	6/15/1987	306.59	263.31	43.28	1
7	0_7726605	Confined	3,271	12/15/1987	287.77	277.06	10.71	1
7	0_7726605	Confined	3,356	3/9/1988	288.47	278.04	10.43	1
7	0_7726605	Confined	3,362	3/15/1988	288.26	278.03	10.23	1
7	0_7726605	Confined	3,530	8/30/1988	266.98	277.49	-10.51	1
7	0_7726605	Confined	3,546	9/15/1988	266.82	277.43	-10.61	1
7	0_7726605	Confined	3,591	10/30/1988	274.72	277.29	-2.57	1
7	0_7726605	Confined	3,607	11/15/1988	277.17	277.24	-0.07	1
7	0_7726605	Confined	3,691	2/7/1989	284.89	277.12	7.77	1
7	0_7726605	Confined	4,182	6/13/1990	281.94	280.39	1.55	1
7	0_7726605	Confined	4,273	9/12/1990	284.97	282.05	2.92	1
7	0_7726605	Confined	4,362	12/10/1990	292.22	283.67	8.55	1
7	0_7726605	Confined	4,432	2/18/1991	268.17	281.11	-12.94	1
7	0_7726605	Confined	4,447	3/5/1991	298.22	280.21	18.01	1
7	0_7726605	Confined	4,538	6/4/1991	296.62	274.74	21.88	1
7	0_7726605	Confined	4,636	9/10/1991	272.62	268.85	3.77	1
7	0_7726605	Confined	4,727	12/10/1991	296.20	263.38	32.82	1
7	0_7726605	Confined	4,797	2/18/1992	305.73	260.94	44.79	1
7	0_7726605	Confined	4,811	3/3/1992	308.22	260.60	47.62	1
7	0_7726605	Confined	4,916	6/16/1992	308.57	258.08	50.49	1
7	0_7726605	Confined	4,986	8/25/1992	304.62	256.41	48.21	1
7	0_7726605	Confined	5,084	12/1/1992	302.87	254.05	48.82	1
7	0_7726605	Confined	5,163	2/18/1993	304.62	251.67	52.95	1
7	0_7726605	Confined	5,532	2/22/1994	302.82	240.55	62.27	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726605	Confined	6,234	1/25/1996	269.42	228.60	40.82	1
7	0_7726605	Confined	6,994	2/23/1998	289.10	235.45	53.65	1
7	0_7726605	Confined	7,347	2/11/1999	280.84	238.66	42.18	1
7	0_7726605	Confined	7,721	2/20/2000	277.57	241.31	36.26	1
7	0_7726605	Confined	8,081	2/14/2001	296.07	232.64	63.43	1
7	0_7726605	Confined	8,438	2/6/2002	261.97	233.50	28.47	1
7	0_7726605	Confined	8,808	2/11/2003	276.62	223.65	52.97	1
7	0_7726605	Confined	9,152	1/21/2004	287.02	223.11	63.91	1
7	0_7726605	Confined	9,537	2/9/2005	296.04	227.50	68.54	1
7	0_7726605	Confined	10,265	2/7/2007	255.83	239.61	16.22	1
7	0_7726605	Confined	10,651	2/28/2008	280.52	240.49	40.03	1
7	0_7726605	Confined	11,350	1/27/2010	243.74	188.41	55.33	1
7	0_7726610	Confined	2,188	12/27/1984	226.09	238.72	-12.63	1
7	0_7726610	Confined	2,600	2/12/1986	272.57	233.56	39.01	1
7	0_7726612	Confined	772	2/10/1981	229.25	229.57	-0.16	0.5
7	0_7726612	Confined	1,500	2/8/1983	220.96	243.65	-11.35	0.5
7	0_7726613	Confined	1,500	2/8/1983	311.78	242.16	69.62	1
7	0_7726613	Confined	1,874	2/17/1984	317.38	245.21	72.17	1
7	0_7726613	Confined	2,235	2/12/1985	302.32	237.32	65.00	1
7	0_7726613	Confined	2,598	2/10/1986	292.41	232.53	59.88	1
7	0_7726613	Confined	2,964	2/11/1987	327.95	258.49	69.46	1
7	0_7726613	Confined	3,356	3/9/1988	323.88	283.27	40.61	1
7	0_7726708	Confined	772	2/10/1981	422.52	343.71	7.88	0.1
7	0_7726708	Confined	1,496	2/4/1983	413.82	348.00	6.58	0.1
7	0_7726708	Confined	1,873	2/16/1984	412.71	350.14	6.26	0.1
7	0_7726708	Confined	2,601	2/13/1986	419.00	352.97	6.60	0.1
7	0_7726708	Confined	2,964	2/11/1987	411.59	355.27	5.63	0.1
7	0_7726708	Confined	3,357	3/10/1988	401.41	358.90	4.25	0.1
7	0_7726708	Confined	3,691	2/7/1989	409.79	360.43	4.94	0.1
7	0_7726708	Confined	4,062	2/13/1990	410.71	363.18	4.75	0.1
7	0_7726708	Confined	5,164	2/19/1993	403.68	364.46	3.92	0.1
7	0_7726708	Confined	5,532	2/22/1994	400.23	361.35	3.89	0.1
7	0_7726708	Confined	6,234	1/25/1996	409.98	356.84	5.31	0.1
7	0_7726708	Confined	6,619	2/13/1997	408.68	353.64	5.50	0.1
7	0_7726708	Confined	6,995	2/24/1998	409.00	354.04	5.50	0.1
7	0_7726708	Confined	7,347	2/11/1999	407.58	354.45	5.31	0.1
7	0_7726708	Confined	7,725	2/24/2000	407.08	353.50	5.36	0.1
7	0_7726708	Confined	8,081	2/14/2001	405.68	351.21	5.45	0.1
7	0_7726708	Confined	8,438	2/6/2002	405.74	350.62	5.51	0.1
7	0_7726708	Confined	8,808	2/11/2003	404.97	349.51	5.55	0.1
7	0_7726708	Confined	9,152	1/21/2004	406.65	349.00	5.77	0.1
7	0_7726708	Confined	9,537	2/9/2005	405.69	351.27	5.44	0.1
7	0_7726708	Confined	9,935	3/14/2006	393.43	352.43	4.10	0.1
7	0_7726708	Confined	10,265	2/7/2007	403.08	355.06	4.80	0.1
7	0_7726708	Confined	10,649	2/26/2008	401.58	358.21	4.34	0.1
7	0_7726708	Confined	11,350	1/27/2010	399.00	343.73	5.53	0.1
7	0_7726708	Confined	11,723	2/4/2011	399.37	334.42	6.49	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7726708	Confined	12,079	1/26/2012	396.14	325.88	7.03	0.1
7	0_7726708	Confined	12,442	1/23/2013	392.98	316.42	7.66	0.1
7	0_7726708	Confined	12,820	2/5/2014	393.05	310.89	8.22	0.1
7	0_7726708	Confined	13,072	10/15/2014	392.12	308.09	8.40	0.1
7	0_7726708	Confined	13,450	10/28/2015	391.78	306.72	8.51	0.1
7	0_7726708	Confined	13,813	10/25/2016	390.54	306.27	8.43	0.1
7	0_7726708	Confined	14,170	10/17/2017	390.07	306.06	8.40	0.1
7	0_7726805	Confined	772	2/10/1981	278.81	158.66	12.01	0.1
7	0_7726805	Confined	2,598	2/10/1986	304.82	189.83	11.50	0.1
7	0_7726817	Confined	7,809	5/18/2000	347.34	293.02	5.43	0.1
7	0_7726904	Confined	772	2/10/1981	286.44	220.98	6.55	0.1
7	0_7727504	Confined	6,666	4/1/1997	246.19	252.97	-6.78	1
7	0_7727504	Confined	6,840	9/22/1997	264.37	255.94	8.43	1
7	0_7728503	Confined	773	2/11/1981	242.83	268.45	-25.62	1
7	0_7728503	Confined	1,500	2/8/1983	238.65	277.58	-38.93	1
7	0_7728503	Confined	1,875	2/18/1984	265.29	279.51	-14.22	1
7	0_7728503	Confined	2,234	2/11/1985	259.65	274.20	-14.55	1
7	0_7728503	Confined	2,962	2/9/1987	276.77	291.30	-14.53	1
7	0_7728503	Confined	3,691	2/7/1989	271.39	312.54	-41.15	1
7	0_7728503	Confined	4,063	2/14/1990	256.69	308.68	-51.99	1
7	0_7728503	Confined	4,428	2/14/1991	256.95	308.68	-51.73	1
7	0_7728503	Confined	4,797	2/18/1992	279.49	289.72	-10.23	1
7	0_7728503	Confined	5,804	11/21/1994	261.72	267.54	-5.82	1
7	0_7728503	Confined	6,234	1/25/1996	248.99	258.39	-9.40	1
7	0_7728503	Confined	6,994	2/23/1998	252.61	258.40	-5.79	1
7	0_7728503	Confined	7,347	2/11/1999	251.34	261.73	-10.39	1
7	0_7728503	Confined	7,725	2/24/2000	250.59	263.52	-12.93	1
7	0_7728503	Confined	8,438	2/6/2002	218.85	254.30	-35.45	1
7	0_7728503	Confined	8,808	2/11/2003	235.79	245.48	-9.69	1
7	0_7728503	Confined	9,151	1/20/2004	248.79	242.97	5.82	1
7	0_7728503	Confined	9,536	2/8/2005	266.19	246.15	20.04	1
7	0_7728503	Confined	9,935	3/14/2006	284.89	250.19	34.70	1
7	0_7728503	Confined	10,264	2/6/2007	212.69	257.20	-44.51	1
7	0_7728503	Confined	11,350	1/27/2010	213.64	212.16	1.48	1
7	0_7728503	Confined	12,080	1/27/2012	119.42	156.36	-36.94	1
7	0_7728503	Confined	12,443	1/24/2013	87.46	151.53	-64.07	1
7	0_7728507	Confined	6,836	9/18/1997	237.48	256.20	-18.72	1
7	0_7728804	Confined	1,500	2/8/1983	261.35	277.38	-8.01	0.5
7	0_7730502	Confined	779	2/17/1981	225.69	280.36	-54.67	1
7	0_7730502	Confined	1,143	2/16/1982	268.55	281.17	-12.62	1
7	0_7730502	Confined	1,513	2/21/1983	260.85	282.25	-21.40	1
7	0_7730502	Confined	1,870	2/13/1984	263.83	284.91	-21.08	1
7	0_7730502	Confined	2,237	2/14/1985	248.98	282.84	-33.86	1
7	0_7730502	Confined	2,608	2/20/1986	249.75	287.91	-38.16	1
7	0_7730502	Confined	2,962	2/9/1987	249.65	289.69	-40.04	1
7	0_7730502	Confined	4,791	2/12/1992	208.45	270.55	-62.10	1
7	0_7730502	Confined	5,533	2/23/1994	243.75	246.68	-2.93	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7730502	Confined	5,805	11/22/1994	204.06	238.14	-34.08	1
7	0_7730502	Confined	6,233	1/24/1996	189.55	227.33	-37.78	1
7	0_7730502	Confined	6,624	2/18/1997	173.05	220.50	-47.45	1
7	0_7730502	Confined	7,340	2/4/1999	172.85	208.21	-35.36	1
7	0_7730502	Confined	8,436	2/4/2002	168.77	172.20	-3.43	1
7	0_7730502	Confined	9,151	1/20/2004	169.65	149.73	19.92	1
7	0_7730502	Confined	11,721	2/2/2011	203.46	62.02	141.44	1
7	0_7730502	Confined	12,077	1/24/2012	167.10	40.12	126.98	1
7	0_7730801	Confined	779	2/17/1981	223.49	280.79	-57.30	1
7	0_7730801	Confined	1,143	2/16/1982	236.87	281.67	-44.80	1
7	0_7730801	Confined	1,513	2/21/1983	259.16	282.67	-23.51	1
7	0_7730801	Confined	2,237	2/14/1985	242.21	283.43	-41.22	1
7	0_7730801	Confined	2,608	2/20/1986	251.97	287.87	-35.90	1
7	0_7730801	Confined	2,962	2/9/1987	257.11	289.89	-32.78	1
7	0_7730801	Confined	3,364	3/17/1988	260.03	291.93	-31.90	1
7	0_7730801	Confined	4,070	2/21/1990	228.27	289.09	-60.82	1
7	0_7730801	Confined	4,790	2/11/1992	236.03	274.95	-38.92	1
7	0_7730801	Confined	5,169	2/24/1993	181.31	263.30	-81.99	1
7	0_7730801	Confined	5,533	2/23/1994	173.16	252.09	-78.93	1
7	0_7730801	Confined	5,805	11/22/1994	217.08	243.84	-26.76	1
7	0_7730801	Confined	6,624	2/18/1997	189.41	225.33	-35.92	1
7	0_7730801	Confined	6,994	2/23/1998	176.72	224.89	-48.17	1
7	0_7730801	Confined	7,725	2/24/2000	192.01	202.66	-10.65	1
7	0_7730801	Confined	8,080	2/13/2001	192.21	187.30	4.91	1
7	0_7730801	Confined	8,437	2/5/2002	186.21	178.57	7.64	1
7	0_7730801	Confined	8,808	2/11/2003	200.61	164.16	36.45	1
7	0_7730801	Confined	9,166	2/4/2004	193.81	156.22	37.59	1
7	0_7730801	Confined	9,544	2/16/2005	236.31	152.24	84.07	1
7	0_7730801	Confined	9,920	2/27/2006	211.51	149.00	62.51	1
7	0_7730801	Confined	10,263	2/5/2007	172.31	149.77	22.54	1
7	0_7731706	Confined	6,865	10/17/1997	181.89	227.80	-45.91	1
7	0_7733201	Unconfined	773	2/11/1981	625.37	645.74	-20.37	1
7	0_7733301	Confined	731	12/31/1980	516.61	495.47	2.11	0.1
7	0_7733301	Confined	736	1/5/1981	516.51	495.48	2.10	0.1
7	0_7733301	Confined	737	1/6/1981	516.60	495.49	2.11	0.1
7	0_7733301	Confined	773	2/11/1981	515.83	495.62	2.02	0.1
7	0_7733301	Confined	777	2/15/1981	516.58	495.63	2.09	0.1
7	0_7733301	Confined	782	2/20/1981	516.76	495.65	2.11	0.1
7	0_7733301	Confined	787	2/25/1981	516.56	495.67	2.09	0.1
7	0_7733301	Confined	795	3/5/1981	516.64	495.70	2.09	0.1
7	0_7733301	Confined	800	3/10/1981	516.11	495.72	2.04	0.1
7	0_7733301	Confined	805	3/15/1981	516.63	495.73	2.09	0.1
7	0_7733301	Confined	810	3/20/1981	516.52	495.75	2.08	0.1
7	0_7733301	Confined	815	3/25/1981	516.43	495.77	2.07	0.1
7	0_7733301	Confined	820	3/30/1981	516.52	495.79	2.07	0.1
7	0_7733301	Confined	826	4/5/1981	516.38	495.81	2.06	0.1
7	0_7733301	Confined	831	4/10/1981	516.41	495.83	2.06	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	836	4/15/1981	516.29	495.84	2.04	0.1
7	0_7733301	Confined	841	4/20/1981	516.54	495.86	2.07	0.1
7	0_7733301	Confined	846	4/25/1981	516.43	495.88	2.05	0.1
7	0_7733301	Confined	851	4/30/1981	516.46	495.90	2.06	0.1
7	0_7733301	Confined	856	5/5/1981	516.68	495.92	2.08	0.1
7	0_7733301	Confined	861	5/10/1981	516.60	495.93	2.07	0.1
7	0_7733301	Confined	864	5/13/1981	516.75	495.95	2.08	0.1
7	0_7733301	Confined	954	8/11/1981	516.63	496.27	2.04	0.1
7	0_7733301	Confined	958	8/15/1981	516.81	496.28	2.05	0.1
7	0_7733301	Confined	963	8/20/1981	516.69	496.30	2.04	0.1
7	0_7733301	Confined	968	8/25/1981	516.73	496.32	2.04	0.1
7	0_7733301	Confined	973	8/30/1981	516.63	496.34	2.03	0.1
7	0_7733301	Confined	979	9/5/1981	516.32	496.36	2.00	0.1
7	0_7733301	Confined	984	9/10/1981	516.31	496.38	1.99	0.1
7	0_7733301	Confined	989	9/15/1981	516.44	496.40	2.00	0.1
7	0_7733301	Confined	994	9/20/1981	516.18	496.41	1.98	0.1
7	0_7733301	Confined	999	9/25/1981	516.08	496.43	1.96	0.1
7	0_7733301	Confined	1,004	9/30/1981	516.12	496.45	1.97	0.1
7	0_7733301	Confined	1,009	10/5/1981	516.28	496.47	1.98	0.1
7	0_7733301	Confined	1,014	10/10/1981	516.06	496.49	1.96	0.1
7	0_7733301	Confined	1,019	10/15/1981	515.97	496.50	1.95	0.1
7	0_7733301	Confined	1,024	10/20/1981	514.77	496.52	1.82	0.1
7	0_7733301	Confined	1,029	10/25/1981	515.85	496.54	1.93	0.1
7	0_7733301	Confined	1,034	10/30/1981	515.06	496.56	1.85	0.1
7	0_7733301	Confined	1,040	11/5/1981	514.29	496.58	1.77	0.1
7	0_7733301	Confined	1,045	11/10/1981	513.95	496.60	1.74	0.1
7	0_7733301	Confined	1,050	11/15/1981	513.92	496.62	1.73	0.1
7	0_7733301	Confined	1,052	11/17/1981	513.55	496.62	1.69	0.1
7	0_7733301	Confined	1,055	11/20/1981	513.82	496.63	1.72	0.1
7	0_7733301	Confined	1,060	11/25/1981	514.00	496.65	1.73	0.1
7	0_7733301	Confined	1,065	11/30/1981	513.52	496.67	1.69	0.1
7	0_7733301	Confined	1,070	12/5/1981	513.18	496.69	1.65	0.1
7	0_7733301	Confined	1,075	12/10/1981	514.34	496.71	1.76	0.1
7	0_7733301	Confined	1,080	12/15/1981	514.30	496.72	1.76	0.1
7	0_7733301	Confined	1,085	12/20/1981	513.86	496.74	1.71	0.1
7	0_7733301	Confined	1,090	12/25/1981	513.23	496.76	1.65	0.1
7	0_7733301	Confined	1,095	12/30/1981	513.35	496.78	1.66	0.1
7	0_7733301	Confined	1,101	1/5/1982	513.77	496.79	1.70	0.1
7	0_7733301	Confined	1,106	1/10/1982	513.32	496.80	1.65	0.1
7	0_7733301	Confined	1,111	1/15/1982	513.47	496.81	1.67	0.1
7	0_7733301	Confined	1,116	1/20/1982	513.80	496.82	1.70	0.1
7	0_7733301	Confined	1,121	1/25/1982	513.06	496.83	1.62	0.1
7	0_7733301	Confined	1,126	1/30/1982	513.60	496.83	1.68	0.1
7	0_7733301	Confined	1,132	2/5/1982	513.63	496.85	1.68	0.1
7	0_7733301	Confined	1,137	2/10/1982	514.31	496.85	1.75	0.1
7	0_7733301	Confined	1,142	2/15/1982	514.33	496.86	1.75	0.1
7	0_7733301	Confined	1,145	2/18/1982	516.49	496.87	1.96	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	1,147	2/20/1982	514.49	496.87	1.76	0.1
7	0_7733301	Confined	1,152	2/25/1982	514.67	496.88	1.78	0.1
7	0_7733301	Confined	1,160	3/5/1982	515.09	496.90	1.82	0.1
7	0_7733301	Confined	1,165	3/10/1982	515.02	496.91	1.81	0.1
7	0_7733301	Confined	1,170	3/15/1982	515.17	496.91	1.83	0.1
7	0_7733301	Confined	1,175	3/20/1982	514.98	496.92	1.81	0.1
7	0_7733301	Confined	1,180	3/25/1982	515.04	496.93	1.81	0.1
7	0_7733301	Confined	1,185	3/30/1982	515.03	496.94	1.81	0.1
7	0_7733301	Confined	1,191	4/5/1982	515.31	496.95	1.84	0.1
7	0_7733301	Confined	1,196	4/10/1982	515.08	496.96	1.81	0.1
7	0_7733301	Confined	1,201	4/15/1982	515.35	496.97	1.84	0.1
7	0_7733301	Confined	1,206	4/20/1982	515.32	496.98	1.83	0.1
7	0_7733301	Confined	1,211	4/25/1982	515.30	496.99	1.83	0.1
7	0_7733301	Confined	1,242	5/26/1982	515.40	497.04	1.84	0.1
7	0_7733301	Confined	1,246	5/30/1982	515.48	497.05	1.84	0.1
7	0_7733301	Confined	1,252	6/5/1982	515.37	497.06	1.83	0.1
7	0_7733301	Confined	1,257	6/10/1982	515.33	497.07	1.83	0.1
7	0_7733301	Confined	1,262	6/15/1982	515.59	497.08	1.85	0.1
7	0_7733301	Confined	1,267	6/20/1982	515.35	497.09	1.83	0.1
7	0_7733301	Confined	1,272	6/25/1982	515.46	497.10	1.84	0.1
7	0_7733301	Confined	1,277	6/30/1982	515.41	497.11	1.83	0.1
7	0_7733301	Confined	1,282	7/5/1982	515.53	497.12	1.84	0.1
7	0_7733301	Confined	1,287	7/10/1982	515.53	497.12	1.84	0.1
7	0_7733301	Confined	1,292	7/15/1982	515.52	497.13	1.84	0.1
7	0_7733301	Confined	1,297	7/20/1982	515.55	497.14	1.84	0.1
7	0_7733301	Confined	1,302	7/25/1982	515.51	497.15	1.84	0.1
7	0_7733301	Confined	1,307	7/30/1982	515.51	497.16	1.83	0.1
7	0_7733301	Confined	1,313	8/5/1982	515.51	497.17	1.83	0.1
7	0_7733301	Confined	1,318	8/10/1982	515.47	497.18	1.83	0.1
7	0_7733301	Confined	1,323	8/15/1982	515.61	497.19	1.84	0.1
7	0_7733301	Confined	1,328	8/20/1982	515.46	497.20	1.83	0.1
7	0_7733301	Confined	1,333	8/25/1982	515.56	497.21	1.84	0.1
7	0_7733301	Confined	1,338	8/30/1982	515.37	497.22	1.82	0.1
7	0_7733301	Confined	1,341	9/2/1982	515.20	497.22	1.80	0.1
7	0_7733301	Confined	1,344	9/5/1982	515.22	497.23	1.80	0.1
7	0_7733301	Confined	1,349	9/10/1982	515.28	497.24	1.80	0.1
7	0_7733301	Confined	1,354	9/15/1982	514.92	497.25	1.77	0.1
7	0_7733301	Confined	1,359	9/20/1982	515.03	497.25	1.78	0.1
7	0_7733301	Confined	1,364	9/25/1982	514.91	497.26	1.76	0.1
7	0_7733301	Confined	1,369	9/30/1982	514.87	497.27	1.76	0.1
7	0_7733301	Confined	1,374	10/5/1982	514.81	497.28	1.75	0.1
7	0_7733301	Confined	1,379	10/10/1982	514.59	497.29	1.73	0.1
7	0_7733301	Confined	1,384	10/15/1982	514.71	497.30	1.74	0.1
7	0_7733301	Confined	1,389	10/20/1982	514.80	497.31	1.75	0.1
7	0_7733301	Confined	1,394	10/25/1982	514.58	497.32	1.73	0.1
7	0_7733301	Confined	1,399	10/30/1982	514.81	497.33	1.75	0.1
7	0_7733301	Confined	1,405	11/5/1982	514.48	497.34	1.71	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	1,410	11/10/1982	514.69	497.35	1.73	0.1
7	0_7733301	Confined	1,415	11/15/1982	514.56	497.35	1.72	0.1
7	0_7733301	Confined	1,420	11/20/1982	514.81	497.36	1.74	0.1
7	0_7733301	Confined	1,425	11/25/1982	514.53	497.37	1.72	0.1
7	0_7733301	Confined	1,430	11/30/1982	515.03	497.38	1.76	0.1
7	0_7733301	Confined	1,435	12/5/1982	514.86	497.39	1.75	0.1
7	0_7733301	Confined	1,440	12/10/1982	515.01	497.40	1.76	0.1
7	0_7733301	Confined	1,445	12/15/1982	514.96	497.41	1.76	0.1
7	0_7733301	Confined	1,446	12/16/1982	514.75	497.41	1.73	0.1
7	0_7733301	Confined	1,450	12/20/1982	515.01	497.42	1.76	0.1
7	0_7733301	Confined	1,455	12/25/1982	515.01	497.43	1.76	0.1
7	0_7733301	Confined	1,460	12/30/1982	514.90	497.44	1.75	0.1
7	0_7733301	Confined	1,466	1/5/1983	514.88	497.45	1.74	0.1
7	0_7733301	Confined	1,471	1/10/1983	515.10	497.46	1.76	0.1
7	0_7733301	Confined	1,476	1/15/1983	514.86	497.47	1.74	0.1
7	0_7733301	Confined	1,481	1/20/1983	515.33	497.49	1.78	0.1
7	0_7733301	Confined	1,486	1/25/1983	515.13	497.50	1.76	0.1
7	0_7733301	Confined	1,491	1/30/1983	515.30	497.51	1.78	0.1
7	0_7733301	Confined	1,495	2/3/1983	514.60	497.52	1.71	0.1
7	0_7733301	Confined	1,497	2/5/1983	514.88	497.53	1.74	0.1
7	0_7733301	Confined	1,502	2/10/1983	515.06	497.54	1.75	0.1
7	0_7733301	Confined	1,507	2/15/1983	515.15	497.55	1.76	0.1
7	0_7733301	Confined	1,512	2/20/1983	515.27	497.56	1.77	0.1
7	0_7733301	Confined	1,517	2/25/1983	515.04	497.57	1.75	0.1
7	0_7733301	Confined	1,520	2/28/1983	515.25	497.58	1.77	0.1
7	0_7733301	Confined	1,525	3/5/1983	514.79	497.59	1.72	0.1
7	0_7733301	Confined	1,530	3/10/1983	515.33	497.61	1.77	0.1
7	0_7733301	Confined	1,535	3/15/1983	515.33	497.62	1.77	0.1
7	0_7733301	Confined	1,540	3/20/1983	514.94	497.63	1.73	0.1
7	0_7733301	Confined	1,545	3/25/1983	515.31	497.64	1.77	0.1
7	0_7733301	Confined	1,550	3/30/1983	514.93	497.65	1.73	0.1
7	0_7733301	Confined	1,556	4/5/1983	515.21	497.67	1.75	0.1
7	0_7733301	Confined	1,561	4/10/1983	514.86	497.68	1.72	0.1
7	0_7733301	Confined	1,566	4/15/1983	514.65	497.69	1.70	0.1
7	0_7733301	Confined	1,571	4/20/1983	515.17	497.71	1.75	0.1
7	0_7733301	Confined	1,576	4/25/1983	515.00	497.72	1.73	0.1
7	0_7733301	Confined	1,581	4/30/1983	515.04	497.73	1.73	0.1
7	0_7733301	Confined	1,586	5/5/1983	514.90	497.74	1.72	0.1
7	0_7733301	Confined	1,591	5/10/1983	514.96	497.75	1.72	0.1
7	0_7733301	Confined	1,596	5/15/1983	514.89	497.77	1.71	0.1
7	0_7733301	Confined	1,601	5/20/1983	515.00	497.78	1.72	0.1
7	0_7733301	Confined	1,605	5/24/1983	514.73	497.79	1.69	0.1
7	0_7733301	Confined	1,606	5/25/1983	514.88	497.79	1.71	0.1
7	0_7733301	Confined	1,611	5/30/1983	515.17	497.80	1.74	0.1
7	0_7733301	Confined	1,617	6/5/1983	514.96	497.82	1.71	0.1
7	0_7733301	Confined	1,622	6/10/1983	514.50	497.83	1.67	0.1
7	0_7733301	Confined	1,627	6/15/1983	514.61	497.84	1.68	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	1,632	6/20/1983	514.77	497.85	1.69	0.1
7	0_7733301	Confined	1,637	6/25/1983	514.76	497.87	1.69	0.1
7	0_7733301	Confined	1,642	6/30/1983	514.79	497.88	1.69	0.1
7	0_7733301	Confined	1,647	7/5/1983	514.74	497.89	1.68	0.1
7	0_7733301	Confined	1,652	7/10/1983	514.79	497.90	1.69	0.1
7	0_7733301	Confined	1,657	7/15/1983	514.87	497.92	1.70	0.1
7	0_7733301	Confined	1,662	7/20/1983	514.35	497.93	1.64	0.1
7	0_7733301	Confined	1,667	7/25/1983	514.49	497.94	1.65	0.1
7	0_7733301	Confined	1,672	7/30/1983	513.93	497.95	1.60	0.1
7	0_7733301	Confined	1,678	8/5/1983	513.31	497.97	1.53	0.1
7	0_7733301	Confined	1,683	8/10/1983	513.93	497.98	1.60	0.1
7	0_7733301	Confined	1,688	8/15/1983	513.08	497.99	1.51	0.1
7	0_7733301	Confined	1,691	8/18/1983	513.69	498.00	1.57	0.1
7	0_7733301	Confined	1,693	8/20/1983	513.80	498.00	1.58	0.1
7	0_7733301	Confined	1,698	8/25/1983	512.58	498.02	1.46	0.1
7	0_7733301	Confined	1,703	8/30/1983	512.64	498.03	1.46	0.1
7	0_7733301	Confined	1,709	9/5/1983	511.72	498.04	1.37	0.1
7	0_7733301	Confined	1,714	9/10/1983	511.58	498.06	1.35	0.1
7	0_7733301	Confined	1,719	9/15/1983	510.96	498.07	1.29	0.1
7	0_7733301	Confined	1,724	9/20/1983	510.96	498.08	1.29	0.1
7	0_7733301	Confined	1,729	9/25/1983	510.79	498.09	1.27	0.1
7	0_7733301	Confined	1,734	9/30/1983	510.86	498.10	1.28	0.1
7	0_7733301	Confined	1,739	10/5/1983	510.78	498.12	1.27	0.1
7	0_7733301	Confined	1,744	10/10/1983	511.85	498.13	1.37	0.1
7	0_7733301	Confined	1,749	10/15/1983	512.52	498.14	1.44	0.1
7	0_7733301	Confined	1,754	10/20/1983	512.26	498.15	1.41	0.1
7	0_7733301	Confined	1,759	10/25/1983	511.18	498.17	1.30	0.1
7	0_7733301	Confined	1,764	10/30/1983	510.73	498.18	1.26	0.1
7	0_7733301	Confined	1,770	11/5/1983	511.88	498.19	1.37	0.1
7	0_7733301	Confined	1,775	11/10/1983	511.27	498.20	1.31	0.1
7	0_7733301	Confined	1,780	11/15/1983	510.97	498.22	1.28	0.1
7	0_7733301	Confined	1,785	11/20/1983	510.85	498.23	1.26	0.1
7	0_7733301	Confined	1,790	11/25/1983	511.36	498.24	1.31	0.1
7	0_7733301	Confined	1,794	11/29/1983	509.16	498.25	1.09	0.1
7	0_7733301	Confined	1,795	11/30/1983	509.03	498.25	1.08	0.1
7	0_7733301	Confined	1,800	12/5/1983	510.10	498.27	1.18	0.1
7	0_7733301	Confined	1,805	12/10/1983	508.95	498.28	1.07	0.1
7	0_7733301	Confined	1,810	12/15/1983	508.50	498.29	1.02	0.1
7	0_7733301	Confined	1,815	12/20/1983	508.38	498.30	1.01	0.1
7	0_7733301	Confined	1,820	12/25/1983	507.86	498.31	0.95	0.1
7	0_7733301	Confined	1,825	12/30/1983	508.07	498.33	0.97	0.1
7	0_7733301	Confined	1,831	1/5/1984	509.83	498.33	1.15	0.1
7	0_7733301	Confined	1,836	1/10/1984	509.91	498.33	1.16	0.1
7	0_7733301	Confined	1,841	1/15/1984	510.21	498.32	1.19	0.1
7	0_7733301	Confined	1,846	1/20/1984	510.29	498.32	1.20	0.1
7	0_7733301	Confined	1,851	1/25/1984	510.72	498.32	1.24	0.1
7	0_7733301	Confined	1,856	1/30/1984	510.93	498.32	1.26	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	1,862	2/5/1984	510.67	498.32	1.24	0.1
7	0_7733301	Confined	1,867	2/10/1984	510.88	498.32	1.26	0.1
7	0_7733301	Confined	1,872	2/15/1984	509.26	498.31	1.09	0.1
7	0_7733301	Confined	1,873	2/16/1984	509.08	498.31	1.08	0.1
7	0_7733301	Confined	1,877	2/20/1984	508.53	498.31	1.02	0.1
7	0_7733301	Confined	1,882	2/25/1984	508.80	498.31	1.05	0.1
7	0_7733301	Confined	1,891	3/5/1984	509.13	498.31	1.08	0.1
7	0_7733301	Confined	1,896	3/10/1984	509.58	498.31	1.13	0.1
7	0_7733301	Confined	1,901	3/15/1984	509.93	498.31	1.16	0.1
7	0_7733301	Confined	1,906	3/20/1984	509.12	498.30	1.08	0.1
7	0_7733301	Confined	1,911	3/25/1984	509.95	498.30	1.16	0.1
7	0_7733301	Confined	1,916	3/30/1984	509.91	498.30	1.16	0.1
7	0_7733301	Confined	1,922	4/5/1984	509.53	498.30	1.12	0.1
7	0_7733301	Confined	1,927	4/10/1984	509.55	498.30	1.13	0.1
7	0_7733301	Confined	1,928	4/11/1984	508.69	498.30	1.04	0.1
7	0_7733301	Confined	1,932	4/15/1984	509.41	498.30	1.11	0.1
7	0_7733301	Confined	1,937	4/20/1984	510.41	498.29	1.21	0.1
7	0_7733301	Confined	1,942	4/25/1984	509.92	498.29	1.16	0.1
7	0_7733301	Confined	1,947	4/30/1984	509.79	498.29	1.15	0.1
7	0_7733301	Confined	1,952	5/5/1984	509.96	498.29	1.17	0.1
7	0_7733301	Confined	1,957	5/10/1984	510.14	498.29	1.19	0.1
7	0_7733301	Confined	1,962	5/15/1984	509.91	498.29	1.16	0.1
7	0_7733301	Confined	1,967	5/20/1984	510.36	498.28	1.21	0.1
7	0_7733301	Confined	1,972	5/25/1984	509.60	498.28	1.13	0.1
7	0_7733301	Confined	1,977	5/30/1984	510.02	498.28	1.17	0.1
7	0_7733301	Confined	1,983	6/5/1984	509.80	498.28	1.15	0.1
7	0_7733301	Confined	1,988	6/10/1984	510.23	498.28	1.20	0.1
7	0_7733301	Confined	1,990	6/12/1984	509.48	498.28	1.12	0.1
7	0_7733301	Confined	1,993	6/15/1984	510.03	498.28	1.18	0.1
7	0_7733301	Confined	1,998	6/20/1984	509.72	498.28	1.14	0.1
7	0_7733301	Confined	2,003	6/25/1984	509.56	498.27	1.13	0.1
7	0_7733301	Confined	2,008	6/30/1984	509.89	498.27	1.16	0.1
7	0_7733301	Confined	2,013	7/5/1984	509.76	498.27	1.15	0.1
7	0_7733301	Confined	2,018	7/10/1984	509.98	498.27	1.17	0.1
7	0_7733301	Confined	2,023	7/15/1984	511.27	498.27	1.30	0.1
7	0_7733301	Confined	2,028	7/20/1984	510.47	498.27	1.22	0.1
7	0_7733301	Confined	2,033	7/25/1984	510.09	498.26	1.18	0.1
7	0_7733301	Confined	2,038	7/30/1984	509.36	498.26	1.11	0.1
7	0_7733301	Confined	2,044	8/5/1984	509.77	498.26	1.15	0.1
7	0_7733301	Confined	2,049	8/10/1984	510.13	498.26	1.19	0.1
7	0_7733301	Confined	2,054	8/15/1984	510.27	498.26	1.20	0.1
7	0_7733301	Confined	2,059	8/20/1984	510.63	498.26	1.24	0.1
7	0_7733301	Confined	2,064	8/25/1984	510.64	498.25	1.24	0.1
7	0_7733301	Confined	2,069	8/30/1984	510.75	498.25	1.25	0.1
7	0_7733301	Confined	2,075	9/5/1984	510.70	498.25	1.24	0.1
7	0_7733301	Confined	2,080	9/10/1984	510.08	498.25	1.18	0.1
7	0_7733301	Confined	2,085	9/15/1984	509.14	498.25	1.09	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	2,090	9/20/1984	510.00	498.25	1.18	0.1
7	0_7733301	Confined	2,091	9/21/1984	512.02	498.25	1.38	0.1
7	0_7733301	Confined	2,095	9/25/1984	509.66	498.24	1.14	0.1
7	0_7733301	Confined	2,100	9/30/1984	509.45	498.24	1.12	0.1
7	0_7733301	Confined	2,105	10/5/1984	509.04	498.24	1.08	0.1
7	0_7733301	Confined	2,110	10/10/1984	509.38	498.24	1.11	0.1
7	0_7733301	Confined	2,115	10/15/1984	510.10	498.24	1.19	0.1
7	0_7733301	Confined	2,120	10/20/1984	510.12	498.24	1.19	0.1
7	0_7733301	Confined	2,125	10/25/1984	509.08	498.24	1.08	0.1
7	0_7733301	Confined	2,130	10/30/1984	509.66	498.23	1.14	0.1
7	0_7733301	Confined	2,136	11/5/1984	508.98	498.23	1.07	0.1
7	0_7733301	Confined	2,141	11/10/1984	508.28	498.23	1.00	0.1
7	0_7733301	Confined	2,146	11/15/1984	508.05	498.23	0.98	0.1
7	0_7733301	Confined	2,151	11/20/1984	508.61	498.23	1.04	0.1
7	0_7733301	Confined	2,156	11/25/1984	506.88	498.23	0.87	0.1
7	0_7733301	Confined	2,161	11/30/1984	506.66	498.22	0.84	0.1
7	0_7733301	Confined	2,166	12/5/1984	508.21	498.22	1.00	0.1
7	0_7733301	Confined	2,171	12/10/1984	507.74	498.22	0.95	0.1
7	0_7733301	Confined	2,176	12/15/1984	508.25	498.22	1.00	0.1
7	0_7733301	Confined	2,181	12/20/1984	507.34	498.22	0.91	0.1
7	0_7733301	Confined	2,186	12/25/1984	508.11	498.22	0.99	0.1
7	0_7733301	Confined	2,191	12/30/1984	508.23	498.21	1.00	0.1
7	0_7733301	Confined	2,197	1/5/1985	508.77	498.22	1.06	0.1
7	0_7733301	Confined	2,200	1/8/1985	509.21	498.22	1.10	0.1
7	0_7733301	Confined	2,202	1/10/1985	509.22	498.22	1.10	0.1
7	0_7733301	Confined	2,207	1/15/1985	509.48	498.22	1.13	0.1
7	0_7733301	Confined	2,212	1/20/1985	509.70	498.22	1.15	0.1
7	0_7733301	Confined	2,217	1/25/1985	509.59	498.22	1.14	0.1
7	0_7733301	Confined	2,231	2/8/1985	509.54	498.22	1.13	0.1
7	0_7733301	Confined	2,293	4/11/1985	509.04	498.24	1.08	0.1
7	0_7733301	Confined	2,297	4/15/1985	509.63	498.24	1.14	0.1
7	0_7733301	Confined	2,302	4/20/1985	509.81	498.24	1.16	0.1
7	0_7733301	Confined	2,307	4/25/1985	509.97	498.24	1.17	0.1
7	0_7733301	Confined	2,308	4/26/1985	508.18	498.24	0.99	0.1
7	0_7733301	Confined	2,312	4/30/1985	509.80	498.24	1.16	0.1
7	0_7733301	Confined	2,317	5/5/1985	509.98	498.24	1.17	0.1
7	0_7733301	Confined	2,322	5/10/1985	510.18	498.24	1.19	0.1
7	0_7733301	Confined	2,327	5/15/1985	509.91	498.24	1.17	0.1
7	0_7733301	Confined	2,332	5/20/1985	510.23	498.24	1.20	0.1
7	0_7733301	Confined	2,337	5/25/1985	510.25	498.24	1.20	0.1
7	0_7733301	Confined	2,342	5/30/1985	510.38	498.25	1.21	0.1
7	0_7733301	Confined	2,348	6/5/1985	510.38	498.25	1.21	0.1
7	0_7733301	Confined	2,353	6/10/1985	510.45	498.25	1.22	0.1
7	0_7733301	Confined	2,358	6/15/1985	510.48	498.25	1.22	0.1
7	0_7733301	Confined	2,363	6/20/1985	510.53	498.25	1.23	0.1
7	0_7733301	Confined	2,368	6/25/1985	510.46	498.25	1.22	0.1
7	0_7733301	Confined	2,373	6/30/1985	510.43	498.25	1.22	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	2,378	7/5/1985	510.66	498.25	1.24	0.1
7	0_7733301	Confined	2,383	7/10/1985	510.58	498.25	1.23	0.1
7	0_7733301	Confined	2,388	7/15/1985	510.64	498.25	1.24	0.1
7	0_7733301	Confined	2,393	7/20/1985	510.74	498.26	1.25	0.1
7	0_7733301	Confined	2,398	7/25/1985	510.74	498.26	1.25	0.1
7	0_7733301	Confined	2,403	7/30/1985	510.72	498.26	1.25	0.1
7	0_7733301	Confined	2,409	8/5/1985	510.84	498.26	1.26	0.1
7	0_7733301	Confined	2,414	8/10/1985	510.83	498.26	1.26	0.1
7	0_7733301	Confined	2,419	8/15/1985	511.19	498.26	1.29	0.1
7	0_7733301	Confined	2,424	8/20/1985	510.37	498.26	1.21	0.1
7	0_7733301	Confined	2,429	8/25/1985	510.24	498.26	1.20	0.1
7	0_7733301	Confined	2,434	8/30/1985	509.94	498.26	1.17	0.1
7	0_7733301	Confined	2,440	9/5/1985	509.98	498.27	1.17	0.1
7	0_7733301	Confined	2,445	9/10/1985	509.81	498.27	1.15	0.1
7	0_7733301	Confined	2,450	9/15/1985	509.68	498.27	1.14	0.1
7	0_7733301	Confined	2,455	9/20/1985	509.53	498.27	1.13	0.1
7	0_7733301	Confined	2,460	9/25/1985	508.59	498.27	1.03	0.1
7	0_7733301	Confined	2,461	9/26/1985	508.18	498.27	0.99	0.1
7	0_7733301	Confined	2,465	9/30/1985	507.93	498.27	0.97	0.1
7	0_7733301	Confined	2,470	10/5/1985	507.76	498.27	0.95	0.1
7	0_7733301	Confined	2,475	10/10/1985	508.16	498.27	0.99	0.1
7	0_7733301	Confined	2,480	10/15/1985	507.70	498.27	0.94	0.1
7	0_7733301	Confined	2,485	10/20/1985	507.89	498.27	0.96	0.1
7	0_7733301	Confined	2,490	10/25/1985	508.48	498.28	1.02	0.1
7	0_7733301	Confined	2,495	10/30/1985	508.93	498.28	1.07	0.1
7	0_7733301	Confined	2,501	11/5/1985	509.01	498.28	1.07	0.1
7	0_7733301	Confined	2,506	11/10/1985	509.18	498.28	1.09	0.1
7	0_7733301	Confined	2,511	11/15/1985	508.88	498.28	1.06	0.1
7	0_7733301	Confined	2,516	11/20/1985	508.00	498.28	0.97	0.1
7	0_7733301	Confined	2,521	11/25/1985	509.00	498.28	1.07	0.1
7	0_7733301	Confined	2,526	11/30/1985	509.33	498.28	1.10	0.1
7	0_7733301	Confined	2,531	12/5/1985	508.65	498.28	1.04	0.1
7	0_7733301	Confined	2,536	12/10/1985	509.13	498.29	1.08	0.1
7	0_7733301	Confined	2,541	12/15/1985	508.26	498.29	1.00	0.1
7	0_7733301	Confined	2,546	12/20/1985	507.77	498.29	0.95	0.1
7	0_7733301	Confined	2,551	12/25/1985	507.63	498.29	0.93	0.1
7	0_7733301	Confined	2,556	12/30/1985	508.52	498.29	1.02	0.1
7	0_7733301	Confined	2,562	1/5/1986	507.43	498.31	0.91	0.1
7	0_7733301	Confined	2,567	1/10/1986	508.11	498.34	0.98	0.1
7	0_7733301	Confined	2,570	1/13/1986	509.28	498.35	1.09	0.1
7	0_7733301	Confined	2,572	1/15/1986	508.66	498.36	1.03	0.1
7	0_7733301	Confined	2,577	1/20/1986	508.93	498.38	1.05	0.1
7	0_7733301	Confined	2,582	1/25/1986	508.14	498.40	0.97	0.1
7	0_7733301	Confined	2,587	1/30/1986	508.68	498.43	1.03	0.1
7	0_7733301	Confined	2,593	2/5/1986	508.16	498.45	0.97	0.1
7	0_7733301	Confined	2,598	2/10/1986	508.29	498.48	0.98	0.1
7	0_7733301	Confined	2,599	2/11/1986	508.38	498.48	0.99	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	2,603	2/15/1986	508.65	498.50	1.02	0.1
7	0_7733301	Confined	2,608	2/20/1986	508.43	498.52	0.99	0.1
7	0_7733301	Confined	2,613	2/25/1986	508.30	498.55	0.98	0.1
7	0_7733301	Confined	2,616	2/28/1986	508.23	498.56	0.97	0.1
7	0_7733301	Confined	2,621	3/5/1986	507.73	498.58	0.91	0.1
7	0_7733301	Confined	2,626	3/10/1986	507.48	498.60	0.89	0.1
7	0_7733301	Confined	2,631	3/15/1986	507.71	498.63	0.91	0.1
7	0_7733301	Confined	2,636	3/20/1986	507.64	498.65	0.90	0.1
7	0_7733301	Confined	2,641	3/25/1986	508.31	498.67	0.96	0.1
7	0_7733301	Confined	2,646	3/30/1986	508.58	498.70	0.99	0.1
7	0_7733301	Confined	2,652	4/5/1986	508.61	498.72	0.99	0.1
7	0_7733301	Confined	2,657	4/10/1986	508.73	498.75	1.00	0.1
7	0_7733301	Confined	2,662	4/15/1986	508.59	498.77	0.98	0.1
7	0_7733301	Confined	2,667	4/20/1986	508.83	498.79	1.00	0.1
7	0_7733301	Confined	2,672	4/25/1986	509.11	498.81	1.03	0.1
7	0_7733301	Confined	2,677	4/30/1986	509.10	498.84	1.03	0.1
7	0_7733301	Confined	2,682	5/5/1986	509.39	498.86	1.05	0.1
7	0_7733301	Confined	2,687	5/10/1986	509.28	498.88	1.04	0.1
7	0_7733301	Confined	2,692	5/15/1986	509.40	498.91	1.05	0.1
7	0_7733301	Confined	2,697	5/20/1986	509.33	498.93	1.04	0.1
7	0_7733301	Confined	2,702	5/25/1986	509.41	498.95	1.05	0.1
7	0_7733301	Confined	2,707	5/30/1986	509.48	498.97	1.05	0.1
7	0_7733301	Confined	2,713	6/5/1986	509.65	499.00	1.06	0.1
7	0_7733301	Confined	2,718	6/10/1986	509.57	499.03	1.05	0.1
7	0_7733301	Confined	2,723	6/15/1986	509.68	499.05	1.06	0.1
7	0_7733301	Confined	2,728	6/20/1986	509.70	499.07	1.06	0.1
7	0_7733301	Confined	2,733	6/25/1986	509.75	499.09	1.07	0.1
7	0_7733301	Confined	2,738	6/30/1986	509.89	499.12	1.08	0.1
7	0_7733301	Confined	2,743	7/5/1986	509.88	499.14	1.07	0.1
7	0_7733301	Confined	2,748	7/10/1986	509.99	499.16	1.08	0.1
7	0_7733301	Confined	2,753	7/15/1986	509.85	499.18	1.07	0.1
7	0_7733301	Confined	2,758	7/20/1986	510.01	499.21	1.08	0.1
7	0_7733301	Confined	2,763	7/25/1986	510.06	499.23	1.08	0.1
7	0_7733301	Confined	2,768	7/30/1986	509.90	499.25	1.06	0.1
7	0_7733301	Confined	2,774	8/5/1986	509.66	499.28	1.04	0.1
7	0_7733301	Confined	2,779	8/10/1986	509.82	499.30	1.05	0.1
7	0_7733301	Confined	2,784	8/15/1986	509.95	499.33	1.06	0.1
7	0_7733301	Confined	2,789	8/20/1986	510.00	499.35	1.07	0.1
7	0_7733301	Confined	2,794	8/25/1986	509.96	499.37	1.06	0.1
7	0_7733301	Confined	2,799	8/30/1986	508.42	499.40	0.90	0.1
7	0_7733301	Confined	2,805	9/5/1986	508.18	499.42	0.88	0.1
7	0_7733301	Confined	2,810	9/10/1986	508.98	499.45	0.95	0.1
7	0_7733301	Confined	2,815	9/15/1986	509.01	499.47	0.95	0.1
7	0_7733301	Confined	2,820	9/20/1986	507.68	499.49	0.82	0.1
7	0_7733301	Confined	2,825	9/25/1986	507.28	499.51	0.78	0.1
7	0_7733301	Confined	2,830	9/30/1986	507.14	499.54	0.76	0.1
7	0_7733301	Confined	2,835	10/5/1986	506.34	499.56	0.68	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	2,840	10/10/1986	507.48	499.58	0.79	0.1
7	0_7733301	Confined	2,845	10/15/1986	507.58	499.61	0.80	0.1
7	0_7733301	Confined	2,850	10/20/1986	507.92	499.63	0.83	0.1
7	0_7733301	Confined	2,855	10/25/1986	508.16	499.65	0.85	0.1
7	0_7733301	Confined	2,860	10/30/1986	508.28	499.67	0.86	0.1
7	0_7733301	Confined	2,866	11/5/1986	508.48	499.70	0.88	0.1
7	0_7733301	Confined	2,871	11/10/1986	508.65	499.72	0.89	0.1
7	0_7733301	Confined	2,876	11/15/1986	508.82	499.75	0.91	0.1
7	0_7733301	Confined	2,881	11/20/1986	508.98	499.77	0.92	0.1
7	0_7733301	Confined	2,886	11/25/1986	508.91	499.79	0.91	0.1
7	0_7733301	Confined	2,891	11/30/1986	508.73	499.82	0.89	0.1
7	0_7733301	Confined	2,896	12/5/1986	508.58	499.84	0.87	0.1
7	0_7733301	Confined	2,901	12/10/1986	507.68	499.86	0.78	0.1
7	0_7733301	Confined	2,906	12/15/1986	507.88	499.88	0.80	0.1
7	0_7733301	Confined	2,911	12/20/1986	508.21	499.91	0.83	0.1
7	0_7733301	Confined	2,916	12/25/1986	508.51	499.93	0.86	0.1
7	0_7733301	Confined	2,921	12/30/1986	508.60	499.95	0.86	0.1
7	0_7733301	Confined	2,927	1/5/1987	508.83	500.00	0.88	0.1
7	0_7733301	Confined	2,932	1/10/1987	509.00	500.03	0.90	0.1
7	0_7733301	Confined	2,937	1/15/1987	508.50	500.07	0.84	0.1
7	0_7733301	Confined	2,942	1/20/1987	508.93	500.11	0.88	0.1
7	0_7733301	Confined	2,947	1/25/1987	509.13	500.15	0.90	0.1
7	0_7733301	Confined	2,952	1/30/1987	509.06	500.19	0.89	0.1
7	0_7733301	Confined	2,958	2/5/1987	509.17	500.23	0.89	0.1
7	0_7733301	Confined	2,963	2/10/1987	509.17	500.27	0.89	0.1
7	0_7733301	Confined	2,968	2/15/1987	509.82	500.31	0.95	0.1
7	0_7733301	Confined	2,973	2/20/1987	509.28	500.35	0.89	0.1
7	0_7733301	Confined	2,978	2/25/1987	509.50	500.39	0.91	0.1
7	0_7733301	Confined	2,981	2/28/1987	509.75	500.41	0.93	0.1
7	0_7733301	Confined	2,986	3/5/1987	509.21	500.45	0.88	0.1
7	0_7733301	Confined	2,991	3/10/1987	509.47	500.49	0.90	0.1
7	0_7733301	Confined	2,996	3/15/1987	509.80	500.53	0.93	0.1
7	0_7733301	Confined	3,001	3/20/1987	509.61	500.56	0.90	0.1
7	0_7733301	Confined	3,006	3/25/1987	508.40	500.60	0.78	0.1
7	0_7733301	Confined	3,011	3/30/1987	508.41	500.64	0.78	0.1
7	0_7733301	Confined	3,017	4/5/1987	509.01	500.69	0.83	0.1
7	0_7733301	Confined	3,022	4/10/1987	509.43	500.73	0.87	0.1
7	0_7733301	Confined	3,027	4/15/1987	508.95	500.76	0.82	0.1
7	0_7733301	Confined	3,032	4/20/1987	508.35	500.80	0.75	0.1
7	0_7733301	Confined	3,037	4/25/1987	508.58	500.84	0.77	0.1
7	0_7733301	Confined	3,042	4/30/1987	509.14	500.88	0.83	0.1
7	0_7733301	Confined	3,047	5/5/1987	509.03	500.92	0.81	0.1
7	0_7733301	Confined	3,052	5/10/1987	509.32	500.96	0.84	0.1
7	0_7733301	Confined	3,057	5/15/1987	509.25	501.00	0.83	0.1
7	0_7733301	Confined	3,062	5/20/1987	509.43	501.03	0.84	0.1
7	0_7733301	Confined	3,067	5/25/1987	509.53	501.07	0.85	0.1
7	0_7733301	Confined	3,072	5/30/1987	509.45	501.11	0.83	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	3,078	6/5/1987	509.36	501.16	0.82	0.1
7	0_7733301	Confined	3,083	6/10/1987	509.66	501.20	0.85	0.1
7	0_7733301	Confined	3,088	6/15/1987	509.68	501.23	0.84	0.1
7	0_7733301	Confined	3,093	6/20/1987	509.78	501.27	0.85	0.1
7	0_7733301	Confined	3,098	6/25/1987	509.63	501.31	0.83	0.1
7	0_7733301	Confined	3,103	6/30/1987	509.75	501.35	0.84	0.1
7	0_7733301	Confined	3,108	7/5/1987	509.78	501.39	0.84	0.1
7	0_7733301	Confined	3,113	7/10/1987	509.74	501.43	0.83	0.1
7	0_7733301	Confined	3,118	7/15/1987	509.75	501.46	0.83	0.1
7	0_7733301	Confined	3,123	7/20/1987	509.72	501.50	0.82	0.1
7	0_7733301	Confined	3,128	7/25/1987	509.74	501.54	0.82	0.1
7	0_7733301	Confined	3,133	7/30/1987	509.88	501.58	0.83	0.1
7	0_7733301	Confined	3,139	8/5/1987	509.93	501.63	0.83	0.1
7	0_7733301	Confined	3,144	8/10/1987	509.96	501.66	0.83	0.1
7	0_7733301	Confined	3,149	8/15/1987	510.01	501.70	0.83	0.1
7	0_7733301	Confined	3,154	8/20/1987	509.85	501.74	0.81	0.1
7	0_7733301	Confined	3,159	8/25/1987	509.98	501.78	0.82	0.1
7	0_7733301	Confined	3,164	8/30/1987	509.87	501.82	0.81	0.1
7	0_7733301	Confined	3,170	9/5/1987	509.57	501.86	0.77	0.1
7	0_7733301	Confined	3,175	9/10/1987	508.34	501.90	0.64	0.1
7	0_7733301	Confined	3,180	9/15/1987	508.48	501.94	0.65	0.1
7	0_7733301	Confined	3,185	9/20/1987	507.67	501.98	0.57	0.1
7	0_7733301	Confined	3,190	9/25/1987	507.13	502.02	0.51	0.1
7	0_7733301	Confined	3,195	9/30/1987	508.48	502.06	0.64	0.1
7	0_7733301	Confined	3,200	10/5/1987	506.61	502.09	0.45	0.1
7	0_7733301	Confined	3,205	10/10/1987	505.97	502.13	0.38	0.1
7	0_7733301	Confined	3,210	10/15/1987	506.15	502.17	0.40	0.1
7	0_7733301	Confined	3,215	10/20/1987	505.73	502.21	0.35	0.1
7	0_7733301	Confined	3,220	10/25/1987	506.21	502.25	0.40	0.1
7	0_7733301	Confined	3,225	10/30/1987	505.97	502.29	0.37	0.1
7	0_7733301	Confined	3,231	11/5/1987	505.37	502.33	0.30	0.1
7	0_7733301	Confined	3,236	11/10/1987	505.65	502.37	0.33	0.1
7	0_7733301	Confined	3,241	11/15/1987	506.76	502.41	0.43	0.1
7	0_7733301	Confined	3,246	11/20/1987	504.93	502.45	0.25	0.1
7	0_7733301	Confined	3,251	11/25/1987	505.28	502.49	0.28	0.1
7	0_7733301	Confined	3,256	11/30/1987	504.83	502.53	0.23	0.1
7	0_7733301	Confined	3,261	12/5/1987	505.53	502.56	0.30	0.1
7	0_7733301	Confined	3,266	12/10/1987	505.57	502.60	0.30	0.1
7	0_7733301	Confined	3,271	12/15/1987	505.20	502.64	0.26	0.1
7	0_7733301	Confined	3,276	12/20/1987	505.53	502.68	0.29	0.1
7	0_7733301	Confined	3,281	12/25/1987	505.48	502.72	0.28	0.1
7	0_7733301	Confined	3,286	12/30/1987	504.83	502.76	0.21	0.1
7	0_7733301	Confined	3,292	1/5/1988	505.88	502.78	0.31	0.1
7	0_7733301	Confined	3,297	1/10/1988	506.01	502.79	0.32	0.1
7	0_7733301	Confined	3,302	1/15/1988	506.49	502.81	0.37	0.1
7	0_7733301	Confined	3,307	1/20/1988	506.60	502.82	0.38	0.1
7	0_7733301	Confined	3,312	1/25/1988	506.51	502.84	0.37	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	3,317	1/30/1988	505.88	502.85	0.30	0.1
7	0_7733301	Confined	3,323	2/5/1988	505.34	502.87	0.25	0.1
7	0_7733301	Confined	3,328	2/10/1988	506.38	502.88	0.35	0.1
7	0_7733301	Confined	3,333	2/15/1988	506.30	502.90	0.34	0.1
7	0_7733301	Confined	3,338	2/20/1988	506.46	502.91	0.36	0.1
7	0_7733301	Confined	3,343	2/25/1988	506.46	502.92	0.35	0.1
7	0_7733301	Confined	3,346	2/28/1988	506.90	502.93	0.40	0.1
7	0_7733301	Confined	3,352	3/5/1988	506.79	502.95	0.38	0.1
7	0_7733301	Confined	3,357	3/10/1988	507.13	502.96	0.42	0.1
7	0_7733301	Confined	3,362	3/15/1988	506.74	502.98	0.38	0.1
7	0_7733301	Confined	3,367	3/20/1988	506.87	502.99	0.39	0.1
7	0_7733301	Confined	3,372	3/25/1988	507.03	503.01	0.40	0.1
7	0_7733301	Confined	3,377	3/30/1988	507.12	503.02	0.41	0.1
7	0_7733301	Confined	3,383	4/5/1988	507.18	503.04	0.41	0.1
7	0_7733301	Confined	3,388	4/10/1988	507.12	503.05	0.41	0.1
7	0_7733301	Confined	3,393	4/15/1988	507.45	503.07	0.44	0.1
7	0_7733301	Confined	3,398	4/20/1988	507.63	503.08	0.45	0.1
7	0_7733301	Confined	3,403	4/25/1988	507.54	503.09	0.44	0.1
7	0_7733301	Confined	3,408	4/30/1988	507.63	503.11	0.45	0.1
7	0_7733301	Confined	3,413	5/5/1988	507.55	503.12	0.44	0.1
7	0_7733301	Confined	3,418	5/10/1988	507.68	503.14	0.45	0.1
7	0_7733301	Confined	3,423	5/15/1988	507.98	503.15	0.48	0.1
7	0_7733301	Confined	3,428	5/20/1988	508.08	503.17	0.49	0.1
7	0_7733301	Confined	3,433	5/25/1988	507.92	503.18	0.47	0.1
7	0_7733301	Confined	3,438	5/30/1988	508.20	503.19	0.50	0.1
7	0_7733301	Confined	3,444	6/5/1988	508.06	503.21	0.48	0.1
7	0_7733301	Confined	3,449	6/10/1988	508.20	503.23	0.50	0.1
7	0_7733301	Confined	3,454	6/15/1988	508.04	503.24	0.48	0.1
7	0_7733301	Confined	3,459	6/20/1988	508.23	503.25	0.50	0.1
7	0_7733301	Confined	3,464	6/25/1988	508.37	503.27	0.51	0.1
7	0_7733301	Confined	3,469	6/30/1988	508.53	503.28	0.52	0.1
7	0_7733301	Confined	3,474	7/5/1988	508.30	503.30	0.50	0.1
7	0_7733301	Confined	3,479	7/10/1988	508.51	503.31	0.52	0.1
7	0_7733301	Confined	3,484	7/15/1988	508.42	503.33	0.51	0.1
7	0_7733301	Confined	3,489	7/20/1988	508.48	503.34	0.51	0.1
7	0_7733301	Confined	3,494	7/25/1988	508.55	503.35	0.52	0.1
7	0_7733301	Confined	3,499	7/30/1988	508.46	503.37	0.51	0.1
7	0_7733301	Confined	3,505	8/5/1988	508.65	503.39	0.53	0.1
7	0_7733301	Confined	3,510	8/10/1988	508.73	503.40	0.53	0.1
7	0_7733301	Confined	3,515	8/15/1988	508.57	503.41	0.52	0.1
7	0_7733301	Confined	3,520	8/20/1988	508.71	503.43	0.53	0.1
7	0_7733301	Confined	3,525	8/25/1988	508.66	503.44	0.52	0.1
7	0_7733301	Confined	3,530	8/30/1988	508.69	503.46	0.52	0.1
7	0_7733301	Confined	3,536	9/5/1988	508.64	503.47	0.52	0.1
7	0_7733301	Confined	3,541	9/10/1988	508.61	503.49	0.51	0.1
7	0_7733301	Confined	3,546	9/15/1988	508.66	503.50	0.52	0.1
7	0_7733301	Confined	3,551	9/20/1988	508.61	503.52	0.51	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	3,556	9/25/1988	508.50	503.53	0.50	0.1
7	0_7733301	Confined	3,561	9/30/1988	508.49	503.54	0.49	0.1
7	0_7733301	Confined	3,566	10/5/1988	508.37	503.56	0.48	0.1
7	0_7733301	Confined	3,571	10/10/1988	508.50	503.57	0.49	0.1
7	0_7733301	Confined	3,576	10/15/1988	508.66	503.59	0.51	0.1
7	0_7733301	Confined	3,581	10/20/1988	508.73	503.60	0.51	0.1
7	0_7733301	Confined	3,586	10/25/1988	508.60	503.62	0.50	0.1
7	0_7733301	Confined	3,591	10/30/1988	508.47	503.63	0.48	0.1
7	0_7733301	Confined	3,597	11/5/1988	508.75	503.65	0.51	0.1
7	0_7733301	Confined	3,602	11/10/1988	508.49	503.66	0.48	0.1
7	0_7733301	Confined	3,607	11/15/1988	508.88	503.68	0.52	0.1
7	0_7733301	Confined	3,612	11/20/1988	508.36	503.69	0.47	0.1
7	0_7733301	Confined	3,617	11/25/1988	509.08	503.70	0.54	0.1
7	0_7733301	Confined	3,622	11/30/1988	508.38	503.72	0.47	0.1
7	0_7733301	Confined	3,627	12/5/1988	508.43	503.73	0.47	0.1
7	0_7733301	Confined	3,632	12/10/1988	508.62	503.75	0.49	0.1
7	0_7733301	Confined	3,637	12/15/1988	508.74	503.76	0.50	0.1
7	0_7733301	Confined	3,642	12/20/1988	508.84	503.78	0.51	0.1
7	0_7733301	Confined	3,647	12/25/1988	508.58	503.79	0.48	0.1
7	0_7733301	Confined	3,652	12/30/1988	508.50	503.80	0.47	0.1
7	0_7733301	Confined	3,658	1/5/1989	508.61	503.83	0.48	0.1
7	0_7733301	Confined	3,663	1/10/1989	508.38	503.85	0.45	0.1
7	0_7733301	Confined	3,668	1/15/1989	508.43	503.88	0.46	0.1
7	0_7733301	Confined	3,673	1/20/1989	508.37	503.90	0.45	0.1
7	0_7733301	Confined	3,678	1/25/1989	508.66	503.92	0.47	0.1
7	0_7733301	Confined	3,683	1/30/1989	508.43	503.95	0.45	0.1
7	0_7733301	Confined	3,689	2/5/1989	508.53	503.98	0.46	0.1
7	0_7733301	Confined	3,692	2/8/1989	508.09	503.99	0.41	0.1
7	0_7733301	Confined	3,694	2/10/1989	508.51	504.00	0.45	0.1
7	0_7733301	Confined	3,699	2/15/1989	508.84	504.02	0.48	0.1
7	0_7733301	Confined	3,704	2/20/1989	509.11	504.05	0.51	0.1
7	0_7733301	Confined	3,709	2/25/1989	508.74	504.07	0.47	0.1
7	0_7733301	Confined	3,712	2/28/1989	509.14	504.08	0.51	0.1
7	0_7733301	Confined	3,717	3/5/1989	508.34	504.11	0.42	0.1
7	0_7733301	Confined	3,722	3/10/1989	508.66	504.13	0.45	0.1
7	0_7733301	Confined	3,727	3/15/1989	509.10	504.15	0.49	0.1
7	0_7733301	Confined	3,732	3/20/1989	509.03	504.18	0.49	0.1
7	0_7733301	Confined	3,737	3/25/1989	508.95	504.20	0.48	0.1
7	0_7733301	Confined	3,742	3/30/1989	508.86	504.22	0.46	0.1
7	0_7733301	Confined	3,748	4/5/1989	508.38	504.25	0.41	0.1
7	0_7733301	Confined	3,753	4/10/1989	508.44	504.27	0.42	0.1
7	0_7733301	Confined	3,758	4/15/1989	508.61	504.30	0.43	0.1
7	0_7733301	Confined	3,763	4/20/1989	508.64	504.32	0.43	0.1
7	0_7733301	Confined	3,768	4/25/1989	508.73	504.34	0.44	0.1
7	0_7733301	Confined	3,773	4/30/1989	508.65	504.37	0.43	0.1
7	0_7733301	Confined	3,778	5/5/1989	508.94	504.39	0.45	0.1
7	0_7733301	Confined	3,783	5/10/1989	508.79	504.41	0.44	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	3,788	5/15/1989	508.84	504.44	0.44	0.1
7	0_7733301	Confined	3,793	5/20/1989	508.78	504.46	0.43	0.1
7	0_7733301	Confined	3,798	5/25/1989	509.00	504.49	0.45	0.1
7	0_7733301	Confined	3,803	5/30/1989	508.89	504.51	0.44	0.1
7	0_7733301	Confined	3,809	6/5/1989	508.91	504.54	0.44	0.1
7	0_7733301	Confined	3,814	6/10/1989	508.91	504.56	0.44	0.1
7	0_7733301	Confined	3,819	6/15/1989	508.65	504.58	0.41	0.1
7	0_7733301	Confined	3,824	6/20/1989	508.95	504.61	0.43	0.1
7	0_7733301	Confined	3,829	6/25/1989	508.89	504.63	0.43	0.1
7	0_7733301	Confined	3,834	6/30/1989	508.89	504.65	0.42	0.1
7	0_7733301	Confined	3,839	7/5/1989	508.84	504.68	0.42	0.1
7	0_7733301	Confined	3,844	7/10/1989	508.93	504.70	0.42	0.1
7	0_7733301	Confined	3,849	7/15/1989	509.03	504.72	0.43	0.1
7	0_7733301	Confined	3,854	7/20/1989	508.98	504.75	0.42	0.1
7	0_7733301	Confined	3,859	7/25/1989	508.86	504.77	0.41	0.1
7	0_7733301	Confined	3,864	7/30/1989	509.08	504.79	0.43	0.1
7	0_7733301	Confined	3,870	8/5/1989	509.09	504.82	0.43	0.1
7	0_7733301	Confined	3,875	8/10/1989	508.93	504.85	0.41	0.1
7	0_7733301	Confined	3,880	8/15/1989	509.10	504.87	0.42	0.1
7	0_7733301	Confined	3,885	8/20/1989	509.15	504.89	0.43	0.1
7	0_7733301	Confined	3,890	8/25/1989	509.10	504.92	0.42	0.1
7	0_7733301	Confined	3,895	8/30/1989	509.11	504.94	0.42	0.1
7	0_7733301	Confined	3,901	9/5/1989	509.03	504.97	0.41	0.1
7	0_7733301	Confined	3,906	9/10/1989	509.12	504.99	0.41	0.1
7	0_7733301	Confined	3,911	9/15/1989	508.93	505.01	0.39	0.1
7	0_7733301	Confined	3,916	9/20/1989	509.11	505.04	0.41	0.1
7	0_7733301	Confined	3,921	9/25/1989	509.02	505.06	0.40	0.1
7	0_7733301	Confined	3,926	9/30/1989	509.13	505.08	0.40	0.1
7	0_7733301	Confined	3,931	10/5/1989	509.18	505.11	0.41	0.1
7	0_7733301	Confined	3,936	10/10/1989	508.97	505.13	0.38	0.1
7	0_7733301	Confined	3,941	10/15/1989	509.32	505.15	0.42	0.1
7	0_7733301	Confined	3,946	10/20/1989	508.96	505.18	0.38	0.1
7	0_7733301	Confined	3,951	10/25/1989	509.11	505.20	0.39	0.1
7	0_7733301	Confined	3,956	10/30/1989	509.20	505.22	0.40	0.1
7	0_7733301	Confined	3,962	11/5/1989	509.27	505.25	0.40	0.1
7	0_7733301	Confined	3,967	11/10/1989	509.03	505.28	0.38	0.1
7	0_7733301	Confined	3,972	11/15/1989	509.27	505.30	0.40	0.1
7	0_7733301	Confined	3,977	11/20/1989	509.09	505.32	0.38	0.1
7	0_7733301	Confined	3,982	11/25/1989	509.28	505.35	0.39	0.1
7	0_7733301	Confined	3,987	11/30/1989	508.80	505.37	0.34	0.1
7	0_7733301	Confined	3,992	12/5/1989	509.42	505.39	0.40	0.1
7	0_7733301	Confined	3,997	12/10/1989	509.42	505.42	0.40	0.1
7	0_7733301	Confined	4,002	12/15/1989	509.28	505.44	0.38	0.1
7	0_7733301	Confined	4,007	12/20/1989	509.05	505.46	0.36	0.1
7	0_7733301	Confined	4,012	12/25/1989	509.13	505.49	0.36	0.1
7	0_7733301	Confined	4,017	12/30/1989	509.41	505.51	0.39	0.1
7	0_7733301	Confined	4,023	1/5/1990	509.20	505.55	0.37	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	4,028	1/10/1990	509.03	505.59	0.34	0.1
7	0_7733301	Confined	4,033	1/15/1990	509.30	505.62	0.37	0.1
7	0_7733301	Confined	4,038	1/20/1990	509.18	505.66	0.35	0.1
7	0_7733301	Confined	4,043	1/25/1990	509.23	505.69	0.35	0.1
7	0_7733301	Confined	4,048	1/30/1990	509.31	505.73	0.36	0.1
7	0_7733301	Confined	4,054	2/5/1990	509.21	505.77	0.34	0.1
7	0_7733301	Confined	4,059	2/10/1990	509.23	505.81	0.34	0.1
7	0_7733301	Confined	4,064	2/15/1990	509.44	505.84	0.36	0.1
7	0_7733301	Confined	4,069	2/20/1990	509.23	505.88	0.34	0.1
7	0_7733301	Confined	4,074	2/25/1990	508.95	505.91	0.30	0.1
7	0_7733301	Confined	4,077	2/28/1990	509.09	505.93	0.32	0.1
7	0_7733301	Confined	4,082	3/5/1990	509.40	505.97	0.34	0.1
7	0_7733301	Confined	4,087	3/10/1990	509.27	506.00	0.33	0.1
7	0_7733301	Confined	4,092	3/15/1990	509.28	506.04	0.32	0.1
7	0_7733301	Confined	4,097	3/20/1990	508.86	506.08	0.28	0.1
7	0_7733301	Confined	4,102	3/25/1990	508.91	506.11	0.28	0.1
7	0_7733301	Confined	4,107	3/30/1990	509.54	506.15	0.34	0.1
7	0_7733301	Confined	4,113	4/5/1990	509.48	506.19	0.33	0.1
7	0_7733301	Confined	4,118	4/10/1990	509.22	506.23	0.30	0.1
7	0_7733301	Confined	4,123	4/15/1990	509.38	506.26	0.31	0.1
7	0_7733301	Confined	4,128	4/20/1990	509.18	506.30	0.29	0.1
7	0_7733301	Confined	4,133	4/25/1990	509.46	506.33	0.31	0.1
7	0_7733301	Confined	4,138	4/30/1990	509.34	506.37	0.30	0.1
7	0_7733301	Confined	4,143	5/5/1990	508.94	506.40	0.25	0.1
7	0_7733301	Confined	4,148	5/10/1990	509.18	506.44	0.27	0.1
7	0_7733301	Confined	4,153	5/15/1990	509.33	506.47	0.29	0.1
7	0_7733301	Confined	4,158	5/20/1990	509.39	506.51	0.29	0.1
7	0_7733301	Confined	4,163	5/25/1990	509.29	506.55	0.27	0.1
7	0_7733301	Confined	4,168	5/30/1990	509.28	506.58	0.27	0.1
7	0_7733301	Confined	4,174	6/5/1990	509.25	506.62	0.26	0.1
7	0_7733301	Confined	4,179	6/10/1990	509.10	506.66	0.24	0.1
7	0_7733301	Confined	4,184	6/15/1990	509.33	506.69	0.26	0.1
7	0_7733301	Confined	4,189	6/20/1990	509.21	506.73	0.25	0.1
7	0_7733301	Confined	4,194	6/25/1990	509.08	506.77	0.23	0.1
7	0_7733301	Confined	4,199	6/30/1990	508.96	506.80	0.22	0.1
7	0_7733301	Confined	4,204	7/5/1990	509.06	506.84	0.22	0.1
7	0_7733301	Confined	4,209	7/10/1990	508.95	506.87	0.21	0.1
7	0_7733301	Confined	4,214	7/15/1990	509.02	506.91	0.21	0.1
7	0_7733301	Confined	4,219	7/20/1990	508.92	506.94	0.20	0.1
7	0_7733301	Confined	4,224	7/25/1990	509.04	506.98	0.21	0.1
7	0_7733301	Confined	4,229	7/30/1990	509.01	507.01	0.20	0.1
7	0_7733301	Confined	4,235	8/5/1990	509.03	507.06	0.20	0.1
7	0_7733301	Confined	4,240	8/10/1990	509.05	507.09	0.20	0.1
7	0_7733301	Confined	4,245	8/15/1990	509.14	507.13	0.20	0.1
7	0_7733301	Confined	4,250	8/20/1990	509.15	507.16	0.20	0.1
7	0_7733301	Confined	4,255	8/25/1990	509.15	507.20	0.20	0.1
7	0_7733301	Confined	4,260	8/30/1990	509.20	507.23	0.20	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	4,266	9/5/1990	509.05	507.28	0.18	0.1
7	0_7733301	Confined	4,271	9/10/1990	509.24	507.31	0.19	0.1
7	0_7733301	Confined	4,276	9/15/1990	509.20	507.35	0.19	0.1
7	0_7733301	Confined	4,277	9/16/1990	509.14	507.36	0.18	0.1
7	0_7733301	Confined	4,281	9/20/1990	509.22	507.38	0.18	0.1
7	0_7733301	Confined	4,286	9/25/1990	509.20	507.42	0.18	0.1
7	0_7733301	Confined	4,291	9/30/1990	509.10	507.46	0.16	0.1
7	0_7733301	Confined	4,296	10/5/1990	509.14	507.49	0.16	0.1
7	0_7733301	Confined	4,301	10/10/1990	509.06	507.53	0.15	0.1
7	0_7733301	Confined	4,306	10/15/1990	509.29	507.56	0.17	0.1
7	0_7733301	Confined	4,311	10/20/1990	509.43	507.60	0.18	0.1
7	0_7733301	Confined	4,316	10/25/1990	509.01	507.63	0.14	0.1
7	0_7733301	Confined	4,321	10/30/1990	509.17	507.67	0.15	0.1
7	0_7733301	Confined	4,327	11/5/1990	509.30	507.71	0.16	0.1
7	0_7733301	Confined	4,332	11/10/1990	509.00	507.75	0.13	0.1
7	0_7733301	Confined	4,337	11/15/1990	509.20	507.78	0.14	0.1
7	0_7733301	Confined	4,342	11/20/1990	509.42	507.82	0.16	0.1
7	0_7733301	Confined	4,347	11/25/1990	509.43	507.85	0.16	0.1
7	0_7733301	Confined	4,352	11/30/1990	509.10	507.89	0.12	0.1
7	0_7733301	Confined	4,357	12/5/1990	509.22	507.92	0.13	0.1
7	0_7733301	Confined	4,362	12/10/1990	509.23	507.96	0.13	0.1
7	0_7733301	Confined	4,367	12/15/1990	509.34	508.00	0.13	0.1
7	0_7733301	Confined	4,372	12/20/1990	509.46	508.03	0.14	0.1
7	0_7733301	Confined	4,377	12/25/1990	509.13	508.07	0.11	0.1
7	0_7733301	Confined	4,382	12/30/1990	509.38	508.10	0.13	0.1
7	0_7733301	Confined	4,388	1/5/1991	509.31	508.15	0.12	0.1
7	0_7733301	Confined	4,393	1/10/1991	509.38	508.18	0.12	0.1
7	0_7733301	Confined	4,398	1/15/1991	509.51	508.22	0.13	0.1
7	0_7733301	Confined	4,403	1/20/1991	509.38	508.26	0.11	0.1
7	0_7733301	Confined	4,408	1/25/1991	509.19	508.30	0.09	0.1
7	0_7733301	Confined	4,413	1/30/1991	509.44	508.33	0.11	0.1
7	0_7733301	Confined	4,419	2/5/1991	509.30	508.38	0.09	0.1
7	0_7733301	Confined	4,424	2/10/1991	509.33	508.42	0.09	0.1
7	0_7733301	Confined	4,425	2/11/1991	509.25	508.42	0.08	0.1
7	0_7733301	Confined	4,447	3/5/1991	509.64	508.59	0.11	0.1
7	0_7733301	Confined	4,452	3/10/1991	509.17	508.63	0.05	0.1
7	0_7733301	Confined	4,457	3/15/1991	509.41	508.66	0.07	0.1
7	0_7733301	Confined	4,462	3/20/1991	509.51	508.70	0.08	0.1
7	0_7733301	Confined	4,467	3/25/1991	509.50	508.74	0.08	0.1
7	0_7733301	Confined	4,472	3/30/1991	509.25	508.78	0.05	0.1
7	0_7733301	Confined	4,478	4/5/1991	509.26	508.82	0.04	0.1
7	0_7733301	Confined	4,483	4/10/1991	509.48	508.86	0.06	0.1
7	0_7733301	Confined	4,488	4/15/1991	509.28	508.90	0.04	0.1
7	0_7733301	Confined	4,493	4/20/1991	509.18	508.93	0.02	0.1
7	0_7733301	Confined	4,498	4/25/1991	509.45	508.97	0.05	0.1
7	0_7733301	Confined	4,503	4/30/1991	509.21	509.01	0.02	0.1
7	0_7733301	Confined	4,508	5/5/1991	509.28	509.05	0.02	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	4,513	5/10/1991	509.41	509.08	0.03	0.1
7	0_7733301	Confined	4,518	5/15/1991	509.55	509.12	0.04	0.1
7	0_7733301	Confined	4,523	5/20/1991	509.35	509.16	0.02	0.1
7	0_7733301	Confined	4,528	5/25/1991	509.41	509.20	0.02	0.1
7	0_7733301	Confined	4,533	5/30/1991	509.63	509.23	0.04	0.1
7	0_7733301	Confined	4,539	6/5/1991	509.38	509.28	0.01	0.1
7	0_7733301	Confined	4,544	6/10/1991	509.35	509.32	0.00	0.1
7	0_7733301	Confined	4,549	6/15/1991	509.43	509.35	0.01	0.1
7	0_7733301	Confined	4,554	6/20/1991	509.43	509.39	0.00	0.1
7	0_7733301	Confined	4,559	6/25/1991	509.38	509.43	0.00	0.1
7	0_7733301	Confined	4,564	6/30/1991	509.36	509.47	-0.01	0.1
7	0_7733301	Confined	4,569	7/5/1991	509.44	509.50	-0.01	0.1
7	0_7733301	Confined	4,574	7/10/1991	509.46	509.54	-0.01	0.1
7	0_7733301	Confined	4,579	7/15/1991	509.37	509.58	-0.02	0.1
7	0_7733301	Confined	4,584	7/20/1991	509.47	509.62	-0.01	0.1
7	0_7733301	Confined	4,589	7/25/1991	509.50	509.65	-0.02	0.1
7	0_7733301	Confined	4,594	7/30/1991	509.47	509.69	-0.02	0.1
7	0_7733301	Confined	4,600	8/5/1991	509.43	509.74	-0.03	0.1
7	0_7733301	Confined	4,605	8/10/1991	509.49	509.77	-0.03	0.1
7	0_7733301	Confined	4,610	8/15/1991	509.46	509.81	-0.04	0.1
7	0_7733301	Confined	4,615	8/20/1991	509.40	509.85	-0.04	0.1
7	0_7733301	Confined	4,620	8/25/1991	509.37	509.89	-0.05	0.1
7	0_7733301	Confined	4,625	8/30/1991	509.58	509.92	-0.03	0.1
7	0_7733301	Confined	4,631	9/5/1991	509.49	509.97	-0.05	0.1
7	0_7733301	Confined	4,636	9/10/1991	509.36	510.01	-0.06	0.1
7	0_7733301	Confined	4,641	9/15/1991	509.50	510.04	-0.05	0.1
7	0_7733301	Confined	4,646	9/20/1991	509.20	510.08	-0.09	0.1
7	0_7733301	Confined	4,651	9/25/1991	509.41	510.12	-0.07	0.1
7	0_7733301	Confined	4,656	9/30/1991	509.38	510.16	-0.08	0.1
7	0_7733301	Confined	4,661	10/5/1991	509.53	510.19	-0.07	0.1
7	0_7733301	Confined	4,666	10/10/1991	509.36	510.23	-0.09	0.1
7	0_7733301	Confined	4,671	10/15/1991	509.45	510.27	-0.08	0.1
7	0_7733301	Confined	4,727	12/10/1991	509.40	510.69	-0.13	0.1
7	0_7733301	Confined	4,732	12/15/1991	509.00	510.73	-0.17	0.1
7	0_7733301	Confined	4,737	12/20/1991	509.60	510.76	-0.12	0.1
7	0_7733301	Confined	4,742	12/25/1991	509.43	510.80	-0.14	0.1
7	0_7733301	Confined	4,747	12/30/1991	509.45	510.84	-0.14	0.1
7	0_7733301	Confined	4,753	1/5/1992	509.54	510.89	-0.13	0.1
7	0_7733301	Confined	4,758	1/10/1992	509.20	510.93	-0.17	0.1
7	0_7733301	Confined	4,763	1/15/1992	509.33	510.97	-0.16	0.1
7	0_7733301	Confined	4,768	1/20/1992	509.34	511.01	-0.17	0.1
7	0_7733301	Confined	4,773	1/25/1992	509.35	511.05	-0.17	0.1
7	0_7733301	Confined	4,778	1/30/1992	509.35	511.09	-0.17	0.1
7	0_7733301	Confined	4,784	2/5/1992	509.48	511.14	-0.17	0.1
7	0_7733301	Confined	4,789	2/10/1992	509.40	511.18	-0.18	0.1
7	0_7733301	Confined	4,794	2/15/1992	509.54	511.22	-0.17	0.1
7	0_7733301	Confined	4,799	2/20/1992	509.30	511.26	-0.20	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	4,804	2/25/1992	509.43	511.30	-0.19	0.1
7	0_7733301	Confined	4,808	2/29/1992	509.41	511.33	-0.19	0.1
7	0_7733301	Confined	4,813	3/5/1992	509.64	511.37	-0.17	0.1
7	0_7733301	Confined	4,818	3/10/1992	509.33	511.42	-0.21	0.1
7	0_7733301	Confined	4,823	3/15/1992	509.48	511.46	-0.20	0.1
7	0_7733301	Confined	4,828	3/20/1992	509.31	511.50	-0.22	0.1
7	0_7733301	Confined	4,833	3/25/1992	509.41	511.54	-0.21	0.1
7	0_7733301	Confined	4,838	3/30/1992	509.34	511.58	-0.22	0.1
7	0_7733301	Confined	4,844	4/5/1992	509.63	511.63	-0.20	0.1
7	0_7733301	Confined	4,849	4/10/1992	509.56	511.67	-0.21	0.1
7	0_7733301	Confined	4,854	4/15/1992	509.53	511.71	-0.22	0.1
7	0_7733301	Confined	4,859	4/20/1992	509.47	511.75	-0.23	0.1
7	0_7733301	Confined	4,864	4/25/1992	509.36	511.79	-0.24	0.1
7	0_7733301	Confined	4,869	4/30/1992	509.53	511.83	-0.23	0.1
7	0_7733301	Confined	4,874	5/5/1992	509.48	511.87	-0.24	0.1
7	0_7733301	Confined	4,879	5/10/1992	509.56	511.91	-0.24	0.1
7	0_7733301	Confined	4,884	5/15/1992	509.56	511.95	-0.24	0.1
7	0_7733301	Confined	4,889	5/20/1992	509.50	511.99	-0.25	0.1
7	0_7733301	Confined	4,894	5/25/1992	509.67	512.03	-0.24	0.1
7	0_7733301	Confined	4,899	5/30/1992	509.36	512.07	-0.27	0.1
7	0_7733301	Confined	4,905	6/5/1992	509.65	512.12	-0.25	0.1
7	0_7733301	Confined	4,910	6/10/1992	509.48	512.16	-0.27	0.1
7	0_7733301	Confined	4,915	6/15/1992	509.55	512.20	-0.27	0.1
7	0_7733301	Confined	4,920	6/20/1992	509.53	512.24	-0.27	0.1
7	0_7733301	Confined	4,925	6/25/1992	509.65	512.28	-0.26	0.1
7	0_7733301	Confined	4,930	6/30/1992	509.61	512.32	-0.27	0.1
7	0_7733301	Confined	4,935	7/5/1992	509.45	512.37	-0.29	0.1
7	0_7733301	Confined	4,940	7/10/1992	509.51	512.41	-0.29	0.1
7	0_7733301	Confined	4,945	7/15/1992	509.60	512.45	-0.28	0.1
7	0_7733301	Confined	4,950	7/20/1992	509.43	512.49	-0.31	0.1
7	0_7733301	Confined	4,955	7/25/1992	509.45	512.53	-0.31	0.1
7	0_7733301	Confined	4,960	7/30/1992	509.59	512.57	-0.30	0.1
7	0_7733301	Confined	4,966	8/5/1992	509.54	512.62	-0.31	0.1
7	0_7733301	Confined	4,971	8/10/1992	509.54	512.66	-0.31	0.1
7	0_7733301	Confined	4,976	8/15/1992	509.44	512.70	-0.33	0.1
7	0_7733301	Confined	4,981	8/20/1992	509.55	512.74	-0.32	0.1
7	0_7733301	Confined	4,986	8/25/1992	509.54	512.78	-0.32	0.1
7	0_7733301	Confined	4,991	8/30/1992	509.57	512.82	-0.32	0.1
7	0_7733301	Confined	4,997	9/5/1992	509.55	512.87	-0.33	0.1
7	0_7733301	Confined	5,002	9/10/1992	509.57	512.91	-0.33	0.1
7	0_7733301	Confined	5,007	9/15/1992	509.47	512.95	-0.35	0.1
7	0_7733301	Confined	5,012	9/20/1992	509.75	512.99	-0.32	0.1
7	0_7733301	Confined	5,017	9/25/1992	509.62	513.03	-0.34	0.1
7	0_7733301	Confined	5,022	9/30/1992	509.38	513.07	-0.37	0.1
7	0_7733301	Confined	5,027	10/5/1992	509.52	513.11	-0.36	0.1
7	0_7733301	Confined	5,032	10/10/1992	509.56	513.15	-0.36	0.1
7	0_7733301	Confined	5,037	10/15/1992	509.56	513.19	-0.36	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	5,042	10/20/1992	509.49	513.23	-0.37	0.1
7	0_7733301	Confined	5,047	10/25/1992	509.62	513.27	-0.37	0.1
7	0_7733301	Confined	5,052	10/30/1992	509.67	513.32	-0.36	0.1
7	0_7733301	Confined	5,058	11/5/1992	509.30	513.36	-0.41	0.1
7	0_7733301	Confined	5,063	11/10/1992	509.59	513.40	-0.38	0.1
7	0_7733301	Confined	5,068	11/15/1992	509.28	513.44	-0.42	0.1
7	0_7733301	Confined	5,073	11/20/1992	509.79	513.49	-0.37	0.1
7	0_7733301	Confined	5,078	11/25/1992	509.49	513.53	-0.40	0.1
7	0_7733301	Confined	5,084	12/1/1992	509.52	513.57	-0.41	0.1
7	0_7733301	Confined	5,088	12/5/1992	509.27	513.61	-0.43	0.1
7	0_7733301	Confined	5,093	12/10/1992	509.47	513.65	-0.42	0.1
7	0_7733301	Confined	5,098	12/15/1992	509.60	513.69	-0.41	0.1
7	0_7733301	Confined	5,103	12/20/1992	509.48	513.73	-0.42	0.1
7	0_7733301	Confined	5,108	12/25/1992	509.38	513.77	-0.44	0.1
7	0_7733301	Confined	5,113	12/30/1992	509.52	513.81	-0.43	0.1
7	0_7733301	Confined	5,144	1/30/1993	509.09	513.90	-0.48	0.1
7	0_7733301	Confined	5,150	2/5/1993	509.30	513.91	-0.46	0.1
7	0_7733301	Confined	5,155	2/10/1993	509.74	513.93	-0.42	0.1
7	0_7733301	Confined	5,157	2/12/1993	509.39	513.93	-0.45	0.1
7	0_7733301	Confined	5,346	8/20/1993	509.20	514.43	-0.52	0.1
7	0_7733301	Confined	5,351	8/25/1993	509.19	514.44	-0.53	0.1
7	0_7733301	Confined	5,356	8/30/1993	509.30	514.46	-0.52	0.1
7	0_7733301	Confined	5,362	9/5/1993	509.27	514.47	-0.52	0.1
7	0_7733301	Confined	5,367	9/10/1993	509.08	514.48	-0.54	0.1
7	0_7733301	Confined	5,372	9/15/1993	508.98	514.50	-0.55	0.1
7	0_7733301	Confined	5,377	9/20/1993	509.21	514.51	-0.53	0.1
7	0_7733301	Confined	5,382	9/25/1993	509.30	514.52	-0.52	0.1
7	0_7733301	Confined	5,387	9/30/1993	509.11	514.54	-0.54	0.1
7	0_7733301	Confined	5,392	10/5/1993	509.08	514.55	-0.55	0.1
7	0_7733301	Confined	5,397	10/10/1993	509.04	514.56	-0.55	0.1
7	0_7733301	Confined	5,402	10/15/1993	509.22	514.58	-0.54	0.1
7	0_7733301	Confined	5,407	10/20/1993	509.14	514.59	-0.54	0.1
7	0_7733301	Confined	5,412	10/25/1993	509.19	514.60	-0.54	0.1
7	0_7733301	Confined	5,417	10/30/1993	508.94	514.62	-0.57	0.1
7	0_7733301	Confined	5,423	11/5/1993	509.28	514.63	-0.54	0.1
7	0_7733301	Confined	5,428	11/10/1993	508.84	514.64	-0.58	0.1
7	0_7733301	Confined	5,433	11/15/1993	508.92	514.66	-0.57	0.1
7	0_7733301	Confined	5,438	11/20/1993	508.86	514.67	-0.58	0.1
7	0_7733301	Confined	5,443	11/25/1993	509.05	514.68	-0.56	0.1
7	0_7733301	Confined	5,448	11/30/1993	508.99	514.70	-0.57	0.1
7	0_7733301	Confined	5,453	12/5/1993	509.05	514.71	-0.57	0.1
7	0_7733301	Confined	5,458	12/10/1993	509.01	514.72	-0.57	0.1
7	0_7733301	Confined	5,463	12/15/1993	509.07	514.74	-0.57	0.1
7	0_7733301	Confined	5,468	12/20/1993	509.03	514.75	-0.57	0.1
7	0_7733301	Confined	5,473	12/25/1993	508.61	514.76	-0.62	0.1
7	0_7733301	Confined	5,478	12/30/1993	508.64	514.78	-0.61	0.1
7	0_7733301	Confined	5,484	1/5/1994	509.08	514.80	-0.57	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	5,489	1/10/1994	508.95	514.82	-0.59	0.1
7	0_7733301	Confined	5,494	1/15/1994	508.83	514.84	-0.60	0.1
7	0_7733301	Confined	5,499	1/20/1994	508.71	514.86	-0.61	0.1
7	0_7733301	Confined	5,504	1/25/1994	509.03	514.87	-0.58	0.1
7	0_7733301	Confined	5,509	1/30/1994	508.69	514.89	-0.62	0.1
7	0_7733301	Confined	5,515	2/5/1994	508.96	514.92	-0.60	0.1
7	0_7733301	Confined	5,520	2/10/1994	508.77	514.94	-0.62	0.1
7	0_7733301	Confined	5,525	2/15/1994	508.75	514.96	-0.62	0.1
7	0_7733301	Confined	5,530	2/20/1994	508.98	514.97	-0.60	0.1
7	0_7733301	Confined	5,535	2/25/1994	508.78	514.99	-0.62	0.1
7	0_7733301	Confined	5,538	2/28/1994	508.96	515.01	-0.60	0.1
7	0_7733301	Confined	5,543	3/5/1994	509.01	515.02	-0.60	0.1
7	0_7733301	Confined	5,548	3/10/1994	508.40	515.04	-0.66	0.1
7	0_7733301	Confined	5,553	3/15/1994	508.90	515.06	-0.62	0.1
7	0_7733301	Confined	5,558	3/20/1994	508.97	515.08	-0.61	0.1
7	0_7733301	Confined	5,563	3/25/1994	508.78	515.10	-0.63	0.1
7	0_7733301	Confined	5,568	3/30/1994	508.37	515.12	-0.68	0.1
7	0_7733301	Confined	5,574	4/5/1994	509.04	515.14	-0.61	0.1
7	0_7733301	Confined	5,579	4/10/1994	509.00	515.16	-0.62	0.1
7	0_7733301	Confined	5,584	4/15/1994	508.88	515.18	-0.63	0.1
7	0_7733301	Confined	5,589	4/20/1994	508.70	515.20	-0.65	0.1
7	0_7733301	Confined	5,594	4/25/1994	509.01	515.22	-0.62	0.1
7	0_7733301	Confined	5,599	4/30/1994	508.64	515.24	-0.66	0.1
7	0_7733301	Confined	5,604	5/5/1994	508.58	515.26	-0.67	0.1
7	0_7733301	Confined	5,609	5/10/1994	508.75	515.28	-0.65	0.1
7	0_7733301	Confined	5,614	5/15/1994	508.78	515.30	-0.65	0.1
7	0_7733301	Confined	5,619	5/20/1994	508.71	515.32	-0.66	0.1
7	0_7733301	Confined	5,624	5/25/1994	508.98	515.34	-0.64	0.1
7	0_7733301	Confined	5,629	5/30/1994	508.80	515.36	-0.66	0.1
7	0_7733301	Confined	5,635	6/5/1994	508.80	515.38	-0.66	0.1
7	0_7733301	Confined	5,640	6/10/1994	508.70	515.40	-0.67	0.1
7	0_7733301	Confined	5,645	6/15/1994	508.70	515.42	-0.67	0.1
7	0_7733301	Confined	5,650	6/20/1994	508.72	515.44	-0.67	0.1
7	0_7733301	Confined	5,655	6/25/1994	508.76	515.46	-0.67	0.1
7	0_7733301	Confined	5,660	6/30/1994	508.80	515.47	-0.67	0.1
7	0_7733301	Confined	5,665	7/5/1994	508.72	515.49	-0.68	0.1
7	0_7733301	Confined	5,670	7/10/1994	508.65	515.51	-0.69	0.1
7	0_7733301	Confined	5,675	7/15/1994	508.60	515.53	-0.69	0.1
7	0_7733301	Confined	5,680	7/20/1994	508.75	515.55	-0.68	0.1
7	0_7733301	Confined	5,685	7/25/1994	508.76	515.57	-0.68	0.1
7	0_7733301	Confined	5,690	7/30/1994	508.70	515.59	-0.69	0.1
7	0_7733301	Confined	5,696	8/5/1994	508.62	515.61	-0.70	0.1
7	0_7733301	Confined	5,701	8/10/1994	508.58	515.63	-0.71	0.1
7	0_7733301	Confined	5,706	8/15/1994	508.74	515.65	-0.69	0.1
7	0_7733301	Confined	5,711	8/20/1994	508.82	515.67	-0.69	0.1
7	0_7733301	Confined	5,716	8/25/1994	508.58	515.69	-0.71	0.1
7	0_7733301	Confined	5,721	8/30/1994	508.74	515.71	-0.70	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	5,727	9/5/1994	508.68	515.73	-0.71	0.1
7	0_7733301	Confined	5,732	9/10/1994	508.65	515.75	-0.71	0.1
7	0_7733301	Confined	5,737	9/15/1994	508.75	515.77	-0.70	0.1
7	0_7733301	Confined	5,742	9/20/1994	508.68	515.79	-0.71	0.1
7	0_7733301	Confined	5,747	9/25/1994	508.60	515.81	-0.72	0.1
7	0_7733301	Confined	5,752	9/30/1994	508.71	515.83	-0.71	0.1
7	0_7733301	Confined	5,757	10/5/1994	508.61	515.85	-0.72	0.1
7	0_7733301	Confined	5,762	10/10/1994	508.42	515.87	-0.74	0.1
7	0_7733301	Confined	5,804	11/21/1994	508.44	516.03	-0.76	0.1
7	0_7733301	Confined	5,808	11/25/1994	508.62	516.04	-0.74	0.1
7	0_7733301	Confined	5,813	11/30/1994	508.27	516.06	-0.78	0.1
7	0_7733301	Confined	5,818	12/5/1994	508.61	516.08	-0.75	0.1
7	0_7733301	Confined	5,823	12/10/1994	508.46	516.10	-0.76	0.1
7	0_7733301	Confined	5,828	12/15/1994	508.67	516.12	-0.75	0.1
7	0_7733301	Confined	5,833	12/20/1994	508.62	516.14	-0.75	0.1
7	0_7733301	Confined	5,838	12/25/1994	508.49	516.16	-0.77	0.1
7	0_7733301	Confined	5,843	12/30/1994	508.64	516.18	-0.75	0.1
7	0_7733301	Confined	5,849	1/5/1995	508.85	516.19	-0.73	0.1
7	0_7733301	Confined	5,854	1/10/1995	508.71	516.19	-0.75	0.1
7	0_7733301	Confined	5,859	1/15/1995	508.69	516.20	-0.75	0.1
7	0_7733301	Confined	5,864	1/20/1995	508.50	516.20	-0.77	0.1
7	0_7733301	Confined	5,869	1/25/1995	508.53	516.21	-0.77	0.1
7	0_7733301	Confined	5,874	1/30/1995	508.30	516.21	-0.79	0.1
7	0_7733301	Confined	5,884	2/9/1995	508.63	516.23	-0.76	0.1
7	0_7733301	Confined	5,885	2/10/1995	508.96	516.23	-0.73	0.1
7	0_7733301	Confined	5,890	2/15/1995	508.86	516.23	-0.74	0.1
7	0_7733301	Confined	5,895	2/20/1995	508.48	516.24	-0.78	0.1
7	0_7733301	Confined	5,900	2/25/1995	508.65	516.24	-0.76	0.1
7	0_7733301	Confined	5,903	2/28/1995	508.74	516.25	-0.75	0.1
7	0_7733301	Confined	5,908	3/5/1995	508.81	516.25	-0.74	0.1
7	0_7733301	Confined	5,913	3/10/1995	508.52	516.26	-0.77	0.1
7	0_7733301	Confined	5,918	3/15/1995	508.66	516.26	-0.76	0.1
7	0_7733301	Confined	5,923	3/20/1995	508.86	516.27	-0.74	0.1
7	0_7733301	Confined	5,928	3/25/1995	508.86	516.27	-0.74	0.1
7	0_7733301	Confined	5,933	3/30/1995	508.53	516.28	-0.77	0.1
7	0_7733301	Confined	5,939	4/5/1995	508.72	516.29	-0.76	0.1
7	0_7733301	Confined	5,944	4/10/1995	508.98	516.29	-0.73	0.1
7	0_7733301	Confined	5,949	4/15/1995	508.75	516.30	-0.75	0.1
7	0_7733301	Confined	5,954	4/20/1995	508.80	516.30	-0.75	0.1
7	0_7733301	Confined	5,959	4/25/1995	508.49	516.31	-0.78	0.1
7	0_7733301	Confined	5,964	4/30/1995	508.77	516.31	-0.75	0.1
7	0_7733301	Confined	5,969	5/5/1995	508.62	516.32	-0.77	0.1
7	0_7733301	Confined	5,974	5/10/1995	508.63	516.33	-0.77	0.1
7	0_7733301	Confined	5,979	5/15/1995	508.51	516.33	-0.78	0.1
7	0_7733301	Confined	5,984	5/20/1995	508.50	516.34	-0.78	0.1
7	0_7733301	Confined	5,989	5/25/1995	508.51	516.34	-0.78	0.1
7	0_7733301	Confined	5,994	5/30/1995	508.46	516.35	-0.79	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	6,000	6/5/1995	508.66	516.35	-0.77	0.1
7	0_7733301	Confined	6,005	6/10/1995	508.56	516.36	-0.78	0.1
7	0_7733301	Confined	6,010	6/15/1995	508.50	516.36	-0.79	0.1
7	0_7733301	Confined	6,015	6/20/1995	508.59	516.37	-0.78	0.1
7	0_7733301	Confined	6,020	6/25/1995	508.59	516.38	-0.78	0.1
7	0_7733301	Confined	6,025	6/30/1995	508.44	516.38	-0.79	0.1
7	0_7733301	Confined	6,030	7/5/1995	508.60	516.39	-0.78	0.1
7	0_7733301	Confined	6,035	7/10/1995	508.51	516.39	-0.79	0.1
7	0_7733301	Confined	6,040	7/15/1995	508.56	516.40	-0.78	0.1
7	0_7733301	Confined	6,045	7/20/1995	508.57	516.40	-0.78	0.1
7	0_7733301	Confined	6,050	7/25/1995	508.55	516.41	-0.79	0.1
7	0_7733301	Confined	6,055	7/30/1995	508.59	516.41	-0.78	0.1
7	0_7733301	Confined	6,061	8/5/1995	508.60	516.42	-0.78	0.1
7	0_7733301	Confined	6,066	8/10/1995	508.57	516.43	-0.79	0.1
7	0_7733301	Confined	6,071	8/15/1995	508.56	516.43	-0.79	0.1
7	0_7733301	Confined	6,076	8/20/1995	508.45	516.44	-0.80	0.1
7	0_7733301	Confined	6,081	8/25/1995	508.58	516.44	-0.79	0.1
7	0_7733301	Confined	6,086	8/30/1995	508.52	516.45	-0.79	0.1
7	0_7733301	Confined	6,092	9/5/1995	508.46	516.46	-0.80	0.1
7	0_7733301	Confined	6,097	9/10/1995	508.44	516.46	-0.80	0.1
7	0_7733301	Confined	6,102	9/15/1995	508.49	516.47	-0.80	0.1
7	0_7733301	Confined	6,107	9/20/1995	508.46	516.47	-0.80	0.1
7	0_7733301	Confined	6,112	9/25/1995	508.54	516.48	-0.79	0.1
7	0_7733301	Confined	6,117	9/30/1995	508.56	516.48	-0.79	0.1
7	0_7733301	Confined	6,122	10/5/1995	508.71	516.49	-0.78	0.1
7	0_7733301	Confined	6,127	10/10/1995	508.38	516.49	-0.81	0.1
7	0_7733301	Confined	6,132	10/15/1995	508.28	516.50	-0.82	0.1
7	0_7733301	Confined	6,137	10/20/1995	508.28	516.50	-0.82	0.1
7	0_7733301	Confined	6,142	10/25/1995	508.47	516.51	-0.80	0.1
7	0_7733301	Confined	6,147	10/30/1995	508.42	516.52	-0.81	0.1
7	0_7733301	Confined	6,153	11/5/1995	508.29	516.52	-0.82	0.1
7	0_7733301	Confined	6,158	11/10/1995	508.71	516.53	-0.78	0.1
7	0_7733301	Confined	6,163	11/15/1995	508.35	516.53	-0.82	0.1
7	0_7733301	Confined	6,168	11/20/1995	508.36	516.54	-0.82	0.1
7	0_7733301	Confined	6,173	11/25/1995	508.34	516.54	-0.82	0.1
7	0_7733301	Confined	6,178	11/30/1995	508.39	516.55	-0.82	0.1
7	0_7733301	Confined	6,183	12/5/1995	508.47	516.56	-0.81	0.1
7	0_7733301	Confined	6,188	12/10/1995	507.97	516.56	-0.86	0.1
7	0_7733301	Confined	6,193	12/15/1995	508.51	516.57	-0.81	0.1
7	0_7733301	Confined	6,198	12/20/1995	508.26	516.57	-0.83	0.1
7	0_7733301	Confined	6,203	12/25/1995	508.15	516.58	-0.84	0.1
7	0_7733301	Confined	6,208	12/30/1995	508.57	516.58	-0.80	0.1
7	0_7733301	Confined	6,214	1/5/1996	508.43	516.58	-0.82	0.1
7	0_7733301	Confined	6,219	1/10/1996	508.51	516.58	-0.81	0.1
7	0_7733301	Confined	6,224	1/15/1996	508.50	516.57	-0.81	0.1
7	0_7733301	Confined	6,229	1/20/1996	508.31	516.57	-0.83	0.1
7	0_7733301	Confined	6,234	1/25/1996	508.45	516.57	-0.81	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	6,239	1/30/1996	508.32	516.56	-0.82	0.1
7	0_7733301	Confined	6,245	2/5/1996	508.18	516.56	-0.84	0.1
7	0_7733301	Confined	6,250	2/10/1996	508.44	516.55	-0.81	0.1
7	0_7733301	Confined	6,255	2/15/1996	508.58	516.55	-0.80	0.1
7	0_7733301	Confined	6,260	2/20/1996	508.21	516.55	-0.83	0.1
7	0_7733301	Confined	6,265	2/25/1996	508.15	516.54	-0.84	0.1
7	0_7733301	Confined	6,269	2/29/1996	507.84	516.54	-0.87	0.1
7	0_7733301	Confined	6,274	3/5/1996	508.37	516.54	-0.82	0.1
7	0_7733301	Confined	6,279	3/10/1996	507.93	516.53	-0.86	0.1
7	0_7733301	Confined	6,284	3/15/1996	508.38	516.53	-0.81	0.1
7	0_7733301	Confined	6,289	3/20/1996	507.85	516.52	-0.87	0.1
7	0_7733301	Confined	6,294	3/25/1996	508.28	516.52	-0.82	0.1
7	0_7733301	Confined	6,299	3/30/1996	508.31	516.52	-0.82	0.1
7	0_7733301	Confined	6,305	4/5/1996	508.12	516.51	-0.84	0.1
7	0_7733301	Confined	6,310	4/10/1996	508.19	516.51	-0.83	0.1
7	0_7733301	Confined	6,315	4/15/1996	507.90	516.51	-0.86	0.1
7	0_7733301	Confined	6,320	4/20/1996	508.29	516.50	-0.82	0.1
7	0_7733301	Confined	6,325	4/25/1996	508.37	516.50	-0.81	0.1
7	0_7733301	Confined	6,330	4/30/1996	508.07	516.49	-0.84	0.1
7	0_7733301	Confined	6,335	5/5/1996	508.09	516.49	-0.84	0.1
7	0_7733301	Confined	6,340	5/10/1996	508.08	516.49	-0.84	0.1
7	0_7733301	Confined	6,345	5/15/1996	508.15	516.48	-0.83	0.1
7	0_7733301	Confined	6,350	5/20/1996	508.27	516.48	-0.82	0.1
7	0_7733301	Confined	6,355	5/25/1996	508.13	516.48	-0.83	0.1
7	0_7733301	Confined	6,360	5/30/1996	508.06	516.47	-0.84	0.1
7	0_7733301	Confined	6,366	6/5/1996	508.02	516.47	-0.84	0.1
7	0_7733301	Confined	6,371	6/10/1996	508.14	516.46	-0.83	0.1
7	0_7733301	Confined	6,376	6/15/1996	508.04	516.46	-0.84	0.1
7	0_7733301	Confined	6,381	6/20/1996	508.09	516.46	-0.84	0.1
7	0_7733301	Confined	6,386	6/25/1996	507.97	516.45	-0.85	0.1
7	0_7733301	Confined	6,391	6/30/1996	507.89	516.45	-0.86	0.1
7	0_7733301	Confined	6,396	7/5/1996	508.01	516.45	-0.84	0.1
7	0_7733301	Confined	6,401	7/10/1996	507.87	516.44	-0.86	0.1
7	0_7733301	Confined	6,406	7/15/1996	507.91	516.44	-0.85	0.1
7	0_7733301	Confined	6,411	7/20/1996	508.02	516.43	-0.84	0.1
7	0_7733301	Confined	6,416	7/25/1996	507.93	516.43	-0.85	0.1
7	0_7733301	Confined	6,421	7/30/1996	508.02	516.43	-0.84	0.1
7	0_7733301	Confined	6,427	8/5/1996	508.00	516.42	-0.84	0.1
7	0_7733301	Confined	6,432	8/10/1996	508.00	516.42	-0.84	0.1
7	0_7733301	Confined	6,437	8/15/1996	507.88	516.42	-0.85	0.1
7	0_7733301	Confined	6,442	8/20/1996	507.80	516.41	-0.86	0.1
7	0_7733301	Confined	6,447	8/25/1996	507.90	516.41	-0.85	0.1
7	0_7733301	Confined	6,452	8/30/1996	507.94	516.40	-0.85	0.1
7	0_7733301	Confined	6,458	9/5/1996	507.93	516.40	-0.85	0.1
7	0_7733301	Confined	6,463	9/10/1996	507.76	516.40	-0.86	0.1
7	0_7733301	Confined	6,468	9/15/1996	508.08	516.39	-0.83	0.1
7	0_7733301	Confined	6,473	9/20/1996	507.90	516.39	-0.85	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	6,478	9/25/1996	507.91	516.38	-0.85	0.1
7	0_7733301	Confined	6,483	9/30/1996	507.66	516.38	-0.87	0.1
7	0_7733301	Confined	6,488	10/5/1996	507.75	516.38	-0.86	0.1
7	0_7733301	Confined	6,493	10/10/1996	507.61	516.37	-0.88	0.1
7	0_7733301	Confined	6,498	10/15/1996	507.89	516.37	-0.85	0.1
7	0_7733301	Confined	6,503	10/20/1996	508.03	516.37	-0.83	0.1
7	0_7733301	Confined	6,508	10/25/1996	507.99	516.36	-0.84	0.1
7	0_7733301	Confined	6,513	10/30/1996	507.70	516.36	-0.87	0.1
7	0_7733301	Confined	6,519	11/5/1996	507.85	516.35	-0.85	0.1
7	0_7733301	Confined	6,524	11/10/1996	507.57	516.35	-0.88	0.1
7	0_7733301	Confined	6,529	11/15/1996	507.95	516.35	-0.84	0.1
7	0_7733301	Confined	6,534	11/20/1996	507.97	516.34	-0.84	0.1
7	0_7733301	Confined	6,539	11/25/1996	507.46	516.34	-0.89	0.1
7	0_7733301	Confined	6,544	11/30/1996	508.08	516.34	-0.83	0.1
7	0_7733301	Confined	6,549	12/5/1996	507.79	516.33	-0.85	0.1
7	0_7733301	Confined	6,554	12/10/1996	507.83	516.33	-0.85	0.1
7	0_7733301	Confined	6,559	12/15/1996	507.68	516.32	-0.86	0.1
7	0_7733301	Confined	6,564	12/20/1996	507.48	516.32	-0.88	0.1
7	0_7733301	Confined	6,569	12/25/1996	507.65	516.32	-0.87	0.1
7	0_7733301	Confined	6,574	12/30/1996	507.64	516.31	-0.87	0.1
7	0_7733301	Confined	6,580	1/5/1997	507.69	516.34	-0.87	0.1
7	0_7733301	Confined	6,585	1/10/1997	507.64	516.37	-0.87	0.1
7	0_7733301	Confined	6,590	1/15/1997	507.54	516.40	-0.89	0.1
7	0_7733301	Confined	6,595	1/20/1997	507.61	516.43	-0.88	0.1
7	0_7733301	Confined	6,600	1/25/1997	507.54	516.46	-0.89	0.1
7	0_7733301	Confined	6,605	1/30/1997	507.34	516.49	-0.91	0.1
7	0_7733301	Confined	6,611	2/5/1997	507.37	516.52	-0.92	0.1
7	0_7733301	Confined	6,616	2/10/1997	507.33	516.55	-0.92	0.1
7	0_7733301	Confined	6,621	2/15/1997	507.26	516.58	-0.93	0.1
7	0_7733301	Confined	6,626	2/20/1997	507.97	516.61	-0.86	0.1
7	0_7733301	Confined	6,631	2/25/1997	507.75	516.64	-0.89	0.1
7	0_7733301	Confined	6,634	2/28/1997	507.84	516.65	-0.88	0.1
7	0_7733301	Confined	6,639	3/5/1997	507.52	516.68	-0.92	0.1
7	0_7733301	Confined	6,644	3/10/1997	507.44	516.71	-0.93	0.1
7	0_7733301	Confined	6,649	3/15/1997	507.19	516.74	-0.96	0.1
7	0_7733301	Confined	6,654	3/20/1997	507.46	516.77	-0.93	0.1
7	0_7733301	Confined	6,659	3/25/1997	507.60	516.80	-0.92	0.1
7	0_7733301	Confined	6,664	3/30/1997	507.48	516.83	-0.93	0.1
7	0_7733301	Confined	6,670	4/5/1997	507.61	516.86	-0.93	0.1
7	0_7733301	Confined	6,675	4/10/1997	507.55	516.89	-0.93	0.1
7	0_7733301	Confined	6,680	4/15/1997	507.24	516.92	-0.97	0.1
7	0_7733301	Confined	6,685	4/20/1997	507.70	516.95	-0.92	0.1
7	0_7733301	Confined	6,690	4/25/1997	507.67	516.98	-0.93	0.1
7	0_7733301	Confined	6,695	4/30/1997	507.55	517.01	-0.95	0.1
7	0_7733301	Confined	6,700	5/5/1997	507.32	517.04	-0.97	0.1
7	0_7733301	Confined	6,705	5/10/1997	507.20	517.07	-0.99	0.1
7	0_7733301	Confined	6,710	5/15/1997	507.43	517.09	-0.97	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	6,715	5/20/1997	507.34	517.12	-0.98	0.1
7	0_7733301	Confined	6,720	5/25/1997	507.54	517.15	-0.96	0.1
7	0_7733301	Confined	6,725	5/30/1997	507.40	517.18	-0.98	0.1
7	0_7733301	Confined	6,731	6/5/1997	507.54	517.22	-0.97	0.1
7	0_7733301	Confined	6,736	6/10/1997	507.23	517.25	-1.00	0.1
7	0_7733301	Confined	6,741	6/15/1997	507.39	517.27	-0.99	0.1
7	0_7733301	Confined	6,746	6/20/1997	507.33	517.30	-1.00	0.1
7	0_7733301	Confined	6,751	6/25/1997	507.20	517.33	-1.01	0.1
7	0_7733301	Confined	6,756	6/30/1997	507.30	517.36	-1.01	0.1
7	0_7733301	Confined	6,761	7/5/1997	507.22	517.39	-1.02	0.1
7	0_7733301	Confined	6,766	7/10/1997	507.29	517.42	-1.01	0.1
7	0_7733301	Confined	6,771	7/15/1997	507.23	517.45	-1.02	0.1
7	0_7733301	Confined	6,776	7/20/1997	507.26	517.48	-1.02	0.1
7	0_7733301	Confined	6,781	7/25/1997	507.26	517.51	-1.02	0.1
7	0_7733301	Confined	6,786	7/30/1997	507.22	517.53	-1.03	0.1
7	0_7733301	Confined	6,792	8/5/1997	507.25	517.57	-1.03	0.1
7	0_7733301	Confined	6,797	8/10/1997	507.29	517.60	-1.03	0.1
7	0_7733301	Confined	6,802	8/15/1997	507.41	517.63	-1.02	0.1
7	0_7733301	Confined	6,807	8/20/1997	507.22	517.66	-1.04	0.1
7	0_7733301	Confined	6,812	8/25/1997	507.16	517.69	-1.05	0.1
7	0_7733301	Confined	6,817	8/30/1997	507.29	517.71	-1.04	0.1
7	0_7733301	Confined	6,823	9/5/1997	507.19	517.75	-1.06	0.1
7	0_7733301	Confined	6,828	9/10/1997	507.27	517.78	-1.05	0.1
7	0_7733301	Confined	6,833	9/15/1997	507.21	517.81	-1.06	0.1
7	0_7733301	Confined	6,838	9/20/1997	507.15	517.84	-1.07	0.1
7	0_7733301	Confined	6,843	9/25/1997	507.10	517.86	-1.08	0.1
7	0_7733301	Confined	6,848	9/30/1997	507.12	517.89	-1.08	0.1
7	0_7733301	Confined	6,853	10/5/1997	507.13	517.92	-1.08	0.1
7	0_7733301	Confined	6,858	10/10/1997	507.09	517.95	-1.09	0.1
7	0_7733301	Confined	6,863	10/15/1997	506.80	517.98	-1.12	0.1
7	0_7733301	Confined	6,868	10/20/1997	507.13	518.01	-1.09	0.1
7	0_7733301	Confined	6,873	10/25/1997	507.50	518.04	-1.05	0.1
7	0_7733301	Confined	6,878	10/30/1997	507.21	518.07	-1.09	0.1
7	0_7733301	Confined	6,884	11/5/1997	507.13	518.10	-1.10	0.1
7	0_7733301	Confined	6,889	11/10/1997	507.17	518.13	-1.10	0.1
7	0_7733301	Confined	6,894	11/15/1997	507.00	518.16	-1.12	0.1
7	0_7733301	Confined	6,899	11/20/1997	507.30	518.19	-1.09	0.1
7	0_7733301	Confined	6,904	11/25/1997	507.02	518.22	-1.12	0.1
7	0_7733301	Confined	6,909	11/30/1997	507.09	518.25	-1.12	0.1
7	0_7733301	Confined	6,914	12/5/1997	506.89	518.28	-1.14	0.1
7	0_7733301	Confined	6,919	12/10/1997	507.08	518.30	-1.12	0.1
7	0_7733301	Confined	6,924	12/15/1997	507.00	518.33	-1.13	0.1
7	0_7733301	Confined	6,929	12/20/1997	507.32	518.36	-1.10	0.1
7	0_7733301	Confined	6,934	12/25/1997	507.06	518.39	-1.13	0.1
7	0_7733301	Confined	6,939	12/30/1997	507.00	518.42	-1.14	0.1
7	0_7733301	Confined	6,945	1/5/1998	507.18	518.46	-1.13	0.1
7	0_7733301	Confined	6,950	1/10/1998	506.94	518.49	-1.16	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	6,955	1/15/1998	506.87	518.52	-1.17	0.1
7	0_7733301	Confined	6,960	1/20/1998	507.14	518.56	-1.14	0.1
7	0_7733301	Confined	6,965	1/25/1998	506.95	518.59	-1.16	0.1
7	0_7733301	Confined	6,970	1/30/1998	507.07	518.62	-1.15	0.1
7	0_7733301	Confined	6,976	2/5/1998	507.01	518.66	-1.16	0.1
7	0_7733301	Confined	6,981	2/10/1998	507.10	518.69	-1.16	0.1
7	0_7733301	Confined	6,986	2/15/1998	507.24	518.72	-1.15	0.1
7	0_7733301	Confined	6,991	2/20/1998	506.83	518.76	-1.19	0.1
7	0_7733301	Confined	6,996	2/25/1998	507.27	518.79	-1.15	0.1
7	0_7733301	Confined	6,999	2/28/1998	506.85	518.81	-1.20	0.1
7	0_7733301	Confined	7,004	3/5/1998	507.02	518.84	-1.18	0.1
7	0_7733301	Confined	7,009	3/10/1998	506.31	518.87	-1.26	0.1
7	0_7733301	Confined	7,014	3/15/1998	507.25	518.90	-1.17	0.1
7	0_7733301	Confined	7,019	3/20/1998	506.70	518.94	-1.22	0.1
7	0_7733301	Confined	7,024	3/25/1998	506.86	518.97	-1.21	0.1
7	0_7733301	Confined	7,029	3/30/1998	507.25	519.00	-1.18	0.1
7	0_7733301	Confined	7,035	4/5/1998	506.84	519.04	-1.22	0.1
7	0_7733301	Confined	7,040	4/10/1998	506.58	519.07	-1.25	0.1
7	0_7733301	Confined	7,045	4/15/1998	507.06	519.10	-1.20	0.1
7	0_7733301	Confined	7,050	4/20/1998	506.68	519.14	-1.25	0.1
7	0_7733301	Confined	7,055	4/25/1998	507.10	519.17	-1.21	0.1
7	0_7733301	Confined	7,060	4/30/1998	506.84	519.20	-1.24	0.1
7	0_7733301	Confined	7,065	5/5/1998	506.92	519.23	-1.23	0.1
7	0_7733301	Confined	7,070	5/10/1998	506.73	519.27	-1.25	0.1
7	0_7733301	Confined	7,075	5/15/1998	506.69	519.30	-1.26	0.1
7	0_7733301	Confined	7,080	5/20/1998	506.74	519.33	-1.26	0.1
7	0_7733301	Confined	7,085	5/25/1998	506.86	519.36	-1.25	0.1
7	0_7733301	Confined	7,090	5/30/1998	506.78	519.40	-1.26	0.1
7	0_7733301	Confined	7,096	6/5/1998	506.92	519.43	-1.25	0.1
7	0_7733301	Confined	7,101	6/10/1998	506.83	519.47	-1.26	0.1
7	0_7733301	Confined	7,106	6/15/1998	506.90	519.50	-1.26	0.1
7	0_7733301	Confined	7,111	6/20/1998	506.76	519.53	-1.28	0.1
7	0_7733301	Confined	7,116	6/25/1998	506.70	519.56	-1.29	0.1
7	0_7733301	Confined	7,121	6/30/1998	506.70	519.60	-1.29	0.1
7	0_7733301	Confined	7,126	7/5/1998	506.71	519.63	-1.29	0.1
7	0_7733301	Confined	7,131	7/10/1998	506.64	519.66	-1.30	0.1
7	0_7733301	Confined	7,136	7/15/1998	506.67	519.69	-1.30	0.1
7	0_7733301	Confined	7,141	7/20/1998	506.68	519.73	-1.30	0.1
7	0_7733301	Confined	7,146	7/25/1998	506.61	519.76	-1.31	0.1
7	0_7733301	Confined	7,151	7/30/1998	506.68	519.79	-1.31	0.1
7	0_7733301	Confined	7,157	8/5/1998	506.60	519.83	-1.32	0.1
7	0_7733301	Confined	7,162	8/10/1998	506.64	519.86	-1.32	0.1
7	0_7733301	Confined	7,167	8/15/1998	506.66	519.89	-1.32	0.1
7	0_7733301	Confined	7,172	8/20/1998	506.57	519.93	-1.34	0.1
7	0_7733301	Confined	7,177	8/25/1998	506.70	519.96	-1.33	0.1
7	0_7733301	Confined	7,182	8/30/1998	506.58	519.99	-1.34	0.1
7	0_7733301	Confined	7,188	9/5/1998	506.50	520.03	-1.35	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	7,193	9/10/1998	506.63	520.06	-1.34	0.1
7	0_7733301	Confined	7,198	9/15/1998	506.51	520.09	-1.36	0.1
7	0_7733301	Confined	7,203	9/20/1998	506.63	520.13	-1.35	0.1
7	0_7733301	Confined	7,208	9/25/1998	506.49	520.16	-1.37	0.1
7	0_7733301	Confined	7,213	9/30/1998	506.54	520.19	-1.37	0.1
7	0_7733301	Confined	7,218	10/5/1998	506.67	520.22	-1.36	0.1
7	0_7733301	Confined	7,223	10/10/1998	506.51	520.26	-1.37	0.1
7	0_7733301	Confined	7,228	10/15/1998	506.62	520.29	-1.37	0.1
7	0_7733301	Confined	7,233	10/20/1998	506.31	520.32	-1.40	0.1
7	0_7733301	Confined	7,238	10/25/1998	506.46	520.35	-1.39	0.1
7	0_7733301	Confined	7,243	10/30/1998	506.62	520.38	-1.38	0.1
7	0_7733301	Confined	7,249	11/5/1998	506.26	520.42	-1.42	0.1
7	0_7733301	Confined	7,254	11/10/1998	506.77	520.46	-1.37	0.1
7	0_7733301	Confined	7,259	11/15/1998	506.49	520.49	-1.40	0.1
7	0_7733301	Confined	7,264	11/20/1998	506.40	520.52	-1.41	0.1
7	0_7733301	Confined	7,269	11/25/1998	506.41	520.55	-1.41	0.1
7	0_7733301	Confined	7,274	11/30/1998	506.55	520.59	-1.40	0.1
7	0_7733301	Confined	7,279	12/5/1998	506.58	520.62	-1.40	0.1
7	0_7733301	Confined	7,284	12/10/1998	506.15	520.65	-1.45	0.1
7	0_7733301	Confined	7,289	12/15/1998	506.15	520.68	-1.45	0.1
7	0_7733301	Confined	7,294	12/20/1998	506.52	520.71	-1.42	0.1
7	0_7733301	Confined	7,299	12/25/1998	506.16	520.75	-1.46	0.1
7	0_7733301	Confined	7,304	12/30/1998	506.36	520.78	-1.44	0.1
7	0_7733301	Confined	7,310	1/5/1999	506.26	520.81	-1.45	0.1
7	0_7733301	Confined	7,315	1/10/1999	506.13	520.83	-1.47	0.1
7	0_7733301	Confined	7,320	1/15/1999	506.30	520.86	-1.46	0.1
7	0_7733301	Confined	7,325	1/20/1999	506.39	520.88	-1.45	0.1
7	0_7733301	Confined	7,330	1/25/1999	506.09	520.90	-1.48	0.1
7	0_7733301	Confined	7,335	1/30/1999	506.14	520.93	-1.48	0.1
7	0_7733301	Confined	7,341	2/5/1999	506.19	520.96	-1.48	0.1
7	0_7733301	Confined	7,346	2/10/1999	508.28	520.98	-1.27	0.1
7	0_7733301	Confined	7,351	2/15/1999	506.38	521.00	-1.46	0.1
7	0_7733301	Confined	7,356	2/20/1999	506.30	521.03	-1.47	0.1
7	0_7733301	Confined	7,361	2/25/1999	506.27	521.05	-1.48	0.1
7	0_7733301	Confined	7,364	2/28/1999	506.17	521.06	-1.49	0.1
7	0_7733301	Confined	7,369	3/5/1999	506.30	521.09	-1.48	0.1
7	0_7733301	Confined	7,506	7/20/1999	506.04	521.73	-1.57	0.1
7	0_7733301	Confined	7,511	7/25/1999	506.08	521.76	-1.57	0.1
7	0_7733301	Confined	7,516	7/30/1999	506.16	521.78	-1.56	0.1
7	0_7733301	Confined	7,522	8/5/1999	506.08	521.81	-1.57	0.1
7	0_7733301	Confined	7,527	8/10/1999	506.08	521.83	-1.58	0.1
7	0_7733301	Confined	7,532	8/15/1999	505.99	521.85	-1.59	0.1
7	0_7733301	Confined	7,537	8/20/1999	506.02	521.88	-1.59	0.1
7	0_7733301	Confined	7,542	8/25/1999	505.98	521.90	-1.59	0.1
7	0_7733301	Confined	7,547	8/30/1999	506.01	521.92	-1.59	0.1
7	0_7733301	Confined	7,553	9/5/1999	505.97	521.95	-1.60	0.1
7	0_7733301	Confined	7,558	9/10/1999	506.00	521.98	-1.60	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	7,563	9/15/1999	505.96	522.00	-1.60	0.1
7	0_7733301	Confined	7,568	9/20/1999	506.00	522.02	-1.60	0.1
7	0_7733301	Confined	7,573	9/25/1999	506.09	522.05	-1.60	0.1
7	0_7733301	Confined	7,578	9/30/1999	505.88	522.07	-1.62	0.1
7	0_7733301	Confined	7,583	10/5/1999	505.89	522.09	-1.62	0.1
7	0_7733301	Confined	7,588	10/10/1999	505.87	522.12	-1.62	0.1
7	0_7733301	Confined	7,593	10/15/1999	506.01	522.14	-1.61	0.1
7	0_7733301	Confined	7,598	10/20/1999	505.76	522.16	-1.64	0.1
7	0_7733301	Confined	7,603	10/25/1999	505.90	522.19	-1.63	0.1
7	0_7733301	Confined	7,608	10/30/1999	506.02	522.21	-1.62	0.1
7	0_7733301	Confined	7,614	11/5/1999	505.88	522.24	-1.64	0.1
7	0_7733301	Confined	7,619	11/10/1999	505.97	522.26	-1.63	0.1
7	0_7733301	Confined	7,624	11/15/1999	505.95	522.29	-1.63	0.1
7	0_7733301	Confined	7,629	11/20/1999	505.97	522.31	-1.63	0.1
7	0_7733301	Confined	7,634	11/25/1999	505.83	522.33	-1.65	0.1
7	0_7733301	Confined	7,639	11/30/1999	505.70	522.36	-1.67	0.1
7	0_7733301	Confined	7,644	12/5/1999	505.72	522.38	-1.67	0.1
7	0_7733301	Confined	7,649	12/10/1999	505.88	522.40	-1.65	0.1
7	0_7733301	Confined	7,654	12/15/1999	505.74	522.43	-1.67	0.1
7	0_7733301	Confined	7,659	12/20/1999	505.98	522.45	-1.65	0.1
7	0_7733301	Confined	7,664	12/25/1999	505.54	522.48	-1.69	0.1
7	0_7733301	Confined	7,669	12/30/1999	506.02	522.50	-1.65	0.1
7	0_7733301	Confined	7,675	1/5/2000	505.66	522.53	-1.69	0.1
7	0_7733301	Confined	7,680	1/10/2000	505.85	522.56	-1.67	0.1
7	0_7733301	Confined	7,685	1/15/2000	505.55	522.58	-1.70	0.1
7	0_7733301	Confined	7,690	1/20/2000	505.93	522.61	-1.67	0.1
7	0_7733301	Confined	7,695	1/25/2000	505.67	522.64	-1.70	0.1
7	0_7733301	Confined	7,700	1/30/2000	505.53	522.66	-1.71	0.1
7	0_7733301	Confined	7,706	2/5/2000	505.49	522.70	-1.72	0.1
7	0_7733301	Confined	7,711	2/10/2000	506.05	522.72	-1.67	0.1
7	0_7733301	Confined	7,716	2/15/2000	505.73	522.75	-1.70	0.1
7	0_7733301	Confined	7,721	2/20/2000	505.40	522.78	-1.74	0.1
7	0_7733301	Confined	7,725	2/24/2000	507.48	522.80	-1.53	0.1
7	0_7733301	Confined	7,726	2/25/2000	505.93	522.80	-1.69	0.1
7	0_7733301	Confined	7,730	2/29/2000	505.73	522.82	-1.71	0.1
7	0_7733301	Confined	7,735	3/5/2000	505.77	522.85	-1.71	0.1
7	0_7733301	Confined	7,740	3/10/2000	505.75	522.88	-1.71	0.1
7	0_7733301	Confined	7,745	3/15/2000	505.81	522.90	-1.71	0.1
7	0_7733301	Confined	7,750	3/20/2000	505.88	522.93	-1.71	0.1
7	0_7733301	Confined	7,755	3/25/2000	505.54	522.96	-1.74	0.1
7	0_7733301	Confined	7,760	3/30/2000	505.67	522.98	-1.73	0.1
7	0_7733301	Confined	7,766	4/5/2000	505.59	523.02	-1.74	0.1
7	0_7733301	Confined	7,771	4/10/2000	505.73	523.04	-1.73	0.1
7	0_7733301	Confined	7,776	4/15/2000	505.84	523.07	-1.72	0.1
7	0_7733301	Confined	7,781	4/20/2000	505.69	523.10	-1.74	0.1
7	0_7733301	Confined	7,786	4/25/2000	505.52	523.12	-1.76	0.1
7	0_7733301	Confined	7,791	4/30/2000	505.68	523.15	-1.75	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	7,796	5/5/2000	505.64	523.18	-1.75	0.1
7	0_7733301	Confined	7,801	5/10/2000	505.62	523.20	-1.76	0.1
7	0_7733301	Confined	7,806	5/15/2000	505.45	523.23	-1.78	0.1
7	0_7733301	Confined	7,811	5/20/2000	505.39	523.26	-1.79	0.1
7	0_7733301	Confined	7,816	5/25/2000	505.70	523.28	-1.76	0.1
7	0_7733301	Confined	7,821	5/30/2000	505.49	523.31	-1.78	0.1
7	0_7733301	Confined	7,827	6/5/2000	505.38	523.34	-1.80	0.1
7	0_7733301	Confined	7,832	6/10/2000	505.54	523.37	-1.78	0.1
7	0_7733301	Confined	7,837	6/15/2000	505.66	523.40	-1.77	0.1
7	0_7733301	Confined	7,842	6/20/2000	505.49	523.42	-1.79	0.1
7	0_7733301	Confined	7,847	6/25/2000	505.48	523.45	-1.80	0.1
7	0_7733301	Confined	7,852	6/30/2000	505.41	523.48	-1.81	0.1
7	0_7733301	Confined	7,857	7/5/2000	505.30	523.50	-1.82	0.1
7	0_7733301	Confined	7,862	7/10/2000	505.24	523.53	-1.83	0.1
7	0_7733301	Confined	7,867	7/15/2000	505.39	523.56	-1.82	0.1
7	0_7733301	Confined	7,872	7/20/2000	505.33	523.58	-1.83	0.1
7	0_7733301	Confined	7,877	7/25/2000	505.35	523.61	-1.83	0.1
7	0_7733301	Confined	7,882	7/30/2000	505.31	523.64	-1.83	0.1
7	0_7733301	Confined	7,888	8/5/2000	505.28	523.67	-1.84	0.1
7	0_7733301	Confined	7,893	8/10/2000	505.18	523.70	-1.85	0.1
7	0_7733301	Confined	7,898	8/15/2000	505.11	523.72	-1.86	0.1
7	0_7733301	Confined	7,903	8/20/2000	505.27	523.75	-1.85	0.1
7	0_7733301	Confined	7,908	8/25/2000	505.27	523.78	-1.85	0.1
7	0_7733301	Confined	7,913	8/30/2000	505.20	523.80	-1.86	0.1
7	0_7733301	Confined	7,919	9/5/2000	505.20	523.84	-1.86	0.1
7	0_7733301	Confined	7,924	9/10/2000	505.21	523.86	-1.87	0.1
7	0_7733301	Confined	7,929	9/15/2000	505.06	523.89	-1.88	0.1
7	0_7733301	Confined	7,934	9/20/2000	505.27	523.92	-1.86	0.1
7	0_7733301	Confined	7,939	9/25/2000	504.85	523.94	-1.91	0.1
7	0_7733301	Confined	7,944	9/30/2000	505.10	523.97	-1.89	0.1
7	0_7733301	Confined	7,949	10/5/2000	505.14	524.00	-1.89	0.1
7	0_7733301	Confined	7,954	10/10/2000	504.88	524.02	-1.91	0.1
7	0_7733301	Confined	7,959	10/15/2000	505.19	524.05	-1.89	0.1
7	0_7733301	Confined	7,964	10/20/2000	505.13	524.08	-1.89	0.1
7	0_7733301	Confined	7,969	10/25/2000	505.13	524.10	-1.90	0.1
7	0_7733301	Confined	7,974	10/30/2000	505.05	524.13	-1.91	0.1
7	0_7733301	Confined	7,980	11/5/2000	505.41	524.16	-1.88	0.1
7	0_7733301	Confined	7,985	11/10/2000	504.88	524.19	-1.93	0.1
7	0_7733301	Confined	7,990	11/15/2000	505.11	524.21	-1.91	0.1
7	0_7733301	Confined	7,995	11/20/2000	504.69	524.24	-1.96	0.1
7	0_7733301	Confined	8,000	11/25/2000	505.06	524.27	-1.92	0.1
7	0_7733301	Confined	8,005	11/30/2000	504.90	524.30	-1.94	0.1
7	0_7733301	Confined	8,010	12/5/2000	504.95	524.32	-1.94	0.1
7	0_7733301	Confined	8,015	12/10/2000	505.15	524.35	-1.92	0.1
7	0_7733301	Confined	8,020	12/15/2000	505.07	524.38	-1.93	0.1
7	0_7733301	Confined	8,025	12/20/2000	505.29	524.40	-1.91	0.1
7	0_7733301	Confined	8,030	12/25/2000	505.04	524.43	-1.94	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	8,035	12/30/2000	504.84	524.46	-1.96	0.1
7	0_7733301	Confined	8,041	1/5/2001	505.13	524.49	-1.94	0.1
7	0_7733301	Confined	8,046	1/10/2001	505.06	524.51	-1.94	0.1
7	0_7733301	Confined	8,051	1/15/2001	504.94	524.53	-1.96	0.1
7	0_7733301	Confined	8,056	1/20/2001	504.78	524.56	-1.98	0.1
7	0_7733301	Confined	8,061	1/25/2001	504.94	524.58	-1.96	0.1
7	0_7733301	Confined	8,066	1/30/2001	505.08	524.61	-1.95	0.1
7	0_7733301	Confined	8,072	2/5/2001	504.94	524.63	-1.97	0.1
7	0_7733301	Confined	8,077	2/10/2001	504.65	524.66	-2.00	0.1
7	0_7733301	Confined	8,082	2/15/2001	505.21	524.68	-1.95	0.1
7	0_7733301	Confined	8,087	2/20/2001	504.94	524.71	-1.98	0.1
7	0_7733301	Confined	8,092	2/25/2001	504.93	524.73	-1.98	0.1
7	0_7733301	Confined	8,095	2/28/2001	504.95	524.75	-1.98	0.1
7	0_7733301	Confined	8,100	3/5/2001	504.52	524.77	-2.02	0.1
7	0_7733301	Confined	8,105	3/10/2001	505.07	524.79	-1.97	0.1
7	0_7733301	Confined	8,110	3/15/2001	505.05	524.82	-1.98	0.1
7	0_7733301	Confined	8,115	3/20/2001	504.69	524.84	-2.02	0.1
7	0_7733301	Confined	8,120	3/25/2001	504.63	524.87	-2.02	0.1
7	0_7733301	Confined	8,125	3/30/2001	504.96	524.89	-1.99	0.1
7	0_7733301	Confined	8,131	4/5/2001	504.81	524.92	-2.01	0.1
7	0_7733301	Confined	8,136	4/10/2001	505.08	524.94	-1.99	0.1
7	0_7733301	Confined	8,141	4/15/2001	504.82	524.97	-2.01	0.1
7	0_7733301	Confined	8,146	4/20/2001	504.94	524.99	-2.01	0.1
7	0_7733301	Confined	8,151	4/25/2001	504.58	525.02	-2.04	0.1
7	0_7733301	Confined	8,156	4/30/2001	504.71	525.04	-2.03	0.1
7	0_7733301	Confined	8,161	5/5/2001	504.92	525.06	-2.01	0.1
7	0_7733301	Confined	8,166	5/10/2001	504.79	525.09	-2.03	0.1
7	0_7733301	Confined	8,171	5/15/2001	504.79	525.11	-2.03	0.1
7	0_7733301	Confined	8,176	5/20/2001	505.00	525.14	-2.01	0.1
7	0_7733301	Confined	8,181	5/25/2001	504.68	525.16	-2.05	0.1
7	0_7733301	Confined	8,186	5/30/2001	504.63	525.18	-2.06	0.1
7	0_7733301	Confined	8,192	6/5/2001	504.69	525.21	-2.05	0.1
7	0_7733301	Confined	8,197	6/10/2001	504.62	525.24	-2.06	0.1
7	0_7733301	Confined	8,202	6/15/2001	504.44	525.26	-2.08	0.1
7	0_7733301	Confined	8,207	6/20/2001	504.41	525.29	-2.09	0.1
7	0_7733301	Confined	8,212	6/25/2001	504.51	525.31	-2.08	0.1
7	0_7733301	Confined	8,217	6/30/2001	504.61	525.33	-2.07	0.1
7	0_7733301	Confined	8,222	7/5/2001	504.52	525.36	-2.08	0.1
7	0_7733301	Confined	8,227	7/10/2001	504.54	525.38	-2.08	0.1
7	0_7733301	Confined	8,232	7/15/2001	504.54	525.41	-2.09	0.1
7	0_7733301	Confined	8,237	7/20/2001	504.50	525.43	-2.09	0.1
7	0_7733301	Confined	8,242	7/25/2001	504.50	525.45	-2.10	0.1
7	0_7733301	Confined	8,247	7/30/2001	504.38	525.48	-2.11	0.1
7	0_7733301	Confined	8,253	8/5/2001	504.36	525.51	-2.11	0.1
7	0_7733301	Confined	8,258	8/10/2001	504.38	525.53	-2.12	0.1
7	0_7733301	Confined	8,263	8/15/2001	504.44	525.56	-2.11	0.1
7	0_7733301	Confined	8,268	8/20/2001	504.38	525.58	-2.12	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733301	Confined	8,273	8/25/2001	504.42	525.60	-2.12	0.1
7	0_7733301	Confined	8,278	8/30/2001	504.44	525.63	-2.12	0.1
7	0_7733301	Confined	8,284	9/5/2001	504.29	525.66	-2.14	0.1
7	0_7733301	Confined	8,289	9/10/2001	504.04	525.68	-2.16	0.1
7	0_7733301	Confined	8,294	9/15/2001	504.31	525.71	-2.14	0.1
7	0_7733301	Confined	8,299	9/20/2001	504.29	525.73	-2.14	0.1
7	0_7733301	Confined	8,304	9/25/2001	504.16	525.75	-2.16	0.1
7	0_7733301	Confined	8,309	9/30/2001	504.17	525.78	-2.16	0.1
7	0_7733301	Confined	8,314	10/5/2001	504.38	525.80	-2.14	0.1
7	0_7733301	Confined	8,319	10/10/2001	504.34	525.83	-2.15	0.1
7	0_7733301	Confined	8,324	10/15/2001	504.15	525.85	-2.17	0.1
7	0_7733301	Confined	8,329	10/20/2001	504.29	525.87	-2.16	0.1
7	0_7733301	Confined	8,334	10/25/2001	504.17	525.90	-2.17	0.1
7	0_7733301	Confined	8,339	10/30/2001	504.10	525.92	-2.18	0.1
7	0_7733301	Confined	8,345	11/5/2001	504.15	525.95	-2.18	0.1
7	0_7733301	Confined	8,350	11/10/2001	504.17	525.98	-2.18	0.1
7	0_7733301	Confined	8,355	11/15/2001	504.39	526.00	-2.16	0.1
7	0_7733301	Confined	8,360	11/20/2001	503.98	526.02	-2.20	0.1
7	0_7733301	Confined	8,365	11/25/2001	504.19	526.05	-2.19	0.1
7	0_7733301	Confined	8,370	11/30/2001	504.05	526.07	-2.20	0.1
7	0_7733301	Confined	8,375	12/5/2001	504.15	526.10	-2.19	0.1
7	0_7733301	Confined	8,380	12/10/2001	504.13	526.12	-2.20	0.1
7	0_7733301	Confined	8,385	12/15/2001	504.29	526.14	-2.19	0.1
7	0_7733301	Confined	8,390	12/20/2001	503.82	526.17	-2.23	0.1
7	0_7733301	Confined	8,395	12/25/2001	503.92	526.19	-2.23	0.1
7	0_7733301	Confined	8,400	12/30/2001	503.89	526.22	-2.23	0.1
7	0_7733301	Confined	8,406	1/5/2002	504.19	526.26	-2.21	0.1
7	0_7733301	Confined	8,411	1/10/2002	504.23	526.30	-2.21	0.1
7	0_7733301	Confined	8,416	1/15/2002	504.01	526.33	-2.23	0.1
7	0_7733301	Confined	8,421	1/20/2002	504.18	526.37	-2.22	0.1
7	0_7733301	Confined	8,426	1/25/2002	503.66	526.41	-2.27	0.1
7	0_7733301	Confined	8,431	1/30/2002	504.24	526.44	-2.22	0.1
7	0_7733301	Confined	8,437	2/5/2002	503.92	526.49	-2.26	0.1
7	0_7733301	Confined	8,442	2/10/2002	503.80	526.52	-2.27	0.1
7	0_7733301	Confined	8,447	2/15/2002	504.05	526.56	-2.25	0.1
7	0_7733301	Confined	8,452	2/20/2002	503.99	526.60	-2.26	0.1
7	0_7733301	Confined	8,457	2/25/2002	504.05	526.63	-2.26	0.1
7	0_7733301	Confined	8,460	2/28/2002	504.01	526.66	-2.26	0.1
7	0_7733301	Confined	8,465	3/5/2002	503.80	526.69	-2.29	0.1
7	0_7733301	Confined	8,470	3/10/2002	503.62	526.73	-2.31	0.1
7	0_7733301	Confined	8,475	3/15/2002	504.21	526.77	-2.26	0.1
7	0_7733301	Confined	8,480	3/20/2002	503.69	526.80	-2.31	0.1
7	0_7733301	Confined	8,485	3/25/2002	504.12	526.84	-2.27	0.1
7	0_7733301	Confined	8,490	3/30/2002	504.01	526.88	-2.29	0.1
7	0_7733309	Unconfined	7,044	4/14/1998	545.33	529.95	15.38	1
7	0_7733322	Unconfined	773	2/11/1981	566.38	536.07	30.31	1
7	0_7733322	Unconfined	1,495	2/3/1983	565.46	537.43	28.03	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733322	Unconfined	1,873	2/16/1984	564.47	537.06	27.41	1
7	0_7733322	Unconfined	2,231	2/8/1985	563.48	536.03	27.45	1
7	0_7733322	Unconfined	2,601	2/13/1986	561.84	538.02	23.82	1
7	0_7733322	Unconfined	2,964	2/11/1987	561.36	539.95	21.41	1
7	0_7733322	Unconfined	3,357	3/10/1988	561.00	541.60	19.40	1
7	0_7733322	Unconfined	3,692	2/8/1989	559.88	539.46	20.42	1
7	0_7733322	Unconfined	4,062	2/13/1990	558.97	539.53	19.44	1
7	0_7733322	Unconfined	4,429	2/15/1991	558.01	542.40	15.61	1
7	0_7733322	Unconfined	4,797	2/18/1992	556.88	546.17	10.71	1
7	0_7733322	Unconfined	5,164	2/19/1993	555.57	549.87	5.70	1
7	0_7733322	Unconfined	5,532	2/22/1994	554.82	549.68	5.14	1
7	0_7733322	Unconfined	5,804	11/21/1994	555.32	550.87	4.45	1
7	0_7733322	Unconfined	6,238	1/29/1996	554.57	550.04	4.53	1
7	0_7733322	Unconfined	6,616	2/10/1997	553.67	547.98	5.69	1
7	0_7733322	Unconfined	6,995	2/24/1998	552.64	550.98	1.66	1
7	0_7733322	Unconfined	8,081	2/14/2001	551.37	553.04	-1.67	1
7	0_7733322	Unconfined	8,438	2/6/2002	550.59	554.08	-3.49	1
7	0_7733322	Unconfined	8,808	2/11/2003	557.33	559.05	-1.72	1
7	0_7733322	Unconfined	9,152	1/21/2004	549.37	560.40	-11.03	1
7	0_7733611	Unconfined	772	2/10/1981	579.19	575.17	2.01	0.5
7	0_7733611	Unconfined	1,495	2/3/1983	575.45	576.61	-0.58	0.5
7	0_7733611	Unconfined	1,873	2/16/1984	574.93	576.50	-0.79	0.5
7	0_7733611	Unconfined	2,231	2/8/1985	574.30	575.60	-0.65	0.5
7	0_7733611	Unconfined	2,601	2/13/1986	574.13	576.93	-1.40	0.5
7	0_7733611	Unconfined	3,357	3/10/1988	571.59	580.38	-4.39	0.5
7	0_7733611	Unconfined	3,692	2/8/1989	572.73	578.85	-3.06	0.5
7	0_7733611	Unconfined	4,062	2/13/1990	574.13	579.14	-2.51	0.5
7	0_7733611	Unconfined	4,429	2/15/1991	564.08	581.38	-8.65	0.5
7	0_7733611	Unconfined	4,797	2/18/1992	565.77	584.37	-9.30	0.5
7	0_7733611	Unconfined	5,164	2/19/1993	566.38	587.40	-10.51	0.5
7	0_7733611	Unconfined	5,532	2/22/1994	560.78	587.28	-13.25	0.5
7	0_7733611	Unconfined	5,804	11/21/1994	568.71	588.50	-9.89	0.5
7	0_7733611	Unconfined	6,238	1/29/1996	566.48	588.18	-10.85	0.5
7	0_7733611	Unconfined	6,995	2/24/1998	554.74	590.26	-17.76	0.5
7	0_7733611	Unconfined	7,346	2/10/1999	559.93	592.55	-16.31	0.5
7	0_7733611	Unconfined	7,725	2/24/2000	559.13	592.55	-16.71	0.5
7	0_7733611	Unconfined	8,081	2/14/2001	562.33	594.36	-16.01	0.5
7	0_7733611	Unconfined	8,438	2/6/2002	560.59	595.84	-17.63	0.5
7	0_7733611	Unconfined	8,551	5/30/2002	561.08	597.36	-18.14	0.5
7	0_7733611	Unconfined	8,808	2/11/2003	562.06	600.44	-19.19	0.5
7	0_7733611	Unconfined	9,152	1/21/2004	552.73	602.12	-24.69	0.5
7	0_7733611	Unconfined	9,536	2/8/2005	559.96	605.70	-22.87	0.5
7	0_7733611	Unconfined	9,936	3/15/2006	558.31	604.54	-23.12	0.5
7	0_7733611	Unconfined	10,265	2/7/2007	557.54	604.24	-23.35	0.5
7	0_7733611	Unconfined	11,013	2/24/2009	553.60	606.44	-26.42	0.5
7	0_7733611	Unconfined	11,723	2/4/2011	555.26	606.82	-25.78	0.5
7	0_7733611	Unconfined	12,079	1/26/2012	553.10	603.83	-25.36	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7733611	Unconfined	12,442	1/23/2013	551.88	602.90	-25.51	0.5
7	0_7733611	Unconfined	12,820	2/5/2014	545.50	602.32	-28.41	0.5
7	0_7733611	Unconfined	13,450	10/28/2015	549.13	603.18	-27.03	0.5
7	0_7733611	Unconfined	13,813	10/25/2016	548.08	604.85	-28.39	0.5
7	0_7733611	Unconfined	14,170	10/17/2017	547.25	605.02	-28.89	0.5
7	0_7733617	Confined	8,176	5/20/2001	515.29	506.88	4.20	0.5
7	0_7733701	Confined	773	2/11/1981	579.83	591.90	-1.21	0.1
7	0_7733701	Confined	2,601	2/13/1986	579.61	592.86	-1.32	0.1
7	0_7733701	Confined	3,692	2/8/1989	579.03	594.72	-1.57	0.1
7	0_7733701	Confined	4,062	2/13/1990	579.41	595.05	-1.56	0.1
7	0_7733701	Confined	4,429	2/15/1991	572.12	595.60	-2.35	0.1
7	0_7733701	Confined	4,797	2/18/1992	578.87	596.35	-1.75	0.1
7	0_7733701	Confined	5,164	2/19/1993	575.91	597.43	-2.15	0.1
7	0_7733701	Confined	6,238	1/29/1996	579.96	599.20	-1.92	0.1
7	0_7733701	Confined	6,616	2/10/1997	576.56	599.26	-2.27	0.1
7	0_7733701	Confined	6,995	2/24/1998	577.27	600.02	-2.27	0.1
7	0_7733701	Confined	7,346	2/10/1999	567.26	600.93	-3.37	0.1
7	0_7733701	Confined	7,725	2/24/2000	566.06	601.69	-3.56	0.1
7	0_7733701	Confined	8,081	2/14/2001	570.16	602.38	-3.22	0.1
7	0_7733701	Confined	8,438	2/6/2002	569.01	603.13	-3.41	0.1
7	0_7733701	Confined	9,152	1/21/2004	567.21	605.68	-3.85	0.1
7	0_7733701	Confined	9,536	2/8/2005	566.84	607.55	-4.07	0.1
7	0_7733701	Confined	9,936	3/15/2006	556.06	608.89	-5.28	0.1
7	0_7733701	Confined	10,266	2/8/2007	564.05	609.71	-4.57	0.1
7	0_7733701	Confined	10,649	2/26/2008	559.01	611.21	-5.22	0.1
7	0_7734204	Confined	773	2/11/1981	382.74	259.44	12.33	0.1
7	0_7734217	Confined	10,580	12/19/2007	296.31	327.81	-3.15	0.1
7	0_7734319	Confined	773	2/11/1981	291.36	280.77	1.06	0.1
7	0_7734319	Confined	1,873	2/16/1984	284.51	286.95	-0.24	0.1
7	0_7734319	Confined	2,235	2/12/1985	279.81	286.97	-0.72	0.1
7	0_7734402	Confined	772	2/10/1981	461.65	351.96	10.97	0.1
7	0_7734402	Confined	1,495	2/3/1983	453.16	358.06	9.51	0.1
7	0_7734402	Confined	1,873	2/16/1984	453.41	361.18	9.22	0.1
7	0_7734402	Confined	2,235	2/12/1985	444.64	360.39	8.42	0.1
7	0_7734402	Confined	2,963	2/10/1987	458.94	364.91	9.40	0.1
7	0_7734606	Confined	4,048	1/30/1990	330.49	321.95	8.54	1
7	0_7734606	Confined	6,835	9/17/1997	325.69	302.28	23.41	1
7	0_7734607	Confined	773	2/11/1981	363.39	313.77	24.81	0.5
7	0_7734607	Confined	1,495	2/3/1983	365.24	316.53	24.35	0.5
7	0_7734607	Confined	2,235	2/12/1985	339.88	318.82	10.53	0.5
7	0_7734607	Confined	2,602	2/14/1986	364.18	318.54	22.82	0.5
7	0_7734607	Confined	2,963	2/10/1987	369.89	321.19	24.35	0.5
7	0_7734607	Confined	3,357	3/10/1988	378.48	326.37	26.05	0.5
7	0_7734607	Confined	3,691	2/7/1989	372.26	330.08	21.09	0.5
7	0_7734607	Confined	4,062	2/13/1990	366.57	333.91	16.33	0.5
7	0_7734607	Confined	4,798	2/19/1992	384.94	336.52	24.21	0.5
7	0_7734607	Confined	5,164	2/19/1993	380.53	335.72	22.40	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7734607	Confined	5,532	2/22/1994	371.23	333.87	18.68	0.5
7	0_7734607	Confined	5,812	11/29/1994	372.27	333.07	19.60	0.5
7	0_7734607	Confined	6,234	1/25/1996	368.63	330.18	19.22	0.5
7	0_7734607	Confined	8,081	2/14/2001	360.53	326.91	16.81	0.5
7	0_7734607	Confined	8,439	2/7/2002	350.43	327.11	11.66	0.5
7	0_7734607	Confined	8,808	2/11/2003	353.58	325.33	14.13	0.5
7	0_7734607	Confined	9,153	1/22/2004	373.43	324.62	24.41	0.5
7	0_7734607	Confined	11,013	2/24/2009	370.53	323.19	23.67	0.5
7	0_7734702	Confined	773	2/11/1981	479.97	393.28	43.35	0.5
7	0_7734702	Confined	1,495	2/3/1983	479.38	396.82	41.28	0.5
7	0_7734702	Confined	1,873	2/16/1984	476.06	398.55	38.76	0.5
7	0_7734702	Confined	2,235	2/12/1985	471.16	397.51	36.83	0.5
7	0_7734702	Confined	2,602	2/14/1986	471.68	396.62	37.53	0.5
7	0_7734702	Confined	2,963	2/10/1987	480.61	401.67	39.47	0.5
7	0_7734702	Confined	3,691	2/7/1989	482.11	409.22	36.45	0.5
7	0_7734702	Confined	4,062	2/13/1990	480.60	413.40	33.60	0.5
7	0_7734702	Confined	4,433	2/19/1991	482.99	416.49	33.25	0.5
7	0_7734702	Confined	4,798	2/19/1992	483.04	416.91	33.07	0.5
7	0_7734702	Confined	5,164	2/19/1993	483.76	416.88	33.44	0.5
7	0_7734702	Confined	5,532	2/22/1994	480.96	414.43	33.27	0.5
7	0_7734702	Confined	5,812	11/29/1994	482.02	414.57	33.72	0.5
7	0_7734702	Confined	6,234	1/25/1996	478.76	412.31	33.23	0.5
7	0_7734702	Confined	6,995	2/24/1998	476.72	414.76	30.98	0.5
7	0_7734702	Confined	7,346	2/10/1999	477.36	415.63	30.86	0.5
7	0_7734702	Confined	7,725	2/24/2000	476.46	417.44	29.51	0.5
7	0_7734702	Confined	8,081	2/14/2001	474.46	417.48	28.49	0.5
7	0_7734702	Confined	8,439	2/7/2002	469.76	417.98	25.89	0.5
7	0_7734702	Confined	9,153	1/22/2004	473.31	417.26	28.03	0.5
7	0_7734702	Confined	9,536	2/8/2005	474.00	417.63	28.19	0.5
7	0_7734702	Confined	9,935	3/14/2006	450.69	418.11	16.29	0.5
7	0_7734702	Confined	10,265	2/7/2007	464.15	418.99	22.58	0.5
7	0_7734702	Confined	10,649	2/26/2008	463.76	419.46	22.15	0.5
7	0_7734702	Confined	11,722	2/3/2011	442.29	409.33	16.48	0.5
7	0_7734702	Confined	12,079	1/26/2012	412.42	404.12	4.15	0.5
7	0_7734702	Confined	12,442	1/23/2013	379.36	396.79	-8.71	0.5
7	0_7734702	Confined	12,820	2/5/2014	357.54	391.93	-17.20	0.5
7	0_7734702	Confined	13,451	10/29/2015	402.56	386.35	8.11	0.5
7	0_7734702	Confined	13,801	10/13/2016	400.64	384.63	8.01	0.5
7	0_7734702	Confined	14,170	10/17/2017	393.14	383.74	4.70	0.5
7	0_7735601	Confined	773	2/11/1981	345.58	297.86	23.86	0.5
7	0_7735601	Confined	1,495	2/3/1983	338.86	302.49	18.19	0.5
7	0_7735601	Confined	1,873	2/16/1984	331.03	304.42	13.30	0.5
7	0_7735601	Confined	2,235	2/12/1985	327.65	303.30	12.18	0.5
7	0_7735601	Confined	2,963	2/10/1987	330.51	308.60	10.95	0.5
7	0_7735601	Confined	3,357	3/10/1988	331.89	318.78	6.56	0.5
7	0_7735601	Confined	3,692	2/8/1989	332.45	322.70	4.88	0.5
7	0_7735601	Confined	4,798	2/19/1992	333.63	322.03	5.80	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7735601	Confined	5,812	11/29/1994	327.78	309.32	9.23	0.5
7	0_7735601	Confined	6,234	1/25/1996	322.91	303.60	9.66	0.5
7	0_7735802	Confined	772	2/10/1981	296.66	307.36	-10.70	1
7	0_7735802	Confined	1,873	2/16/1984	303.78	312.82	-9.04	1
7	0_7735802	Confined	2,236	2/13/1985	292.14	312.35	-20.21	1
7	0_7735802	Confined	2,600	2/12/1986	312.09	311.33	0.76	1
7	0_7735802	Confined	2,963	2/10/1987	318.45	316.02	2.43	1
7	0_7737101	Confined	773	2/11/1981	263.96	274.94	-5.49	0.5
7	0_7737101	Confined	1,500	2/8/1983	261.50	278.01	-8.25	0.5
7	0_7737101	Confined	1,875	2/18/1984	267.69	279.88	-6.10	0.5
7	0_7737101	Confined	2,236	2/13/1985	260.41	280.02	-9.80	0.5
7	0_7737101	Confined	2,599	2/11/1986	264.19	279.64	-7.73	0.5
7	0_7737101	Confined	2,962	2/9/1987	271.64	283.39	-5.88	0.5
7	0_7737101	Confined	3,356	3/9/1988	285.68	290.69	-2.50	0.5
7	0_7737101	Confined	4,063	2/14/1990	256.89	298.12	-20.61	0.5
7	0_7737101	Confined	4,428	2/14/1991	263.94	299.58	-17.82	0.5
7	0_7737101	Confined	4,797	2/18/1992	265.54	296.15	-15.30	0.5
7	0_7737101	Confined	5,163	2/18/1993	275.54	290.40	-7.43	0.5
7	0_7737501	Confined	772	2/10/1981	241.82	278.75	-36.93	1
7	0_7737501	Confined	1,500	2/8/1983	236.50	280.17	-43.67	1
7	0_7737501	Confined	1,871	2/14/1984	267.47	281.74	-14.27	1
7	0_7737501	Confined	2,236	2/13/1985	243.79	281.97	-38.18	1
7	0_7737501	Confined	2,599	2/11/1986	248.13	283.46	-35.33	1
7	0_7737501	Confined	2,962	2/9/1987	265.60	285.62	-20.02	1
7	0_7737501	Confined	3,356	3/9/1988	273.03	288.41	-15.38	1
7	0_7737501	Confined	3,691	2/7/1989	264.59	290.19	-25.60	1
7	0_7737501	Confined	4,063	2/14/1990	248.54	290.89	-42.35	1
7	0_7737501	Confined	4,428	2/14/1991	256.28	290.90	-34.62	1
7	0_7737501	Confined	4,797	2/18/1992	315.88	286.42	29.46	1
7	0_7737501	Confined	5,163	2/18/1993	319.98	279.63	40.35	1
7	0_7737501	Confined	5,531	2/21/1994	319.08	271.51	47.57	1
7	0_7737501	Confined	5,804	11/21/1994	299.06	265.12	33.94	1
7	0_7737501	Confined	6,234	1/25/1996	303.48	255.09	48.39	1
7	0_7737501	Confined	6,619	2/13/1997	288.68	246.84	41.84	1
7	0_7737501	Confined	6,984	2/13/1998	292.90	242.09	50.81	1
7	0_7737501	Confined	7,347	2/11/1999	310.18	235.48	74.70	1
7	0_7737501	Confined	7,725	2/24/2000	306.23	227.86	78.37	1
7	0_7737501	Confined	8,080	2/13/2001	303.13	218.46	84.67	1
7	0_7737501	Confined	8,438	2/6/2002	296.50	209.79	86.71	1
7	0_7737501	Confined	9,536	2/8/2005	327.06	184.05	143.01	1
7	0_7737501	Confined	9,935	3/14/2006	311.71	178.78	132.93	1
7	0_7737501	Confined	10,000	5/18/2006	308.58	178.30	130.28	1
7	0_7738103	Confined	9,085	11/15/2003	209.75	161.90	47.85	1
7	0_7738103	Confined	9,090	11/20/2003	210.58	161.77	48.81	1
7	0_7738103	Confined	9,095	11/25/2003	211.65	161.65	50.00	1
7	0_7738103	Confined	9,100	11/30/2003	212.00	161.52	50.48	1
7	0_7738103	Confined	9,105	12/5/2003	212.69	161.40	51.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	9,110	12/10/2003	213.09	161.27	51.82	1
7	0_7738103	Confined	9,115	12/15/2003	213.86	161.15	52.71	1
7	0_7738103	Confined	9,120	12/20/2003	214.05	161.02	53.03	1
7	0_7738103	Confined	9,125	12/25/2003	214.92	160.90	54.02	1
7	0_7738103	Confined	9,130	12/30/2003	215.55	160.78	54.77	1
7	0_7738103	Confined	9,136	1/5/2004	216.58	160.69	55.89	1
7	0_7738103	Confined	9,141	1/10/2004	216.79	160.62	56.17	1
7	0_7738103	Confined	9,146	1/15/2004	218.67	160.56	58.11	1
7	0_7738103	Confined	9,151	1/20/2004	219.34	160.50	58.84	1
7	0_7738103	Confined	9,156	1/25/2004	220.55	160.43	60.12	1
7	0_7738103	Confined	9,161	1/30/2004	220.75	160.37	60.38	1
7	0_7738103	Confined	9,167	2/5/2004	222.05	160.29	61.76	1
7	0_7738103	Confined	9,172	2/10/2004	223.16	160.23	62.93	1
7	0_7738103	Confined	9,177	2/15/2004	221.45	160.16	61.29	1
7	0_7738103	Confined	9,182	2/20/2004	223.05	160.10	62.95	1
7	0_7738103	Confined	9,187	2/25/2004	226.08	160.04	66.04	1
7	0_7738103	Confined	9,190	2/28/2004	226.08	160.00	66.08	1
7	0_7738103	Confined	9,191	2/29/2004	227.91	159.99	67.92	1
7	0_7738103	Confined	9,196	3/5/2004	229.12	159.92	69.20	1
7	0_7738103	Confined	9,201	3/10/2004	229.40	159.86	69.54	1
7	0_7738103	Confined	9,206	3/15/2004	231.15	159.80	71.35	1
7	0_7738103	Confined	9,211	3/20/2004	231.66	159.73	71.93	1
7	0_7738103	Confined	9,216	3/25/2004	231.56	159.67	71.89	1
7	0_7738103	Confined	9,221	3/30/2004	230.74	159.60	71.14	1
7	0_7738103	Confined	9,227	4/5/2004	229.49	159.53	69.96	1
7	0_7738103	Confined	9,232	4/10/2004	229.37	159.46	69.91	1
7	0_7738103	Confined	9,237	4/15/2004	227.53	159.40	68.13	1
7	0_7738103	Confined	9,242	4/20/2004	227.52	159.34	68.18	1
7	0_7738103	Confined	9,247	4/25/2004	227.52	159.27	68.25	1
7	0_7738103	Confined	9,252	4/30/2004	227.84	159.21	68.63	1
7	0_7738103	Confined	9,257	5/5/2004	229.77	159.15	70.62	1
7	0_7738103	Confined	9,262	5/10/2004	230.34	159.08	71.26	1
7	0_7738103	Confined	9,267	5/15/2004	228.04	159.02	69.02	1
7	0_7738103	Confined	9,272	5/20/2004	228.05	158.96	69.09	1
7	0_7738103	Confined	9,277	5/25/2004	227.73	158.89	68.84	1
7	0_7738103	Confined	9,282	5/30/2004	229.05	158.83	70.22	1
7	0_7738103	Confined	9,288	6/5/2004	229.69	158.75	70.94	1
7	0_7738103	Confined	9,293	6/10/2004	229.87	158.69	71.18	1
7	0_7738103	Confined	9,298	6/15/2004	229.90	158.62	71.28	1
7	0_7738103	Confined	9,303	6/20/2004	230.09	158.56	71.53	1
7	0_7738103	Confined	9,308	6/25/2004	227.33	158.50	68.83	1
7	0_7738103	Confined	9,313	6/30/2004	230.28	158.43	71.85	1
7	0_7738103	Confined	9,318	7/5/2004	230.55	158.37	72.18	1
7	0_7738103	Confined	9,323	7/10/2004	230.78	158.31	72.47	1
7	0_7738103	Confined	9,328	7/15/2004	231.00	158.24	72.76	1
7	0_7738103	Confined	9,333	7/20/2004	231.11	158.18	72.93	1
7	0_7738103	Confined	9,338	7/25/2004	230.71	158.12	72.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	9,343	7/30/2004	228.69	158.05	70.64	1
7	0_7738103	Confined	9,349	8/5/2004	231.43	157.98	73.45	1
7	0_7738103	Confined	9,354	8/10/2004	231.04	157.91	73.13	1
7	0_7738103	Confined	9,359	8/15/2004	230.56	157.85	72.71	1
7	0_7738103	Confined	9,364	8/20/2004	229.86	157.78	72.08	1
7	0_7738103	Confined	9,369	8/25/2004	229.33	157.72	71.61	1
7	0_7738103	Confined	9,374	8/30/2004	228.53	157.66	70.87	1
7	0_7738103	Confined	9,380	9/5/2004	228.00	157.58	70.42	1
7	0_7738103	Confined	9,385	9/10/2004	227.71	157.52	70.19	1
7	0_7738103	Confined	9,390	9/15/2004	228.04	157.45	70.59	1
7	0_7738103	Confined	9,395	9/20/2004	227.69	157.39	70.30	1
7	0_7738103	Confined	9,400	9/25/2004	224.95	157.33	67.62	1
7	0_7738103	Confined	9,405	9/30/2004	227.45	157.26	70.19	1
7	0_7738103	Confined	9,410	10/5/2004	224.80	157.20	67.60	1
7	0_7738103	Confined	9,415	10/10/2004	224.99	157.14	67.85	1
7	0_7738103	Confined	9,420	10/15/2004	224.78	157.07	67.71	1
7	0_7738103	Confined	9,425	10/20/2004	224.65	157.01	67.64	1
7	0_7738103	Confined	9,566	3/10/2005	238.84	155.30	83.54	1
7	0_7738103	Confined	9,571	3/15/2005	242.21	155.25	86.96	1
7	0_7738103	Confined	9,576	3/20/2005	242.71	155.19	87.52	1
7	0_7738103	Confined	9,581	3/25/2005	243.24	155.13	88.11	1
7	0_7738103	Confined	9,586	3/30/2005	240.93	155.07	85.86	1
7	0_7738103	Confined	9,592	4/5/2005	241.03	155.01	86.02	1
7	0_7738103	Confined	9,597	4/10/2005	244.06	154.95	89.11	1
7	0_7738103	Confined	9,602	4/15/2005	243.70	154.89	88.81	1
7	0_7738103	Confined	9,607	4/20/2005	243.45	154.83	88.62	1
7	0_7738103	Confined	9,612	4/25/2005	240.25	154.78	85.47	1
7	0_7738103	Confined	9,617	4/30/2005	242.96	154.72	88.24	1
7	0_7738103	Confined	9,622	5/5/2005	239.34	154.66	84.68	1
7	0_7738103	Confined	9,627	5/10/2005	242.06	154.61	87.45	1
7	0_7738103	Confined	9,632	5/15/2005	241.53	154.55	86.98	1
7	0_7738103	Confined	9,637	5/20/2005	241.42	154.49	86.93	1
7	0_7738103	Confined	9,642	5/25/2005	241.28	154.43	86.85	1
7	0_7738103	Confined	9,647	5/30/2005	240.92	154.38	86.54	1
7	0_7738103	Confined	9,653	6/5/2005	240.95	154.31	86.64	1
7	0_7738103	Confined	9,658	6/10/2005	240.70	154.25	86.45	1
7	0_7738103	Confined	9,663	6/15/2005	240.20	154.19	86.01	1
7	0_7738103	Confined	9,668	6/20/2005	239.73	154.14	85.59	1
7	0_7738103	Confined	9,673	6/25/2005	237.65	154.08	83.57	1
7	0_7738103	Confined	9,678	6/30/2005	237.15	154.02	83.13	1
7	0_7738103	Confined	9,683	7/5/2005	236.04	153.97	82.07	1
7	0_7738103	Confined	9,688	7/10/2005	234.92	153.91	81.01	1
7	0_7738103	Confined	9,693	7/15/2005	233.66	153.85	79.81	1
7	0_7738103	Confined	9,698	7/20/2005	232.68	153.79	78.89	1
7	0_7738103	Confined	9,703	7/25/2005	231.56	153.74	77.82	1
7	0_7738103	Confined	9,708	7/30/2005	230.59	153.68	76.91	1
7	0_7738103	Confined	9,714	8/5/2005	229.33	153.61	75.72	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	9,719	8/10/2005	228.48	153.55	74.93	1
7	0_7738103	Confined	9,724	8/15/2005	227.19	153.50	73.69	1
7	0_7738103	Confined	9,729	8/20/2005	226.07	153.44	72.63	1
7	0_7738103	Confined	9,734	8/25/2005	224.44	153.38	71.06	1
7	0_7738103	Confined	9,739	8/30/2005	223.11	153.33	69.78	1
7	0_7738103	Confined	9,745	9/5/2005	218.78	153.26	65.52	1
7	0_7738103	Confined	9,750	9/10/2005	217.67	153.20	64.47	1
7	0_7738103	Confined	9,755	9/15/2005	209.45	153.14	56.31	1
7	0_7738103	Confined	9,760	9/20/2005	209.45	153.09	56.36	1
7	0_7738103	Confined	9,765	9/25/2005	209.45	153.03	56.42	1
7	0_7738103	Confined	9,770	9/30/2005	209.45	152.97	56.48	1
7	0_7738103	Confined	9,775	10/5/2005	209.45	152.91	56.54	1
7	0_7738103	Confined	9,780	10/10/2005	209.45	152.86	56.59	1
7	0_7738103	Confined	9,785	10/15/2005	209.45	152.80	56.65	1
7	0_7738103	Confined	9,790	10/20/2005	209.45	152.74	56.71	1
7	0_7738103	Confined	9,795	10/25/2005	209.45	152.69	56.76	1
7	0_7738103	Confined	9,800	10/30/2005	209.45	152.63	56.82	1
7	0_7738103	Confined	9,806	11/5/2005	209.45	152.56	56.89	1
7	0_7738103	Confined	9,811	11/10/2005	209.45	152.50	56.95	1
7	0_7738103	Confined	9,816	11/15/2005	209.45	152.45	57.00	1
7	0_7738103	Confined	9,821	11/20/2005	209.45	152.39	57.06	1
7	0_7738103	Confined	9,826	11/25/2005	209.45	152.33	57.12	1
7	0_7738103	Confined	9,831	11/30/2005	209.45	152.28	57.17	1
7	0_7738103	Confined	9,836	12/5/2005	209.73	152.22	57.51	1
7	0_7738103	Confined	9,841	12/10/2005	209.73	152.16	57.57	1
7	0_7738103	Confined	9,846	12/15/2005	214.58	152.10	62.48	1
7	0_7738103	Confined	9,851	12/20/2005	214.83	152.05	62.78	1
7	0_7738103	Confined	9,856	12/25/2005	215.38	151.99	63.39	1
7	0_7738103	Confined	9,861	12/30/2005	215.85	151.93	63.92	1
7	0_7738103	Confined	9,867	1/5/2006	215.79	151.92	63.87	1
7	0_7738103	Confined	9,872	1/10/2006	216.05	151.93	64.12	1
7	0_7738103	Confined	9,877	1/15/2006	216.51	151.93	64.58	1
7	0_7738103	Confined	9,882	1/20/2006	216.59	151.94	64.65	1
7	0_7738103	Confined	9,887	1/25/2006	216.41	151.94	64.47	1
7	0_7738103	Confined	9,892	1/30/2006	216.84	151.94	64.90	1
7	0_7738103	Confined	9,898	2/5/2006	218.22	151.95	66.27	1
7	0_7738103	Confined	9,903	2/10/2006	218.18	151.95	66.23	1
7	0_7738103	Confined	9,908	2/15/2006	218.20	151.95	66.25	1
7	0_7738103	Confined	9,913	2/20/2006	218.01	151.96	66.05	1
7	0_7738103	Confined	9,918	2/25/2006	218.09	151.96	66.13	1
7	0_7738103	Confined	9,921	2/28/2006	218.15	151.96	66.19	1
7	0_7738103	Confined	9,926	3/5/2006	217.78	151.97	65.81	1
7	0_7738103	Confined	9,931	3/10/2006	217.89	151.97	65.92	1
7	0_7738103	Confined	9,936	3/15/2006	217.04	151.97	65.07	1
7	0_7738103	Confined	9,941	3/20/2006	216.87	151.98	64.89	1
7	0_7738103	Confined	9,946	3/25/2006	215.89	151.98	63.91	1
7	0_7738103	Confined	9,951	3/30/2006	215.13	151.98	63.15	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	9,957	4/5/2006	214.24	151.99	62.25	1
7	0_7738103	Confined	9,962	4/10/2006	213.25	151.99	61.26	1
7	0_7738103	Confined	9,967	4/15/2006	212.48	152.00	60.48	1
7	0_7738103	Confined	9,972	4/20/2006	211.84	152.00	59.84	1
7	0_7738103	Confined	9,977	4/25/2006	211.19	152.00	59.19	1
7	0_7738103	Confined	9,982	4/30/2006	210.12	152.01	58.11	1
7	0_7738103	Confined	9,987	5/5/2006	209.52	152.01	57.51	1
7	0_7738103	Confined	9,992	5/10/2006	209.01	152.01	57.00	1
7	0_7738103	Confined	9,997	5/15/2006	207.98	152.02	55.96	1
7	0_7738103	Confined	10,002	5/20/2006	207.84	152.02	55.82	1
7	0_7738103	Confined	10,007	5/25/2006	207.17	152.02	55.15	1
7	0_7738103	Confined	10,012	5/30/2006	206.18	152.03	54.15	1
7	0_7738103	Confined	10,018	6/5/2006	205.52	152.03	53.49	1
7	0_7738103	Confined	10,023	6/10/2006	204.81	152.04	52.77	1
7	0_7738103	Confined	10,028	6/15/2006	203.70	152.04	51.66	1
7	0_7738103	Confined	10,033	6/20/2006	202.82	152.04	50.78	1
7	0_7738103	Confined	10,038	6/25/2006	201.60	152.05	49.55	1
7	0_7738103	Confined	10,043	6/30/2006	200.37	152.05	48.32	1
7	0_7738103	Confined	10,048	7/5/2006	199.42	152.05	47.37	1
7	0_7738103	Confined	10,053	7/10/2006	198.40	152.06	46.34	1
7	0_7738103	Confined	10,058	7/15/2006	197.32	152.06	45.26	1
7	0_7738103	Confined	10,063	7/20/2006	196.29	152.07	44.22	1
7	0_7738103	Confined	10,068	7/25/2006	195.13	152.07	43.06	1
7	0_7738103	Confined	10,079	8/5/2006	190.38	152.08	38.30	1
7	0_7738103	Confined	10,094	8/20/2006	188.62	152.09	36.53	1
7	0_7738103	Confined	10,099	8/25/2006	188.62	152.09	36.53	1
7	0_7738103	Confined	10,120	9/15/2006	188.62	152.11	36.51	1
7	0_7738103	Confined	10,125	9/20/2006	188.62	152.11	36.51	1
7	0_7738103	Confined	10,130	9/25/2006	188.62	152.11	36.51	1
7	0_7738103	Confined	10,135	9/30/2006	188.62	152.12	36.50	1
7	0_7738103	Confined	10,140	10/5/2006	188.62	152.12	36.50	1
7	0_7738103	Confined	10,145	10/10/2006	188.62	152.12	36.50	1
7	0_7738103	Confined	10,150	10/15/2006	188.62	152.13	36.49	1
7	0_7738103	Confined	10,155	10/20/2006	188.62	152.13	36.49	1
7	0_7738103	Confined	10,160	10/25/2006	188.62	152.13	36.49	1
7	0_7738103	Confined	10,165	10/30/2006	188.62	152.14	36.48	1
7	0_7738103	Confined	10,171	11/5/2006	188.62	152.14	36.48	1
7	0_7738103	Confined	10,176	11/10/2006	188.62	152.15	36.47	1
7	0_7738103	Confined	10,181	11/15/2006	188.62	152.15	36.47	1
7	0_7738103	Confined	10,186	11/20/2006	169.00	152.15	16.85	1
7	0_7738103	Confined	10,191	11/25/2006	171.40	152.16	19.24	1
7	0_7738103	Confined	10,196	11/30/2006	171.42	152.16	19.26	1
7	0_7738103	Confined	10,201	12/5/2006	175.38	152.16	23.22	1
7	0_7738103	Confined	10,206	12/10/2006	200.42	152.17	48.25	1
7	0_7738103	Confined	10,211	12/15/2006	203.18	152.17	51.01	1
7	0_7738103	Confined	10,216	12/20/2006	205.16	152.18	52.98	1
7	0_7738103	Confined	10,221	12/25/2006	205.27	152.18	53.09	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	10,226	12/30/2006	205.28	152.18	53.10	1
7	0_7738103	Confined	10,232	1/5/2007	205.30	152.16	53.14	1
7	0_7738103	Confined	10,237	1/10/2007	205.34	152.14	53.20	1
7	0_7738103	Confined	10,242	1/15/2007	205.35	152.11	53.24	1
7	0_7738103	Confined	10,247	1/20/2007	205.36	152.09	53.27	1
7	0_7738103	Confined	10,252	1/25/2007	211.57	152.07	59.50	1
7	0_7738103	Confined	10,257	1/30/2007	213.00	152.05	60.95	1
7	0_7738103	Confined	10,263	2/5/2007	213.56	152.02	61.54	1
7	0_7738103	Confined	10,268	2/10/2007	214.59	151.99	62.60	1
7	0_7738103	Confined	10,273	2/15/2007	215.34	151.97	63.37	1
7	0_7738103	Confined	10,278	2/20/2007	215.88	151.95	63.93	1
7	0_7738103	Confined	10,283	2/25/2007	215.10	151.93	63.17	1
7	0_7738103	Confined	10,286	2/28/2007	215.76	151.91	63.85	1
7	0_7738103	Confined	10,291	3/5/2007	215.55	151.89	63.66	1
7	0_7738103	Confined	10,296	3/10/2007	216.22	151.87	64.35	1
7	0_7738103	Confined	10,301	3/15/2007	216.47	151.84	64.63	1
7	0_7738103	Confined	10,306	3/20/2007	216.47	151.82	64.65	1
7	0_7738103	Confined	10,311	3/25/2007	216.89	151.80	65.09	1
7	0_7738103	Confined	10,316	3/30/2007	216.60	151.77	64.83	1
7	0_7738103	Confined	10,322	4/5/2007	216.60	151.75	64.85	1
7	0_7738103	Confined	10,327	4/10/2007	217.43	151.72	65.71	1
7	0_7738103	Confined	10,332	4/15/2007	217.76	151.70	66.06	1
7	0_7738103	Confined	10,337	4/20/2007	218.40	151.68	66.72	1
7	0_7738103	Confined	10,342	4/25/2007	218.93	151.65	67.28	1
7	0_7738103	Confined	10,347	4/30/2007	219.19	151.63	67.56	1
7	0_7738103	Confined	10,352	5/5/2007	219.26	151.61	67.65	1
7	0_7738103	Confined	10,357	5/10/2007	219.25	151.59	67.66	1
7	0_7738103	Confined	10,362	5/15/2007	219.25	151.56	67.69	1
7	0_7738103	Confined	10,367	5/20/2007	219.27	151.54	67.73	1
7	0_7738103	Confined	10,377	5/30/2007	219.29	151.49	67.80	1
7	0_7738103	Confined	10,388	6/10/2007	194.66	151.44	43.22	1
7	0_7738103	Confined	10,393	6/15/2007	195.53	151.42	44.11	1
7	0_7738103	Confined	10,398	6/20/2007	195.88	151.40	44.48	1
7	0_7738103	Confined	10,403	6/25/2007	196.67	151.37	45.30	1
7	0_7738103	Confined	10,408	6/30/2007	197.47	151.35	46.12	1
7	0_7738103	Confined	10,413	7/5/2007	195.58	151.33	44.25	1
7	0_7738103	Confined	10,418	7/10/2007	203.26	151.31	51.95	1
7	0_7738103	Confined	10,423	7/15/2007	203.81	151.28	52.53	1
7	0_7738103	Confined	10,428	7/20/2007	203.09	151.26	51.83	1
7	0_7738103	Confined	10,433	7/25/2007	205.70	151.24	54.46	1
7	0_7738103	Confined	10,438	7/30/2007	208.87	151.21	57.66	1
7	0_7738103	Confined	10,444	8/5/2007	210.46	151.19	59.27	1
7	0_7738103	Confined	10,449	8/10/2007	208.52	151.16	57.36	1
7	0_7738103	Confined	10,454	8/15/2007	211.75	151.14	60.61	1
7	0_7738103	Confined	10,459	8/20/2007	211.89	151.12	60.77	1
7	0_7738103	Confined	10,464	8/25/2007	212.06	151.09	60.97	1
7	0_7738103	Confined	10,469	8/30/2007	211.98	151.07	60.91	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	10,475	9/5/2007	211.88	151.04	60.84	1
7	0_7738103	Confined	10,480	9/10/2007	212.01	151.02	60.99	1
7	0_7738103	Confined	10,485	9/15/2007	212.19	151.00	61.19	1
7	0_7738103	Confined	10,490	9/20/2007	212.49	150.97	61.52	1
7	0_7738103	Confined	10,495	9/25/2007	212.48	150.95	61.53	1
7	0_7738103	Confined	10,500	9/30/2007	212.54	150.93	61.61	1
7	0_7738103	Confined	10,505	10/5/2007	212.86	150.91	61.95	1
7	0_7738103	Confined	10,510	10/10/2007	212.87	150.88	61.99	1
7	0_7738103	Confined	10,515	10/15/2007	213.06	150.86	62.20	1
7	0_7738103	Confined	10,520	10/20/2007	213.07	150.84	62.23	1
7	0_7738103	Confined	10,525	10/25/2007	213.06	150.81	62.25	1
7	0_7738103	Confined	10,530	10/30/2007	213.06	150.79	62.27	1
7	0_7738103	Confined	10,536	11/5/2007	213.06	150.76	62.30	1
7	0_7738103	Confined	10,541	11/10/2007	213.06	150.74	62.32	1
7	0_7738103	Confined	10,546	11/15/2007	213.06	150.72	62.34	1
7	0_7738103	Confined	10,551	11/20/2007	213.05	150.69	62.36	1
7	0_7738103	Confined	10,556	11/25/2007	213.05	150.67	62.38	1
7	0_7738103	Confined	10,561	11/30/2007	213.05	150.65	62.40	1
7	0_7738103	Confined	10,566	12/5/2007	213.32	150.63	62.69	1
7	0_7738103	Confined	10,571	12/10/2007	213.87	150.60	63.27	1
7	0_7738103	Confined	10,576	12/15/2007	214.37	150.58	63.79	1
7	0_7738103	Confined	10,581	12/20/2007	214.71	150.56	64.15	1
7	0_7738103	Confined	10,586	12/25/2007	214.98	150.53	64.45	1
7	0_7738103	Confined	10,591	12/30/2007	215.37	150.51	64.86	1
7	0_7738103	Confined	10,597	1/5/2008	215.58	150.35	65.23	1
7	0_7738103	Confined	10,602	1/10/2008	216.20	150.18	66.02	1
7	0_7738103	Confined	10,607	1/15/2008	216.30	150.02	66.28	1
7	0_7738103	Confined	10,612	1/20/2008	216.46	149.86	66.60	1
7	0_7738103	Confined	10,617	1/25/2008	216.57	149.70	66.87	1
7	0_7738103	Confined	10,622	1/30/2008	216.75	149.54	67.21	1
7	0_7738103	Confined	10,628	2/5/2008	217.33	149.35	67.98	1
7	0_7738103	Confined	10,633	2/10/2008	217.45	149.19	68.26	1
7	0_7738103	Confined	10,638	2/15/2008	217.47	149.03	68.44	1
7	0_7738103	Confined	10,648	2/25/2008	217.47	148.70	68.77	1
7	0_7738103	Confined	10,651	2/28/2008	217.47	148.61	68.86	1
7	0_7738103	Confined	10,657	3/5/2008	217.47	148.41	69.06	1
7	0_7738103	Confined	10,662	3/10/2008	217.47	148.25	69.22	1
7	0_7738103	Confined	10,667	3/15/2008	208.57	148.09	60.48	1
7	0_7738103	Confined	10,672	3/20/2008	207.55	147.93	59.62	1
7	0_7738103	Confined	10,677	3/25/2008	207.25	147.77	59.48	1
7	0_7738103	Confined	10,682	3/30/2008	204.33	147.61	56.72	1
7	0_7738103	Confined	10,688	4/5/2008	203.52	147.42	56.10	1
7	0_7738103	Confined	10,693	4/10/2008	203.52	147.26	56.26	1
7	0_7738103	Confined	10,698	4/15/2008	203.52	147.10	56.42	1
7	0_7738103	Confined	10,703	4/20/2008	203.52	146.93	56.59	1
7	0_7738103	Confined	10,708	4/25/2008	203.52	146.77	56.75	1
7	0_7738103	Confined	10,718	5/5/2008	201.31	146.45	54.86	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	10,723	5/10/2008	201.31	146.29	55.02	1
7	0_7738103	Confined	10,728	5/15/2008	201.31	146.13	55.18	1
7	0_7738103	Confined	10,733	5/20/2008	201.31	145.97	55.34	1
7	0_7738103	Confined	10,738	5/25/2008	201.31	145.81	55.50	1
7	0_7738103	Confined	10,743	5/30/2008	201.31	145.65	55.66	1
7	0_7738103	Confined	10,749	6/5/2008	201.31	145.46	55.85	1
7	0_7738103	Confined	10,754	6/10/2008	205.15	145.29	59.86	1
7	0_7738103	Confined	10,759	6/15/2008	205.15	145.13	60.02	1
7	0_7738103	Confined	10,764	6/20/2008	205.15	144.97	60.18	1
7	0_7738103	Confined	10,769	6/25/2008	205.41	144.81	60.60	1
7	0_7738103	Confined	10,774	6/30/2008	205.41	144.65	60.76	1
7	0_7738103	Confined	10,779	7/5/2008	205.41	144.49	60.92	1
7	0_7738103	Confined	10,784	7/10/2008	205.41	144.33	61.08	1
7	0_7738103	Confined	10,789	7/15/2008	205.41	144.17	61.24	1
7	0_7738103	Confined	10,794	7/20/2008	205.41	144.01	61.40	1
7	0_7738103	Confined	10,799	7/25/2008	205.41	143.85	61.56	1
7	0_7738103	Confined	10,804	7/30/2008	205.41	143.69	61.72	1
7	0_7738103	Confined	10,810	8/5/2008	205.41	143.49	61.92	1
7	0_7738103	Confined	10,815	8/10/2008	205.41	143.33	62.08	1
7	0_7738103	Confined	10,820	8/15/2008	205.41	143.17	62.24	1
7	0_7738103	Confined	10,830	8/25/2008	205.41	142.85	62.56	1
7	0_7738103	Confined	11,068	4/20/2009	176.03	130.52	45.51	1
7	0_7738103	Confined	11,073	4/25/2009	176.92	130.15	46.77	1
7	0_7738103	Confined	11,078	4/30/2009	177.74	129.77	47.97	1
7	0_7738103	Confined	11,083	5/5/2009	178.56	129.40	49.16	1
7	0_7738103	Confined	11,088	5/10/2009	179.38	129.03	50.35	1
7	0_7738103	Confined	11,093	5/15/2009	180.34	128.65	51.69	1
7	0_7738103	Confined	11,098	5/20/2009	181.46	128.28	53.18	1
7	0_7738103	Confined	11,103	5/25/2009	182.50	127.91	54.59	1
7	0_7738103	Confined	11,108	5/30/2009	185.03	127.53	57.50	1
7	0_7738103	Confined	11,114	6/5/2009	183.99	127.09	56.90	1
7	0_7738103	Confined	11,119	6/10/2009	186.52	126.71	59.81	1
7	0_7738103	Confined	11,124	6/15/2009	185.55	126.34	59.21	1
7	0_7738103	Confined	11,129	6/20/2009	186.30	125.97	60.33	1
7	0_7738103	Confined	11,134	6/25/2009	187.34	125.59	61.75	1
7	0_7738103	Confined	11,139	6/30/2009	188.16	125.22	62.94	1
7	0_7738103	Confined	11,144	7/5/2009	189.13	124.85	64.28	1
7	0_7738103	Confined	11,149	7/10/2009	160.47	124.47	36.00	1
7	0_7738103	Confined	11,154	7/15/2009	159.58	124.10	35.48	1
7	0_7738103	Confined	11,159	7/20/2009	158.69	123.73	34.96	1
7	0_7738103	Confined	11,164	7/25/2009	157.79	123.35	34.44	1
7	0_7738103	Confined	11,169	7/30/2009	156.75	122.98	33.77	1
7	0_7738103	Confined	11,175	8/5/2009	155.63	122.53	33.10	1
7	0_7738103	Confined	11,180	8/10/2009	153.10	122.16	30.94	1
7	0_7738103	Confined	11,185	8/15/2009	150.80	121.79	29.01	1
7	0_7738103	Confined	11,190	8/20/2009	149.68	121.41	28.27	1
7	0_7738103	Confined	11,195	8/25/2009	150.05	121.04	29.01	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	11,200	8/30/2009	149.08	120.67	28.41	1
7	0_7738103	Confined	11,206	9/5/2009	147.45	120.22	27.23	1
7	0_7738103	Confined	11,211	9/10/2009	146.18	119.84	26.34	1
7	0_7738103	Confined	11,216	9/15/2009	145.44	119.47	25.97	1
7	0_7738103	Confined	11,221	9/20/2009	144.91	119.10	25.81	1
7	0_7738103	Confined	11,226	9/25/2009	144.10	118.72	25.38	1
7	0_7738103	Confined	11,272	11/10/2009	146.65	115.29	31.36	1
7	0_7738103	Confined	11,277	11/15/2009	147.39	114.92	32.47	1
7	0_7738103	Confined	11,282	11/20/2009	148.21	114.54	33.67	1
7	0_7738103	Confined	11,287	11/25/2009	149.03	114.17	34.86	1
7	0_7738103	Confined	11,292	11/30/2009	149.70	113.80	35.90	1
7	0_7738103	Confined	11,297	12/5/2009	148.58	113.42	35.16	1
7	0_7738103	Confined	11,302	12/10/2009	151.56	113.05	38.51	1
7	0_7738103	Confined	11,307	12/15/2009	152.38	112.68	39.70	1
7	0_7738103	Confined	11,312	12/20/2009	153.50	112.30	41.20	1
7	0_7738103	Confined	11,317	12/25/2009	154.24	111.93	42.31	1
7	0_7738103	Confined	11,322	12/30/2009	155.28	111.56	43.72	1
7	0_7738103	Confined	11,328	1/5/2010	156.77	111.13	45.64	1
7	0_7738103	Confined	11,333	1/10/2010	157.67	110.77	46.90	1
7	0_7738103	Confined	11,338	1/15/2010	158.48	110.42	48.06	1
7	0_7738103	Confined	11,343	1/20/2010	159.38	110.06	49.32	1
7	0_7738103	Confined	11,348	1/25/2010	160.35	109.70	50.65	1
7	0_7738103	Confined	11,353	1/30/2010	161.31	109.35	51.96	1
7	0_7738103	Confined	11,359	2/5/2010	162.58	108.92	53.66	1
7	0_7738103	Confined	11,364	2/10/2010	163.70	108.56	55.14	1
7	0_7738103	Confined	11,369	2/15/2010	164.74	108.21	56.53	1
7	0_7738103	Confined	11,374	2/20/2010	163.25	107.85	55.40	1
7	0_7738103	Confined	11,379	2/25/2010	166.67	107.50	59.17	1
7	0_7738103	Confined	11,387	3/5/2010	168.01	106.93	61.08	1
7	0_7738103	Confined	11,392	3/10/2010	166.67	106.57	60.10	1
7	0_7738103	Confined	11,397	3/15/2010	169.65	106.21	63.44	1
7	0_7738103	Confined	11,402	3/20/2010	170.40	105.86	64.54	1
7	0_7738103	Confined	11,407	3/25/2010	170.92	105.50	65.42	1
7	0_7738103	Confined	11,412	3/30/2010	171.51	105.15	66.36	1
7	0_7738103	Confined	11,418	4/5/2010	171.44	104.72	66.72	1
7	0_7738103	Confined	11,423	4/10/2010	171.21	104.36	66.85	1
7	0_7738103	Confined	11,428	4/15/2010	171.21	104.01	67.20	1
7	0_7738103	Confined	11,433	4/20/2010	171.21	103.65	67.56	1
7	0_7738103	Confined	11,438	4/25/2010	171.14	103.29	67.85	1
7	0_7738103	Confined	11,443	4/30/2010	171.21	102.94	68.27	1
7	0_7738103	Confined	11,448	5/5/2010	171.51	102.58	68.93	1
7	0_7738103	Confined	11,453	5/10/2010	170.84	102.23	68.61	1
7	0_7738103	Confined	11,458	5/15/2010	171.14	101.87	69.27	1
7	0_7738103	Confined	11,463	5/20/2010	170.62	101.51	69.11	1
7	0_7738103	Confined	11,468	5/25/2010	170.17	101.16	69.01	1
7	0_7738103	Confined	11,473	5/30/2010	169.73	100.80	68.93	1
7	0_7738103	Confined	11,479	6/5/2010	169.28	100.37	68.91	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	11,484	6/10/2010	168.31	100.02	68.29	1
7	0_7738103	Confined	11,489	6/15/2010	169.06	99.66	69.40	1
7	0_7738103	Confined	11,499	6/25/2010	168.24	98.95	69.29	1
7	0_7738103	Confined	11,509	7/5/2010	167.19	98.24	68.95	1
7	0_7738103	Confined	11,514	7/10/2010	167.19	97.88	69.31	1
7	0_7738103	Confined	11,519	7/15/2010	164.66	97.53	67.13	1
7	0_7738103	Confined	11,524	7/20/2010	167.19	97.17	70.02	1
7	0_7738103	Confined	11,529	7/25/2010	167.19	96.81	70.38	1
7	0_7738103	Confined	11,534	7/30/2010	167.34	96.46	70.88	1
7	0_7738103	Confined	11,540	8/5/2010	167.19	96.03	71.16	1
7	0_7738103	Confined	11,545	8/10/2010	166.82	95.67	71.15	1
7	0_7738103	Confined	11,550	8/15/2010	166.23	95.32	70.91	1
7	0_7738103	Confined	11,555	8/20/2010	163.70	94.96	68.74	1
7	0_7738103	Confined	11,560	8/25/2010	164.29	94.61	69.68	1
7	0_7738103	Confined	11,565	8/30/2010	162.80	94.25	68.55	1
7	0_7738103	Confined	11,571	9/5/2010	161.46	93.82	67.64	1
7	0_7738103	Confined	11,576	9/10/2010	160.05	93.47	66.58	1
7	0_7738103	Confined	11,581	9/15/2010	159.23	93.11	66.12	1
7	0_7738103	Confined	11,591	9/25/2010	158.34	92.40	65.94	1
7	0_7738103	Confined	11,596	9/30/2010	158.04	92.04	66.00	1
7	0_7738103	Confined	11,601	10/5/2010	157.52	91.69	65.83	1
7	0_7738103	Confined	11,606	10/10/2010	156.77	91.33	65.44	1
7	0_7738103	Confined	11,611	10/15/2010	156.10	90.97	65.13	1
7	0_7738103	Confined	11,616	10/20/2010	155.28	90.62	64.66	1
7	0_7738103	Confined	11,621	10/25/2010	152.31	90.26	62.05	1
7	0_7738103	Confined	11,626	10/30/2010	151.71	89.91	61.80	1
7	0_7738103	Confined	11,632	11/5/2010	152.31	89.48	62.83	1
7	0_7738103	Confined	11,637	11/10/2010	151.19	89.12	62.07	1
7	0_7738103	Confined	11,642	11/15/2010	150.30	88.77	61.53	1
7	0_7738103	Confined	11,647	11/20/2010	150.07	88.41	61.66	1
7	0_7738103	Confined	11,652	11/25/2010	149.10	88.05	61.05	1
7	0_7738103	Confined	11,657	11/30/2010	146.35	87.70	58.65	1
7	0_7738103	Confined	11,672	12/15/2010	150.44	86.63	63.81	1
7	0_7738103	Confined	11,677	12/20/2010	150.52	86.27	64.25	1
7	0_7738103	Confined	11,682	12/25/2010	151.26	85.92	65.34	1
7	0_7738103	Confined	11,687	12/30/2010	150.59	85.56	65.03	1
7	0_7738103	Confined	11,693	1/5/2011	147.69	85.16	62.53	1
7	0_7738103	Confined	11,708	1/20/2011	148.51	84.16	64.35	1
7	0_7738103	Confined	11,718	1/30/2011	147.99	83.49	64.50	1
7	0_7738103	Confined	11,729	2/10/2011	148.81	82.76	66.05	1
7	0_7738103	Confined	11,739	2/20/2011	150.59	82.09	68.50	1
7	0_7738103	Confined	11,744	2/25/2011	147.62	81.76	65.86	1
7	0_7738103	Confined	11,757	3/10/2011	150.89	80.89	70.00	1
7	0_7738103	Confined	11,767	3/20/2011	150.97	80.22	70.75	1
7	0_7738103	Confined	11,772	3/25/2011	150.37	79.89	70.48	1
7	0_7738103	Confined	11,788	4/10/2011	145.75	78.82	66.93	1
7	0_7738103	Confined	11,793	4/15/2011	140.25	78.49	61.76	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	11,813	5/5/2011	132.80	77.16	55.64	1
7	0_7738103	Confined	11,818	5/10/2011	130.42	76.82	53.60	1
7	0_7738103	Confined	11,823	5/15/2011	128.63	76.49	52.14	1
7	0_7738103	Confined	11,828	5/20/2011	128.04	76.16	51.88	1
7	0_7738103	Confined	11,833	5/25/2011	125.43	75.82	49.61	1
7	0_7738103	Confined	11,854	6/15/2011	124.41	74.43	49.98	1
7	0_7738103	Confined	11,859	6/20/2011	122.40	74.09	48.31	1
7	0_7738103	Confined	11,864	6/25/2011	121.28	73.76	47.52	1
7	0_7738103	Confined	11,869	6/30/2011	118.68	73.43	45.25	1
7	0_7738103	Confined	11,874	7/5/2011	119.87	73.09	46.78	1
7	0_7738103	Confined	11,879	7/10/2011	117.93	72.76	45.17	1
7	0_7738103	Confined	11,884	7/15/2011	118.83	72.43	46.40	1
7	0_7738103	Confined	11,889	7/20/2011	119.12	72.09	47.03	1
7	0_7738103	Confined	11,894	7/25/2011	120.76	71.76	49.00	1
7	0_7738103	Confined	11,899	7/30/2011	118.83	71.43	47.40	1
7	0_7738103	Confined	12,012	11/20/2011	75.63	63.89	11.74	1
7	0_7738103	Confined	12,017	11/25/2011	73.72	63.56	10.16	1
7	0_7738103	Confined	12,022	11/30/2011	74.89	63.23	11.66	1
7	0_7738103	Confined	12,027	12/5/2011	73.94	62.89	11.05	1
7	0_7738103	Confined	12,032	12/10/2011	73.49	62.56	10.93	1
7	0_7738103	Confined	12,037	12/15/2011	73.42	62.23	11.19	1
7	0_7738103	Confined	12,042	12/20/2011	73.20	61.89	11.31	1
7	0_7738103	Confined	12,047	12/25/2011	73.64	61.56	12.08	1
7	0_7738103	Confined	12,052	12/30/2011	73.86	61.23	12.63	1
7	0_7738103	Confined	12,077	1/24/2012	71.34	61.08	10.26	1
7	0_7738103	Confined	12,089	2/5/2012	68.65	61.05	7.60	1
7	0_7738103	Confined	12,094	2/10/2012	68.51	61.03	7.48	1
7	0_7738103	Confined	12,099	2/15/2012	68.58	61.01	7.57	1
7	0_7738103	Confined	12,104	2/20/2012	66.37	61.00	5.37	1
7	0_7738103	Confined	12,109	2/25/2012	70.13	60.98	9.15	1
7	0_7738103	Confined	12,112	2/28/2012	70.13	60.97	9.16	1
7	0_7738103	Confined	12,123	3/10/2012	72.71	60.94	11.77	1
7	0_7738103	Confined	12,128	3/15/2012	72.86	60.92	11.94	1
7	0_7738103	Confined	12,133	3/20/2012	69.46	60.91	8.55	1
7	0_7738103	Confined	12,138	3/25/2012	71.60	60.89	10.71	1
7	0_7738103	Confined	12,143	3/30/2012	69.54	60.88	8.66	1
7	0_7738103	Confined	12,149	4/5/2012	66.59	60.86	5.73	1
7	0_7738103	Confined	12,154	4/10/2012	63.78	60.84	2.94	1
7	0_7738103	Confined	12,164	4/20/2012	62.90	60.81	2.09	1
7	0_7738103	Confined	12,169	4/25/2012	62.16	60.79	1.37	1
7	0_7738103	Confined	12,174	4/30/2012	62.46	60.78	1.68	1
7	0_7738103	Confined	12,179	5/5/2012	58.55	60.76	-2.21	1
7	0_7738103	Confined	12,184	5/10/2012	58.10	60.75	-2.65	1
7	0_7738103	Confined	12,189	5/15/2012	55.52	60.73	-5.21	1
7	0_7738103	Confined	12,194	5/20/2012	57.14	60.72	-3.58	1
7	0_7738103	Confined	12,199	5/25/2012	56.55	60.70	-4.15	1
7	0_7738103	Confined	12,204	5/30/2012	56.33	60.68	-4.35	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	12,210	6/5/2012	55.82	60.67	-4.85	1
7	0_7738103	Confined	12,215	6/10/2012	55.08	60.65	-5.57	1
7	0_7738103	Confined	12,220	6/15/2012	55.08	60.63	-5.55	1
7	0_7738103	Confined	12,225	6/20/2012	54.19	60.62	-6.43	1
7	0_7738103	Confined	12,230	6/25/2012	53.53	60.60	-7.07	1
7	0_7738103	Confined	12,235	6/30/2012	52.64	60.59	-7.95	1
7	0_7738103	Confined	12,240	7/5/2012	49.84	60.57	-10.73	1
7	0_7738103	Confined	12,245	7/10/2012	47.33	60.56	-13.23	1
7	0_7738103	Confined	12,250	7/15/2012	44.19	60.54	-16.35	1
7	0_7738103	Confined	12,255	7/20/2012	42.41	60.52	-18.11	1
7	0_7738103	Confined	12,260	7/25/2012	41.75	60.51	-18.76	1
7	0_7738103	Confined	12,265	7/30/2012	38.80	60.49	-21.69	1
7	0_7738103	Confined	12,271	8/5/2012	38.95	60.47	-21.52	1
7	0_7738103	Confined	12,286	8/20/2012	33.31	60.43	-27.12	1
7	0_7738103	Confined	12,291	8/25/2012	29.91	60.41	-30.50	1
7	0_7738103	Confined	12,296	8/30/2012	30.73	60.39	-29.66	1
7	0_7738103	Confined	12,302	9/5/2012	33.90	60.38	-26.48	1
7	0_7738103	Confined	12,307	9/10/2012	31.02	60.36	-29.34	1
7	0_7738103	Confined	12,312	9/15/2012	27.78	60.34	-32.56	1
7	0_7738103	Confined	12,317	9/20/2012	26.45	60.33	-33.88	1
7	0_7738103	Confined	12,322	9/25/2012	26.45	60.31	-33.86	1
7	0_7738103	Confined	12,327	9/30/2012	25.64	60.30	-34.66	1
7	0_7738103	Confined	12,332	10/5/2012	25.78	60.28	-34.50	1
7	0_7738103	Confined	12,337	10/10/2012	24.90	60.27	-35.37	1
7	0_7738103	Confined	12,342	10/15/2012	24.97	60.25	-35.28	1
7	0_7738103	Confined	12,347	10/20/2012	24.68	60.23	-35.55	1
7	0_7738103	Confined	12,352	10/25/2012	27.26	60.22	-32.96	1
7	0_7738103	Confined	12,357	10/30/2012	28.22	60.20	-31.98	1
7	0_7738103	Confined	12,368	11/10/2012	24.09	60.17	-36.08	1
7	0_7738103	Confined	12,373	11/15/2012	26.37	60.15	-33.78	1
7	0_7738103	Confined	12,383	11/25/2012	22.91	60.12	-37.21	1
7	0_7738103	Confined	12,385	11/27/2012	16.97	60.12	-43.15	1
7	0_7738103	Confined	12,388	11/30/2012	14.76	60.11	-45.35	1
7	0_7738103	Confined	12,393	12/5/2012	10.12	60.09	-49.97	1
7	0_7738103	Confined	12,398	12/10/2012	8.94	60.07	-51.13	1
7	0_7738103	Confined	12,403	12/15/2012	3.20	60.06	-56.86	1
7	0_7738103	Confined	12,408	12/20/2012	0.33	60.04	-59.71	1
7	0_7738103	Confined	12,413	12/25/2012	-1.50	60.03	-61.53	1
7	0_7738103	Confined	12,418	12/30/2012	-0.18	60.01	-60.19	1
7	0_7738103	Confined	12,424	1/5/2013	2.54	60.00	-57.46	1
7	0_7738103	Confined	12,429	1/10/2013	5.34	59.98	-54.64	1
7	0_7738103	Confined	12,434	1/15/2013	5.34	59.97	-54.63	1
7	0_7738103	Confined	12,439	1/20/2013	3.79	59.96	-56.17	1
7	0_7738103	Confined	12,443	1/24/2013	8.92	59.95	-51.03	1
7	0_7738103	Confined	12,444	1/25/2013	7.54	59.95	-52.41	1
7	0_7738103	Confined	12,449	1/30/2013	10.86	59.94	-49.08	1
7	0_7738103	Confined	12,455	2/5/2013	13.88	59.92	-46.04	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	12,460	2/10/2013	17.04	59.91	-42.87	1
7	0_7738103	Confined	12,465	2/15/2013	18.08	59.90	-41.82	1
7	0_7738103	Confined	12,470	2/20/2013	14.25	59.88	-45.63	1
7	0_7738103	Confined	12,475	2/25/2013	14.91	59.87	-44.96	1
7	0_7738103	Confined	12,478	2/28/2013	14.91	59.86	-44.95	1
7	0_7738103	Confined	12,483	3/5/2013	18.44	59.85	-41.41	1
7	0_7738103	Confined	12,488	3/10/2013	15.06	59.84	-44.78	1
7	0_7738103	Confined	12,493	3/15/2013	13.44	59.83	-46.39	1
7	0_7738103	Confined	12,498	3/20/2013	14.61	59.82	-45.21	1
7	0_7738103	Confined	12,503	3/25/2013	11.59	59.80	-48.21	1
7	0_7738103	Confined	12,508	3/30/2013	11.96	59.79	-47.83	1
7	0_7738103	Confined	12,514	4/5/2013	11.67	59.78	-48.11	1
7	0_7738103	Confined	12,519	4/10/2013	8.94	59.76	-50.82	1
7	0_7738103	Confined	12,524	4/15/2013	6.29	59.75	-53.46	1
7	0_7738103	Confined	12,529	4/20/2013	6.44	59.74	-53.30	1
7	0_7738103	Confined	12,534	4/25/2013	6.73	59.73	-53.00	1
7	0_7738103	Confined	12,539	4/30/2013	2.02	59.72	-57.70	1
7	0_7738103	Confined	12,544	5/5/2013	0.92	59.70	-58.78	1
7	0_7738103	Confined	12,549	5/10/2013	-0.47	59.69	-60.16	1
7	0_7738103	Confined	12,554	5/15/2013	0.62	59.68	-59.06	1
7	0_7738103	Confined	12,559	5/20/2013	1.21	59.67	-58.46	1
7	0_7738103	Confined	12,564	5/25/2013	-1.72	59.65	-61.37	1
7	0_7738103	Confined	12,569	5/30/2013	-6.14	59.64	-65.78	1
7	0_7738103	Confined	12,575	6/5/2013	-8.13	59.63	-67.76	1
7	0_7738103	Confined	12,585	6/15/2013	-14.79	59.60	-74.39	1
7	0_7738103	Confined	12,600	6/30/2013	-12.73	59.57	-72.30	1
7	0_7738103	Confined	12,605	7/5/2013	-13.98	59.56	-73.54	1
7	0_7738103	Confined	12,610	7/10/2013	-15.16	59.54	-74.70	1
7	0_7738103	Confined	12,615	7/15/2013	-18.47	59.53	-78.00	1
7	0_7738103	Confined	12,620	7/20/2013	-20.61	59.52	-80.13	1
7	0_7738103	Confined	12,625	7/25/2013	-21.86	59.51	-81.37	1
7	0_7738103	Confined	12,630	7/30/2013	-21.27	59.49	-80.76	1
7	0_7738103	Confined	12,636	8/5/2013	-21.49	59.48	-80.97	1
7	0_7738103	Confined	12,641	8/10/2013	-21.42	59.47	-80.89	1
7	0_7738103	Confined	12,646	8/15/2013	-23.40	59.46	-82.86	1
7	0_7738103	Confined	12,651	8/20/2013	-23.48	59.44	-82.92	1
7	0_7738103	Confined	12,656	8/25/2013	-24.29	59.43	-83.72	1
7	0_7738103	Confined	12,661	8/30/2013	-25.54	59.42	-84.96	1
7	0_7738103	Confined	12,667	9/5/2013	-27.09	59.40	-86.49	1
7	0_7738103	Confined	12,672	9/10/2013	-26.06	59.39	-85.45	1
7	0_7738103	Confined	12,677	9/15/2013	-23.33	59.38	-82.71	1
7	0_7738103	Confined	12,682	9/20/2013	-22.37	59.37	-81.74	1
7	0_7738103	Confined	12,687	9/25/2013	-24.73	59.36	-84.09	1
7	0_7738103	Confined	12,692	9/30/2013	-25.76	59.34	-85.10	1
7	0_7738103	Confined	12,697	10/5/2013	-30.99	59.33	-90.32	1
7	0_7738103	Confined	12,702	10/10/2013	-32.76	59.32	-92.08	1
7	0_7738103	Confined	12,707	10/15/2013	-31.06	59.31	-90.37	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	12,712	10/20/2013	-30.69	59.29	-89.98	1
7	0_7738103	Confined	12,717	10/25/2013	-27.16	59.28	-86.44	1
7	0_7738103	Confined	12,722	10/30/2013	-28.26	59.27	-87.53	1
7	0_7738103	Confined	12,728	11/5/2013	-26.94	59.26	-86.20	1
7	0_7738103	Confined	12,733	11/10/2013	-23.48	59.24	-82.72	1
7	0_7738103	Confined	12,738	11/15/2013	-29.74	59.23	-88.97	1
7	0_7738103	Confined	12,743	11/20/2013	-30.77	59.22	-89.99	1
7	0_7738103	Confined	12,748	11/25/2013	-31.73	59.21	-90.94	1
7	0_7738103	Confined	12,753	11/30/2013	-36.22	59.19	-95.41	1
7	0_7738103	Confined	12,758	12/5/2013	-35.55	59.18	-94.73	1
7	0_7738103	Confined	12,763	12/10/2013	-34.60	59.17	-93.77	1
7	0_7738103	Confined	12,768	12/15/2013	-30.99	59.16	-90.15	1
7	0_7738103	Confined	12,773	12/20/2013	-27.16	59.15	-86.31	1
7	0_7738103	Confined	12,778	12/25/2013	-24.36	59.13	-83.49	1
7	0_7738103	Confined	12,783	12/30/2013	-24.14	59.12	-83.26	1
7	0_7738103	Confined	12,789	1/5/2014	-22.67	59.15	-81.82	1
7	0_7738103	Confined	12,794	1/10/2014	-21.42	59.18	-80.60	1
7	0_7738103	Confined	12,799	1/15/2014	-18.25	59.21	-77.46	1
7	0_7738103	Confined	12,804	1/20/2014	-16.70	59.24	-75.94	1
7	0_7738103	Confined	12,809	1/25/2014	-11.92	59.27	-71.19	1
7	0_7738103	Confined	12,814	1/30/2014	-9.19	59.30	-68.49	1
7	0_7738103	Confined	12,820	2/5/2014	-6.71	59.34	-66.05	1
7	0_7738103	Confined	12,825	2/10/2014	-6.47	59.37	-65.84	1
7	0_7738103	Confined	12,830	2/15/2014	-8.16	59.40	-67.56	1
7	0_7738103	Confined	12,835	2/20/2014	-8.53	59.43	-67.96	1
7	0_7738103	Confined	12,840	2/25/2014	-9.12	59.46	-68.58	1
7	0_7738103	Confined	12,843	2/28/2014	-7.94	59.48	-67.42	1
7	0_7738103	Confined	12,848	3/5/2014	-7.20	59.51	-66.71	1
7	0_7738103	Confined	12,853	3/10/2014	-8.60	59.54	-68.14	1
7	0_7738103	Confined	12,858	3/15/2014	-8.09	59.57	-67.66	1
7	0_7738103	Confined	12,863	3/20/2014	-5.14	59.60	-64.74	1
7	0_7738103	Confined	12,868	3/25/2014	-4.63	59.63	-64.26	1
7	0_7738103	Confined	12,873	3/30/2014	-4.85	59.66	-64.51	1
7	0_7738103	Confined	12,879	4/5/2014	-9.49	59.69	-69.18	1
7	0_7738103	Confined	12,884	4/10/2014	-15.01	59.73	-74.74	1
7	0_7738103	Confined	12,889	4/15/2014	-18.03	59.76	-77.79	1
7	0_7738103	Confined	12,894	4/20/2014	-23.11	59.79	-82.90	1
7	0_7738103	Confined	12,899	4/25/2014	-25.83	59.82	-85.65	1
7	0_7738103	Confined	12,904	4/30/2014	-27.09	59.85	-86.94	1
7	0_7738103	Confined	12,909	5/5/2014	-25.10	59.88	-84.98	1
7	0_7738103	Confined	12,914	5/10/2014	-25.17	59.91	-85.08	1
7	0_7738103	Confined	12,919	5/15/2014	-25.69	59.94	-85.63	1
7	0_7738103	Confined	12,924	5/20/2014	-23.48	59.97	-83.45	1
7	0_7738103	Confined	12,929	5/25/2014	-25.76	60.00	-85.76	1
7	0_7738103	Confined	12,934	5/30/2014	-27.90	60.03	-87.93	1
7	0_7738103	Confined	12,940	6/5/2014	-29.37	60.06	-89.43	1
7	0_7738103	Confined	12,945	6/10/2014	-30.47	60.09	-90.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	12,950	6/15/2014	-29.37	60.13	-89.50	1
7	0_7738103	Confined	12,955	6/20/2014	-29.81	60.16	-89.97	1
7	0_7738103	Confined	12,960	6/25/2014	-29.81	60.19	-90.00	1
7	0_7738103	Confined	12,965	6/30/2014	-28.19	60.22	-88.41	1
7	0_7738103	Confined	12,970	7/5/2014	-26.35	60.25	-86.60	1
7	0_7738103	Confined	12,975	7/10/2014	-25.98	60.28	-86.26	1
7	0_7738103	Confined	12,980	7/15/2014	-30.69	60.31	-91.00	1
7	0_7738103	Confined	12,985	7/20/2014	-37.76	60.34	-98.10	1
7	0_7738103	Confined	12,990	7/25/2014	-39.75	60.37	-100.12	1
7	0_7738103	Confined	12,995	7/30/2014	-40.12	60.40	-100.52	1
7	0_7738103	Confined	13,001	8/5/2014	-37.98	60.43	-98.41	1
7	0_7738103	Confined	13,006	8/10/2014	-40.41	60.46	-100.87	1
7	0_7738103	Confined	13,011	8/15/2014	-42.92	60.49	-103.41	1
7	0_7738103	Confined	13,016	8/20/2014	-42.77	60.53	-103.30	1
7	0_7738103	Confined	13,021	8/25/2014	-42.48	60.56	-103.04	1
7	0_7738103	Confined	13,026	8/30/2014	-45.42	60.59	-106.01	1
7	0_7738103	Confined	13,032	9/5/2014	-48.96	60.62	-109.58	1
7	0_7738103	Confined	13,037	9/10/2014	-51.31	60.65	-111.96	1
7	0_7738103	Confined	13,042	9/15/2014	-49.18	60.68	-109.86	1
7	0_7738103	Confined	13,047	9/20/2014	-45.64	60.71	-106.35	1
7	0_7738103	Confined	13,052	9/25/2014	-44.61	60.74	-105.35	1
7	0_7738103	Confined	13,057	9/30/2014	-46.16	60.77	-106.93	1
7	0_7738103	Confined	13,062	10/5/2014	-49.69	60.80	-110.49	1
7	0_7738103	Confined	13,066	10/9/2014	-51.07	60.83	-111.90	1
7	0_7738103	Confined	13,067	10/10/2014	-49.66	60.83	-110.49	1
7	0_7738103	Confined	13,072	10/15/2014	-48.19	60.86	-109.05	1
7	0_7738103	Confined	13,077	10/20/2014	-47.38	60.89	-108.27	1
7	0_7738103	Confined	13,082	10/25/2014	-47.60	60.93	-108.53	1
7	0_7738103	Confined	13,087	10/30/2014	-47.97	60.96	-108.93	1
7	0_7738103	Confined	13,093	11/5/2014	-53.42	60.99	-114.41	1
7	0_7738103	Confined	13,098	11/10/2014	-51.36	61.02	-112.38	1
7	0_7738103	Confined	13,103	11/15/2014	-49.96	61.05	-111.01	1
7	0_7738103	Confined	13,108	11/20/2014	-46.79	61.08	-107.87	1
7	0_7738103	Confined	13,113	11/25/2014	-46.05	61.11	-107.16	1
7	0_7738103	Confined	13,118	11/30/2014	-46.05	61.14	-107.19	1
7	0_7738103	Confined	13,123	12/5/2014	-46.13	61.17	-107.30	1
7	0_7738103	Confined	13,128	12/10/2014	-45.24	61.20	-106.44	1
7	0_7738103	Confined	13,133	12/15/2014	-46.20	61.23	-107.43	1
7	0_7738103	Confined	13,138	12/20/2014	-49.22	61.26	-110.48	1
7	0_7738103	Confined	13,143	12/25/2014	-47.53	61.29	-108.82	1
7	0_7738103	Confined	13,148	12/30/2014	-47.01	61.33	-108.34	1
7	0_7738103	Confined	13,154	1/5/2015	-46.94	61.43	-108.37	1
7	0_7738103	Confined	13,159	1/10/2015	-46.86	61.54	-108.40	1
7	0_7738103	Confined	13,164	1/15/2015	-47.53	61.64	-109.17	1
7	0_7738103	Confined	13,169	1/20/2015	-40.75	61.74	-102.49	1
7	0_7738103	Confined	13,174	1/25/2015	-36.85	61.84	-98.69	1
7	0_7738103	Confined	13,179	1/30/2015	-35.52	61.94	-97.46	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	13,185	2/5/2015	-32.87	62.07	-94.94	1
7	0_7738103	Confined	13,190	2/10/2015	-32.36	62.17	-94.53	1
7	0_7738103	Confined	13,195	2/15/2015	-35.89	62.27	-98.16	1
7	0_7738103	Confined	13,200	2/20/2015	-33.17	62.37	-95.54	1
7	0_7738103	Confined	13,205	2/25/2015	-31.77	62.48	-94.25	1
7	0_7738103	Confined	13,208	2/28/2015	-30.89	62.54	-93.43	1
7	0_7738103	Confined	13,213	3/5/2015	-28.16	62.64	-90.80	1
7	0_7738103	Confined	13,218	3/10/2015	-29.93	62.74	-92.67	1
7	0_7738103	Confined	13,223	3/15/2015	-28.60	62.84	-91.44	1
7	0_7738103	Confined	13,228	3/20/2015	-26.47	62.95	-89.42	1
7	0_7738103	Confined	13,233	3/25/2015	-24.04	63.05	-87.09	1
7	0_7738103	Confined	13,238	3/30/2015	-24.48	63.15	-87.63	1
7	0_7738103	Confined	13,244	4/5/2015	-28.01	63.27	-91.28	1
7	0_7738103	Confined	13,249	4/10/2015	-29.04	63.37	-92.41	1
7	0_7738103	Confined	13,254	4/15/2015	-31.18	63.48	-94.66	1
7	0_7738103	Confined	13,259	4/20/2015	-36.63	63.58	-100.21	1
7	0_7738103	Confined	13,264	4/25/2015	-39.43	63.68	-103.11	1
7	0_7738103	Confined	13,269	4/30/2015	-40.53	63.78	-104.31	1
7	0_7738103	Confined	13,274	5/5/2015	-40.83	63.89	-104.72	1
7	0_7738103	Confined	13,279	5/10/2015	-42.23	63.99	-106.22	1
7	0_7738103	Confined	13,284	5/15/2015	-42.08	64.09	-106.17	1
7	0_7738103	Confined	13,289	5/20/2015	-40.83	64.19	-105.02	1
7	0_7738103	Confined	13,294	5/25/2015	-37.59	64.29	-101.88	1
7	0_7738103	Confined	13,299	5/30/2015	-35.08	64.40	-99.48	1
7	0_7738103	Confined	13,305	6/5/2015	-34.42	64.52	-98.94	1
7	0_7738103	Confined	13,310	6/10/2015	-32.73	64.62	-97.35	1
7	0_7738103	Confined	13,315	6/15/2015	-33.83	64.72	-98.55	1
7	0_7738103	Confined	13,320	6/20/2015	-28.90	64.83	-93.73	1
7	0_7738103	Confined	13,325	6/25/2015	-23.45	64.93	-88.38	1
7	0_7738103	Confined	13,330	6/30/2015	-19.99	65.03	-85.02	1
7	0_7738103	Confined	13,335	7/5/2015	-16.08	65.13	-81.21	1
7	0_7738103	Confined	13,340	7/10/2015	-11.89	65.23	-77.12	1
7	0_7738103	Confined	13,345	7/15/2015	-8.57	65.34	-73.91	1
7	0_7738103	Confined	13,350	7/20/2015	-10.19	65.44	-75.63	1
7	0_7738103	Confined	13,355	7/25/2015	-7.91	65.54	-73.45	1
7	0_7738103	Confined	13,360	7/30/2015	-8.50	65.64	-74.14	1
7	0_7738103	Confined	13,366	8/5/2015	-7.25	65.77	-73.02	1
7	0_7738103	Confined	13,371	8/10/2015	-7.54	65.87	-73.41	1
7	0_7738103	Confined	13,376	8/15/2015	-6.73	65.97	-72.70	1
7	0_7738103	Confined	13,381	8/20/2015	-6.81	66.07	-72.88	1
7	0_7738103	Confined	13,386	8/25/2015	-6.73	66.17	-72.90	1
7	0_7738103	Confined	13,391	8/30/2015	-9.09	66.28	-75.37	1
7	0_7738103	Confined	13,397	9/5/2015	-7.17	66.40	-73.57	1
7	0_7738103	Confined	13,402	9/10/2015	-5.19	66.50	-71.69	1
7	0_7738103	Confined	13,407	9/15/2015	-7.32	66.60	-73.92	1
7	0_7738103	Confined	13,412	9/20/2015	-7.40	66.71	-74.11	1
7	0_7738103	Confined	13,417	9/25/2015	-5.78	66.81	-72.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	13,422	9/30/2015	-6.44	66.91	-73.35	1
7	0_7738103	Confined	13,427	10/5/2015	-5.11	67.01	-72.12	1
7	0_7738103	Confined	13,432	10/10/2015	-6.07	67.11	-73.18	1
7	0_7738103	Confined	13,437	10/15/2015	-7.32	67.22	-74.54	1
7	0_7738103	Confined	13,442	10/20/2015	-8.35	67.32	-75.67	1
7	0_7738103	Confined	13,447	10/25/2015	-11.67	67.42	-79.09	1
7	0_7738103	Confined	13,451	10/29/2015	-11.82	67.50	-79.32	1
7	0_7738103	Confined	13,452	10/30/2015	-13.14	67.52	-80.66	1
7	0_7738103	Confined	13,458	11/5/2015	-9.90	67.65	-77.55	1
7	0_7738103	Confined	13,463	11/10/2015	-8.28	67.75	-76.03	1
7	0_7738103	Confined	13,468	11/15/2015	-7.47	67.85	-75.32	1
7	0_7738103	Confined	13,473	11/20/2015	-8.21	67.95	-76.16	1
7	0_7738103	Confined	13,478	11/25/2015	-6.14	68.05	-74.19	1
7	0_7738103	Confined	13,483	11/30/2015	-4.82	68.16	-72.98	1
7	0_7738103	Confined	13,488	12/5/2015	-3.42	68.26	-71.68	1
7	0_7738103	Confined	13,493	12/10/2015	-3.27	68.36	-71.63	1
7	0_7738103	Confined	13,498	12/15/2015	-2.31	68.46	-70.77	1
7	0_7738103	Confined	13,503	12/20/2015	-1.21	68.57	-69.78	1
7	0_7738103	Confined	13,508	12/25/2015	-3.05	68.67	-71.72	1
7	0_7738103	Confined	13,513	12/30/2015	-7.25	68.77	-76.02	1
7	0_7738103	Confined	13,519	1/5/2016	-8.13	68.86	-76.99	1
7	0_7738103	Confined	13,524	1/10/2016	-8.59	68.93	-77.52	1
7	0_7738103	Confined	13,529	1/15/2016	-9.18	69.00	-78.18	1
7	0_7738103	Confined	13,534	1/20/2016	-8.44	69.07	-77.51	1
7	0_7738103	Confined	13,539	1/25/2016	-8.59	69.14	-77.73	1
7	0_7738103	Confined	13,544	1/30/2016	-10.87	69.21	-80.08	1
7	0_7738103	Confined	13,550	2/5/2016	-13.23	69.29	-82.52	1
7	0_7738103	Confined	13,555	2/10/2016	-5.06	69.36	-74.42	1
7	0_7738103	Confined	13,560	2/15/2016	-1.45	69.43	-70.88	1
7	0_7738103	Confined	13,565	2/20/2016	-0.12	69.50	-69.62	1
7	0_7738103	Confined	13,570	2/25/2016	0.16	69.57	-69.41	1
7	0_7738103	Confined	13,579	3/5/2016	1.12	69.69	-68.57	1
7	0_7738103	Confined	13,584	3/10/2016	1.63	69.76	-68.13	1
7	0_7738103	Confined	13,589	3/15/2016	3.25	69.83	-66.58	1
7	0_7738103	Confined	13,594	3/20/2016	4.51	69.90	-65.39	1
7	0_7738103	Confined	13,599	3/25/2016	5.54	69.97	-64.43	1
7	0_7738103	Confined	13,604	3/30/2016	6.13	70.04	-63.91	1
7	0_7738103	Confined	13,610	4/5/2016	3.62	70.12	-66.50	1
7	0_7738103	Confined	13,615	4/10/2016	2.15	70.19	-68.04	1
7	0_7738103	Confined	13,620	4/15/2016	4.87	70.26	-65.39	1
7	0_7738103	Confined	13,625	4/20/2016	7.08	70.33	-63.25	1
7	0_7738103	Confined	13,630	4/25/2016	8.19	70.40	-62.21	1
7	0_7738103	Confined	13,635	4/30/2016	8.78	70.47	-61.69	1
7	0_7738103	Confined	13,640	5/5/2016	8.92	70.54	-61.62	1
7	0_7738103	Confined	13,645	5/10/2016	7.45	70.61	-63.16	1
7	0_7738103	Confined	13,650	5/15/2016	7.45	70.68	-63.23	1
7	0_7738103	Confined	13,655	5/20/2016	7.75	70.75	-63.00	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	13,660	5/25/2016	8.26	70.82	-62.56	1
7	0_7738103	Confined	13,665	5/30/2016	9.37	70.89	-61.52	1
7	0_7738103	Confined	13,671	6/5/2016	10.32	70.97	-60.65	1
7	0_7738103	Confined	13,676	6/10/2016	12.02	71.04	-59.02	1
7	0_7738103	Confined	13,681	6/15/2016	13.34	71.11	-57.77	1
7	0_7738103	Confined	13,686	6/20/2016	14.15	71.18	-57.03	1
7	0_7738103	Confined	13,691	6/25/2016	14.52	71.25	-56.73	1
7	0_7738103	Confined	13,694	6/28/2016	14.00	71.29	-57.29	1
7	0_7738103	Confined	13,696	6/30/2016	4.09	71.32	-67.23	1
7	0_7738103	Confined	13,701	7/5/2016	10.47	71.39	-60.92	1
7	0_7738103	Confined	13,706	7/10/2016	6.20	71.46	-65.26	1
7	0_7738103	Confined	13,711	7/15/2016	0.31	71.53	-71.22	1
7	0_7738103	Confined	13,716	7/20/2016	1.78	71.60	-69.82	1
7	0_7738103	Confined	13,721	7/25/2016	0.90	71.67	-70.77	1
7	0_7738103	Confined	13,726	7/30/2016	-0.20	71.74	-71.94	1
7	0_7738103	Confined	13,732	8/5/2016	-4.47	71.82	-76.29	1
7	0_7738103	Confined	13,737	8/10/2016	-7.56	71.89	-79.45	1
7	0_7738103	Confined	13,742	8/15/2016	-9.84	71.96	-81.80	1
7	0_7738103	Confined	13,747	8/20/2016	-9.03	72.03	-81.06	1
7	0_7738103	Confined	13,752	8/25/2016	-7.71	72.10	-79.81	1
7	0_7738103	Confined	13,763	9/5/2016	0.60	72.25	-71.65	1
7	0_7738103	Confined	13,768	9/10/2016	2.22	72.32	-70.10	1
7	0_7738103	Confined	13,773	9/15/2016	2.81	72.39	-69.58	1
7	0_7738103	Confined	13,778	9/20/2016	2.89	72.46	-69.57	1
7	0_7738103	Confined	13,783	9/25/2016	3.18	72.53	-69.35	1
7	0_7738103	Confined	13,788	9/30/2016	3.99	72.60	-68.61	1
7	0_7738103	Confined	13,793	10/5/2016	4.58	72.67	-68.09	1
7	0_7738103	Confined	13,798	10/10/2016	5.61	72.74	-67.13	1
7	0_7738103	Confined	13,801	10/13/2016	5.41	72.78	-67.37	1
7	0_7738103	Confined	13,803	10/15/2016	5.90	72.80	-66.90	1
7	0_7738103	Confined	13,808	10/20/2016	7.01	72.87	-65.86	1
7	0_7738103	Confined	13,813	10/25/2016	7.82	72.94	-65.12	1
7	0_7738103	Confined	13,818	10/30/2016	5.09	73.01	-67.92	1
7	0_7738103	Confined	13,824	11/5/2016	3.92	73.10	-69.18	1
7	0_7738103	Confined	13,829	11/10/2016	5.24	73.17	-67.93	1
7	0_7738103	Confined	13,834	11/15/2016	5.83	73.24	-67.41	1
7	0_7738103	Confined	13,839	11/20/2016	6.94	73.31	-66.37	1
7	0_7738103	Confined	13,844	11/25/2016	8.33	73.37	-65.04	1
7	0_7738103	Confined	13,849	11/30/2016	9.51	73.44	-63.93	1
7	0_7738103	Confined	13,854	12/5/2016	10.99	73.51	-62.52	1
7	0_7738103	Confined	13,859	12/10/2016	12.46	73.58	-61.12	1
7	0_7738103	Confined	13,864	12/15/2016	10.47	73.65	-63.18	1
7	0_7738103	Confined	13,869	12/20/2016	9.37	73.72	-64.35	1
7	0_7738103	Confined	13,874	12/25/2016	8.04	73.79	-65.75	1
7	0_7738103	Confined	13,879	12/30/2016	7.23	73.86	-66.63	1
7	0_7738103	Confined	13,885	1/5/2017	6.27	73.92	-67.65	1
7	0_7738103	Confined	13,890	1/10/2017	5.76	73.97	-68.21	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	13,895	1/15/2017	8.63	74.02	-65.39	1
7	0_7738103	Confined	13,900	1/20/2017	10.62	74.07	-63.45	1
7	0_7738103	Confined	13,905	1/25/2017	12.38	74.12	-61.74	1
7	0_7738103	Confined	13,910	1/30/2017	13.93	74.17	-60.24	1
7	0_7738103	Confined	13,916	2/5/2017	10.99	74.23	-63.24	1
7	0_7738103	Confined	13,921	2/10/2017	8.53	74.28	-65.75	1
7	0_7738103	Confined	13,926	2/15/2017	4.04	74.33	-70.29	1
7	0_7738103	Confined	13,931	2/20/2017	2.19	74.38	-72.19	1
7	0_7738103	Confined	13,949	3/10/2017	-11.12	74.55	-85.67	1
7	0_7738103	Confined	13,954	3/15/2017	-9.65	74.60	-84.25	1
7	0_7738103	Confined	13,959	3/20/2017	-7.07	74.65	-81.72	1
7	0_7738103	Confined	13,964	3/25/2017	-7.07	74.70	-81.77	1
7	0_7738103	Confined	13,969	3/30/2017	-7.37	74.75	-82.12	1
7	0_7738103	Confined	13,975	4/5/2017	-3.10	74.81	-77.91	1
7	0_7738103	Confined	13,980	4/10/2017	-2.36	74.86	-77.22	1
7	0_7738103	Confined	13,985	4/15/2017	-0.67	74.91	-75.58	1
7	0_7738103	Confined	13,990	4/20/2017	-1.55	74.96	-76.51	1
7	0_7738103	Confined	13,995	4/25/2017	-4.28	75.01	-79.29	1
7	0_7738103	Confined	14,000	4/30/2017	-5.90	75.06	-80.96	1
7	0_7738103	Confined	14,005	5/5/2017	-7.15	75.11	-82.26	1
7	0_7738103	Confined	14,010	5/10/2017	-8.10	75.16	-83.26	1
7	0_7738103	Confined	14,015	5/15/2017	-9.43	75.21	-84.64	1
7	0_7738103	Confined	14,020	5/20/2017	-8.25	75.25	-83.50	1
7	0_7738103	Confined	14,025	5/25/2017	-7.66	75.30	-82.96	1
7	0_7738103	Confined	14,030	5/30/2017	-7.74	75.35	-83.09	1
7	0_7738103	Confined	14,036	6/5/2017	-6.19	75.41	-81.60	1
7	0_7738103	Confined	14,041	6/10/2017	-8.03	75.46	-83.49	1
7	0_7738103	Confined	14,046	6/15/2017	-10.31	75.51	-85.82	1
7	0_7738103	Confined	14,051	6/20/2017	-11.93	75.56	-87.49	1
7	0_7738103	Confined	14,056	6/25/2017	-13.33	75.61	-88.94	1
7	0_7738103	Confined	14,061	6/30/2017	-11.79	75.66	-87.45	1
7	0_7738103	Confined	14,066	7/5/2017	-10.46	75.71	-86.17	1
7	0_7738103	Confined	14,071	7/10/2017	-14.00	75.76	-89.76	1
7	0_7738103	Confined	14,076	7/15/2017	-16.50	75.81	-92.31	1
7	0_7738103	Confined	14,081	7/20/2017	-17.01	75.86	-92.87	1
7	0_7738103	Confined	14,086	7/25/2017	-18.93	75.91	-94.84	1
7	0_7738103	Confined	14,091	7/30/2017	-18.71	75.95	-94.66	1
7	0_7738103	Confined	14,097	8/5/2017	-17.82	76.01	-93.83	1
7	0_7738103	Confined	14,102	8/10/2017	-17.97	76.06	-94.03	1
7	0_7738103	Confined	14,107	8/15/2017	-17.97	76.11	-94.08	1
7	0_7738103	Confined	14,112	8/20/2017	-20.70	76.16	-96.86	1
7	0_7738103	Confined	14,117	8/25/2017	-23.13	76.21	-99.34	1
7	0_7738103	Confined	14,122	8/30/2017	-23.27	76.26	-99.53	1
7	0_7738103	Confined	14,128	9/5/2017	-25.92	76.32	-102.24	1
7	0_7738103	Confined	14,133	9/10/2017	-32.48	76.37	-108.85	1
7	0_7738103	Confined	14,138	9/15/2017	-35.20	76.42	-111.62	1
7	0_7738103	Confined	14,143	9/20/2017	-35.28	76.47	-111.75	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738103	Confined	14,148	9/25/2017	-34.69	76.52	-111.21	1
7	0_7738103	Confined	14,153	9/30/2017	-32.55	76.57	-109.12	1
7	0_7738103	Confined	14,158	10/5/2017	-30.56	76.61	-107.17	1
7	0_7738103	Confined	14,163	10/10/2017	-29.02	76.66	-105.68	1
7	0_7738103	Confined	14,168	10/15/2017	-27.62	76.71	-104.33	1
7	0_7738103	Confined	14,172	10/19/2017	-28.35	76.75	-105.10	1
7	0_7738103	Confined	14,173	10/20/2017	-27.62	76.76	-104.38	1
7	0_7738103	Confined	14,178	10/25/2017	-29.75	76.81	-106.56	1
7	0_7738103	Confined	14,183	10/30/2017	-33.29	76.86	-110.15	1
7	0_7738103	Confined	14,189	11/5/2017	-34.10	76.92	-111.02	1
7	0_7738103	Confined	14,194	11/10/2017	-32.85	76.97	-109.82	1
7	0_7738103	Confined	14,199	11/15/2017	-30.93	77.02	-107.95	1
7	0_7738103	Confined	14,204	11/20/2017	-28.35	77.07	-105.42	1
7	0_7738103	Confined	14,209	11/25/2017	-26.15	77.12	-103.27	1
7	0_7738103	Confined	14,214	11/30/2017	-24.45	77.17	-101.62	1
7	0_7738103	Confined	14,219	12/5/2017	-23.05	77.22	-100.27	1
7	0_7738103	Confined	14,224	12/10/2017	-22.68	77.27	-99.95	1
7	0_7738103	Confined	14,229	12/15/2017	-24.08	77.31	-101.39	1
7	0_7738103	Confined	14,234	12/20/2017	-23.57	77.36	-100.93	1
7	0_7738103	Confined	14,239	12/25/2017	-23.13	77.41	-100.54	1
7	0_7738103	Confined	14,244	12/30/2017	-22.02	77.46	-99.48	1
7	0_7738201	Confined	779	2/17/1981	202.35	281.79	-79.44	1
7	0_7738201	Confined	2,962	2/9/1987	245.73	290.34	-44.61	1
7	0_7738201	Confined	3,364	3/17/1988	254.21	292.31	-38.10	1
7	0_7738201	Confined	3,699	2/15/1989	239.81	291.93	-52.12	1
7	0_7738201	Confined	4,070	2/21/1990	219.23	289.84	-70.61	1
7	0_7738201	Confined	4,427	2/13/1991	226.06	288.31	-62.25	1
7	0_7738201	Confined	4,790	2/11/1992	225.36	276.52	-51.16	1
7	0_7738201	Confined	5,804	11/21/1994	206.58	245.63	-39.05	1
7	0_7738201	Confined	6,233	1/24/1996	198.38	234.44	-36.06	1
7	0_7738201	Confined	6,624	2/18/1997	189.18	227.06	-37.88	1
7	0_7738201	Confined	6,983	2/12/1998	200.87	226.58	-25.71	1
7	0_7738201	Confined	8,808	2/11/2003	183.90	166.68	17.22	1
7	0_7738201	Confined	9,535	2/7/2005	223.98	154.33	69.65	1
7	0_7738201	Confined	9,928	3/7/2006	203.80	150.88	52.92	1
7	0_7738201	Confined	12,077	1/24/2012	63.27	56.87	6.40	1
7	0_7738201	Confined	13,073	10/16/2014	-8.91	60.35	-69.26	1
7	0_7738201	Confined	13,451	10/29/2015	-30.16	67.65	-97.81	1
7	0_7738201	Confined	13,801	10/13/2016	-11.76	73.21	-84.97	1
7	0_7738703	Confined	12,352	10/25/2012	251.78	67.47	184.31	1
7	0_7738901	Confined	1,506	2/14/1983	258.55	284.34	-25.79	1
7	0_7738901	Confined	1,871	2/14/1984	260.15	286.46	-26.31	1
7	0_7738901	Confined	2,236	2/13/1985	231.63	285.45	-53.82	1
7	0_7738901	Confined	2,609	2/21/1986	244.58	289.12	-44.54	1
7	0_7738901	Confined	2,957	2/4/1987	249.32	290.93	-41.61	1
7	0_7738901	Confined	3,363	3/16/1988	240.15	292.86	-52.71	1
7	0_7738901	Confined	3,699	2/15/1989	247.13	292.49	-45.36	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7738901	Confined	4,071	2/22/1990	225.30	290.62	-65.32	1
7	0_7738901	Confined	4,427	2/13/1991	224.26	289.05	-64.79	1
7	0_7738901	Confined	4,790	2/11/1992	222.57	277.70	-55.13	1
7	0_7738901	Confined	5,806	11/23/1994	217.32	246.76	-29.44	1
7	0_7739301	Confined	779	2/17/1981	233.54	283.02	-49.48	1
7	0_7739301	Confined	1,507	2/15/1983	262.01	284.42	-22.41	1
7	0_7739301	Confined	1,871	2/14/1984	265.53	286.61	-21.08	1
7	0_7739301	Confined	2,237	2/14/1985	253.64	285.48	-31.84	1
7	0_7739301	Confined	2,609	2/21/1986	243.21	289.34	-46.13	1
7	0_7739301	Confined	2,957	2/4/1987	252.64	291.09	-38.45	1
7	0_7739301	Confined	3,699	2/15/1989	244.69	292.51	-47.82	1
7	0_7739301	Confined	4,070	2/21/1990	226.76	290.56	-63.80	1
7	0_7739301	Confined	4,427	2/13/1991	233.67	288.99	-55.32	1
7	0_7739301	Confined	4,789	2/10/1992	242.74	277.15	-34.41	1
7	0_7739301	Confined	6,232	1/23/1996	240.36	234.78	5.58	1
7	0_7739301	Confined	6,625	2/19/1997	206.46	227.73	-21.27	1
7	0_7739301	Confined	6,983	2/12/1998	209.22	227.41	-18.19	1
7	0_7739301	Confined	7,340	2/4/1999	205.46	216.55	-11.09	1
7	0_7739301	Confined	9,150	1/19/2004	234.36	159.44	74.92	1
7	0_7739301	Confined	9,536	2/8/2005	238.86	155.16	83.70	1
7	0_7739301	Confined	9,921	2/28/2006	224.38	151.73	72.65	1
7	0_7739301	Confined	13,452	10/30/2015	12.46	68.98	-56.52	1
7	0_7739407	Confined	1,206	4/20/1982	232.99	283.57	-50.58	1
7	0_7739407	Confined	2,609	2/21/1986	236.80	289.13	-52.33	1
7	0_7739407	Confined	2,962	2/9/1987	243.08	290.95	-47.87	1
7	0_7739407	Confined	3,699	2/15/1989	238.32	292.42	-54.10	1
7	0_7739407	Confined	4,070	2/21/1990	207.54	290.51	-82.97	1
7	0_7739407	Confined	4,426	2/12/1991	236.39	288.96	-52.57	1
7	0_7739407	Confined	4,790	2/11/1992	221.73	277.29	-55.56	1
7	0_7739407	Confined	5,169	2/24/1993	234.09	266.24	-32.15	1
7	0_7739407	Confined	5,534	2/24/1994	210.99	254.81	-43.82	1
7	0_7739407	Confined	5,811	11/28/1994	216.21	246.06	-29.85	1
7	0_7739407	Confined	6,232	1/23/1996	202.49	235.03	-32.54	1
7	0_7739407	Confined	6,624	2/18/1997	189.09	227.86	-38.77	1
7	0_7739407	Confined	6,984	2/13/1998	179.27	227.33	-48.06	1
7	0_7739407	Confined	8,437	2/5/2002	158.69	181.74	-23.05	1
7	0_7739407	Confined	8,807	2/10/2003	185.99	167.71	18.28	1
7	0_7739407	Confined	9,151	1/20/2004	197.29	159.69	37.60	1
7	0_7739407	Confined	9,536	2/8/2005	211.89	155.30	56.59	1
7	0_7739407	Confined	9,920	2/27/2006	189.94	151.82	38.12	1
7	0_7739407	Confined	9,949	3/28/2006	187.40	151.88	35.52	1
7	0_7739407	Confined	10,264	2/6/2007	167.44	152.25	15.19	1
7	0_7739407	Confined	12,077	1/24/2012	76.24	58.33	17.91	1
7	0_7739407	Confined	13,452	10/30/2015	-44.00	68.85	-112.85	1
7	0_7739407	Confined	13,801	10/13/2016	-26.90	74.41	-101.31	1
7	0_7739407	Confined	14,170	10/17/2017	-54.03	78.54	-132.57	1
7	0_7739408	Confined	3,433	5/25/1988	231.54	292.83	-61.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7739409	Confined	13,553	2/8/2016	-35.23	70.77	-106.00	1
7	0_7740303	Confined	779	2/17/1981	250.99	283.07	-16.04	0.5
7	0_7740303	Confined	1,143	2/16/1982	268.38	283.63	-7.63	0.5
7	0_7740303	Confined	2,608	2/20/1986	249.54	289.34	-19.90	0.5
7	0_7740303	Confined	2,957	2/4/1987	264.39	291.12	-13.36	0.5
7	0_7740303	Confined	3,364	3/17/1988	276.58	293.03	-8.22	0.5
7	0_7740303	Confined	4,426	2/12/1991	242.16	289.09	-23.46	0.5
7	0_7740303	Confined	5,533	2/23/1994	241.69	254.95	-6.63	0.5
7	0_7740303	Confined	5,805	11/22/1994	230.21	246.37	-8.08	0.5
7	0_7740303	Confined	6,232	1/23/1996	225.69	235.21	-4.76	0.5
7	0_7740303	Confined	6,983	2/12/1998	225.01	227.64	-1.32	0.5
7	0_7740303	Confined	8,075	2/8/2001	219.19	191.06	14.07	0.5
7	0_7740303	Confined	8,443	2/11/2002	198.29	181.76	8.27	0.5
7	0_7741202	Confined	11,756	3/9/2011	549.04	558.06	-9.02	1
7	0_7741401	Confined	773	2/11/1981	598.61	581.72	8.45	0.5
7	0_7741401	Confined	2,231	2/8/1985	596.00	582.00	7.00	0.5
7	0_7741401	Confined	2,601	2/13/1986	594.88	582.10	6.39	0.5
7	0_7741401	Confined	3,357	3/10/1988	591.51	582.83	4.34	0.5
7	0_7741401	Confined	3,692	2/8/1989	564.12	582.90	-9.39	0.5
7	0_7741401	Confined	4,061	2/12/1990	587.18	582.88	2.15	0.5
7	0_7741401	Confined	4,797	2/18/1992	590.85	583.07	3.89	0.5
7	0_7741401	Confined	5,164	2/19/1993	614.14	583.91	15.11	0.5
7	0_7741401	Confined	6,238	1/29/1996	624.44	584.69	19.88	0.5
7	0_7742101	Confined	11,707	1/19/2011	459.36	455.76	3.60	1
7	0_7742801	Confined	773	2/11/1981	443.76	419.91	11.93	0.5
7	0_7742801	Confined	1,872	2/15/1984	436.69	421.53	7.58	0.5
7	0_7742801	Confined	2,236	2/13/1985	437.06	421.92	7.57	0.5
7	0_7742801	Confined	2,600	2/12/1986	431.19	422.09	4.55	0.5
7	0_7742801	Confined	2,963	2/10/1987	444.64	422.93	10.85	0.5
7	0_7742801	Confined	3,692	2/8/1989	448.12	426.71	10.70	0.5
7	0_7742801	Confined	4,062	2/13/1990	444.67	428.69	7.99	0.5
7	0_7742801	Confined	4,433	2/19/1991	441.34	430.32	5.51	0.5
7	0_7742801	Confined	4,798	2/19/1992	448.01	430.55	8.73	0.5
7	0_7742801	Confined	5,813	11/30/1994	447.02	428.65	9.19	0.5
7	0_7742801	Confined	6,234	1/25/1996	442.09	426.75	7.67	0.5
7	0_7742801	Confined	6,619	2/13/1997	438.99	425.01	6.99	0.5
7	0_7742801	Confined	6,995	2/24/1998	438.94	423.82	7.56	0.5
7	0_7742801	Confined	7,725	2/24/2000	434.89	422.33	6.28	0.5
7	0_7742801	Confined	8,080	2/13/2001	438.04	421.34	8.35	0.5
7	0_7742801	Confined	9,166	2/4/2004	436.49	418.21	9.14	0.5
7	0_7742801	Confined	9,536	2/8/2005	436.25	417.40	9.42	0.5
7	0_7742801	Confined	9,935	3/14/2006	429.86	416.71	6.58	0.5
7	0_7742801	Confined	12,079	1/26/2012	298.16	402.55	-52.19	0.5
7	0_7742801	Confined	12,442	1/23/2013	250.89	395.95	-72.53	0.5
7	0_7742801	Confined	13,451	10/29/2015	271.19	384.10	-56.45	0.5
7	0_7742801	Confined	13,801	10/13/2016	264.07	382.00	-58.97	0.5
7	0_7742801	Confined	14,170	10/17/2017	246.59	380.70	-67.06	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7744101	Confined	772	2/10/1981	299.10	308.38	-4.64	0.5
7	0_7744101	Confined	1,500	2/8/1983	286.81	311.76	-12.48	0.5
7	0_7744101	Confined	1,872	2/15/1984	292.21	313.47	-10.63	0.5
7	0_7744101	Confined	2,236	2/13/1985	288.32	313.13	-12.40	0.5
7	0_7744101	Confined	2,600	2/12/1986	286.05	312.26	-13.11	0.5
7	0_7744101	Confined	2,963	2/10/1987	312.42	316.44	-2.01	0.5
7	0_7744101	Confined	3,362	3/15/1988	314.82	323.54	-4.36	0.5
7	0_7744101	Confined	3,692	2/8/1989	306.45	327.34	-10.44	0.5
7	0_7744101	Confined	4,433	2/19/1991	303.70	332.92	-14.61	0.5
7	0_7744101	Confined	4,798	2/19/1992	305.35	331.11	-12.88	0.5
7	0_7744101	Confined	5,163	2/18/1993	320.32	328.27	-3.97	0.5
7	0_7744101	Confined	5,531	2/21/1994	305.72	324.20	-9.24	0.5
7	0_7744101	Confined	5,812	11/29/1994	301.29	321.67	-10.19	0.5
7	0_7744101	Confined	6,233	1/24/1996	280.72	316.76	-18.02	0.5
7	0_7744101	Confined	6,995	2/24/1998	282.97	311.86	-14.44	0.5
7	0_7744101	Confined	7,346	2/10/1999	288.07	311.11	-11.52	0.5
7	0_7744101	Confined	8,080	2/13/2001	276.27	308.65	-16.19	0.5
7	0_7744101	Confined	8,439	2/7/2002	268.43	306.80	-19.18	0.5
7	0_7744101	Confined	8,808	2/11/2003	275.17	303.36	-14.10	0.5
7	0_7744101	Confined	9,153	1/22/2004	280.14	300.56	-10.21	0.5
7	0_7744101	Confined	9,536	2/8/2005	291.67	298.67	-3.50	0.5
7	0_7744101	Confined	9,935	3/14/2006	264.00	297.58	-16.79	0.5
7	0_7744101	Confined	12,079	1/26/2012	157.05	263.55	-53.25	0.5
7	0_7744101	Confined	12,442	1/23/2013	87.62	252.11	-82.25	0.5
7	0_7744101	Confined	12,820	2/5/2014	83.20	243.91	-80.36	0.5
7	0_7744106	Confined	6,662	3/28/1997	273.76	313.75	-39.99	1
7	0_7744107	Confined	14,170	10/17/2017	36.80	234.14	-98.67	0.5
7	0_7745602	Confined	5,773	10/21/1994	261.51	273.06	-11.55	1
7	0_7748301	Confined	779	2/17/1981	262.44	283.19	-20.75	1
7	0_7748301	Confined	1,508	2/16/1983	277.58	284.50	-6.92	1
7	0_7748301	Confined	2,237	2/14/1985	275.88	285.69	-9.81	1
7	0_7748301	Confined	2,608	2/20/1986	265.45	289.07	-23.62	1
7	0_7748301	Confined	3,700	2/16/1989	268.45	292.62	-24.17	1
7	0_7748301	Confined	4,071	2/22/1990	255.28	290.88	-35.60	1
7	0_7748301	Confined	4,427	2/13/1991	255.03	289.33	-34.30	1
7	0_7748301	Confined	4,790	2/11/1992	252.51	278.69	-26.18	1
7	0_7748301	Confined	5,168	2/23/1993	257.98	267.84	-9.86	1
7	0_7748301	Confined	5,534	2/24/1994	260.58	256.60	3.98	1
7	0_7748301	Confined	5,805	11/22/1994	252.28	248.15	4.13	1
7	0_7748301	Confined	6,232	1/23/1996	244.38	236.86	7.52	1
7	0_7748301	Confined	6,625	2/19/1997	225.08	229.46	-4.38	1
7	0_7748301	Confined	6,983	2/12/1998	229.69	228.37	1.32	1
7	0_7748301	Confined	7,340	2/4/1999	224.28	218.55	5.73	1
7	0_7748301	Confined	7,725	2/24/2000	219.48	207.66	11.82	1
7	0_7748301	Confined	8,080	2/13/2001	208.78	193.32	15.46	1
7	0_7748301	Confined	8,437	2/5/2002	213.34	183.97	29.37	1
7	0_7748301	Confined	8,809	2/12/2003	211.26	170.33	40.93	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7748301	Confined	9,151	1/20/2004	213.18	162.01	51.17	1
7	0_7748301	Confined	9,536	2/8/2005	234.33	157.16	77.17	1
7	0_7748301	Confined	9,921	2/28/2006	226.45	153.51	72.94	1
7	0_7748301	Confined	9,950	3/29/2006	226.01	153.53	72.48	1
7	0_7748301	Confined	10,264	2/6/2007	207.48	153.54	53.94	1
7	0_7748301	Confined	10,630	2/7/2008	208.58	150.89	57.69	1
7	0_7748301	Confined	11,014	2/25/2009	199.92	136.29	63.63	1
7	0_7748301	Confined	12,442	1/23/2013	83.63	62.09	21.54	1
7	0_7748301	Confined	12,822	2/7/2014	61.18	61.73	-0.55	1
7	0_7748301	Confined	13,073	10/16/2014	44.63	63.38	-18.75	1
7	0_7748301	Confined	13,452	10/30/2015	24.75	69.88	-45.13	1
7	0_7748301	Confined	13,801	10/13/2016	41.56	75.37	-33.81	1
7	0_7748301	Confined	14,171	10/18/2017	24.46	79.60	-55.14	1
7	0_7748303	Confined	12,150	4/6/2012	191.53	62.31	129.22	1
7	0_7748801	Confined	6,799	8/12/1997	241.16	229.67	11.49	1
7	0_7748801	Confined	6,983	2/12/1998	239.31	228.49	10.82	1
7	0_7748801	Confined	8,437	2/5/2002	229.50	184.26	45.24	1
7	0_7748801	Confined	8,809	2/12/2003	222.39	170.68	51.71	1
7	0_7748801	Confined	9,536	2/8/2005	235.79	157.38	78.41	1
7	0_7748801	Confined	10,264	2/6/2007	234.29	153.67	80.62	1
7	0_7748801	Confined	12,077	1/24/2012	197.09	63.49	133.60	1
7	0_7748801	Confined	12,822	2/7/2014	65.73	61.92	3.81	1
7	0_7748801	Confined	13,073	10/16/2014	53.93	63.52	-9.59	1
7	0_7748801	Confined	13,452	10/30/2015	40.59	69.94	-29.35	1
7	0_7748801	Confined	13,801	10/13/2016	46.99	75.41	-28.42	1
7	0_7748801	Confined	14,171	10/18/2017	37.64	79.66	-42.02	1
7	0_7749501	Confined	3,774	5/1/1989	552.39	559.21	-6.82	1
7	0_7750201	Confined	772	2/10/1981	468.76	478.11	-9.35	1
7	0_7750201	Confined	1,872	2/15/1984	462.95	478.62	-15.67	1
7	0_7750201	Confined	2,236	2/13/1985	459.16	478.76	-19.60	1
7	0_7750201	Confined	2,601	2/13/1986	451.59	478.98	-27.39	1
7	0_7750201	Confined	4,798	2/19/1992	459.41	482.36	-22.95	1
7	0_7750601	Confined	2,245	2/22/1985	427.27	434.23	-6.96	1
7	0_7750601	Confined	2,615	2/27/1986	424.93	434.42	-9.49	1
7	0_7750601	Confined	3,362	3/15/1988	428.81	435.60	-6.79	1
7	0_7750603	Confined	3,423	5/15/1988	477.28	435.89	41.39	1
7	0_7750603	Confined	3,707	2/23/1989	439.91	436.66	3.25	1
7	0_7750603	Confined	7,038	4/8/1998	408.74	436.13	-27.39	1
7	0_7750603	Confined	9,963	4/11/2006	420.36	428.96	-8.60	1
7	0_7752801	Confined	5,935	4/1/1995	302.76	352.51	-49.75	1
7	0_7756801	Confined	778	2/16/1981	315.94	283.38	3.26	0.1
7	0_7756801	Confined	1,142	2/15/1982	315.74	283.87	3.19	0.1
7	0_7758301	Confined	1,875	2/18/1984	506.12	443.08	63.04	1
7	0_7758301	Confined	2,245	2/22/1985	508.54	443.13	65.41	1
7	0_7758301	Confined	2,615	2/27/1986	505.94	443.22	62.72	1
7	0_7758301	Confined	3,362	3/15/1988	508.30	443.65	64.65	1
7	0_7759401	Confined	1,875	2/18/1984	415.55	429.49	-6.97	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7759401	Confined	2,245	2/22/1985	412.48	429.43	-8.48	0.5
7	0_7759401	Confined	3,362	3/15/1988	418.16	429.69	-5.77	0.5
7	0_7759401	Confined	3,707	2/23/1989	419.04	429.82	-5.39	0.5
7	0_7759401	Confined	4,355	12/3/1990	416.90	430.13	-6.62	0.5
7	0_7759501	Confined	7,017	3/18/1998	433.14	405.64	27.50	1
7	0_7760201	Confined	3,292	1/5/1988	306.79	370.01	-63.22	1
7	0_7764401	Confined	775	2/13/1981	317.45	283.48	33.97	1
7	0_7764401	Confined	1,139	2/12/1982	313.14	283.96	29.18	1
7	0_7764401	Confined	1,503	2/11/1983	316.17	284.69	31.48	1
7	0_7764401	Confined	1,872	2/15/1984	317.85	286.61	31.24	1
7	0_7764401	Confined	2,236	2/13/1985	311.47	286.01	25.46	1
7	0_7764401	Confined	2,957	2/4/1987	306.63	290.97	15.66	1
7	0_7764401	Confined	3,700	2/16/1989	310.57	292.86	17.71	1
7	0_7764401	Confined	4,791	2/12/1992	299.23	280.01	19.22	1
7	0_7764401	Confined	5,036	10/14/1992	299.79	273.17	26.62	1
7	0_7764401	Confined	5,812	11/29/1994	293.39	249.72	43.67	1
7	0_7764401	Confined	6,232	1/23/1996	290.37	238.55	51.82	1
7	0_7764401	Confined	6,624	2/18/1997	284.87	230.91	53.96	1
7	0_7764401	Confined	6,984	2/13/1998	278.45	229.22	49.23	1
7	0_7764401	Confined	7,724	2/23/2000	273.12	209.53	63.59	1
7	0_7764401	Confined	8,439	2/7/2002	272.72	185.88	86.84	1
7	0_7764401	Confined	8,809	2/12/2003	264.80	172.68	92.12	1
7	0_7764401	Confined	10,264	2/6/2007	267.17	154.56	112.61	1
7	0_7764401	Confined	11,014	2/25/2009	261.84	138.61	123.23	1
7	0_7764401	Confined	12,441	1/22/2013	172.62	64.03	108.59	1
7	0_7764401	Confined	12,821	2/6/2014	161.97	63.24	98.73	1
7	0_7764401	Confined	13,073	10/16/2014	137.18	64.61	72.57	1
7	0_7764401	Confined	13,799	10/11/2016	141.91	75.90	66.01	1
7	0_7764401	Confined	14,171	10/18/2017	121.03	80.23	40.80	1
7	0_7802702	Confined	1,135	2/8/1982	371.06	395.59	-24.53	1
7	0_7802702	Confined	1,517	2/25/1983	370.84	397.68	-26.84	1
7	0_7802702	Confined	1,873	2/16/1984	366.17	401.88	-35.71	1
7	0_7802702	Confined	2,601	2/13/1986	361.32	408.56	-47.24	1
7	0_7802702	Confined	3,000	3/19/1987	358.35	408.73	-50.38	1
7	0_7802702	Confined	3,342	2/24/1988	356.09	410.43	-54.34	1
7	0_7802702	Confined	3,700	2/16/1989	330.79	404.91	-74.12	1
7	0_7802702	Confined	4,446	3/4/1991	333.59	398.26	-64.67	1
7	0_7802702	Confined	4,755	1/7/1992	342.59	378.63	-36.04	1
7	0_7802702	Confined	5,504	1/25/1994	359.59	360.48	-0.89	1
7	0_7802702	Confined	6,235	1/26/1996	309.24	344.55	-35.31	1
7	0_7802702	Confined	6,656	3/22/1997	334.79	346.46	-11.67	1
7	0_7802702	Confined	7,317	1/12/1999	332.49	338.15	-5.66	1
7	0_7802702	Confined	8,066	1/30/2001	322.89	306.94	15.95	1
7	0_7802702	Confined	8,410	1/9/2002	303.59	308.43	-4.84	1
7	0_7802702	Confined	8,781	1/15/2003	300.09	293.03	7.06	1
7	0_7802702	Confined	9,158	1/27/2004	305.09	294.40	10.69	1
7	0_7802702	Confined	9,504	1/7/2005	328.59	300.69	27.90	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7802702	Confined	9,882	1/20/2006	314.49	300.06	14.43	1
7	0_7802702	Confined	10,280	2/22/2007	333.09	307.81	25.28	1
7	0_7802702	Confined	10,643	2/20/2008	329.59	305.35	24.24	1
7	0_7802702	Confined	11,008	2/19/2009	317.99	277.20	40.79	1
7	0_7802702	Confined	11,446	5/3/2010	311.59	227.84	83.75	1
7	0_7802815	Confined	6,638	3/4/1997	330.55	357.82	-13.63	0.5
7	0_7802815	Confined	6,948	1/8/1998	340.35	370.28	-14.97	0.5
7	0_7802815	Confined	7,318	1/13/1999	339.40	351.12	-5.86	0.5
7	0_7802815	Confined	7,702	2/1/2000	321.70	340.73	-9.51	0.5
7	0_7802815	Confined	8,410	1/9/2002	321.70	322.02	-0.16	0.5
7	0_7802815	Confined	8,773	1/7/2003	334.70	307.36	13.67	0.5
7	0_7802815	Confined	9,153	1/22/2004	335.40	308.69	13.35	0.5
7	0_7802815	Confined	9,523	1/26/2005	341.90	315.01	13.45	0.5
7	0_7802815	Confined	9,866	1/4/2006	320.70	313.50	3.60	0.5
7	0_7802815	Confined	10,264	2/6/2007	314.70	321.18	-3.24	0.5
7	0_7802815	Confined	10,599	1/7/2008	328.40	324.56	1.92	0.5
7	0_7802815	Confined	10,993	2/4/2009	309.00	297.30	5.85	0.5
7	0_7802815	Confined	11,327	1/4/2010	308.60	256.77	25.91	0.5
7	0_7802815	Confined	12,059	1/6/2012	286.00	208.83	38.58	0.5
7	0_7802815	Confined	12,114	3/1/2012	292.40	214.88	38.76	0.5
7	0_7802815	Confined	12,149	4/5/2012	293.40	218.73	37.33	0.5
7	0_7802815	Confined	12,176	5/2/2012	260.30	221.70	19.30	0.5
7	0_7802815	Confined	12,210	6/5/2012	266.30	225.44	20.43	0.5
7	0_7802815	Confined	12,237	7/2/2012	254.90	228.41	13.25	0.5
7	0_7802815	Confined	12,265	7/30/2012	246.70	231.49	7.61	0.5
7	0_7802815	Confined	12,307	9/10/2012	244.20	236.10	4.05	0.5
7	0_7802815	Confined	12,346	10/19/2012	245.20	240.39	2.40	0.5
7	0_7802815	Confined	12,367	11/9/2012	253.70	242.70	5.50	0.5
7	0_7802815	Confined	12,391	12/3/2012	271.40	245.34	13.03	0.5
7	0_7802815	Confined	12,425	1/6/2013	282.60	248.54	17.03	0.5
7	0_7802815	Confined	12,456	2/6/2013	278.40	249.17	14.62	0.5
7	0_7802815	Confined	12,479	3/1/2013	276.70	249.64	13.53	0.5
7	0_7802815	Confined	12,514	4/5/2013	274.50	250.34	12.08	0.5
7	0_7802815	Confined	12,575	6/5/2013	247.00	251.58	-2.29	0.5
7	0_7802815	Confined	12,632	8/1/2013	253.90	252.74	0.58	0.5
7	0_7802815	Confined	12,672	9/10/2013	242.70	253.55	-5.42	0.5
7	0_7802815	Confined	12,711	10/19/2013	244.70	254.34	-4.82	0.5
7	0_7802815	Confined	12,756	12/3/2013	270.80	255.25	7.78	0.5
7	0_7802815	Confined	12,785	1/1/2014	252.20	255.85	-1.82	0.5
7	0_7802815	Confined	12,816	2/1/2014	253.50	256.84	-1.67	0.5
7	0_7802815	Confined	12,844	3/1/2014	254.90	257.74	-1.42	0.5
7	0_7802815	Confined	12,905	5/1/2014	229.00	259.70	-15.35	0.5
7	0_7802815	Confined	12,966	7/1/2014	227.80	261.66	-16.93	0.5
7	0_7802815	Confined	12,997	8/1/2014	224.90	262.66	-18.88	0.5
7	0_7802815	Confined	13,089	11/1/2014	224.70	265.61	-20.46	0.5
7	0_7802815	Confined	13,119	12/1/2014	229.80	266.58	-18.39	0.5
7	0_7802815	Confined	13,150	1/1/2015	232.60	267.60	-17.50	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7802815	Confined	13,181	2/1/2015	253.50	269.25	-7.87	0.5
7	0_7802815	Confined	13,209	3/1/2015	243.80	270.74	-13.47	0.5
7	0_7802815	Confined	13,881	1/1/2017	276.00	297.15	-10.57	0.5
7	0_7802815	Confined	13,912	2/1/2017	276.60	297.51	-10.46	0.5
7	0_7802815	Confined	13,940	3/1/2017	303.50	297.85	2.83	0.5
7	0_7802815	Confined	13,971	4/1/2017	300.40	298.21	1.09	0.5
7	0_7802815	Confined	14,001	5/1/2017	294.90	298.57	-1.83	0.5
7	0_7802815	Confined	14,032	6/1/2017	288.40	298.93	-5.27	0.5
7	0_7802815	Confined	14,124	9/1/2017	255.10	300.02	-22.46	0.5
7	0_7802815	Confined	14,154	10/1/2017	254.70	300.38	-22.84	0.5
7	0_7802815	Confined	14,185	11/1/2017	256.30	300.74	-22.22	0.5
7	0_7802815	Confined	14,215	12/1/2017	258.10	301.10	-21.50	0.5
7	0_7803302	Confined	1,166	3/11/1982	400.50	346.33	27.09	0.5
7	0_7804107	Confined	7,964	10/20/2000	320.16	334.80	-14.64	1
7	0_7804204	Confined	2,230	2/7/1985	369.38	341.01	14.18	0.5
7	0_7804204	Confined	2,600	2/12/1986	377.67	344.74	16.47	0.5
7	0_7804204	Confined	4,092	3/15/1990	357.71	340.56	8.58	0.5
7	0_7804204	Confined	4,391	1/8/1991	363.25	340.88	11.18	0.5
7	0_7804204	Confined	5,122	1/8/1993	391.64	346.59	22.52	0.5
7	0_7809305	Confined	2,236	2/13/1985	329.36	387.49	-58.13	1
7	0_7809305	Confined	2,601	2/13/1986	348.74	395.80	-47.06	1
7	0_7809305	Confined	3,000	3/19/1987	357.28	396.32	-39.04	1
7	0_7809305	Confined	3,342	2/24/1988	348.34	397.54	-49.20	1
7	0_7809305	Confined	3,699	2/15/1989	315.13	393.06	-77.93	1
7	0_7809305	Confined	4,446	3/4/1991	324.14	386.85	-62.71	1
7	0_7809305	Confined	4,790	2/11/1992	325.84	368.41	-42.57	1
7	0_7809305	Confined	5,129	1/15/1993	330.04	361.82	-31.78	1
7	0_7809305	Confined	5,504	1/25/1994	328.04	350.05	-22.01	1
7	0_7809305	Confined	6,224	1/15/1996	324.64	333.99	-9.35	1
7	0_7809305	Confined	6,648	3/14/1997	294.89	334.57	-39.68	1
7	0_7809305	Confined	6,984	2/13/1998	308.04	343.25	-35.21	1
7	0_7809305	Confined	7,318	1/13/1999	306.29	326.98	-20.69	1
7	0_7809305	Confined	8,066	1/30/2001	301.44	297.36	4.08	1
7	0_7809305	Confined	8,410	1/9/2002	297.74	297.20	0.54	1
7	0_7809305	Confined	8,781	1/15/2003	295.94	282.79	13.15	1
7	0_7809305	Confined	9,153	1/22/2004	294.14	282.46	11.68	1
7	0_7809305	Confined	9,504	1/7/2005	296.74	287.27	9.47	1
7	0_7809305	Confined	9,880	1/18/2006	292.44	286.56	5.88	1
7	0_7809305	Confined	10,271	2/13/2007	286.04	293.07	-7.03	1
7	0_7809305	Confined	10,643	2/20/2008	290.94	290.31	0.63	1
7	0_7809305	Confined	11,008	2/19/2009	275.24	264.90	10.34	1
7	0_7809305	Confined	11,446	5/3/2010	271.34	219.06	52.28	1
7	0_7809506	Confined	4,750	1/2/1992	282.91	339.46	-28.28	0.5
7	0_7809506	Confined	4,782	2/3/1992	306.11	338.71	-16.30	0.5
7	0_7809506	Confined	4,810	3/2/1992	311.41	338.06	-13.33	0.5
7	0_7809506	Confined	4,840	4/1/1992	335.91	337.36	-0.73	0.5
7	0_7809506	Confined	4,964	8/3/1992	303.91	334.47	-15.28	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7809506	Confined	5,023	10/1/1992	282.51	333.09	-25.29	0.5
7	0_7809506	Confined	5,055	11/2/1992	292.51	332.34	-19.92	0.5
7	0_7809506	Confined	5,087	12/4/1992	293.91	331.59	-18.84	0.5
7	0_7809506	Confined	5,118	1/4/1993	299.51	330.83	-15.66	0.5
7	0_7809506	Confined	5,246	5/12/1993	316.11	326.52	-5.20	0.5
7	0_7809506	Confined	5,267	6/2/1993	317.21	325.81	-4.30	0.5
7	0_7809506	Confined	5,328	8/2/1993	289.06	323.76	-17.35	0.5
7	0_7809506	Confined	5,358	9/1/1993	248.81	322.75	-36.97	0.5
7	0_7809506	Confined	5,388	10/1/1993	244.51	321.74	-38.61	0.5
7	0_7809506	Confined	5,420	11/2/1993	259.26	320.66	-30.70	0.5
7	0_7809506	Confined	5,451	12/3/1993	276.36	319.62	-21.63	0.5
7	0_7809506	Confined	5,483	1/4/1994	279.61	318.54	-19.47	0.5
7	0_7809506	Confined	5,513	2/3/1994	293.06	317.54	-12.24	0.5
7	0_7809506	Confined	5,539	3/1/1994	303.51	316.68	-6.58	0.5
7	0_7809506	Confined	5,574	4/5/1994	308.51	315.51	-3.50	0.5
7	0_7809506	Confined	5,602	5/3/1994	301.86	314.58	-6.36	0.5
7	0_7809506	Confined	5,646	6/16/1994	294.81	313.11	-9.15	0.5
7	0_7809506	Confined	5,665	7/5/1994	290.31	312.48	-11.08	0.5
7	0_7809506	Confined	5,692	8/1/1994	264.06	311.58	-23.76	0.5
7	0_7809506	Confined	5,724	9/2/1994	257.81	310.51	-26.35	0.5
7	0_7809506	Confined	5,758	10/6/1994	238.31	309.38	-35.53	0.5
7	0_7809506	Confined	5,785	11/2/1994	268.31	308.48	-20.08	0.5
7	0_7809506	Confined	5,814	12/1/1994	286.01	307.51	-10.75	0.5
7	0_7809506	Confined	5,849	1/5/1995	298.66	306.43	-3.88	0.5
7	0_7809506	Confined	5,878	2/3/1995	302.41	305.92	-1.75	0.5
7	0_7809506	Confined	5,911	3/8/1995	309.46	305.34	2.06	0.5
7	0_7809506	Confined	5,944	4/10/1995	310.31	304.75	2.78	0.5
7	0_7809506	Confined	5,966	5/2/1995	299.46	304.37	-2.45	0.5
7	0_7809506	Confined	5,997	6/2/1995	285.81	303.82	-9.01	0.5
7	0_7809506	Confined	6,037	7/12/1995	286.51	303.12	-8.30	0.5
7	0_7809506	Confined	6,068	8/12/1995	239.41	302.57	-31.58	0.5
7	0_7809506	Confined	6,093	9/6/1995	222.91	302.13	-39.61	0.5
7	0_7809506	Confined	6,120	10/3/1995	227.26	301.66	-37.20	0.5
7	0_7809506	Confined	6,150	11/2/1995	241.96	301.13	-29.59	0.5
7	0_7809506	Confined	6,183	12/5/1995	265.56	300.55	-17.49	0.5
7	0_7809506	Confined	6,212	1/3/1996	279.31	300.07	-10.38	0.5
7	0_7809506	Confined	6,246	2/6/1996	283.41	299.80	-8.20	0.5
7	0_7809506	Confined	6,274	3/5/1996	271.21	299.59	-14.19	0.5
7	0_7809506	Confined	6,303	4/3/1996	260.11	299.36	-19.63	0.5
7	0_7809506	Confined	6,333	5/3/1996	237.90	299.13	-30.61	0.5
7	0_7809506	Confined	6,366	6/5/1996	228.32	298.87	-35.28	0.5
7	0_7809506	Confined	6,371	6/10/1996	225.31	298.83	-36.76	0.5
7	0_7809506	Confined	6,376	6/15/1996	223.97	298.79	-37.41	0.5
7	0_7809506	Confined	6,381	6/20/1996	221.17	298.75	-38.79	0.5
7	0_7809506	Confined	6,386	6/25/1996	220.47	298.71	-39.12	0.5
7	0_7809506	Confined	6,391	6/30/1996	220.47	298.68	-39.10	0.5
7	0_7809506	Confined	6,396	7/5/1996	221.67	298.64	-38.48	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7809506	Confined	6,401	7/10/1996	218.15	298.60	-40.22	0.5
7	0_7809506	Confined	6,406	7/15/1996	218.15	298.56	-40.20	0.5
7	0_7809506	Confined	6,411	7/20/1996	218.15	298.52	-40.19	0.5
7	0_7809506	Confined	6,416	7/25/1996	215.05	298.48	-41.72	0.5
7	0_7809506	Confined	6,421	7/30/1996	212.57	298.44	-42.94	0.5
7	0_7809506	Confined	6,427	8/5/1996	207.82	298.40	-45.29	0.5
7	0_7809506	Confined	6,432	8/10/1996	207.82	298.36	-45.27	0.5
7	0_7809506	Confined	6,437	8/15/1996	192.37	298.32	-52.97	0.5
7	0_7809506	Confined	6,442	8/20/1996	189.41	298.28	-54.43	0.5
7	0_7809506	Confined	6,447	8/25/1996	187.97	298.24	-55.14	0.5
7	0_7809506	Confined	6,452	8/30/1996	192.01	298.20	-53.10	0.5
7	0_7809506	Confined	6,458	9/5/1996	197.86	298.15	-50.15	0.5
7	0_7809506	Confined	6,463	9/10/1996	197.80	298.12	-50.16	0.5
7	0_7809506	Confined	6,468	9/15/1996	202.31	298.08	-47.88	0.5
7	0_7809506	Confined	6,473	9/20/1996	207.68	298.04	-45.18	0.5
7	0_7809506	Confined	6,478	9/25/1996	209.77	298.00	-44.11	0.5
7	0_7809506	Confined	6,483	9/30/1996	206.35	297.96	-45.81	0.5
7	0_7809506	Confined	6,488	10/5/1996	204.60	297.92	-46.66	0.5
7	0_7809506	Confined	6,493	10/10/1996	207.10	297.88	-45.39	0.5
7	0_7809506	Confined	6,498	10/15/1996	206.79	297.84	-45.53	0.5
7	0_7809506	Confined	6,503	10/20/1996	207.50	297.80	-45.15	0.5
7	0_7809506	Confined	6,508	10/25/1996	208.37	297.77	-44.70	0.5
7	0_7809506	Confined	6,513	10/30/1996	210.54	297.73	-43.59	0.5
7	0_7809506	Confined	6,519	11/5/1996	215.02	297.68	-41.33	0.5
7	0_7809506	Confined	6,524	11/10/1996	214.64	297.64	-41.50	0.5
7	0_7809506	Confined	6,529	11/15/1996	216.14	297.60	-40.73	0.5
7	0_7809506	Confined	6,534	11/20/1996	218.27	297.56	-39.65	0.5
7	0_7809506	Confined	6,539	11/25/1996	220.84	297.52	-38.34	0.5
7	0_7809506	Confined	6,544	11/30/1996	224.02	297.49	-36.73	0.5
7	0_7809506	Confined	6,549	12/5/1996	227.04	297.45	-35.20	0.5
7	0_7809506	Confined	6,554	12/10/1996	229.66	297.41	-33.87	0.5
7	0_7809506	Confined	6,559	12/15/1996	230.86	297.37	-33.25	0.5
7	0_7809506	Confined	6,564	12/20/1996	232.50	297.33	-32.42	0.5
7	0_7809506	Confined	6,569	12/25/1996	231.81	297.29	-32.74	0.5
7	0_7809506	Confined	6,574	12/30/1996	234.01	297.25	-31.62	0.5
7	0_7809506	Confined	6,580	1/5/1997	235.30	297.42	-31.06	0.5
7	0_7809506	Confined	6,585	1/10/1997	236.13	297.59	-30.73	0.5
7	0_7809506	Confined	6,590	1/15/1997	239.33	297.77	-29.22	0.5
7	0_7809506	Confined	6,595	1/20/1997	239.80	297.94	-29.07	0.5
7	0_7809506	Confined	6,600	1/25/1997	238.75	298.12	-29.68	0.5
7	0_7809506	Confined	6,605	1/30/1997	238.99	298.29	-29.65	0.5
7	0_7809506	Confined	6,611	2/5/1997	238.18	298.50	-30.16	0.5
7	0_7809506	Confined	6,616	2/10/1997	238.43	298.67	-30.12	0.5
7	0_7809506	Confined	6,621	2/15/1997	239.26	298.85	-29.79	0.5
7	0_7809506	Confined	6,626	2/20/1997	243.35	299.02	-27.84	0.5
7	0_7809506	Confined	6,631	2/25/1997	243.53	299.20	-27.83	0.5
7	0_7809506	Confined	6,634	2/28/1997	245.03	299.30	-27.14	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7809506	Confined	6,651	3/17/1997	252.21	299.89	-23.84	0.5
7	0_7809506	Confined	6,974	2/3/1998	278.23	308.21	-14.99	0.5
7	0_7809506	Confined	7,318	1/13/1999	280.70	290.71	-5.00	0.5
7	0_7809506	Confined	7,702	2/1/2000	239.71	279.23	-19.76	0.5
7	0_7809506	Confined	8,065	1/29/2001	251.51	259.19	-3.84	0.5
7	0_7809506	Confined	8,409	1/8/2002	264.83	257.98	3.42	0.5
7	0_7809506	Confined	8,781	1/15/2003	288.31	242.07	23.12	0.5
7	0_7809506	Confined	10,264	2/6/2007	260.91	249.40	5.75	0.5
7	0_7809506	Confined	10,599	1/7/2008	270.91	248.40	11.26	0.5
7	0_7809506	Confined	11,009	2/20/2009	248.41	219.38	14.51	0.5
7	0_7809506	Confined	11,341	1/18/2010	266.01	178.83	43.59	0.5
7	0_7809507	Confined	4,447	3/5/1991	322.88	363.77	-20.44	0.5
7	0_7809507	Confined	4,790	2/11/1992	317.13	344.72	-13.80	0.5
7	0_7809507	Confined	5,504	1/25/1994	290.13	324.48	-17.17	0.5
7	0_7809507	Confined	5,859	1/15/1995	292.88	313.07	-10.09	0.5
7	0_7809507	Confined	6,224	1/15/1996	284.03	306.95	-11.46	0.5
7	0_7809507	Confined	6,648	3/14/1997	280.38	306.98	-13.30	0.5
7	0_7809507	Confined	6,984	2/13/1998	282.18	315.13	-16.47	0.5
7	0_7809507	Confined	7,318	1/13/1999	283.38	298.37	-7.50	0.5
7	0_7809507	Confined	8,065	1/29/2001	274.63	267.07	3.78	0.5
7	0_7809507	Confined	8,409	1/8/2002	270.73	266.02	2.35	0.5
7	0_7809507	Confined	8,781	1/15/2003	269.43	250.44	9.49	0.5
7	0_7809507	Confined	9,154	1/23/2004	269.03	249.12	9.96	0.5
7	0_7809507	Confined	9,504	1/7/2005	272.63	253.16	9.74	0.5
7	0_7809507	Confined	9,880	1/18/2006	269.63	252.29	8.67	0.5
7	0_7809507	Confined	10,263	2/5/2007	266.43	258.65	3.89	0.5
7	0_7809507	Confined	10,599	1/7/2008	267.93	257.95	4.99	0.5
7	0_7809507	Confined	11,009	2/20/2009	252.73	229.09	11.82	0.5
7	0_7809507	Confined	11,341	1/18/2010	252.93	188.69	32.12	0.5
7	0_7818702	Confined	9,949	3/28/2006	238.30	203.32	34.98	1
7	0_7821804	Confined	13,448	10/26/2015	137.48	238.23	-100.75	1
7	0_7821804	Confined	13,800	10/12/2016	142.41	239.19	-96.78	1
7	0_7821804	Confined	14,169	10/16/2017	145.28	239.78	-94.50	1
7	0_7825502	Confined	11,844	6/5/2011	166.20	72.00	94.20	1
7	0_7825502	Confined	11,849	6/10/2011	167.21	71.67	95.54	1
7	0_7825502	Confined	11,854	6/15/2011	155.03	71.35	83.68	1
7	0_7825502	Confined	11,859	6/20/2011	162.02	71.02	91.00	1
7	0_7825502	Confined	11,864	6/25/2011	160.61	70.69	89.92	1
7	0_7825502	Confined	11,869	6/30/2011	161.63	70.37	91.26	1
7	0_7825502	Confined	11,870	7/1/2011	159.79	70.30	89.49	1
7	0_7825502	Confined	11,874	7/5/2011	158.99	70.04	88.95	1
7	0_7825502	Confined	11,879	7/10/2011	159.14	69.71	89.43	1
7	0_7825502	Confined	11,881	7/12/2011	156.07	69.58	86.49	1
7	0_7825502	Confined	11,889	7/20/2011	156.06	69.06	87.00	1
7	0_7825502	Confined	11,894	7/25/2011	155.62	68.74	86.88	1
7	0_7825502	Confined	11,899	7/30/2011	157.55	68.41	89.14	1
7	0_7825502	Confined	11,901	8/1/2011	157.25	68.28	88.97	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	11,905	8/5/2011	153.66	68.02	85.64	1
7	0_7825502	Confined	11,910	8/10/2011	141.80	67.69	74.11	1
7	0_7825502	Confined	11,915	8/15/2011	151.50	67.36	84.14	1
7	0_7825502	Confined	11,920	8/20/2011	150.17	67.04	83.13	1
7	0_7825502	Confined	11,925	8/25/2011	150.40	66.71	83.69	1
7	0_7825502	Confined	11,930	8/30/2011	146.59	66.39	80.20	1
7	0_7825502	Confined	11,932	9/1/2011	136.84	66.26	70.58	1
7	0_7825502	Confined	11,941	9/10/2011	142.95	65.67	77.28	1
7	0_7825502	Confined	11,943	9/12/2011	148.15	65.54	82.61	1
7	0_7825502	Confined	11,946	9/15/2011	143.50	65.34	78.16	1
7	0_7825502	Confined	11,951	9/20/2011	137.52	65.01	72.51	1
7	0_7825502	Confined	11,956	9/25/2011	128.28	64.69	63.59	1
7	0_7825502	Confined	11,961	9/30/2011	135.36	64.36	71.00	1
7	0_7825502	Confined	11,962	10/1/2011	135.94	64.30	71.64	1
7	0_7825502	Confined	11,966	10/5/2011	136.18	64.04	72.14	1
7	0_7825502	Confined	11,971	10/10/2011	134.22	63.71	70.51	1
7	0_7825502	Confined	11,976	10/15/2011	133.20	63.38	69.82	1
7	0_7825502	Confined	11,981	10/20/2011	133.21	63.06	70.15	1
7	0_7825502	Confined	11,986	10/25/2011	134.38	62.73	71.65	1
7	0_7825502	Confined	11,991	10/30/2011	133.14	62.40	70.74	1
7	0_7825502	Confined	11,993	11/1/2011	131.17	62.27	68.90	1
7	0_7825502	Confined	11,997	11/5/2011	129.99	62.01	67.98	1
7	0_7825502	Confined	12,002	11/10/2011	129.26	61.69	67.57	1
7	0_7825502	Confined	12,007	11/15/2011	127.73	61.36	66.37	1
7	0_7825502	Confined	12,012	11/20/2011	130.23	61.03	69.20	1
7	0_7825502	Confined	12,017	11/25/2011	118.09	60.71	57.38	1
7	0_7825502	Confined	12,022	11/30/2011	130.03	60.38	69.65	1
7	0_7825502	Confined	12,023	12/1/2011	127.61	60.31	67.30	1
7	0_7825502	Confined	12,027	12/5/2011	125.89	60.05	65.84	1
7	0_7825502	Confined	12,032	12/10/2011	125.03	59.73	65.30	1
7	0_7825502	Confined	12,037	12/15/2011	124.05	59.40	64.65	1
7	0_7825502	Confined	12,042	12/20/2011	126.20	59.07	67.13	1
7	0_7825502	Confined	12,047	12/25/2011	125.80	58.75	67.05	1
7	0_7825502	Confined	12,052	12/30/2011	129.88	58.42	71.46	1
7	0_7825502	Confined	12,054	1/1/2012	128.33	58.37	69.96	1
7	0_7825502	Confined	12,058	1/5/2012	119.60	58.42	61.18	1
7	0_7825502	Confined	12,063	1/10/2012	99.13	58.48	40.65	1
7	0_7825502	Confined	12,068	1/15/2012	119.62	58.54	61.08	1
7	0_7825502	Confined	12,073	1/20/2012	128.63	58.61	70.02	1
7	0_7825502	Confined	12,078	1/25/2012	130.95	58.67	72.28	1
7	0_7825502	Confined	12,083	1/30/2012	129.83	58.73	71.10	1
7	0_7825502	Confined	12,085	2/1/2012	129.45	58.75	70.70	1
7	0_7825502	Confined	12,089	2/5/2012	131.01	58.80	72.21	1
7	0_7825502	Confined	12,094	2/10/2012	130.51	58.87	71.64	1
7	0_7825502	Confined	12,099	2/15/2012	131.59	58.93	72.66	1
7	0_7825502	Confined	12,104	2/20/2012	133.31	58.99	74.32	1
7	0_7825502	Confined	12,109	2/25/2012	134.66	59.05	75.61	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	12,113	2/29/2012	138.52	59.10	79.42	1
7	0_7825502	Confined	12,114	3/1/2012	135.37	59.12	76.25	1
7	0_7825502	Confined	12,118	3/5/2012	134.27	59.17	75.10	1
7	0_7825502	Confined	12,123	3/10/2012	133.43	59.23	74.20	1
7	0_7825502	Confined	12,128	3/15/2012	133.29	59.29	74.00	1
7	0_7825502	Confined	12,133	3/20/2012	132.92	59.35	73.57	1
7	0_7825502	Confined	12,138	3/25/2012	135.26	59.41	75.85	1
7	0_7825502	Confined	12,144	3/31/2012	136.28	59.49	76.79	1
7	0_7825502	Confined	12,145	4/1/2012	135.95	59.50	76.45	1
7	0_7825502	Confined	12,149	4/5/2012	134.93	59.55	75.38	1
7	0_7825502	Confined	12,154	4/10/2012	135.79	59.61	76.18	1
7	0_7825502	Confined	12,159	4/15/2012	135.50	59.68	75.82	1
7	0_7825502	Confined	12,164	4/20/2012	126.38	59.74	66.64	1
7	0_7825502	Confined	12,169	4/25/2012	137.85	59.80	78.05	1
7	0_7825502	Confined	12,174	4/30/2012	135.79	59.86	75.93	1
7	0_7825502	Confined	12,175	5/1/2012	136.41	59.87	76.54	1
7	0_7825502	Confined	12,179	5/5/2012	135.55	59.92	75.63	1
7	0_7825502	Confined	12,184	5/10/2012	133.59	59.99	73.60	1
7	0_7825502	Confined	12,189	5/15/2012	134.26	60.05	74.21	1
7	0_7825502	Confined	12,194	5/20/2012	134.66	60.11	74.55	1
7	0_7825502	Confined	12,199	5/25/2012	135.99	60.17	75.82	1
7	0_7825502	Confined	12,204	5/30/2012	132.23	60.24	71.99	1
7	0_7825502	Confined	12,206	6/1/2012	132.36	60.26	72.10	1
7	0_7825502	Confined	12,210	6/5/2012	129.77	60.31	69.46	1
7	0_7825502	Confined	12,215	6/10/2012	129.66	60.37	69.29	1
7	0_7825502	Confined	12,220	6/15/2012	129.06	60.43	68.63	1
7	0_7825502	Confined	12,225	6/20/2012	128.32	60.50	67.82	1
7	0_7825502	Confined	12,230	6/25/2012	126.22	60.56	65.66	1
7	0_7825502	Confined	12,235	6/30/2012	124.66	60.62	64.04	1
7	0_7825502	Confined	12,236	7/1/2012	124.14	60.63	63.51	1
7	0_7825502	Confined	12,240	7/5/2012	125.18	60.68	64.50	1
7	0_7825502	Confined	12,245	7/10/2012	122.69	60.75	61.94	1
7	0_7825502	Confined	12,247	7/12/2012	122.85	60.77	62.08	1
7	0_7825502	Confined	12,255	7/20/2012	121.06	60.87	60.19	1
7	0_7825502	Confined	12,260	7/25/2012	124.78	60.93	63.85	1
7	0_7825502	Confined	12,265	7/30/2012	112.77	60.99	51.78	1
7	0_7825502	Confined	12,267	8/1/2012	122.43	61.02	61.41	1
7	0_7825502	Confined	12,271	8/5/2012	119.99	61.07	58.92	1
7	0_7825502	Confined	12,276	8/10/2012	121.97	61.13	60.84	1
7	0_7825502	Confined	12,281	8/15/2012	118.17	61.19	56.98	1
7	0_7825502	Confined	12,286	8/20/2012	117.40	61.26	56.14	1
7	0_7825502	Confined	12,291	8/25/2012	107.22	61.32	45.90	1
7	0_7825502	Confined	12,296	8/30/2012	106.05	61.38	44.67	1
7	0_7825502	Confined	12,298	9/1/2012	114.68	61.41	53.27	1
7	0_7825502	Confined	12,307	9/10/2012	110.98	61.52	49.46	1
7	0_7825502	Confined	12,309	9/12/2012	104.82	61.54	43.28	1
7	0_7825502	Confined	12,312	9/15/2012	109.44	61.58	47.86	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	12,317	9/20/2012	111.02	61.64	49.38	1
7	0_7825502	Confined	12,322	9/25/2012	110.35	61.70	48.65	1
7	0_7825502	Confined	12,327	9/30/2012	109.31	61.77	47.54	1
7	0_7825502	Confined	12,328	10/1/2012	109.24	61.78	47.46	1
7	0_7825502	Confined	12,332	10/5/2012	109.27	61.83	47.44	1
7	0_7825502	Confined	12,337	10/10/2012	101.53	61.89	39.64	1
7	0_7825502	Confined	12,342	10/15/2012	109.59	61.95	47.64	1
7	0_7825502	Confined	12,347	10/20/2012	111.50	62.02	49.48	1
7	0_7825502	Confined	12,352	10/25/2012	111.41	62.08	49.33	1
7	0_7825502	Confined	12,357	10/30/2012	108.18	62.14	46.04	1
7	0_7825502	Confined	12,359	11/1/2012	108.08	62.16	45.92	1
7	0_7825502	Confined	12,363	11/5/2012	108.35	62.21	46.14	1
7	0_7825502	Confined	12,368	11/10/2012	108.59	62.28	46.31	1
7	0_7825502	Confined	12,373	11/15/2012	100.31	62.34	37.97	1
7	0_7825502	Confined	12,378	11/20/2012	109.43	62.40	47.03	1
7	0_7825502	Confined	12,383	11/25/2012	109.09	62.46	46.63	1
7	0_7825502	Confined	12,388	11/30/2012	111.66	62.53	49.13	1
7	0_7825502	Confined	12,389	12/1/2012	109.65	62.54	47.11	1
7	0_7825502	Confined	12,393	12/5/2012	109.10	62.59	46.51	1
7	0_7825502	Confined	12,398	12/10/2012	109.34	62.65	46.69	1
7	0_7825502	Confined	12,403	12/15/2012	110.66	62.71	47.95	1
7	0_7825502	Confined	12,408	12/20/2012	110.71	62.77	47.94	1
7	0_7825502	Confined	12,413	12/25/2012	110.85	62.84	48.01	1
7	0_7825502	Confined	12,418	12/30/2012	112.37	62.90	49.47	1
7	0_7825502	Confined	12,420	1/1/2013	111.81	62.91	48.90	1
7	0_7825502	Confined	12,424	1/5/2013	112.28	62.92	49.36	1
7	0_7825502	Confined	12,429	1/10/2013	113.36	62.93	50.43	1
7	0_7825502	Confined	12,434	1/15/2013	114.70	62.94	51.76	1
7	0_7825502	Confined	12,439	1/20/2013	111.65	62.95	48.70	1
7	0_7825502	Confined	12,444	1/25/2013	113.58	62.96	50.62	1
7	0_7825502	Confined	12,449	1/30/2013	112.92	62.97	49.95	1
7	0_7825502	Confined	12,451	2/1/2013	113.12	62.97	50.15	1
7	0_7825502	Confined	12,455	2/5/2013	105.61	62.98	42.63	1
7	0_7825502	Confined	12,460	2/10/2013	113.56	62.99	50.57	1
7	0_7825502	Confined	12,465	2/15/2013	115.39	63.00	52.39	1
7	0_7825502	Confined	12,470	2/20/2013	116.24	63.01	53.23	1
7	0_7825502	Confined	12,475	2/25/2013	118.96	63.02	55.94	1
7	0_7825502	Confined	12,478	2/28/2013	106.48	63.03	43.45	1
7	0_7825502	Confined	12,479	3/1/2013	106.15	63.03	43.12	1
7	0_7825502	Confined	12,483	3/5/2013	118.14	63.04	55.10	1
7	0_7825502	Confined	12,488	3/10/2013	118.51	63.05	55.46	1
7	0_7825502	Confined	12,493	3/15/2013	118.84	63.06	55.78	1
7	0_7825502	Confined	12,498	3/20/2013	104.59	63.07	41.52	1
7	0_7825502	Confined	12,503	3/25/2013	116.28	63.08	53.20	1
7	0_7825502	Confined	12,509	3/31/2013	112.93	63.09	49.84	1
7	0_7825502	Confined	12,510	4/1/2013	112.60	63.09	49.51	1
7	0_7825502	Confined	12,514	4/5/2013	113.96	63.10	50.86	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	12,519	4/10/2013	111.06	63.11	47.95	1
7	0_7825502	Confined	12,524	4/15/2013	111.14	63.12	48.02	1
7	0_7825502	Confined	12,529	4/20/2013	111.90	63.13	48.77	1
7	0_7825502	Confined	12,534	4/25/2013	108.65	63.14	45.51	1
7	0_7825502	Confined	12,539	4/30/2013	99.88	63.15	36.73	1
7	0_7825502	Confined	12,540	5/1/2013	107.29	63.15	44.14	1
7	0_7825502	Confined	12,544	5/5/2013	106.95	63.16	43.79	1
7	0_7825502	Confined	12,549	5/10/2013	104.65	63.17	41.48	1
7	0_7825502	Confined	12,554	5/15/2013	100.20	63.18	37.02	1
7	0_7825502	Confined	12,559	5/20/2013	99.87	63.19	36.68	1
7	0_7825502	Confined	12,564	5/25/2013	100.20	63.19	37.01	1
7	0_7825502	Confined	12,569	5/30/2013	99.93	63.20	36.73	1
7	0_7825502	Confined	12,571	6/1/2013	99.88	63.21	36.67	1
7	0_7825502	Confined	12,575	6/5/2013	99.98	63.22	36.76	1
7	0_7825502	Confined	12,580	6/10/2013	100.08	63.23	36.85	1
7	0_7825502	Confined	12,585	6/15/2013	100.04	63.24	36.80	1
7	0_7825502	Confined	12,590	6/20/2013	100.11	63.25	36.86	1
7	0_7825502	Confined	12,595	6/25/2013	100.11	63.26	36.85	1
7	0_7825502	Confined	12,600	6/30/2013	99.87	63.27	36.60	1
7	0_7825502	Confined	12,601	7/1/2013	99.99	63.27	36.72	1
7	0_7825502	Confined	12,605	7/5/2013	100.07	63.28	36.79	1
7	0_7825502	Confined	12,610	7/10/2013	100.16	63.28	36.88	1
7	0_7825502	Confined	12,612	7/12/2013	99.97	63.29	36.68	1
7	0_7825502	Confined	12,620	7/20/2013	100.14	63.30	36.84	1
7	0_7825502	Confined	12,625	7/25/2013	100.01	63.31	36.70	1
7	0_7825502	Confined	12,630	7/30/2013	100.17	63.32	36.85	1
7	0_7825502	Confined	12,632	8/1/2013	100.11	63.33	36.78	1
7	0_7825502	Confined	12,636	8/5/2013	100.12	63.34	36.78	1
7	0_7825502	Confined	12,641	8/10/2013	100.06	63.35	36.71	1
7	0_7825502	Confined	12,646	8/15/2013	100.04	63.36	36.68	1
7	0_7825502	Confined	12,651	8/20/2013	100.09	63.37	36.72	1
7	0_7825502	Confined	12,656	8/25/2013	100.15	63.37	36.78	1
7	0_7825502	Confined	12,661	8/30/2013	100.17	63.38	36.79	1
7	0_7825502	Confined	12,672	9/10/2013	79.41	63.41	16.00	1
7	0_7825502	Confined	12,677	9/15/2013	79.30	63.42	15.88	1
7	0_7825502	Confined	12,682	9/20/2013	91.39	63.43	27.96	1
7	0_7825502	Confined	12,687	9/25/2013	81.55	63.44	18.11	1
7	0_7825502	Confined	12,692	9/30/2013	82.45	63.45	19.00	1
7	0_7825502	Confined	12,693	10/1/2013	82.41	63.45	18.96	1
7	0_7825502	Confined	12,697	10/5/2013	81.23	63.46	17.77	1
7	0_7825502	Confined	12,702	10/10/2013	92.76	63.46	29.30	1
7	0_7825502	Confined	12,707	10/15/2013	85.06	63.47	21.59	1
7	0_7825502	Confined	12,712	10/20/2013	85.17	63.48	21.69	1
7	0_7825502	Confined	12,717	10/25/2013	88.19	63.49	24.70	1
7	0_7825502	Confined	12,722	10/30/2013	69.20	63.50	5.70	1
7	0_7825502	Confined	12,724	11/1/2013	67.14	63.51	3.63	1
7	0_7825502	Confined	12,728	11/5/2013	69.20	63.52	5.68	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	12,733	11/10/2013	72.11	63.53	8.58	1
7	0_7825502	Confined	12,738	11/15/2013	72.12	63.54	8.58	1
7	0_7825502	Confined	12,743	11/20/2013	63.74	63.55	0.19	1
7	0_7825502	Confined	12,748	11/25/2013	72.90	63.55	9.35	1
7	0_7825502	Confined	12,753	11/30/2013	73.77	63.56	10.21	1
7	0_7825502	Confined	12,754	12/1/2013	74.38	63.57	10.81	1
7	0_7825502	Confined	12,758	12/5/2013	73.24	63.57	9.67	1
7	0_7825502	Confined	12,763	12/10/2013	73.45	63.58	9.87	1
7	0_7825502	Confined	12,768	12/15/2013	75.66	63.59	12.07	1
7	0_7825502	Confined	12,773	12/20/2013	75.72	63.60	12.12	1
7	0_7825502	Confined	12,778	12/25/2013	76.38	63.61	12.77	1
7	0_7825502	Confined	12,783	12/30/2013	77.55	63.62	13.93	1
7	0_7825502	Confined	12,785	1/1/2014	77.63	63.64	13.99	1
7	0_7825502	Confined	12,789	1/5/2014	81.39	63.68	17.71	1
7	0_7825502	Confined	12,794	1/10/2014	78.18	63.73	14.45	1
7	0_7825502	Confined	12,799	1/15/2014	79.03	63.78	15.25	1
7	0_7825502	Confined	12,804	1/20/2014	80.89	63.83	17.06	1
7	0_7825502	Confined	12,809	1/25/2014	80.71	63.88	16.83	1
7	0_7825502	Confined	12,814	1/30/2014	83.23	63.93	19.30	1
7	0_7825502	Confined	12,816	2/1/2014	82.81	63.95	18.86	1
7	0_7825502	Confined	12,820	2/5/2014	81.18	63.99	17.19	1
7	0_7825502	Confined	12,825	2/10/2014	81.31	64.04	17.27	1
7	0_7825502	Confined	12,830	2/15/2014	73.98	64.09	9.89	1
7	0_7825502	Confined	12,835	2/20/2014	80.40	64.14	16.26	1
7	0_7825502	Confined	12,840	2/25/2014	76.45	64.19	12.26	1
7	0_7825502	Confined	12,843	2/28/2014	74.50	64.22	10.28	1
7	0_7825502	Confined	12,844	3/1/2014	74.57	64.23	10.34	1
7	0_7825502	Confined	12,848	3/5/2014	72.22	64.27	7.95	1
7	0_7825502	Confined	12,853	3/10/2014	70.71	64.32	6.39	1
7	0_7825502	Confined	12,858	3/15/2014	70.37	64.37	6.00	1
7	0_7825502	Confined	12,863	3/20/2014	69.49	64.42	5.07	1
7	0_7825502	Confined	12,868	3/25/2014	70.09	64.47	5.62	1
7	0_7825502	Confined	12,874	3/31/2014	70.36	64.53	5.83	1
7	0_7825502	Confined	12,875	4/1/2014	70.76	64.54	6.22	1
7	0_7825502	Confined	12,879	4/5/2014	62.94	64.58	-1.64	1
7	0_7825502	Confined	12,884	4/10/2014	72.22	64.63	7.59	1
7	0_7825502	Confined	12,889	4/15/2014	74.08	64.68	9.40	1
7	0_7825502	Confined	12,894	4/20/2014	71.32	64.73	6.59	1
7	0_7825502	Confined	12,899	4/25/2014	70.95	64.78	6.17	1
7	0_7825502	Confined	12,904	4/30/2014	70.76	64.83	5.93	1
7	0_7825502	Confined	12,905	5/1/2014	71.18	64.84	6.34	1
7	0_7825502	Confined	12,909	5/5/2014	67.49	64.88	2.61	1
7	0_7825502	Confined	12,914	5/10/2014	67.10	64.93	2.17	1
7	0_7825502	Confined	12,919	5/15/2014	65.50	64.98	0.52	1
7	0_7825502	Confined	12,924	5/20/2014	57.59	65.03	-7.44	1
7	0_7825502	Confined	12,929	5/25/2014	63.50	65.08	-1.58	1
7	0_7825502	Confined	12,934	5/30/2014	60.67	65.13	-4.46	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	12,936	6/1/2014	61.61	65.15	-3.54	1
7	0_7825502	Confined	12,940	6/5/2014	58.72	65.19	-6.47	1
7	0_7825502	Confined	12,945	6/10/2014	54.68	65.24	-10.56	1
7	0_7825502	Confined	12,950	6/15/2014	58.21	65.29	-7.08	1
7	0_7825502	Confined	12,955	6/20/2014	55.15	65.34	-10.19	1
7	0_7825502	Confined	12,960	6/25/2014	55.04	65.39	-10.35	1
7	0_7825502	Confined	12,965	6/30/2014	52.07	65.44	-13.37	1
7	0_7825502	Confined	12,966	7/1/2014	52.33	65.45	-13.12	1
7	0_7825502	Confined	12,970	7/5/2014	52.04	65.49	-13.45	1
7	0_7825502	Confined	12,975	7/10/2014	51.07	65.54	-14.47	1
7	0_7825502	Confined	12,977	7/12/2014	49.97	65.56	-15.59	1
7	0_7825502	Confined	12,985	7/20/2014	49.96	65.64	-15.68	1
7	0_7825502	Confined	12,990	7/25/2014	50.06	65.69	-15.63	1
7	0_7825502	Confined	12,995	7/30/2014	49.94	65.74	-15.80	1
7	0_7825502	Confined	12,997	8/1/2014	49.93	65.76	-15.83	1
7	0_7825502	Confined	13,001	8/5/2014	50.05	65.80	-15.75	1
7	0_7825502	Confined	13,026	8/30/2014	39.20	66.05	-26.85	1
7	0_7825502	Confined	13,057	9/30/2014	22.00	66.37	-44.37	1
7	0_7825502	Confined	13,072	10/15/2014	21.78	66.52	-44.74	1
7	0_7825502	Confined	13,077	10/20/2014	21.39	66.57	-45.18	1
7	0_7825502	Confined	13,082	10/25/2014	20.20	66.62	-46.42	1
7	0_7825502	Confined	13,087	10/30/2014	21.20	66.67	-45.47	1
7	0_7825502	Confined	13,089	11/1/2014	21.20	66.69	-45.49	1
7	0_7825502	Confined	13,093	11/5/2014	22.20	66.73	-44.53	1
7	0_7825502	Confined	13,098	11/10/2014	22.20	66.78	-44.58	1
7	0_7825502	Confined	13,103	11/15/2014	22.20	66.83	-44.63	1
7	0_7825502	Confined	13,108	11/20/2014	23.20	66.88	-43.68	1
7	0_7825502	Confined	13,113	11/25/2014	23.20	66.93	-43.73	1
7	0_7825502	Confined	13,118	11/30/2014	23.20	66.98	-43.78	1
7	0_7825502	Confined	13,119	12/1/2014	24.20	66.99	-42.79	1
7	0_7825502	Confined	13,123	12/5/2014	25.20	67.03	-41.83	1
7	0_7825502	Confined	13,128	12/10/2014	26.10	67.08	-40.98	1
7	0_7825502	Confined	13,133	12/15/2014	26.11	67.13	-41.02	1
7	0_7825502	Confined	13,138	12/20/2014	23.36	67.18	-43.82	1
7	0_7825502	Confined	13,143	12/25/2014	24.60	67.23	-42.63	1
7	0_7825502	Confined	13,148	12/30/2014	26.53	67.28	-40.75	1
7	0_7825502	Confined	13,150	1/1/2015	23.22	67.31	-44.09	1
7	0_7825502	Confined	13,154	1/5/2015	24.66	67.42	-42.76	1
7	0_7825502	Confined	13,159	1/10/2015	25.17	67.54	-42.37	1
7	0_7825502	Confined	13,164	1/15/2015	28.14	67.67	-39.53	1
7	0_7825502	Confined	13,169	1/20/2015	25.75	67.80	-42.05	1
7	0_7825502	Confined	13,174	1/25/2015	26.69	67.92	-41.23	1
7	0_7825502	Confined	13,179	1/30/2015	28.91	68.05	-39.14	1
7	0_7825502	Confined	13,181	2/1/2015	29.01	68.10	-39.09	1
7	0_7825502	Confined	13,185	2/5/2015	29.94	68.20	-38.26	1
7	0_7825502	Confined	13,190	2/10/2015	26.52	68.33	-41.81	1
7	0_7825502	Confined	13,195	2/15/2015	32.11	68.45	-36.34	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	13,200	2/20/2015	33.85	68.58	-34.73	1
7	0_7825502	Confined	13,205	2/25/2015	35.47	68.71	-33.24	1
7	0_7825502	Confined	13,208	2/28/2015	35.80	68.78	-32.98	1
7	0_7825502	Confined	13,209	3/1/2015	35.81	68.81	-33.00	1
7	0_7825502	Confined	13,238	3/30/2015	45.47	69.54	-24.07	1
7	0_7825502	Confined	13,240	4/1/2015	44.75	69.59	-24.84	1
7	0_7825502	Confined	13,244	4/5/2015	42.89	69.69	-26.80	1
7	0_7825502	Confined	13,249	4/10/2015	44.36	69.82	-25.46	1
7	0_7825502	Confined	13,254	4/15/2015	47.59	69.94	-22.35	1
7	0_7825502	Confined	13,259	4/20/2015	46.64	70.07	-23.43	1
7	0_7825502	Confined	13,264	4/25/2015	49.16	70.20	-21.04	1
7	0_7825502	Confined	13,269	4/30/2015	49.86	70.32	-20.46	1
7	0_7825502	Confined	13,270	5/1/2015	51.27	70.35	-19.08	1
7	0_7825502	Confined	13,274	5/5/2015	53.95	70.45	-16.50	1
7	0_7825502	Confined	13,279	5/10/2015	56.36	70.58	-14.22	1
7	0_7825502	Confined	13,284	5/15/2015	57.51	70.70	-13.19	1
7	0_7825502	Confined	13,289	5/20/2015	59.41	70.83	-11.42	1
7	0_7825502	Confined	13,294	5/25/2015	60.75	70.96	-10.21	1
7	0_7825502	Confined	13,299	5/30/2015	62.02	71.08	-9.06	1
7	0_7825502	Confined	13,301	6/1/2015	61.86	71.13	-9.27	1
7	0_7825502	Confined	13,305	6/5/2015	62.22	71.23	-9.01	1
7	0_7825502	Confined	13,310	6/10/2015	63.79	71.36	-7.57	1
7	0_7825502	Confined	13,315	6/15/2015	65.46	71.49	-6.03	1
7	0_7825502	Confined	13,320	6/20/2015	66.98	71.61	-4.63	1
7	0_7825502	Confined	13,325	6/25/2015	66.31	71.74	-5.43	1
7	0_7825502	Confined	13,330	6/30/2015	68.09	71.87	-3.78	1
7	0_7825502	Confined	13,331	7/1/2015	68.02	71.89	-3.87	1
7	0_7825502	Confined	13,335	7/5/2015	68.34	71.99	-3.65	1
7	0_7825502	Confined	13,340	7/10/2015	68.35	72.12	-3.77	1
7	0_7825502	Confined	13,345	7/15/2015	68.47	72.24	-3.77	1
7	0_7825502	Confined	13,350	7/20/2015	68.64	72.37	-3.73	1
7	0_7825502	Confined	13,355	7/25/2015	68.05	72.50	-4.45	1
7	0_7825502	Confined	13,360	7/30/2015	67.01	72.62	-5.61	1
7	0_7825502	Confined	13,362	8/1/2015	66.64	72.67	-6.03	1
7	0_7825502	Confined	13,366	8/5/2015	68.64	72.78	-4.14	1
7	0_7825502	Confined	13,371	8/10/2015	64.78	72.90	-8.12	1
7	0_7825502	Confined	13,376	8/15/2015	64.08	73.03	-8.95	1
7	0_7825502	Confined	13,381	8/20/2015	62.39	73.16	-10.77	1
7	0_7825502	Confined	13,386	8/25/2015	61.75	73.28	-11.53	1
7	0_7825502	Confined	13,391	8/30/2015	57.85	73.41	-15.56	1
7	0_7825502	Confined	13,393	9/1/2015	57.65	73.46	-15.81	1
7	0_7825502	Confined	13,397	9/5/2015	54.45	73.56	-19.11	1
7	0_7825502	Confined	13,402	9/10/2015	51.31	73.69	-22.38	1
7	0_7825502	Confined	13,407	9/15/2015	52.86	73.81	-20.95	1
7	0_7825502	Confined	13,412	9/20/2015	53.33	73.94	-20.61	1
7	0_7825502	Confined	13,417	9/25/2015	50.04	74.07	-24.03	1
7	0_7825502	Confined	13,422	9/30/2015	48.95	74.19	-25.24	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	13,423	10/1/2015	48.33	74.22	-25.89	1
7	0_7825502	Confined	13,427	10/5/2015	47.50	74.32	-26.82	1
7	0_7825502	Confined	13,432	10/10/2015	47.23	74.44	-27.21	1
7	0_7825502	Confined	13,437	10/15/2015	46.94	74.57	-27.63	1
7	0_7825502	Confined	13,442	10/20/2015	47.22	74.70	-27.48	1
7	0_7825502	Confined	13,447	10/25/2015	45.63	74.82	-29.19	1
7	0_7825502	Confined	13,452	10/30/2015	44.74	74.95	-30.21	1
7	0_7825502	Confined	13,454	11/1/2015	44.17	75.00	-30.83	1
7	0_7825502	Confined	13,458	11/5/2015	43.89	75.10	-31.21	1
7	0_7825502	Confined	13,463	11/10/2015	42.44	75.23	-32.79	1
7	0_7825502	Confined	13,468	11/15/2015	41.43	75.35	-33.92	1
7	0_7825502	Confined	13,473	11/20/2015	40.16	75.48	-35.32	1
7	0_7825502	Confined	13,478	11/25/2015	37.28	75.61	-38.33	1
7	0_7825502	Confined	13,483	11/30/2015	36.76	75.73	-38.97	1
7	0_7825502	Confined	13,484	12/1/2015	36.75	75.76	-39.01	1
7	0_7825502	Confined	13,488	12/5/2015	36.47	75.86	-39.39	1
7	0_7825502	Confined	13,493	12/10/2015	36.87	75.99	-39.12	1
7	0_7825502	Confined	13,498	12/15/2015	24.90	76.11	-51.21	1
7	0_7825502	Confined	13,503	12/20/2015	33.61	76.24	-42.63	1
7	0_7825502	Confined	13,508	12/25/2015	33.67	76.37	-42.70	1
7	0_7825502	Confined	13,513	12/30/2015	30.03	76.49	-46.46	1
7	0_7825502	Confined	13,515	1/1/2016	30.66	76.53	-45.87	1
7	0_7825502	Confined	13,519	1/5/2016	28.29	76.59	-48.30	1
7	0_7825502	Confined	13,524	1/10/2016	27.79	76.66	-48.87	1
7	0_7825502	Confined	13,529	1/15/2016	28.10	76.72	-48.62	1
7	0_7825502	Confined	13,534	1/20/2016	24.59	76.79	-52.20	1
7	0_7825502	Confined	13,539	1/25/2016	24.28	76.86	-52.58	1
7	0_7825502	Confined	13,544	1/30/2016	22.95	76.93	-53.98	1
7	0_7825502	Confined	13,546	2/1/2016	23.74	76.96	-53.22	1
7	0_7825502	Confined	13,550	2/5/2016	23.58	77.01	-53.43	1
7	0_7825502	Confined	13,555	2/10/2016	-5.03	77.08	-82.11	1
7	0_7825502	Confined	13,560	2/15/2016	15.94	77.15	-61.21	1
7	0_7825502	Confined	13,565	2/20/2016	13.50	77.22	-63.72	1
7	0_7825502	Confined	13,570	2/25/2016	18.42	77.29	-58.87	1
7	0_7825502	Confined	13,574	2/29/2016	20.19	77.34	-57.15	1
7	0_7825502	Confined	13,575	3/1/2016	19.79	77.36	-57.57	1
7	0_7825502	Confined	13,579	3/5/2016	22.44	77.41	-54.97	1
7	0_7825502	Confined	13,584	3/10/2016	24.24	77.48	-53.24	1
7	0_7825502	Confined	13,589	3/15/2016	27.33	77.55	-50.22	1
7	0_7825502	Confined	13,594	3/20/2016	22.13	77.62	-55.49	1
7	0_7825502	Confined	13,599	3/25/2016	24.65	77.69	-53.04	1
7	0_7825502	Confined	13,604	3/30/2016	25.07	77.76	-52.69	1
7	0_7825502	Confined	13,606	4/1/2016	25.86	77.78	-51.92	1
7	0_7825502	Confined	13,610	4/5/2016	23.56	77.84	-54.28	1
7	0_7825502	Confined	13,615	4/10/2016	12.02	77.91	-65.89	1
7	0_7825502	Confined	13,620	4/15/2016	7.77	77.98	-70.21	1
7	0_7825502	Confined	13,625	4/20/2016	-4.98	78.05	-83.03	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	13,630	4/25/2016	-22.21	78.11	-100.32	1
7	0_7825502	Confined	13,635	4/30/2016	-33.57	78.18	-111.75	1
7	0_7825502	Confined	13,636	5/1/2016	80.20	78.20	2.00	1
7	0_7825502	Confined	13,640	5/5/2016	79.70	78.25	1.45	1
7	0_7825502	Confined	13,645	5/10/2016	79.20	78.32	0.88	1
7	0_7825502	Confined	13,650	5/15/2016	77.70	78.39	-0.69	1
7	0_7825502	Confined	13,655	5/20/2016	79.20	78.46	0.74	1
7	0_7825502	Confined	13,660	5/25/2016	78.60	78.53	0.07	1
7	0_7825502	Confined	13,665	5/30/2016	82.37	78.60	3.77	1
7	0_7825502	Confined	13,667	6/1/2016	82.79	78.62	4.17	1
7	0_7825502	Confined	13,671	6/5/2016	84.00	78.68	5.32	1
7	0_7825502	Confined	13,676	6/10/2016	84.59	78.75	5.84	1
7	0_7825502	Confined	13,681	6/15/2016	81.26	78.82	2.44	1
7	0_7825502	Confined	13,686	6/20/2016	86.70	78.88	7.82	1
7	0_7825502	Confined	13,691	6/25/2016	87.26	78.95	8.31	1
7	0_7825502	Confined	13,696	6/30/2016	86.63	79.02	7.61	1
7	0_7825502	Confined	13,697	7/1/2016	86.91	79.04	7.87	1
7	0_7825502	Confined	13,701	7/5/2016	87.03	79.09	7.94	1
7	0_7825502	Confined	13,706	7/10/2016	85.77	79.16	6.61	1
7	0_7825502	Confined	13,711	7/15/2016	83.41	79.23	4.18	1
7	0_7825502	Confined	13,716	7/20/2016	83.61	79.30	4.31	1
7	0_7825502	Confined	13,721	7/25/2016	82.44	79.37	3.07	1
7	0_7825502	Confined	13,728	8/1/2016	76.60	79.46	-2.86	1
7	0_7825502	Confined	13,732	8/5/2016	82.10	79.52	2.58	1
7	0_7825502	Confined	13,737	8/10/2016	82.30	79.59	2.71	1
7	0_7825502	Confined	13,742	8/15/2016	80.22	79.66	0.56	1
7	0_7825502	Confined	13,747	8/20/2016	80.62	79.72	0.90	1
7	0_7825502	Confined	13,752	8/25/2016	81.11	79.79	1.32	1
7	0_7825502	Confined	13,757	8/30/2016	81.22	79.86	1.36	1
7	0_7825502	Confined	13,759	9/1/2016	81.72	79.89	1.83	1
7	0_7825502	Confined	13,763	9/5/2016	81.00	79.94	1.06	1
7	0_7825502	Confined	13,768	9/10/2016	80.65	80.01	0.64	1
7	0_7825502	Confined	13,773	9/15/2016	76.60	80.08	-3.48	1
7	0_7825502	Confined	13,778	9/20/2016	75.24	80.15	-4.91	1
7	0_7825502	Confined	13,783	9/25/2016	72.74	80.22	-7.48	1
7	0_7825502	Confined	13,788	9/30/2016	72.19	80.29	-8.10	1
7	0_7825502	Confined	13,789	10/1/2016	72.71	80.30	-7.59	1
7	0_7825502	Confined	13,793	10/5/2016	73.04	80.36	-7.32	1
7	0_7825502	Confined	13,798	10/10/2016	74.96	80.43	-5.47	1
7	0_7825502	Confined	13,803	10/15/2016	74.34	80.50	-6.16	1
7	0_7825502	Confined	13,808	10/20/2016	73.69	80.56	-6.87	1
7	0_7825502	Confined	13,813	10/25/2016	73.22	80.63	-7.41	1
7	0_7825502	Confined	13,818	10/30/2016	70.82	80.70	-9.88	1
7	0_7825502	Confined	13,820	11/1/2016	70.25	80.73	-10.48	1
7	0_7825502	Confined	13,824	11/5/2016	70.37	80.78	-10.41	1
7	0_7825502	Confined	13,829	11/10/2016	79.29	80.85	-1.56	1
7	0_7825502	Confined	13,834	11/15/2016	68.68	80.92	-12.24	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	13,839	11/20/2016	70.75	80.99	-10.24	1
7	0_7825502	Confined	13,844	11/25/2016	72.11	81.06	-8.95	1
7	0_7825502	Confined	13,849	11/30/2016	75.00	81.13	-6.13	1
7	0_7825502	Confined	13,850	12/1/2016	74.14	81.14	-7.00	1
7	0_7825502	Confined	13,854	12/5/2016	75.41	81.20	-5.79	1
7	0_7825502	Confined	13,859	12/10/2016	77.29	81.27	-3.98	1
7	0_7825502	Confined	13,864	12/15/2016	79.29	81.33	-2.04	1
7	0_7825502	Confined	13,869	12/20/2016	81.40	81.40	0.00	1
7	0_7825502	Confined	13,874	12/25/2016	83.84	81.47	2.37	1
7	0_7825502	Confined	13,879	12/30/2016	86.21	81.54	4.67	1
7	0_7825502	Confined	13,881	1/1/2017	85.49	81.56	3.93	1
7	0_7825502	Confined	13,885	1/5/2017	85.86	81.60	4.26	1
7	0_7825502	Confined	13,890	1/10/2017	88.06	81.64	6.42	1
7	0_7825502	Confined	13,895	1/15/2017	89.35	81.69	7.66	1
7	0_7825502	Confined	13,900	1/20/2017	88.50	81.74	6.76	1
7	0_7825502	Confined	13,905	1/25/2017	89.70	81.78	7.92	1
7	0_7825502	Confined	13,910	1/30/2017	91.01	81.83	9.18	1
7	0_7825502	Confined	13,912	2/1/2017	90.73	81.84	8.89	1
7	0_7825502	Confined	13,916	2/5/2017	91.01	81.88	9.13	1
7	0_7825502	Confined	13,921	2/10/2017	91.76	81.92	9.84	1
7	0_7825502	Confined	13,926	2/15/2017	92.48	81.97	10.51	1
7	0_7825502	Confined	13,931	2/20/2017	92.89	82.01	10.88	1
7	0_7825502	Confined	13,936	2/25/2017	92.03	82.06	9.97	1
7	0_7825502	Confined	13,939	2/28/2017	92.73	82.09	10.64	1
7	0_7825502	Confined	13,940	3/1/2017	92.82	82.10	10.72	1
7	0_7825502	Confined	13,944	3/5/2017	93.57	82.13	11.44	1
7	0_7825502	Confined	13,949	3/10/2017	91.06	82.18	8.88	1
7	0_7825502	Confined	13,954	3/15/2017	92.73	82.22	10.51	1
7	0_7825502	Confined	13,959	3/20/2017	94.51	82.27	12.24	1
7	0_7825502	Confined	13,964	3/25/2017	95.60	82.31	13.29	1
7	0_7825502	Confined	13,969	3/30/2017	97.37	82.36	15.01	1
7	0_7825502	Confined	13,971	4/1/2017	97.21	82.38	14.83	1
7	0_7825502	Confined	13,975	4/5/2017	95.99	82.41	13.58	1
7	0_7825502	Confined	13,980	4/10/2017	97.16	82.46	14.70	1
7	0_7825502	Confined	13,985	4/15/2017	97.34	82.50	14.84	1
7	0_7825502	Confined	13,990	4/20/2017	92.71	82.55	10.16	1
7	0_7825502	Confined	13,995	4/25/2017	97.46	82.59	14.87	1
7	0_7825502	Confined	14,000	4/30/2017	101.27	82.64	18.63	1
7	0_7825502	Confined	14,001	5/1/2017	100.74	82.65	18.09	1
7	0_7825502	Confined	14,005	5/5/2017	97.91	82.68	15.23	1
7	0_7825502	Confined	14,010	5/10/2017	95.65	82.73	12.92	1
7	0_7825502	Confined	14,015	5/15/2017	90.61	82.77	7.84	1
7	0_7825502	Confined	14,020	5/20/2017	87.11	82.82	4.29	1
7	0_7825502	Confined	14,025	5/25/2017	85.19	82.86	2.33	1
7	0_7825502	Confined	14,030	5/30/2017	84.92	82.91	2.01	1
7	0_7825502	Confined	14,032	6/1/2017	83.78	82.93	0.85	1
7	0_7825502	Confined	14,036	6/5/2017	83.02	82.96	0.06	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_7825502	Confined	14,041	6/10/2017	81.46	83.01	-1.55	1
7	0_7825502	Confined	14,046	6/15/2017	77.82	83.05	-5.23	1
7	0_7825502	Confined	14,051	6/20/2017	73.01	83.10	-10.09	1
7	0_7825502	Confined	14,056	6/25/2017	66.05	83.14	-17.09	1
7	0_7825502	Confined	14,061	6/30/2017	62.09	83.19	-21.10	1
7	0_7825502	Confined	14,062	7/1/2017	60.72	83.20	-22.48	1
7	0_7825502	Confined	14,066	7/5/2017	55.86	83.23	-27.37	1
7	0_7825502	Confined	14,071	7/10/2017	50.86	83.28	-32.42	1
7	0_7825502	Confined	14,076	7/15/2017	44.84	83.32	-38.48	1
7	0_7825502	Confined	14,081	7/20/2017	37.47	83.37	-45.90	1
7	0_7825502	Confined	14,086	7/25/2017	29.95	83.41	-53.46	1
7	0_7825502	Confined	14,102	8/10/2017	58.30	83.56	-25.26	1
7	0_7825502	Confined	14,107	8/15/2017	65.50	83.60	-18.10	1
7	0_7825502	Confined	14,117	8/25/2017	57.80	83.69	-25.89	1
7	0_7825502	Confined	14,128	9/5/2017	59.09	83.79	-24.70	1
7	0_7825502	Confined	14,133	9/10/2017	59.09	83.84	-24.75	1
7	0_7825502	Confined	14,138	9/15/2017	59.97	83.88	-23.91	1
7	0_7825502	Confined	14,143	9/20/2017	57.89	83.93	-26.04	1
7	0_7825502	Confined	14,148	9/25/2017	56.55	83.97	-27.42	1
7	0_7825502	Confined	14,153	9/30/2017	58.50	84.02	-25.52	1
7	0_7825502	Confined	14,158	10/5/2017	57.40	84.06	-26.66	1
7	0_7825502	Confined	14,163	10/10/2017	57.30	84.11	-26.81	1
7	0_7825502	Confined	14,168	10/15/2017	57.20	84.15	-26.95	1
7	0_7825502	Confined	14,173	10/20/2017	57.30	84.20	-26.90	1
7	0_7825502	Confined	14,178	10/25/2017	57.20	84.24	-27.04	1
7	0_7825502	Confined	14,183	10/30/2017	73.93	84.29	-10.36	1
7	0_7825502	Confined	14,185	11/1/2017	75.35	84.30	-8.95	1
7	0_7825502	Confined	14,189	11/5/2017	74.66	84.34	-9.68	1
7	0_7825502	Confined	14,194	11/10/2017	62.37	84.39	-22.02	1
7	0_7825502	Confined	14,199	11/15/2017	62.77	84.43	-21.66	1
7	0_7825502	Confined	14,204	11/20/2017	62.64	84.48	-21.84	1
7	0_7825502	Confined	14,209	11/25/2017	62.03	84.52	-22.49	1
7	0_7825502	Confined	14,214	11/30/2017	57.86	84.57	-26.71	1
7	0_7825502	Confined	14,215	12/1/2017	58.02	84.57	-26.55	1
7	0_7825502	Confined	14,219	12/5/2017	59.04	84.61	-25.57	1
7	0_7825502	Confined	14,224	12/10/2017	60.10	84.66	-24.56	1
7	0_7825502	Confined	14,229	12/15/2017	60.87	84.70	-23.83	1
7	0_7825502	Confined	14,234	12/20/2017	60.88	84.75	-23.87	1
7	0_7825502	Confined	14,239	12/25/2017	61.95	84.79	-22.84	1
7	0_7825803	Confined	779	2/17/1981	261.70	281.84	-20.14	1
7	0_7827303	Confined	778	2/16/1981	317.59	272.68	22.46	0.5
7	0_7841301	Confined	779	2/17/1981	279.28	283.12	-3.84	1
7	0_7841301	Confined	1,143	2/16/1982	279.37	283.63	-4.26	1
7	0_7841301	Confined	1,871	2/14/1984	273.80	286.37	-12.57	1
7	0_7841301	Confined	2,237	2/14/1985	257.13	285.63	-28.50	1
7	0_8501301	Confined	1,494	2/2/1983	515.71	441.73	36.99	0.5
7	0_8501301	Confined	1,874	2/17/1984	502.01	441.57	30.22	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	0_8501301	Confined	2,244	2/21/1985	504.76	441.56	31.60	0.5
7	0_8501301	Confined	2,614	2/26/1986	495.56	441.60	26.98	0.5
7	0_8503905	Confined	6,967	1/27/1998	431.95	398.19	16.88	0.5
7	0_8504401	Confined	1,138	2/11/1982	438.40	402.92	17.74	0.5
7	0_8504401	Confined	2,614	2/26/1986	423.63	402.62	10.51	0.5
7	0_8504401	Confined	2,955	2/2/1987	428.00	402.72	12.64	0.5
7	0_8504401	Confined	3,707	2/23/1989	425.71	403.15	11.28	0.5
7	0_8504401	Confined	4,793	2/14/1992	420.03	402.69	8.67	0.5
7	0_8504401	Confined	5,203	3/30/1993	425.20	402.21	11.49	0.5
7	0_8504401	Confined	5,491	1/12/1994	421.40	401.93	9.74	0.5
7	0_8504401	Confined	5,812	11/29/1994	421.93	401.61	10.16	0.5
7	0_8504401	Confined	6,241	2/1/1996	409.90	401.00	4.45	0.5
7	0_8504401	Confined	6,619	2/13/1997	419.50	400.25	9.63	0.5
7	0_8504401	Confined	6,982	2/11/1998	411.92	399.48	6.22	0.5
7	0_8504401	Confined	7,724	2/23/2000	410.00	397.40	6.30	0.5
7	0_8504401	Confined	8,440	2/8/2002	402.26	395.12	3.57	0.5
7	0_8504401	Confined	8,809	2/12/2003	400.62	393.77	3.42	0.5
7	0_8504401	Confined	9,164	2/2/2004	398.20	392.34	2.93	0.5
7	0_8504401	Confined	9,537	2/9/2005	397.10	390.72	3.19	0.5
7	0_8504401	Confined	13,071	10/14/2014	340.55	368.38	-13.92	0.5
7	0_8511302	Confined	1,139	2/12/1982	448.59	400.66	47.93	1
7	10206_0	Confined	10,030	6/17/2006	255.60	154.62	100.98	1
7	10207_0	Confined	11,306	12/14/2009	212.66	118.55	94.11	1
7	11644_0	Confined	11,762	3/15/2011	233.69	226.79	6.90	1
7	11666_7836204	Confined	3,049	5/7/1987	274.23	269.90	4.33	1
7	11817_0	Confined	8,258	8/10/2001	269.03	285.58	-16.55	1
7	11819_0	Confined	11,714	1/26/2011	249.96	237.74	12.22	1
7	11821_0	Confined	11,164	7/25/2009	308.31	272.81	35.50	1
7	11824_7804509	Confined	10,423	7/15/2007	331.76	318.93	12.83	1
7	11826_7803311	Confined	10,073	7/30/2006	305.03	312.32	-7.29	1
7	11830_0	Confined	11,663	12/6/2010	258.72	259.15	-0.43	1
7	11831_0	Confined	11,524	7/20/2010	246.26	247.40	-1.14	1
7	11832_0	Confined	11,639	11/12/2010	132.23	221.15	-88.92	1
7	11833_0	Confined	8,991	8/13/2003	258.10	267.92	-9.82	1
7	11834_0	Confined	8,279	8/31/2001	253.82	271.87	-18.05	1
7	11835_0	Confined	11,869	6/30/2011	209.77	242.61	-32.84	1
7	11836_0	Confined	11,862	6/23/2011	221.02	244.77	-23.75	1
7	11837_0	Confined	11,643	11/16/2010	225.96	257.08	-31.12	1
7	11838_0	Confined	11,677	12/20/2010	248.60	259.74	-11.14	1
7	11840_0	Confined	11,062	4/14/2009	268.07	271.52	-3.45	1
7	11841_0	Confined	11,331	1/8/2010	310.41	291.09	19.32	1
7	11845_0	Confined	11,343	1/20/2010	278.82	260.24	18.58	1
7	11846_0	Confined	11,547	8/12/2010	265.01	258.52	6.49	1
7	11847_0	Confined	11,646	11/19/2010	220.95	226.21	-5.26	1
7	11848_0	Confined	11,499	6/25/2010	248.40	226.90	21.50	1
7	11850_0	Confined	11,669	12/12/2010	138.70	218.47	-79.77	1
7	11851_0	Confined	11,677	12/20/2010	110.34	218.18	-107.84	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	11852_0	Confined	11,540	8/5/2010	233.64	218.21	15.43	1
7	11853_0	Confined	11,712	1/24/2011	27.53	191.99	-164.46	1
7	11855_0	Confined	11,209	9/8/2009	187.41	205.75	-18.34	1
7	11856_0	Confined	11,659	12/2/2010	202.92	196.90	6.02	1
7	11857_0	Confined	11,848	6/9/2011	203.02	183.52	19.50	1
7	11858_0	Confined	11,176	8/6/2009	229.39	198.64	30.75	1
7	11860_0	Confined	11,819	5/11/2011	261.67	206.26	55.41	1
7	11861_0	Confined	11,643	11/16/2010	231.24	205.63	25.61	1
7	11862_0	Confined	11,345	1/22/2010	233.04	213.39	19.65	1
7	11863_0	Confined	11,506	7/2/2010	209.55	210.10	-0.55	1
7	11865_0	Confined	11,469	5/26/2010	206.82	211.56	-4.74	1
7	11866_0	Confined	11,314	12/22/2009	227.93	215.19	12.74	1
7	11867_0	Confined	11,831	5/23/2011	183.50	205.68	-22.18	1
7	11868_0	Confined	11,618	10/22/2010	229.41	211.33	18.08	1
7	11869_0	Confined	11,448	5/5/2010	241.88	217.01	24.87	1
7	11870_0	Confined	11,824	5/16/2011	210.28	212.90	-2.62	1
7	11871_0	Confined	11,715	1/27/2011	215.19	216.50	-1.31	1
7	11872_0	Confined	11,848	6/9/2011	207.61	214.27	-6.66	1
7	13227_0	Confined	11,519	7/15/2010	255.44	223.22	32.22	1
7	13228_0	Confined	11,397	3/15/2010	225.30	243.31	-18.01	1
7	13229_0	Confined	11,670	12/13/2010	242.16	224.76	17.40	1
7	13230_0	Confined	10,179	11/13/2006	222.10	231.95	-9.85	1
7	13231_0	Confined	11,804	4/26/2011	214.19	154.00	60.19	1
7	13232_0	Confined	11,639	11/12/2010	196.26	84.58	111.68	1
7	13233_0	Confined	11,533	7/29/2010	282.06	103.99	178.07	1
7	13234_0	Confined	10,169	11/3/2006	235.59	157.93	77.66	1
7	13235_0	Confined	11,078	4/30/2009	225.43	138.36	8.71	0.1
7	13236_0	Confined	11,160	7/21/2009	217.09	128.55	88.54	1
7	13237_7811218	Confined	4,209	7/10/1990	306.89	327.80	-20.91	1
7	13244_7804820	Confined	6,078	8/22/1995	310.56	313.41	-1.42	0.5
7	13246_7804313	Confined	8,390	12/20/2001	315.44	318.87	-3.43	1
7	13247_7804612	Confined	4,520	5/17/1991	332.60	329.35	3.25	1
7	13247_7804612	Confined	5,490	1/11/1994	331.95	332.14	-0.19	1
7	13247_7804612	Confined	5,535	2/25/1994	342.00	332.01	9.99	1
7	13247_7804612	Confined	7,316	1/11/1999	336.35	324.16	12.19	1
7	13247_7804612	Confined	7,682	1/12/2000	329.20	321.28	7.92	1
7	13247_7804612	Confined	8,045	1/9/2001	330.10	312.37	17.73	1
7	13247_7804612	Confined	8,415	1/14/2002	318.40	314.37	4.03	1
7	13247_7804612	Confined	8,772	1/6/2003	323.00	309.13	13.87	1
7	13247_7804612	Confined	9,138	1/7/2004	324.80	310.29	14.51	1
7	13247_7804612	Confined	9,517	1/20/2005	324.40	313.43	10.97	1
7	13247_7804612	Confined	9,865	1/3/2006	321.80	311.73	10.07	1
7	13247_7804612	Confined	10,263	2/5/2007	320.00	315.77	4.23	1
7	13247_7804612	Confined	10,601	1/9/2008	322.80	325.21	-2.41	1
7	13247_7804612	Confined	10,992	2/3/2009	321.40	317.26	4.14	1
7	13247_7804612	Confined	11,359	2/5/2010	323.40	303.53	19.87	1
7	13255_7805212	Confined	5,493	1/14/1994	352.51	345.58	6.93	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	13255_7805212	Confined	6,229	1/20/1996	332.41	343.99	-11.58	1
7	13255_7805212	Confined	7,316	1/11/1999	329.91	343.03	-13.12	1
7	13255_7805212	Confined	8,051	1/15/2001	326.01	337.47	-11.46	1
7	13255_7805212	Confined	8,417	1/16/2002	323.91	338.79	-14.88	1
7	13255_7805212	Confined	8,775	1/9/2003	325.11	337.18	-12.07	1
7	13255_7805212	Confined	9,139	1/8/2004	324.31	337.80	-13.49	1
7	13255_7805212	Confined	9,517	1/20/2005	324.51	339.37	-14.86	1
7	13255_7805212	Confined	9,865	1/3/2006	322.11	338.15	-16.04	1
7	13255_7805212	Confined	10,263	2/5/2007	320.21	340.13	-19.92	1
7	13255_7805212	Confined	10,601	1/9/2008	320.81	345.39	-24.58	1
7	13255_7805212	Confined	10,992	2/3/2009	320.31	340.89	-20.58	1
7	13255_7805212	Confined	11,359	2/5/2010	321.31	335.04	-13.73	1
7	13256_6861909	Confined	10,731	5/18/2008	345.42	350.89	-5.47	1
7	13260_7804312	Confined	6,448	8/26/1996	272.03	320.84	-48.81	1
7	13263_7805124	Confined	6,788	8/1/1997	325.29	318.60	6.69	1
7	13263_7805124	Confined	7,457	6/1/1999	333.46	315.99	17.47	1
7	13287_7815805	Confined	1,151	2/24/1982	261.00	259.89	1.11	1
7	13287_7815805	Confined	1,878	2/21/1984	252.50	264.16	-11.66	1
7	13287_7815805	Confined	2,998	3/17/1987	266.87	264.85	2.02	1
7	13287_7815805	Confined	3,337	2/19/1988	256.89	267.48	-10.59	1
7	13287_7815805	Confined	4,089	3/12/1990	253.37	264.55	-11.18	1
7	13287_7815805	Confined	4,404	1/21/1991	275.77	263.80	11.97	1
7	13287_7815805	Confined	5,125	1/11/1993	262.52	264.28	-1.76	1
7	13287_7815805	Confined	7,676	1/6/2000	256.17	260.22	-4.05	1
7	13287_7815805	Confined	8,060	1/24/2001	242.17	258.04	-15.87	1
7	13287_7815805	Confined	8,417	1/16/2002	243.87	259.42	-15.55	1
7	13287_7815805	Confined	8,782	1/16/2003	244.57	257.72	-13.15	1
7	13287_7815805	Confined	9,150	1/19/2004	245.87	258.56	-12.69	1
7	13287_7815805	Confined	9,516	1/19/2005	246.87	260.25	-13.38	1
7	13287_7815805	Confined	9,881	1/19/2006	245.57	261.13	-15.56	1
7	13287_7815805	Confined	10,238	1/11/2007	250.07	263.32	-13.25	1
7	13287_7815805	Confined	10,602	1/10/2008	247.07	266.63	-19.56	1
7	13287_7815805	Confined	11,000	2/11/2009	246.17	265.12	-18.95	1
7	13287_7815805	Confined	11,454	5/11/2010	227.27	257.41	-30.14	1
7	13287_7815805	Confined	12,090	2/6/2012	201.57	246.56	-44.99	1
7	13287_7815805	Confined	12,149	4/5/2012	203.07	247.89	-44.82	1
7	13287_7815805	Confined	12,176	5/2/2012	202.47	248.51	-46.04	1
7	13287_7815805	Confined	12,209	6/4/2012	177.37	249.25	-71.88	1
7	13287_7815805	Confined	12,236	7/1/2012	201.97	249.86	-47.89	1
7	13287_7815805	Confined	12,267	8/1/2012	199.57	250.56	-50.99	1
7	13287_7815805	Confined	12,298	9/1/2012	196.57	251.27	-54.70	1
7	13287_7815805	Confined	12,328	10/1/2012	189.07	251.94	-62.87	1
7	13287_7815805	Confined	12,359	11/1/2012	192.27	252.65	-60.38	1
7	13287_7815805	Confined	12,389	12/1/2012	200.47	253.32	-52.85	1
7	13287_7815805	Confined	12,425	1/6/2013	186.77	254.04	-67.27	1
7	13287_7815805	Confined	12,456	2/6/2013	192.97	254.24	-61.27	1
7	13287_7815805	Confined	12,479	3/1/2013	186.67	254.38	-67.71	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	13287_7815805	Confined	12,541	5/2/2013	188.37	254.78	-66.41	1
7	13287_7815805	Confined	12,574	6/4/2013	188.27	254.99	-66.72	1
7	13287_7815805	Confined	12,601	7/1/2013	191.87	255.16	-63.29	1
7	13287_7815805	Confined	12,632	8/1/2013	195.07	255.35	-60.28	1
7	13287_7815805	Confined	12,663	9/1/2013	201.77	255.55	-53.78	1
7	13287_7815805	Confined	12,693	10/1/2013	195.37	255.74	-60.37	1
7	13287_7815805	Confined	12,724	11/1/2013	187.17	255.94	-68.77	1
7	13287_7815805	Confined	12,754	12/1/2013	181.07	256.13	-75.06	1
7	13287_7815805	Confined	13,516	1/2/2016	186.27	260.35	-74.08	1
7	13287_7815805	Confined	13,547	2/2/2016	185.57	260.47	-74.90	1
7	13287_7815805	Confined	13,668	6/2/2016	203.37	260.96	-57.59	1
7	13287_7815805	Confined	13,760	9/2/2016	210.17	261.34	-51.17	1
7	13287_7815805	Confined	13,790	10/2/2016	206.27	261.46	-55.19	1
7	13287_7815805	Confined	13,821	11/2/2016	210.07	261.59	-51.52	1
7	13290_7813705	Confined	6,135	10/18/1995	286.54	281.11	5.43	1
7	13294_7828501	Confined	778	2/16/1981	310.12	272.22	37.90	1
7	13294_7828501	Confined	1,502	2/10/1983	293.85	273.37	20.48	1
7	13294_7828501	Confined	1,877	2/20/1984	293.16	272.30	20.86	1
7	13294_7828501	Confined	2,228	2/5/1985	272.56	271.50	1.06	1
7	13294_7828501	Confined	2,593	2/5/1986	281.55	273.07	8.48	1
7	13294_7828501	Confined	2,956	2/3/1987	285.03	272.56	12.47	1
7	13294_7828501	Confined	3,364	3/17/1988	291.42	272.98	18.44	1
7	13294_7828501	Confined	3,700	2/16/1989	276.20	272.30	3.90	1
7	13294_7828501	Confined	4,072	2/23/1990	265.23	270.84	-5.61	1
7	13294_7828501	Confined	4,426	2/12/1991	268.49	269.48	-0.99	1
7	13294_7828501	Confined	4,789	2/10/1992	271.40	266.96	4.44	1
7	13294_7828501	Confined	5,063	11/10/1992	277.16	265.91	11.25	1
7	13294_7828501	Confined	5,434	11/16/1993	278.92	263.48	15.44	1
7	13294_7828501	Confined	5,869	1/25/1995	278.15	260.55	17.60	1
7	13294_7828501	Confined	6,231	1/22/1996	268.35	257.96	10.39	1
7	13294_7828501	Confined	6,625	2/19/1997	252.25	254.86	-2.61	1
7	13294_7828501	Confined	6,983	2/12/1998	257.07	252.35	4.72	1
7	13294_7828501	Confined	8,075	2/8/2001	242.85	251.31	-8.46	1
7	13294_7828501	Confined	8,443	2/11/2002	241.37	250.73	-9.36	1
7	13294_7828501	Confined	8,821	2/24/2003	242.44	248.09	-5.65	1
7	13294_7828501	Confined	9,594	4/7/2005	264.00	244.05	19.95	1
7	13294_7828501	Confined	13,448	10/26/2015	122.15	210.92	-88.77	1
7	13298_7834205	Confined	6,347	5/17/1996	255.92	246.77	9.15	1
7	13301_7836205	Confined	6,554	12/10/1996	251.95	251.67	0.28	1
7	13426_7814802	Confined	3,365	3/18/1988	304.39	274.22	30.17	1
7	13426_7814802	Confined	4,077	2/28/1990	283.42	270.96	12.46	1
7	13426_7814802	Confined	5,479	12/31/1993	256.29	269.65	-13.36	1
7	13426_7814802	Confined	6,661	3/27/1997	253.39	268.03	-14.64	1
7	13426_7814802	Confined	6,952	1/12/1998	287.12	268.94	18.18	1
7	13426_7814802	Confined	7,313	1/8/1999	281.11	266.52	14.59	1
7	13426_7814802	Confined	7,676	1/6/2000	286.89	267.22	19.67	1
7	13426_7814802	Confined	8,060	1/24/2001	275.34	265.70	9.64	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	13426_7814802	Confined	8,419	1/18/2002	269.56	267.25	2.31	1
7	13426_7814802	Confined	8,782	1/16/2003	275.34	265.73	9.61	1
7	13426_7814802	Confined	9,150	1/19/2004	272.99	266.56	6.43	1
7	13426_7814802	Confined	9,538	2/10/2005	275.34	268.20	7.14	1
7	13426_7814802	Confined	9,885	1/23/2006	274.18	268.93	5.25	1
7	13426_7814802	Confined	10,266	2/8/2007	269.56	271.15	-1.59	1
7	13426_7814802	Confined	10,600	1/8/2008	271.87	274.01	-2.14	1
7	13426_7814802	Confined	11,000	2/11/2009	272.99	272.30	0.69	1
7	13426_7814802	Confined	11,344	1/21/2010	272.99	267.53	5.46	1
7	13452_7818601	Confined	1,874	2/17/1984	322.40	281.71	40.69	1
7	14368_0	Confined	8,162	5/6/2001	395.85	394.42	1.43	1
7	14369_0	Confined	9,121	12/21/2003	386.03	393.19	-7.16	1
7	14376_0	Confined	10,694	4/11/2008	392.11	391.11	1.00	1
7	14470_0	Confined	11,001	2/12/2009	418.81	389.09	29.72	1
7	14471_0	Confined	11,637	11/10/2010	377.95	389.98	-12.03	1
7	15302_6743903	Confined	8,046	1/10/2001	332.70	341.92	-9.22	1
7	15302_6743903	Confined	8,095	2/28/2001	337.40	341.97	-4.57	1
7	15302_6743903	Confined	8,101	3/6/2001	338.50	341.97	-3.47	1
7	15302_6743903	Confined	8,263	8/15/2001	329.30	342.14	-12.84	1
7	15302_6743903	Confined	8,266	8/18/2001	326.27	342.14	-15.87	1
7	15302_6743903	Confined	8,451	2/19/2002	288.10	342.23	-54.13	1
7	15302_6743903	Confined	8,531	5/10/2002	303.10	342.17	-39.07	1
7	15302_6743903	Confined	8,633	8/20/2002	330.31	342.08	-11.77	1
7	15302_6743903	Confined	8,928	6/11/2003	303.10	342.18	-39.08	1
7	15302_6743903	Confined	9,398	9/23/2004	332.05	343.14	-11.09	1
7	15302_6743903	Confined	9,749	9/9/2005	303.10	343.34	-40.24	1
7	15321_6721903	Confined	780	2/18/1981	367.76	365.09	2.67	1
7	15321_6721903	Confined	1,194	4/8/1982	368.05	365.82	2.23	1
7	15321_6721903	Confined	1,510	2/18/1983	367.34	365.45	1.89	1
7	15321_6721903	Confined	1,866	2/9/1984	319.23	364.94	-45.71	1
7	15321_6721903	Confined	2,230	2/7/1985	319.82	364.45	-44.63	1
7	15321_6721903	Confined	2,614	2/26/1986	324.27	365.23	-40.96	1
7	15321_6721903	Confined	2,892	12/1/1986	323.35	365.73	-42.38	1
7	15321_6721903	Confined	3,125	7/22/1987	325.47	366.05	-40.58	1
7	15321_6721903	Confined	3,333	2/15/1988	326.27	366.04	-39.77	1
7	15321_6721903	Confined	3,701	2/17/1989	328.96	364.38	-35.42	1
7	15321_6721903	Confined	4,076	2/27/1990	330.69	363.41	-32.72	1
7	15321_6721903	Confined	11,223	9/22/2009	347.83	365.84	-18.01	1
7	15321_6721903	Confined	11,330	1/7/2010	347.73	365.52	-17.79	1
7	15321_6721903	Confined	11,490	6/16/2010	347.61	365.18	-17.57	1
7	15321_6721903	Confined	11,581	9/15/2010	347.60	364.99	-17.39	1
7	15769_6861413	Confined	1,317	8/9/1982	295.76	366.60	-70.84	1
7	15773_7803601	Confined	772	2/10/1981	373.45	285.10	88.35	1
7	15773_7803601	Confined	1,153	2/26/1982	372.24	300.96	71.28	1
7	15773_7803601	Confined	1,501	2/9/1983	371.31	310.16	61.15	1
7	15773_7803601	Confined	1,879	2/22/1984	362.52	321.95	40.57	1
7	15773_7803601	Confined	2,230	2/7/1985	361.09	329.80	31.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15773_7803601	Confined	2,599	2/11/1986	371.79	339.08	32.71	1
7	15773_7803601	Confined	2,999	3/18/1987	376.10	341.38	34.72	1
7	15773_7803601	Confined	3,336	2/18/1988	369.79	350.03	19.76	1
7	15773_7803601	Confined	3,706	2/22/1989	349.94	346.53	3.41	1
7	15773_7803601	Confined	4,075	2/26/1990	333.77	337.41	-3.64	1
7	15773_7803601	Confined	4,411	1/28/1991	344.30	335.86	8.44	1
7	15776_6729603	Confined	4,139	5/1/1990	341.03	328.58	12.45	1
7	15776_6729603	Confined	4,771	1/23/1992	347.03	328.39	18.64	1
7	15776_6729603	Confined	5,164	2/19/1993	347.23	329.31	17.92	1
7	15776_6729603	Confined	5,528	2/18/1994	345.74	330.07	15.67	1
7	15776_6729603	Confined	6,260	2/20/1996	345.18	329.36	15.82	1
7	15776_6729603	Confined	6,626	2/20/1997	343.03	328.00	15.03	1
7	15776_6729603	Confined	6,976	2/5/1998	348.29	328.26	20.03	1
7	15776_6729603	Confined	7,925	9/11/2000	341.13	326.81	14.32	1
7	15791_6858506	Confined	1,873	2/16/1984	434.01	448.44	-14.43	1
7	15791_6858506	Confined	2,600	2/12/1986	437.18	455.29	-18.11	1
7	15791_6858506	Confined	3,342	2/24/1988	433.56	462.88	-29.32	1
7	15791_6858506	Confined	4,061	2/12/1990	418.53	452.69	-34.16	1
7	15791_6858506	Confined	4,415	2/1/1991	412.36	453.57	-41.21	1
7	15791_6858506	Confined	7,318	1/13/1999	389.91	403.55	-13.64	1
7	15791_6858506	Confined	8,061	1/25/2001	396.46	377.27	19.19	1
7	15791_6858506	Confined	8,411	1/10/2002	391.06	373.90	17.16	1
7	15791_6858506	Confined	8,775	1/9/2003	394.86	365.37	29.49	1
7	15791_6858506	Confined	9,145	1/14/2004	393.46	363.18	30.28	1
7	15791_6858506	Confined	9,517	1/20/2005	394.36	367.91	26.45	1
7	15791_6858506	Confined	9,881	1/19/2006	392.36	365.95	26.41	1
7	15791_6858506	Confined	10,270	2/12/2007	388.96	369.38	19.58	1
7	15791_6858506	Confined	10,624	2/1/2008	391.36	373.93	17.43	1
7	15791_6858506	Confined	11,000	2/11/2009	388.06	355.95	32.11	1
7	15791_6858506	Confined	11,426	4/13/2010	384.76	320.88	63.88	1
7	15802_6859804	Confined	773	2/11/1981	407.53	374.77	32.76	1
7	15802_6859804	Confined	2,231	2/8/1985	397.63	403.72	-6.09	1
7	15802_6859804	Confined	2,599	2/11/1986	404.08	411.32	-7.24	1
7	15802_6859804	Confined	2,999	3/18/1987	401.64	413.76	-12.12	1
7	15802_6859804	Confined	3,336	2/18/1988	402.72	420.69	-17.97	1
7	15802_6859804	Confined	3,706	2/22/1989	389.33	416.89	-27.56	1
7	15802_6859804	Confined	4,411	1/28/1991	366.28	409.59	-43.31	1
7	15802_6859804	Confined	6,665	3/31/1997	375.18	389.39	-14.21	1
7	15802_6859804	Confined	6,966	1/26/1998	388.98	393.63	-4.65	1
7	15802_6859804	Confined	7,313	1/8/1999	387.28	387.46	-0.18	1
7	15802_6859804	Confined	8,045	1/9/2001	379.58	368.27	11.31	1
7	15802_6859804	Confined	8,417	1/16/2002	378.78	366.01	12.77	1
7	15802_6859804	Confined	8,789	1/23/2003	379.78	359.34	20.44	1
7	15802_6859804	Confined	9,150	1/19/2004	382.28	358.01	24.27	1
7	15802_6859804	Confined	9,542	2/14/2005	382.03	360.88	21.15	1
7	15802_6859804	Confined	9,885	1/23/2006	380.28	358.40	21.88	1
7	15802_6859804	Confined	10,257	1/30/2007	379.18	360.81	18.37	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15802_6859804	Confined	10,642	2/19/2008	381.18	369.21	11.97	1
7	15802_6859804	Confined	10,998	2/9/2009	380.28	359.46	20.82	1
7	15802_6859804	Confined	11,433	4/20/2010	378.98	334.49	44.49	1
7	15831_6860401	Confined	773	2/11/1981	417.48	336.45	40.52	0.5
7	15831_6860401	Confined	1,153	2/26/1982	419.15	354.10	32.52	0.5
7	15831_6860401	Confined	1,502	2/10/1983	418.97	362.44	28.27	0.5
7	15831_6860401	Confined	1,878	2/21/1984	416.96	373.14	21.91	0.5
7	15831_6860401	Confined	2,229	2/6/1985	410.78	378.28	16.25	0.5
7	15831_6860401	Confined	2,599	2/11/1986	413.17	387.02	13.07	0.5
7	15831_6860401	Confined	2,999	3/18/1987	413.51	388.88	12.31	0.5
7	15879_6860850	Confined	5,848	1/4/1995	360.07	361.78	-1.71	1
7	15881_6860852	Confined	7,683	1/13/2000	354.90	354.50	0.40	1
7	15881_6860852	Confined	8,044	1/8/2001	274.35	345.67	-71.32	1
7	15881_6860852	Confined	8,408	1/7/2002	360.05	347.07	12.98	1
7	15881_6860852	Confined	8,793	1/27/2003	366.85	342.95	23.90	1
7	15881_6860852	Confined	9,150	1/19/2004	364.35	344.18	20.17	1
7	15881_6860852	Confined	9,517	1/20/2005	375.25	348.60	26.65	1
7	15881_6860852	Confined	9,865	1/3/2006	377.05	346.75	30.30	1
7	15881_6860852	Confined	10,229	1/2/2007	376.95	349.33	27.62	1
7	15881_6860852	Confined	10,594	1/2/2008	385.25	361.02	24.23	1
7	15881_6860852	Confined	10,988	1/30/2009	389.55	353.40	36.15	1
7	15881_6860852	Confined	11,323	12/31/2009	394.95	341.24	53.71	1
7	15881_6860852	Confined	12,059	1/6/2012	402.55	303.63	98.92	1
7	15881_6860852	Confined	12,090	2/6/2012	402.75	305.83	96.92	1
7	15881_6860852	Confined	12,114	3/1/2012	402.45	307.53	94.92	1
7	15881_6860852	Confined	12,149	4/5/2012	402.75	310.00	92.75	1
7	15881_6860852	Confined	12,176	5/2/2012	402.05	311.92	90.13	1
7	15881_6860852	Confined	12,206	6/1/2012	403.65	314.04	89.61	1
7	15881_6860852	Confined	12,241	7/6/2012	403.45	316.52	86.93	1
7	15881_6860852	Confined	12,269	8/3/2012	402.55	318.50	84.05	1
7	15881_6860852	Confined	12,308	9/11/2012	403.35	321.27	82.08	1
7	15881_6860852	Confined	12,347	10/20/2012	404.85	324.03	80.82	1
7	15881_6860852	Confined	12,386	11/28/2012	404.55	326.79	77.76	1
7	15881_6860852	Confined	12,394	12/6/2012	403.75	327.36	76.39	1
7	15881_6860852	Confined	12,425	1/6/2013	404.75	329.24	75.51	1
7	15881_6860852	Confined	12,456	2/6/2013	405.55	329.83	75.72	1
7	15881_6860852	Confined	12,479	3/1/2013	405.75	330.27	75.48	1
7	15881_6860852	Confined	12,514	4/5/2013	405.45	330.94	74.51	1
7	15881_6860852	Confined	12,541	5/2/2013	405.55	331.45	74.10	1
7	15881_6860852	Confined	12,571	6/1/2013	405.75	332.02	73.73	1
7	15881_6860852	Confined	12,606	7/6/2013	405.35	332.69	72.66	1
7	15881_6860852	Confined	12,634	8/3/2013	405.95	333.22	72.73	1
7	15881_6860852	Confined	12,673	9/11/2013	405.75	333.97	71.78	1
7	15881_6860852	Confined	12,693	10/1/2013	405.55	334.35	71.20	1
7	15881_6860852	Confined	12,744	11/21/2013	407.05	335.32	71.73	1
7	15881_6860852	Confined	12,754	12/1/2013	406.75	335.51	71.24	1
7	15881_6860852	Confined	12,785	1/1/2014	406.45	336.10	70.35	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15881_6860852	Confined	12,816	2/1/2014	408.45	336.66	71.79	1
7	15881_6860852	Confined	12,844	3/1/2014	409.35	337.16	72.19	1
7	15881_6860852	Confined	12,875	4/1/2014	406.15	337.72	68.43	1
7	15881_6860852	Confined	12,905	5/1/2014	405.95	338.26	67.69	1
7	15881_6860852	Confined	12,936	6/1/2014	407.85	338.82	69.03	1
7	15881_6860852	Confined	12,966	7/1/2014	408.75	339.36	69.39	1
7	15881_6860852	Confined	12,997	8/1/2014	408.55	339.92	68.63	1
7	15881_6860852	Confined	13,028	9/1/2014	408.35	340.48	67.87	1
7	15881_6860852	Confined	13,058	10/1/2014	408.65	341.02	67.63	1
7	15881_6860852	Confined	13,089	11/1/2014	408.55	341.58	66.97	1
7	15881_6860852	Confined	13,119	12/1/2014	408.85	342.13	66.72	1
7	15881_6860852	Confined	13,150	1/1/2015	408.75	342.70	66.05	1
7	15881_6860852	Confined	13,209	3/1/2015	407.65	344.68	62.97	1
7	15881_6860852	Confined	13,240	4/1/2015	409.15	345.73	63.42	1
7	15881_6860852	Confined	13,270	5/1/2015	410.65	346.73	63.92	1
7	15881_6860852	Confined	13,301	6/1/2015	412.25	347.78	64.47	1
7	15881_6860852	Confined	13,331	7/1/2015	412.35	348.78	63.57	1
7	15881_6860852	Confined	13,362	8/1/2015	411.25	349.83	61.42	1
7	15881_6860852	Confined	13,393	9/1/2015	409.45	350.87	58.58	1
7	15881_6860852	Confined	13,423	10/1/2015	411.95	351.88	60.07	1
7	15881_6860852	Confined	13,454	11/1/2015	411.65	352.92	58.73	1
7	15881_6860852	Confined	13,484	12/1/2015	413.15	353.93	59.22	1
7	15881_6860852	Confined	13,515	1/1/2016	413.25	354.96	58.29	1
7	15881_6860852	Confined	13,546	2/1/2016	413.85	355.65	58.20	1
7	15881_6860852	Confined	13,575	3/1/2016	414.35	356.30	58.05	1
7	15881_6860852	Confined	13,606	4/1/2016	415.25	357.00	58.25	1
7	15881_6860852	Confined	13,636	5/1/2016	414.15	357.67	56.48	1
7	15881_6860852	Confined	13,667	6/1/2016	414.45	358.37	56.08	1
7	15881_6860852	Confined	13,697	7/1/2016	414.35	359.04	55.31	1
7	15881_6860852	Confined	13,728	8/1/2016	414.15	359.74	54.41	1
7	15881_6860852	Confined	13,759	9/1/2016	415.25	360.44	54.81	1
7	15881_6860852	Confined	13,789	10/1/2016	416.45	361.11	55.34	1
7	15881_6860852	Confined	13,820	11/1/2016	418.35	361.81	56.54	1
7	15881_6860852	Confined	13,850	12/1/2016	419.25	362.48	56.77	1
7	15881_6860852	Confined	13,881	1/1/2017	418.55	363.16	55.39	1
7	15881_6860852	Confined	13,912	2/1/2017	417.65	363.25	54.40	1
7	15881_6860852	Confined	13,940	3/1/2017	417.95	363.33	54.62	1
7	15881_6860852	Confined	13,971	4/1/2017	417.65	363.43	54.22	1
7	15881_6860852	Confined	14,001	5/1/2017	417.45	363.52	53.93	1
7	15881_6860852	Confined	14,032	6/1/2017	417.45	363.61	53.84	1
7	15881_6860852	Confined	14,124	9/1/2017	420.65	363.89	56.76	1
7	15881_6860852	Confined	14,154	10/1/2017	423.95	363.98	59.97	1
7	15881_6860852	Confined	14,185	11/1/2017	424.05	364.07	59.98	1
7	15881_6860852	Confined	14,215	12/1/2017	425.05	364.16	60.89	1
7	15885_6860912	Confined	4,750	1/2/1992	359.79	352.61	7.18	1
7	15885_6860912	Confined	4,784	2/5/1992	364.24	352.97	11.27	1
7	15885_6860912	Confined	4,810	3/2/1992	366.44	353.24	13.20	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	4,839	3/31/1992	367.59	353.55	14.04	1
7	15885_6860912	Confined	4,876	5/7/1992	369.64	353.93	15.71	1
7	15885_6860912	Confined	4,902	6/2/1992	370.69	354.21	16.48	1
7	15885_6860912	Confined	4,932	7/2/1992	368.54	354.52	14.02	1
7	15885_6860912	Confined	4,965	8/4/1992	362.54	354.87	7.67	1
7	15885_6860912	Confined	5,027	10/5/1992	341.24	355.52	-14.28	1
7	15885_6860912	Confined	5,055	11/2/1992	347.34	355.81	-8.47	1
7	15885_6860912	Confined	5,087	12/4/1992	356.84	356.15	0.69	1
7	15885_6860912	Confined	5,118	1/4/1993	362.24	356.42	5.82	1
7	15885_6860912	Confined	5,146	2/1/1993	364.79	356.28	8.51	1
7	15885_6860912	Confined	5,237	5/3/1993	365.54	355.84	9.70	1
7	15885_6860912	Confined	5,331	8/5/1993	357.34	355.38	1.96	1
7	15885_6860912	Confined	5,359	9/2/1993	338.64	355.24	-16.60	1
7	15885_6860912	Confined	5,388	10/1/1993	333.04	355.10	-22.06	1
7	15885_6860912	Confined	5,419	11/1/1993	342.54	354.95	-12.41	1
7	15885_6860912	Confined	5,450	12/2/1993	350.99	354.80	-3.81	1
7	15885_6860912	Confined	5,482	1/3/1994	354.94	354.66	0.28	1
7	15885_6860912	Confined	5,512	2/2/1994	358.24	354.62	3.62	1
7	15885_6860912	Confined	5,573	4/4/1994	362.19	354.55	7.64	1
7	15885_6860912	Confined	5,613	5/14/1994	352.74	354.50	-1.76	1
7	15885_6860912	Confined	5,639	6/9/1994	355.94	354.47	1.47	1
7	15885_6860912	Confined	5,661	7/1/1994	361.44	354.44	7.00	1
7	15885_6860912	Confined	5,692	8/1/1994	345.74	354.41	-8.67	1
7	15885_6860912	Confined	5,723	9/1/1994	335.14	354.37	-19.23	1
7	15885_6860912	Confined	5,757	10/5/1994	334.54	354.33	-19.79	1
7	15885_6860912	Confined	5,784	11/1/1994	346.54	354.30	-7.76	1
7	15885_6860912	Confined	5,818	12/5/1994	354.09	354.26	-0.17	1
7	15885_6860912	Confined	5,847	1/3/1995	359.39	354.21	5.18	1
7	15885_6860912	Confined	5,877	2/2/1995	359.74	354.05	5.69	1
7	15885_6860912	Confined	5,909	3/6/1995	360.84	353.89	6.95	1
7	15885_6860912	Confined	5,940	4/6/1995	364.19	353.72	10.47	1
7	15885_6860912	Confined	5,965	5/1/1995	361.94	353.59	8.35	1
7	15885_6860912	Confined	5,996	6/1/1995	360.34	353.43	6.91	1
7	15885_6860912	Confined	6,038	7/13/1995	358.49	353.21	5.28	1
7	15885_6860912	Confined	6,057	8/1/1995	348.69	353.11	-4.42	1
7	15885_6860912	Confined	6,092	9/5/1995	336.54	352.93	-16.39	1
7	15885_6860912	Confined	6,119	10/2/1995	333.39	352.79	-19.40	1
7	15885_6860912	Confined	6,149	11/1/1995	336.94	352.63	-15.69	1
7	15885_6860912	Confined	6,182	12/4/1995	347.79	352.46	-4.67	1
7	15885_6860912	Confined	6,211	1/2/1996	352.54	352.30	0.24	1
7	15885_6860912	Confined	6,245	2/5/1996	352.54	352.05	0.49	1
7	15885_6860912	Confined	6,273	3/4/1996	349.29	351.85	-2.56	1
7	15885_6860912	Confined	6,284	3/15/1996	347.83	351.77	-3.94	1
7	15885_6860912	Confined	6,289	3/20/1996	348.25	351.73	-3.48	1
7	15885_6860912	Confined	6,294	3/25/1996	345.97	351.70	-5.73	1
7	15885_6860912	Confined	6,299	3/30/1996	348.04	351.66	-3.62	1
7	15885_6860912	Confined	6,305	4/5/1996	346.18	351.62	-5.44	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	6,310	4/10/1996	346.01	351.58	-5.57	1
7	15885_6860912	Confined	6,315	4/15/1996	345.50	351.54	-6.04	1
7	15885_6860912	Confined	6,320	4/20/1996	342.46	351.51	-9.05	1
7	15885_6860912	Confined	6,325	4/25/1996	341.74	351.47	-9.73	1
7	15885_6860912	Confined	6,330	4/30/1996	340.45	351.43	-10.98	1
7	15885_6860912	Confined	6,335	5/5/1996	341.09	351.40	-10.31	1
7	15885_6860912	Confined	6,340	5/10/1996	342.19	351.36	-9.17	1
7	15885_6860912	Confined	6,345	5/15/1996	342.41	351.33	-8.92	1
7	15885_6860912	Confined	6,350	5/20/1996	340.42	351.29	-10.87	1
7	15885_6860912	Confined	6,355	5/25/1996	337.40	351.25	-13.85	1
7	15885_6860912	Confined	6,360	5/30/1996	334.42	351.22	-16.80	1
7	15885_6860912	Confined	6,366	6/5/1996	334.39	351.17	-16.78	1
7	15885_6860912	Confined	6,371	6/10/1996	332.14	351.14	-19.00	1
7	15885_6860912	Confined	6,376	6/15/1996	327.87	351.10	-23.23	1
7	15885_6860912	Confined	6,381	6/20/1996	325.88	351.06	-25.18	1
7	15885_6860912	Confined	6,386	6/25/1996	325.88	351.03	-25.15	1
7	15885_6860912	Confined	6,391	6/30/1996	325.88	350.99	-25.11	1
7	15885_6860912	Confined	6,396	7/5/1996	325.87	350.95	-25.08	1
7	15885_6860912	Confined	6,401	7/10/1996	325.87	350.92	-25.05	1
7	15885_6860912	Confined	6,406	7/15/1996	325.87	350.88	-25.01	1
7	15885_6860912	Confined	6,423	8/1/1996	314.84	350.76	-35.92	1
7	15885_6860912	Confined	6,493	10/10/1996	326.31	350.25	-23.94	1
7	15885_6860912	Confined	6,498	10/15/1996	326.15	350.21	-24.06	1
7	15885_6860912	Confined	6,503	10/20/1996	326.37	350.17	-23.80	1
7	15885_6860912	Confined	6,508	10/25/1996	327.87	350.14	-22.27	1
7	15885_6860912	Confined	6,513	10/30/1996	329.55	350.10	-20.55	1
7	15885_6860912	Confined	6,519	11/5/1996	330.00	350.06	-20.06	1
7	15885_6860912	Confined	6,524	11/10/1996	330.42	350.02	-19.60	1
7	15885_6860912	Confined	6,529	11/15/1996	331.54	349.98	-18.44	1
7	15885_6860912	Confined	6,534	11/20/1996	332.26	349.95	-17.69	1
7	15885_6860912	Confined	6,539	11/25/1996	333.47	349.91	-16.44	1
7	15885_6860912	Confined	6,544	11/30/1996	336.14	349.87	-13.73	1
7	15885_6860912	Confined	6,549	12/5/1996	338.06	349.84	-11.78	1
7	15885_6860912	Confined	6,554	12/10/1996	339.49	349.80	-10.31	1
7	15885_6860912	Confined	6,559	12/15/1996	339.73	349.77	-10.04	1
7	15885_6860912	Confined	6,564	12/20/1996	341.32	349.73	-8.41	1
7	15885_6860912	Confined	6,569	12/25/1996	341.55	349.69	-8.14	1
7	15885_6860912	Confined	6,574	12/30/1996	342.63	349.66	-7.03	1
7	15885_6860912	Confined	6,580	1/5/1997	342.29	349.69	-7.40	1
7	15885_6860912	Confined	6,585	1/10/1997	343.88	349.74	-5.86	1
7	15885_6860912	Confined	6,590	1/15/1997	345.11	349.78	-4.67	1
7	15885_6860912	Confined	6,595	1/20/1997	345.87	349.83	-3.96	1
7	15885_6860912	Confined	6,600	1/25/1997	345.96	349.87	-3.91	1
7	15885_6860912	Confined	6,605	1/30/1997	344.40	349.92	-5.52	1
7	15885_6860912	Confined	6,611	2/5/1997	344.45	349.97	-5.52	1
7	15885_6860912	Confined	6,616	2/10/1997	345.30	350.01	-4.71	1
7	15885_6860912	Confined	6,621	2/15/1997	346.29	350.06	-3.77	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	6,626	2/20/1997	347.79	350.10	-2.31	1
7	15885_6860912	Confined	6,631	2/25/1997	348.58	350.15	-1.57	1
7	15885_6860912	Confined	6,634	2/28/1997	349.15	350.17	-1.02	1
7	15885_6860912	Confined	6,637	3/3/1997	349.94	350.20	-0.26	1
7	15885_6860912	Confined	6,639	3/5/1997	349.20	350.22	-1.02	1
7	15885_6860912	Confined	6,644	3/10/1997	349.08	350.26	-1.18	1
7	15885_6860912	Confined	6,649	3/15/1997	349.45	350.31	-0.86	1
7	15885_6860912	Confined	6,654	3/20/1997	350.74	350.35	0.39	1
7	15885_6860912	Confined	6,659	3/25/1997	350.47	350.39	0.08	1
7	15885_6860912	Confined	6,664	3/30/1997	350.50	350.44	0.06	1
7	15885_6860912	Confined	6,670	4/5/1997	352.28	350.49	1.79	1
7	15885_6860912	Confined	6,675	4/10/1997	353.02	350.54	2.48	1
7	15885_6860912	Confined	6,680	4/15/1997	352.08	350.58	1.50	1
7	15885_6860912	Confined	6,685	4/20/1997	351.93	350.62	1.31	1
7	15885_6860912	Confined	6,690	4/25/1997	351.46	350.67	0.79	1
7	15885_6860912	Confined	6,695	4/30/1997	353.39	350.71	2.68	1
7	15885_6860912	Confined	6,700	5/5/1997	353.03	350.76	2.27	1
7	15885_6860912	Confined	6,705	5/10/1997	352.78	350.80	1.98	1
7	15885_6860912	Confined	6,710	5/15/1997	353.35	350.85	2.50	1
7	15885_6860912	Confined	6,715	5/20/1997	352.32	350.89	1.43	1
7	15885_6860912	Confined	6,720	5/25/1997	353.21	350.94	2.27	1
7	15885_6860912	Confined	6,725	5/30/1997	354.00	350.98	3.02	1
7	15885_6860912	Confined	6,731	6/5/1997	352.54	351.03	1.51	1
7	15885_6860912	Confined	6,736	6/10/1997	354.01	351.08	2.93	1
7	15885_6860912	Confined	6,741	6/15/1997	353.92	351.12	2.80	1
7	15885_6860912	Confined	6,746	6/20/1997	354.45	351.17	3.28	1
7	15885_6860912	Confined	6,751	6/25/1997	355.39	351.21	4.18	1
7	15885_6860912	Confined	6,756	6/30/1997	355.58	351.25	4.33	1
7	15885_6860912	Confined	6,761	7/5/1997	354.92	351.30	3.62	1
7	15885_6860912	Confined	6,766	7/10/1997	353.07	351.34	1.73	1
7	15885_6860912	Confined	6,771	7/15/1997	351.28	351.39	-0.11	1
7	15885_6860912	Confined	6,776	7/20/1997	348.72	351.43	-2.71	1
7	15885_6860912	Confined	6,781	7/25/1997	346.03	351.48	-5.45	1
7	15885_6860912	Confined	6,786	7/30/1997	343.13	351.52	-8.39	1
7	15885_6860912	Confined	6,792	8/5/1997	341.71	351.57	-9.86	1
7	15885_6860912	Confined	6,797	8/10/1997	342.10	351.62	-9.52	1
7	15885_6860912	Confined	6,802	8/15/1997	341.50	351.66	-10.16	1
7	15885_6860912	Confined	6,807	8/20/1997	337.12	351.71	-14.59	1
7	15885_6860912	Confined	6,812	8/25/1997	333.92	351.75	-17.83	1
7	15885_6860912	Confined	6,817	8/30/1997	330.95	351.80	-20.85	1
7	15885_6860912	Confined	6,823	9/5/1997	330.18	351.85	-21.67	1
7	15885_6860912	Confined	6,828	9/10/1997	329.85	351.89	-22.04	1
7	15885_6860912	Confined	6,833	9/15/1997	327.50	351.94	-24.44	1
7	15885_6860912	Confined	6,838	9/20/1997	325.64	351.98	-26.34	1
7	15885_6860912	Confined	6,843	9/25/1997	329.33	352.03	-22.70	1
7	15885_6860912	Confined	6,848	9/30/1997	330.22	352.07	-21.85	1
7	15885_6860912	Confined	6,853	10/5/1997	327.33	352.12	-24.79	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	6,858	10/10/1997	330.94	352.16	-21.22	1
7	15885_6860912	Confined	6,863	10/15/1997	334.58	352.20	-17.62	1
7	15885_6860912	Confined	6,868	10/20/1997	336.82	352.25	-15.43	1
7	15885_6860912	Confined	6,873	10/25/1997	338.24	352.29	-14.05	1
7	15885_6860912	Confined	6,878	10/30/1997	339.94	352.34	-12.40	1
7	15885_6860912	Confined	6,884	11/5/1997	340.07	352.39	-12.32	1
7	15885_6860912	Confined	6,889	11/10/1997	339.80	352.43	-12.63	1
7	15885_6860912	Confined	6,894	11/15/1997	342.47	352.48	-10.01	1
7	15885_6860912	Confined	6,899	11/20/1997	344.78	352.52	-7.74	1
7	15885_6860912	Confined	6,904	11/25/1997	346.15	352.57	-6.42	1
7	15885_6860912	Confined	6,909	11/30/1997	347.22	352.61	-5.39	1
7	15885_6860912	Confined	6,914	12/5/1997	347.21	352.66	-5.45	1
7	15885_6860912	Confined	6,919	12/10/1997	348.39	352.70	-4.31	1
7	15885_6860912	Confined	6,924	12/15/1997	349.05	352.75	-3.70	1
7	15885_6860912	Confined	6,929	12/20/1997	346.95	352.79	-5.84	1
7	15885_6860912	Confined	6,934	12/25/1997	349.28	352.83	-3.55	1
7	15885_6860912	Confined	6,939	12/30/1997	350.66	352.88	-2.22	1
7	15885_6860912	Confined	6,945	1/5/1998	352.00	352.86	-0.86	1
7	15885_6860912	Confined	6,950	1/10/1998	352.67	352.84	-0.17	1
7	15885_6860912	Confined	6,955	1/15/1998	353.41	352.81	0.60	1
7	15885_6860912	Confined	6,960	1/20/1998	354.08	352.78	1.30	1
7	15885_6860912	Confined	6,965	1/25/1998	354.39	352.76	1.63	1
7	15885_6860912	Confined	6,970	1/30/1998	353.70	352.73	0.97	1
7	15885_6860912	Confined	6,973	2/2/1998	354.26	352.72	1.54	1
7	15885_6860912	Confined	6,976	2/5/1998	355.02	352.70	2.32	1
7	15885_6860912	Confined	6,981	2/10/1998	355.96	352.67	3.29	1
7	15885_6860912	Confined	6,986	2/15/1998	356.76	352.65	4.11	1
7	15885_6860912	Confined	6,991	2/20/1998	357.20	352.62	4.58	1
7	15885_6860912	Confined	6,996	2/25/1998	358.01	352.60	5.41	1
7	15885_6860912	Confined	6,999	2/28/1998	358.03	352.58	5.45	1
7	15885_6860912	Confined	7,004	3/5/1998	358.48	352.55	5.93	1
7	15885_6860912	Confined	7,009	3/10/1998	358.22	352.53	5.69	1
7	15885_6860912	Confined	7,014	3/15/1998	358.68	352.50	6.18	1
7	15885_6860912	Confined	7,019	3/20/1998	359.12	352.48	6.64	1
7	15885_6860912	Confined	7,024	3/25/1998	358.67	352.45	6.22	1
7	15885_6860912	Confined	7,029	3/30/1998	359.16	352.42	6.74	1
7	15885_6860912	Confined	7,035	4/5/1998	358.15	352.39	5.76	1
7	15885_6860912	Confined	7,040	4/10/1998	356.98	352.37	4.61	1
7	15885_6860912	Confined	7,045	4/15/1998	356.20	352.34	3.86	1
7	15885_6860912	Confined	7,050	4/20/1998	355.51	352.32	3.19	1
7	15885_6860912	Confined	7,055	4/25/1998	353.71	352.29	1.42	1
7	15885_6860912	Confined	7,060	4/30/1998	353.11	352.26	0.85	1
7	15885_6860912	Confined	7,065	5/5/1998	350.53	352.24	-1.71	1
7	15885_6860912	Confined	7,070	5/10/1998	346.41	352.21	-5.80	1
7	15885_6860912	Confined	7,075	5/15/1998	343.33	352.19	-8.86	1
7	15885_6860912	Confined	7,080	5/20/1998	341.03	352.16	-11.13	1
7	15885_6860912	Confined	7,085	5/25/1998	339.14	352.13	-12.99	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	7,090	5/30/1998	337.04	352.11	-15.07	1
7	15885_6860912	Confined	7,096	6/5/1998	331.39	352.08	-20.69	1
7	15885_6860912	Confined	7,101	6/10/1998	329.12	352.05	-22.93	1
7	15885_6860912	Confined	7,106	6/15/1998	329.19	352.02	-22.83	1
7	15885_6860912	Confined	7,111	6/20/1998	326.58	352.00	-25.42	1
7	15885_6860912	Confined	7,116	6/25/1998	322.73	351.97	-29.24	1
7	15885_6860912	Confined	7,121	6/30/1998	320.70	351.95	-31.25	1
7	15885_6860912	Confined	7,126	7/5/1998	324.33	351.92	-27.59	1
7	15885_6860912	Confined	7,131	7/10/1998	322.49	351.89	-29.40	1
7	15885_6860912	Confined	7,136	7/15/1998	316.73	351.87	-35.14	1
7	15885_6860912	Confined	7,141	7/20/1998	317.90	351.84	-33.94	1
7	15885_6860912	Confined	7,146	7/25/1998	312.02	351.82	-39.80	1
7	15885_6860912	Confined	7,151	7/30/1998	312.05	351.79	-39.74	1
7	15885_6860912	Confined	7,157	8/5/1998	307.34	351.76	-44.42	1
7	15885_6860912	Confined	7,162	8/10/1998	315.78	351.73	-35.95	1
7	15885_6860912	Confined	7,167	8/15/1998	319.13	351.71	-32.58	1
7	15885_6860912	Confined	7,172	8/20/1998	323.72	351.68	-27.96	1
7	15885_6860912	Confined	7,177	8/25/1998	328.30	351.66	-23.36	1
7	15885_6860912	Confined	7,182	8/30/1998	330.61	351.63	-21.02	1
7	15885_6860912	Confined	7,188	9/5/1998	326.74	351.60	-24.86	1
7	15885_6860912	Confined	7,193	9/10/1998	328.10	351.57	-23.47	1
7	15885_6860912	Confined	7,198	9/15/1998	331.50	351.55	-20.05	1
7	15885_6860912	Confined	7,203	9/20/1998	333.85	351.52	-17.67	1
7	15885_6860912	Confined	7,208	9/25/1998	332.87	351.49	-18.62	1
7	15885_6860912	Confined	7,213	9/30/1998	331.23	351.47	-20.24	1
7	15885_6860912	Confined	7,218	10/5/1998	328.51	351.44	-22.93	1
7	15885_6860912	Confined	7,223	10/10/1998	333.22	351.42	-18.20	1
7	15885_6860912	Confined	7,228	10/15/1998	335.70	351.39	-15.69	1
7	15885_6860912	Confined	7,233	10/20/1998	338.58	351.36	-12.78	1
7	15885_6860912	Confined	7,238	10/25/1998	340.77	351.34	-10.57	1
7	15885_6860912	Confined	7,243	10/30/1998	342.13	351.31	-9.18	1
7	15885_6860912	Confined	7,249	11/5/1998	344.03	351.28	-7.25	1
7	15885_6860912	Confined	7,254	11/10/1998	345.14	351.26	-6.12	1
7	15885_6860912	Confined	7,259	11/15/1998	346.53	351.23	-4.70	1
7	15885_6860912	Confined	7,264	11/20/1998	347.31	351.20	-3.89	1
7	15885_6860912	Confined	7,269	11/25/1998	348.37	351.18	-2.81	1
7	15885_6860912	Confined	7,274	11/30/1998	348.90	351.15	-2.25	1
7	15885_6860912	Confined	7,279	12/5/1998	349.47	351.13	-1.66	1
7	15885_6860912	Confined	7,284	12/10/1998	350.22	351.10	-0.88	1
7	15885_6860912	Confined	7,289	12/15/1998	351.10	351.07	0.03	1
7	15885_6860912	Confined	7,294	12/20/1998	351.74	351.05	0.69	1
7	15885_6860912	Confined	7,313	1/8/1999	352.88	350.94	1.94	1
7	15885_6860912	Confined	7,466	6/10/1999	339.46	349.88	-10.42	1
7	15885_6860912	Confined	7,471	6/15/1999	337.04	349.85	-12.81	1
7	15885_6860912	Confined	7,476	6/20/1999	338.37	349.82	-11.45	1
7	15885_6860912	Confined	7,481	6/25/1999	343.03	349.78	-6.75	1
7	15885_6860912	Confined	7,486	6/30/1999	344.74	349.75	-5.01	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	7,491	7/5/1999	344.52	349.71	-5.19	1
7	15885_6860912	Confined	7,496	7/10/1999	346.88	349.68	-2.80	1
7	15885_6860912	Confined	7,501	7/15/1999	346.96	349.64	-2.68	1
7	15885_6860912	Confined	7,506	7/20/1999	346.63	349.61	-2.98	1
7	15885_6860912	Confined	7,511	7/25/1999	346.77	349.58	-2.81	1
7	15885_6860912	Confined	7,516	7/30/1999	343.66	349.54	-5.88	1
7	15885_6860912	Confined	7,522	8/5/1999	336.48	349.50	-13.02	1
7	15885_6860912	Confined	7,527	8/10/1999	333.62	349.47	-15.85	1
7	15885_6860912	Confined	7,532	8/15/1999	330.48	349.43	-18.95	1
7	15885_6860912	Confined	7,537	8/20/1999	327.85	349.40	-21.55	1
7	15885_6860912	Confined	7,542	8/25/1999	331.04	349.36	-18.32	1
7	15885_6860912	Confined	7,547	8/30/1999	334.32	349.33	-15.01	1
7	15885_6860912	Confined	7,553	9/5/1999	330.20	349.29	-19.09	1
7	15885_6860912	Confined	7,558	9/10/1999	333.56	349.25	-15.69	1
7	15885_6860912	Confined	7,563	9/15/1999	333.35	349.22	-15.87	1
7	15885_6860912	Confined	7,568	9/20/1999	330.08	349.18	-19.10	1
7	15885_6860912	Confined	7,573	9/25/1999	326.68	349.15	-22.47	1
7	15885_6860912	Confined	7,578	9/30/1999	326.83	349.11	-22.28	1
7	15885_6860912	Confined	7,583	10/5/1999	326.45	349.08	-22.63	1
7	15885_6860912	Confined	7,588	10/10/1999	326.99	349.05	-22.06	1
7	15885_6860912	Confined	7,593	10/15/1999	325.30	349.01	-23.71	1
7	15885_6860912	Confined	7,598	10/20/1999	328.75	348.98	-20.23	1
7	15885_6860912	Confined	7,603	10/25/1999	330.64	348.94	-18.30	1
7	15885_6860912	Confined	7,608	10/30/1999	331.63	348.91	-17.28	1
7	15885_6860912	Confined	7,614	11/5/1999	332.16	348.87	-16.71	1
7	15885_6860912	Confined	7,619	11/10/1999	332.04	348.83	-16.79	1
7	15885_6860912	Confined	7,624	11/15/1999	331.87	348.80	-16.93	1
7	15885_6860912	Confined	7,629	11/20/1999	331.30	348.76	-17.46	1
7	15885_6860912	Confined	7,634	11/25/1999	333.10	348.73	-15.63	1
7	15885_6860912	Confined	7,639	11/30/1999	333.49	348.70	-15.21	1
7	15885_6860912	Confined	7,644	12/5/1999	332.22	348.66	-16.44	1
7	15885_6860912	Confined	7,649	12/10/1999	334.03	348.63	-14.60	1
7	15885_6860912	Confined	7,654	12/15/1999	334.34	348.59	-14.25	1
7	15885_6860912	Confined	7,659	12/20/1999	333.83	348.56	-14.73	1
7	15885_6860912	Confined	7,664	12/25/1999	336.09	348.52	-12.43	1
7	15885_6860912	Confined	7,669	12/30/1999	337.94	348.49	-10.55	1
7	15885_6860912	Confined	7,675	1/5/2000	342.80	348.41	-5.61	1
7	15885_6860912	Confined	7,695	1/25/2000	342.82	348.11	-5.29	1
7	15885_6860912	Confined	7,700	1/30/2000	343.38	348.04	-4.66	1
7	15885_6860912	Confined	7,706	2/5/2000	344.65	347.95	-3.30	1
7	15885_6860912	Confined	7,711	2/10/2000	344.78	347.87	-3.09	1
7	15885_6860912	Confined	7,716	2/15/2000	342.31	347.80	-5.49	1
7	15885_6860912	Confined	7,721	2/20/2000	341.99	347.72	-5.73	1
7	15885_6860912	Confined	7,726	2/25/2000	344.17	347.65	-3.48	1
7	15885_6860912	Confined	7,730	2/29/2000	344.69	347.59	-2.90	1
7	15885_6860912	Confined	7,735	3/5/2000	343.87	347.51	-3.64	1
7	15885_6860912	Confined	7,740	3/10/2000	342.27	347.44	-5.17	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	7,745	3/15/2000	341.25	347.36	-6.11	1
7	15885_6860912	Confined	7,834	6/12/2000	343.81	346.04	-2.23	1
7	15885_6860912	Confined	7,842	6/20/2000	344.09	345.92	-1.83	1
7	15885_6860912	Confined	7,847	6/25/2000	343.29	345.84	-2.55	1
7	15885_6860912	Confined	7,852	6/30/2000	341.19	345.77	-4.58	1
7	15885_6860912	Confined	7,857	7/5/2000	340.72	345.69	-4.97	1
7	15885_6860912	Confined	7,862	7/10/2000	338.29	345.62	-7.33	1
7	15885_6860912	Confined	7,867	7/15/2000	334.75	345.54	-10.79	1
7	15885_6860912	Confined	7,872	7/20/2000	331.99	345.47	-13.48	1
7	15885_6860912	Confined	7,877	7/25/2000	328.31	345.40	-17.09	1
7	15885_6860912	Confined	7,882	7/30/2000	325.89	345.32	-19.43	1
7	15885_6860912	Confined	7,888	8/5/2000	321.71	345.23	-23.52	1
7	15885_6860912	Confined	7,893	8/10/2000	319.50	345.16	-25.66	1
7	15885_6860912	Confined	7,898	8/15/2000	316.81	345.08	-28.27	1
7	15885_6860912	Confined	7,903	8/20/2000	313.99	345.01	-31.02	1
7	15885_6860912	Confined	7,908	8/25/2000	312.96	344.93	-31.97	1
7	15885_6860912	Confined	7,913	8/30/2000	310.72	344.86	-34.14	1
7	15885_6860912	Confined	7,919	9/5/2000	309.31	344.77	-35.46	1
7	15885_6860912	Confined	7,944	9/30/2000	309.10	344.40	-35.30	1
7	15885_6860912	Confined	7,949	10/5/2000	311.29	344.32	-33.03	1
7	15885_6860912	Confined	7,954	10/10/2000	315.27	344.25	-28.98	1
7	15885_6860912	Confined	7,959	10/15/2000	320.66	344.17	-23.51	1
7	15885_6860912	Confined	7,964	10/20/2000	324.27	344.10	-19.83	1
7	15885_6860912	Confined	7,969	10/25/2000	327.41	344.02	-16.61	1
7	15885_6860912	Confined	7,974	10/30/2000	329.06	343.95	-14.89	1
7	15885_6860912	Confined	7,980	11/5/2000	332.19	343.86	-11.67	1
7	15885_6860912	Confined	7,985	11/10/2000	333.57	343.78	-10.21	1
7	15885_6860912	Confined	7,990	11/15/2000	335.14	343.71	-8.57	1
7	15885_6860912	Confined	7,995	11/20/2000	336.43	343.64	-7.21	1
7	15885_6860912	Confined	8,000	11/25/2000	337.92	343.56	-5.64	1
7	15885_6860912	Confined	8,005	11/30/2000	339.09	343.49	-4.40	1
7	15885_6860912	Confined	8,010	12/5/2000	340.31	343.41	-3.10	1
7	15885_6860912	Confined	8,020	12/15/2000	341.10	343.26	-2.16	1
7	15885_6860912	Confined	8,025	12/20/2000	342.16	343.19	-1.03	1
7	15885_6860912	Confined	8,030	12/25/2000	342.77	343.11	-0.34	1
7	15885_6860912	Confined	8,035	12/30/2000	343.31	343.04	0.27	1
7	15885_6860912	Confined	8,041	1/5/2001	344.42	343.03	1.39	1
7	15885_6860912	Confined	8,046	1/10/2001	345.03	343.04	1.99	1
7	15885_6860912	Confined	8,051	1/15/2001	344.84	343.05	1.79	1
7	15885_6860912	Confined	8,181	5/25/2001	346.01	343.27	2.74	1
7	15885_6860912	Confined	8,186	5/30/2001	342.08	343.28	-1.20	1
7	15885_6860912	Confined	8,192	6/5/2001	339.16	343.29	-4.13	1
7	15885_6860912	Confined	8,197	6/10/2001	333.37	343.30	-9.93	1
7	15885_6860912	Confined	8,202	6/15/2001	330.60	343.31	-12.71	1
7	15885_6860912	Confined	8,207	6/20/2001	329.05	343.32	-14.27	1
7	15885_6860912	Confined	8,212	6/25/2001	327.62	343.33	-15.71	1
7	15885_6860912	Confined	8,217	6/30/2001	326.62	343.34	-16.72	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	8,222	7/5/2001	330.25	343.34	-13.09	1
7	15885_6860912	Confined	8,227	7/10/2001	327.99	343.35	-15.36	1
7	15885_6860912	Confined	8,232	7/15/2001	323.20	343.36	-20.16	1
7	15885_6860912	Confined	8,237	7/20/2001	319.63	343.37	-23.74	1
7	15885_6860912	Confined	8,242	7/25/2001	314.63	343.38	-28.75	1
7	15885_6860912	Confined	8,247	7/30/2001	313.86	343.39	-29.53	1
7	15885_6860912	Confined	8,253	8/5/2001	310.71	343.40	-32.69	1
7	15885_6860912	Confined	8,258	8/10/2001	306.14	343.41	-37.27	1
7	15885_6860912	Confined	8,263	8/15/2001	304.08	343.42	-39.34	1
7	15885_6860912	Confined	8,268	8/20/2001	304.00	343.42	-39.42	1
7	15885_6860912	Confined	8,273	8/25/2001	299.97	343.43	-43.46	1
7	15885_6860912	Confined	8,278	8/30/2001	302.66	343.44	-40.78	1
7	15885_6860912	Confined	8,284	9/5/2001	313.29	343.45	-30.16	1
7	15885_6860912	Confined	8,289	9/10/2001	318.56	343.46	-24.90	1
7	15885_6860912	Confined	8,294	9/15/2001	321.05	343.47	-22.42	1
7	15885_6860912	Confined	8,299	9/20/2001	321.86	343.48	-21.62	1
7	15885_6860912	Confined	8,304	9/25/2001	322.99	343.49	-20.50	1
7	15885_6860912	Confined	8,309	9/30/2001	325.05	343.49	-18.44	1
7	15885_6860912	Confined	8,314	10/5/2001	325.73	343.50	-17.77	1
7	15885_6860912	Confined	8,319	10/10/2001	324.81	343.51	-18.70	1
7	15885_6860912	Confined	8,324	10/15/2001	326.04	343.52	-17.48	1
7	15885_6860912	Confined	8,329	10/20/2001	327.96	343.53	-15.57	1
7	15885_6860912	Confined	8,334	10/25/2001	327.79	343.54	-15.75	1
7	15885_6860912	Confined	8,339	10/30/2001	325.94	343.55	-17.61	1
7	15885_6860912	Confined	8,345	11/5/2001	324.89	343.56	-18.67	1
7	15885_6860912	Confined	8,350	11/10/2001	328.55	343.57	-15.02	1
7	15885_6860912	Confined	8,355	11/15/2001	329.35	343.57	-14.22	1
7	15885_6860912	Confined	8,360	11/20/2001	332.07	343.58	-11.51	1
7	15885_6860912	Confined	8,365	11/25/2001	333.65	343.59	-9.94	1
7	15885_6860912	Confined	8,370	11/30/2001	333.27	343.60	-10.33	1
7	15885_6860912	Confined	8,375	12/5/2001	336.25	343.61	-7.36	1
7	15885_6860912	Confined	8,380	12/10/2001	337.89	343.62	-5.73	1
7	15885_6860912	Confined	8,385	12/15/2001	339.29	343.63	-4.34	1
7	15885_6860912	Confined	8,390	12/20/2001	340.45	343.63	-3.18	1
7	15885_6860912	Confined	8,395	12/25/2001	341.56	343.64	-2.08	1
7	15885_6860912	Confined	8,400	12/30/2001	341.72	343.65	-1.93	1
7	15885_6860912	Confined	8,406	1/5/2002	342.18	343.62	-1.44	1
7	15885_6860912	Confined	8,411	1/10/2002	342.99	343.59	-0.60	1
7	15885_6860912	Confined	8,416	1/15/2002	341.82	343.56	-1.74	1
7	15885_6860912	Confined	8,421	1/20/2002	341.88	343.53	-1.65	1
7	15885_6860912	Confined	8,426	1/25/2002	341.82	343.49	-1.67	1
7	15885_6860912	Confined	8,431	1/30/2002	343.15	343.46	-0.31	1
7	15885_6860912	Confined	8,437	2/5/2002	343.59	343.42	0.17	1
7	15885_6860912	Confined	8,442	2/10/2002	344.66	343.39	1.27	1
7	15885_6860912	Confined	8,447	2/15/2002	344.20	343.36	0.84	1
7	15885_6860912	Confined	8,452	2/20/2002	342.37	343.33	-0.96	1
7	15885_6860912	Confined	8,457	2/25/2002	343.19	343.30	-0.11	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	8,460	2/28/2002	343.19	343.28	-0.09	1
7	15885_6860912	Confined	8,465	3/5/2002	342.70	343.24	-0.54	1
7	15885_6860912	Confined	8,470	3/10/2002	341.60	343.21	-1.61	1
7	15885_6860912	Confined	8,475	3/15/2002	339.93	343.18	-3.25	1
7	15885_6860912	Confined	8,480	3/20/2002	338.17	343.15	-4.98	1
7	15885_6860912	Confined	8,485	3/25/2002	340.05	343.12	-3.07	1
7	15885_6860912	Confined	8,490	3/30/2002	339.62	343.08	-3.46	1
7	15885_6860912	Confined	8,496	4/5/2002	337.22	343.05	-5.83	1
7	15885_6860912	Confined	8,501	4/10/2002	340.89	343.01	-2.12	1
7	15885_6860912	Confined	8,506	4/15/2002	342.11	342.98	-0.87	1
7	15885_6860912	Confined	8,511	4/20/2002	341.33	342.95	-1.62	1
7	15885_6860912	Confined	8,516	4/25/2002	340.61	342.92	-2.31	1
7	15885_6860912	Confined	8,521	4/30/2002	339.48	342.89	-3.41	1
7	15885_6860912	Confined	8,526	5/5/2002	337.95	342.85	-4.90	1
7	15885_6860912	Confined	8,531	5/10/2002	337.49	342.82	-5.33	1
7	15885_6860912	Confined	8,536	5/15/2002	336.76	342.79	-6.03	1
7	15885_6860912	Confined	8,541	5/20/2002	337.38	342.76	-5.38	1
7	15885_6860912	Confined	8,546	5/25/2002	333.51	342.73	-9.22	1
7	15885_6860912	Confined	8,551	5/30/2002	333.05	342.69	-9.64	1
7	15885_6860912	Confined	8,557	6/5/2002	328.16	342.66	-14.50	1
7	15885_6860912	Confined	8,562	6/10/2002	324.32	342.62	-18.30	1
7	15885_6860912	Confined	8,567	6/15/2002	321.23	342.59	-21.36	1
7	15885_6860912	Confined	8,572	6/20/2002	318.17	342.56	-24.39	1
7	15885_6860912	Confined	8,577	6/25/2002	316.76	342.53	-25.77	1
7	15885_6860912	Confined	8,582	6/30/2002	316.77	342.50	-25.73	1
7	15885_6860912	Confined	8,587	7/5/2002	323.70	342.46	-18.76	1
7	15885_6860912	Confined	8,592	7/10/2002	327.26	342.43	-15.17	1
7	15885_6860912	Confined	8,597	7/15/2002	329.96	342.40	-12.44	1
7	15885_6860912	Confined	8,602	7/20/2002	333.42	342.37	-8.95	1
7	15885_6860912	Confined	8,607	7/25/2002	334.14	342.34	-8.20	1
7	15885_6860912	Confined	8,612	7/30/2002	332.96	342.30	-9.34	1
7	15885_6860912	Confined	8,618	8/5/2002	329.59	342.27	-12.68	1
7	15885_6860912	Confined	8,623	8/10/2002	326.22	342.23	-16.01	1
7	15885_6860912	Confined	8,628	8/15/2002	324.18	342.20	-18.02	1
7	15885_6860912	Confined	8,633	8/20/2002	323.36	342.17	-18.81	1
7	15885_6860912	Confined	8,638	8/25/2002	320.98	342.14	-21.16	1
7	15885_6860912	Confined	8,643	8/30/2002	319.19	342.11	-22.92	1
7	15885_6860912	Confined	8,649	9/5/2002	317.38	342.07	-24.69	1
7	15885_6860912	Confined	8,654	9/10/2002	322.57	342.04	-19.47	1
7	15885_6860912	Confined	8,659	9/15/2002	327.81	342.00	-14.19	1
7	15885_6860912	Confined	8,664	9/20/2002	331.28	341.97	-10.69	1
7	15885_6860912	Confined	8,669	9/25/2002	333.12	341.94	-8.82	1
7	15885_6860912	Confined	8,674	9/30/2002	332.94	341.91	-8.97	1
7	15885_6860912	Confined	8,679	10/5/2002	330.59	341.88	-11.29	1
7	15885_6860912	Confined	8,684	10/10/2002	333.32	341.84	-8.52	1
7	15885_6860912	Confined	8,689	10/15/2002	335.85	341.81	-5.96	1
7	15885_6860912	Confined	8,694	10/20/2002	337.34	341.78	-4.44	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	8,699	10/25/2002	339.45	341.75	-2.30	1
7	15885_6860912	Confined	8,704	10/30/2002	340.93	341.72	-0.79	1
7	15885_6860912	Confined	8,725	11/20/2002	343.39	341.58	1.81	1
7	15885_6860912	Confined	8,730	11/25/2002	344.08	341.55	2.53	1
7	15885_6860912	Confined	8,735	11/30/2002	344.91	341.52	3.39	1
7	15885_6860912	Confined	8,740	12/5/2002	345.21	341.49	3.72	1
7	15885_6860912	Confined	8,745	12/10/2002	346.47	341.45	5.02	1
7	15885_6860912	Confined	8,750	12/15/2002	347.34	341.42	5.92	1
7	15885_6860912	Confined	8,755	12/20/2002	347.79	341.39	6.40	1
7	15885_6860912	Confined	8,760	12/25/2002	348.34	341.36	6.98	1
7	15885_6860912	Confined	8,765	12/30/2002	349.05	341.33	7.72	1
7	15885_6860912	Confined	8,771	1/5/2003	348.96	341.32	7.64	1
7	15885_6860912	Confined	8,776	1/10/2003	348.97	341.32	7.65	1
7	15885_6860912	Confined	8,781	1/15/2003	349.55	341.33	8.22	1
7	15885_6860912	Confined	8,786	1/20/2003	350.17	341.33	8.84	1
7	15885_6860912	Confined	8,791	1/25/2003	350.00	341.33	8.67	1
7	15885_6860912	Confined	8,796	1/30/2003	350.97	341.34	9.63	1
7	15885_6860912	Confined	8,802	2/5/2003	351.49	341.34	10.15	1
7	15885_6860912	Confined	8,807	2/10/2003	352.07	341.34	10.73	1
7	15885_6860912	Confined	8,812	2/15/2003	352.16	341.35	10.81	1
7	15885_6860912	Confined	8,817	2/20/2003	351.83	341.35	10.48	1
7	15885_6860912	Confined	8,822	2/25/2003	352.54	341.35	11.19	1
7	15885_6860912	Confined	8,825	2/28/2003	352.54	341.35	11.19	1
7	15885_6860912	Confined	8,830	3/5/2003	353.60	341.36	12.24	1
7	15885_6860912	Confined	8,835	3/10/2003	353.75	341.36	12.39	1
7	15885_6860912	Confined	8,840	3/15/2003	353.89	341.36	12.53	1
7	15885_6860912	Confined	8,845	3/20/2003	353.52	341.36	12.16	1
7	15885_6860912	Confined	8,850	3/25/2003	353.69	341.37	12.32	1
7	15885_6860912	Confined	8,855	3/30/2003	353.16	341.37	11.79	1
7	15885_6860912	Confined	8,861	4/5/2003	353.20	341.37	11.83	1
7	15885_6860912	Confined	8,866	4/10/2003	351.25	341.38	9.87	1
7	15885_6860912	Confined	8,871	4/15/2003	351.32	341.38	9.94	1
7	15885_6860912	Confined	8,876	4/20/2003	350.31	341.38	8.93	1
7	15885_6860912	Confined	8,881	4/25/2003	349.19	341.39	7.80	1
7	15885_6860912	Confined	8,886	4/30/2003	346.71	341.39	5.32	1
7	15885_6860912	Confined	8,891	5/5/2003	347.19	341.39	5.80	1
7	15885_6860912	Confined	8,896	5/10/2003	345.21	341.39	3.82	1
7	15885_6860912	Confined	8,901	5/15/2003	342.95	341.40	1.55	1
7	15885_6860912	Confined	8,906	5/20/2003	340.76	341.40	-0.64	1
7	15885_6860912	Confined	8,911	5/25/2003	336.04	341.40	-5.36	1
7	15885_6860912	Confined	8,916	5/30/2003	333.77	341.41	-7.64	1
7	15885_6860912	Confined	8,922	6/5/2003	333.32	341.41	-8.09	1
7	15885_6860912	Confined	8,927	6/10/2003	335.58	341.41	-5.83	1
7	15885_6860912	Confined	8,932	6/15/2003	337.61	341.41	-3.80	1
7	15885_6860912	Confined	8,937	6/20/2003	338.62	341.42	-2.80	1
7	15885_6860912	Confined	8,942	6/25/2003	337.35	341.42	-4.07	1
7	15885_6860912	Confined	8,947	6/30/2003	336.28	341.42	-5.14	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	8,952	7/5/2003	334.25	341.43	-7.18	1
7	15885_6860912	Confined	8,957	7/10/2003	339.16	341.43	-2.27	1
7	15885_6860912	Confined	8,962	7/15/2003	340.16	341.43	-1.27	1
7	15885_6860912	Confined	8,967	7/20/2003	341.89	341.44	0.45	1
7	15885_6860912	Confined	8,972	7/25/2003	341.51	341.44	0.07	1
7	15885_6860912	Confined	8,977	7/30/2003	342.83	341.44	1.39	1
7	15885_6860912	Confined	8,983	8/5/2003	340.03	341.44	-1.41	1
7	15885_6860912	Confined	8,988	8/10/2003	335.30	341.45	-6.15	1
7	15885_6860912	Confined	8,993	8/15/2003	333.63	341.45	-7.82	1
7	15885_6860912	Confined	8,998	8/20/2003	333.01	341.45	-8.44	1
7	15885_6860912	Confined	9,003	8/25/2003	328.61	341.46	-12.85	1
7	15885_6860912	Confined	9,008	8/30/2003	326.88	341.46	-14.58	1
7	15885_6860912	Confined	9,014	9/5/2003	332.56	341.46	-8.90	1
7	15885_6860912	Confined	9,019	9/10/2003	335.85	341.47	-5.62	1
7	15885_6860912	Confined	9,024	9/15/2003	338.64	341.47	-2.83	1
7	15885_6860912	Confined	9,029	9/20/2003	340.84	341.47	-0.63	1
7	15885_6860912	Confined	9,034	9/25/2003	342.78	341.47	1.31	1
7	15885_6860912	Confined	9,039	9/30/2003	343.33	341.48	1.85	1
7	15885_6860912	Confined	9,044	10/5/2003	344.08	341.48	2.60	1
7	15885_6860912	Confined	9,049	10/10/2003	343.68	341.48	2.20	1
7	15885_6860912	Confined	9,054	10/15/2003	345.67	341.49	4.18	1
7	15885_6860912	Confined	9,059	10/20/2003	346.41	341.49	4.92	1
7	15885_6860912	Confined	9,064	10/25/2003	346.35	341.49	4.86	1
7	15885_6860912	Confined	9,069	10/30/2003	346.93	341.49	5.44	1
7	15885_6860912	Confined	9,075	11/5/2003	348.11	341.50	6.61	1
7	15885_6860912	Confined	9,080	11/10/2003	347.89	341.50	6.39	1
7	15885_6860912	Confined	9,085	11/15/2003	348.07	341.50	6.57	1
7	15885_6860912	Confined	9,090	11/20/2003	348.05	341.51	6.54	1
7	15885_6860912	Confined	9,095	11/25/2003	347.23	341.51	5.72	1
7	15885_6860912	Confined	9,100	11/30/2003	346.32	341.51	4.81	1
7	15885_6860912	Confined	9,105	12/5/2003	347.16	341.52	5.64	1
7	15885_6860912	Confined	9,110	12/10/2003	346.89	341.52	5.37	1
7	15885_6860912	Confined	9,115	12/15/2003	347.45	341.52	5.93	1
7	15885_6860912	Confined	9,120	12/20/2003	347.50	341.52	5.98	1
7	15885_6860912	Confined	9,125	12/25/2003	347.35	341.53	5.82	1
7	15885_6860912	Confined	9,130	12/30/2003	347.64	341.53	6.11	1
7	15885_6860912	Confined	9,136	1/5/2004	347.46	341.57	5.89	1
7	15885_6860912	Confined	9,140	1/9/2004	347.64	341.59	6.05	1
7	15885_6860912	Confined	9,141	1/10/2004	346.38	341.60	4.78	1
7	15885_6860912	Confined	9,146	1/15/2004	347.39	341.63	5.76	1
7	15885_6860912	Confined	9,151	1/20/2004	348.89	341.67	7.22	1
7	15885_6860912	Confined	9,156	1/25/2004	350.19	341.70	8.49	1
7	15885_6860912	Confined	9,161	1/30/2004	350.79	341.74	9.05	1
7	15885_6860912	Confined	9,167	2/5/2004	351.58	341.78	9.80	1
7	15885_6860912	Confined	9,172	2/10/2004	351.41	341.82	9.59	1
7	15885_6860912	Confined	9,177	2/15/2004	352.31	341.85	10.46	1
7	15885_6860912	Confined	9,182	2/20/2004	352.76	341.89	10.87	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	9,187	2/25/2004	353.17	341.92	11.25	1
7	15885_6860912	Confined	9,190	2/28/2004	353.17	341.94	11.23	1
7	15885_6860912	Confined	9,191	2/29/2004	353.82	341.95	11.87	1
7	15885_6860912	Confined	9,196	3/5/2004	354.21	341.98	12.23	1
7	15885_6860912	Confined	9,201	3/10/2004	353.93	342.02	11.91	1
7	15885_6860912	Confined	9,206	3/15/2004	354.31	342.05	12.26	1
7	15885_6860912	Confined	9,211	3/20/2004	353.93	342.09	11.84	1
7	15885_6860912	Confined	9,216	3/25/2004	354.44	342.12	12.32	1
7	15885_6860912	Confined	9,221	3/30/2004	354.33	342.16	12.17	1
7	15885_6860912	Confined	9,227	4/5/2004	354.96	342.20	12.76	1
7	15885_6860912	Confined	9,232	4/10/2004	355.49	342.23	13.26	1
7	15885_6860912	Confined	9,237	4/15/2004	355.74	342.27	13.47	1
7	15885_6860912	Confined	9,242	4/20/2004	355.57	342.30	13.27	1
7	15885_6860912	Confined	9,247	4/25/2004	355.23	342.34	12.89	1
7	15885_6860912	Confined	9,252	4/30/2004	355.99	342.37	13.62	1
7	15885_6860912	Confined	9,257	5/5/2004	355.92	342.41	13.51	1
7	15885_6860912	Confined	9,262	5/10/2004	355.64	342.44	13.20	1
7	15885_6860912	Confined	9,267	5/15/2004	355.93	342.48	13.45	1
7	15885_6860912	Confined	9,272	5/20/2004	355.01	342.51	12.50	1
7	15885_6860912	Confined	9,277	5/25/2004	352.92	342.55	10.37	1
7	15885_6860912	Confined	9,282	5/30/2004	350.65	342.58	8.07	1
7	15885_6860912	Confined	9,288	6/5/2004	345.72	342.62	3.10	1
7	15885_6860912	Confined	9,293	6/10/2004	347.56	342.66	4.90	1
7	15885_6860912	Confined	9,298	6/15/2004	348.73	342.69	6.04	1
7	15885_6860912	Confined	9,303	6/20/2004	347.84	342.73	5.11	1
7	15885_6860912	Confined	9,308	6/25/2004	349.41	342.76	6.65	1
7	15885_6860912	Confined	9,313	6/30/2004	351.04	342.80	8.24	1
7	15885_6860912	Confined	9,318	7/5/2004	352.78	342.83	9.95	1
7	15885_6860912	Confined	9,323	7/10/2004	351.09	342.87	8.22	1
7	15885_6860912	Confined	9,328	7/15/2004	350.64	342.90	7.74	1
7	15885_6860912	Confined	9,333	7/20/2004	348.75	342.94	5.81	1
7	15885_6860912	Confined	9,338	7/25/2004	348.23	342.97	5.26	1
7	15885_6860912	Confined	9,343	7/30/2004	345.90	343.01	2.89	1
7	15885_6860912	Confined	9,349	8/5/2004	345.10	343.05	2.05	1
7	15885_6860912	Confined	9,354	8/10/2004	345.69	343.08	2.61	1
7	15885_6860912	Confined	9,359	8/15/2004	343.42	343.12	0.30	1
7	15885_6860912	Confined	9,364	8/20/2004	339.81	343.15	-3.34	1
7	15885_6860912	Confined	9,369	8/25/2004	341.12	343.19	-2.07	1
7	15885_6860912	Confined	9,374	8/30/2004	343.34	343.22	0.12	1
7	15885_6860912	Confined	9,380	9/5/2004	347.04	343.27	3.77	1
7	15885_6860912	Confined	9,385	9/10/2004	348.70	343.30	5.40	1
7	15885_6860912	Confined	9,390	9/15/2004	347.12	343.34	3.78	1
7	15885_6860912	Confined	9,395	9/20/2004	347.78	343.37	4.41	1
7	15885_6860912	Confined	9,400	9/25/2004	345.20	343.41	1.79	1
7	15885_6860912	Confined	9,405	9/30/2004	345.29	343.44	1.85	1
7	15885_6860912	Confined	9,410	10/5/2004	346.86	343.47	3.39	1
7	15885_6860912	Confined	9,415	10/10/2004	348.69	343.51	5.18	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	9,420	10/15/2004	348.31	343.54	4.77	1
7	15885_6860912	Confined	9,425	10/20/2004	347.82	343.58	4.24	1
7	15885_6860912	Confined	9,430	10/25/2004	349.62	343.61	6.01	1
7	15885_6860912	Confined	9,435	10/30/2004	351.04	343.65	7.39	1
7	15885_6860912	Confined	9,441	11/5/2004	351.55	343.69	7.86	1
7	15885_6860912	Confined	9,446	11/10/2004	352.33	343.73	8.60	1
7	15885_6860912	Confined	9,451	11/15/2004	352.97	343.76	9.21	1
7	15885_6860912	Confined	9,456	11/20/2004	354.36	343.80	10.56	1
7	15885_6860912	Confined	9,461	11/25/2004	355.50	343.83	11.67	1
7	15885_6860912	Confined	9,466	11/30/2004	356.41	343.87	12.54	1
7	15885_6860912	Confined	9,471	12/5/2004	357.30	343.90	13.40	1
7	15885_6860912	Confined	9,476	12/10/2004	357.87	343.93	13.94	1
7	15885_6860912	Confined	9,481	12/15/2004	357.96	343.97	13.99	1
7	15885_6860912	Confined	9,486	12/20/2004	358.26	344.00	14.26	1
7	15885_6860912	Confined	9,491	12/25/2004	358.12	344.04	14.08	1
7	15885_6860912	Confined	9,496	12/30/2004	358.91	344.07	14.84	1
7	15885_6860912	Confined	9,502	1/5/2005	358.95	344.06	14.89	1
7	15885_6860912	Confined	9,507	1/10/2005	359.09	344.04	15.05	1
7	15885_6860912	Confined	9,512	1/15/2005	357.53	344.02	13.51	1
7	15885_6860912	Confined	9,517	1/20/2005	359.20	344.00	15.20	1
7	15885_6860912	Confined	9,522	1/25/2005	358.43	343.98	14.45	1
7	15885_6860912	Confined	9,527	1/30/2005	359.04	343.96	15.08	1
7	15885_6860912	Confined	9,528	1/31/2005	348.84	343.95	4.89	1
7	15885_6860912	Confined	9,533	2/5/2005	360.11	343.93	16.18	1
7	15885_6860912	Confined	9,538	2/10/2005	360.90	343.91	16.99	1
7	15885_6860912	Confined	9,543	2/15/2005	361.27	343.89	17.38	1
7	15885_6860912	Confined	9,548	2/20/2005	361.36	343.87	17.49	1
7	15885_6860912	Confined	9,553	2/25/2005	361.83	343.85	17.98	1
7	15885_6860912	Confined	9,556	2/28/2005	361.83	343.84	17.99	1
7	15885_6860912	Confined	9,561	3/5/2005	362.62	343.82	18.80	1
7	15885_6860912	Confined	9,566	3/10/2005	363.08	343.80	19.28	1
7	15885_6860912	Confined	9,571	3/15/2005	363.26	343.77	19.49	1
7	15885_6860912	Confined	9,576	3/20/2005	363.50	343.75	19.75	1
7	15885_6860912	Confined	9,581	3/25/2005	362.92	343.73	19.19	1
7	15885_6860912	Confined	9,586	3/30/2005	362.66	343.71	18.95	1
7	15885_6860912	Confined	9,592	4/5/2005	360.33	343.69	16.64	1
7	15885_6860912	Confined	9,597	4/10/2005	357.90	343.67	14.23	1
7	15885_6860912	Confined	9,602	4/15/2005	355.63	343.65	11.98	1
7	15885_6860912	Confined	9,607	4/20/2005	355.55	343.63	11.92	1
7	15885_6860912	Confined	9,612	4/25/2005	356.37	343.60	12.77	1
7	15885_6860912	Confined	9,617	4/30/2005	354.64	343.58	11.06	1
7	15885_6860912	Confined	9,622	5/5/2005	353.60	343.56	10.04	1
7	15885_6860912	Confined	9,627	5/10/2005	354.27	343.54	10.73	1
7	15885_6860912	Confined	9,632	5/15/2005	352.48	343.52	8.96	1
7	15885_6860912	Confined	9,637	5/20/2005	353.67	343.50	10.17	1
7	15885_6860912	Confined	9,642	5/25/2005	352.80	343.48	9.32	1
7	15885_6860912	Confined	9,647	5/30/2005	352.38	343.46	8.92	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	9,653	6/5/2005	352.87	343.43	9.44	1
7	15885_6860912	Confined	9,658	6/10/2005	352.67	343.41	9.26	1
7	15885_6860912	Confined	9,663	6/15/2005	348.71	343.39	5.32	1
7	15885_6860912	Confined	9,668	6/20/2005	347.60	343.37	4.23	1
7	15885_6860912	Confined	9,673	6/25/2005	342.11	343.35	-1.24	1
7	15885_6860912	Confined	9,678	6/30/2005	342.82	343.33	-0.51	1
7	15885_6860912	Confined	9,683	7/5/2005	339.68	343.31	-3.63	1
7	15885_6860912	Confined	9,688	7/10/2005	335.38	343.29	-7.91	1
7	15885_6860912	Confined	9,693	7/15/2005	333.90	343.27	-9.37	1
7	15885_6860912	Confined	9,698	7/20/2005	337.70	343.25	-5.55	1
7	15885_6860912	Confined	9,703	7/25/2005	337.41	343.23	-5.82	1
7	15885_6860912	Confined	9,708	7/30/2005	336.03	343.21	-7.18	1
7	15885_6860912	Confined	9,714	8/5/2005	334.82	343.18	-8.36	1
7	15885_6860912	Confined	9,719	8/10/2005	335.09	343.16	-8.07	1
7	15885_6860912	Confined	9,724	8/15/2005	336.49	343.14	-6.65	1
7	15885_6860912	Confined	9,729	8/20/2005	334.50	343.12	-8.62	1
7	15885_6860912	Confined	9,734	8/25/2005	332.48	343.10	-10.62	1
7	15885_6860912	Confined	9,739	8/30/2005	329.95	343.08	-13.13	1
7	15885_6860912	Confined	9,745	9/5/2005	329.89	343.05	-13.16	1
7	15885_6860912	Confined	9,750	9/10/2005	328.79	343.03	-14.24	1
7	15885_6860912	Confined	9,755	9/15/2005	332.86	343.01	-10.15	1
7	15885_6860912	Confined	9,760	9/20/2005	333.27	342.99	-9.72	1
7	15885_6860912	Confined	9,765	9/25/2005	332.86	342.97	-10.11	1
7	15885_6860912	Confined	9,770	9/30/2005	329.72	342.95	-13.23	1
7	15885_6860912	Confined	9,775	10/5/2005	329.69	342.93	-13.24	1
7	15885_6860912	Confined	9,780	10/10/2005	330.73	342.91	-12.18	1
7	15885_6860912	Confined	9,785	10/15/2005	335.51	342.89	-7.38	1
7	15885_6860912	Confined	9,790	10/20/2005	334.44	342.87	-8.43	1
7	15885_6860912	Confined	9,795	10/25/2005	337.48	342.85	-5.37	1
7	15885_6860912	Confined	9,800	10/30/2005	340.20	342.83	-2.63	1
7	15885_6860912	Confined	9,806	11/5/2005	339.29	342.80	-3.51	1
7	15885_6860912	Confined	9,811	11/10/2005	339.63	342.78	-3.15	1
7	15885_6860912	Confined	9,816	11/15/2005	341.61	342.76	-1.15	1
7	15885_6860912	Confined	9,821	11/20/2005	340.76	342.74	-1.98	1
7	15885_6860912	Confined	9,826	11/25/2005	341.40	342.72	-1.32	1
7	15885_6860912	Confined	9,831	11/30/2005	342.80	342.70	0.10	1
7	15885_6860912	Confined	9,836	12/5/2005	343.30	342.68	0.62	1
7	15885_6860912	Confined	9,841	12/10/2005	344.19	342.66	1.53	1
7	15885_6860912	Confined	9,846	12/15/2005	345.65	342.63	3.02	1
7	15885_6860912	Confined	9,851	12/20/2005	346.74	342.61	4.13	1
7	15885_6860912	Confined	9,856	12/25/2005	347.89	342.59	5.30	1
7	15885_6860912	Confined	9,861	12/30/2005	347.16	342.57	4.59	1
7	15885_6860912	Confined	9,865	1/3/2006	346.54	342.58	3.96	1
7	15885_6860912	Confined	9,867	1/5/2006	344.45	342.59	1.86	1
7	15885_6860912	Confined	9,872	1/10/2006	345.12	342.61	2.51	1
7	15885_6860912	Confined	9,877	1/15/2006	345.02	342.62	2.40	1
7	15885_6860912	Confined	9,882	1/20/2006	345.36	342.64	2.72	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	9,887	1/25/2006	346.61	342.66	3.95	1
7	15885_6860912	Confined	9,892	1/30/2006	348.18	342.68	5.50	1
7	15885_6860912	Confined	9,898	2/5/2006	346.94	342.70	4.24	1
7	15885_6860912	Confined	9,903	2/10/2006	346.17	342.72	3.45	1
7	15885_6860912	Confined	9,908	2/15/2006	346.04	342.74	3.30	1
7	15885_6860912	Confined	9,913	2/20/2006	345.60	342.76	2.84	1
7	15885_6860912	Confined	9,918	2/25/2006	347.70	342.78	4.92	1
7	15885_6860912	Confined	9,921	2/28/2006	347.70	342.79	4.91	1
7	15885_6860912	Confined	9,926	3/5/2006	344.77	342.81	1.96	1
7	15885_6860912	Confined	9,931	3/10/2006	344.53	342.82	1.71	1
7	15885_6860912	Confined	9,936	3/15/2006	341.22	342.84	-1.62	1
7	15885_6860912	Confined	9,941	3/20/2006	342.18	342.86	-0.68	1
7	15885_6860912	Confined	9,946	3/25/2006	343.42	342.88	0.54	1
7	15885_6860912	Confined	9,951	3/30/2006	344.38	342.90	1.48	1
7	15885_6860912	Confined	9,957	4/5/2006	340.25	342.92	-2.67	1
7	15885_6860912	Confined	9,962	4/10/2006	339.07	342.94	-3.87	1
7	15885_6860912	Confined	9,967	4/15/2006	334.73	342.96	-8.23	1
7	15885_6860912	Confined	9,972	4/20/2006	331.51	342.98	-11.47	1
7	15885_6860912	Confined	9,977	4/25/2006	330.10	343.00	-12.90	1
7	15885_6860912	Confined	9,982	4/30/2006	330.51	343.01	-12.50	1
7	15885_6860912	Confined	9,987	5/5/2006	330.46	343.03	-12.57	1
7	15885_6860912	Confined	9,992	5/10/2006	330.89	343.05	-12.16	1
7	15885_6860912	Confined	9,997	5/15/2006	327.63	343.07	-15.44	1
7	15885_6860912	Confined	10,002	5/20/2006	325.32	343.09	-17.77	1
7	15885_6860912	Confined	10,007	5/25/2006	323.34	343.11	-19.77	1
7	15885_6860912	Confined	10,012	5/30/2006	318.81	343.13	-24.32	1
7	15885_6860912	Confined	10,018	6/5/2006	322.44	343.15	-20.71	1
7	15885_6860912	Confined	10,023	6/10/2006	320.58	343.17	-22.59	1
7	15885_6860912	Confined	10,028	6/15/2006	317.88	343.18	-25.30	1
7	15885_6860912	Confined	10,033	6/20/2006	318.35	343.20	-24.85	1
7	15885_6860912	Confined	10,038	6/25/2006	314.24	343.22	-28.98	1
7	15885_6860912	Confined	10,043	6/30/2006	312.76	343.24	-30.48	1
7	15885_6860912	Confined	10,048	7/5/2006	317.57	343.26	-25.69	1
7	15885_6860912	Confined	10,053	7/10/2006	320.11	343.28	-23.17	1
7	15885_6860912	Confined	10,058	7/15/2006	316.92	343.30	-26.38	1
7	15885_6860912	Confined	10,063	7/20/2006	314.14	343.31	-29.17	1
7	15885_6860912	Confined	10,068	7/25/2006	314.89	343.33	-28.44	1
7	15885_6860912	Confined	10,073	7/30/2006	314.95	343.35	-28.40	1
7	15885_6860912	Confined	10,079	8/5/2006	313.34	343.37	-30.03	1
7	15885_6860912	Confined	10,084	8/10/2006	309.99	343.39	-33.40	1
7	15885_6860912	Confined	10,089	8/15/2006	310.12	343.41	-33.29	1
7	15885_6860912	Confined	10,094	8/20/2006	307.22	343.43	-36.21	1
7	15885_6860912	Confined	10,099	8/25/2006	308.26	343.45	-35.19	1
7	15885_6860912	Confined	10,104	8/30/2006	306.96	343.47	-36.51	1
7	15885_6860912	Confined	10,110	9/5/2006	306.65	343.49	-36.84	1
7	15885_6860912	Confined	10,115	9/10/2006	307.83	343.51	-35.68	1
7	15885_6860912	Confined	10,120	9/15/2006	313.30	343.53	-30.23	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	10,125	9/20/2006	317.10	343.54	-26.44	1
7	15885_6860912	Confined	10,130	9/25/2006	319.43	343.56	-24.13	1
7	15885_6860912	Confined	10,135	9/30/2006	319.76	343.58	-23.82	1
7	15885_6860912	Confined	10,140	10/5/2006	317.94	343.60	-25.66	1
7	15885_6860912	Confined	10,145	10/10/2006	318.95	343.62	-24.67	1
7	15885_6860912	Confined	10,150	10/15/2006	321.75	343.64	-21.89	1
7	15885_6860912	Confined	10,155	10/20/2006	322.54	343.66	-21.12	1
7	15885_6860912	Confined	10,160	10/25/2006	319.69	343.67	-23.98	1
7	15885_6860912	Confined	10,165	10/30/2006	321.15	343.69	-22.54	1
7	15885_6860912	Confined	10,171	11/5/2006	323.12	343.72	-20.60	1
7	15885_6860912	Confined	10,176	11/10/2006	323.05	343.73	-20.68	1
7	15885_6860912	Confined	10,181	11/15/2006	322.93	343.75	-20.82	1
7	15885_6860912	Confined	10,186	11/20/2006	322.98	343.77	-20.79	1
7	15885_6860912	Confined	10,191	11/25/2006	324.52	343.79	-19.27	1
7	15885_6860912	Confined	10,196	11/30/2006	323.49	343.81	-20.32	1
7	15885_6860912	Confined	10,201	12/5/2006	325.36	343.83	-18.47	1
7	15885_6860912	Confined	10,206	12/10/2006	326.49	343.85	-17.36	1
7	15885_6860912	Confined	10,211	12/15/2006	325.89	343.86	-17.97	1
7	15885_6860912	Confined	10,216	12/20/2006	326.57	343.88	-17.31	1
7	15885_6860912	Confined	10,221	12/25/2006	329.30	343.90	-14.60	1
7	15885_6860912	Confined	10,226	12/30/2006	331.58	343.92	-12.34	1
7	15885_6860912	Confined	10,231	1/4/2007	333.64	344.01	-10.37	1
7	15885_6860912	Confined	10,232	1/5/2007	333.98	344.03	-10.05	1
7	15885_6860912	Confined	10,237	1/10/2007	335.24	344.13	-8.89	1
7	15885_6860912	Confined	10,242	1/15/2007	336.59	344.23	-7.64	1
7	15885_6860912	Confined	10,252	1/25/2007	339.09	344.44	-5.35	1
7	15885_6860912	Confined	10,257	1/30/2007	340.28	344.54	-4.26	1
7	15885_6860912	Confined	10,263	2/5/2007	341.59	344.66	-3.07	1
7	15885_6860912	Confined	10,268	2/10/2007	342.82	344.77	-1.95	1
7	15885_6860912	Confined	10,273	2/15/2007	343.42	344.87	-1.45	1
7	15885_6860912	Confined	10,278	2/20/2007	344.20	344.97	-0.77	1
7	15885_6860912	Confined	10,283	2/25/2007	344.60	345.07	-0.47	1
7	15885_6860912	Confined	10,286	2/28/2007	344.06	345.14	-1.08	1
7	15885_6860912	Confined	10,291	3/5/2007	343.16	345.24	-2.08	1
7	15885_6860912	Confined	10,296	3/10/2007	342.91	345.34	-2.43	1
7	15885_6860912	Confined	10,301	3/15/2007	344.10	345.44	-1.34	1
7	15885_6860912	Confined	10,306	3/20/2007	345.66	345.55	0.11	1
7	15885_6860912	Confined	10,311	3/25/2007	346.91	345.65	1.26	1
7	15885_6860912	Confined	10,316	3/30/2007	348.12	345.75	2.37	1
7	15885_6860912	Confined	10,322	4/5/2007	349.04	345.87	3.17	1
7	15885_6860912	Confined	10,327	4/10/2007	350.05	345.98	4.07	1
7	15885_6860912	Confined	10,332	4/15/2007	350.35	346.08	4.27	1
7	15885_6860912	Confined	10,337	4/20/2007	349.54	346.18	3.36	1
7	15885_6860912	Confined	10,342	4/25/2007	349.31	346.29	3.02	1
7	15885_6860912	Confined	10,347	4/30/2007	349.84	346.39	3.45	1
7	15885_6860912	Confined	10,352	5/5/2007	350.72	346.49	4.23	1
7	15885_6860912	Confined	10,357	5/10/2007	351.07	346.59	4.48	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	10,362	5/15/2007	351.39	346.70	4.69	1
7	15885_6860912	Confined	10,367	5/20/2007	348.59	346.80	1.79	1
7	15885_6860912	Confined	10,372	5/25/2007	350.33	346.90	3.43	1
7	15885_6860912	Confined	10,377	5/30/2007	351.77	347.00	4.77	1
7	15885_6860912	Confined	10,383	6/5/2007	349.72	347.13	2.59	1
7	15885_6860912	Confined	10,388	6/10/2007	350.72	347.23	3.49	1
7	15885_6860912	Confined	10,393	6/15/2007	348.06	347.33	0.73	1
7	15885_6860912	Confined	10,398	6/20/2007	348.65	347.44	1.21	1
7	15885_6860912	Confined	10,403	6/25/2007	350.37	347.54	2.83	1
7	15885_6860912	Confined	10,408	6/30/2007	352.07	347.64	4.43	1
7	15885_6860912	Confined	10,413	7/5/2007	352.95	347.74	5.21	1
7	15885_6860912	Confined	10,418	7/10/2007	354.17	347.85	6.32	1
7	15885_6860912	Confined	10,423	7/15/2007	352.61	347.95	4.66	1
7	15885_6860912	Confined	10,428	7/20/2007	353.60	348.05	5.55	1
7	15885_6860912	Confined	10,433	7/25/2007	354.87	348.15	6.72	1
7	15885_6860912	Confined	10,438	7/30/2007	355.89	348.26	7.63	1
7	15885_6860912	Confined	10,444	8/5/2007	354.77	348.38	6.39	1
7	15885_6860912	Confined	10,449	8/10/2007	353.18	348.48	4.70	1
7	15885_6860912	Confined	10,454	8/15/2007	350.69	348.59	2.10	1
7	15885_6860912	Confined	10,459	8/20/2007	352.70	348.69	4.01	1
7	15885_6860912	Confined	10,464	8/25/2007	352.80	348.79	4.01	1
7	15885_6860912	Confined	10,469	8/30/2007	351.73	348.89	2.84	1
7	15885_6860912	Confined	10,475	9/5/2007	353.02	349.02	4.00	1
7	15885_6860912	Confined	10,480	9/10/2007	352.78	349.12	3.66	1
7	15885_6860912	Confined	10,485	9/15/2007	350.42	349.22	1.20	1
7	15885_6860912	Confined	10,490	9/20/2007	349.56	349.32	0.24	1
7	15885_6860912	Confined	10,495	9/25/2007	347.95	349.43	-1.48	1
7	15885_6860912	Confined	10,500	9/30/2007	345.40	349.53	-4.13	1
7	15885_6860912	Confined	10,505	10/5/2007	345.68	349.63	-3.95	1
7	15885_6860912	Confined	10,510	10/10/2007	344.89	349.74	-4.85	1
7	15885_6860912	Confined	10,515	10/15/2007	344.81	349.84	-5.03	1
7	15885_6860912	Confined	10,520	10/20/2007	345.77	349.94	-4.17	1
7	15885_6860912	Confined	10,525	10/25/2007	348.29	350.04	-1.75	1
7	15885_6860912	Confined	10,530	10/30/2007	348.62	350.15	-1.53	1
7	15885_6860912	Confined	10,536	11/5/2007	347.04	350.27	-3.23	1
7	15885_6860912	Confined	10,541	11/10/2007	347.37	350.37	-3.00	1
7	15885_6860912	Confined	10,546	11/15/2007	347.45	350.47	-3.02	1
7	15885_6860912	Confined	10,551	11/20/2007	348.99	350.58	-1.59	1
7	15885_6860912	Confined	10,556	11/25/2007	350.04	350.68	-0.64	1
7	15885_6860912	Confined	10,561	11/30/2007	352.53	350.78	1.75	1
7	15885_6860912	Confined	10,566	12/5/2007	352.17	350.89	1.28	1
7	15885_6860912	Confined	10,571	12/10/2007	353.22	350.99	2.23	1
7	15885_6860912	Confined	10,576	12/15/2007	354.54	351.09	3.45	1
7	15885_6860912	Confined	10,581	12/20/2007	354.96	351.19	3.77	1
7	15885_6860912	Confined	10,586	12/25/2007	355.12	351.30	3.82	1
7	15885_6860912	Confined	10,591	12/30/2007	353.70	351.40	2.30	1
7	15885_6860912	Confined	10,594	1/2/2008	353.49	351.40	2.09	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15885_6860912	Confined	10,597	1/5/2008	353.20	351.36	1.84	1
7	15885_6860912	Confined	10,602	1/10/2008	353.52	351.31	2.21	1
7	15885_6860912	Confined	10,607	1/15/2008	354.94	351.25	3.69	1
7	15885_6860912	Confined	10,612	1/20/2008	355.93	351.20	4.73	1
7	15885_6860912	Confined	10,617	1/25/2008	356.79	351.14	5.65	1
7	15885_6860912	Confined	10,622	1/30/2008	357.66	351.09	6.57	1
7	15885_6860912	Confined	10,628	2/5/2008	357.36	351.02	6.34	1
7	15885_6860912	Confined	10,633	2/10/2008	355.42	350.96	4.46	1
7	15885_6860912	Confined	10,638	2/15/2008	356.42	350.91	5.51	1
7	15885_6860912	Confined	10,643	2/20/2008	356.55	350.85	5.70	1
7	15885_6860912	Confined	10,648	2/25/2008	355.93	350.80	5.13	1
7	15885_6860912	Confined	10,652	2/29/2008	354.64	350.75	3.89	1
7	15885_6860912	Confined	10,657	3/5/2008	353.58	350.70	2.88	1
7	15885_6860912	Confined	10,662	3/10/2008	353.30	350.64	2.66	1
7	15885_6860912	Confined	10,667	3/15/2008	354.75	350.59	4.16	1
7	15885_6860912	Confined	10,672	3/20/2008	354.41	350.53	3.88	1
7	15885_6860912	Confined	10,677	3/25/2008	353.27	350.47	2.80	1
7	15885_6860912	Confined	10,682	3/30/2008	351.26	350.42	0.84	1
7	15885_6860912	Confined	10,688	4/5/2008	351.82	350.35	1.47	1
7	15885_6860912	Confined	10,693	4/10/2008	350.07	350.30	-0.23	1
7	15885_6860912	Confined	10,698	4/15/2008	347.39	350.24	-2.85	1
7	15885_6860912	Confined	10,703	4/20/2008	347.46	350.18	-2.72	1
7	15885_6860912	Confined	10,708	4/25/2008	349.39	350.13	-0.74	1
7	15885_6860912	Confined	10,713	4/30/2008	351.12	350.07	1.05	1
7	15885_6860912	Confined	10,718	5/5/2008	349.47	350.02	-0.55	1
7	15885_6860912	Confined	10,723	5/10/2008	348.36	349.96	-1.60	1
7	15885_6860912	Confined	10,993	2/4/2009	351.04	346.61	4.43	1
7	15885_6860912	Confined	11,338	1/15/2010	342.84	339.10	3.74	1
7	15898_6860527	Confined	2,434	8/30/1985	364.21	366.01	-1.80	1
7	15898_6860527	Confined	11,384	3/2/2010	370.21	335.51	34.70	1
7	15903_6861304	Confined	8,773	1/7/2003	365.49	350.45	15.04	1
7	15903_6861304	Confined	9,143	1/12/2004	361.69	352.69	9.00	1
7	15903_6861304	Confined	9,532	2/4/2005	404.69	357.66	47.03	1
7	15903_6861304	Confined	9,872	1/10/2006	396.69	355.75	40.94	1
7	15903_6861304	Confined	10,231	1/4/2007	376.69	358.90	17.79	1
7	15903_6861304	Confined	10,595	1/3/2008	416.69	371.70	44.99	1
7	15903_6861304	Confined	11,021	3/4/2009	406.19	361.07	45.12	1
7	15903_6861304	Confined	11,341	1/18/2010	417.69	348.85	68.84	1
7	15903_6861304	Confined	12,059	1/6/2012	399.89	314.76	85.13	1
7	15903_6861304	Confined	12,114	3/1/2012	384.49	319.10	65.39	1
7	15903_6861304	Confined	12,149	4/5/2012	385.19	321.86	63.33	1
7	15903_6861304	Confined	12,176	5/2/2012	373.89	323.99	49.90	1
7	15903_6861304	Confined	12,211	6/6/2012	373.09	326.75	46.34	1
7	15903_6861304	Confined	12,236	7/1/2012	325.89	328.73	-2.84	1
7	15903_6861304	Confined	12,267	8/1/2012	339.19	331.17	8.02	1
7	15903_6861304	Confined	12,298	9/1/2012	343.19	333.62	9.57	1
7	15903_6861304	Confined	12,328	10/1/2012	369.49	335.98	33.51	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15903_6861304	Confined	12,359	11/1/2012	379.99	338.43	41.56	1
7	15903_6861304	Confined	12,393	12/5/2012	353.49	341.11	12.38	1
7	15903_6861304	Confined	12,425	1/6/2013	345.99	343.30	2.69	1
7	15903_6861304	Confined	12,456	2/6/2013	344.69	344.03	0.66	1
7	15903_6861304	Confined	12,479	3/1/2013	328.99	344.56	-15.57	1
7	15903_6861304	Confined	12,514	4/5/2013	322.49	345.38	-22.89	1
7	15903_6861304	Confined	12,541	5/2/2013	324.49	346.00	-21.51	1
7	15903_6861304	Confined	12,576	6/6/2013	322.49	346.82	-24.33	1
7	15903_6861304	Confined	12,601	7/1/2013	324.89	347.40	-22.51	1
7	15903_6861304	Confined	12,632	8/1/2013	319.69	348.12	-28.43	1
7	15903_6861304	Confined	12,663	9/1/2013	317.49	348.84	-31.35	1
7	15903_6861304	Confined	12,693	10/1/2013	353.69	349.54	4.15	1
7	15903_6861304	Confined	12,724	11/1/2013	371.19	350.26	20.93	1
7	15903_6861304	Confined	12,758	12/5/2013	336.69	351.05	-14.36	1
7	15908_6861319	Confined	8,527	5/6/2002	357.86	351.04	6.82	1
7	15909_6861320	Confined	9,698	7/20/2005	383.46	355.93	27.53	1
7	15909_6861320	Confined	9,872	1/10/2006	375.06	355.00	20.06	1
7	15909_6861320	Confined	10,229	1/2/2007	356.26	357.77	-1.51	1
7	15909_6861320	Confined	10,595	1/3/2008	400.26	369.68	30.58	1
7	15909_6861320	Confined	10,987	1/29/2009	366.56	360.99	5.57	1
7	15909_6861320	Confined	11,334	1/11/2010	399.66	349.55	50.11	1
7	15909_6861320	Confined	12,059	1/6/2012	379.76	318.41	61.35	1
7	15909_6861320	Confined	12,114	3/1/2012	372.26	322.38	49.88	1
7	15909_6861320	Confined	12,149	4/5/2012	372.16	324.90	47.26	1
7	15909_6861320	Confined	12,176	5/2/2012	364.26	326.85	37.41	1
7	15909_6861320	Confined	12,206	6/1/2012	363.86	329.01	34.85	1
7	15909_6861320	Confined	12,241	7/6/2012	333.06	331.53	1.53	1
7	15909_6861320	Confined	12,269	8/3/2012	340.66	333.55	7.11	1
7	15909_6861320	Confined	12,347	10/20/2012	356.66	339.17	17.49	1
7	15909_6861320	Confined	12,386	11/28/2012	383.86	341.98	41.88	1
7	15909_6861320	Confined	12,394	12/6/2012	353.66	342.56	11.10	1
7	15909_6861320	Confined	12,425	1/6/2013	343.26	344.48	-1.22	1
7	15909_6861320	Confined	12,456	2/6/2013	343.26	345.08	-1.82	1
7	15909_6861320	Confined	12,479	3/1/2013	334.66	345.53	-10.87	1
7	15909_6861320	Confined	12,514	4/5/2013	325.96	346.21	-20.25	1
7	15909_6861320	Confined	12,541	5/2/2013	324.96	346.74	-21.78	1
7	15909_6861320	Confined	12,571	6/1/2013	322.36	347.33	-24.97	1
7	15909_6861320	Confined	12,606	7/6/2013	324.96	348.01	-23.05	1
7	15909_6861320	Confined	12,693	10/1/2013	336.86	349.71	-12.85	1
7	15909_6861320	Confined	12,744	11/21/2013	349.46	350.70	-1.24	1
7	15909_6861320	Confined	12,754	12/1/2013	366.86	350.90	15.96	1
7	15909_6861320	Confined	12,785	1/1/2014	386.16	351.50	34.66	1
7	15909_6861320	Confined	12,816	2/1/2014	349.46	351.90	-2.44	1
7	15909_6861320	Confined	12,844	3/1/2014	343.96	352.26	-8.30	1
7	15909_6861320	Confined	12,875	4/1/2014	315.36	352.66	-37.30	1
7	15909_6861320	Confined	12,905	5/1/2014	311.96	353.05	-41.09	1
7	15909_6861320	Confined	12,936	6/1/2014	311.96	353.45	-41.49	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15909_6861320	Confined	12,966	7/1/2014	309.96	353.83	-43.87	1
7	15909_6861320	Confined	12,997	8/1/2014	303.06	354.23	-51.17	1
7	15909_6861320	Confined	13,028	9/1/2014	329.16	354.63	-25.47	1
7	15909_6861320	Confined	13,058	10/1/2014	340.06	355.02	-14.96	1
7	15909_6861320	Confined	13,089	11/1/2014	341.36	355.42	-14.06	1
7	15909_6861320	Confined	13,119	12/1/2014	342.36	355.81	-13.45	1
7	15909_6861320	Confined	13,150	1/1/2015	351.46	356.22	-4.76	1
7	15909_6861320	Confined	13,181	2/1/2015	330.26	357.08	-26.82	1
7	15909_6861320	Confined	13,240	4/1/2015	329.96	358.71	-28.75	1
7	15909_6861320	Confined	13,270	5/1/2015	332.46	359.54	-27.08	1
7	15909_6861320	Confined	13,301	6/1/2015	354.86	360.40	-5.54	1
7	15909_6861320	Confined	13,331	7/1/2015	351.86	361.23	-9.37	1
7	15909_6861320	Confined	13,362	8/1/2015	348.06	362.09	-14.03	1
7	15909_6861320	Confined	13,393	9/1/2015	352.06	362.95	-10.89	1
7	15909_6861320	Confined	13,423	10/1/2015	352.96	363.78	-10.82	1
7	15909_6861320	Confined	13,454	11/1/2015	357.16	364.63	-7.47	1
7	15909_6861320	Confined	13,484	12/1/2015	361.76	365.46	-3.70	1
7	15909_6861320	Confined	13,515	1/1/2016	368.96	366.31	2.65	1
7	15909_6861320	Confined	13,575	3/1/2016	371.46	367.14	4.32	1
7	15909_6861320	Confined	13,606	4/1/2016	368.76	367.57	1.19	1
7	15909_6861320	Confined	13,636	5/1/2016	366.76	367.99	-1.23	1
7	15909_6861320	Confined	13,667	6/1/2016	364.36	368.42	-4.06	1
7	15909_6861320	Confined	13,697	7/1/2016	361.96	368.84	-6.88	1
7	15909_6861320	Confined	13,728	8/1/2016	364.16	369.27	-5.11	1
7	15909_6861320	Confined	13,759	9/1/2016	365.76	369.70	-3.94	1
7	15909_6861320	Confined	13,789	10/1/2016	366.36	370.12	-3.76	1
7	15909_6861320	Confined	13,820	11/1/2016	354.56	370.55	-15.99	1
7	15909_6861320	Confined	13,850	12/1/2016	352.86	370.96	-18.10	1
7	15909_6861320	Confined	13,881	1/1/2017	350.06	371.38	-21.32	1
7	15909_6861320	Confined	13,912	2/1/2017	348.36	371.24	-22.88	1
7	15909_6861320	Confined	13,940	3/1/2017	347.96	371.11	-23.15	1
7	15909_6861320	Confined	13,971	4/1/2017	345.76	370.98	-25.22	1
7	15909_6861320	Confined	14,001	5/1/2017	344.16	370.84	-26.68	1
7	15909_6861320	Confined	14,032	6/1/2017	342.46	370.71	-28.25	1
7	15909_6861320	Confined	14,124	9/1/2017	338.26	370.30	-32.04	1
7	15909_6861320	Confined	14,154	10/1/2017	338.56	370.17	-31.61	1
7	15909_6861320	Confined	14,185	11/1/2017	340.96	370.03	-29.07	1
7	15909_6861320	Confined	14,215	12/1/2017	343.26	369.90	-26.64	1
7	15910_6861322	Confined	9,737	8/28/2005	395.84	359.50	36.34	1
7	15917_6861507	Confined	10,987	1/29/2009	348.65	363.23	-14.58	1
7	15917_6861507	Confined	12,059	1/6/2012	349.85	333.91	15.94	1
7	15917_6861507	Confined	12,149	4/5/2012	348.45	338.89	9.56	1
7	15917_6861507	Confined	12,176	5/2/2012	340.25	340.38	-0.13	1
7	15917_6861507	Confined	12,206	6/1/2012	338.95	342.04	-3.09	1
7	15917_6861507	Confined	12,241	7/6/2012	341.45	343.98	-2.53	1
7	15917_6861507	Confined	12,269	8/3/2012	331.95	345.52	-13.57	1
7	15917_6861507	Confined	12,308	9/11/2012	326.35	347.68	-21.33	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15917_6861507	Confined	12,347	10/20/2012	332.85	349.83	-16.98	1
7	15917_6861507	Confined	12,386	11/28/2012	345.25	351.99	-6.74	1
7	15917_6861507	Confined	12,394	12/6/2012	337.55	352.43	-14.88	1
7	15917_6861507	Confined	12,425	1/6/2013	322.65	353.89	-31.24	1
7	15917_6861507	Confined	12,456	2/6/2013	334.75	354.29	-19.54	1
7	15917_6861507	Confined	12,479	3/1/2013	333.45	354.58	-21.13	1
7	15917_6861507	Confined	12,514	4/5/2013	329.95	355.03	-25.08	1
7	15917_6861507	Confined	12,541	5/2/2013	326.45	355.38	-28.93	1
7	15917_6861507	Confined	12,571	6/1/2013	324.45	355.76	-31.31	1
7	15917_6861507	Confined	12,606	7/6/2013	325.95	356.21	-30.26	1
7	15917_6861507	Confined	12,634	8/3/2013	324.85	356.56	-31.71	1
7	15917_6861507	Confined	12,673	9/11/2013	320.65	357.06	-36.41	1
7	15917_6861507	Confined	12,693	10/1/2013	327.25	357.32	-30.07	1
7	15917_6861507	Confined	12,744	11/21/2013	332.45	357.97	-25.52	1
7	15917_6861507	Confined	12,754	12/1/2013	336.85	358.10	-21.25	1
7	15917_6861507	Confined	12,785	1/1/2014	332.05	358.49	-26.44	1
7	15917_6861507	Confined	12,816	2/1/2014	335.95	358.78	-22.83	1
7	15917_6861507	Confined	12,844	3/1/2014	333.15	359.05	-25.90	1
7	15917_6861507	Confined	12,875	4/1/2014	330.25	359.34	-29.09	1
7	15917_6861507	Confined	12,905	5/1/2014	318.65	359.62	-40.97	1
7	15917_6861507	Confined	12,936	6/1/2014	320.75	359.91	-39.16	1
7	15917_6861507	Confined	12,997	8/1/2014	317.05	360.48	-43.43	1
7	15917_6861507	Confined	13,089	11/1/2014	338.35	361.35	-23.00	1
7	15917_6861507	Confined	13,150	1/1/2015	337.45	361.93	-24.48	1
7	15917_6861507	Confined	13,181	2/1/2015	330.95	362.52	-31.57	1
7	15917_6861507	Confined	13,209	3/1/2015	326.05	363.04	-36.99	1
7	15917_6861507	Confined	13,240	4/1/2015	327.15	363.63	-36.48	1
7	15917_6861507	Confined	13,270	5/1/2015	329.05	364.19	-35.14	1
7	15917_6861507	Confined	13,301	6/1/2015	337.25	364.78	-27.53	1
7	15917_6861507	Confined	13,331	7/1/2015	337.35	365.34	-27.99	1
7	15917_6861507	Confined	13,362	8/1/2015	338.05	365.93	-27.88	1
7	15917_6861507	Confined	13,393	9/1/2015	341.15	366.51	-25.36	1
7	15917_6861507	Confined	13,423	10/1/2015	340.95	367.08	-26.13	1
7	15917_6861507	Confined	13,454	11/1/2015	343.95	367.66	-23.71	1
7	15917_6861507	Confined	13,484	12/1/2015	342.85	368.23	-25.38	1
7	15917_6861507	Confined	13,515	1/1/2016	344.25	368.80	-24.55	1
7	15917_6861507	Confined	13,546	2/1/2016	345.15	369.10	-23.95	1
7	15917_6861507	Confined	13,575	3/1/2016	344.05	369.37	-25.32	1
7	15917_6861507	Confined	13,606	4/1/2016	342.85	369.67	-26.82	1
7	15917_6861507	Confined	13,636	5/1/2016	342.55	369.95	-27.40	1
7	15917_6861507	Confined	13,667	6/1/2016	344.05	370.25	-26.20	1
7	15917_6861507	Confined	13,697	7/1/2016	343.45	370.53	-27.08	1
7	15917_6861507	Confined	13,728	8/1/2016	342.95	370.83	-27.88	1
7	15917_6861507	Confined	13,759	9/1/2016	343.55	371.12	-27.57	1
7	15917_6861507	Confined	13,789	10/1/2016	344.35	371.41	-27.06	1
7	15917_6861507	Confined	13,820	11/1/2016	335.65	371.70	-36.05	1
7	15917_6861507	Confined	13,850	12/1/2016	333.85	371.98	-38.13	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15917_6861507	Confined	13,881	1/1/2017	332.95	372.27	-39.32	1
7	15917_6861507	Confined	13,940	3/1/2017	346.65	372.05	-25.40	1
7	15917_6861507	Confined	14,001	5/1/2017	345.65	371.82	-26.17	1
7	15917_6861507	Confined	14,032	6/1/2017	345.35	371.70	-26.35	1
7	15920_6861602	Confined	774	2/12/1981	400.67	352.71	47.96	1
7	15920_6861602	Confined	1,167	3/12/1982	404.69	362.89	41.80	1
7	15920_6861602	Confined	1,501	2/9/1983	399.20	365.66	33.54	1
7	15920_6861602	Confined	2,229	2/6/1985	398.35	371.49	26.86	1
7	15920_6861602	Confined	2,598	2/10/1986	400.06	375.12	24.94	1
7	15920_6861602	Confined	2,997	3/16/1987	400.45	374.42	26.03	1
7	15920_6861602	Confined	3,335	2/17/1988	400.65	378.26	22.39	1
7	15920_6861602	Confined	3,701	2/17/1989	398.04	373.57	24.47	1
7	15920_6861602	Confined	4,083	3/6/1990	378.89	367.16	11.73	1
7	15920_6861602	Confined	4,391	1/8/1991	397.92	366.66	31.26	1
7	15920_6861602	Confined	5,116	1/2/1993	392.44	370.86	21.58	1
7	15920_6861602	Confined	5,486	1/7/1994	395.59	368.35	27.24	1
7	15920_6861602	Confined	5,863	1/19/1995	399.49	368.22	31.27	1
7	15920_6861602	Confined	6,254	2/14/1996	397.99	366.01	31.98	1
7	15920_6861602	Confined	6,665	3/31/1997	396.39	363.95	32.44	1
7	15920_6861602	Confined	6,967	1/27/1998	398.69	367.68	31.01	1
7	15920_6861602	Confined	7,316	1/11/1999	395.29	364.65	30.64	1
7	15920_6861602	Confined	8,051	1/15/2001	392.49	355.27	37.22	1
7	15920_6861602	Confined	8,417	1/16/2002	395.59	357.52	38.07	1
7	15920_6861602	Confined	8,789	1/23/2003	397.59	355.09	42.50	1
7	15920_6861602	Confined	9,140	1/9/2004	396.39	356.48	39.91	1
7	15920_6861602	Confined	9,538	2/10/2005	403.09	359.84	43.25	1
7	15920_6861602	Confined	9,875	1/13/2006	400.59	358.11	42.48	1
7	15920_6861602	Confined	10,256	1/29/2007	402.89	361.15	41.74	1
7	15920_6861602	Confined	10,642	2/19/2008	401.99	369.85	32.14	1
7	15920_6861602	Confined	10,980	1/22/2009	400.69	363.46	37.23	1
7	15920_6861602	Confined	11,425	4/12/2010	401.19	349.27	51.92	1
7	15935_6862405	Confined	774	2/12/1981	374.49	358.14	16.35	1
7	15935_6862405	Confined	1,167	3/12/1982	376.38	363.44	12.94	1
7	15935_6862405	Confined	1,501	2/9/1983	375.74	364.60	11.14	1
7	15935_6862405	Confined	1,878	2/21/1984	374.02	366.50	7.52	1
7	15935_6862405	Confined	2,229	2/6/1985	366.69	367.09	-0.40	1
7	15935_6862405	Confined	2,598	2/10/1986	373.14	369.14	4.00	1
7	15935_6862405	Confined	2,997	3/16/1987	375.64	368.73	6.91	1
7	15935_6862405	Confined	3,335	2/17/1988	369.84	370.47	-0.63	1
7	15935_6862405	Confined	3,701	2/17/1989	357.50	367.39	-9.89	1
7	15935_6862405	Confined	4,083	3/6/1990	349.91	363.72	-13.81	1
7	15935_6862405	Confined	4,391	1/8/1991	359.30	363.47	-4.17	1
7	15935_6862405	Confined	5,486	1/7/1994	358.17	364.83	-6.66	1
7	15935_6862405	Confined	5,863	1/19/1995	363.72	364.61	-0.89	1
7	15935_6862405	Confined	6,254	2/14/1996	357.12	363.31	-6.19	1
7	15935_6862405	Confined	6,660	3/26/1997	352.12	361.49	-9.37	1
7	15935_6862405	Confined	6,967	1/27/1998	363.62	363.74	-0.12	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15935_6862405	Confined	7,316	1/11/1999	351.57	362.20	-10.63	1
7	15935_6862405	Confined	8,051	1/15/2001	347.62	356.44	-8.82	1
7	15935_6862405	Confined	8,417	1/16/2002	345.52	357.80	-12.28	1
7	15935_6862405	Confined	8,789	1/23/2003	342.72	356.60	-13.88	1
7	15935_6862405	Confined	9,152	1/21/2004	346.52	357.40	-10.88	1
7	15935_6862405	Confined	9,539	2/11/2005	367.12	359.48	7.64	1
7	15935_6862405	Confined	9,885	1/23/2006	360.62	358.34	2.28	1
7	15935_6862405	Confined	10,267	2/9/2007	358.12	360.34	-2.22	1
7	15935_6862405	Confined	10,663	3/11/2008	359.92	365.35	-5.43	1
7	15935_6862405	Confined	11,007	2/18/2009	343.12	361.05	-17.93	1
7	15935_6862405	Confined	11,425	4/12/2010	365.37	352.93	12.44	1
7	15948_7805104	Confined	5,482	1/3/1994	340.89	324.82	16.07	1
7	15948_7805104	Confined	5,512	2/2/1994	343.74	324.73	19.01	1
7	15948_7805104	Confined	5,539	3/1/1994	346.09	324.65	21.44	1
7	15948_7805104	Confined	5,573	4/4/1994	348.94	324.54	24.40	1
7	15948_7805104	Confined	5,640	6/10/1994	348.34	324.34	24.00	1
7	15948_7805104	Confined	5,661	7/1/1994	349.24	324.28	24.96	1
7	15948_7805104	Confined	5,724	9/2/1994	327.04	324.09	2.95	1
7	15948_7805104	Confined	5,753	10/1/1994	317.34	324.00	-6.66	1
7	15948_7805104	Confined	5,785	11/2/1994	329.34	323.91	5.43	1
7	15948_7805104	Confined	5,816	12/3/1994	338.24	323.81	14.43	1
7	15948_7805104	Confined	5,847	1/3/1995	349.64	323.71	25.93	1
7	15948_7805104	Confined	6,211	1/2/1996	339.04	321.38	17.66	1
7	15948_7805104	Confined	6,637	3/3/1997	332.69	317.08	15.61	1
7	15951_7805116	Confined	772	2/10/1981	359.42	326.60	32.82	1
7	15951_7805116	Confined	1,166	3/11/1982	364.85	331.98	32.87	1
7	15951_7805116	Confined	1,501	2/9/1983	361.26	333.55	27.71	1
7	15951_7805116	Confined	1,878	2/21/1984	362.30	336.03	26.27	1
7	15951_7805116	Confined	2,227	2/4/1985	348.68	337.29	11.39	1
7	15951_7805116	Confined	2,599	2/11/1986	356.41	331.72	24.69	1
7	15951_7805116	Confined	3,000	3/19/1987	359.24	331.15	28.09	1
7	15951_7805116	Confined	3,336	2/18/1988	352.57	332.94	19.63	1
7	15951_7805116	Confined	3,706	2/22/1989	337.87	328.42	9.45	1
7	15951_7805116	Confined	4,084	3/7/1990	336.46	326.07	10.39	1
7	15951_7805116	Confined	4,391	1/8/1991	338.17	328.78	9.39	1
7	15951_7805116	Confined	4,709	11/22/1991	335.04	330.59	4.45	1
7	15951_7805116	Confined	5,863	1/19/1995	343.69	330.75	12.94	1
7	15951_7805116	Confined	6,244	2/4/1996	337.14	328.44	8.70	1
7	15951_7805116	Confined	6,660	3/26/1997	334.89	325.72	9.17	1
7	15951_7805116	Confined	6,967	1/27/1998	337.54	328.32	9.22	1
7	15951_7805116	Confined	7,313	1/8/1999	335.04	326.03	9.01	1
7	15951_7805116	Confined	8,067	1/31/2001	334.44	315.73	18.71	1
7	15951_7805116	Confined	8,417	1/16/2002	332.49	318.63	13.86	1
7	15951_7805116	Confined	8,789	1/23/2003	336.74	314.18	22.56	1
7	15951_7805116	Confined	9,152	1/21/2004	341.74	316.29	25.45	1
7	15951_7805116	Confined	9,542	2/14/2005	339.74	319.42	20.32	1
7	15951_7805116	Confined	9,885	1/23/2006	343.74	318.52	25.22	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15951_7805116	Confined	10,267	2/9/2007	342.24	322.51	19.73	1
7	15951_7805116	Confined	10,663	3/11/2008	343.64	329.02	14.62	1
7	15951_7805116	Confined	11,007	2/18/2009	342.14	321.93	20.21	1
7	15951_7805116	Confined	11,425	4/12/2010	344.24	306.77	37.47	1
7	15966_7805501	Confined	772	2/10/1981	352.18	314.34	37.84	1
7	15966_7805501	Confined	1,153	2/26/1982	354.91	317.66	37.25	1
7	15966_7805501	Confined	1,500	2/8/1983	352.81	318.86	33.95	1
7	15966_7805501	Confined	2,227	2/4/1985	336.61	320.98	15.63	1
7	15966_7805501	Confined	2,599	2/11/1986	348.30	320.76	27.54	1
7	15966_7805501	Confined	2,998	3/17/1987	352.39	320.12	32.27	1
7	15966_7805501	Confined	3,336	2/18/1988	349.17	321.40	27.77	1
7	15966_7805501	Confined	3,706	2/22/1989	334.19	319.90	14.29	1
7	15966_7805501	Confined	4,084	3/7/1990	328.22	318.01	10.21	1
7	15966_7805501	Confined	4,391	1/8/1991	333.13	318.67	14.46	1
7	15976_7805802	Confined	1,878	2/21/1984	346.53	316.91	29.62	1
7	15976_7805802	Confined	5,486	1/7/1994	328.11	316.98	11.13	1
7	15976_7805802	Confined	7,316	1/11/1999	327.06	315.23	11.83	1
7	15976_7805802	Confined	8,051	1/15/2001	325.41	313.30	12.11	1
7	15976_7805802	Confined	8,417	1/16/2002	324.01	313.99	10.02	1
7	15976_7805802	Confined	8,796	1/30/2003	324.31	312.83	11.48	1
7	15976_7805802	Confined	9,143	1/12/2004	323.61	313.10	10.51	1
7	15976_7805802	Confined	9,522	1/25/2005	323.01	313.47	9.54	1
7	15976_7805802	Confined	9,881	1/19/2006	330.91	313.44	17.47	1
7	15976_7805802	Confined	10,263	2/5/2007	319.31	314.53	4.78	1
7	15976_7805802	Confined	10,601	1/9/2008	320.51	316.39	4.12	1
7	15976_7805802	Confined	10,992	2/3/2009	319.51	314.81	4.70	1
7	15976_7805802	Confined	11,359	2/5/2010	321.61	312.07	9.54	1
7	15979_7806103	Confined	1,878	2/21/1984	359.58	359.81	-0.23	1
7	15979_7806103	Confined	2,598	2/10/1986	358.92	361.44	-2.52	1
7	15979_7806103	Confined	4,093	3/16/1990	330.66	357.73	-27.07	1
7	15979_7806103	Confined	4,407	1/24/1991	339.59	357.72	-18.13	1
7	15979_7806103	Confined	5,126	1/12/1993	347.01	359.61	-12.60	1
7	15979_7806103	Confined	5,493	1/14/1994	344.21	358.71	-14.50	1
7	15979_7806103	Confined	5,863	1/19/1995	366.41	358.54	7.87	1
7	15979_7806103	Confined	6,660	3/26/1997	336.01	356.66	-20.65	1
7	15979_7806103	Confined	6,967	1/27/1998	338.91	358.23	-19.32	1
7	15979_7806103	Confined	7,316	1/11/1999	335.31	356.92	-21.61	1
7	15979_7806103	Confined	8,051	1/15/2001	333.21	352.94	-19.73	1
7	15979_7806103	Confined	8,419	1/18/2002	329.91	353.91	-24.00	1
7	15979_7806103	Confined	8,796	1/30/2003	331.51	352.93	-21.42	1
7	15979_7806103	Confined	9,150	1/19/2004	331.21	353.43	-22.22	1
7	15979_7806103	Confined	9,522	1/25/2005	329.11	354.65	-25.54	1
7	15979_7806103	Confined	9,881	1/19/2006	328.31	353.84	-25.53	1
7	15979_7806103	Confined	10,256	1/29/2007	324.81	355.15	-30.34	1
7	15979_7806103	Confined	10,601	1/9/2008	327.61	359.19	-31.58	1
7	15979_7806103	Confined	10,992	2/3/2009	325.21	355.88	-30.67	1
7	15979_7806103	Confined	11,359	2/5/2010	326.61	351.59	-24.98	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15986_7806507	Confined	1,499	2/7/1983	343.06	299.78	43.28	1
7	15986_7806507	Confined	2,960	2/7/1987	336.06	301.30	34.76	1
7	15986_7806507	Confined	3,337	2/19/1988	348.06	303.91	44.15	1
7	15986_7806507	Confined	3,706	2/22/1989	333.06	301.95	31.11	1
7	15986_7806507	Confined	4,413	1/30/1991	335.06	298.67	36.39	1
7	15986_7806507	Confined	5,139	1/25/1993	333.06	300.27	32.79	1
7	15986_7806507	Confined	5,493	1/14/1994	328.96	299.55	29.41	1
7	15986_7806507	Confined	10,238	1/11/2007	329.96	298.36	31.60	1
7	15986_7806507	Confined	10,601	1/9/2008	330.56	301.67	28.89	1
7	15986_7806507	Confined	10,992	2/3/2009	328.86	298.19	30.67	1
7	15986_7806507	Confined	11,419	4/6/2010	328.56	290.45	38.11	1
7	15996_7810303	Confined	771	2/9/1981	347.82	283.09	64.73	1
7	15996_7810303	Confined	1,153	2/26/1982	366.95	297.67	69.28	1
7	15996_7810303	Confined	1,500	2/8/1983	370.57	307.08	63.49	1
7	15996_7810303	Confined	2,230	2/7/1985	344.30	326.14	18.16	1
7	15996_7810303	Confined	2,593	2/5/1986	360.14	334.37	25.77	1
7	15996_7810303	Confined	3,337	2/19/1988	358.71	343.76	14.95	1
7	15996_7810303	Confined	3,700	2/16/1989	324.38	341.43	-17.05	1
7	15996_7810303	Confined	4,072	2/23/1990	317.85	332.32	-14.47	1
7	15996_7810303	Confined	4,405	1/22/1991	335.24	330.40	4.84	1
7	15996_7810303	Confined	5,493	1/14/1994	333.48	325.84	7.64	1
7	15996_7810303	Confined	8,415	1/14/2002	287.18	291.43	-4.25	1
7	15996_7810303	Confined	8,772	1/6/2003	293.98	282.08	11.90	1
7	15996_7810303	Confined	9,150	1/19/2004	292.78	280.68	12.10	1
7	15996_7810303	Confined	9,530	2/2/2005	289.78	281.99	7.79	1
7	15996_7810303	Confined	9,875	1/13/2006	290.98	280.44	10.54	1
7	15996_7810303	Confined	10,238	1/11/2007	286.78	284.62	2.16	1
7	15996_7810303	Confined	10,603	1/11/2008	289.78	295.33	-5.55	1
7	15996_7810303	Confined	10,992	2/3/2009	287.18	286.48	0.70	1
7	15996_7810303	Confined	11,433	4/20/2010	285.98	260.24	25.74	1
7	15996_7810303	Confined	12,059	1/6/2012	260.28	217.50	42.78	1
7	15996_7810303	Confined	12,090	2/6/2012	260.58	219.65	40.93	1
7	15996_7810303	Confined	12,114	3/1/2012	270.18	221.32	48.86	1
7	15996_7810303	Confined	12,149	4/5/2012	273.18	223.76	49.42	1
7	15996_7810303	Confined	12,176	5/2/2012	254.28	225.63	28.65	1
7	15996_7810303	Confined	12,307	9/10/2012	225.18	234.75	-9.57	1
7	15996_7810303	Confined	12,346	10/19/2012	235.98	237.46	-1.48	1
7	15996_7810303	Confined	12,367	11/9/2012	241.58	238.92	2.66	1
7	15996_7810303	Confined	12,391	12/3/2012	248.38	240.59	7.79	1
7	15996_7810303	Confined	12,425	1/6/2013	252.58	242.69	9.89	1
7	15996_7810303	Confined	12,456	2/6/2013	259.48	243.49	15.99	1
7	15996_7810303	Confined	12,479	3/1/2013	258.38	244.09	14.29	1
7	15996_7810303	Confined	12,514	4/5/2013	244.58	245.00	-0.42	1
7	15996_7810303	Confined	12,541	5/2/2013	236.68	245.69	-9.01	1
7	15996_7810303	Confined	12,575	6/5/2013	235.38	246.58	-11.20	1
7	15996_7810303	Confined	12,602	7/2/2013	235.98	247.27	-11.29	1
7	15996_7810303	Confined	12,632	8/1/2013	234.08	248.05	-13.97	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	15996_7810303	Confined	12,672	9/10/2013	215.88	249.09	-33.21	1
7	15996_7810303	Confined	12,711	10/19/2013	219.38	250.10	-30.72	1
7	15996_7810303	Confined	12,732	11/9/2013	232.08	250.64	-18.56	1
7	15996_7810303	Confined	12,756	12/3/2013	240.18	251.26	-11.08	1
7	16001_7810606	Confined	771	2/9/1981	344.45	283.50	60.95	1
7	16001_7810606	Confined	1,150	2/23/1982	343.60	293.89	49.71	1
7	16001_7810606	Confined	1,500	2/8/1983	341.28	299.68	41.60	1
7	16001_7810606	Confined	1,878	2/21/1984	335.72	306.49	29.23	1
7	16001_7810606	Confined	2,593	2/5/1986	330.65	313.99	16.66	1
7	16001_7810606	Confined	4,072	2/23/1990	295.09	309.92	-14.83	1
7	16001_7810606	Confined	4,405	1/22/1991	305.10	309.13	-4.03	1
7	16001_7810606	Confined	5,490	1/11/1994	299.92	306.79	-6.87	1
7	16001_7810606	Confined	5,864	1/20/1995	306.22	304.48	1.74	1
7	16001_7810606	Confined	8,417	1/16/2002	279.12	286.08	-6.96	1
7	16001_7810606	Confined	8,773	1/7/2003	281.52	280.19	1.33	1
7	16001_7810606	Confined	9,143	1/12/2004	279.82	279.52	0.30	1
7	16001_7810606	Confined	9,542	2/14/2005	282.62	280.54	2.08	1
7	16001_7810606	Confined	9,875	1/13/2006	280.72	280.20	0.52	1
7	16001_7810606	Confined	10,238	1/11/2007	278.32	283.36	-5.04	1
7	16001_7810606	Confined	10,603	1/11/2008	281.92	289.87	-7.95	1
7	16001_7810606	Confined	10,992	2/3/2009	278.92	284.69	-5.77	1
7	16001_7810606	Confined	11,433	4/20/2010	277.32	266.87	10.45	1
7	16008_7811202	Confined	1,153	2/26/1982	344.43	305.15	39.28	1
7	16008_7811202	Confined	1,501	2/9/1983	343.65	312.44	31.21	1
7	16008_7811202	Confined	1,874	2/17/1984	342.62	321.14	21.48	1
7	16008_7811202	Confined	2,230	2/7/1985	326.62	325.85	0.77	1
7	16008_7811202	Confined	2,593	2/5/1986	347.43	330.82	16.61	1
7	16008_7811202	Confined	2,998	3/17/1987	349.66	330.33	19.33	1
7	16008_7811202	Confined	3,337	2/19/1988	341.44	336.32	5.12	1
7	16008_7811202	Confined	3,700	2/16/1989	320.16	334.28	-14.12	1
7	16008_7811202	Confined	4,082	3/5/1990	303.52	326.81	-23.29	1
7	16008_7811202	Confined	4,405	1/22/1991	305.68	326.40	-20.72	1
7	16008_7811202	Confined	5,125	1/11/1993	315.78	327.89	-12.11	1
7	16008_7811202	Confined	5,490	1/11/1994	315.48	325.49	-10.01	1
7	16008_7811202	Confined	5,864	1/20/1995	324.28	323.34	0.94	1
7	16008_7811202	Confined	6,229	1/20/1996	306.73	320.09	-13.36	1
7	16008_7811202	Confined	6,672	4/7/1997	302.23	318.10	-15.87	1
7	16008_7811202	Confined	6,968	1/28/1998	303.88	320.77	-16.89	1
7	16008_7811202	Confined	7,317	1/12/1999	303.38	315.41	-12.03	1
7	16008_7811202	Confined	8,045	1/9/2001	301.48	302.96	-1.48	1
7	16008_7811202	Confined	8,415	1/14/2002	297.88	303.01	-5.13	1
7	16008_7811202	Confined	8,789	1/23/2003	287.68	296.29	-8.61	1
7	16008_7811202	Confined	9,150	1/19/2004	295.18	295.83	-0.65	1
7	16008_7811202	Confined	9,542	2/14/2005	298.08	297.17	0.91	1
7	16008_7811202	Confined	9,875	1/13/2006	296.28	296.87	-0.59	1
7	16008_7811202	Confined	10,238	1/11/2007	299.88	300.63	-0.75	1
7	16008_7811202	Confined	10,603	1/11/2008	302.18	308.79	-6.61	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16008_7811202	Confined	10,992	2/3/2009	298.18	303.09	-4.91	1
7	16008_7811202	Confined	11,374	2/20/2010	294.08	287.58	6.50	1
7	16011_7811301	Confined	771	2/9/1981	374.24	297.48	76.76	1
7	16011_7811301	Confined	1,874	2/17/1984	352.79	325.80	26.99	1
7	16011_7811301	Confined	3,337	2/19/1988	343.37	341.45	1.92	1
7	16011_7811301	Confined	4,082	3/5/1990	317.91	331.96	-14.05	1
7	16011_7811301	Confined	4,405	1/22/1991	327.51	331.36	-3.85	1
7	16011_7811301	Confined	7,680	1/10/2000	304.96	317.85	-12.89	1
7	16011_7811301	Confined	8,045	1/9/2001	302.36	308.36	-6.00	1
7	16011_7811301	Confined	8,416	1/15/2002	299.86	308.38	-8.52	1
7	16011_7811301	Confined	8,773	1/7/2003	301.26	301.71	-0.45	1
7	16011_7811301	Confined	9,150	1/19/2004	301.76	301.26	0.50	1
7	16011_7811301	Confined	9,517	1/20/2005	296.96	302.66	-5.70	1
7	16011_7811301	Confined	9,868	1/6/2006	295.76	302.20	-6.44	1
7	16011_7811301	Confined	10,238	1/11/2007	294.16	306.05	-11.89	1
7	16011_7811301	Confined	10,603	1/11/2008	294.86	314.46	-19.60	1
7	16011_7811301	Confined	10,992	2/3/2009	292.96	308.73	-15.77	1
7	16011_7811301	Confined	11,433	4/20/2010	287.36	289.24	-1.88	1
7	16015_7811501	Confined	771	2/9/1981	355.36	277.17	78.19	1
7	16015_7811501	Confined	2,230	2/7/1985	309.50	293.97	15.53	1
7	16023_7811903	Confined	771	2/9/1981	325.09	276.18	48.91	1
7	16023_7811903	Confined	1,150	2/23/1982	328.79	283.59	45.20	1
7	16023_7811903	Confined	1,500	2/8/1983	327.43	286.30	41.13	1
7	16023_7811903	Confined	2,230	2/7/1985	296.93	290.53	6.40	1
7	16023_7811903	Confined	2,594	2/6/1986	312.19	292.94	19.25	1
7	16023_7811903	Confined	2,998	3/17/1987	321.16	291.76	29.40	1
7	16023_7811903	Confined	3,337	2/19/1988	316.57	294.65	21.92	1
7	16023_7811903	Confined	3,706	2/22/1989	296.87	292.91	3.96	1
7	16023_7811903	Confined	4,075	2/26/1990	251.83	288.31	-36.48	1
7	16029_7812701	Confined	771	2/9/1981	326.43	280.15	46.28	1
7	16029_7812701	Confined	1,874	2/17/1984	320.32	293.01	27.31	1
7	16029_7812701	Confined	2,594	2/6/1986	320.62	296.62	24.00	1
7	16029_7812701	Confined	2,998	3/17/1987	327.23	295.22	32.01	1
7	16036_7814204	Confined	1,499	2/7/1983	362.05	283.12	78.93	1
7	16040_7814801	Confined	3,365	3/18/1988	317.52	271.40	46.12	1
7	16040_7814801	Confined	4,077	2/28/1990	287.73	268.46	19.27	1
7	16040_7814801	Confined	5,479	12/31/1993	263.22	266.92	-3.70	1
7	16040_7814801	Confined	6,661	3/27/1997	264.42	265.24	-0.82	1
7	16040_7814801	Confined	6,952	1/12/1998	296.97	265.96	31.01	1
7	16040_7814801	Confined	7,313	1/8/1999	280.80	263.61	17.19	1
7	16040_7814801	Confined	7,676	1/6/2000	299.72	264.70	35.02	1
7	16040_7814801	Confined	8,060	1/24/2001	283.57	263.66	19.91	1
7	16040_7814801	Confined	8,417	1/16/2002	276.87	265.23	11.64	1
7	16040_7814801	Confined	8,789	1/23/2003	303.90	263.91	39.99	1
7	16040_7814801	Confined	9,150	1/19/2004	300.44	264.63	35.81	1
7	16040_7814801	Confined	9,538	2/10/2005	300.44	266.18	34.26	1
7	16040_7814801	Confined	9,885	1/23/2006	298.13	266.92	31.21	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16040_7814801	Confined	10,266	2/8/2007	288.89	269.04	19.85	1
7	16040_7814801	Confined	10,600	1/8/2008	290.04	271.80	18.24	1
7	16040_7814801	Confined	11,000	2/11/2009	284.22	270.36	13.86	1
7	16040_7814801	Confined	11,344	1/21/2010	288.92	265.86	23.06	1
7	16041_7815301	Confined	1,151	2/24/1982	381.25	259.00	61.12	0.5
7	16041_7815301	Confined	1,499	2/7/1983	382.97	261.20	60.88	0.5
7	16041_7815301	Confined	1,878	2/21/1984	371.22	263.76	53.73	0.5
7	16041_7815301	Confined	2,227	2/4/1985	366.86	264.74	51.06	0.5
7	16041_7815301	Confined	2,594	2/6/1986	363.43	264.68	49.37	0.5
7	16041_7815301	Confined	2,998	3/17/1987	368.02	265.41	51.30	0.5
7	16041_7815301	Confined	3,337	2/19/1988	364.86	268.24	48.31	0.5
7	16041_7815301	Confined	3,701	2/17/1989	361.66	267.81	46.92	0.5
7	16044_7815810	Confined	6,715	5/20/1997	311.76	261.92	49.84	1
7	16046_7818206	Confined	1,136	2/9/1982	381.79	276.39	52.70	0.5
7	16046_7818206	Confined	1,514	2/22/1983	383.58	279.48	52.05	0.5
7	16046_7818206	Confined	1,872	2/15/1984	383.91	282.44	50.73	0.5
7	16046_7818206	Confined	2,601	2/13/1986	382.72	286.10	48.31	0.5
7	16046_7818206	Confined	3,342	2/24/1988	382.64	288.32	47.16	0.5
7	16046_7818206	Confined	3,699	2/15/1989	383.02	287.61	47.71	0.5
7	16046_7818206	Confined	4,071	2/22/1990	380.12	284.27	47.92	0.5
7	16046_7818206	Confined	4,481	4/8/1991	381.42	281.89	49.77	0.5
7	16046_7818206	Confined	4,755	1/7/1992	381.62	278.16	51.73	0.5
7	16046_7818206	Confined	5,142	1/28/1993	383.22	275.91	53.65	0.5
7	16046_7818206	Confined	5,503	1/24/1994	380.72	272.18	54.27	0.5
7	16046_7818206	Confined	5,857	1/13/1995	369.02	268.60	50.21	0.5
7	16046_7818206	Confined	6,233	1/24/1996	378.42	265.05	56.69	0.5
7	16046_7818206	Confined	6,673	4/8/1997	376.97	261.98	57.50	0.5
7	16046_7818206	Confined	6,984	2/13/1998	375.92	261.78	57.07	0.5
7	16046_7818206	Confined	7,317	1/12/1999	376.02	256.09	59.96	0.5
7	16046_7818206	Confined	8,073	2/6/2001	372.72	246.98	62.87	0.5
7	16046_7818206	Confined	8,415	1/14/2002	373.62	245.64	63.99	0.5
7	16046_7818206	Confined	8,604	7/22/2002	376.78	242.66	67.06	0.5
7	16046_7818206	Confined	8,782	1/16/2003	372.72	240.01	66.36	0.5
7	16046_7818206	Confined	9,165	2/3/2004	374.02	237.60	68.21	0.5
7	16046_7818206	Confined	9,543	2/15/2005	378.22	236.94	70.64	0.5
7	16046_7818206	Confined	9,901	2/8/2006	377.12	235.99	70.56	0.5
7	16046_7818206	Confined	10,284	2/26/2007	375.92	237.50	69.21	0.5
7	16046_7818206	Confined	10,643	2/20/2008	377.02	238.53	69.25	0.5
7	16046_7818206	Confined	11,029	3/12/2009	375.62	232.12	71.75	0.5
7	16046_7818206	Confined	11,426	4/13/2010	375.02	217.34	78.84	0.5
7	16050_7820101	Confined	1,151	2/24/1982	321.12	281.54	39.58	1
7	16050_7820101	Confined	1,874	2/17/1984	313.75	284.71	29.04	1
7	16050_7820101	Confined	2,594	2/6/1986	305.82	287.83	17.99	1
7	16050_7820101	Confined	3,337	2/19/1988	307.60	288.87	18.73	1
7	16050_7820101	Confined	3,706	2/22/1989	292.86	287.20	5.66	1
7	16050_7820101	Confined	4,065	2/16/1990	277.45	283.23	-5.78	1
7	16050_7820101	Confined	4,404	1/21/1991	290.20	282.28	7.92	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16050_7820101	Confined	5,119	1/5/1993	294.95	281.25	13.70	1
7	16050_7820101	Confined	5,419	11/1/1993	287.45	279.40	8.05	1
7	16050_7820101	Confined	5,493	1/14/1994	292.00	278.96	13.04	1
7	16050_7820101	Confined	5,513	2/3/1994	290.05	278.86	11.19	1
7	16050_7820101	Confined	5,574	4/5/1994	297.50	278.55	18.95	1
7	16050_7820101	Confined	5,647	6/17/1994	299.20	278.19	21.01	1
7	16050_7820101	Confined	5,661	7/1/1994	299.25	278.12	21.13	1
7	16050_7820101	Confined	5,847	1/3/1995	292.50	277.20	15.30	1
7	16050_7820101	Confined	6,212	1/3/1996	283.35	274.98	8.37	1
7	16050_7820101	Confined	6,637	3/3/1997	270.80	272.73	-1.93	1
7	16050_7820101	Confined	6,952	1/12/1998	289.65	273.00	16.65	1
7	16050_7820101	Confined	7,317	1/12/1999	289.65	268.25	21.40	1
7	16050_7820101	Confined	8,061	1/25/2001	263.25	267.97	-4.72	1
7	16050_7820101	Confined	8,416	1/15/2002	259.95	268.90	-8.95	1
7	16050_7820101	Confined	8,773	1/7/2003	264.95	265.49	-0.54	1
7	16050_7820101	Confined	9,152	1/21/2004	263.25	264.79	-1.54	1
7	16050_7820101	Confined	9,347	8/3/2004	287.15	264.95	22.20	1
7	16050_7820101	Confined	9,538	2/10/2005	286.25	264.99	21.26	1
7	16050_7820101	Confined	9,885	1/23/2006	281.05	264.54	16.51	1
7	16050_7820101	Confined	10,229	1/2/2007	246.05	266.00	-19.95	1
7	16050_7820101	Confined	10,599	1/7/2008	271.25	269.55	1.70	1
7	16050_7820101	Confined	10,993	2/4/2009	262.35	266.10	-3.75	1
7	16050_7820101	Confined	11,338	1/15/2010	247.35	258.17	-10.82	1
7	16050_7820101	Confined	12,090	2/6/2012	217.25	234.72	-17.47	1
7	16050_7820101	Confined	12,114	3/1/2012	221.85	235.30	-13.45	1
7	16050_7820101	Confined	12,149	4/5/2012	223.95	236.15	-12.20	1
7	16050_7820101	Confined	12,176	5/2/2012	225.25	236.80	-11.55	1
7	16050_7820101	Confined	12,209	6/4/2012	221.25	237.60	-16.35	1
7	16050_7820101	Confined	12,236	7/1/2012	215.75	238.25	-22.50	1
7	16050_7820101	Confined	12,267	8/1/2012	216.25	239.00	-22.75	1
7	16050_7820101	Confined	12,298	9/1/2012	204.85	239.74	-34.89	1
7	16050_7820101	Confined	12,328	10/1/2012	203.95	240.47	-36.52	1
7	16050_7820101	Confined	12,359	11/1/2012	207.15	241.22	-34.07	1
7	16050_7820101	Confined	12,389	12/1/2012	208.45	241.94	-33.49	1
7	16050_7820101	Confined	12,425	1/6/2013	207.65	242.70	-35.05	1
7	16050_7820101	Confined	12,456	2/6/2013	211.05	242.91	-31.86	1
7	16050_7820101	Confined	12,479	3/1/2013	210.55	243.06	-32.51	1
7	16050_7820101	Confined	12,514	4/5/2013	211.05	243.29	-32.24	1
7	16050_7820101	Confined	12,541	5/2/2013	201.65	243.47	-41.82	1
7	16050_7820101	Confined	12,574	6/4/2013	200.85	243.68	-42.83	1
7	16050_7820101	Confined	12,601	7/1/2013	194.45	243.86	-49.41	1
7	16050_7820101	Confined	12,632	8/1/2013	189.65	244.07	-54.42	1
7	16050_7820101	Confined	12,663	9/1/2013	184.45	244.27	-59.82	1
7	16050_7820101	Confined	12,724	11/1/2013	182.85	244.67	-61.82	1
7	16050_7820101	Confined	12,754	12/1/2013	182.35	244.87	-62.52	1
7	16050_7820101	Confined	12,785	1/1/2014	184.65	245.07	-60.42	1
7	16055_7821106	Confined	1,151	2/24/1982	329.73	278.16	51.57	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16055_7821106	Confined	1,500	2/8/1983	314.89	272.01	42.88	1
7	16055_7821106	Confined	1,874	2/17/1984	304.37	268.15	36.22	1
7	16055_7821106	Confined	2,594	2/6/1986	297.87	270.65	27.22	1
7	16055_7821106	Confined	3,337	2/19/1988	299.13	267.93	31.20	1
7	16055_7821106	Confined	4,093	3/16/1990	282.57	263.23	19.34	1
7	16055_7821106	Confined	4,404	1/21/1991	281.38	262.12	19.26	1
7	16056_7821801	Confined	778	2/16/1981	330.70	267.47	63.23	1
7	16056_7821801	Confined	1,150	2/23/1982	330.17	268.23	61.94	1
7	16056_7821801	Confined	1,502	2/10/1983	291.05	255.28	35.77	1
7	16056_7821801	Confined	1,877	2/20/1984	289.39	245.65	43.74	1
7	16056_7821801	Confined	2,228	2/5/1985	267.24	241.52	25.72	1
7	16056_7821801	Confined	2,591	2/3/1986	278.99	246.31	32.68	1
7	16056_7821801	Confined	2,956	2/3/1987	282.33	242.04	40.29	1
7	16056_7821801	Confined	4,072	2/23/1990	263.96	237.50	26.46	1
7	16056_7821801	Confined	4,426	2/12/1991	267.26	235.48	31.78	1
7	16056_7821801	Confined	4,789	2/10/1992	270.61	231.86	38.75	1
7	16056_7821801	Confined	5,434	11/16/1993	273.39	230.44	42.95	1
7	16056_7821801	Confined	5,869	1/25/1995	273.96	229.43	44.53	1
7	16056_7821801	Confined	6,231	1/22/1996	267.56	228.81	38.75	1
7	16056_7821801	Confined	6,625	2/19/1997	251.96	227.31	24.65	1
7	16056_7821801	Confined	6,983	2/12/1998	254.54	222.36	32.18	1
7	16056_7821801	Confined	7,337	2/1/1999	250.05	219.57	30.48	1
7	16056_7821801	Confined	7,718	2/17/2000	248.56	246.58	1.98	1
7	16056_7821801	Confined	8,443	2/11/2002	241.39	257.71	-16.32	1
7	16056_7821801	Confined	9,594	4/7/2005	261.26	256.23	5.03	1
7	16056_7821801	Confined	10,278	2/20/2007	235.86	256.00	-20.14	1
7	16056_7821801	Confined	10,627	2/4/2008	248.48	256.82	-8.34	1
7	16056_7821801	Confined	10,998	2/9/2009	240.16	256.04	-15.88	1
7	16056_7821801	Confined	11,723	2/4/2011	239.00	245.69	-6.69	1
7	16056_7821801	Confined	14,169	10/16/2017	143.63	238.92	-95.29	1
7	16057_7822201	Confined	3,365	3/18/1988	318.01	268.89	49.12	1
7	16057_7822201	Confined	4,077	2/28/1990	302.22	266.26	35.96	1
7	16057_7822201	Confined	5,118	1/4/1993	261.92	265.19	-3.27	1
7	16057_7822201	Confined	5,483	1/4/1994	261.92	264.53	-2.61	1
7	16057_7822201	Confined	6,637	3/3/1997	258.92	262.77	-3.85	1
7	16057_7822201	Confined	6,952	1/12/1998	297.60	263.34	34.26	1
7	16057_7822201	Confined	7,316	1/11/1999	291.83	261.07	30.76	1
7	16057_7822201	Confined	7,676	1/6/2000	290.72	262.56	28.16	1
7	16057_7822201	Confined	8,060	1/24/2001	274.50	262.01	12.49	1
7	16057_7822201	Confined	8,416	1/15/2002	269.88	263.57	6.31	1
7	16057_7822201	Confined	8,773	1/7/2003	269.88	262.43	7.45	1
7	16057_7822201	Confined	9,150	1/19/2004	271.04	263.08	7.96	1
7	16057_7822201	Confined	9,538	2/10/2005	275.66	264.51	11.15	1
7	16057_7822201	Confined	9,885	1/23/2006	274.50	265.23	9.27	1
7	16057_7822201	Confined	10,230	1/3/2007	272.88	266.94	5.94	1
7	16057_7822201	Confined	10,600	1/8/2008	277.04	269.84	7.20	1
7	16057_7822201	Confined	10,992	2/3/2009	275.62	268.77	6.85	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16057_7822201	Confined	11,344	1/21/2010	274.72	264.52	10.20	1
7	16058_7822202	Confined	771	2/9/1981	333.65	263.08	70.57	1
7	16058_7822202	Confined	1,150	2/23/1982	341.64	266.82	74.82	1
7	16058_7822202	Confined	1,499	2/7/1983	339.12	267.87	71.25	1
7	16058_7822202	Confined	2,594	2/6/1986	335.98	257.55	78.43	1
7	16058_7822202	Confined	3,365	3/18/1988	322.64	270.27	52.37	1
7	16058_7822202	Confined	5,479	12/31/1993	268.32	265.83	2.49	1
7	16063_7826601	Confined	778	2/16/1981	311.10	272.04	39.06	1
7	16065_7827503	Confined	778	2/16/1981	294.95	272.71	11.12	0.5
7	16065_7827503	Confined	1,150	2/23/1982	294.11	275.23	9.44	0.5
7	16065_7827503	Confined	1,502	2/10/1983	294.43	275.95	9.24	0.5
7	16065_7827503	Confined	2,228	2/5/1985	268.65	276.28	-3.81	0.5
7	16065_7827503	Confined	2,593	2/5/1986	278.68	277.92	0.38	0.5
7	16065_7827503	Confined	2,956	2/3/1987	282.43	277.97	2.23	0.5
7	16065_7827503	Confined	3,700	2/16/1989	272.10	278.59	-3.24	0.5
7	16065_7827503	Confined	4,072	2/23/1990	261.10	276.71	-7.80	0.5
7	16065_7827503	Confined	4,426	2/12/1991	259.31	275.24	-7.96	0.5
7	16065_7827503	Confined	5,036	10/14/1992	272.18	270.80	0.69	0.5
7	16065_7827503	Confined	5,063	11/10/1992	274.76	270.64	2.06	0.5
7	16065_7827503	Confined	5,869	1/25/1995	223.53	264.35	-20.41	0.5
7	16068_7828602	Confined	2,228	2/5/1985	261.46	269.51	-8.05	1
7	16068_7828602	Confined	2,593	2/5/1986	279.77	271.17	8.60	1
7	16068_7828602	Confined	2,956	2/3/1987	283.21	270.46	12.75	1
7	16068_7828602	Confined	3,700	2/16/1989	277.06	269.88	7.18	1
7	16068_7828602	Confined	4,072	2/23/1990	263.23	268.53	-5.30	1
7	16068_7828602	Confined	4,426	2/12/1991	266.63	267.15	-0.52	1
7	16068_7828602	Confined	4,789	2/10/1992	269.67	264.64	5.03	1
7	16068_7828602	Confined	5,063	11/10/1992	263.70	263.71	-0.01	1
7	16068_7828602	Confined	5,434	11/16/1993	271.61	261.36	10.25	1
7	16068_7828602	Confined	5,869	1/25/1995	272.87	258.59	14.28	1
7	16068_7828602	Confined	6,231	1/22/1996	271.17	256.16	15.01	1
7	16068_7828602	Confined	6,625	2/19/1997	249.17	253.21	-4.04	1
7	16068_7828602	Confined	6,983	2/12/1998	253.09	250.56	2.53	1
7	16068_7828602	Confined	7,718	2/17/2000	247.52	251.11	-3.59	1
7	16068_7828602	Confined	8,075	2/8/2001	239.82	251.76	-11.94	1
7	16068_7828602	Confined	8,443	2/11/2002	238.35	251.52	-13.17	1
7	16068_7828602	Confined	8,821	2/24/2003	240.44	249.16	-8.72	1
7	16070_7828702	Confined	778	2/16/1981	288.90	272.70	8.10	0.5
7	16070_7828702	Confined	1,502	2/10/1983	277.77	274.26	1.76	0.5
7	16070_7828702	Confined	2,592	2/4/1986	264.77	274.37	-4.80	0.5
7	16070_7828702	Confined	4,072	2/23/1990	272.24	272.98	-0.37	0.5
7	16070_7828702	Confined	4,426	2/12/1991	271.21	271.76	-0.27	0.5
7	16070_7828702	Confined	4,789	2/10/1992	272.48	269.30	1.59	0.5
7	16070_7828702	Confined	5,063	11/10/1992	282.47	267.88	7.29	0.5
7	16070_7828702	Confined	5,434	11/16/1993	279.27	265.22	7.02	0.5
7	16070_7828702	Confined	5,869	1/25/1995	283.57	261.90	10.84	0.5
7	16070_7828702	Confined	6,231	1/22/1996	281.07	258.92	11.07	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16070_7828702	Confined	6,625	2/19/1997	255.07	255.40	-0.16	0.5
7	16084_7836902	Confined	778	2/16/1981	324.97	272.68	52.29	1
7	16085_7837103	Confined	778	2/16/1981	300.12	272.86	13.63	0.5
7	16085_7837103	Confined	2,228	2/5/1985	286.26	268.21	9.03	0.5
7	16085_7837103	Confined	2,591	2/3/1986	271.52	268.84	1.34	0.5
7	16085_7837103	Confined	2,956	2/3/1987	275.31	268.31	3.50	0.5
7	16085_7837103	Confined	3,364	3/17/1988	273.21	267.98	2.62	0.5
7	16085_7837103	Confined	3,700	2/16/1989	271.03	267.40	1.82	0.5
7	16085_7837103	Confined	4,072	2/23/1990	265.09	267.05	-0.98	0.5
7	16085_7837103	Confined	4,426	2/12/1991	256.24	266.28	-5.02	0.5
7	16085_7837103	Confined	4,789	2/10/1992	258.97	264.39	-2.71	0.5
7	16085_7837103	Confined	5,063	11/10/1992	263.63	263.13	0.25	0.5
7	16085_7837103	Confined	5,434	11/16/1993	267.24	260.55	3.34	0.5
7	16085_7837103	Confined	6,231	1/22/1996	264.08	254.10	4.99	0.5
7	16085_7837103	Confined	6,982	2/11/1998	240.00	246.80	-3.40	0.5
7	16085_7837103	Confined	7,337	2/1/1999	235.68	243.24	-3.78	0.5
7	16085_7837103	Confined	7,718	2/17/2000	238.68	245.49	-3.41	0.5
7	16085_7837103	Confined	8,443	2/11/2002	225.18	244.07	-9.45	0.5
7	16085_7837103	Confined	10,278	2/20/2007	226.68	231.03	-2.18	0.5
7	16085_7837103	Confined	10,627	2/4/2008	232.27	229.77	1.25	0.5
7	16085_7837103	Confined	10,998	2/9/2009	231.28	227.39	1.94	0.5
7	16085_7837103	Confined	11,723	2/4/2011	206.01	215.16	-4.58	0.5
7	16085_7837103	Confined	12,079	1/26/2012	177.02	206.59	-14.78	0.5
7	16086_7842902	Confined	778	2/16/1981	327.52	282.34	22.59	0.5
7	16162_7804803	Confined	5,491	1/12/1994	331.26	314.49	16.77	1
7	16162_7804803	Confined	5,867	1/23/1995	338.56	313.25	25.31	1
7	16286_6855902	Confined	7,719	2/18/2000	282.62	355.13	-72.51	1
7	16301_0	Unconfined	10,482	9/12/2007	403.04	449.89	-46.85	1
7	16302_0	Confined	10,689	4/6/2008	501.33	432.37	6.90	0.1
7	16305_0	Unconfined	10,797	7/23/2008	447.35	448.76	-0.14	0.1
7	16316_0	Confined	10,865	9/29/2008	369.66	408.11	-38.45	1
7	16317_0	Confined	10,866	9/30/2008	429.10	400.80	28.30	1
7	16336_0	Confined	11,688	12/31/2010	407.50	416.62	-0.91	0.1
7	16393_6727401	Confined	12,440	1/21/2013	360.29	370.16	-0.99	0.1
7	16393_6727401	Confined	12,589	6/19/2013	359.74	370.58	-1.08	0.1
7	16393_6727401	Confined	12,687	9/25/2013	359.29	370.86	-1.16	0.1
7	16393_6727401	Confined	12,806	1/22/2014	360.08	371.04	-1.10	0.1
7	16393_6727401	Confined	12,944	6/9/2014	360.85	370.48	-0.96	0.1
7	16393_6727401	Confined	13,038	9/11/2014	359.34	370.10	-1.08	0.1
7	16393_6727401	Confined	13,527	1/13/2016	359.32	374.13	-1.48	0.1
7	16393_6727401	Confined	13,688	6/22/2016	359.32	375.02	-1.57	0.1
7	16393_6727401	Confined	13,778	9/20/2016	357.42	375.51	-1.81	0.1
7	16393_6727401	Confined	13,911	1/31/2017	359.32	375.92	-1.66	0.1
7	16393_6727401	Confined	14,050	6/19/2017	357.48	375.22	-1.77	0.1
7	16404_6733803	Unconfined	9,747	9/7/2005	436.16	447.45	-11.29	1
7	16404_6733803	Unconfined	9,881	1/19/2006	436.54	445.47	-8.93	1
7	16404_6733803	Unconfined	10,018	6/5/2006	436.46	444.28	-7.82	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16404_6733803	Unconfined	10,130	9/25/2006	435.11	443.30	-8.19	1
7	16404_6733803	Unconfined	10,256	1/29/2007	436.13	443.19	-7.06	1
7	16404_6733803	Unconfined	10,389	6/11/2007	435.74	446.54	-10.80	1
7	16404_6733803	Unconfined	10,487	9/17/2007	435.53	449.02	-13.49	1
7	16404_6733803	Unconfined	10,606	1/14/2008	435.31	451.41	-16.10	1
7	16404_6733803	Unconfined	10,763	6/19/2008	435.39	448.56	-13.17	1
7	16404_6733803	Unconfined	10,847	9/11/2008	434.93	447.03	-12.10	1
7	16404_6733803	Unconfined	10,966	1/8/2009	435.16	444.98	-9.82	1
7	16404_6733803	Unconfined	11,120	6/11/2009	434.91	444.29	-9.38	1
7	16404_6733803	Unconfined	11,232	10/1/2009	434.86	443.78	-8.92	1
7	16404_6733803	Unconfined	11,343	1/20/2010	435.26	443.32	-8.06	1
7	16404_6733803	Unconfined	11,568	9/2/2010	434.66	442.78	-8.12	1
7	16404_6733803	Unconfined	11,700	1/12/2011	433.91	442.23	-8.32	1
7	16404_6733803	Unconfined	11,855	6/16/2011	434.04	438.90	-4.86	1
7	16404_6733803	Unconfined	11,952	9/21/2011	434.01	436.81	-2.80	1
7	16404_6733803	Unconfined	12,085	2/1/2012	434.25	434.90	-0.65	1
7	16404_6733803	Unconfined	12,205	5/31/2012	433.78	435.90	-2.12	1
7	16404_6733803	Unconfined	12,440	1/21/2013	433.37	437.82	-4.45	1
7	16404_6733803	Unconfined	12,589	6/19/2013	432.85	438.77	-5.92	1
7	16404_6733803	Unconfined	12,687	9/25/2013	432.59	439.40	-6.81	1
7	16404_6733803	Unconfined	12,806	1/22/2014	432.53	439.98	-7.45	1
7	16404_6733803	Unconfined	12,944	6/9/2014	432.26	439.77	-7.51	1
7	16404_6733803	Unconfined	13,038	9/11/2014	431.79	439.63	-7.84	1
7	16404_6733803	Unconfined	13,164	1/15/2015	431.56	439.67	-8.11	1
7	16404_6733803	Unconfined	13,311	6/11/2015	431.16	441.78	-10.62	1
7	16404_6733803	Unconfined	13,527	1/13/2016	432.99	444.77	-11.78	1
7	16404_6733803	Unconfined	13,688	6/22/2016	432.75	445.74	-12.99	1
7	16404_6733803	Unconfined	13,778	9/20/2016	432.37	446.28	-13.91	1
7	16404_6733803	Unconfined	14,050	6/19/2017	431.69	445.99	-14.30	1
7	16408_6734301	Confined	10,712	4/29/2008	388.86	394.23	-0.54	0.1
7	16408_6734301	Confined	10,847	9/11/2008	388.38	392.37	-0.40	0.1
7	16408_6734301	Confined	10,966	1/8/2009	387.86	390.80	-0.29	0.1
7	16408_6734301	Confined	11,111	6/2/2009	387.57	390.09	-0.25	0.1
7	16408_6734301	Confined	11,203	9/2/2009	386.94	389.64	-0.27	0.1
7	16408_6734301	Confined	11,327	1/4/2010	384.69	389.05	-0.44	0.1
7	16408_6734301	Confined	11,476	6/2/2010	386.74	388.88	-0.21	0.1
7	16408_6734301	Confined	11,587	9/21/2010	385.82	388.76	-0.29	0.1
7	16408_6734301	Confined	11,693	1/5/2011	385.30	388.55	-0.32	0.1
7	16408_6734301	Confined	11,840	6/1/2011	378.90	385.64	-0.67	0.1
7	16408_6734301	Confined	11,937	9/6/2011	382.92	383.73	-0.08	0.1
7	16408_6734301	Confined	12,070	1/17/2012	382.86	381.46	0.14	0.1
7	16408_6734301	Confined	12,210	6/5/2012	382.36	381.64	0.07	0.1
7	16408_6734301	Confined	12,302	9/5/2012	381.49	381.75	-0.03	0.1
7	16408_6734301	Confined	12,422	1/3/2013	380.86	381.91	-0.10	0.1
7	16408_6734301	Confined	12,584	6/14/2013	378.20	382.44	-0.42	0.1
7	16408_6734301	Confined	12,668	9/6/2013	379.14	382.72	-0.36	0.1
7	16408_6734301	Confined	12,786	1/2/2014	379.96	383.10	-0.31	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	16408_6734301	Confined	12,939	6/4/2014	376.83	382.62	-0.58	0.1
7	16408_6734301	Confined	13,029	9/2/2014	376.19	382.34	-0.61	0.1
7	16408_6734301	Confined	13,148	12/30/2014	375.18	381.96	-0.68	0.1
7	16408_6734301	Confined	13,305	6/5/2015	376.24	383.62	-0.74	0.1
7	16408_6734301	Confined	13,519	1/5/2016	370.97	385.87	-1.49	0.1
7	16408_6734301	Confined	13,673	6/7/2016	371.47	386.86	-1.54	0.1
7	16408_6734301	Confined	13,779	9/21/2016	370.02	387.54	-1.75	0.1
7	16408_6734301	Confined	13,884	1/4/2017	367.66	388.18	-2.05	0.1
7	16408_6734301	Confined	14,036	6/5/2017	368.33	387.56	-1.92	0.1
7	16409_6734302	Confined	779	2/17/1981	434.00	393.50	4.05	0.1
7	16409_6734302	Confined	1,145	2/18/1982	433.92	395.55	3.84	0.1
7	16409_6734302	Confined	1,517	2/25/1983	433.75	393.31	4.04	0.1
7	16409_6734302	Confined	1,872	2/15/1984	433.46	391.66	4.18	0.1
7	16409_6734302	Confined	2,229	2/6/1985	432.39	389.56	4.28	0.1
7	16412_6734704	Confined	779	2/17/1981	431.68	413.28	1.84	0.1
7	16412_6734704	Confined	1,517	2/25/1983	429.54	413.06	1.65	0.1
7	16412_6734704	Confined	1,872	2/15/1984	429.37	411.69	1.77	0.1
7	16412_6734704	Confined	2,234	2/11/1985	428.42	409.93	1.85	0.1
7	16412_6734704	Confined	2,606	2/18/1986	428.02	412.07	1.59	0.1
7	16412_6734704	Confined	2,893	12/2/1986	427.19	413.03	1.42	0.1
7	16412_6734704	Confined	3,705	2/21/1989	429.01	409.28	1.97	0.1
7	16412_6734704	Confined	4,058	2/9/1990	425.96	407.49	1.85	0.1
7	16412_6734704	Confined	4,426	2/12/1991	425.04	408.65	1.64	0.1
7	16412_6734704	Confined	4,798	2/19/1992	425.14	411.13	1.40	0.1
7	16412_6734704	Confined	5,164	2/19/1993	427.65	412.82	1.48	0.1
7	16412_6734704	Confined	5,464	12/16/1993	427.42	410.61	1.68	0.1
7	16412_6734704	Confined	6,263	2/23/1996	426.44	408.16	1.83	0.1
7	16412_6734704	Confined	6,617	2/11/1997	425.34	405.27	2.01	0.1
7	16412_6734704	Confined	6,940	12/31/1997	424.39	407.14	1.73	0.1
7	16412_6734704	Confined	7,396	4/1/1999	426.44	407.76	1.87	0.1
7	16412_6734704	Confined	7,723	2/22/2000	425.59	404.99	2.06	0.1
7	16412_6734704	Confined	7,926	9/12/2000	424.63	404.32	2.03	0.1
7	16412_6734704	Confined	8,073	2/6/2001	424.69	403.92	2.08	0.1
7	16412_6734704	Confined	8,438	2/6/2002	425.48	403.92	2.16	0.1
7	16412_6734704	Confined	8,815	2/18/2003	427.36	407.34	2.00	0.1
7	16412_6734704	Confined	9,180	2/18/2004	425.44	408.08	1.74	0.1
7	2569_8519903	Confined	5,357	8/31/1993	378.35	375.51	2.84	1
7	2569_8519903	Confined	6,661	3/27/1997	423.35	377.45	45.90	1
7	35771_6857307	Unconfined	771	2/9/1981	535.08	510.65	24.43	1
7	35771_6857307	Unconfined	1,144	2/17/1982	533.89	520.00	13.89	1
7	35771_6857307	Unconfined	1,506	2/14/1983	532.71	521.99	10.72	1
7	35771_6857307	Unconfined	1,880	2/23/1984	531.23	520.59	10.64	1
7	35771_6857307	Unconfined	2,234	2/11/1985	529.93	503.06	26.87	1
7	35771_6857307	Unconfined	2,607	2/19/1986	528.39	522.97	5.42	1
7	35771_6857307	Unconfined	3,008	3/27/1987	527.14	534.58	-7.44	1
7	35771_6857307	Unconfined	3,363	3/16/1988	527.20	539.78	-12.58	1
7	35771_6857307	Unconfined	3,687	2/3/1989	525.36	537.04	-11.68	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	35771_6857307	Unconfined	4,056	2/7/1990	526.29	535.26	-8.97	1
7	35771_6857307	Unconfined	4,408	1/25/1991	524.99	537.98	-12.99	1
7	35771_6857307	Unconfined	4,785	2/6/1992	523.79	538.28	-14.49	1
7	35771_6857307	Unconfined	5,176	3/3/1993	523.23	537.94	-14.71	1
7	35771_6857307	Unconfined	5,619	5/20/1994	521.96	527.99	-6.03	1
7	35771_6857307	Unconfined	5,790	11/7/1994	521.79	522.40	-0.61	1
7	35771_6857307	Unconfined	6,282	3/13/1996	520.41	505.86	14.55	1
7	35771_6857307	Unconfined	6,619	2/13/1997	518.63	496.98	21.65	1
7	35771_6857307	Unconfined	6,998	2/27/1998	516.61	502.22	14.39	1
7	35771_6857307	Unconfined	7,379	3/15/1999	513.59	501.59	12.00	1
7	35771_6857307	Unconfined	7,717	2/16/2000	515.89	494.57	21.32	1
7	35771_6857307	Unconfined	8,443	2/11/2002	514.07	483.79	30.28	1
7	35771_6857307	Unconfined	8,822	2/25/2003	512.49	484.13	28.36	1
7	35771_6857307	Unconfined	9,172	2/10/2004	511.49	482.19	29.30	1
7	35771_6857307	Unconfined	9,528	1/31/2005	511.61	485.85	25.76	1
7	35771_6857307	Unconfined	9,927	3/6/2006	509.80	480.10	29.70	1
7	35771_6857307	Unconfined	10,264	2/6/2007	508.67	478.82	29.85	1
7	35771_6857307	Unconfined	10,648	2/25/2008	507.71	487.80	19.91	1
7	35771_6857307	Unconfined	11,009	2/20/2009	506.16	477.84	28.32	1
7	35771_6857307	Unconfined	11,366	2/12/2010	507.51	464.15	43.36	1
7	35771_6857307	Unconfined	11,772	3/25/2011	506.83	445.44	61.39	1
7	35771_6857307	Unconfined	11,989	10/28/2011	506.34	432.91	73.43	1
7	35771_6857307	Unconfined	12,714	10/22/2013	502.79	439.83	62.96	1
7	35771_6857307	Unconfined	13,072	10/15/2014	500.71	444.57	56.14	1
7	35771_6857307	Unconfined	13,434	10/12/2015	499.36	457.55	41.81	1
7	35771_6857307	Unconfined	13,802	10/14/2016	498.24	469.98	28.26	1
7	35771_6857307	Unconfined	14,176	10/23/2017	496.88	476.93	19.95	1
7	3841_0	Confined	8,355	11/15/2001	129.49	189.32	-59.83	1
7	3842_0	Confined	8,549	5/28/2002	141.82	176.65	-34.83	1
7	38947_6734706	Confined	6,991	2/20/1998	414.59	408.08	6.51	1
7	38947_6734706	Confined	9,152	1/21/2004	403.49	409.19	-5.70	1
7	38947_6734706	Confined	9,398	9/23/2004	389.59	411.38	-21.79	1
7	38947_6734706	Confined	9,523	1/26/2005	403.09	412.01	-8.92	1
7	38947_6734706	Confined	9,749	9/9/2005	399.09	409.80	-10.71	1
7	38947_6734706	Confined	9,881	1/19/2006	401.73	408.57	-6.84	1
7	38947_6734706	Confined	10,018	6/5/2006	399.24	407.68	-8.44	1
7	38947_6734706	Confined	10,389	6/11/2007	400.89	409.26	-8.37	1
7	38947_6734706	Confined	10,487	9/17/2007	400.40	411.04	-10.64	1
7	38947_6734706	Confined	10,606	1/14/2008	400.82	412.79	-11.97	1
7	38947_6734706	Confined	10,763	6/19/2008	397.33	410.95	-13.62	1
7	38947_6734706	Confined	10,847	9/11/2008	397.49	409.96	-12.47	1
7	38947_6734706	Confined	10,966	1/8/2009	398.64	408.61	-9.97	1
7	38947_6734706	Confined	11,120	6/11/2009	397.85	407.59	-9.74	1
7	38947_6734706	Confined	11,232	10/1/2009	395.65	406.85	-11.20	1
7	38947_6734706	Confined	11,568	9/2/2010	396.09	404.65	-8.56	1
7	38947_6734706	Confined	11,700	1/12/2011	397.99	403.67	-5.68	1
7	38947_6734706	Confined	12,085	2/1/2012	395.06	397.80	-2.74	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	38947_6734706	Confined	12,205	5/31/2012	392.65	398.43	-5.78	1
7	38947_6734706	Confined	12,323	9/26/2012	390.18	399.05	-8.87	1
7	38947_6734706	Confined	12,440	1/21/2013	393.31	399.58	-6.27	1
7	38947_6734706	Confined	12,589	6/19/2013	391.62	399.79	-8.17	1
7	38947_6734706	Confined	12,687	9/25/2013	388.14	399.93	-11.79	1
7	38947_6734706	Confined	12,806	1/22/2014	388.75	399.95	-11.20	1
7	38947_6734706	Confined	12,944	6/9/2014	386.05	399.22	-13.17	1
7	38947_6734706	Confined	13,038	9/11/2014	383.29	398.73	-15.44	1
7	38947_6734706	Confined	13,163	1/14/2015	383.99	398.19	-14.20	1
7	38947_6734706	Confined	13,301	6/1/2015	384.84	398.63	-13.79	1
7	38947_6734706	Confined	13,409	9/17/2015	382.60	398.97	-16.37	1
7	38947_6734706	Confined	13,527	1/13/2016	382.69	399.37	-16.68	1
7	38947_6734706	Confined	13,688	6/22/2016	385.29	400.30	-15.01	1
7	38947_6734706	Confined	13,778	9/20/2016	385.29	400.82	-15.53	1
7	38947_6734706	Confined	13,911	1/31/2017	384.02	401.26	-17.24	1
7	38947_6734706	Confined	14,050	6/19/2017	383.88	400.62	-16.74	1
7	38947_6734706	Confined	14,141	9/18/2017	380.99	400.21	-19.22	1
7	38953_6733704	Unconfined	2,816	9/16/1986	473.70	447.26	26.44	1
7	38998_6733705	Unconfined	6,340	5/10/1996	450.41	442.76	3.83	0.5
7	39003_0	Confined	10,995	2/6/2009	432.91	366.00	6.69	0.1
7	39005_0	Confined	9,616	4/29/2005	456.13	366.02	9.01	0.1
7	39006_0	Confined	11,375	2/21/2010	453.36	343.19	11.02	0.1
7	39170_6713605	Confined	782	2/20/1981	422.34	399.92	22.42	1
7	39170_6713605	Confined	1,144	2/17/1982	425.21	401.42	23.79	1
7	39170_6713605	Confined	1,551	3/31/1983	432.84	399.88	32.96	1
7	39170_6713605	Confined	1,870	2/13/1984	431.80	398.88	32.92	1
7	39170_6713605	Confined	2,903	12/12/1986	464.46	400.56	63.90	1
7	39170_6713605	Confined	11,224	9/23/2009	456.59	399.74	56.85	1
7	39324_6706502	Confined	836	4/15/1981	357.09	392.65	-35.56	1
7	39327_6706609	Confined	3,126	7/23/1987	404.31	392.10	12.21	1
7	39328_6706802	Confined	836	4/15/1981	407.91	392.96	14.95	1
7	39344_6736501	Confined	10,393	6/15/2007	346.66	337.21	9.45	1
7	39344_6736501	Confined	10,489	9/19/2007	347.49	337.58	9.91	1
7	39344_6736501	Confined	10,608	1/16/2008	346.92	337.94	8.98	1
7	39344_6736501	Confined	10,775	7/1/2008	342.87	337.59	5.28	1
7	39344_6736501	Confined	11,204	9/3/2009	340.02	336.11	3.91	1
7	39344_6736501	Confined	11,328	1/5/2010	342.65	335.55	7.10	1
7	39344_6736501	Confined	11,488	6/14/2010	344.71	334.46	10.25	1
7	39344_6736501	Confined	11,590	9/24/2010	342.30	333.75	8.55	1
7	39344_6736501	Confined	11,694	1/6/2011	342.86	333.05	9.81	1
7	39344_6736501	Confined	11,841	6/2/2011	340.38	332.39	7.99	1
7	39344_6736501	Confined	11,938	9/7/2011	334.93	331.96	2.97	1
7	39344_6736501	Confined	12,071	1/18/2012	337.55	331.17	6.38	1
7	39344_6736501	Confined	12,211	6/6/2012	338.99	329.06	9.93	1
7	39344_6736501	Confined	12,316	9/19/2012	334.17	327.47	6.70	1
7	39344_6736501	Confined	12,674	9/12/2013	329.58	319.10	10.48	1
7	39344_6736501	Confined	12,787	1/3/2014	328.43	316.07	12.36	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39344_6736501	Confined	12,940	6/5/2014	325.02	311.56	13.46	1
7	39344_6736501	Confined	13,030	9/3/2014	320.89	308.91	11.98	1
7	39344_6736501	Confined	13,155	1/6/2015	318.06	305.16	12.90	1
7	39344_6736501	Confined	13,311	6/11/2015	316.61	298.96	17.65	1
7	39344_6736501	Confined	13,528	1/14/2016	311.00	290.97	20.03	1
7	39344_6736501	Confined	13,689	6/23/2016	310.82	291.79	19.03	1
7	39344_6736501	Confined	13,760	9/2/2016	311.45	292.15	19.30	1
7	39344_6736501	Confined	13,886	1/6/2017	309.11	292.70	16.41	1
7	39344_6736501	Confined	14,038	6/7/2017	307.33	291.32	16.01	1
7	39352_6735201	Confined	7,429	5/4/1999	359.83	345.04	14.79	1
7	39352_6735201	Confined	7,953	10/9/2000	355.80	344.14	11.66	1
7	39352_6735201	Confined	8,046	1/10/2001	358.47	344.14	14.33	1
7	39352_6735201	Confined	8,101	3/6/2001	358.87	344.12	14.75	1
7	39352_6735201	Confined	8,164	5/8/2001	358.81	344.09	14.72	1
7	39352_6735201	Confined	8,263	8/15/2001	355.89	344.04	11.85	1
7	39352_6735201	Confined	8,451	2/19/2002	356.70	344.22	12.48	1
7	39352_6735201	Confined	8,531	5/10/2002	356.18	344.60	11.58	1
7	39352_6735201	Confined	8,590	7/8/2002	353.48	344.88	8.60	1
7	39352_6735201	Confined	9,152	1/21/2004	352.93	345.87	7.06	1
7	39352_6735201	Confined	9,398	9/23/2004	350.63	346.70	3.93	1
7	39352_6735201	Confined	9,523	1/26/2005	354.33	346.92	7.41	1
7	39352_6735201	Confined	9,879	1/17/2006	350.93	345.39	5.54	1
7	39352_6735201	Confined	10,607	1/15/2008	352.10	347.01	5.09	1
7	39352_6735201	Confined	10,774	6/30/2008	343.58	346.14	-2.56	1
7	39352_6735201	Confined	11,327	1/4/2010	344.12	344.53	-0.41	1
7	39352_6735201	Confined	11,476	6/2/2010	343.10	344.30	-1.20	1
7	39352_6735201	Confined	11,587	9/21/2010	341.38	344.13	-2.75	1
7	39352_6735201	Confined	11,693	1/5/2011	339.25	343.94	-4.69	1
7	39352_6735201	Confined	11,840	6/1/2011	333.50	342.80	-9.30	1
7	39352_6735201	Confined	11,937	9/6/2011	339.33	342.05	-2.72	1
7	39352_6735201	Confined	12,070	1/17/2012	344.13	341.09	3.04	1
7	39352_6735201	Confined	12,210	6/5/2012	339.91	340.63	-0.72	1
7	39352_6735201	Confined	12,302	9/5/2012	334.11	340.32	-6.21	1
7	39352_6735201	Confined	12,668	9/6/2013	338.59	338.23	0.36	1
7	39352_6735201	Confined	12,786	1/2/2014	337.11	337.42	-0.31	1
7	39352_6735201	Confined	13,148	12/30/2014	326.70	333.74	-7.04	1
7	39352_6735201	Confined	13,305	6/5/2015	326.29	332.48	-6.19	1
7	39352_6735201	Confined	13,519	1/5/2016	322.93	330.81	-7.88	1
7	39352_6735201	Confined	13,694	6/28/2016	323.18	331.07	-7.89	1
7	39352_6735201	Confined	13,786	9/28/2016	322.57	331.20	-8.63	1
7	39352_6735201	Confined	13,903	1/23/2017	322.99	331.24	-8.25	1
7	39363_6720805	Unconfined	11,223	9/22/2009	353.18	343.82	9.36	1
7	39363_6720805	Unconfined	11,331	1/8/2010	353.07	343.77	9.30	1
7	39363_6720805	Unconfined	11,488	6/14/2010	353.50	344.29	9.21	1
7	39363_6720805	Unconfined	11,582	9/16/2010	351.89	344.61	7.28	1
7	39363_6720805	Unconfined	11,700	1/12/2011	353.82	344.77	9.05	1
7	39363_6720805	Unconfined	11,842	6/3/2011	353.56	342.57	10.99	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39363_6720805	Unconfined	12,079	1/26/2012	352.74	339.35	13.39	1
7	39363_6720805	Unconfined	12,206	6/1/2012	352.69	339.65	13.04	1
7	39364_6721204	Confined	857	5/6/1981	378.48	386.25	-0.78	0.1
7	39367_6721705	Confined	6,567	12/23/1996	344.05	350.30	-6.25	1
7	39375_6727703	Confined	731	12/31/1980	356.04	349.95	6.09	1
7	39375_6727703	Confined	837	4/16/1981	364.31	350.27	14.04	1
7	39375_6727703	Confined	857	5/6/1981	364.38	350.33	14.05	1
7	39375_6727703	Confined	877	5/26/1981	364.56	350.39	14.17	1
7	39375_6727703	Confined	899	6/17/1981	364.57	350.45	14.12	1
7	39375_6727703	Confined	928	7/16/1981	365.04	350.54	14.50	1
7	39375_6727703	Confined	990	9/16/1981	365.01	350.73	14.28	1
7	39375_6727703	Confined	1,024	10/20/1981	365.04	350.83	14.21	1
7	39375_6727703	Confined	1,054	11/19/1981	360.39	350.92	9.47	1
7	39375_6727703	Confined	1,081	12/16/1981	365.57	351.01	14.56	1
7	39375_6727703	Confined	1,116	1/20/1982	362.72	350.99	11.73	1
7	39375_6727703	Confined	1,143	2/16/1982	365.54	350.91	14.63	1
7	39375_6727703	Confined	1,167	3/12/1982	364.96	350.83	14.13	1
7	39375_6727703	Confined	1,206	4/20/1982	365.18	350.72	14.46	1
7	39375_6727703	Confined	1,230	5/14/1982	365.09	350.64	14.45	1
7	39375_6727703	Confined	1,265	6/18/1982	364.92	350.54	14.38	1
7	39375_6727703	Confined	1,292	7/15/1982	364.86	350.45	14.41	1
7	39375_6727703	Confined	1,334	8/26/1982	364.76	350.33	14.43	1
7	39375_6727703	Confined	1,359	9/20/1982	365.24	350.25	14.99	1
7	39375_6727703	Confined	1,389	10/20/1982	364.04	350.16	13.88	1
7	39375_6727703	Confined	1,419	11/19/1982	364.42	350.07	14.35	1
7	39375_6727703	Confined	1,446	12/16/1982	363.99	349.99	14.00	1
7	39375_6727703	Confined	1,478	1/17/1983	364.33	349.91	14.42	1
7	39375_6727703	Confined	1,515	2/23/1983	363.92	349.86	14.06	1
7	39375_6727703	Confined	1,542	3/22/1983	363.83	349.82	14.01	1
7	39375_6727703	Confined	1,571	4/20/1983	363.44	349.77	13.67	1
7	39375_6727703	Confined	1,632	6/20/1983	364.04	349.68	14.36	1
7	39375_6727703	Confined	1,732	9/28/1983	363.09	349.53	13.56	1
7	39375_6727703	Confined	1,808	12/13/1983	363.76	349.41	14.35	1
7	39375_6727703	Confined	1,901	3/15/1984	362.84	349.15	13.69	1
7	39375_6727703	Confined	2,074	9/4/1984	362.41	348.62	13.79	1
7	39375_6727703	Confined	2,263	3/12/1985	362.94	348.54	14.40	1
7	39375_6727703	Confined	2,357	6/14/1985	361.84	348.91	12.93	1
7	39376_6727806	Confined	838	4/17/1981	363.00	346.80	1.62	0.1
7	39376_6727806	Confined	877	5/26/1981	362.10	346.94	1.52	0.1
7	39376_6727806	Confined	898	6/16/1981	363.53	347.01	1.65	0.1
7	39376_6727806	Confined	899	6/17/1981	363.55	347.01	1.65	0.1
7	39376_6727806	Confined	928	7/16/1981	363.53	347.11	1.64	0.1
7	39376_6727806	Confined	990	9/16/1981	363.30	347.32	1.60	0.1
7	39376_6727806	Confined	1,024	10/20/1981	363.16	347.43	1.57	0.1
7	39376_6727806	Confined	1,054	11/19/1981	363.52	347.53	1.60	0.1
7	39376_6727806	Confined	1,081	12/16/1981	363.46	347.63	1.58	0.1
7	39376_6727806	Confined	1,113	1/17/1982	362.52	347.63	1.49	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39376_6727806	Confined	1,116	1/20/1982	363.13	347.62	1.55	0.1
7	39376_6727806	Confined	1,143	2/16/1982	363.45	347.54	1.59	0.1
7	39376_6727806	Confined	1,167	3/12/1982	363.46	347.46	1.60	0.1
7	39376_6727806	Confined	1,206	4/20/1982	363.23	347.35	1.59	0.1
7	39376_6727806	Confined	1,230	5/14/1982	363.42	347.27	1.61	0.1
7	39376_6727806	Confined	1,265	6/18/1982	363.18	347.17	1.60	0.1
7	39376_6727806	Confined	1,292	7/15/1982	362.89	347.09	1.58	0.1
7	39376_6727806	Confined	1,359	9/20/1982	362.30	346.89	1.54	0.1
7	39376_6727806	Confined	1,389	10/20/1982	362.10	346.80	1.53	0.1
7	39376_6727806	Confined	1,419	11/19/1982	362.50	346.71	1.58	0.1
7	39376_6727806	Confined	1,446	12/16/1982	362.37	346.62	1.57	0.1
7	39376_6727806	Confined	1,478	1/17/1983	362.52	346.54	1.60	0.1
7	39376_6727806	Confined	1,515	2/23/1983	362.57	346.47	1.61	0.1
7	39376_6727806	Confined	1,542	3/22/1983	362.48	346.42	1.61	0.1
7	39376_6727806	Confined	1,571	4/20/1983	362.63	346.36	1.63	0.1
7	39376_6727806	Confined	1,632	6/20/1983	362.53	346.23	1.63	0.1
7	39376_6727806	Confined	1,732	9/28/1983	361.33	346.03	1.53	0.1
7	39376_6727806	Confined	1,808	12/13/1983	361.15	345.88	1.53	0.1
7	39376_6727806	Confined	1,901	3/15/1984	361.94	345.58	1.64	0.1
7	39376_6727806	Confined	1,997	6/19/1984	361.34	345.24	1.61	0.1
7	39376_6727806	Confined	2,074	9/4/1984	360.75	344.97	1.58	0.1
7	39376_6727806	Confined	2,178	12/17/1984	361.12	344.61	1.65	0.1
7	39376_6727806	Confined	2,263	3/12/1985	361.41	344.84	1.66	0.1
7	39376_6727806	Confined	2,357	6/14/1985	360.46	345.22	1.52	0.1
7	39379_6727903	Confined	7,836	6/14/2000	347.13	333.09	7.02	0.5
7	39379_6727903	Confined	8,635	8/22/2002	343.43	333.79	4.82	0.5
7	39379_6727903	Confined	8,928	6/11/2003	342.71	334.34	4.19	0.5
7	39379_6727903	Confined	9,033	9/24/2003	342.03	334.40	3.82	0.5
7	39379_6727903	Confined	9,152	1/21/2004	342.33	334.52	3.90	0.5
7	39379_6727903	Confined	9,398	9/23/2004	340.91	335.30	2.80	0.5
7	39379_6727903	Confined	9,513	1/16/2005	339.50	335.57	1.97	0.5
7	39379_6727903	Confined	9,749	9/9/2005	339.28	334.86	2.21	0.5
7	39379_6727903	Confined	9,878	1/16/2006	339.50	334.48	2.51	0.5
7	39379_6727903	Confined	10,392	6/14/2007	343.85	334.60	4.63	0.5
7	39379_6727903	Confined	10,488	9/18/2007	344.49	335.15	4.67	0.5
7	39379_6727903	Confined	10,607	1/15/2008	343.46	335.69	3.88	0.5
7	39379_6727903	Confined	10,774	6/30/2008	338.30	335.08	1.61	0.5
7	39379_6727903	Confined	11,203	9/2/2009	340.03	333.76	3.14	0.5
7	39379_6727903	Confined	11,327	1/4/2010	341.21	333.43	3.89	0.5
7	39379_6727903	Confined	11,476	6/2/2010	340.08	333.07	3.50	0.5
7	39379_6727903	Confined	11,587	9/21/2010	340.61	332.80	3.90	0.5
7	39379_6727903	Confined	11,693	1/5/2011	341.11	332.53	4.29	0.5
7	39379_6727903	Confined	11,840	6/1/2011	334.47	331.70	1.38	0.5
7	39379_6727903	Confined	11,937	9/6/2011	330.49	331.16	-0.34	0.5
7	39379_6727903	Confined	12,070	1/17/2012	337.78	330.39	3.69	0.5
7	39379_6727903	Confined	12,210	6/5/2012	337.65	329.38	4.14	0.5
7	39379_6727903	Confined	12,302	9/5/2012	333.88	328.71	2.58	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39379_6727903	Confined	12,668	9/6/2013	331.63	324.77	3.43	0.5
7	39379_6727903	Confined	12,786	1/2/2014	335.01	323.29	5.86	0.5
7	39379_6727903	Confined	12,938	6/3/2014	331.60	320.98	5.31	0.5
7	39379_6727903	Confined	13,029	9/2/2014	326.31	319.59	3.36	0.5
7	39379_6727903	Confined	13,148	12/30/2014	326.62	317.78	4.42	0.5
7	39379_6727903	Confined	13,305	6/5/2015	326.71	315.09	5.81	0.5
7	39379_6727903	Confined	13,516	1/2/2016	323.45	311.51	5.97	0.5
7	39379_6727903	Confined	13,668	6/2/2016	324.05	311.87	6.09	0.5
7	39379_6727903	Confined	13,884	1/4/2017	323.59	312.36	5.62	0.5
7	39405_6728704	Confined	9,353	8/9/2004	331.35	334.21	-2.86	1
7	39408_6729303	Confined	3,880	8/15/1989	355.48	351.24	4.24	1
7	39423_6734612	Confined	7,593	10/15/1999	367.18	384.34	-1.72	0.1
7	39423_6734612	Confined	8,333	10/24/2001	382.93	382.84	0.01	0.1
7	39423_6734612	Confined	8,635	8/22/2002	382.05	385.46	-0.34	0.1
7	39423_6734612	Confined	8,928	6/11/2003	380.39	387.13	-0.67	0.1
7	39423_6734612	Confined	9,033	9/24/2003	380.26	387.23	-0.70	0.1
7	39423_6734612	Confined	9,152	1/21/2004	380.46	387.51	-0.70	0.1
7	39423_6734612	Confined	9,398	9/23/2004	379.30	389.65	-1.03	0.1
7	39423_6734612	Confined	9,749	9/9/2005	378.38	388.20	-0.98	0.1
7	39423_6734612	Confined	9,878	1/16/2006	379.08	387.03	-0.79	0.1
7	39423_6734612	Confined	10,392	6/14/2007	379.35	386.68	-0.73	0.1
7	39423_6734612	Confined	10,488	9/18/2007	379.24	388.21	-0.90	0.1
7	39423_6734612	Confined	10,607	1/15/2008	379.16	389.73	-1.06	0.1
7	39423_6734612	Confined	10,774	6/30/2008	377.41	388.14	-1.07	0.1
7	39423_6734612	Confined	11,203	9/2/2009	376.69	385.09	-0.84	0.1
7	39423_6734612	Confined	11,327	1/4/2010	376.50	384.45	-0.79	0.1
7	39423_6734612	Confined	12,668	9/6/2013	364.54	377.94	-1.34	0.1
7	39423_6734612	Confined	12,786	1/2/2014	364.55	378.13	-1.36	0.1
7	39423_6734612	Confined	12,938	6/3/2014	360.13	377.56	-1.74	0.1
7	39423_6734612	Confined	13,305	6/5/2015	355.48	377.60	-2.21	0.1
7	39423_6734612	Confined	13,519	1/5/2016	352.78	378.74	-2.60	0.1
7	39423_6734612	Confined	13,668	6/2/2016	352.68	379.53	-2.68	0.1
7	39423_6734612	Confined	14,037	6/6/2017	347.58	380.14	-3.26	0.1
7	39428_6734905	Confined	7,852	6/30/2000	374.48	351.90	2.26	0.1
7	39428_6734905	Confined	7,948	10/4/2000	370.96	351.76	1.92	0.1
7	39428_6734905	Confined	8,046	1/10/2001	373.79	351.64	2.22	0.1
7	39428_6734905	Confined	8,101	3/6/2001	375.11	351.65	2.35	0.1
7	39428_6734905	Confined	8,531	5/10/2002	365.67	351.88	1.38	0.1
7	39428_6734905	Confined	8,635	8/22/2002	367.81	352.03	1.58	0.1
7	39428_6734905	Confined	8,928	6/11/2003	349.84	352.31	-0.25	0.1
7	39428_6734905	Confined	9,033	9/24/2003	349.89	352.37	-0.25	0.1
7	39428_6734905	Confined	9,152	1/21/2004	357.09	352.48	0.46	0.1
7	39428_6734905	Confined	9,398	9/23/2004	352.56	353.08	-0.05	0.1
7	39428_6734905	Confined	9,523	1/26/2005	357.04	353.28	0.38	0.1
7	39428_6734905	Confined	9,749	9/9/2005	342.09	352.92	-1.08	0.1
7	39428_6734905	Confined	9,878	1/16/2006	353.85	352.73	0.11	0.1
7	39428_6734905	Confined	10,392	6/14/2007	355.47	353.14	0.23	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39428_6734905	Confined	10,488	9/18/2007	355.07	353.56	0.15	0.1
7	39428_6734905	Confined	10,607	1/15/2008	356.34	353.98	0.24	0.1
7	39428_6734905	Confined	10,774	6/30/2008	344.06	353.55	-0.95	0.1
7	39428_6734905	Confined	11,203	9/2/2009	339.15	352.32	-1.32	0.1
7	39428_6734905	Confined	11,327	1/4/2010	354.06	351.93	0.21	0.1
7	39428_6734905	Confined	11,476	6/2/2010	353.28	351.30	0.20	0.1
7	39428_6734905	Confined	11,587	9/21/2010	349.59	350.84	-0.13	0.1
7	39428_6734905	Confined	11,693	1/5/2011	355.08	350.39	0.47	0.1
7	39428_6734905	Confined	11,840	6/1/2011	345.31	349.71	-0.44	0.1
7	39428_6734905	Confined	11,937	9/6/2011	333.66	349.26	-1.56	0.1
7	39428_6734905	Confined	12,070	1/17/2012	347.38	348.62	-0.12	0.1
7	39428_6734905	Confined	12,210	6/5/2012	345.61	347.75	-0.21	0.1
7	39428_6734905	Confined	12,302	9/5/2012	334.49	347.19	-1.27	0.1
7	39428_6734905	Confined	12,668	9/6/2013	331.55	343.63	-1.21	0.1
7	39428_6734905	Confined	12,786	1/2/2014	333.80	342.27	-0.85	0.1
7	39428_6734905	Confined	12,938	6/3/2014	331.53	340.23	-0.87	0.1
7	39428_6734905	Confined	13,148	12/30/2014	315.96	337.41	-2.15	0.1
7	39428_6734905	Confined	13,305	6/5/2015	320.66	334.79	-1.41	0.1
7	39428_6734905	Confined	13,519	1/5/2016	320.33	331.31	-1.10	0.1
7	39428_6734905	Confined	13,668	6/2/2016	328.33	331.93	-0.36	0.1
7	39428_6734905	Confined	13,889	1/9/2017	330.28	332.78	-0.25	0.1
7	39428_6734905	Confined	14,036	6/5/2017	321.68	332.12	-1.04	0.1
7	39430_6735401	Confined	7,429	5/4/1999	377.80	362.99	14.81	1
7	39430_6735401	Confined	8,046	1/10/2001	377.45	361.59	15.86	1
7	39430_6735401	Confined	8,101	3/6/2001	377.70	361.54	16.16	1
7	39430_6735401	Confined	8,164	5/8/2001	377.07	361.48	15.59	1
7	39430_6735401	Confined	8,171	5/15/2001	375.00	361.48	13.52	1
7	39430_6735401	Confined	8,334	10/25/2001	375.88	361.33	14.55	1
7	39430_6735401	Confined	8,451	2/19/2002	375.28	361.66	13.62	1
7	39430_6735401	Confined	8,531	5/10/2002	374.80	362.28	12.52	1
7	39430_6735401	Confined	8,635	8/22/2002	374.70	363.08	11.62	1
7	39430_6735401	Confined	8,928	6/11/2003	370.77	364.09	6.68	1
7	39430_6735401	Confined	9,033	9/24/2003	370.80	364.08	6.72	1
7	39430_6735401	Confined	9,152	1/21/2004	372.15	364.20	7.95	1
7	39430_6735401	Confined	9,398	9/23/2004	367.55	365.59	1.96	1
7	39430_6735401	Confined	9,523	1/26/2005	371.08	365.98	5.10	1
7	39430_6735401	Confined	9,878	1/16/2006	370.00	363.67	6.33	1
7	39430_6735401	Confined	10,392	6/14/2007	370.53	363.76	6.77	1
7	39430_6735401	Confined	10,488	9/18/2007	370.25	364.84	5.41	1
7	39430_6735401	Confined	10,607	1/15/2008	370.37	365.89	4.48	1
7	39430_6735401	Confined	10,774	6/30/2008	365.95	364.66	1.29	1
7	39430_6735401	Confined	11,203	9/2/2009	362.64	362.58	0.06	1
7	39430_6735401	Confined	11,327	1/4/2010	367.51	362.22	5.29	1
7	39430_6735401	Confined	11,476	6/2/2010	367.62	361.92	5.70	1
7	39430_6735401	Confined	11,587	9/21/2010	364.04	361.70	2.34	1
7	39430_6735401	Confined	11,693	1/5/2011	366.31	361.45	4.86	1
7	39430_6735401	Confined	11,840	6/1/2011	360.48	359.85	0.63	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39430_6735401	Confined	11,937	9/6/2011	357.97	358.80	-0.83	1
7	39430_6735401	Confined	12,070	1/17/2012	362.11	357.51	4.60	1
7	39430_6735401	Confined	12,210	6/5/2012	361.44	357.25	4.19	1
7	39430_6735401	Confined	12,302	9/5/2012	357.39	357.07	0.32	1
7	39430_6735401	Confined	12,668	9/6/2013	347.49	355.91	-8.42	1
7	39430_6735401	Confined	12,786	1/2/2014	355.42	355.46	-0.04	1
7	39430_6735401	Confined	12,938	6/3/2014	352.43	354.24	-1.81	1
7	39430_6735401	Confined	13,029	9/2/2014	348.94	353.51	-4.57	1
7	39430_6735401	Confined	13,148	12/30/2014	347.27	352.56	-5.29	1
7	39430_6735401	Confined	13,534	1/20/2016	343.82	351.44	-7.62	1
7	39430_6735401	Confined	13,884	1/4/2017	341.87	352.28	-10.41	1
7	39430_6735401	Confined	14,036	6/5/2017	338.70	351.65	-12.95	1
7	39433_6735404	Confined	12,070	1/17/2012	357.07	353.59	3.48	1
7	39433_6735404	Confined	12,210	6/5/2012	358.20	353.13	5.07	1
7	39433_6735404	Confined	12,786	1/2/2014	354.81	350.04	4.77	1
7	39442_6735903	Confined	5,309	7/14/1993	360.66	337.48	23.18	1
7	39455_6736806	Confined	10,286	2/28/2007	333.44	339.61	-6.17	1
7	39458_6742202	Confined	779	2/17/1981	392.13	377.19	14.94	1
7	39458_6742202	Confined	1,145	2/18/1982	392.10	377.85	14.25	1
7	39458_6742202	Confined	1,509	2/17/1983	392.16	377.10	15.06	1
7	39458_6742202	Confined	1,866	2/9/1984	392.04	376.64	15.40	1
7	39458_6742202	Confined	2,609	2/21/1986	389.80	377.02	12.78	1
7	39458_6742202	Confined	2,892	12/1/1986	389.62	377.45	12.17	1
7	39458_6742202	Confined	3,700	2/16/1989	386.96	375.48	11.48	1
7	39458_6742202	Confined	4,426	2/12/1991	387.95	375.10	12.85	1
7	39458_6742202	Confined	4,806	2/27/1992	389.88	376.39	13.49	1
7	39458_6742202	Confined	5,161	2/16/1993	387.45	377.23	10.22	1
7	39458_6742202	Confined	5,524	2/14/1994	387.25	376.70	10.55	1
7	39458_6742202	Confined	5,890	2/15/1995	389.30	376.78	12.52	1
7	39458_6742202	Confined	6,261	2/21/1996	387.90	375.84	12.06	1
7	39458_6742202	Confined	6,626	2/20/1997	387.40	374.50	12.90	1
7	39458_6742202	Confined	6,990	2/19/1998	387.50	375.44	12.06	1
7	39458_6742202	Confined	7,926	9/12/2000	383.20	374.11	9.09	1
7	39458_6742202	Confined	11,204	9/3/2009	385.95	374.87	11.08	1
7	39458_6742202	Confined	11,328	1/5/2010	388.42	374.34	14.08	1
7	39458_6742202	Confined	11,476	6/2/2010	390.14	373.59	16.55	1
7	39458_6742202	Confined	11,587	9/21/2010	388.17	373.02	15.15	1
7	39458_6742202	Confined	11,693	1/5/2011	387.64	372.47	15.17	1
7	39458_6742202	Confined	11,937	9/6/2011	383.04	370.35	12.69	1
7	39458_6742202	Confined	12,070	1/17/2012	380.44	369.31	11.13	1
7	39459_6742205	Confined	8,975	7/28/2003	343.77	362.90	-19.13	1
7	39459_6742205	Confined	11,476	6/2/2010	340.50	361.45	-20.95	1
7	39459_6742205	Confined	11,587	9/21/2010	341.25	360.72	-19.47	1
7	39459_6742205	Confined	11,937	9/6/2011	317.77	358.54	-40.77	1
7	39459_6742205	Confined	12,668	9/6/2013	315.27	350.95	-35.68	1
7	39459_6742205	Confined	12,786	1/2/2014	318.13	349.08	-30.95	1
7	39459_6742205	Confined	12,938	6/3/2014	311.94	346.29	-34.35	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39459_6742205	Confined	13,311	6/11/2015	314.06	338.64	-24.58	1
7	39460_6742303	Confined	7,869	7/17/2000	361.63	350.03	11.60	1
7	39460_6742303	Confined	11,203	9/2/2009	348.29	350.47	-2.18	1
7	39460_6742303	Confined	11,327	1/4/2010	350.42	349.96	0.46	1
7	39460_6742303	Confined	11,587	9/21/2010	350.93	348.38	2.55	1
7	39460_6742303	Confined	11,693	1/5/2011	350.54	347.75	2.79	1
7	39460_6742303	Confined	11,845	6/6/2011	349.78	347.06	2.72	1
7	39460_6742303	Confined	11,937	9/6/2011	346.41	346.64	-0.23	1
7	39460_6742303	Confined	12,786	1/2/2014	347.16	335.81	11.35	1
7	39460_6742303	Confined	12,938	6/3/2014	349.59	332.75	16.84	1
7	39460_6742303	Confined	13,029	9/2/2014	347.16	330.92	16.24	1
7	39460_6742303	Confined	13,148	12/30/2014	346.92	328.52	18.40	1
7	39460_6742303	Confined	13,305	6/5/2015	351.65	324.33	27.32	1
7	39460_6742303	Confined	13,519	1/5/2016	349.69	318.78	30.91	1
7	39460_6742303	Confined	13,668	6/2/2016	355.21	319.68	35.53	1
7	39460_6742303	Confined	13,884	1/4/2017	349.89	320.94	28.95	1
7	39460_6742303	Confined	14,036	6/5/2017	348.89	319.97	28.92	1
7	39463_6742602	Confined	11,203	9/2/2009	323.38	349.14	-25.76	1
7	39463_6742602	Confined	11,327	1/4/2010	333.27	348.34	-15.07	1
7	39463_6742602	Confined	11,476	6/2/2010	332.02	346.86	-14.84	1
7	39463_6742602	Confined	11,587	9/21/2010	330.36	345.75	-15.39	1
7	39463_6742602	Confined	11,693	1/5/2011	333.47	344.72	-11.25	1
7	39463_6742602	Confined	11,840	6/1/2011	325.84	343.91	-18.07	1
7	39463_6742602	Confined	11,937	9/6/2011	326.76	343.38	-16.62	1
7	39471_6742905	Confined	8,115	3/20/2001	355.05	347.18	7.87	1
7	39471_6742905	Confined	8,164	5/8/2001	354.61	347.28	7.33	1
7	39471_6742905	Confined	8,263	8/15/2001	344.87	347.46	-2.59	1
7	39471_6742905	Confined	8,333	10/24/2001	345.16	347.59	-2.43	1
7	39471_6742905	Confined	8,451	2/19/2002	347.19	347.63	-0.44	1
7	39471_6742905	Confined	8,531	5/10/2002	344.92	347.49	-2.57	1
7	39471_6742905	Confined	8,635	8/22/2002	347.24	347.30	-0.06	1
7	39471_6742905	Confined	8,928	6/11/2003	334.87	347.37	-12.50	1
7	39471_6742905	Confined	9,033	9/24/2003	336.92	347.57	-10.65	1
7	39471_6742905	Confined	9,152	1/21/2004	342.47	347.83	-5.36	1
7	39471_6742905	Confined	9,398	9/23/2004	340.77	348.73	-7.96	1
7	39471_6742905	Confined	9,523	1/26/2005	343.66	349.08	-5.42	1
7	39471_6742905	Confined	9,878	1/16/2006	341.23	348.99	-7.76	1
7	39471_6742905	Confined	10,392	6/14/2007	341.89	350.51	-8.62	1
7	39471_6742905	Confined	10,488	9/18/2007	340.77	351.09	-10.32	1
7	39471_6742905	Confined	10,607	1/15/2008	341.60	351.66	-10.06	1
7	39471_6742905	Confined	11,203	9/2/2009	323.22	348.35	-25.13	1
7	39471_6742905	Confined	11,327	1/4/2010	338.11	347.34	-9.23	1
7	39471_6742905	Confined	11,476	6/2/2010	336.11	345.46	-9.35	1
7	39471_6742905	Confined	11,587	9/21/2010	334.79	344.07	-9.28	1
7	39471_6742905	Confined	11,693	1/5/2011	338.84	342.77	-3.93	1
7	39471_6742905	Confined	11,840	6/1/2011	328.69	341.86	-13.17	1
7	39471_6742905	Confined	11,937	9/6/2011	317.53	341.26	-23.73	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39471_6742905	Confined	12,070	1/17/2012	329.20	340.17	-10.97	1
7	39471_6742905	Confined	12,210	6/5/2012	321.97	337.14	-15.17	1
7	39471_6742905	Confined	12,668	9/6/2013	305.88	322.92	-17.04	1
7	39471_6742905	Confined	12,786	1/2/2014	315.44	318.32	-2.88	1
7	39471_6742905	Confined	12,938	6/3/2014	307.24	312.05	-4.81	1
7	39472_6742906	Confined	8,593	7/11/2002	344.73	346.07	-1.34	1
7	39473_6742913	Confined	7,171	8/19/1998	353.81	351.64	2.17	1
7	39474_6742914	Confined	7,813	5/22/2000	340.34	347.66	-7.32	1
7	39475_6742915	Confined	8,911	5/25/2003	327.93	346.19	-18.26	1
7	39475_6742915	Confined	13,305	6/5/2015	305.26	283.80	21.46	1
7	39475_6742915	Confined	13,519	1/5/2016	295.16	269.71	25.45	1
7	39475_6742915	Confined	13,669	6/3/2016	301.38	272.93	28.45	1
7	39475_6742915	Confined	13,764	9/6/2016	295.05	274.98	20.07	1
7	39475_6742915	Confined	13,897	1/17/2017	304.43	277.20	27.23	1
7	39475_6742915	Confined	14,036	6/5/2017	289.23	274.96	14.27	1
7	39476_6743103	Confined	7,683	1/13/2000	365.47	348.64	16.83	1
7	39476_6743103	Confined	7,760	3/30/2000	366.82	348.50	18.32	1
7	39476_6743103	Confined	7,815	5/24/2000	366.85	348.40	18.45	1
7	39476_6743103	Confined	7,852	6/30/2000	366.54	348.33	18.21	1
7	39476_6743103	Confined	7,948	10/4/2000	362.17	348.16	14.01	1
7	39476_6743103	Confined	8,046	1/10/2001	365.97	348.01	17.96	1
7	39476_6743103	Confined	8,101	3/6/2001	366.63	348.03	18.60	1
7	39476_6743103	Confined	8,164	5/8/2001	366.48	348.06	18.42	1
7	39476_6743103	Confined	8,263	8/15/2001	361.67	348.10	13.57	1
7	39476_6743103	Confined	8,334	10/25/2001	363.66	348.13	15.53	1
7	39476_6743103	Confined	8,451	2/19/2002	361.17	348.18	12.99	1
7	39476_6743103	Confined	8,531	5/10/2002	364.44	348.23	16.21	1
7	39476_6743103	Confined	8,635	8/22/2002	362.72	348.29	14.43	1
7	39476_6743103	Confined	8,928	6/11/2003	339.52	348.48	-8.96	1
7	39476_6743103	Confined	9,033	9/24/2003	344.23	348.56	-4.33	1
7	39476_6743103	Confined	9,152	1/21/2004	349.24	348.68	0.56	1
7	39476_6743103	Confined	9,398	9/23/2004	344.96	349.22	-4.26	1
7	39476_6743103	Confined	9,523	1/26/2005	349.92	349.42	0.50	1
7	39476_6743103	Confined	9,749	9/9/2005	334.29	349.20	-14.91	1
7	39476_6743103	Confined	9,878	1/16/2006	345.43	349.08	-3.65	1
7	39476_6743103	Confined	10,392	6/14/2007	342.75	349.61	-6.86	1
7	39476_6743103	Confined	10,488	9/18/2007	343.10	349.99	-6.89	1
7	39476_6743103	Confined	10,607	1/15/2008	343.55	350.36	-6.81	1
7	39476_6743103	Confined	10,774	6/30/2008	329.50	349.98	-20.48	1
7	39476_6743103	Confined	11,203	9/2/2009	323.77	348.72	-24.95	1
7	39476_6743103	Confined	11,327	1/4/2010	343.31	348.28	-4.97	1
7	39476_6743103	Confined	11,476	6/2/2010	341.53	347.52	-5.99	1
7	39476_6743103	Confined	11,587	9/21/2010	337.32	346.95	-9.63	1
7	39476_6743103	Confined	11,693	1/5/2011	354.47	346.42	8.05	1
7	39476_6743103	Confined	11,840	6/1/2011	327.59	345.80	-18.21	1
7	39476_6743103	Confined	11,937	9/6/2011	316.65	345.38	-28.73	1
7	39476_6743103	Confined	12,070	1/17/2012	337.12	344.75	-7.63	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39476_6743103	Confined	12,210	6/5/2012	332.93	343.56	-10.63	1
7	39476_6743103	Confined	12,302	9/5/2012	317.85	342.77	-24.92	1
7	39476_6743103	Confined	12,668	9/6/2013	316.35	337.94	-21.59	1
7	39476_6743103	Confined	12,786	1/2/2014	317.82	336.11	-18.29	1
7	39476_6743103	Confined	12,938	6/3/2014	317.57	333.48	-15.91	1
7	39476_6743103	Confined	13,029	9/2/2014	302.11	331.91	-29.80	1
7	39476_6743103	Confined	13,305	6/5/2015	305.47	326.28	-20.81	1
7	39476_6743103	Confined	13,519	1/5/2016	304.19	321.56	-17.37	1
7	39476_6743103	Confined	13,668	6/2/2016	312.39	322.32	-9.93	1
7	39476_6743103	Confined	13,786	9/28/2016	305.38	322.93	-17.55	1
7	39476_6743103	Confined	13,889	1/9/2017	311.44	323.36	-11.92	1
7	39476_6743103	Confined	14,036	6/5/2017	300.01	322.54	-22.53	1
7	39494_6743805	Confined	8,635	8/22/2002	331.17	343.63	-12.46	1
7	39494_6743805	Confined	8,928	6/11/2003	324.26	343.72	-19.46	1
7	39494_6743805	Confined	9,878	1/16/2006	322.63	344.94	-22.31	1
7	39494_6743805	Confined	10,392	6/14/2007	323.61	346.03	-22.42	1
7	39494_6743805	Confined	10,488	9/18/2007	323.69	346.48	-22.79	1
7	39494_6743805	Confined	10,607	1/15/2008	324.31	346.94	-22.63	1
7	39494_6743805	Confined	10,774	6/30/2008	319.46	346.48	-27.02	1
7	39494_6743805	Confined	11,203	9/2/2009	322.34	344.53	-22.19	1
7	39494_6743805	Confined	11,327	1/4/2010	319.91	343.78	-23.87	1
7	39494_6743805	Confined	11,476	6/2/2010	322.73	342.39	-19.66	1
7	39494_6743805	Confined	11,587	9/21/2010	318.80	341.35	-22.55	1
7	39494_6743805	Confined	11,693	1/5/2011	320.03	340.38	-20.35	1
7	39494_6743805	Confined	11,841	6/2/2011	316.56	339.60	-23.04	1
7	39494_6743805	Confined	11,938	9/7/2011	305.06	339.08	-34.02	1
7	39494_6743805	Confined	12,070	1/17/2012	311.56	338.19	-26.63	1
7	39494_6743805	Confined	12,211	6/6/2012	312.46	335.93	-23.47	1
7	39494_6743805	Confined	12,316	9/19/2012	301.46	334.24	-32.78	1
7	39494_6743805	Confined	12,787	1/3/2014	297.21	321.85	-24.64	1
7	39494_6743805	Confined	12,940	6/5/2014	294.38	317.00	-22.62	1
7	39494_6743805	Confined	13,030	9/3/2014	281.38	314.15	-32.77	1
7	39494_6743805	Confined	13,155	1/6/2015	282.94	310.12	-27.18	1
7	39494_6743805	Confined	13,311	6/11/2015	289.54	303.39	-13.85	1
7	39494_6743805	Confined	13,528	1/14/2016	278.99	294.77	-15.78	1
7	39494_6743805	Confined	13,669	6/3/2016	287.18	296.04	-8.86	1
7	39494_6743805	Confined	13,760	9/2/2016	280.92	296.87	-15.95	1
7	39494_6743805	Confined	13,886	1/6/2017	286.10	297.89	-11.79	1
7	39494_6743805	Confined	14,038	6/7/2017	280.19	296.36	-16.17	1
7	39496_6743901	Confined	781	2/19/1981	359.13	344.44	14.69	1
7	39499_6743907	Confined	9,878	1/16/2006	322.82	343.23	-20.41	1
7	39499_6743907	Confined	10,393	6/15/2007	327.05	344.23	-17.18	1
7	39499_6743907	Confined	10,488	9/18/2007	328.20	344.65	-16.45	1
7	39499_6743907	Confined	10,607	1/15/2008	333.40	345.07	-11.67	1
7	39499_6743907	Confined	10,774	6/30/2008	328.78	344.66	-15.88	1
7	39499_6743907	Confined	11,203	9/2/2009	310.11	342.87	-32.76	1
7	39499_6743907	Confined	11,327	1/4/2010	329.35	342.18	-12.83	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39499_6743907	Confined	11,476	6/2/2010	320.68	340.89	-20.21	1
7	39499_6743907	Confined	11,588	9/22/2010	323.01	339.93	-16.92	1
7	39499_6743907	Confined	13,155	1/6/2015	287.02	310.54	-23.52	1
7	39499_6743907	Confined	13,311	6/11/2015	288.38	304.22	-15.84	1
7	39499_6743907	Confined	13,528	1/14/2016	283.15	296.09	-12.94	1
7	39499_6743907	Confined	13,669	6/3/2016	288.89	297.13	-8.24	1
7	39499_6743907	Confined	13,760	9/2/2016	278.56	297.81	-19.25	1
7	39499_6743907	Confined	13,886	1/6/2017	284.44	298.64	-14.20	1
7	39499_6743907	Confined	14,038	6/7/2017	277.94	297.21	-19.27	1
7	39501_6751102	Confined	11,476	6/2/2010	329.36	344.58	-15.22	1
7	39501_6751102	Confined	11,587	9/21/2010	328.17	343.40	-15.23	1
7	39501_6751102	Confined	11,693	1/5/2011	328.19	342.29	-14.10	1
7	39501_6751102	Confined	11,840	6/1/2011	324.13	341.41	-17.28	1
7	39501_6751102	Confined	11,937	9/6/2011	316.36	340.84	-24.48	1
7	39501_6751102	Confined	12,064	1/11/2012	319.63	339.97	-20.34	1
7	39501_6751102	Confined	12,210	6/5/2012	317.37	337.63	-20.26	1
7	39501_6751102	Confined	12,302	9/5/2012	309.24	336.16	-26.92	1
7	39501_6751102	Confined	12,673	9/11/2013	301.47	326.73	-25.26	1
7	39501_6751102	Confined	12,806	1/22/2014	308.66	322.72	-14.06	1
7	39501_6751102	Confined	12,953	6/18/2014	299.70	317.93	-18.23	1
7	39501_6751102	Confined	13,038	9/11/2014	295.41	315.16	-19.75	1
7	39502_6727701	Confined	779	2/17/1981	370.75	357.36	13.39	1
7	39502_6727701	Confined	1,145	2/18/1982	371.68	357.99	13.69	1
7	39502_6727701	Confined	1,509	2/17/1983	369.32	357.27	12.05	1
7	39502_6727701	Confined	1,866	2/9/1984	368.86	356.78	12.08	1
7	39502_6727701	Confined	2,230	2/7/1985	368.70	356.07	12.63	1
7	39506_6749201	Confined	778	2/16/1981	374.91	381.87	-6.96	1
7	39506_6749201	Confined	1,145	2/18/1982	369.57	382.50	-12.93	1
7	39506_6749201	Confined	1,507	2/15/1983	370.72	382.00	-11.28	1
7	39506_6749201	Confined	2,893	12/2/1986	388.51	382.41	6.10	1
7	39506_6749201	Confined	3,999	12/12/1989	372.51	379.58	-7.07	1
7	39506_6749201	Confined	5,119	1/5/1993	400.51	379.61	20.90	1
7	39506_6749201	Confined	5,358	9/1/1993	397.51	380.11	17.40	1
7	39506_6749201	Confined	5,388	10/1/1993	412.01	380.17	31.84	1
7	39506_6749201	Confined	5,419	11/1/1993	396.46	380.24	16.22	1
7	39506_6749201	Confined	5,450	12/2/1993	393.21	380.30	12.91	1
7	39506_6749201	Confined	5,482	1/3/1994	393.51	380.36	13.15	1
7	39506_6749201	Confined	5,512	2/2/1994	394.81	380.36	14.45	1
7	39506_6749201	Confined	5,539	3/1/1994	404.51	380.35	24.16	1
7	39506_6749201	Confined	5,573	4/4/1994	404.51	380.35	24.16	1
7	39506_6749201	Confined	5,601	5/2/1994	403.51	380.34	23.17	1
7	39506_6749201	Confined	5,639	6/9/1994	401.51	380.33	21.18	1
7	39506_6749201	Confined	5,661	7/1/1994	405.51	380.33	25.18	1
7	39506_6749201	Confined	5,849	1/5/1995	404.21	380.29	23.92	1
7	39506_6749201	Confined	6,211	1/2/1996	393.21	379.94	13.27	1
7	39506_6749201	Confined	6,637	3/3/1997	392.96	377.55	15.41	1
7	39506_6749201	Confined	6,973	2/2/1998	376.36	378.44	-2.08	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39506_6749201	Confined	7,121	6/30/1998	371.30	378.41	-7.11	1
7	39506_6749201	Confined	7,325	1/20/1999	373.41	378.30	-4.89	1
7	39506_6749201	Confined	7,927	9/13/2000	366.36	375.51	-9.15	1
7	39506_6749201	Confined	8,069	2/2/2001	371.51	374.90	-3.39	1
7	39506_6749201	Confined	8,429	1/28/2002	374.31	375.64	-1.33	1
7	39506_6749201	Confined	8,774	1/8/2003	373.11	375.23	-2.12	1
7	39506_6749201	Confined	9,143	1/12/2004	371.31	375.89	-4.58	1
7	39506_6749201	Confined	9,558	3/2/2005	372.61	377.76	-5.15	1
7	39506_6749201	Confined	9,873	1/11/2006	365.11	377.21	-12.10	1
7	39506_6749201	Confined	10,230	1/3/2007	364.41	377.91	-13.50	1
7	39506_6749201	Confined	10,600	1/8/2008	368.01	381.70	-13.69	1
7	39506_6749201	Confined	10,992	2/3/2009	366.01	378.84	-12.83	1
7	39506_6749201	Confined	11,343	1/20/2010	366.51	374.76	-8.25	1
7	39506_6749201	Confined	12,059	1/6/2012	357.61	364.94	-7.33	1
7	39506_6749201	Confined	12,090	2/6/2012	359.31	365.17	-5.86	1
7	39506_6749201	Confined	12,114	3/1/2012	361.21	365.34	-4.13	1
7	39506_6749201	Confined	12,149	4/5/2012	361.01	365.60	-4.59	1
7	39506_6749201	Confined	12,211	6/6/2012	354.01	366.05	-12.04	1
7	39506_6749201	Confined	12,236	7/1/2012	353.51	366.24	-12.73	1
7	39506_6749201	Confined	12,267	8/1/2012	353.61	366.46	-12.85	1
7	39506_6749201	Confined	12,298	9/1/2012	349.01	366.69	-17.68	1
7	39506_6749201	Confined	12,328	10/1/2012	351.71	366.91	-15.20	1
7	39506_6749201	Confined	12,359	11/1/2012	354.11	367.14	-13.03	1
7	39506_6749201	Confined	12,393	12/5/2012	354.11	367.38	-13.27	1
7	39506_6749201	Confined	12,425	1/6/2013	355.71	367.57	-11.86	1
7	39506_6749201	Confined	12,456	2/6/2013	355.41	367.53	-12.12	1
7	39506_6749201	Confined	12,479	3/1/2013	356.31	367.49	-11.18	1
7	39506_6749201	Confined	12,514	4/5/2013	354.11	367.45	-13.34	1
7	39506_6749201	Confined	12,541	5/2/2013	352.81	367.41	-14.60	1
7	39506_6749201	Confined	12,576	6/6/2013	351.81	367.36	-15.55	1
7	39506_6749201	Confined	12,601	7/1/2013	350.81	367.33	-16.52	1
7	39506_6749201	Confined	12,632	8/1/2013	348.51	367.29	-18.78	1
7	39506_6749201	Confined	12,663	9/1/2013	345.51	367.25	-21.74	1
7	39506_6749201	Confined	12,693	10/1/2013	346.71	367.20	-20.49	1
7	39506_6749201	Confined	12,724	11/1/2013	349.51	367.16	-17.65	1
7	39506_6749201	Confined	12,758	12/5/2013	351.21	367.12	-15.91	1
7	39506_6749201	Confined	12,785	1/1/2014	351.81	367.07	-15.26	1
7	39506_6749201	Confined	12,816	2/1/2014	356.31	366.84	-10.53	1
7	39506_6749201	Confined	12,875	4/1/2014	351.41	366.39	-14.98	1
7	39506_6749201	Confined	12,905	5/1/2014	348.11	366.16	-18.05	1
7	39506_6749201	Confined	12,936	6/1/2014	348.31	365.92	-17.61	1
7	39506_6749201	Confined	12,966	7/1/2014	347.91	365.69	-17.78	1
7	39506_6749201	Confined	12,997	8/1/2014	343.81	365.46	-21.65	1
7	39506_6749201	Confined	13,028	9/1/2014	340.01	365.22	-25.21	1
7	39506_6749201	Confined	13,058	10/1/2014	340.01	364.99	-24.98	1
7	39506_6749201	Confined	13,089	11/1/2014	341.91	364.76	-22.85	1
7	39506_6749201	Confined	13,119	12/1/2014	342.61	364.53	-21.92	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39506_6749201	Confined	13,150	1/1/2015	344.61	364.30	-19.69	1
7	39506_6749201	Confined	13,181	2/1/2015	344.31	364.16	-19.85	1
7	39506_6749201	Confined	13,209	3/1/2015	347.11	364.04	-16.93	1
7	39506_6749201	Confined	13,240	4/1/2015	347.61	363.91	-16.30	1
7	39506_6749201	Confined	13,362	8/1/2015	347.21	363.39	-16.18	1
7	39506_6749201	Confined	13,454	11/1/2015	340.61	363.00	-22.39	1
7	39506_6749201	Confined	13,484	12/1/2015	341.91	362.87	-20.96	1
7	39506_6749201	Confined	13,515	1/1/2016	346.51	362.75	-16.24	1
7	39506_6749201	Confined	13,546	2/1/2016	347.21	362.78	-15.57	1
7	39506_6749201	Confined	13,575	3/1/2016	349.31	362.81	-13.50	1
7	39506_6749201	Confined	13,606	4/1/2016	347.81	362.85	-15.04	1
7	39506_6749201	Confined	13,636	5/1/2016	348.61	362.88	-14.27	1
7	39506_6749201	Confined	13,667	6/1/2016	349.61	362.92	-13.31	1
7	39506_6749201	Confined	13,697	7/1/2016	347.71	362.95	-15.24	1
7	39506_6749201	Confined	13,728	8/1/2016	342.11	362.98	-20.87	1
7	39506_6749201	Confined	13,759	9/1/2016	346.71	363.02	-16.31	1
7	39506_6749201	Confined	13,789	10/1/2016	345.91	363.05	-17.14	1
7	39506_6749201	Confined	13,820	11/1/2016	344.11	363.08	-18.97	1
7	39506_6749201	Confined	13,850	12/1/2016	344.01	363.12	-19.11	1
7	39506_6749201	Confined	13,881	1/1/2017	343.61	363.14	-19.53	1
7	39506_6749201	Confined	13,912	2/1/2017	348.91	362.97	-14.06	1
7	39506_6749201	Confined	13,940	3/1/2017	349.41	362.81	-13.40	1
7	39506_6749201	Confined	14,124	9/1/2017	341.31	361.78	-20.47	1
7	39506_6749201	Confined	14,154	10/1/2017	341.71	361.61	-19.90	1
7	39506_6749201	Confined	14,185	11/1/2017	342.81	361.43	-18.62	1
7	39506_6749201	Confined	14,215	12/1/2017	342.91	361.27	-18.36	1
7	39531_6855704	Confined	779	2/17/1981	392.39	371.01	21.38	1
7	39531_6855704	Confined	1,145	2/18/1982	391.73	372.18	19.55	1
7	39531_6855704	Confined	1,503	2/11/1983	391.61	372.06	19.55	1
7	39531_6855704	Confined	1,864	2/7/1984	391.00	372.04	18.96	1
7	39531_6855704	Confined	2,601	2/13/1986	390.03	372.89	17.14	1
7	39531_6855704	Confined	2,895	12/4/1986	387.36	373.04	14.32	1
7	39531_6855704	Confined	3,334	2/16/1988	389.59	373.13	16.46	1
7	39531_6855704	Confined	3,698	2/14/1989	380.71	371.34	9.37	1
7	39531_6855704	Confined	3,998	12/11/1989	378.28	370.32	7.96	1
7	39531_6855704	Confined	4,364	12/12/1990	380.47	369.64	10.83	1
7	39531_6855704	Confined	5,141	1/27/1993	385.36	370.27	15.09	1
7	39531_6855704	Confined	5,853	1/9/1995	385.96	370.54	15.42	1
7	39531_6855704	Confined	6,220	1/11/1996	383.26	370.18	13.08	1
7	39531_6855704	Confined	6,675	4/10/1997	379.86	368.24	11.62	1
7	39531_6855704	Confined	6,969	1/29/1998	376.76	369.14	7.62	1
7	39531_6855704	Confined	7,325	1/20/1999	378.11	368.95	9.16	1
7	39531_6855704	Confined	8,073	2/6/2001	379.96	365.76	14.20	1
7	39531_6855704	Confined	8,424	1/23/2002	377.86	366.46	11.40	1
7	39531_6855704	Confined	8,793	1/27/2003	379.26	366.09	13.17	1
7	39531_6855704	Confined	9,157	1/26/2004	379.56	366.61	12.95	1
7	39531_6855704	Confined	9,564	3/8/2005	381.16	368.12	13.04	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39531_6855704	Confined	9,879	1/17/2006	379.26	367.50	11.76	1
7	39531_6855704	Confined	10,238	1/11/2007	377.76	368.26	9.50	1
7	39531_6855704	Confined	10,644	2/21/2008	379.76	371.50	8.26	1
7	39531_6855704	Confined	10,999	2/10/2009	378.26	368.92	9.34	1
7	39531_6855704	Confined	11,442	4/29/2010	379.86	363.78	16.08	1
7	39542_6854301	Unconfined	779	2/17/1981	383.44	388.17	-4.73	1
7	39542_6854301	Unconfined	1,144	2/17/1982	382.93	388.37	-5.44	1
7	39542_6854301	Unconfined	1,507	2/15/1983	381.42	388.11	-6.69	1
7	39542_6854301	Unconfined	1,864	2/7/1984	381.81	388.06	-6.25	1
7	39542_6854301	Unconfined	2,228	2/5/1985	381.06	387.94	-6.88	1
7	39550_6863802	Confined	779	2/17/1981	342.73	337.38	5.35	1
7	39550_6863802	Confined	1,144	2/17/1982	332.52	339.43	-6.91	1
7	39550_6863802	Confined	1,506	2/14/1983	330.08	339.91	-9.83	1
7	39550_6863802	Confined	1,863	2/6/1984	327.47	340.30	-12.83	1
7	39550_6863802	Confined	2,602	2/14/1986	332.43	341.34	-8.91	1
7	39550_6863802	Confined	2,895	12/4/1986	329.81	341.31	-11.50	1
7	39550_6863802	Confined	3,335	2/17/1988	332.86	341.62	-8.76	1
7	39550_6863802	Confined	3,998	12/11/1989	317.85	337.55	-19.70	1
7	39550_6863802	Confined	4,364	12/12/1990	328.73	335.82	-7.09	1
7	39550_6863802	Confined	7,326	1/21/1999	304.86	333.86	-29.00	1
7	39550_6863802	Confined	8,076	2/9/2001	301.96	328.91	-26.95	1
7	39550_6863802	Confined	8,431	1/30/2002	300.66	330.19	-29.53	1
7	39550_6863802	Confined	8,793	1/27/2003	301.86	328.12	-26.26	1
7	39550_6863802	Confined	9,157	1/26/2004	305.06	329.44	-24.38	1
7	39550_6863802	Confined	9,530	2/2/2005	305.66	331.73	-26.07	1
7	39550_6863802	Confined	9,879	1/17/2006	305.26	331.96	-26.70	1
7	39550_6863802	Confined	10,266	2/8/2007	301.86	334.42	-32.56	1
7	39550_6863802	Confined	10,645	2/22/2008	305.06	338.03	-32.97	1
7	39550_6863802	Confined	11,022	3/5/2009	299.26	334.37	-35.11	1
7	39550_6863802	Confined	11,443	4/30/2010	306.76	325.35	-18.59	1
7	39551_6863803	Confined	8,696	10/22/2002	334.80	328.02	6.78	1
7	39555_6864401	Confined	779	2/17/1981	369.95	352.39	17.56	1
7	39555_6864401	Confined	1,863	2/6/1984	373.61	353.27	20.34	1
7	39555_6864401	Confined	2,227	2/4/1985	373.99	352.52	21.47	1
7	39555_6864401	Confined	2,895	12/4/1986	369.76	354.47	15.29	1
7	39555_6864401	Confined	3,334	2/16/1988	372.87	354.19	18.68	1
7	39555_6864401	Confined	3,699	2/15/1989	363.91	352.02	11.89	1
7	39555_6864401	Confined	3,998	12/11/1989	359.69	350.65	9.04	1
7	39555_6864401	Confined	4,364	12/12/1990	363.31	348.31	15.00	1
7	39555_6864401	Confined	5,119	1/5/1993	362.96	348.00	14.96	1
7	39556_6864402	Confined	5,358	9/1/1993	361.38	349.66	11.72	1
7	39556_6864402	Confined	5,388	10/1/1993	358.68	349.86	8.82	1
7	39556_6864402	Confined	5,419	11/1/1993	361.13	350.07	11.06	1
7	39556_6864402	Confined	5,450	12/2/1993	361.13	350.28	10.85	1
7	39556_6864402	Confined	5,482	1/3/1994	361.13	350.46	10.67	1
7	39556_6864402	Confined	5,512	2/2/1994	361.13	350.41	10.72	1
7	39556_6864402	Confined	5,539	3/1/1994	361.13	350.37	10.76	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39556_6864402	Confined	5,573	4/4/1994	367.13	350.31	16.82	1
7	39556_6864402	Confined	5,601	5/2/1994	367.13	350.26	16.87	1
7	39556_6864402	Confined	6,976	2/5/1998	361.23	347.25	13.98	1
7	39556_6864402	Confined	7,326	1/21/1999	359.63	346.44	13.19	1
7	39556_6864402	Confined	7,927	9/13/2000	352.63	341.95	10.68	1
7	39556_6864402	Confined	8,076	2/9/2001	358.18	340.73	17.45	1
7	39556_6864402	Confined	8,430	1/29/2002	360.43	342.00	18.43	1
7	39556_6864402	Confined	8,808	2/11/2003	363.43	339.75	23.68	1
7	39556_6864402	Confined	9,157	1/26/2004	362.13	341.18	20.95	1
7	39556_6864402	Confined	9,564	3/8/2005	365.63	343.96	21.67	1
7	39556_6864402	Confined	9,907	2/14/2006	359.93	344.54	15.39	1
7	39556_6864402	Confined	10,294	3/8/2007	353.03	347.52	5.51	1
7	39556_6864402	Confined	10,645	2/22/2008	355.83	351.24	4.59	1
7	39556_6864402	Confined	11,040	3/23/2009	354.33	346.96	7.37	1
7	39556_6864402	Confined	11,443	4/30/2010	355.23	336.93	18.30	1
7	39559_6741304	Confined	7,932	9/18/2000	401.14	416.70	-15.56	1
7	39560_6741401	Confined	778	2/16/1981	416.29	420.03	-0.37	0.1
7	39560_6741401	Confined	1,195	4/9/1982	429.30	420.92	0.84	0.1
7	39560_6741401	Confined	1,508	2/16/1983	417.77	419.86	-0.21	0.1
7	39560_6741401	Confined	2,227	2/4/1985	419.36	418.07	0.13	0.1
7	39560_6741401	Confined	2,893	12/2/1986	418.69	420.35	-0.17	0.1
7	39580_6749206	Confined	7,747	3/17/2000	374.92	376.03	-1.11	1
7	39580_6749206	Confined	8,429	1/28/2002	374.82	375.01	-0.19	1
7	39580_6749206	Confined	8,774	1/8/2003	369.52	374.57	-5.05	1
7	39580_6749206	Confined	9,143	1/12/2004	373.92	375.25	-1.33	1
7	39580_6749206	Confined	9,558	3/2/2005	375.72	377.13	-1.41	1
7	39580_6749206	Confined	9,873	1/11/2006	374.92	376.61	-1.69	1
7	39580_6749206	Confined	10,230	1/3/2007	370.92	377.33	-6.41	1
7	39580_6749206	Confined	10,600	1/8/2008	373.72	381.13	-7.41	1
7	39580_6749206	Confined	10,992	2/3/2009	371.12	378.26	-7.14	1
7	39580_6749206	Confined	11,343	1/20/2010	371.67	374.13	-2.46	1
7	39580_6749206	Confined	12,059	1/6/2012	360.42	364.19	-3.77	1
7	39580_6749206	Confined	12,090	2/6/2012	362.42	364.42	-2.00	1
7	39580_6749206	Confined	12,114	3/1/2012	363.32	364.59	-1.27	1
7	39580_6749206	Confined	12,149	4/5/2012	359.32	364.85	-5.53	1
7	39580_6749206	Confined	12,176	5/2/2012	364.82	365.05	-0.23	1
7	39580_6749206	Confined	12,236	7/1/2012	359.42	365.49	-6.07	1
7	39580_6749206	Confined	12,267	8/1/2012	348.12	365.72	-17.60	1
7	39580_6749206	Confined	12,298	9/1/2012	355.22	365.95	-10.73	1
7	39580_6749206	Confined	12,328	10/1/2012	357.67	366.17	-8.50	1
7	39580_6749206	Confined	12,359	11/1/2012	365.32	366.40	-1.08	1
7	39580_6749206	Confined	12,393	12/5/2012	359.12	366.65	-7.53	1
7	39580_6749206	Confined	12,425	1/6/2013	360.92	366.83	-5.91	1
7	39580_6749206	Confined	12,479	3/1/2013	357.72	366.76	-9.04	1
7	39580_6749206	Confined	12,514	4/5/2013	358.12	366.71	-8.59	1
7	39580_6749206	Confined	12,541	5/2/2013	354.92	366.67	-11.75	1
7	39580_6749206	Confined	12,576	6/6/2013	354.62	366.62	-12.00	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39580_6749206	Confined	12,601	7/1/2013	353.72	366.59	-12.87	1
7	39580_6749206	Confined	12,724	11/1/2013	352.82	366.41	-13.59	1
7	39580_6749206	Confined	12,758	12/5/2013	354.82	366.36	-11.54	1
7	39585_6750302	Confined	7,597	10/19/1999	355.37	350.47	4.90	1
7	39585_6750302	Confined	9,873	1/11/2006	345.37	350.67	-5.30	1
7	39585_6750302	Confined	10,231	1/4/2007	337.67	351.19	-13.52	1
7	39585_6750302	Confined	10,600	1/8/2008	342.77	353.38	-10.61	1
7	39585_6750302	Confined	10,992	2/3/2009	337.77	351.78	-14.01	1
7	39585_6750302	Confined	11,343	1/20/2010	340.77	348.91	-8.14	1
7	39585_6750302	Confined	12,059	1/6/2012	329.57	342.10	-12.53	1
7	39585_6750302	Confined	12,090	2/6/2012	332.17	341.55	-9.38	1
7	39585_6750302	Confined	12,114	3/1/2012	334.17	341.13	-6.96	1
7	39585_6750302	Confined	12,149	4/5/2012	334.67	340.50	-5.83	1
7	39585_6750302	Confined	12,176	5/2/2012	332.57	340.03	-7.46	1
7	39585_6750302	Confined	12,211	6/6/2012	323.97	339.40	-15.43	1
7	39585_6750302	Confined	12,236	7/1/2012	317.77	338.96	-21.19	1
7	39585_6750302	Confined	12,267	8/1/2012	319.87	338.41	-18.54	1
7	39585_6750302	Confined	12,298	9/1/2012	309.07	337.86	-28.79	1
7	39585_6750302	Confined	12,328	10/1/2012	317.97	337.33	-19.36	1
7	39585_6750302	Confined	12,359	11/1/2012	320.87	336.78	-15.91	1
7	39585_6750302	Confined	12,393	12/5/2012	319.77	336.17	-16.40	1
7	39585_6750302	Confined	12,425	1/6/2013	326.07	335.51	-9.44	1
7	39585_6750302	Confined	12,456	2/6/2013	327.07	334.48	-7.41	1
7	39585_6750302	Confined	12,479	3/1/2013	326.57	333.72	-7.15	1
7	39585_6750302	Confined	12,514	4/5/2013	319.97	332.55	-12.58	1
7	39585_6750302	Confined	12,541	5/2/2013	319.97	331.66	-11.69	1
7	39585_6750302	Confined	12,601	7/1/2013	316.57	329.66	-13.09	1
7	39585_6750302	Confined	12,632	8/1/2013	315.77	328.63	-12.86	1
7	39585_6750302	Confined	12,693	10/1/2013	309.17	326.60	-17.43	1
7	39585_6750302	Confined	12,754	12/1/2013	317.57	324.57	-7.00	1
7	39585_6750302	Confined	12,785	1/1/2014	317.27	323.54	-6.27	1
7	39585_6750302	Confined	12,816	2/1/2014	318.97	322.42	-3.45	1
7	39585_6750302	Confined	12,844	3/1/2014	319.17	321.41	-2.24	1
7	39585_6750302	Confined	12,875	4/1/2014	318.47	320.29	-1.82	1
7	39585_6750302	Confined	12,905	5/1/2014	307.97	319.21	-11.24	1
7	39585_6750302	Confined	12,936	6/1/2014	308.07	318.09	-10.02	1
7	39585_6750302	Confined	12,966	7/1/2014	309.17	317.01	-7.84	1
7	39585_6750302	Confined	12,997	8/1/2014	299.17	315.89	-16.72	1
7	39585_6750302	Confined	13,028	9/1/2014	303.47	314.78	-11.31	1
7	39585_6750302	Confined	13,119	12/1/2014	300.97	311.50	-10.53	1
7	39585_6750302	Confined	13,150	1/1/2015	302.77	310.36	-7.59	1
7	39585_6750302	Confined	13,181	2/1/2015	303.07	308.84	-5.77	1
7	39585_6750302	Confined	13,209	3/1/2015	305.17	307.47	-2.30	1
7	39585_6750302	Confined	13,240	4/1/2015	307.67	305.95	1.72	1
7	39585_6750302	Confined	13,270	5/1/2015	310.07	304.47	5.60	1
7	39585_6750302	Confined	13,301	6/1/2015	309.87	302.95	6.92	1
7	39585_6750302	Confined	13,331	7/1/2015	310.97	301.48	9.49	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39585_6750302	Confined	13,454	11/1/2015	291.47	295.44	-3.97	1
7	39585_6750302	Confined	13,484	12/1/2015	297.47	293.97	3.50	1
7	39585_6750302	Confined	13,515	1/1/2016	302.07	292.51	9.56	1
7	39585_6750302	Confined	13,546	2/1/2016	297.17	292.91	4.26	1
7	39585_6750302	Confined	13,575	3/1/2016	310.07	293.28	16.79	1
7	39585_6750302	Confined	13,606	4/1/2016	306.67	293.68	12.99	1
7	39585_6750302	Confined	13,667	6/1/2016	309.87	294.46	15.41	1
7	39585_6750302	Confined	13,697	7/1/2016	300.47	294.85	5.62	1
7	39585_6750302	Confined	13,759	9/1/2016	298.17	295.64	2.53	1
7	39585_6750302	Confined	13,789	10/1/2016	301.47	296.03	5.44	1
7	39585_6750302	Confined	13,820	11/1/2016	293.27	296.43	-3.16	1
7	39585_6750302	Confined	13,881	1/1/2017	308.77	297.18	11.59	1
7	39585_6750302	Confined	13,912	2/1/2017	306.67	296.81	9.86	1
7	39585_6750302	Confined	13,940	3/1/2017	305.17	296.48	8.69	1
7	39585_6750302	Confined	14,124	9/1/2017	292.87	294.27	-1.40	1
7	39585_6750302	Confined	14,154	10/1/2017	293.87	293.91	-0.04	1
7	39585_6750302	Confined	14,185	11/1/2017	294.07	293.54	0.53	1
7	39585_6750302	Confined	14,215	12/1/2017	296.77	293.17	3.60	1
7	39603_6847903	Unconfined	779	2/17/1981	418.97	412.86	3.06	0.5
7	39603_6847903	Unconfined	1,195	4/9/1982	411.86	413.44	-0.79	0.5
7	39603_6847903	Unconfined	1,508	2/16/1983	411.99	412.62	-0.32	0.5
7	39603_6847903	Unconfined	1,864	2/7/1984	412.87	412.36	0.25	0.5
7	39603_6847903	Unconfined	2,228	2/5/1985	408.44	411.90	-1.73	0.5
7	39603_6847903	Unconfined	2,605	2/17/1986	408.54	413.25	-2.35	0.5
7	39603_6847903	Unconfined	2,894	12/3/1986	409.17	413.36	-2.10	0.5
7	39603_6847903	Unconfined	3,334	2/16/1988	408.17	413.18	-2.51	0.5
7	39603_6847903	Unconfined	4,000	12/13/1989	408.80	411.10	-1.15	0.5
7	39603_6847903	Unconfined	4,364	12/12/1990	406.49	411.74	-2.63	0.5
7	39620_6848402	Unconfined	3,774	5/1/1989	428.34	418.47	0.99	0.1
7	39621_6848407	Unconfined	9,616	4/29/2005	415.31	418.77	-3.46	1
7	39624_6848508	Unconfined	5,503	1/24/1994	405.14	408.17	-3.03	1
7	39625_6848601	Unconfined	1,146	2/19/1982	402.69	409.09	-6.40	1
7	39625_6848601	Unconfined	3,334	2/16/1988	399.00	408.71	-9.71	1
7	39625_6848601	Unconfined	3,699	2/15/1989	392.91	407.06	-14.15	1
7	39625_6848601	Unconfined	4,000	12/13/1989	385.41	406.82	-21.41	1
7	39625_6848601	Unconfined	4,363	12/11/1990	405.35	407.21	-1.86	1
7	39625_6848601	Unconfined	5,863	1/19/1995	404.74	408.14	-3.40	1
7	39625_6848601	Unconfined	6,219	1/10/1996	404.39	407.55	-3.16	1
7	39625_6848601	Unconfined	6,641	3/7/1997	404.29	406.42	-2.13	1
7	39625_6848601	Unconfined	7,326	1/21/1999	402.19	407.73	-5.54	1
7	39625_6848601	Unconfined	8,080	2/13/2001	401.94	406.30	-4.36	1
7	39625_6848601	Unconfined	8,430	1/29/2002	400.44	406.48	-6.04	1
7	39625_6848601	Unconfined	8,794	1/28/2003	401.24	407.65	-6.41	1
7	39625_6848601	Unconfined	9,159	1/28/2004	400.84	407.42	-6.58	1
7	39625_6848601	Unconfined	9,558	3/2/2005	401.64	408.31	-6.67	1
7	39625_6848601	Unconfined	9,879	1/17/2006	400.44	406.94	-6.50	1
7	39625_6848601	Unconfined	10,237	1/10/2007	399.44	406.64	-7.20	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39625_6848601	Unconfined	10,644	2/21/2008	400.64	409.20	-8.56	1
7	39625_6848601	Unconfined	10,999	2/10/2009	399.54	407.10	-7.56	1
7	39625_6848601	Unconfined	11,420	4/7/2010	402.14	405.91	-3.77	1
7	39634_6848708	Confined	6,269	2/29/1996	397.47	409.60	-1.21	0.1
7	39634_6848708	Confined	8,583	7/1/2002	395.47	409.45	-1.40	0.1
7	39635_6848709	Confined	10,615	1/23/2008	400.72	410.23	-0.95	0.1
7	39647_6853902	Confined	5,485	1/6/1994	332.13	376.87	-4.47	0.1
7	39647_6853902	Confined	6,975	2/4/1998	337.23	376.05	-3.88	0.1
7	39647_6853902	Confined	7,326	1/21/1999	328.53	376.01	-4.75	0.1
7	39647_6853902	Confined	8,076	2/9/2001	329.73	368.26	-3.85	0.1
7	39647_6853902	Confined	8,424	1/23/2002	324.93	369.26	-4.43	0.1
7	39647_6853902	Confined	8,793	1/27/2003	339.03	368.44	-2.94	0.1
7	39647_6853902	Confined	9,144	1/13/2004	336.73	369.30	-3.26	0.1
7	39647_6853902	Confined	9,532	2/4/2005	361.63	373.14	-1.15	0.1
7	39647_6853902	Confined	9,872	1/10/2006	351.03	371.60	-2.06	0.1
7	39647_6853902	Confined	10,229	1/2/2007	333.33	372.93	-3.96	0.1
7	39647_6853902	Confined	10,595	1/3/2008	378.33	382.74	-0.44	0.1
7	39647_6853902	Confined	10,987	1/29/2009	332.93	376.34	-4.34	0.1
7	39647_6853902	Confined	11,420	4/7/2010	338.43	364.25	-2.58	0.1
7	39647_6853902	Confined	12,059	1/6/2012	359.63	342.86	1.68	0.1
7	39647_6853902	Confined	12,114	3/1/2012	345.83	345.25	0.06	0.1
7	39647_6853902	Confined	12,149	4/5/2012	344.83	346.77	-0.19	0.1
7	39647_6853902	Confined	12,176	5/2/2012	336.23	347.95	-1.17	0.1
7	39647_6853902	Confined	12,211	6/6/2012	335.23	349.47	-1.42	0.1
7	39647_6853902	Confined	12,236	7/1/2012	298.23	350.55	-5.23	0.1
7	39647_6853902	Confined	12,298	9/1/2012	311.23	353.25	-4.20	0.1
7	39647_6853902	Confined	12,328	10/1/2012	337.33	354.55	-1.72	0.1
7	39647_6853902	Confined	12,359	11/1/2012	362.03	355.90	0.61	0.1
7	39647_6853902	Confined	12,393	12/5/2012	318.43	357.38	-3.89	0.1
7	39647_6853902	Confined	12,425	1/6/2013	315.23	358.64	-4.34	0.1
7	39647_6853902	Confined	12,456	2/6/2013	315.63	359.34	-4.37	0.1
7	39647_6853902	Confined	12,479	3/1/2013	302.33	359.85	-5.75	0.1
7	39647_6853902	Confined	12,514	4/5/2013	297.63	360.64	-6.30	0.1
7	39647_6853902	Confined	12,541	5/2/2013	293.03	361.25	-6.82	0.1
7	39647_6853902	Confined	12,576	6/6/2013	291.83	362.03	-7.02	0.1
7	39647_6853902	Confined	12,601	7/1/2013	296.63	362.60	-6.60	0.1
7	39647_6853902	Confined	12,632	8/1/2013	290.83	363.29	-7.25	0.1
7	39647_6853902	Confined	12,663	9/1/2013	290.23	363.99	-7.38	0.1
7	39647_6853902	Confined	12,693	10/1/2013	319.23	364.66	-4.54	0.1
7	39647_6853902	Confined	12,724	11/1/2013	332.73	365.36	-3.26	0.1
7	39647_6853902	Confined	12,758	12/5/2013	368.33	366.12	0.22	0.1
7	39647_6853902	Confined	12,785	1/1/2014	338.23	366.72	-2.85	0.1
7	39647_6853902	Confined	12,816	2/1/2014	304.23	367.03	-6.28	0.1
7	39647_6853902	Confined	12,844	3/1/2014	305.93	367.32	-6.14	0.1
7	39647_6853902	Confined	12,875	4/1/2014	279.73	367.64	-8.79	0.1
7	39647_6853902	Confined	12,905	5/1/2014	269.23	367.94	-9.87	0.1
7	39647_6853902	Confined	12,936	6/1/2014	270.23	368.26	-9.80	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39647_6853902	Confined	12,966	7/1/2014	270.63	368.57	-9.79	0.1
7	39647_6853902	Confined	12,997	8/1/2014	268.83	368.88	-10.01	0.1
7	39647_6853902	Confined	13,028	9/1/2014	285.63	369.20	-8.36	0.1
7	39647_6853902	Confined	13,058	10/1/2014	297.83	369.51	-7.17	0.1
7	39647_6853902	Confined	13,089	11/1/2014	297.83	369.83	-7.20	0.1
7	39647_6853902	Confined	13,119	12/1/2014	323.93	370.13	-4.62	0.1
7	39647_6853902	Confined	13,150	1/1/2015	339.33	370.46	-3.11	0.1
7	39647_6853902	Confined	13,181	2/1/2015	274.33	371.18	-9.68	0.1
7	39647_6853902	Confined	13,209	3/1/2015	289.53	371.83	-8.23	0.1
7	39647_6853902	Confined	13,240	4/1/2015	286.63	372.54	-8.59	0.1
7	39647_6853902	Confined	13,270	5/1/2015	295.83	373.23	-7.74	0.1
7	39647_6853902	Confined	13,301	6/1/2015	337.03	373.95	-3.69	0.1
7	39647_6853902	Confined	13,331	7/1/2015	336.03	374.64	-3.86	0.1
7	39647_6853902	Confined	13,362	8/1/2015	321.63	375.36	-5.37	0.1
7	39647_6853902	Confined	13,393	9/1/2015	330.13	376.08	-4.59	0.1
7	39647_6853902	Confined	13,423	10/1/2015	334.63	376.77	-4.21	0.1
7	39647_6853902	Confined	13,454	11/1/2015	337.73	377.49	-3.98	0.1
7	39647_6853902	Confined	13,484	12/1/2015	345.33	378.18	-3.28	0.1
7	39647_6853902	Confined	13,515	1/1/2016	350.03	378.88	-2.89	0.1
7	39647_6853902	Confined	13,546	2/1/2016	358.13	379.27	-2.11	0.1
7	39647_6853902	Confined	13,575	3/1/2016	367.43	379.63	-1.22	0.1
7	39647_6853902	Confined	13,606	4/1/2016	368.33	380.01	-1.17	0.1
7	39647_6853902	Confined	13,667	6/1/2016	370.23	380.77	-1.05	0.1
7	39647_6853902	Confined	13,697	7/1/2016	370.93	381.14	-1.02	0.1
7	39647_6853902	Confined	13,728	8/1/2016	366.23	381.53	-1.53	0.1
7	39647_6853902	Confined	13,759	9/1/2016	366.43	381.91	-1.55	0.1
7	39647_6853902	Confined	13,789	10/1/2016	366.03	382.28	-1.63	0.1
7	39647_6853902	Confined	13,820	11/1/2016	331.63	382.67	-5.10	0.1
7	39647_6853902	Confined	13,850	12/1/2016	318.23	383.04	-6.48	0.1
7	39647_6853902	Confined	13,881	1/1/2017	321.03	383.41	-6.24	0.1
7	39647_6853902	Confined	13,912	2/1/2017	320.73	383.35	-6.26	0.1
7	39647_6853902	Confined	13,940	3/1/2017	319.73	383.29	-6.36	0.1
7	39647_6853902	Confined	13,971	4/1/2017	361.43	383.22	-2.18	0.1
7	39647_6853902	Confined	14,001	5/1/2017	364.73	383.16	-1.84	0.1
7	39647_6853902	Confined	14,032	6/1/2017	366.13	383.10	-1.70	0.1
7	39647_6853902	Confined	14,124	9/1/2017	366.13	382.91	-1.68	0.1
7	39647_6853902	Confined	14,154	10/1/2017	366.63	382.84	-1.62	0.1
7	39647_6853902	Confined	14,185	11/1/2017	367.83	382.78	-1.49	0.1
7	39647_6853902	Confined	14,215	12/1/2017	367.53	382.72	-1.52	0.1
7	39659_6854802	Confined	1,503	2/11/1983	383.95	378.01	5.94	1
7	39659_6854802	Confined	2,228	2/5/1985	379.46	378.68	0.78	1
7	39659_6854802	Confined	2,601	2/13/1986	380.88	380.86	0.02	1
7	39659_6854802	Confined	3,335	2/17/1988	379.61	381.86	-2.25	1
7	39659_6854802	Confined	3,698	2/14/1989	355.71	379.27	-23.56	1
7	39663_6854807	Confined	7,166	8/14/1998	361.64	375.25	-13.61	1
7	39664_6854808	Confined	7,157	8/5/1998	355.18	375.37	-20.19	1
7	39665_6854901	Confined	1,144	2/17/1982	373.78	374.92	-1.14	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39665_6854901	Confined	1,503	2/11/1983	373.35	374.83	-1.48	1
7	39665_6854901	Confined	1,864	2/7/1984	372.90	374.95	-2.05	1
7	39665_6854901	Confined	2,228	2/5/1985	368.62	374.72	-6.10	1
7	39665_6854901	Confined	2,601	2/13/1986	387.20	376.07	11.13	1
7	39665_6854901	Confined	2,895	12/4/1986	403.62	376.23	27.39	1
7	39665_6854901	Confined	3,335	2/17/1988	404.62	376.45	28.17	1
7	39665_6854901	Confined	3,698	2/14/1989	385.22	374.63	10.59	1
7	39665_6854901	Confined	3,998	12/11/1989	355.03	373.55	-18.52	1
7	39665_6854901	Confined	4,364	12/12/1990	348.92	373.10	-24.18	1
7	39665_6854901	Confined	5,485	1/6/1994	403.42	373.88	29.54	1
7	39665_6854901	Confined	5,853	1/9/1995	405.52	373.83	31.69	1
7	39665_6854901	Confined	6,220	1/11/1996	404.42	373.33	31.09	1
7	39665_6854901	Confined	6,675	4/10/1997	403.32	371.52	31.80	1
7	39665_6854901	Confined	6,975	2/4/1998	403.07	372.54	30.53	1
7	39665_6854901	Confined	7,325	1/20/1999	401.42	372.46	28.96	1
7	39665_6854901	Confined	7,928	9/14/2000	394.17	369.92	24.25	1
7	39665_6854901	Confined	8,073	2/6/2001	394.42	369.46	24.96	1
7	39665_6854901	Confined	8,424	1/23/2002	389.72	369.99	19.73	1
7	39665_6854901	Confined	8,790	1/24/2003	370.12	370.01	0.11	1
7	39665_6854901	Confined	9,159	1/28/2004	362.92	370.34	-7.42	1
7	39665_6854901	Confined	9,551	2/23/2005	366.92	371.77	-4.85	1
7	39665_6854901	Confined	9,887	1/25/2006	362.72	370.87	-8.15	1
7	39665_6854901	Confined	10,237	1/10/2007	355.62	371.34	-15.72	1
7	39665_6854901	Confined	10,252	1/25/2007	360.21	371.50	-11.29	1
7	39665_6854901	Confined	10,292	3/6/2007	361.23	371.92	-10.69	1
7	39665_6854901	Confined	10,305	3/19/2007	362.24	372.06	-9.82	1
7	39665_6854901	Confined	10,329	4/12/2007	363.74	372.31	-8.57	1
7	39665_6854901	Confined	10,354	5/7/2007	364.23	372.58	-8.35	1
7	39665_6854901	Confined	10,419	7/11/2007	365.43	373.26	-7.83	1
7	39665_6854901	Confined	10,470	8/31/2007	367.68	373.80	-6.12	1
7	39665_6854901	Confined	10,474	9/4/2007	367.42	373.84	-6.42	1
7	39665_6854901	Confined	10,487	9/17/2007	366.76	373.98	-7.22	1
7	39665_6854901	Confined	10,531	10/31/2007	367.05	374.44	-7.39	1
7	39665_6854901	Confined	10,572	12/11/2007	368.10	374.87	-6.77	1
7	39665_6854901	Confined	10,600	1/8/2008	368.33	375.03	-6.70	1
7	39665_6854901	Confined	10,644	2/21/2008	369.76	374.72	-4.96	1
7	39665_6854901	Confined	10,676	3/24/2008	369.48	374.50	-5.02	1
7	39665_6854901	Confined	10,686	4/3/2008	369.04	374.43	-5.39	1
7	39665_6854901	Confined	10,729	5/16/2008	366.73	374.13	-7.40	1
7	39665_6854901	Confined	10,747	6/3/2008	365.50	374.00	-8.50	1
7	39665_6854901	Confined	10,755	6/11/2008	364.61	373.95	-9.34	1
7	39665_6854901	Confined	10,869	10/3/2008	362.20	373.16	-10.96	1
7	39665_6854901	Confined	11,021	3/4/2009	362.32	371.99	-9.67	1
7	39665_6854901	Confined	11,440	4/27/2010	364.32	367.72	-3.40	1
7	39669_6855107	Unconfined	2,784	8/15/1986	338.00	385.80	-47.80	1
7	39669_6855107	Unconfined	5,480	1/1/1994	366.00	385.33	-19.33	1
7	39669_6855107	Unconfined	5,856	1/12/1995	381.20	385.46	-4.26	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39674_6855202	Confined	1,145	2/18/1982	386.42	390.67	-0.42	0.1
7	39674_6855202	Confined	1,507	2/15/1983	387.67	390.10	-0.24	0.1
7	39674_6855202	Confined	1,864	2/7/1984	387.21	389.93	-0.27	0.1
7	39674_6855202	Confined	2,228	2/5/1985	385.50	389.60	-0.41	0.1
7	39674_6855202	Confined	2,895	12/4/1986	383.50	390.62	-0.71	0.1
7	39674_6855202	Confined	3,334	2/16/1988	386.07	390.51	-0.44	0.1
7	39674_6855202	Confined	5,485	1/6/1994	373.34	389.63	-1.63	0.1
7	39674_6855202	Confined	6,220	1/11/1996	377.04	389.31	-1.23	0.1
7	39676_6855206	Confined	4,291	9/30/1990	412.64	402.81	0.98	0.1
7	39683_6855407	Confined	779	2/17/1981	410.90	376.69	34.21	1
7	39683_6855407	Confined	1,145	2/18/1982	383.19	377.31	5.88	1
7	39683_6855407	Confined	1,503	2/11/1983	389.05	377.02	12.03	1
7	39683_6855407	Confined	2,228	2/5/1985	404.86	376.67	28.19	1
7	39683_6855407	Confined	2,601	2/13/1986	405.79	377.49	28.30	1
7	39683_6855407	Confined	2,895	12/4/1986	400.22	377.58	22.64	1
7	39683_6855407	Confined	3,334	2/16/1988	397.52	377.57	19.95	1
7	39683_6855407	Confined	3,697	2/13/1989	404.84	376.39	28.45	1
7	39683_6855407	Confined	4,001	12/14/1989	404.77	375.97	28.80	1
7	39683_6855407	Confined	4,364	12/12/1990	406.18	375.86	30.32	1
7	39683_6855407	Confined	5,141	1/27/1993	407.04	376.47	30.57	1
7	39683_6855407	Confined	5,485	1/6/1994	408.04	376.39	31.65	1
7	39683_6855407	Confined	5,853	1/9/1995	409.04	376.41	32.63	1
7	39683_6855407	Confined	6,220	1/11/1996	408.94	376.08	32.86	1
7	39683_6855407	Confined	7,325	1/20/1999	406.84	375.72	31.12	1
7	39683_6855407	Confined	8,076	2/9/2001	405.74	374.07	31.67	1
7	39683_6855407	Confined	8,424	1/23/2002	403.84	374.41	29.43	1
7	39683_6855407	Confined	8,794	1/28/2003	405.44	374.63	30.81	1
7	39683_6855407	Confined	9,145	1/14/2004	404.74	374.70	30.04	1
7	39683_6855407	Confined	9,537	2/9/2005	407.34	375.63	31.71	1
7	39683_6855407	Confined	9,907	2/14/2006	404.14	374.90	29.24	1
7	39683_6855407	Confined	10,294	3/8/2007	403.14	375.46	27.68	1
7	39683_6855407	Confined	10,658	3/6/2008	406.84	377.06	29.78	1
7	39683_6855407	Confined	11,040	3/23/2009	406.44	375.26	31.18	1
7	39683_6855407	Confined	11,442	4/29/2010	405.24	373.13	32.11	1
7	39694_6855706	Confined	1,503	2/11/1983	373.70	378.52	-4.82	1
7	39694_6855706	Confined	2,228	2/5/1985	375.39	378.05	-2.66	1
7	39694_6855706	Confined	2,895	12/4/1986	375.87	379.20	-3.33	1
7	39694_6855706	Confined	3,334	2/16/1988	378.21	379.20	-0.99	1
7	39697_6855806	Confined	2,607	2/19/1986	372.91	386.12	-13.21	1
7	39698_6855901	Confined	7,701	1/31/2000	351.43	354.58	-3.15	1
7	39699_6855903	Confined	778	2/16/1981	369.98	358.95	11.03	1
7	39699_6855903	Confined	1,145	2/18/1982	369.03	359.85	9.18	1
7	39702_6855908	Confined	8,592	7/10/2002	354.51	352.89	0.81	0.5
7	39708_6856201	Confined	779	2/17/1981	396.41	401.51	-5.10	1
7	39708_6856201	Confined	1,145	2/18/1982	395.00	402.15	-7.15	1
7	39708_6856201	Confined	1,507	2/15/1983	394.45	401.45	-7.00	1
7	39708_6856201	Confined	2,229	2/6/1985	395.37	400.66	-5.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39708_6856201	Confined	2,894	12/3/1986	392.20	401.95	-9.75	1
7	39708_6856201	Confined	3,334	2/16/1988	392.83	401.83	-9.00	1
7	39708_6856201	Confined	3,699	2/15/1989	388.01	400.10	-12.09	1
7	39708_6856201	Confined	3,999	12/12/1989	389.42	399.76	-10.34	1
7	39708_6856201	Confined	4,364	12/12/1990	393.30	399.83	-6.53	1
7	39708_6856201	Confined	5,120	1/6/1993	392.16	401.06	-8.90	1
7	39708_6856201	Confined	5,484	1/5/1994	392.06	400.74	-8.68	1
7	39708_6856201	Confined	5,854	1/10/1995	392.76	400.84	-8.08	1
7	39708_6856201	Confined	6,219	1/10/1996	391.61	400.30	-8.69	1
7	39708_6856201	Confined	6,675	4/10/1997	386.91	399.00	-12.09	1
7	39708_6856201	Confined	6,969	1/29/1998	389.56	399.98	-10.42	1
7	39708_6856201	Confined	7,325	1/20/1999	388.16	400.12	-11.96	1
7	39708_6856201	Confined	7,927	9/13/2000	384.66	398.37	-13.71	1
7	39708_6856201	Confined	8,074	2/7/2001	391.86	398.21	-6.35	1
7	39708_6856201	Confined	8,429	1/28/2002	386.66	398.59	-11.93	1
7	39708_6856201	Confined	8,793	1/27/2003	386.66	399.38	-12.72	1
7	39708_6856201	Confined	9,157	1/26/2004	386.46	399.38	-12.92	1
7	39708_6856201	Confined	9,564	3/8/2005	387.46	400.44	-12.98	1
7	39708_6856201	Confined	9,895	2/2/2006	377.66	399.24	-21.58	1
7	39708_6856201	Confined	10,293	3/7/2007	383.41	399.68	-16.27	1
7	39708_6856201	Confined	10,644	2/21/2008	384.06	401.96	-17.90	1
7	39708_6856201	Confined	11,021	3/4/2009	383.36	399.54	-16.18	1
7	39708_6856201	Confined	11,442	4/29/2010	384.86	397.33	-12.47	1
7	39714_6856401	Confined	779	2/17/1981	395.51	397.25	-1.74	1
7	39714_6856401	Confined	1,145	2/18/1982	393.16	397.90	-4.74	1
7	39714_6856401	Confined	1,507	2/15/1983	396.36	397.26	-0.90	1
7	39714_6856401	Confined	2,228	2/5/1985	397.34	396.55	0.79	1
7	39725_6856704	Confined	1,242	5/26/1982	377.07	359.90	17.17	1
7	39732_6856902	Confined	779	2/17/1981	385.32	361.48	23.84	1
7	39732_6856902	Confined	1,145	2/18/1982	381.34	362.24	19.10	1
7	39732_6856902	Confined	1,863	2/6/1984	383.56	361.88	21.68	1
7	39732_6856902	Confined	2,894	12/3/1986	381.13	362.60	18.53	1
7	39732_6856902	Confined	3,334	2/16/1988	382.87	362.42	20.45	1
7	39732_6856902	Confined	3,699	2/15/1989	373.47	360.39	13.08	1
7	39732_6856902	Confined	4,000	12/13/1989	374.86	359.29	15.57	1
7	39732_6856902	Confined	4,364	12/12/1990	374.96	357.12	17.84	1
7	39732_6856902	Confined	5,141	1/27/1993	380.57	357.16	23.41	1
7	39732_6856902	Confined	5,485	1/6/1994	380.47	359.04	21.43	1
7	39732_6856902	Confined	6,641	3/7/1997	376.02	355.57	20.45	1
7	39734_6862104	Confined	5,480	1/1/1994	382.34	376.82	5.52	1
7	39734_6862104	Confined	5,853	1/9/1995	384.19	376.95	7.24	1
7	39734_6862104	Confined	8,417	1/16/2002	363.49	368.93	-5.44	1
7	39734_6862104	Confined	8,773	1/7/2003	365.09	368.48	-3.39	1
7	39734_6862104	Confined	8,982	8/4/2003	364.23	368.78	-4.55	1
7	39734_6862104	Confined	9,014	9/5/2003	361.24	368.82	-7.58	1
7	39734_6862104	Confined	9,019	9/10/2003	362.74	368.83	-6.09	1
7	39734_6862104	Confined	9,024	9/15/2003	363.64	368.84	-5.20	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	9,029	9/20/2003	364.48	368.84	-4.36	1
7	39734_6862104	Confined	9,034	9/25/2003	365.11	368.85	-3.74	1
7	39734_6862104	Confined	9,039	9/30/2003	365.43	368.86	-3.43	1
7	39734_6862104	Confined	9,044	10/5/2003	365.34	368.86	-3.52	1
7	39734_6862104	Confined	9,049	10/10/2003	365.37	368.87	-3.50	1
7	39734_6862104	Confined	9,054	10/15/2003	365.86	368.88	-3.02	1
7	39734_6862104	Confined	9,059	10/20/2003	366.31	368.89	-2.58	1
7	39734_6862104	Confined	9,064	10/25/2003	366.71	368.89	-2.18	1
7	39734_6862104	Confined	9,069	10/30/2003	366.81	368.90	-2.09	1
7	39734_6862104	Confined	9,075	11/5/2003	366.12	368.91	-2.79	1
7	39734_6862104	Confined	9,080	11/10/2003	366.05	368.92	-2.87	1
7	39734_6862104	Confined	9,085	11/15/2003	366.53	368.92	-2.39	1
7	39734_6862104	Confined	9,090	11/20/2003	366.95	368.93	-1.98	1
7	39734_6862104	Confined	9,095	11/25/2003	366.99	368.94	-1.95	1
7	39734_6862104	Confined	9,100	11/30/2003	366.98	368.94	-1.96	1
7	39734_6862104	Confined	9,105	12/5/2003	366.18	368.95	-2.77	1
7	39734_6862104	Confined	9,110	12/10/2003	366.38	368.96	-2.58	1
7	39734_6862104	Confined	9,115	12/15/2003	365.84	368.96	-3.12	1
7	39734_6862104	Confined	9,120	12/20/2003	365.71	368.97	-3.26	1
7	39734_6862104	Confined	9,125	12/25/2003	362.18	368.98	-6.80	1
7	39734_6862104	Confined	9,130	12/30/2003	366.25	368.99	-2.74	1
7	39734_6862104	Confined	9,136	1/5/2004	365.74	369.03	-3.29	1
7	39734_6862104	Confined	9,141	1/10/2004	366.21	369.08	-2.87	1
7	39734_6862104	Confined	9,143	1/12/2004	366.09	369.10	-3.01	1
7	39734_6862104	Confined	9,146	1/15/2004	366.00	369.13	-3.13	1
7	39734_6862104	Confined	9,151	1/20/2004	367.33	369.17	-1.84	1
7	39734_6862104	Confined	9,156	1/25/2004	367.99	369.22	-1.23	1
7	39734_6862104	Confined	9,161	1/30/2004	368.14	369.27	-1.13	1
7	39734_6862104	Confined	9,167	2/5/2004	368.66	369.32	-0.66	1
7	39734_6862104	Confined	9,172	2/10/2004	368.72	369.37	-0.65	1
7	39734_6862104	Confined	9,177	2/15/2004	368.78	369.41	-0.63	1
7	39734_6862104	Confined	9,182	2/20/2004	369.23	369.46	-0.23	1
7	39734_6862104	Confined	9,187	2/25/2004	369.53	369.51	0.02	1
7	39734_6862104	Confined	9,190	2/28/2004	369.53	369.54	-0.01	1
7	39734_6862104	Confined	9,196	3/5/2004	369.76	369.59	0.17	1
7	39734_6862104	Confined	9,201	3/10/2004	369.56	369.64	-0.08	1
7	39734_6862104	Confined	9,206	3/15/2004	369.10	369.68	-0.58	1
7	39734_6862104	Confined	9,211	3/20/2004	369.77	369.73	0.04	1
7	39734_6862104	Confined	9,216	3/25/2004	370.07	369.78	0.29	1
7	39734_6862104	Confined	9,221	3/30/2004	370.08	369.82	0.26	1
7	39734_6862104	Confined	9,227	4/5/2004	370.27	369.88	0.39	1
7	39734_6862104	Confined	9,232	4/10/2004	370.52	369.93	0.59	1
7	39734_6862104	Confined	9,237	4/15/2004	370.50	369.97	0.53	1
7	39734_6862104	Confined	9,242	4/20/2004	370.62	370.02	0.60	1
7	39734_6862104	Confined	9,247	4/25/2004	370.83	370.07	0.76	1
7	39734_6862104	Confined	9,252	4/30/2004	370.93	370.11	0.82	1
7	39734_6862104	Confined	9,257	5/5/2004	371.36	370.16	1.20	1

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	9,262	5/10/2004	371.19	370.20	0.99	1
7	39734_6862104	Confined	9,267	5/15/2004	370.88	370.25	0.63	1
7	39734_6862104	Confined	9,272	5/20/2004	370.44	370.30	0.14	1
7	39734_6862104	Confined	9,277	5/25/2004	370.44	370.34	0.10	1
7	39734_6862104	Confined	9,282	5/30/2004	362.71	370.39	-7.68	1
7	39734_6862104	Confined	9,288	6/5/2004	368.93	370.45	-1.52	1
7	39734_6862104	Confined	9,293	6/10/2004	363.38	370.49	-7.11	1
7	39734_6862104	Confined	9,298	6/15/2004	364.03	370.54	-6.51	1
7	39734_6862104	Confined	9,303	6/20/2004	368.42	370.59	-2.17	1
7	39734_6862104	Confined	9,308	6/25/2004	370.06	370.63	-0.57	1
7	39734_6862104	Confined	9,313	6/30/2004	371.74	370.68	1.06	1
7	39734_6862104	Confined	9,318	7/5/2004	373.77	370.73	3.04	1
7	39734_6862104	Confined	9,323	7/10/2004	373.31	370.77	2.54	1
7	39734_6862104	Confined	9,328	7/15/2004	375.84	370.82	5.02	1
7	39734_6862104	Confined	9,333	7/20/2004	376.91	370.86	6.05	1
7	39734_6862104	Confined	9,338	7/25/2004	377.75	370.91	6.84	1
7	39734_6862104	Confined	9,343	7/30/2004	367.12	370.96	-3.84	1
7	39734_6862104	Confined	9,349	8/5/2004	365.10	371.01	-5.91	1
7	39734_6862104	Confined	9,354	8/10/2004	365.30	371.06	-5.76	1
7	39734_6862104	Confined	9,359	8/15/2004	365.00	371.11	-6.11	1
7	39734_6862104	Confined	9,364	8/20/2004	363.99	371.15	-7.16	1
7	39734_6862104	Confined	9,369	8/25/2004	365.82	371.20	-5.38	1
7	39734_6862104	Confined	9,374	8/30/2004	370.50	371.25	-0.75	1
7	39734_6862104	Confined	9,380	9/5/2004	371.26	371.30	-0.04	1
7	39734_6862104	Confined	9,385	9/10/2004	371.26	371.35	-0.09	1
7	39734_6862104	Confined	9,390	9/15/2004	371.26	371.39	-0.13	1
7	39734_6862104	Confined	9,395	9/20/2004	365.03	371.44	-6.41	1
7	39734_6862104	Confined	9,400	9/25/2004	366.12	371.49	-5.37	1
7	39734_6862104	Confined	9,405	9/30/2004	364.99	371.53	-6.54	1
7	39734_6862104	Confined	9,410	10/5/2004	365.47	371.58	-6.11	1
7	39734_6862104	Confined	9,415	10/10/2004	366.63	371.63	-5.00	1
7	39734_6862104	Confined	9,420	10/15/2004	367.03	371.67	-4.64	1
7	39734_6862104	Confined	9,425	10/20/2004	367.78	371.72	-3.94	1
7	39734_6862104	Confined	9,430	10/25/2004	374.49	371.77	2.72	1
7	39734_6862104	Confined	9,435	10/30/2004	378.59	371.81	6.78	1
7	39734_6862104	Confined	9,441	11/5/2004	375.75	371.87	3.88	1
7	39734_6862104	Confined	9,446	11/10/2004	379.15	371.92	7.23	1
7	39734_6862104	Confined	9,451	11/15/2004	381.18	371.96	9.22	1
7	39734_6862104	Confined	9,456	11/20/2004	382.69	372.01	10.68	1
7	39734_6862104	Confined	9,461	11/25/2004	383.42	372.05	11.37	1
7	39734_6862104	Confined	9,466	11/30/2004	384.10	372.10	12.00	1
7	39734_6862104	Confined	9,471	12/5/2004	384.10	372.15	11.95	1
7	39734_6862104	Confined	9,476	12/10/2004	384.10	372.19	11.91	1
7	39734_6862104	Confined	9,481	12/15/2004	384.10	372.24	11.86	1
7	39734_6862104	Confined	9,491	12/25/2004	386.20	372.33	13.87	1
7	39734_6862104	Confined	9,496	12/30/2004	386.10	372.38	13.72	1
7	39734_6862104	Confined	9,502	1/5/2005	385.54	372.36	13.18	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	9,507	1/10/2005	386.62	372.33	14.29	1
7	39734_6862104	Confined	9,512	1/15/2005	387.17	372.31	14.86	1
7	39734_6862104	Confined	9,517	1/20/2005	387.10	372.28	14.82	1
7	39734_6862104	Confined	9,522	1/25/2005	387.24	372.25	14.99	1
7	39734_6862104	Confined	9,527	1/30/2005	387.33	372.23	15.10	1
7	39734_6862104	Confined	9,532	2/4/2005	387.84	372.20	15.64	1
7	39734_6862104	Confined	9,533	2/5/2005	387.76	372.19	15.57	1
7	39734_6862104	Confined	9,538	2/10/2005	382.48	372.17	10.31	1
7	39734_6862104	Confined	9,543	2/15/2005	379.44	372.14	7.30	1
7	39734_6862104	Confined	9,548	2/20/2005	381.88	372.11	9.77	1
7	39734_6862104	Confined	9,553	2/25/2005	384.76	372.09	12.67	1
7	39734_6862104	Confined	9,556	2/28/2005	384.76	372.07	12.69	1
7	39734_6862104	Confined	9,561	3/5/2005	386.86	372.04	14.82	1
7	39734_6862104	Confined	9,566	3/10/2005	386.89	372.01	14.88	1
7	39734_6862104	Confined	9,571	3/15/2005	380.62	371.99	8.63	1
7	39734_6862104	Confined	9,576	3/20/2005	378.53	371.96	6.57	1
7	39734_6862104	Confined	9,581	3/25/2005	377.53	371.93	5.60	1
7	39734_6862104	Confined	9,586	3/30/2005	376.85	371.91	4.94	1
7	39734_6862104	Confined	9,592	4/5/2005	371.30	371.87	-0.57	1
7	39734_6862104	Confined	9,597	4/10/2005	377.04	371.85	5.19	1
7	39734_6862104	Confined	9,602	4/15/2005	376.76	371.82	4.94	1
7	39734_6862104	Confined	9,607	4/20/2005	372.97	371.79	1.18	1
7	39734_6862104	Confined	9,612	4/25/2005	375.06	371.77	3.29	1
7	39734_6862104	Confined	9,617	4/30/2005	368.55	371.74	-3.19	1
7	39734_6862104	Confined	9,622	5/5/2005	375.33	371.71	3.62	1
7	39734_6862104	Confined	9,627	5/10/2005	374.26	371.68	2.58	1
7	39734_6862104	Confined	9,632	5/15/2005	374.75	371.66	3.09	1
7	39734_6862104	Confined	9,637	5/20/2005	366.48	371.63	-5.15	1
7	39734_6862104	Confined	9,642	5/25/2005	362.55	371.60	-9.05	1
7	39734_6862104	Confined	9,647	5/30/2005	364.95	371.58	-6.63	1
7	39734_6862104	Confined	9,653	6/5/2005	370.26	371.54	-1.28	1
7	39734_6862104	Confined	9,658	6/10/2005	372.56	371.52	1.04	1
7	39734_6862104	Confined	9,663	6/15/2005	366.51	371.49	-4.98	1
7	39734_6862104	Confined	9,668	6/20/2005	371.19	371.46	-0.27	1
7	39734_6862104	Confined	9,673	6/25/2005	371.63	371.43	0.20	1
7	39734_6862104	Confined	9,678	6/30/2005	371.83	371.41	0.42	1
7	39734_6862104	Confined	9,683	7/5/2005	372.40	371.38	1.02	1
7	39734_6862104	Confined	9,688	7/10/2005	370.59	371.35	-0.76	1
7	39734_6862104	Confined	9,693	7/15/2005	368.95	371.33	-2.38	1
7	39734_6862104	Confined	9,698	7/20/2005	370.41	371.30	-0.89	1
7	39734_6862104	Confined	9,703	7/25/2005	372.45	371.27	1.18	1
7	39734_6862104	Confined	9,708	7/30/2005	372.37	371.24	1.13	1
7	39734_6862104	Confined	9,714	8/5/2005	375.06	371.21	3.85	1
7	39734_6862104	Confined	9,719	8/10/2005	374.59	371.18	3.41	1
7	39734_6862104	Confined	9,724	8/15/2005	376.55	371.16	5.39	1
7	39734_6862104	Confined	9,729	8/20/2005	374.32	371.13	3.19	1
7	39734_6862104	Confined	9,734	8/25/2005	372.89	371.10	1.79	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	9,739	8/30/2005	373.12	371.08	2.04	1
7	39734_6862104	Confined	9,745	9/5/2005	366.86	371.04	-4.18	1
7	39734_6862104	Confined	9,750	9/10/2005	359.83	371.02	-11.19	1
7	39734_6862104	Confined	9,755	9/15/2005	360.41	370.99	-10.58	1
7	39734_6862104	Confined	9,760	9/20/2005	364.08	370.96	-6.88	1
7	39734_6862104	Confined	9,765	9/25/2005	364.03	370.94	-6.91	1
7	39734_6862104	Confined	9,770	9/30/2005	364.08	370.91	-6.83	1
7	39734_6862104	Confined	9,775	10/5/2005	364.08	370.88	-6.80	1
7	39734_6862104	Confined	9,780	10/10/2005	364.08	370.85	-6.77	1
7	39734_6862104	Confined	9,785	10/15/2005	373.37	370.83	2.54	1
7	39734_6862104	Confined	9,790	10/20/2005	375.32	370.80	4.52	1
7	39734_6862104	Confined	9,795	10/25/2005	373.90	370.77	3.13	1
7	39734_6862104	Confined	9,800	10/30/2005	374.90	370.75	4.15	1
7	39734_6862104	Confined	9,806	11/5/2005	370.86	370.71	0.15	1
7	39734_6862104	Confined	9,811	11/10/2005	371.65	370.69	0.96	1
7	39734_6862104	Confined	9,816	11/15/2005	376.74	370.66	6.08	1
7	39734_6862104	Confined	9,821	11/20/2005	370.70	370.63	0.07	1
7	39734_6862104	Confined	9,826	11/25/2005	371.43	370.60	0.83	1
7	39734_6862104	Confined	9,831	11/30/2005	378.14	370.58	7.56	1
7	39734_6862104	Confined	9,836	12/5/2005	378.47	370.55	7.92	1
7	39734_6862104	Confined	9,841	12/10/2005	379.29	370.52	8.77	1
7	39734_6862104	Confined	9,846	12/15/2005	376.51	370.50	6.01	1
7	39734_6862104	Confined	9,851	12/20/2005	376.11	370.47	5.64	1
7	39734_6862104	Confined	9,856	12/25/2005	369.64	370.44	-0.80	1
7	39734_6862104	Confined	9,861	12/30/2005	368.67	370.41	-1.74	1
7	39734_6862104	Confined	9,865	1/3/2006	374.09	370.42	3.67	1
7	39734_6862104	Confined	9,867	1/5/2006	371.20	370.42	0.78	1
7	39734_6862104	Confined	9,872	1/10/2006	377.18	370.44	6.74	1
7	39734_6862104	Confined	9,877	1/15/2006	379.07	370.45	8.62	1
7	39734_6862104	Confined	9,882	1/20/2006	375.22	370.46	4.76	1
7	39734_6862104	Confined	9,887	1/25/2006	379.91	370.48	9.43	1
7	39734_6862104	Confined	9,892	1/30/2006	374.39	370.49	3.90	1
7	39734_6862104	Confined	9,898	2/5/2006	380.82	370.51	10.31	1
7	39734_6862104	Confined	9,903	2/10/2006	375.01	370.52	4.49	1
7	39734_6862104	Confined	9,908	2/15/2006	380.39	370.53	9.86	1
7	39734_6862104	Confined	9,918	2/25/2006	376.05	370.56	5.49	1
7	39734_6862104	Confined	9,921	2/28/2006	376.05	370.57	5.48	1
7	39734_6862104	Confined	9,926	3/5/2006	383.29	370.58	12.71	1
7	39734_6862104	Confined	9,931	3/10/2006	384.71	370.59	14.12	1
7	39734_6862104	Confined	9,936	3/15/2006	383.03	370.61	12.42	1
7	39734_6862104	Confined	9,941	3/20/2006	380.90	370.62	10.28	1
7	39734_6862104	Confined	9,946	3/25/2006	373.29	370.63	2.66	1
7	39734_6862104	Confined	9,951	3/30/2006	378.45	370.65	7.80	1
7	39734_6862104	Confined	9,957	4/5/2006	371.40	370.66	0.74	1
7	39734_6862104	Confined	9,962	4/10/2006	368.59	370.68	-2.09	1
7	39734_6862104	Confined	9,967	4/15/2006	370.93	370.69	0.24	1
7	39734_6862104	Confined	9,972	4/20/2006	365.18	370.70	-5.52	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	9,977	4/25/2006	364.28	370.72	-6.44	1
7	39734_6862104	Confined	9,982	4/30/2006	368.29	370.73	-2.44	1
7	39734_6862104	Confined	9,987	5/5/2006	361.52	370.74	-9.22	1
7	39734_6862104	Confined	9,992	5/10/2006	364.54	370.76	-6.22	1
7	39734_6862104	Confined	9,997	5/15/2006	367.21	370.77	-3.56	1
7	39734_6862104	Confined	10,002	5/20/2006	364.78	370.78	-6.00	1
7	39734_6862104	Confined	10,007	5/25/2006	355.27	370.80	-15.53	1
7	39734_6862104	Confined	10,012	5/30/2006	356.98	370.81	-13.83	1
7	39734_6862104	Confined	10,018	6/5/2006	366.75	370.83	-4.08	1
7	39734_6862104	Confined	10,023	6/10/2006	356.62	370.84	-14.22	1
7	39734_6862104	Confined	10,028	6/15/2006	349.22	370.85	-21.63	1
7	39734_6862104	Confined	10,033	6/20/2006	351.68	370.87	-19.19	1
7	39734_6862104	Confined	10,038	6/25/2006	354.69	370.88	-16.19	1
7	39734_6862104	Confined	10,043	6/30/2006	355.28	370.89	-15.61	1
7	39734_6862104	Confined	10,048	7/5/2006	360.33	370.91	-10.58	1
7	39734_6862104	Confined	10,053	7/10/2006	362.85	370.92	-8.07	1
7	39734_6862104	Confined	10,058	7/15/2006	361.55	370.94	-9.39	1
7	39734_6862104	Confined	10,063	7/20/2006	359.76	370.95	-11.19	1
7	39734_6862104	Confined	10,068	7/25/2006	361.56	370.96	-9.40	1
7	39734_6862104	Confined	10,073	7/30/2006	356.10	370.98	-14.88	1
7	39734_6862104	Confined	10,079	8/5/2006	353.99	370.99	-17.00	1
7	39734_6862104	Confined	10,084	8/10/2006	352.85	371.00	-18.15	1
7	39734_6862104	Confined	10,089	8/15/2006	358.42	371.02	-12.60	1
7	39734_6862104	Confined	10,099	8/25/2006	344.86	371.05	-26.19	1
7	39734_6862104	Confined	10,104	8/30/2006	340.15	371.06	-30.91	1
7	39734_6862104	Confined	10,110	9/5/2006	342.53	371.07	-28.54	1
7	39734_6862104	Confined	10,186	11/20/2006	349.55	371.28	-21.73	1
7	39734_6862104	Confined	10,191	11/25/2006	347.71	371.29	-23.58	1
7	39734_6862104	Confined	10,196	11/30/2006	348.04	371.31	-23.27	1
7	39734_6862104	Confined	10,201	12/5/2006	347.53	371.32	-23.79	1
7	39734_6862104	Confined	10,206	12/10/2006	348.00	371.33	-23.33	1
7	39734_6862104	Confined	10,211	12/15/2006	351.98	371.35	-19.37	1
7	39734_6862104	Confined	10,216	12/20/2006	356.17	371.36	-15.19	1
7	39734_6862104	Confined	10,221	12/25/2006	360.47	371.37	-10.90	1
7	39734_6862104	Confined	10,226	12/30/2006	363.20	371.39	-8.19	1
7	39734_6862104	Confined	10,231	1/4/2007	364.09	371.48	-7.39	1
7	39734_6862104	Confined	10,232	1/5/2007	365.98	371.50	-5.52	1
7	39734_6862104	Confined	10,237	1/10/2007	367.36	371.61	-4.25	1
7	39734_6862104	Confined	10,242	1/15/2007	368.74	371.73	-2.99	1
7	39734_6862104	Confined	10,263	2/5/2007	378.84	372.20	6.64	1
7	39734_6862104	Confined	10,268	2/10/2007	377.61	372.31	5.30	1
7	39734_6862104	Confined	10,273	2/15/2007	379.43	372.42	7.01	1
7	39734_6862104	Confined	10,278	2/20/2007	381.61	372.53	9.08	1
7	39734_6862104	Confined	10,283	2/25/2007	381.49	372.65	8.84	1
7	39734_6862104	Confined	10,286	2/28/2007	381.49	372.71	8.78	1
7	39734_6862104	Confined	10,291	3/5/2007	382.44	372.83	9.61	1
7	39734_6862104	Confined	10,296	3/10/2007	382.06	372.94	9.12	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	10,301	3/15/2007	382.91	373.05	9.86	1
7	39734_6862104	Confined	10,306	3/20/2007	384.15	373.16	10.99	1
7	39734_6862104	Confined	10,311	3/25/2007	385.02	373.28	11.74	1
7	39734_6862104	Confined	10,316	3/30/2007	386.00	373.39	12.61	1
7	39734_6862104	Confined	10,322	4/5/2007	386.56	373.52	13.04	1
7	39734_6862104	Confined	10,327	4/10/2007	387.24	373.64	13.60	1
7	39734_6862104	Confined	10,332	4/15/2007	384.31	373.75	10.56	1
7	39734_6862104	Confined	10,337	4/20/2007	378.54	373.86	4.68	1
7	39734_6862104	Confined	10,342	4/25/2007	377.36	373.97	3.39	1
7	39734_6862104	Confined	10,347	4/30/2007	378.09	374.09	4.00	1
7	39734_6862104	Confined	10,352	5/5/2007	378.85	374.20	4.65	1
7	39734_6862104	Confined	10,357	5/10/2007	381.22	374.31	6.91	1
7	39734_6862104	Confined	10,362	5/15/2007	382.94	374.42	8.52	1
7	39734_6862104	Confined	10,367	5/20/2007	383.61	374.53	9.08	1
7	39734_6862104	Confined	10,372	5/25/2007	384.20	374.65	9.55	1
7	39734_6862104	Confined	10,377	5/30/2007	384.95	374.76	10.19	1
7	39734_6862104	Confined	10,383	6/5/2007	383.23	374.89	8.34	1
7	39734_6862104	Confined	10,423	7/15/2007	387.69	375.79	11.90	1
7	39734_6862104	Confined	10,428	7/20/2007	388.10	375.91	12.19	1
7	39734_6862104	Confined	10,433	7/25/2007	388.61	376.02	12.59	1
7	39734_6862104	Confined	10,438	7/30/2007	388.95	376.13	12.82	1
7	39734_6862104	Confined	10,449	8/10/2007	382.66	376.38	6.28	1
7	39734_6862104	Confined	10,459	8/20/2007	383.37	376.60	6.77	1
7	39734_6862104	Confined	10,475	9/5/2007	377.88	376.96	0.92	1
7	39734_6862104	Confined	10,480	9/10/2007	375.72	377.07	-1.35	1
7	39734_6862104	Confined	10,485	9/15/2007	376.81	377.19	-0.38	1
7	39734_6862104	Confined	10,495	9/25/2007	387.52	377.41	10.11	1
7	39734_6862104	Confined	10,500	9/30/2007	389.71	377.52	12.19	1
7	39734_6862104	Confined	10,515	10/15/2007	393.43	377.86	15.57	1
7	39734_6862104	Confined	10,520	10/20/2007	394.25	377.97	16.28	1
7	39734_6862104	Confined	10,525	10/25/2007	395.63	378.08	17.55	1
7	39734_6862104	Confined	10,530	10/30/2007	395.92	378.20	17.72	1
7	39734_6862104	Confined	10,536	11/5/2007	396.48	378.33	18.15	1
7	39734_6862104	Confined	10,541	11/10/2007	395.99	378.44	17.55	1
7	39734_6862104	Confined	10,546	11/15/2007	394.40	378.56	15.84	1
7	39734_6862104	Confined	10,556	11/25/2007	398.00	378.78	19.22	1
7	39734_6862104	Confined	10,566	12/5/2007	399.97	379.01	20.96	1
7	39734_6862104	Confined	10,571	12/10/2007	400.23	379.12	21.11	1
7	39734_6862104	Confined	10,576	12/15/2007	400.47	379.23	21.24	1
7	39734_6862104	Confined	10,581	12/20/2007	400.84	379.34	21.50	1
7	39734_6862104	Confined	10,586	12/25/2007	400.69	379.46	21.23	1
7	39734_6862104	Confined	10,591	12/30/2007	400.87	379.57	21.30	1
7	39734_6862104	Confined	10,594	1/2/2008	400.66	379.56	21.10	1
7	39734_6862104	Confined	10,597	1/5/2008	398.19	379.52	18.67	1
7	39734_6862104	Confined	10,602	1/10/2008	400.75	379.46	21.29	1
7	39734_6862104	Confined	10,607	1/15/2008	400.98	379.39	21.59	1
7	39734_6862104	Confined	10,612	1/20/2008	401.17	379.32	21.85	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	10,617	1/25/2008	401.89	379.25	22.64	1
7	39734_6862104	Confined	10,622	1/30/2008	402.26	379.19	23.07	1
7	39734_6862104	Confined	10,628	2/5/2008	402.39	379.10	23.29	1
7	39734_6862104	Confined	10,633	2/10/2008	398.27	379.04	19.23	1
7	39734_6862104	Confined	10,638	2/15/2008	398.19	378.97	19.22	1
7	39734_6862104	Confined	10,648	2/25/2008	398.18	378.84	19.34	1
7	39734_6862104	Confined	10,651	2/28/2008	398.18	378.79	19.39	1
7	39734_6862104	Confined	10,657	3/5/2008	398.18	378.71	19.47	1
7	39734_6862104	Confined	10,662	3/10/2008	398.87	378.65	20.22	1
7	39734_6862104	Confined	10,667	3/15/2008	401.82	378.58	23.24	1
7	39734_6862104	Confined	10,672	3/20/2008	398.18	378.51	19.67	1
7	39734_6862104	Confined	10,677	3/25/2008	398.18	378.44	19.74	1
7	39734_6862104	Confined	10,682	3/30/2008	398.18	378.38	19.80	1
7	39734_6862104	Confined	10,688	4/5/2008	398.18	378.30	19.88	1
7	39734_6862104	Confined	10,693	4/10/2008	381.74	378.23	3.51	1
7	39734_6862104	Confined	10,698	4/15/2008	385.96	378.16	7.80	1
7	39734_6862104	Confined	10,703	4/20/2008	389.59	378.09	11.50	1
7	39734_6862104	Confined	10,708	4/25/2008	391.25	378.03	13.22	1
7	39734_6862104	Confined	10,718	5/5/2008	393.10	377.89	15.21	1
7	39734_6862104	Confined	10,723	5/10/2008	393.43	377.82	15.61	1
7	39734_6862104	Confined	10,728	5/15/2008	392.99	377.76	15.23	1
7	39734_6862104	Confined	10,733	5/20/2008	392.73	377.69	15.04	1
7	39734_6862104	Confined	10,738	5/25/2008	389.76	377.62	12.14	1
7	39734_6862104	Confined	10,743	5/30/2008	379.83	377.55	2.28	1
7	39734_6862104	Confined	10,749	6/5/2008	384.14	377.47	6.67	1
7	39734_6862104	Confined	10,754	6/10/2008	382.74	377.41	5.33	1
7	39734_6862104	Confined	10,759	6/15/2008	381.57	377.34	4.23	1
7	39734_6862104	Confined	10,764	6/20/2008	379.95	377.27	2.68	1
7	39734_6862104	Confined	10,769	6/25/2008	376.77	377.20	-0.43	1
7	39734_6862104	Confined	10,774	6/30/2008	373.21	377.14	-3.93	1
7	39734_6862104	Confined	10,779	7/5/2008	372.00	377.07	-5.07	1
7	39734_6862104	Confined	10,784	7/10/2008	371.89	377.00	-5.11	1
7	39734_6862104	Confined	10,789	7/15/2008	372.24	376.93	-4.69	1
7	39734_6862104	Confined	10,794	7/20/2008	372.45	376.87	-4.42	1
7	39734_6862104	Confined	10,799	7/25/2008	374.59	376.80	-2.21	1
7	39734_6862104	Confined	10,804	7/30/2008	375.94	376.73	-0.79	1
7	39734_6862104	Confined	10,810	8/5/2008	378.06	376.65	1.41	1
7	39734_6862104	Confined	10,815	8/10/2008	379.40	376.58	2.82	1
7	39734_6862104	Confined	10,820	8/15/2008	378.47	376.52	1.95	1
7	39734_6862104	Confined	10,825	8/20/2008	377.88	376.45	1.43	1
7	39734_6862104	Confined	10,830	8/25/2008	379.94	376.38	3.56	1
7	39734_6862104	Confined	10,835	8/30/2008	379.58	376.31	3.27	1
7	39734_6862104	Confined	10,841	9/5/2008	379.10	376.23	2.87	1
7	39734_6862104	Confined	10,846	9/10/2008	377.68	376.17	1.51	1
7	39734_6862104	Confined	10,851	9/15/2008	377.94	376.10	1.84	1
7	39734_6862104	Confined	10,856	9/20/2008	376.69	376.03	0.66	1
7	39734_6862104	Confined	10,861	9/25/2008	378.52	375.96	2.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	10,866	9/30/2008	379.02	375.90	3.12	1
7	39734_6862104	Confined	10,871	10/5/2008	379.56	375.83	3.73	1
7	39734_6862104	Confined	10,876	10/10/2008	380.29	375.76	4.53	1
7	39734_6862104	Confined	10,881	10/15/2008	380.39	375.69	4.70	1
7	39734_6862104	Confined	10,886	10/20/2008	380.49	375.63	4.86	1
7	39734_6862104	Confined	10,891	10/25/2008	381.47	375.56	5.91	1
7	39734_6862104	Confined	10,896	10/30/2008	376.36	375.49	0.87	1
7	39734_6862104	Confined	10,902	11/5/2008	381.53	375.41	6.12	1
7	39734_6862104	Confined	10,907	11/10/2008	382.09	375.34	6.75	1
7	39734_6862104	Confined	10,912	11/15/2008	382.02	375.28	6.74	1
7	39734_6862104	Confined	10,917	11/20/2008	382.25	375.21	7.04	1
7	39734_6862104	Confined	10,922	11/25/2008	381.79	375.14	6.65	1
7	39734_6862104	Confined	10,927	11/30/2008	382.40	375.07	7.33	1
7	39734_6862104	Confined	10,932	12/5/2008	381.68	375.01	6.67	1
7	39734_6862104	Confined	10,947	12/20/2008	373.45	374.80	-1.35	1
7	39734_6862104	Confined	10,952	12/25/2008	372.91	374.74	-1.83	1
7	39734_6862104	Confined	10,957	12/30/2008	373.31	374.67	-1.36	1
7	39734_6862104	Confined	10,963	1/5/2009	372.68	374.56	-1.88	1
7	39734_6862104	Confined	10,968	1/10/2009	372.85	374.47	-1.62	1
7	39734_6862104	Confined	10,973	1/15/2009	371.84	374.37	-2.53	1
7	39734_6862104	Confined	10,978	1/20/2009	371.40	374.28	-2.88	1
7	39734_6862104	Confined	10,983	1/25/2009	370.73	374.18	-3.45	1
7	39734_6862104	Confined	10,988	1/30/2009	371.06	374.09	-3.03	1
7	39734_6862104	Confined	10,992	2/3/2009	370.09	374.01	-3.92	1
7	39734_6862104	Confined	10,994	2/5/2009	370.15	373.97	-3.82	1
7	39734_6862104	Confined	10,999	2/10/2009	368.77	373.88	-5.11	1
7	39734_6862104	Confined	11,004	2/15/2009	368.89	373.78	-4.89	1
7	39734_6862104	Confined	11,009	2/20/2009	368.86	373.69	-4.83	1
7	39734_6862104	Confined	11,014	2/25/2009	366.25	373.59	-7.34	1
7	39734_6862104	Confined	11,017	2/28/2009	366.25	373.53	-7.28	1
7	39734_6862104	Confined	11,022	3/5/2009	366.54	373.44	-6.90	1
7	39734_6862104	Confined	11,027	3/10/2009	363.24	373.34	-10.10	1
7	39734_6862104	Confined	11,032	3/15/2009	365.25	373.25	-8.00	1
7	39734_6862104	Confined	11,037	3/20/2009	365.62	373.15	-7.53	1
7	39734_6862104	Confined	11,042	3/25/2009	365.10	373.06	-7.96	1
7	39734_6862104	Confined	11,047	3/30/2009	370.06	372.96	-2.90	1
7	39734_6862104	Confined	11,053	4/5/2009	370.54	372.85	-2.31	1
7	39734_6862104	Confined	11,058	4/10/2009	376.07	372.75	3.32	1
7	39734_6862104	Confined	11,063	4/15/2009	375.31	372.66	2.65	1
7	39734_6862104	Confined	11,068	4/20/2009	375.48	372.56	2.92	1
7	39734_6862104	Confined	11,073	4/25/2009	377.65	372.47	5.18	1
7	39734_6862104	Confined	11,078	4/30/2009	378.45	372.37	6.08	1
7	39734_6862104	Confined	11,083	5/5/2009	378.36	372.28	6.08	1
7	39734_6862104	Confined	11,088	5/10/2009	376.00	372.18	3.82	1
7	39734_6862104	Confined	11,093	5/15/2009	370.17	372.09	-1.92	1
7	39734_6862104	Confined	11,098	5/20/2009	374.34	371.99	2.35	1
7	39734_6862104	Confined	11,103	5/25/2009	364.86	371.90	-7.04	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	11,108	5/30/2009	361.25	371.80	-10.55	1
7	39734_6862104	Confined	11,114	6/5/2009	358.38	371.69	-13.31	1
7	39734_6862104	Confined	11,119	6/10/2009	353.75	371.59	-17.84	1
7	39734_6862104	Confined	11,124	6/15/2009	357.01	371.50	-14.49	1
7	39734_6862104	Confined	11,129	6/20/2009	359.67	371.40	-11.73	1
7	39734_6862104	Confined	11,134	6/25/2009	364.61	371.31	-6.70	1
7	39734_6862104	Confined	11,139	6/30/2009	365.46	371.21	-5.75	1
7	39734_6862104	Confined	11,144	7/5/2009	359.98	371.12	-11.14	1
7	39734_6862104	Confined	11,149	7/10/2009	353.39	371.02	-17.63	1
7	39734_6862104	Confined	11,154	7/15/2009	348.62	370.93	-22.31	1
7	39734_6862104	Confined	11,159	7/20/2009	349.17	370.83	-21.66	1
7	39734_6862104	Confined	11,164	7/25/2009	344.54	370.74	-26.20	1
7	39734_6862104	Confined	11,169	7/30/2009	344.73	370.64	-25.91	1
7	39734_6862104	Confined	11,175	8/5/2009	344.56	370.53	-25.97	1
7	39734_6862104	Confined	11,180	8/10/2009	342.79	370.43	-27.64	1
7	39734_6862104	Confined	11,185	8/15/2009	339.55	370.34	-30.79	1
7	39734_6862104	Confined	11,190	8/20/2009	341.91	370.24	-28.33	1
7	39734_6862104	Confined	11,195	8/25/2009	341.05	370.15	-29.10	1
7	39734_6862104	Confined	11,200	8/30/2009	341.09	370.05	-28.96	1
7	39734_6862104	Confined	11,206	9/5/2009	344.97	369.94	-24.97	1
7	39734_6862104	Confined	11,211	9/10/2009	347.53	369.84	-22.31	1
7	39734_6862104	Confined	11,216	9/15/2009	352.17	369.75	-17.58	1
7	39734_6862104	Confined	11,226	9/25/2009	362.63	369.56	-6.93	1
7	39734_6862104	Confined	11,231	9/30/2009	372.94	369.46	3.48	1
7	39734_6862104	Confined	11,236	10/5/2009	378.35	369.37	8.98	1
7	39734_6862104	Confined	11,241	10/10/2009	381.56	369.27	12.29	1
7	39734_6862104	Confined	11,246	10/15/2009	385.72	369.18	16.54	1
7	39734_6862104	Confined	11,251	10/20/2009	389.11	369.08	20.03	1
7	39734_6862104	Confined	11,256	10/25/2009	390.87	368.99	21.88	1
7	39734_6862104	Confined	11,261	10/30/2009	392.06	368.89	23.17	1
7	39734_6862104	Confined	11,267	11/5/2009	393.78	368.78	25.00	1
7	39734_6862104	Confined	11,272	11/10/2009	395.35	368.68	26.67	1
7	39734_6862104	Confined	11,277	11/15/2009	396.30	368.59	27.71	1
7	39734_6862104	Confined	11,282	11/20/2009	397.26	368.49	28.77	1
7	39734_6862104	Confined	11,287	11/25/2009	388.64	368.40	20.24	1
7	39734_6862104	Confined	11,292	11/30/2009	389.05	368.30	20.75	1
7	39734_6862104	Confined	11,297	12/5/2009	389.43	368.20	21.23	1
7	39734_6862104	Confined	11,307	12/15/2009	390.11	368.01	22.10	1
7	39734_6862104	Confined	11,312	12/20/2009	390.29	367.92	22.37	1
7	39734_6862104	Confined	11,317	12/25/2009	391.03	367.82	23.21	1
7	39734_6862104	Confined	11,322	12/30/2009	390.99	367.73	23.26	1
7	39734_6862104	Confined	11,328	1/5/2010	391.76	367.55	24.21	1
7	39734_6862104	Confined	11,333	1/10/2010	392.08	367.39	24.69	1
7	39734_6862104	Confined	11,334	1/11/2010	392.19	367.36	24.83	1
7	39734_6862104	Confined	11,338	1/15/2010	392.87	367.23	25.64	1
7	39734_6862104	Confined	11,343	1/20/2010	392.60	367.07	25.53	1
7	39734_6862104	Confined	11,348	1/25/2010	388.70	366.90	21.80	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	11,353	1/30/2010	391.62	366.74	24.88	1
7	39734_6862104	Confined	11,359	2/5/2010	393.23	366.55	26.68	1
7	39734_6862104	Confined	11,364	2/10/2010	393.69	366.39	27.30	1
7	39734_6862104	Confined	11,369	2/15/2010	394.24	366.23	28.01	1
7	39734_6862104	Confined	11,374	2/20/2010	394.24	366.07	28.17	1
7	39734_6862104	Confined	11,379	2/25/2010	385.17	365.91	19.26	1
7	39734_6862104	Confined	11,382	2/28/2010	385.17	365.81	19.36	1
7	39734_6862104	Confined	11,387	3/5/2010	385.87	365.65	20.22	1
7	39734_6862104	Confined	11,392	3/10/2010	391.12	365.49	25.63	1
7	39734_6862104	Confined	11,397	3/15/2010	392.84	365.33	27.51	1
7	39734_6862104	Confined	11,402	3/20/2010	393.85	365.17	28.68	1
7	39734_6862104	Confined	11,407	3/25/2010	394.61	365.01	29.60	1
7	39734_6862104	Confined	11,412	3/30/2010	395.01	364.84	30.17	1
7	39734_6862104	Confined	11,433	4/20/2010	390.49	364.17	26.32	1
7	39734_6862104	Confined	11,438	4/25/2010	390.04	364.01	26.03	1
7	39734_6862104	Confined	11,448	5/5/2010	388.45	363.69	24.76	1
7	39734_6862104	Confined	11,453	5/10/2010	385.73	363.52	22.21	1
7	39734_6862104	Confined	11,458	5/15/2010	386.45	363.36	23.09	1
7	39734_6862104	Confined	11,463	5/20/2010	387.91	363.20	24.71	1
7	39734_6862104	Confined	11,468	5/25/2010	388.31	363.04	25.27	1
7	39734_6862104	Confined	11,473	5/30/2010	383.29	362.88	20.41	1
7	39734_6862104	Confined	11,479	6/5/2010	387.31	362.69	24.62	1
7	39734_6862104	Confined	11,484	6/10/2010	388.28	362.53	25.75	1
7	39734_6862104	Confined	11,489	6/15/2010	388.83	362.37	26.46	1
7	39734_6862104	Confined	11,494	6/20/2010	388.93	362.20	26.73	1
7	39734_6862104	Confined	11,621	10/25/2010	385.29	358.12	27.17	1
7	39734_6862104	Confined	11,626	10/30/2010	385.51	357.95	27.56	1
7	39734_6862104	Confined	11,632	11/5/2010	386.45	357.76	28.69	1
7	39734_6862104	Confined	11,637	11/10/2010	387.29	357.60	29.69	1
7	39734_6862104	Confined	11,642	11/15/2010	387.50	357.44	30.06	1
7	39734_6862104	Confined	11,647	11/20/2010	388.13	357.28	30.85	1
7	39734_6862104	Confined	11,652	11/25/2010	388.69	357.12	31.57	1
7	39734_6862104	Confined	11,657	11/30/2010	389.06	356.96	32.10	1
7	39734_6862104	Confined	11,662	12/5/2010	389.67	356.80	32.87	1
7	39734_6862104	Confined	11,667	12/10/2010	392.63	356.63	36.00	1
7	39734_6862104	Confined	11,672	12/15/2010	395.27	356.47	38.80	1
7	39734_6862104	Confined	11,677	12/20/2010	396.60	356.31	40.29	1
7	39734_6862104	Confined	11,682	12/25/2010	397.49	356.15	41.34	1
7	39734_6862104	Confined	11,687	12/30/2010	398.57	355.99	42.58	1
7	39734_6862104	Confined	11,693	1/5/2011	399.65	355.84	43.81	1
7	39734_6862104	Confined	11,698	1/10/2011	400.08	355.73	44.35	1
7	39734_6862104	Confined	11,703	1/15/2011	400.37	355.61	44.76	1
7	39734_6862104	Confined	11,708	1/20/2011	401.15	355.50	45.65	1
7	39734_6862104	Confined	11,713	1/25/2011	401.56	355.38	46.18	1
7	39734_6862104	Confined	11,718	1/30/2011	401.98	355.27	46.71	1
7	39734_6862104	Confined	11,724	2/5/2011	401.91	355.13	46.78	1
7	39734_6862104	Confined	11,729	2/10/2011	401.05	355.01	46.04	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	11,734	2/15/2011	400.61	354.90	45.71	1
7	39734_6862104	Confined	11,739	2/20/2011	400.16	354.78	45.38	1
7	39734_6862104	Confined	11,744	2/25/2011	400.56	354.67	45.89	1
7	39734_6862104	Confined	11,752	3/5/2011	398.36	354.48	43.88	1
7	39734_6862104	Confined	11,757	3/10/2011	396.35	354.37	41.98	1
7	39734_6862104	Confined	11,762	3/15/2011	395.08	354.25	40.83	1
7	39734_6862104	Confined	11,767	3/20/2011	394.19	354.14	40.05	1
7	39734_6862104	Confined	11,772	3/25/2011	392.56	354.02	38.54	1
7	39734_6862104	Confined	11,777	3/30/2011	387.24	353.90	33.34	1
7	39734_6862104	Confined	11,783	4/5/2011	377.92	353.77	24.15	1
7	39734_6862104	Confined	11,788	4/10/2011	374.28	353.65	20.63	1
7	39734_6862104	Confined	11,793	4/15/2011	371.35	353.54	17.81	1
7	39734_6862104	Confined	11,798	4/20/2011	368.49	353.42	15.07	1
7	39734_6862104	Confined	11,803	4/25/2011	367.10	353.30	13.80	1
7	39734_6862104	Confined	11,808	4/30/2011	364.73	353.19	11.54	1
7	39734_6862104	Confined	11,813	5/5/2011	363.96	353.07	10.89	1
7	39734_6862104	Confined	11,818	5/10/2011	360.30	352.96	7.34	1
7	39734_6862104	Confined	11,823	5/15/2011	361.29	352.84	8.45	1
7	39734_6862104	Confined	11,828	5/20/2011	361.38	352.73	8.65	1
7	39734_6862104	Confined	11,833	5/25/2011	358.39	352.61	5.78	1
7	39734_6862104	Confined	11,838	5/30/2011	356.21	352.50	3.71	1
7	39734_6862104	Confined	11,844	6/5/2011	353.54	352.36	1.18	1
7	39734_6862104	Confined	11,849	6/10/2011	348.52	352.24	-3.72	1
7	39734_6862104	Confined	11,854	6/15/2011	351.95	352.13	-0.18	1
7	39734_6862104	Confined	11,859	6/20/2011	350.65	352.01	-1.36	1
7	39734_6862104	Confined	11,864	6/25/2011	348.71	351.90	-3.19	1
7	39734_6862104	Confined	11,869	6/30/2011	346.96	351.78	-4.82	1
7	39734_6862104	Confined	11,874	7/5/2011	348.26	351.67	-3.41	1
7	39734_6862104	Confined	11,879	7/10/2011	345.70	351.55	-5.85	1
7	39734_6862104	Confined	11,884	7/15/2011	337.10	351.43	-14.33	1
7	39734_6862104	Confined	11,889	7/20/2011	341.47	351.32	-9.85	1
7	39734_6862104	Confined	11,894	7/25/2011	344.49	351.20	-6.71	1
7	39734_6862104	Confined	11,899	7/30/2011	340.99	351.09	-10.10	1
7	39734_6862104	Confined	11,905	8/5/2011	338.46	350.95	-12.49	1
7	39734_6862104	Confined	11,910	8/10/2011	331.83	350.83	-19.00	1
7	39734_6862104	Confined	11,915	8/15/2011	334.75	350.72	-15.97	1
7	39734_6862104	Confined	11,920	8/20/2011	330.56	350.60	-20.04	1
7	39734_6862104	Confined	11,925	8/25/2011	328.67	350.49	-21.82	1
7	39734_6862104	Confined	11,930	8/30/2011	329.83	350.37	-20.54	1
7	39734_6862104	Confined	11,936	9/5/2011	333.87	350.23	-16.36	1
7	39734_6862104	Confined	11,941	9/10/2011	327.97	350.12	-22.15	1
7	39734_6862104	Confined	11,946	9/15/2011	328.18	350.00	-21.82	1
7	39734_6862104	Confined	11,951	9/20/2011	327.59	349.89	-22.30	1
7	39734_6862104	Confined	11,956	9/25/2011	335.94	349.77	-13.83	1
7	39734_6862104	Confined	11,961	9/30/2011	337.88	349.66	-11.78	1
7	39734_6862104	Confined	11,966	10/5/2011	334.55	349.54	-14.99	1
7	39734_6862104	Confined	11,971	10/10/2011	340.05	349.43	-9.38	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	11,976	10/15/2011	342.99	349.31	-6.32	1
7	39734_6862104	Confined	11,981	10/20/2011	343.74	349.20	-5.46	1
7	39734_6862104	Confined	11,986	10/25/2011	339.37	349.08	-9.71	1
7	39734_6862104	Confined	11,991	10/30/2011	346.80	348.97	-2.17	1
7	39734_6862104	Confined	11,997	11/5/2011	353.58	348.83	4.75	1
7	39734_6862104	Confined	12,002	11/10/2011	360.30	348.71	11.59	1
7	39734_6862104	Confined	12,007	11/15/2011	358.59	348.60	9.99	1
7	39734_6862104	Confined	12,012	11/20/2011	365.57	348.48	17.09	1
7	39734_6862104	Confined	12,017	11/25/2011	366.95	348.36	18.59	1
7	39734_6862104	Confined	12,022	11/30/2011	368.04	348.25	19.79	1
7	39734_6862104	Confined	12,027	12/5/2011	370.59	348.13	22.46	1
7	39734_6862104	Confined	12,032	12/10/2011	373.62	348.02	25.60	1
7	39734_6862104	Confined	12,037	12/15/2011	375.93	347.90	28.03	1
7	39734_6862104	Confined	12,042	12/20/2011	376.93	347.79	29.14	1
7	39734_6862104	Confined	12,047	12/25/2011	378.49	347.67	30.82	1
7	39734_6862104	Confined	12,052	12/30/2011	379.92	347.56	32.36	1
7	39734_6862104	Confined	12,058	1/5/2012	380.68	347.70	32.98	1
7	39734_6862104	Confined	12,063	1/10/2012	381.22	347.86	33.36	1
7	39734_6862104	Confined	12,068	1/15/2012	381.88	348.03	33.85	1
7	39734_6862104	Confined	12,073	1/20/2012	378.31	348.19	30.12	1
7	39734_6862104	Confined	12,078	1/25/2012	376.21	348.36	27.85	1
7	39734_6862104	Confined	12,083	1/30/2012	374.65	348.52	26.13	1
7	39734_6862104	Confined	12,089	2/5/2012	374.14	348.72	25.42	1
7	39734_6862104	Confined	12,094	2/10/2012	374.12	348.88	25.24	1
7	39734_6862104	Confined	12,099	2/15/2012	374.30	349.05	25.25	1
7	39734_6862104	Confined	12,104	2/20/2012	374.53	349.21	25.32	1
7	39734_6862104	Confined	12,109	2/25/2012	374.56	349.38	25.18	1
7	39734_6862104	Confined	12,112	2/28/2012	374.56	349.48	25.08	1
7	39734_6862104	Confined	12,123	3/10/2012	374.59	349.84	24.75	1
7	39734_6862104	Confined	12,128	3/15/2012	374.63	350.00	24.63	1
7	39734_6862104	Confined	12,133	3/20/2012	374.95	350.17	24.78	1
7	39734_6862104	Confined	12,138	3/25/2012	375.20	350.33	24.87	1
7	39734_6862104	Confined	12,143	3/30/2012	375.43	350.50	24.93	1
7	39734_6862104	Confined	12,149	4/5/2012	375.39	350.70	24.69	1
7	39734_6862104	Confined	12,154	4/10/2012	374.52	350.86	23.66	1
7	39734_6862104	Confined	12,159	4/15/2012	374.30	351.02	23.28	1
7	39734_6862104	Confined	12,164	4/20/2012	373.61	351.19	22.42	1
7	39734_6862104	Confined	12,169	4/25/2012	371.19	351.35	19.84	1
7	39734_6862104	Confined	12,174	4/30/2012	369.33	351.52	17.81	1
7	39734_6862104	Confined	12,179	5/5/2012	368.04	351.68	16.36	1
7	39734_6862104	Confined	12,184	5/10/2012	368.60	351.85	16.75	1
7	39734_6862104	Confined	12,189	5/15/2012	369.43	352.01	17.42	1
7	39734_6862104	Confined	12,194	5/20/2012	370.03	352.18	17.85	1
7	39734_6862104	Confined	12,199	5/25/2012	370.52	352.34	18.18	1
7	39734_6862104	Confined	12,204	5/30/2012	370.02	352.51	17.51	1
7	39734_6862104	Confined	12,210	6/5/2012	365.85	352.70	13.15	1
7	39734_6862104	Confined	12,215	6/10/2012	355.78	352.87	2.91	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	12,220	6/15/2012	351.49	353.03	-1.54	1
7	39734_6862104	Confined	12,225	6/20/2012	355.27	353.20	2.07	1
7	39734_6862104	Confined	12,230	6/25/2012	352.28	353.36	-1.08	1
7	39734_6862104	Confined	12,235	6/30/2012	351.02	353.53	-2.51	1
7	39734_6862104	Confined	12,240	7/5/2012	347.23	353.69	-6.46	1
7	39734_6862104	Confined	12,245	7/10/2012	344.57	353.86	-9.29	1
7	39734_6862104	Confined	12,250	7/15/2012	352.86	354.02	-1.16	1
7	39734_6862104	Confined	12,255	7/20/2012	355.79	354.19	1.60	1
7	39734_6862104	Confined	12,260	7/25/2012	356.75	354.35	2.40	1
7	39734_6862104	Confined	12,265	7/30/2012	356.79	354.52	2.27	1
7	39734_6862104	Confined	12,271	8/5/2012	347.65	354.71	-7.06	1
7	39734_6862104	Confined	12,276	8/10/2012	343.82	354.88	-11.06	1
7	39734_6862104	Confined	12,281	8/15/2012	347.09	355.04	-7.95	1
7	39734_6862104	Confined	12,286	8/20/2012	345.26	355.21	-9.95	1
7	39734_6862104	Confined	12,291	8/25/2012	350.41	355.37	-4.96	1
7	39734_6862104	Confined	12,296	8/30/2012	346.42	355.54	-9.12	1
7	39734_6862104	Confined	12,302	9/5/2012	346.33	355.73	-9.40	1
7	39734_6862104	Confined	12,307	9/10/2012	345.53	355.90	-10.37	1
7	39734_6862104	Confined	12,312	9/15/2012	351.26	356.06	-4.80	1
7	39734_6862104	Confined	12,317	9/20/2012	356.08	356.23	-0.15	1
7	39734_6862104	Confined	12,322	9/25/2012	361.83	356.39	5.44	1
7	39734_6862104	Confined	12,327	9/30/2012	364.67	356.56	8.11	1
7	39734_6862104	Confined	12,332	10/5/2012	371.99	356.72	15.27	1
7	39734_6862104	Confined	12,337	10/10/2012	376.33	356.89	19.44	1
7	39734_6862104	Confined	12,342	10/15/2012	378.81	357.05	21.76	1
7	39734_6862104	Confined	12,347	10/20/2012	381.56	357.22	24.34	1
7	39734_6862104	Confined	12,352	10/25/2012	379.61	357.38	22.23	1
7	39734_6862104	Confined	12,357	10/30/2012	380.62	357.55	23.07	1
7	39734_6862104	Confined	12,363	11/5/2012	383.83	357.74	26.09	1
7	39734_6862104	Confined	12,368	11/10/2012	378.59	357.91	20.68	1
7	39734_6862104	Confined	12,373	11/15/2012	375.26	358.07	17.19	1
7	39734_6862104	Confined	12,383	11/25/2012	369.74	358.40	11.34	1
7	39734_6862104	Confined	12,388	11/30/2012	365.73	358.57	7.16	1
7	39734_6862104	Confined	12,393	12/5/2012	361.06	358.73	2.33	1
7	39734_6862104	Confined	12,398	12/10/2012	358.72	358.90	-0.18	1
7	39734_6862104	Confined	12,403	12/15/2012	357.71	359.06	-1.35	1
7	39734_6862104	Confined	12,408	12/20/2012	357.95	359.22	-1.27	1
7	39734_6862104	Confined	12,413	12/25/2012	356.15	359.39	-3.24	1
7	39734_6862104	Confined	12,418	12/30/2012	351.29	359.55	-8.26	1
7	39734_6862104	Confined	12,424	1/5/2013	355.68	359.67	-3.99	1
7	39734_6862104	Confined	12,429	1/10/2013	355.53	359.75	-4.22	1
7	39734_6862104	Confined	12,434	1/15/2013	354.98	359.83	-4.85	1
7	39734_6862104	Confined	12,439	1/20/2013	355.32	359.91	-4.59	1
7	39734_6862104	Confined	12,444	1/25/2013	355.32	359.99	-4.67	1
7	39734_6862104	Confined	12,449	1/30/2013	355.43	360.07	-4.64	1
7	39734_6862104	Confined	12,451	2/1/2013	354.84	360.10	-5.26	1
7	39734_6862104	Confined	12,455	2/5/2013	354.62	360.16	-5.54	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	12,460	2/10/2013	354.37	360.24	-5.87	1
7	39734_6862104	Confined	12,465	2/15/2013	354.13	360.32	-6.19	1
7	39734_6862104	Confined	12,470	2/20/2013	353.66	360.41	-6.75	1
7	39734_6862104	Confined	12,475	2/25/2013	353.03	360.49	-7.46	1
7	39734_6862104	Confined	12,478	2/28/2013	353.03	360.53	-7.50	1
7	39734_6862104	Confined	12,483	3/5/2013	343.12	360.61	-17.49	1
7	39734_6862104	Confined	12,488	3/10/2013	346.57	360.69	-14.12	1
7	39734_6862104	Confined	12,493	3/15/2013	344.16	360.77	-16.61	1
7	39734_6862104	Confined	12,498	3/20/2013	340.24	360.85	-20.61	1
7	39734_6862104	Confined	12,503	3/25/2013	341.59	360.93	-19.34	1
7	39734_6862104	Confined	12,508	3/30/2013	342.21	361.02	-18.81	1
7	39734_6862104	Confined	12,514	4/5/2013	343.10	361.11	-18.01	1
7	39734_6862104	Confined	12,519	4/10/2013	342.21	361.19	-18.98	1
7	39734_6862104	Confined	12,524	4/15/2013	339.20	361.27	-22.07	1
7	39734_6862104	Confined	12,529	4/20/2013	338.25	361.35	-23.10	1
7	39734_6862104	Confined	12,534	4/25/2013	337.29	361.43	-24.14	1
7	39734_6862104	Confined	12,539	4/30/2013	338.28	361.51	-23.23	1
7	39734_6862104	Confined	12,544	5/5/2013	339.33	361.59	-22.26	1
7	39734_6862104	Confined	12,549	5/10/2013	338.58	361.67	-23.09	1
7	39734_6862104	Confined	12,554	5/15/2013	337.94	361.75	-23.81	1
7	39734_6862104	Confined	12,559	5/20/2013	336.92	361.83	-24.91	1
7	39734_6862104	Confined	12,564	5/25/2013	335.75	361.91	-26.16	1
7	39734_6862104	Confined	12,569	5/30/2013	337.47	361.99	-24.52	1
7	39734_6862104	Confined	12,575	6/5/2013	339.84	362.09	-22.25	1
7	39734_6862104	Confined	12,580	6/10/2013	339.88	362.17	-22.29	1
7	39734_6862104	Confined	12,585	6/15/2013	341.78	362.25	-20.47	1
7	39734_6862104	Confined	12,590	6/20/2013	341.51	362.33	-20.82	1
7	39734_6862104	Confined	12,595	6/25/2013	340.62	362.41	-21.79	1
7	39734_6862104	Confined	12,600	6/30/2013	338.82	362.49	-23.67	1
7	39734_6862104	Confined	12,605	7/5/2013	339.58	362.57	-22.99	1
7	39734_6862104	Confined	12,610	7/10/2013	338.93	362.65	-23.72	1
7	39734_6862104	Confined	12,615	7/15/2013	338.03	362.73	-24.70	1
7	39734_6862104	Confined	12,620	7/20/2013	337.80	362.81	-25.01	1
7	39734_6862104	Confined	12,625	7/25/2013	335.08	362.89	-27.81	1
7	39734_6862104	Confined	12,630	7/30/2013	335.08	362.97	-27.89	1
7	39734_6862104	Confined	12,636	8/5/2013	335.69	363.07	-27.38	1
7	39734_6862104	Confined	12,641	8/10/2013	330.70	363.15	-32.45	1
7	39734_6862104	Confined	12,646	8/15/2013	333.46	363.23	-29.77	1
7	39734_6862104	Confined	12,651	8/20/2013	330.28	363.31	-33.03	1
7	39734_6862104	Confined	12,656	8/25/2013	334.12	363.39	-29.27	1
7	39734_6862104	Confined	12,661	8/30/2013	335.45	363.47	-28.02	1
7	39734_6862104	Confined	12,667	9/5/2013	335.20	363.57	-28.37	1
7	39734_6862104	Confined	12,672	9/10/2013	335.16	363.65	-28.49	1
7	39734_6862104	Confined	12,677	9/15/2013	338.49	363.73	-25.24	1
7	39734_6862104	Confined	12,682	9/20/2013	342.47	363.81	-21.34	1
7	39734_6862104	Confined	12,687	9/25/2013	348.11	363.89	-15.78	1
7	39734_6862104	Confined	12,692	9/30/2013	349.56	363.97	-14.41	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	12,697	10/5/2013	352.23	364.05	-11.82	1
7	39734_6862104	Confined	12,702	10/10/2013	353.69	364.13	-10.44	1
7	39734_6862104	Confined	12,707	10/15/2013	354.90	364.21	-9.31	1
7	39734_6862104	Confined	12,712	10/20/2013	358.32	364.29	-5.97	1
7	39734_6862104	Confined	12,717	10/25/2013	359.89	364.37	-4.48	1
7	39734_6862104	Confined	12,722	10/30/2013	360.86	364.45	-3.59	1
7	39734_6862104	Confined	12,728	11/5/2013	364.77	364.55	0.22	1
7	39734_6862104	Confined	12,733	11/10/2013	365.79	364.63	1.16	1
7	39734_6862104	Confined	12,738	11/15/2013	367.44	364.71	2.73	1
7	39734_6862104	Confined	12,743	11/20/2013	368.40	364.79	3.61	1
7	39734_6862104	Confined	12,748	11/25/2013	369.12	364.87	4.25	1
7	39734_6862104	Confined	12,753	11/30/2013	369.93	364.95	4.98	1
7	39734_6862104	Confined	12,758	12/5/2013	370.93	365.03	5.90	1
7	39734_6862104	Confined	12,763	12/10/2013	373.38	365.11	8.27	1
7	39734_6862104	Confined	12,768	12/15/2013	375.12	365.19	9.93	1
7	39734_6862104	Confined	12,773	12/20/2013	376.45	365.27	11.18	1
7	39734_6862104	Confined	12,778	12/25/2013	376.68	365.35	11.33	1
7	39734_6862104	Confined	12,783	12/30/2013	377.61	365.43	12.18	1
7	39734_6862104	Confined	12,789	1/5/2014	366.54	365.48	1.06	1
7	39734_6862104	Confined	12,794	1/10/2014	356.44	365.51	-9.07	1
7	39734_6862104	Confined	12,799	1/15/2014	351.04	365.54	-14.50	1
7	39734_6862104	Confined	12,804	1/20/2014	345.05	365.58	-20.53	1
7	39734_6862104	Confined	12,809	1/25/2014	343.98	365.61	-21.63	1
7	39734_6862104	Confined	12,814	1/30/2014	345.86	365.64	-19.78	1
7	39734_6862104	Confined	12,820	2/5/2014	342.29	365.68	-23.39	1
7	39734_6862104	Confined	12,825	2/10/2014	341.60	365.72	-24.12	1
7	39734_6862104	Confined	12,830	2/15/2014	340.82	365.75	-24.93	1
7	39734_6862104	Confined	12,835	2/20/2014	339.90	365.78	-25.88	1
7	39734_6862104	Confined	12,840	2/25/2014	337.95	365.81	-27.86	1
7	39734_6862104	Confined	12,843	2/28/2014	337.38	365.83	-28.45	1
7	39734_6862104	Confined	12,848	3/5/2014	339.81	365.87	-26.06	1
7	39734_6862104	Confined	12,853	3/10/2014	338.36	365.90	-27.54	1
7	39734_6862104	Confined	12,858	3/15/2014	335.22	365.93	-30.71	1
7	39734_6862104	Confined	12,863	3/20/2014	333.64	365.97	-32.33	1
7	39734_6862104	Confined	12,868	3/25/2014	332.86	366.00	-33.14	1
7	39734_6862104	Confined	12,873	3/30/2014	331.82	366.03	-34.21	1
7	39734_6862104	Confined	12,879	4/5/2014	330.06	366.07	-36.01	1
7	39734_6862104	Confined	12,884	4/10/2014	329.66	366.10	-36.44	1
7	39734_6862104	Confined	12,889	4/15/2014	326.57	366.14	-39.57	1
7	39734_6862104	Confined	12,894	4/20/2014	328.20	366.17	-37.97	1
7	39734_6862104	Confined	12,899	4/25/2014	325.89	366.20	-40.31	1
7	39734_6862104	Confined	12,904	4/30/2014	323.43	366.24	-42.81	1
7	39734_6862104	Confined	12,909	5/5/2014	322.08	366.27	-44.19	1
7	39734_6862104	Confined	12,914	5/10/2014	321.65	366.30	-44.65	1
7	39734_6862104	Confined	12,919	5/15/2014	321.73	366.34	-44.61	1
7	39734_6862104	Confined	12,924	5/20/2014	321.73	366.37	-44.64	1
7	39734_6862104	Confined	12,929	5/25/2014	321.73	366.40	-44.67	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	12,934	5/30/2014	321.73	366.43	-44.70	1
7	39734_6862104	Confined	12,940	6/5/2014	321.73	366.47	-44.74	1
7	39734_6862104	Confined	12,945	6/10/2014	321.73	366.51	-44.78	1
7	39734_6862104	Confined	12,950	6/15/2014	321.74	366.54	-44.80	1
7	39734_6862104	Confined	12,955	6/20/2014	322.67	366.57	-43.90	1
7	39734_6862104	Confined	12,960	6/25/2014	321.03	366.61	-45.58	1
7	39734_6862104	Confined	12,965	6/30/2014	321.18	366.64	-45.46	1
7	39734_6862104	Confined	12,970	7/5/2014	320.23	366.67	-46.44	1
7	39734_6862104	Confined	12,975	7/10/2014	318.93	366.71	-47.78	1
7	39734_6862104	Confined	12,980	7/15/2014	317.52	366.74	-49.22	1
7	39734_6862104	Confined	12,985	7/20/2014	316.99	366.77	-49.78	1
7	39734_6862104	Confined	12,990	7/25/2014	313.43	366.80	-53.37	1
7	39734_6862104	Confined	12,995	7/30/2014	317.62	366.84	-49.22	1
7	39734_6862104	Confined	13,001	8/5/2014	327.31	366.88	-39.57	1
7	39734_6862104	Confined	13,006	8/10/2014	322.33	366.91	-44.58	1
7	39734_6862104	Confined	13,011	8/15/2014	328.11	366.94	-38.83	1
7	39734_6862104	Confined	13,016	8/20/2014	322.39	366.98	-44.59	1
7	39734_6862104	Confined	13,021	8/25/2014	327.22	367.01	-39.79	1
7	39734_6862104	Confined	13,026	8/30/2014	327.11	367.04	-39.93	1
7	39734_6862104	Confined	13,032	9/5/2014	327.70	367.08	-39.38	1
7	39734_6862104	Confined	13,037	9/10/2014	330.91	367.12	-36.21	1
7	39734_6862104	Confined	13,042	9/15/2014	331.48	367.15	-35.67	1
7	39734_6862104	Confined	13,047	9/20/2014	331.47	367.18	-35.71	1
7	39734_6862104	Confined	13,052	9/25/2014	328.00	367.21	-39.21	1
7	39734_6862104	Confined	13,057	9/30/2014	333.83	367.25	-33.42	1
7	39734_6862104	Confined	13,062	10/5/2014	335.15	367.28	-32.13	1
7	39734_6862104	Confined	13,067	10/10/2014	335.63	367.31	-31.68	1
7	39734_6862104	Confined	13,072	10/15/2014	329.92	367.35	-37.43	1
7	39734_6862104	Confined	13,077	10/20/2014	333.98	367.38	-33.40	1
7	39734_6862104	Confined	13,082	10/25/2014	328.59	367.41	-38.82	1
7	39734_6862104	Confined	13,087	10/30/2014	334.04	367.45	-33.41	1
7	39734_6862104	Confined	13,093	11/5/2014	335.51	367.48	-31.97	1
7	39734_6862104	Confined	13,098	11/10/2014	336.43	367.52	-31.09	1
7	39734_6862104	Confined	13,103	11/15/2014	336.96	367.55	-30.59	1
7	39734_6862104	Confined	13,108	11/20/2014	341.40	367.58	-26.18	1
7	39734_6862104	Confined	13,113	11/25/2014	347.30	367.62	-20.32	1
7	39734_6862104	Confined	13,118	11/30/2014	349.98	367.65	-17.67	1
7	39734_6862104	Confined	13,123	12/5/2014	352.38	367.68	-15.30	1
7	39734_6862104	Confined	13,128	12/10/2014	355.62	367.72	-12.10	1
7	39734_6862104	Confined	13,133	12/15/2014	357.04	367.75	-10.71	1
7	39734_6862104	Confined	13,138	12/20/2014	358.93	367.78	-8.85	1
7	39734_6862104	Confined	13,143	12/25/2014	360.24	367.82	-7.58	1
7	39734_6862104	Confined	13,148	12/30/2014	361.22	367.85	-6.63	1
7	39734_6862104	Confined	13,154	1/5/2015	362.32	367.95	-5.63	1
7	39734_6862104	Confined	13,159	1/10/2015	347.61	368.04	-20.43	1
7	39734_6862104	Confined	13,164	1/15/2015	339.29	368.13	-28.84	1
7	39734_6862104	Confined	13,169	1/20/2015	335.78	368.22	-32.44	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	13,174	1/25/2015	334.43	368.31	-33.88	1
7	39734_6862104	Confined	13,179	1/30/2015	333.01	368.40	-35.39	1
7	39734_6862104	Confined	13,185	2/5/2015	331.98	368.51	-36.53	1
7	39734_6862104	Confined	13,190	2/10/2015	326.75	368.60	-41.85	1
7	39734_6862104	Confined	13,195	2/15/2015	330.18	368.70	-38.52	1
7	39734_6862104	Confined	13,200	2/20/2015	332.20	368.79	-36.59	1
7	39734_6862104	Confined	13,205	2/25/2015	333.54	368.88	-35.34	1
7	39734_6862104	Confined	13,208	2/28/2015	333.44	368.93	-35.49	1
7	39734_6862104	Confined	13,213	3/5/2015	334.23	369.02	-34.79	1
7	39734_6862104	Confined	13,218	3/10/2015	334.42	369.12	-34.70	1
7	39734_6862104	Confined	13,223	3/15/2015	334.43	369.21	-34.78	1
7	39734_6862104	Confined	13,228	3/20/2015	334.17	369.30	-35.13	1
7	39734_6862104	Confined	13,233	3/25/2015	334.63	369.39	-34.76	1
7	39734_6862104	Confined	13,238	3/30/2015	334.34	369.48	-35.14	1
7	39734_6862104	Confined	13,244	4/5/2015	328.41	369.59	-41.18	1
7	39734_6862104	Confined	13,249	4/10/2015	333.60	369.68	-36.08	1
7	39734_6862104	Confined	13,254	4/15/2015	334.02	369.77	-35.75	1
7	39734_6862104	Confined	13,259	4/20/2015	338.83	369.87	-31.04	1
7	39734_6862104	Confined	13,264	4/25/2015	336.44	369.96	-33.52	1
7	39734_6862104	Confined	13,269	4/30/2015	343.48	370.05	-26.57	1
7	39734_6862104	Confined	13,274	5/5/2015	348.71	370.14	-21.43	1
7	39734_6862104	Confined	13,279	5/10/2015	351.88	370.23	-18.35	1
7	39734_6862104	Confined	13,284	5/15/2015	354.64	370.32	-15.68	1
7	39734_6862104	Confined	13,289	5/20/2015	356.02	370.41	-14.39	1
7	39734_6862104	Confined	13,294	5/25/2015	357.22	370.51	-13.29	1
7	39734_6862104	Confined	13,299	5/30/2015	357.97	370.60	-12.63	1
7	39734_6862104	Confined	13,305	6/5/2015	362.07	370.71	-8.64	1
7	39734_6862104	Confined	13,310	6/10/2015	361.12	370.80	-9.68	1
7	39734_6862104	Confined	13,315	6/15/2015	353.12	370.89	-17.77	1
7	39734_6862104	Confined	13,320	6/20/2015	346.36	370.98	-24.62	1
7	39734_6862104	Confined	13,325	6/25/2015	349.92	371.07	-21.15	1
7	39734_6862104	Confined	13,330	6/30/2015	359.22	371.16	-11.94	1
7	39734_6862104	Confined	13,335	7/5/2015	363.43	371.26	-7.83	1
7	39734_6862104	Confined	13,340	7/10/2015	364.39	371.35	-6.96	1
7	39734_6862104	Confined	13,345	7/15/2015	348.72	371.44	-22.72	1
7	39734_6862104	Confined	13,350	7/20/2015	348.62	371.53	-22.91	1
7	39734_6862104	Confined	13,355	7/25/2015	346.62	371.62	-25.00	1
7	39734_6862104	Confined	13,360	7/30/2015	343.05	371.71	-28.66	1
7	39734_6862104	Confined	13,366	8/5/2015	351.21	371.82	-20.61	1
7	39734_6862104	Confined	13,371	8/10/2015	348.02	371.91	-23.89	1
7	39734_6862104	Confined	13,376	8/15/2015	354.93	372.01	-17.08	1
7	39734_6862104	Confined	13,381	8/20/2015	356.36	372.10	-15.74	1
7	39734_6862104	Confined	13,386	8/25/2015	351.64	372.19	-20.55	1
7	39734_6862104	Confined	13,391	8/30/2015	356.63	372.28	-15.65	1
7	39734_6862104	Confined	13,397	9/5/2015	356.81	372.39	-15.58	1
7	39734_6862104	Confined	13,402	9/10/2015	355.99	372.48	-16.49	1
7	39734_6862104	Confined	13,407	9/15/2015	357.73	372.57	-14.84	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	13,412	9/20/2015	357.26	372.66	-15.40	1
7	39734_6862104	Confined	13,417	9/25/2015	350.46	372.75	-22.29	1
7	39734_6862104	Confined	13,422	9/30/2015	343.78	372.85	-29.07	1
7	39734_6862104	Confined	13,427	10/5/2015	354.63	372.94	-18.31	1
7	39734_6862104	Confined	13,432	10/10/2015	355.88	373.03	-17.15	1
7	39734_6862104	Confined	13,437	10/15/2015	350.31	373.12	-22.81	1
7	39734_6862104	Confined	13,442	10/20/2015	359.40	373.21	-13.81	1
7	39734_6862104	Confined	13,443	10/21/2015	360.14	373.23	-13.09	1
7	39734_6862104	Confined	13,447	10/25/2015	362.41	373.30	-10.89	1
7	39734_6862104	Confined	13,452	10/30/2015	364.88	373.39	-8.51	1
7	39734_6862104	Confined	13,458	11/5/2015	365.59	373.50	-7.91	1
7	39734_6862104	Confined	13,463	11/10/2015	366.58	373.60	-7.02	1
7	39734_6862104	Confined	13,468	11/15/2015	368.05	373.69	-5.64	1
7	39734_6862104	Confined	13,473	11/20/2015	369.77	373.78	-4.01	1
7	39734_6862104	Confined	13,478	11/25/2015	370.71	373.87	-3.16	1
7	39734_6862104	Confined	13,483	11/30/2015	371.63	373.96	-2.33	1
7	39734_6862104	Confined	13,488	12/5/2015	372.49	374.05	-1.56	1
7	39734_6862104	Confined	13,493	12/10/2015	373.64	374.14	-0.50	1
7	39734_6862104	Confined	13,498	12/15/2015	373.02	374.24	-1.22	1
7	39734_6862104	Confined	13,503	12/20/2015	373.88	374.33	-0.45	1
7	39734_6862104	Confined	13,508	12/25/2015	374.59	374.42	0.17	1
7	39734_6862104	Confined	13,513	12/30/2015	375.13	374.51	0.62	1
7	39734_6862104	Confined	13,519	1/5/2016	375.90	374.57	1.33	1
7	39734_6862104	Confined	13,524	1/10/2016	376.47	374.61	1.86	1
7	39734_6862104	Confined	13,529	1/15/2016	377.49	374.66	2.83	1
7	39734_6862104	Confined	13,534	1/20/2016	378.01	374.70	3.31	1
7	39734_6862104	Confined	13,539	1/25/2016	378.57	374.74	3.83	1
7	39734_6862104	Confined	13,544	1/30/2016	379.26	374.79	4.47	1
7	39734_6862104	Confined	13,550	2/5/2016	379.41	374.84	4.57	1
7	39734_6862104	Confined	13,555	2/10/2016	379.69	374.88	4.81	1
7	39734_6862104	Confined	13,560	2/15/2016	379.50	374.93	4.57	1
7	39734_6862104	Confined	13,565	2/20/2016	378.99	374.97	4.02	1
7	39734_6862104	Confined	13,570	2/25/2016	379.62	375.01	4.61	1
7	39734_6862104	Confined	13,579	3/5/2016	380.55	375.09	5.46	1
7	39734_6862104	Confined	13,584	3/10/2016	381.18	375.13	6.05	1
7	39734_6862104	Confined	13,589	3/15/2016	381.77	375.18	6.59	1
7	39734_6862104	Confined	13,594	3/20/2016	381.40	375.22	6.18	1
7	39734_6862104	Confined	13,599	3/25/2016	381.84	375.26	6.58	1
7	39734_6862104	Confined	13,604	3/30/2016	382.09	375.31	6.78	1
7	39734_6862104	Confined	13,610	4/5/2016	381.61	375.36	6.25	1
7	39734_6862104	Confined	13,615	4/10/2016	381.41	375.40	6.01	1
7	39734_6862104	Confined	13,620	4/15/2016	380.81	375.45	5.36	1
7	39734_6862104	Confined	13,625	4/20/2016	381.60	375.49	6.11	1
7	39734_6862104	Confined	13,630	4/25/2016	382.05	375.53	6.52	1
7	39734_6862104	Confined	13,635	4/30/2016	382.52	375.58	6.94	1
7	39734_6862104	Confined	13,640	5/5/2016	382.43	375.62	6.81	1
7	39734_6862104	Confined	13,645	5/10/2016	381.43	375.66	5.77	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	13,650	5/15/2016	370.49	375.71	-5.22	1
7	39734_6862104	Confined	13,655	5/20/2016	367.53	375.75	-8.22	1
7	39734_6862104	Confined	13,660	5/25/2016	375.27	375.79	-0.52	1
7	39734_6862104	Confined	13,665	5/30/2016	375.27	375.84	-0.57	1
7	39734_6862104	Confined	13,691	6/25/2016	380.41	376.06	4.35	1
7	39734_6862104	Confined	13,696	6/30/2016	381.68	376.10	5.58	1
7	39734_6862104	Confined	13,701	7/5/2016	376.21	376.15	0.06	1
7	39734_6862104	Confined	13,706	7/10/2016	381.52	376.19	5.33	1
7	39734_6862104	Confined	13,711	7/15/2016	379.78	376.23	3.55	1
7	39734_6862104	Confined	13,716	7/20/2016	374.23	376.28	-2.05	1
7	39734_6862104	Confined	13,721	7/25/2016	379.18	376.32	2.86	1
7	39734_6862104	Confined	13,726	7/30/2016	379.56	376.36	3.20	1
7	39734_6862104	Confined	13,732	8/5/2016	374.55	376.42	-1.87	1
7	39734_6862104	Confined	13,737	8/10/2016	376.40	376.46	-0.06	1
7	39734_6862104	Confined	13,742	8/15/2016	379.21	376.50	2.71	1
7	39734_6862104	Confined	13,747	8/20/2016	381.10	376.55	4.55	1
7	39734_6862104	Confined	13,752	8/25/2016	380.80	376.59	4.21	1
7	39734_6862104	Confined	13,763	9/5/2016	383.42	376.68	6.74	1
7	39734_6862104	Confined	13,768	9/10/2016	384.05	376.73	7.32	1
7	39734_6862104	Confined	13,773	9/15/2016	375.89	376.77	-0.88	1
7	39734_6862104	Confined	13,778	9/20/2016	365.82	376.81	-10.99	1
7	39734_6862104	Confined	13,783	9/25/2016	367.13	376.86	-9.73	1
7	39734_6862104	Confined	13,788	9/30/2016	371.20	376.90	-5.70	1
7	39734_6862104	Confined	13,793	10/5/2016	376.60	376.94	-0.34	1
7	39734_6862104	Confined	13,798	10/10/2016	380.03	376.99	3.04	1
7	39734_6862104	Confined	13,798	10/10/2016	378.67	376.99	1.68	1
7	39734_6862104	Confined	13,803	10/15/2016	381.09	377.03	4.06	1
7	39734_6862104	Confined	13,808	10/20/2016	380.62	377.07	3.55	1
7	39734_6862104	Confined	13,813	10/25/2016	380.89	377.12	3.77	1
7	39734_6862104	Confined	13,818	10/30/2016	379.82	377.16	2.66	1
7	39734_6862104	Confined	13,824	11/5/2016	369.30	377.21	-7.91	1
7	39734_6862104	Confined	13,829	11/10/2016	366.62	377.26	-10.64	1
7	39734_6862104	Confined	13,834	11/15/2016	360.01	377.30	-17.29	1
7	39734_6862104	Confined	13,839	11/20/2016	356.77	377.34	-20.57	1
7	39734_6862104	Confined	13,844	11/25/2016	355.05	377.38	-22.33	1
7	39734_6862104	Confined	13,849	11/30/2016	354.18	377.43	-23.25	1
7	39734_6862104	Confined	13,854	12/5/2016	354.85	377.47	-22.62	1
7	39734_6862104	Confined	13,859	12/10/2016	353.53	377.51	-23.98	1
7	39734_6862104	Confined	13,864	12/15/2016	354.80	377.56	-22.76	1
7	39734_6862104	Confined	13,869	12/20/2016	355.66	377.60	-21.94	1
7	39734_6862104	Confined	13,874	12/25/2016	356.42	377.64	-21.22	1
7	39734_6862104	Confined	13,879	12/30/2016	355.97	377.69	-21.72	1
7	39734_6862104	Confined	13,885	1/5/2017	356.87	377.68	-20.81	1
7	39734_6862104	Confined	13,890	1/10/2017	357.60	377.67	-20.07	1
7	39734_6862104	Confined	13,895	1/15/2017	358.22	377.65	-19.43	1
7	39734_6862104	Confined	13,900	1/20/2017	358.09	377.64	-19.55	1
7	39734_6862104	Confined	13,905	1/25/2017	358.86	377.63	-18.77	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	13,910	1/30/2017	357.84	377.61	-19.77	1
7	39734_6862104	Confined	13,916	2/5/2017	357.46	377.59	-20.13	1
7	39734_6862104	Confined	13,921	2/10/2017	357.23	377.58	-20.35	1
7	39734_6862104	Confined	13,926	2/15/2017	358.11	377.57	-19.46	1
7	39734_6862104	Confined	13,931	2/20/2017	360.51	377.55	-17.04	1
7	39734_6862104	Confined	13,936	2/25/2017	361.25	377.54	-16.29	1
7	39734_6862104	Confined	13,944	3/5/2017	362.28	377.51	-15.23	1
7	39734_6862104	Confined	13,964	3/25/2017	369.12	377.46	-8.34	1
7	39734_6862104	Confined	13,969	3/30/2017	374.68	377.44	-2.76	1
7	39734_6862104	Confined	13,975	4/5/2017	378.14	377.43	0.71	1
7	39734_6862104	Confined	13,980	4/10/2017	378.44	377.41	1.03	1
7	39734_6862104	Confined	13,985	4/15/2017	379.25	377.40	1.85	1
7	39734_6862104	Confined	13,990	4/20/2017	379.40	377.38	2.02	1
7	39734_6862104	Confined	13,995	4/25/2017	382.54	377.37	5.17	1
7	39734_6862104	Confined	14,000	4/30/2017	381.87	377.35	4.52	1
7	39734_6862104	Confined	14,005	5/5/2017	381.88	377.34	4.54	1
7	39734_6862104	Confined	14,010	5/10/2017	381.60	377.33	4.27	1
7	39734_6862104	Confined	14,015	5/15/2017	380.75	377.31	3.44	1
7	39734_6862104	Confined	14,020	5/20/2017	380.61	377.30	3.31	1
7	39734_6862104	Confined	14,025	5/25/2017	382.35	377.28	5.07	1
7	39734_6862104	Confined	14,030	5/30/2017	383.06	377.27	5.79	1
7	39734_6862104	Confined	14,036	6/5/2017	384.53	377.25	7.28	1
7	39734_6862104	Confined	14,041	6/10/2017	384.77	377.24	7.53	1
7	39734_6862104	Confined	14,046	6/15/2017	383.42	377.22	6.20	1
7	39734_6862104	Confined	14,051	6/20/2017	382.20	377.21	4.99	1
7	39734_6862104	Confined	14,056	6/25/2017	382.74	377.19	5.55	1
7	39734_6862104	Confined	14,061	6/30/2017	383.90	377.18	6.72	1
7	39734_6862104	Confined	14,066	7/5/2017	377.96	377.17	0.79	1
7	39734_6862104	Confined	14,071	7/10/2017	383.37	377.15	6.22	1
7	39734_6862104	Confined	14,076	7/15/2017	382.77	377.14	5.63	1
7	39734_6862104	Confined	14,081	7/20/2017	377.01	377.12	-0.11	1
7	39734_6862104	Confined	14,086	7/25/2017	382.56	377.11	5.45	1
7	39734_6862104	Confined	14,091	7/30/2017	384.07	377.09	6.98	1
7	39734_6862104	Confined	14,097	8/5/2017	376.47	377.08	-0.61	1
7	39734_6862104	Confined	14,102	8/10/2017	384.33	377.06	7.27	1
7	39734_6862104	Confined	14,107	8/15/2017	385.33	377.05	8.28	1
7	39734_6862104	Confined	14,112	8/20/2017	384.32	377.03	7.29	1
7	39734_6862104	Confined	14,158	10/5/2017	391.06	376.90	14.16	1
7	39734_6862104	Confined	14,163	10/10/2017	391.28	376.89	14.39	1
7	39734_6862104	Confined	14,168	10/15/2017	391.82	376.87	14.95	1
7	39734_6862104	Confined	14,199	11/15/2017	390.54	376.79	13.75	1
7	39734_6862104	Confined	14,204	11/20/2017	390.39	376.77	13.62	1
7	39734_6862104	Confined	14,209	11/25/2017	390.41	376.76	13.65	1
7	39734_6862104	Confined	14,214	11/30/2017	390.37	376.74	13.63	1
7	39734_6862104	Confined	14,219	12/5/2017	390.53	376.73	13.80	1
7	39734_6862104	Confined	14,224	12/10/2017	390.88	376.71	14.17	1
7	39734_6862104	Confined	14,229	12/15/2017	391.58	376.70	14.88	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39734_6862104	Confined	14,234	12/20/2017	392.55	376.69	15.86	1
7	39738_6862108	Confined	5,146	2/1/1993	373.18	378.21	-5.03	1
7	39738_6862108	Confined	6,969	1/29/1998	359.63	375.49	-15.86	1
7	39738_6862108	Confined	7,326	1/21/1999	355.08	375.26	-20.18	1
7	39738_6862108	Confined	7,705	2/4/2000	355.58	372.58	-17.00	1
7	39738_6862108	Confined	8,074	2/7/2001	357.88	369.42	-11.54	1
7	39738_6862108	Confined	8,424	1/23/2002	352.38	370.25	-17.87	1
7	39738_6862108	Confined	8,793	1/27/2003	350.38	370.05	-19.67	1
7	39738_6862108	Confined	9,157	1/26/2004	350.88	370.63	-19.75	1
7	39738_6862108	Confined	9,557	3/1/2005	362.58	373.17	-10.59	1
7	39738_6862108	Confined	9,879	1/17/2006	358.78	371.63	-12.85	1
7	39738_6862108	Confined	10,238	1/11/2007	355.58	372.59	-17.01	1
7	39738_6862108	Confined	10,596	1/4/2008	373.78	379.73	-5.95	1
7	39738_6862108	Confined	11,021	3/4/2009	365.28	374.28	-9.00	1
7	39738_6862108	Confined	11,442	4/29/2010	378.08	365.88	12.20	1
7	39739_6862202	Confined	779	2/17/1981	406.82	363.03	43.79	1
7	39739_6862202	Confined	1,144	2/17/1982	371.93	366.46	5.47	1
7	39739_6862202	Confined	1,506	2/14/1983	372.16	367.11	5.05	1
7	39739_6862202	Confined	1,864	2/7/1984	371.27	368.00	3.27	1
7	39739_6862202	Confined	2,895	12/4/1986	371.92	370.29	1.63	1
7	39742_6862205	Confined	1,506	2/14/1983	379.97	371.25	8.72	1
7	39742_6862205	Confined	2,228	2/5/1985	377.83	372.07	5.76	1
7	39742_6862205	Confined	2,601	2/13/1986	392.47	374.21	18.26	1
7	39742_6862205	Confined	2,895	12/4/1986	378.12	374.34	3.78	1
7	39742_6862205	Confined	3,335	2/17/1988	380.04	375.17	4.87	1
7	39742_6862205	Confined	3,698	2/14/1989	359.47	372.46	-12.99	1
7	39742_6862205	Confined	3,998	12/11/1989	366.78	370.13	-3.35	1
7	39742_6862205	Confined	4,364	12/12/1990	372.02	369.38	2.64	1
7	39752_6862902	Confined	779	2/17/1981	360.46	340.65	19.81	1
7	39752_6862902	Confined	1,506	2/14/1983	357.42	343.79	13.63	1
7	39752_6862902	Confined	1,863	2/6/1984	360.90	344.39	16.51	1
7	39752_6862902	Confined	2,895	12/4/1986	352.04	345.35	6.69	1
7	39752_6862902	Confined	3,698	2/14/1989	332.90	344.01	-11.11	1
7	39752_6862902	Confined	3,998	12/11/1989	336.81	341.58	-4.77	1
7	39752_6862902	Confined	5,120	1/6/1993	350.44	341.19	9.25	1
7	39752_6862902	Confined	5,854	1/10/1995	379.34	341.67	37.67	1
7	39752_6862902	Confined	6,221	1/12/1996	373.24	341.46	31.78	1
7	39752_6862902	Confined	6,655	3/21/1997	339.34	338.83	0.51	1
7	39752_6862902	Confined	6,969	1/29/1998	341.14	340.15	0.99	1
7	39752_6862902	Confined	7,324	1/19/1999	340.34	339.29	1.05	1
7	39752_6862902	Confined	8,074	2/7/2001	338.14	334.90	3.24	1
7	39752_6862902	Confined	8,424	1/23/2002	335.44	336.27	-0.83	1
7	39752_6862902	Confined	8,790	1/24/2003	338.54	334.58	3.96	1
7	39752_6862902	Confined	9,152	1/21/2004	340.14	335.73	4.41	1
7	39752_6862902	Confined	9,546	2/18/2005	347.94	337.67	10.27	1
7	39752_6862902	Confined	9,887	1/25/2006	341.94	337.48	4.46	1
7	39752_6862902	Confined	10,293	3/7/2007	335.94	339.79	-3.85	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	39752_6862902	Confined	10,645	2/22/2008	340.14	342.86	-2.72	1
7	39752_6862902	Confined	11,040	3/23/2009	337.34	338.90	-1.56	1
7	39752_6862902	Confined	11,441	4/28/2010	341.04	331.62	9.42	1
7	39754_6862906	Confined	4,666	10/10/1991	343.37	341.50	1.87	1
7	39754_6862906	Confined	5,483	1/4/1994	352.37	342.74	9.63	1
7	39754_6862906	Confined	5,854	1/10/1995	356.27	342.17	14.10	1
7	39754_6862906	Confined	6,221	1/12/1996	350.17	342.00	8.17	1
7	39754_6862906	Confined	6,675	4/10/1997	346.97	339.32	7.65	1
7	39754_6862906	Confined	6,969	1/29/1998	349.47	340.49	8.98	1
7	39754_6862906	Confined	7,324	1/19/1999	348.62	339.69	8.93	1
7	39754_6862906	Confined	7,694	1/24/2000	347.37	338.40	8.97	1
7	39754_6862906	Confined	8,074	2/7/2001	344.37	335.21	9.16	1
7	39754_6862906	Confined	8,429	1/28/2002	341.62	336.56	5.06	1
7	39754_6862906	Confined	8,790	1/24/2003	345.87	334.86	11.01	1
7	39754_6862906	Confined	9,152	1/21/2004	347.47	336.04	11.43	1
7	39754_6862906	Confined	9,546	2/18/2005	355.67	338.05	17.62	1
7	39754_6862906	Confined	9,887	1/25/2006	343.87	337.91	5.96	1
7	39754_6862906	Confined	10,293	3/7/2007	340.37	340.27	0.10	1
7	39754_6862906	Confined	10,645	2/22/2008	342.77	343.38	-0.61	1
7	39754_6862906	Confined	11,040	3/23/2009	340.68	339.39	1.29	1
7	39754_6862906	Confined	11,441	4/28/2010	340.47	331.91	8.56	1
7	39756_6863208	Confined	2,022	7/14/1984	391.09	360.61	30.48	1
7	39776_7808306	Confined	7,932	9/18/2000	434.94	304.27	130.67	1
7	39820_7808301	Confined	7,932	9/18/2000	360.51	307.71	52.80	1
7	39821_7808302	Confined	7,932	9/18/2000	369.04	307.76	61.28	1
7	39950_0	Confined	8,992	8/14/2003	338.14	338.18	-0.04	1
7	39951_0	Confined	9,025	9/16/2003	333.22	340.94	-7.72	1
7	39952_0	Confined	12,146	4/2/2012	323.13	334.69	-11.56	1
7	39953_0	Confined	11,794	4/16/2011	330.34	335.31	-4.97	1
7	39954_0	Confined	12,224	6/19/2012	330.90	331.57	-0.67	1
7	39975_6863804	Confined	8,649	9/5/2002	360.46	327.92	32.54	1
7	39995_6864902	Confined	731	12/31/1980	332.88	345.06	-12.18	1
7	42152_6848507	Unconfined	779	2/17/1981	417.25	413.42	3.83	1
7	42152_6848507	Unconfined	1,195	4/9/1982	416.66	413.72	2.94	1
7	42152_6848507	Unconfined	1,508	2/16/1983	415.76	413.26	2.50	1
7	42152_6848507	Unconfined	1,864	2/7/1984	414.78	413.12	1.66	1
7	42152_6848507	Unconfined	2,229	2/6/1985	413.80	412.87	0.93	1
7	42152_6848507	Unconfined	2,605	2/17/1986	413.56	413.60	-0.04	1
7	42152_6848507	Unconfined	2,894	12/3/1986	412.99	413.65	-0.66	1
7	42152_6848507	Unconfined	3,334	2/16/1988	413.93	413.55	0.38	1
7	42152_6848507	Unconfined	3,699	2/15/1989	411.23	412.49	-1.26	1
7	42152_6848507	Unconfined	4,000	12/13/1989	412.78	412.45	0.33	1
7	42152_6848507	Unconfined	4,364	12/12/1990	411.27	412.82	-1.55	1
7	42152_6848507	Unconfined	5,119	1/5/1993	415.21	413.64	1.57	1
7	42152_6848507	Unconfined	5,358	9/1/1993	415.91	413.25	2.66	1
7	42152_6848507	Unconfined	5,388	10/1/1993	416.16	413.20	2.96	1
7	42152_6848507	Unconfined	5,419	11/1/1993	415.86	413.15	2.71	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	42152_6848507	Unconfined	5,450	12/2/1993	416.06	413.10	2.96	1
7	42152_6848507	Unconfined	5,482	1/3/1994	415.81	413.05	2.76	1
7	42152_6848507	Unconfined	5,512	2/2/1994	415.51	413.07	2.44	1
7	42152_6848507	Unconfined	5,539	3/1/1994	415.91	413.08	2.83	1
7	42152_6848507	Unconfined	5,573	4/4/1994	415.56	413.10	2.46	1
7	42152_6848507	Unconfined	5,601	5/2/1994	415.11	413.12	1.99	1
7	42152_6848507	Unconfined	5,643	6/13/1994	414.81	413.14	1.67	1
7	42152_6848507	Unconfined	5,661	7/1/1994	414.41	413.15	1.26	1
7	42155_6848812	Confined	779	2/17/1981	415.14	405.60	9.54	1
7	42155_6848812	Confined	1,195	4/9/1982	415.12	406.02	9.10	1
7	42155_6848812	Confined	1,508	2/16/1983	414.36	405.49	8.87	1
7	42155_6848812	Confined	1,864	2/7/1984	414.08	405.27	8.81	1
7	42155_6848812	Confined	2,229	2/6/1985	412.77	404.89	7.88	1
7	42155_6848812	Confined	2,894	12/3/1986	412.57	405.93	6.64	1
7	42155_6848812	Confined	3,334	2/16/1988	413.49	405.82	7.67	1
7	42155_6848812	Confined	3,699	2/15/1989	411.83	404.42	7.41	1
7	42155_6848812	Confined	4,364	12/12/1990	411.69	404.47	7.22	1
7	42155_6848812	Confined	5,120	1/6/1993	413.26	405.53	7.73	1
7	42155_6848812	Confined	5,484	1/5/1994	413.71	405.05	8.66	1
7	42155_6848812	Confined	5,853	1/9/1995	413.11	405.20	7.91	1
7	42155_6848812	Confined	6,219	1/10/1996	405.76	404.71	1.05	1
7	42155_6848812	Confined	6,641	3/7/1997	411.06	403.70	7.36	1
7	42155_6848812	Confined	6,975	2/4/1998	409.56	404.66	4.90	1
7	42155_6848812	Confined	7,324	1/19/1999	410.46	404.79	5.67	1
7	42155_6848812	Confined	7,927	9/13/2000	408.74	403.51	5.23	1
7	42155_6848812	Confined	8,081	2/14/2001	410.21	403.45	6.76	1
7	42155_6848812	Confined	8,430	1/29/2002	408.41	403.68	4.73	1
7	42155_6848812	Confined	8,801	2/4/2003	411.21	404.52	6.69	1
7	42155_6848812	Confined	9,159	1/28/2004	408.91	404.37	4.54	1
7	42155_6848812	Confined	9,564	3/8/2005	411.11	405.14	5.97	1
7	42155_6848812	Confined	9,895	2/2/2006	407.71	404.03	3.68	1
7	42155_6848812	Confined	10,237	1/10/2007	406.41	403.91	2.50	1
7	42155_6848812	Confined	10,644	2/21/2008	407.31	406.14	1.17	1
7	42155_6848812	Confined	11,012	2/23/2009	406.91	404.22	2.69	1
7	42155_6848812	Confined	11,420	4/7/2010	406.91	402.97	3.94	1
7	42665_6860913	Confined	773	2/11/1981	385.26	338.45	46.81	1
7	42665_6860913	Confined	1,153	2/26/1982	385.91	345.42	40.49	1
7	42665_6860913	Confined	1,502	2/10/1983	384.99	348.45	36.54	1
7	42665_6860913	Confined	1,878	2/21/1984	382.53	352.36	30.17	1
7	42672_7802303	Confined	771	2/9/1981	443.89	389.71	54.18	1
7	42672_7802303	Confined	1,166	3/11/1982	402.05	400.10	1.95	1
7	42672_7802303	Confined	2,231	2/8/1985	383.81	412.49	-28.68	1
7	42672_7802303	Confined	4,407	1/24/1991	393.75	418.31	-24.56	1
7	42679_7803509	Confined	772	2/10/1981	381.58	266.21	115.37	1
7	42679_7803509	Confined	1,151	2/24/1982	382.19	285.90	96.29	1
7	42679_7803509	Confined	1,506	2/14/1983	378.19	297.24	80.95	1
7	42679_7803509	Confined	1,879	2/22/1984	369.70	312.07	57.63	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	42679_7803509	Confined	2,230	2/7/1985	367.91	321.62	46.29	1
7	42679_7803509	Confined	2,599	2/11/1986	379.60	332.55	47.05	1
7	42679_7803509	Confined	2,999	3/18/1987	378.35	334.85	43.50	1
7	42679_7803509	Confined	3,706	2/22/1989	359.50	342.21	17.29	1
7	42679_7803509	Confined	4,075	2/26/1990	328.00	330.91	-2.91	1
7	42679_7803509	Confined	4,407	1/24/1991	360.45	328.77	31.68	1
7	42692_7804812	Confined	772	2/10/1981	345.29	297.52	47.77	1
7	42692_7804812	Confined	1,153	2/26/1982	350.58	304.84	45.74	1
7	42692_7804812	Confined	1,500	2/8/1983	351.65	307.58	44.07	1
7	42692_7804812	Confined	1,874	2/17/1984	345.15	310.66	34.49	1
7	42692_7804812	Confined	2,230	2/7/1985	329.35	311.98	17.37	1
7	42692_7804812	Confined	2,998	3/17/1987	349.30	312.46	36.84	1
7	42692_7804812	Confined	3,706	2/22/1989	318.42	313.42	5.00	1
7	42692_7804812	Confined	4,089	3/12/1990	319.74	308.99	10.75	1
7	42692_7804812	Confined	4,412	1/29/1991	323.47	308.94	14.53	1
7	42711_7812502	Confined	10,153	10/18/2006	334.67	289.09	45.58	1
7	42748_6852713	Unconfined	773	2/11/1981	510.28	488.59	10.85	0.5
7	42748_6852713	Unconfined	1,879	2/22/1984	507.83	493.76	7.03	0.5
7	42748_6852713	Unconfined	2,235	2/12/1985	502.99	493.68	4.65	0.5
7	42748_6852713	Unconfined	2,600	2/12/1986	503.37	501.34	1.02	0.5
7	42748_6852713	Unconfined	2,999	3/18/1987	508.92	506.70	1.11	0.5
7	42748_6852713	Unconfined	3,705	2/21/1989	496.08	502.64	-3.28	0.5
7	42748_6852713	Unconfined	4,407	1/24/1991	498.63	501.64	-1.50	0.5
7	42748_6852713	Unconfined	5,118	1/4/1993	497.38	513.15	-7.89	0.5
7	42748_6852713	Unconfined	5,358	9/1/1993	489.18	510.82	-10.82	0.5
7	42748_6852713	Unconfined	5,388	10/1/1993	491.23	510.52	-9.65	0.5
7	42748_6852713	Unconfined	5,419	11/1/1993	491.58	510.22	-9.32	0.5
7	42748_6852713	Unconfined	5,450	12/2/1993	492.58	509.92	-8.67	0.5
7	42748_6852713	Unconfined	5,482	1/3/1994	494.88	509.65	-7.38	0.5
7	42748_6852713	Unconfined	5,512	2/2/1994	498.08	509.75	-5.84	0.5
7	42748_6852713	Unconfined	5,539	3/1/1994	498.28	509.84	-5.78	0.5
7	42748_6852713	Unconfined	5,573	4/4/1994	497.03	509.96	-6.46	0.5
7	42748_6852713	Unconfined	5,602	5/3/1994	499.28	510.06	-5.39	0.5
7	42748_6852713	Unconfined	5,643	6/13/1994	501.58	510.20	-4.31	0.5
7	42748_6852713	Unconfined	5,661	7/1/1994	501.78	510.26	-4.24	0.5
7	42748_6852713	Unconfined	5,847	1/3/1995	507.48	510.84	-1.68	0.5
7	42748_6852713	Unconfined	6,211	1/2/1996	504.68	506.59	-0.96	0.5
7	42748_6852713	Unconfined	6,637	3/3/1997	507.68	499.05	4.31	0.5
7	42748_6852713	Unconfined	6,973	2/2/1998	504.63	503.26	0.68	0.5
7	42748_6852713	Unconfined	7,312	1/7/1999	507.33	505.94	0.69	0.5
7	42748_6852713	Unconfined	8,044	1/8/2001	505.28	495.72	4.78	0.5
7	42748_6852713	Unconfined	8,415	1/14/2002	505.68	493.73	5.97	0.5
7	42748_6852713	Unconfined	8,773	1/7/2003	507.98	500.71	3.64	0.5
7	42748_6852713	Unconfined	9,164	2/2/2004	508.58	500.61	3.99	0.5
7	42748_6852713	Unconfined	9,521	1/24/2005	509.28	506.72	1.28	0.5
7	42748_6852713	Unconfined	9,865	1/3/2006	506.68	499.50	3.59	0.5
7	42748_6852713	Unconfined	10,229	1/2/2007	508.08	493.97	7.05	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	42748_6852713	Unconfined	10,594	1/2/2008	508.68	509.38	-0.35	0.5
7	42748_6852713	Unconfined	10,988	1/30/2009	510.08	500.77	4.66	0.5
7	42748_6852713	Unconfined	11,323	12/31/2009	511.78	495.08	8.35	0.5
7	42748_6852713	Unconfined	12,059	1/6/2012	509.98	467.13	21.42	0.5
7	42748_6852713	Unconfined	12,090	2/6/2012	510.28	467.50	21.39	0.5
7	42748_6852713	Unconfined	12,114	3/1/2012	509.78	467.79	20.99	0.5
7	42748_6852713	Unconfined	12,149	4/5/2012	509.88	468.21	20.83	0.5
7	42748_6852713	Unconfined	12,176	5/2/2012	508.48	468.53	19.97	0.5
7	42748_6852713	Unconfined	12,206	6/1/2012	508.78	468.89	19.94	0.5
7	42748_6852713	Unconfined	12,241	7/6/2012	508.78	469.31	19.73	0.5
7	42748_6852713	Unconfined	12,269	8/3/2012	508.98	469.65	19.67	0.5
7	42748_6852713	Unconfined	12,308	9/11/2012	508.78	470.11	19.33	0.5
7	42748_6852713	Unconfined	12,347	10/20/2012	509.58	470.58	19.50	0.5
7	42748_6852713	Unconfined	12,386	11/28/2012	508.58	471.05	18.77	0.5
7	42748_6852713	Unconfined	12,394	12/6/2012	508.68	471.14	18.77	0.5
7	42748_6852713	Unconfined	12,425	1/6/2013	508.58	471.54	18.52	0.5
7	42748_6852713	Unconfined	12,456	2/6/2013	510.18	472.03	19.07	0.5
7	42748_6852713	Unconfined	12,479	3/1/2013	509.48	472.40	18.54	0.5
7	42748_6852713	Unconfined	12,514	4/5/2013	509.98	472.96	18.51	0.5
7	42748_6852713	Unconfined	12,541	5/2/2013	510.18	473.39	18.40	0.5
7	42748_6852713	Unconfined	12,571	6/1/2013	509.58	473.87	17.86	0.5
7	42748_6852713	Unconfined	12,606	7/6/2013	509.98	474.42	17.78	0.5
7	42748_6852713	Unconfined	12,634	8/3/2013	509.98	474.87	17.55	0.5
7	42748_6852713	Unconfined	12,673	9/11/2013	509.58	475.49	17.04	0.5
7	42748_6852713	Unconfined	12,693	10/1/2013	510.18	475.81	17.18	0.5
7	42748_6852713	Unconfined	12,744	11/21/2013	511.18	476.62	17.28	0.5
7	42748_6852713	Unconfined	12,754	12/1/2013	509.98	476.78	16.60	0.5
7	42748_6852713	Unconfined	12,785	1/1/2014	509.98	477.27	16.35	0.5
7	42748_6852713	Unconfined	12,816	2/1/2014	514.98	477.61	18.68	0.5
7	42748_6852713	Unconfined	12,844	3/1/2014	515.48	477.92	18.78	0.5
7	42748_6852713	Unconfined	12,875	4/1/2014	509.98	478.26	15.86	0.5
7	42748_6852713	Unconfined	12,905	5/1/2014	509.98	478.60	15.69	0.5
7	42748_6852713	Unconfined	12,936	6/1/2014	511.98	478.94	16.52	0.5
7	42748_6852713	Unconfined	12,966	7/1/2014	515.98	479.27	18.36	0.5
7	42748_6852713	Unconfined	12,997	8/1/2014	509.18	479.61	14.78	0.5
7	42748_6852713	Unconfined	13,028	9/1/2014	508.88	479.95	14.46	0.5
7	42748_6852713	Unconfined	13,058	10/1/2014	509.48	480.28	14.60	0.5
7	42748_6852713	Unconfined	13,089	11/1/2014	509.48	480.63	14.43	0.5
7	42748_6852713	Unconfined	13,119	12/1/2014	509.98	480.96	14.51	0.5
7	42748_6852713	Unconfined	13,150	1/1/2015	512.98	481.33	15.82	0.5
7	42748_6852713	Unconfined	13,209	3/1/2015	509.38	483.95	12.71	0.5
7	42748_6852713	Unconfined	13,270	5/1/2015	509.98	486.66	11.66	0.5
7	42748_6852713	Unconfined	13,301	6/1/2015	510.18	488.04	11.07	0.5
7	42748_6852713	Unconfined	13,331	7/1/2015	510.18	489.37	10.41	0.5
7	42748_6852713	Unconfined	13,362	8/1/2015	509.68	490.75	9.47	0.5
7	42748_6852713	Unconfined	13,393	9/1/2015	509.18	492.12	8.53	0.5
7	42748_6852713	Unconfined	13,423	10/1/2015	508.98	493.45	7.76	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	42748_6852713	Unconfined	13,454	11/1/2015	509.38	494.83	7.27	0.5
7	42748_6852713	Unconfined	13,484	12/1/2015	509.48	496.16	6.66	0.5
7	42748_6852713	Unconfined	13,515	1/1/2016	509.58	497.53	6.03	0.5
7	42748_6852713	Unconfined	13,546	2/1/2016	509.78	498.58	5.60	0.5
7	42748_6852713	Unconfined	13,575	3/1/2016	509.58	499.56	5.01	0.5
7	42748_6852713	Unconfined	13,606	4/1/2016	509.68	500.61	4.53	0.5
7	42748_6852713	Unconfined	13,636	5/1/2016	509.38	501.63	3.88	0.5
7	42748_6852713	Unconfined	13,667	6/1/2016	509.38	502.68	3.35	0.5
7	42748_6852713	Unconfined	13,697	7/1/2016	509.28	503.70	2.79	0.5
7	42748_6852713	Unconfined	13,728	8/1/2016	508.98	504.75	2.12	0.5
7	42748_6852713	Unconfined	13,759	9/1/2016	509.18	505.80	1.69	0.5
7	42748_6852713	Unconfined	13,789	10/1/2016	508.98	506.81	1.08	0.5
7	42748_6852713	Unconfined	13,820	11/1/2016	509.38	507.86	0.76	0.5
7	42748_6852713	Unconfined	13,850	12/1/2016	508.48	508.88	-0.20	0.5
7	42748_6852713	Unconfined	13,881	1/1/2017	508.18	509.91	-0.86	0.5
7	42748_6852713	Unconfined	13,912	2/1/2017	507.98	510.28	-1.15	0.5
7	42748_6852713	Unconfined	13,940	3/1/2017	508.38	510.61	-1.11	0.5
7	42748_6852713	Unconfined	13,971	4/1/2017	507.98	510.97	-1.50	0.5
7	42748_6852713	Unconfined	14,001	5/1/2017	506.68	511.33	-2.32	0.5
7	42748_6852713	Unconfined	14,032	6/1/2017	506.98	511.70	-2.36	0.5
7	42952_6742308	Confined	11,203	9/2/2009	374.60	356.24	9.18	0.5
7	42952_6742308	Confined	11,327	1/4/2010	376.54	355.64	10.45	0.5
7	42952_6742308	Confined	11,476	6/2/2010	377.48	354.58	11.45	0.5
7	42952_6742308	Confined	11,587	9/21/2010	376.79	353.80	11.50	0.5
7	42952_6742308	Confined	11,693	1/5/2011	376.92	353.05	11.93	0.5
7	42952_6742308	Confined	11,840	6/1/2011	375.96	352.27	11.85	0.5
7	42952_6742308	Confined	11,937	9/6/2011	374.02	351.75	11.14	0.5
7	42952_6742308	Confined	12,786	1/2/2014	374.26	340.11	17.07	0.5
7	42952_6742308	Confined	12,938	6/3/2014	374.20	336.79	18.71	0.5
7	42952_6742308	Confined	13,029	9/2/2014	372.23	334.80	18.72	0.5
7	42952_6742308	Confined	13,148	12/30/2014	373.25	332.20	20.53	0.5
7	42952_6742308	Confined	13,311	6/11/2015	373.58	327.51	23.03	0.5
7	42952_6742308	Confined	13,519	1/5/2016	373.28	321.71	25.79	0.5
7	42952_6742308	Confined	13,668	6/2/2016	373.05	322.77	25.14	0.5
7	42952_6742308	Confined	13,884	1/4/2017	372.66	324.25	24.20	0.5
7	42952_6742308	Confined	14,036	6/5/2017	373.84	323.18	25.33	0.5
7	42953_0	Confined	9,045	10/6/2003	350.34	358.75	-8.41	1
7	43043_7822304	Confined	12,630	7/30/2013	212.61	259.80	-47.19	1
7	43060_6734705	Confined	2,291	4/9/1985	425.08	411.04	14.04	1
7	43099_6856409	Confined	3,319	2/1/1988	380.26	398.20	-17.94	1
7	43262_7711718	Confined	771	2/9/1981	323.06	318.29	4.77	1
7	43262_7711718	Confined	1,875	2/18/1984	320.74	325.93	-5.19	1
7	43262_7711718	Confined	2,228	2/5/1985	302.50	318.05	-15.55	1
7	43262_7711718	Confined	2,595	2/7/1986	335.64	315.64	20.00	1
7	43262_7711718	Confined	2,965	2/12/1987	354.10	351.57	2.53	1
7	43262_7711718	Confined	3,355	3/8/1988	344.84	372.11	-27.27	1
7	43262_7711718	Confined	3,697	2/13/1989	341.94	359.65	-17.71	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	43262_7711718	Confined	4,064	2/15/1990	321.34	346.68	-25.34	1
7	43262_7711718	Confined	4,799	2/20/1992	358.04	312.81	45.23	1
7	43262_7711718	Confined	5,157	2/12/1993	368.24	308.01	60.23	1
7	43262_7711718	Confined	5,793	11/10/1994	329.14	303.76	25.38	1
7	43262_7711718	Confined	6,996	2/25/1998	329.92	297.61	32.31	1
7	43262_7711718	Confined	7,344	2/8/1999	325.74	302.86	22.88	1
7	43262_7711718	Confined	7,753	3/23/2000	316.79	303.09	13.70	1
7	43262_7711718	Confined	8,082	2/15/2001	310.94	291.28	19.66	1
7	43262_7711718	Confined	9,179	2/17/2004	315.64	283.90	31.74	1
7	43262_7711718	Confined	9,533	2/5/2005	340.44	291.71	48.73	1
7	43262_7711718	Confined	9,937	3/16/2006	297.60	298.11	-0.51	1
7	48075_6853811	Confined	8,543	5/22/2002	354.78	350.56	0.42	0.1
7	48076_6853908	Confined	8,522	5/1/2002	359.74	364.23	-0.45	0.1
7	48077_6853909	Confined	8,602	7/20/2002	361.59	369.93	-0.83	0.1
7	48080_6861313	Confined	8,517	4/26/2002	353.73	354.84	-1.11	1
7	48081_6853911	Confined	8,556	6/4/2002	354.24	364.52	-1.03	0.1
7	48082_6853912	Confined	8,649	9/5/2002	353.15	366.61	-1.35	0.1
7	48083_6853913	Confined	8,668	9/24/2002	360.72	371.84	-1.11	0.1
7	48089_6861318	Confined	8,614	8/1/2002	352.79	357.92	-5.13	1
7	48091_6853918	Confined	9,612	4/25/2005	387.56	369.40	1.82	0.1
7	48092_6853919	Confined	9,685	7/7/2005	397.01	371.45	2.56	0.1
7	48093_6853920	Confined	9,753	9/13/2005	356.58	373.11	-1.65	0.1
7	48094_6853812	Confined	9,662	6/14/2005	384.69	361.56	2.31	0.1
7	48096_6853922	Confined	9,631	5/14/2005	387.25	366.50	2.07	0.1
7	48097_6853923	Confined	9,696	7/18/2005	394.07	367.75	26.32	1
7	48098_6861222	Confined	9,667	6/19/2005	393.43	357.15	3.63	0.1
7	48099_6853924	Confined	9,672	6/24/2005	395.91	366.38	29.53	1
7	48101_6861323	Confined	9,726	8/17/2005	398.39	364.08	34.31	1
7	48102_6861324	Confined	9,706	7/28/2005	399.78	363.60	36.18	1
7	48103_6853910	Confined	9,619	5/2/2005	364.30	377.27	-1.30	0.1
7	48104_6853914	Confined	8,634	8/21/2002	350.88	363.33	-1.25	0.1
7	48105_6853915	Confined	10,488	9/18/2007	379.61	387.83	-0.82	0.1
7	48106_6853916	Confined	10,476	9/6/2007	377.49	388.55	-1.11	0.1
7	48107_6853917	Confined	10,450	8/11/2007	391.29	391.38	-0.01	0.1
7	48108_0	Confined	10,970	1/12/2009	379.48	387.24	-0.78	0.1
7	48109_0	Confined	11,019	3/2/2009	379.83	394.77	-1.49	0.1
7	48110_0	Confined	11,001	2/12/2009	382.80	394.99	-1.22	0.1
7	48111_0	Confined	11,047	3/30/2009	385.07	369.06	16.01	1
7	48112_0	Confined	10,452	8/13/2007	381.99	389.29	-0.73	0.1
7	48113_0	Confined	10,942	12/15/2008	387.70	392.92	-0.52	0.1
7	48193_0	Confined	9,367	8/23/2004	382.68	387.33	-0.46	0.1
7	48194_0	Confined	9,396	9/21/2004	371.39	379.60	-0.82	0.1
7	48204_0	Confined	11,657	11/30/2010	325.28	352.49	-27.21	1
7	48220_0	Confined	12,743	11/20/2013	358.23	372.14	-1.39	0.1
7	48224_6743607	Confined	9,023	9/14/2003	326.68	340.93	-14.25	1
7	48224_6743607	Confined	11,693	1/5/2011	324.05	337.99	-13.94	1
7	48224_6743607	Confined	11,840	6/1/2011	317.48	337.28	-19.80	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	48224_6743607	Confined	11,938	9/7/2011	309.85	336.80	-26.95	1
7	48224_6743607	Confined	12,064	1/11/2012	316.52	336.09	-19.57	1
7	48224_6743607	Confined	12,210	6/5/2012	316.72	333.98	-17.26	1
7	48224_6743607	Confined	12,302	9/5/2012	306.36	332.65	-26.29	1
7	48224_6743607	Confined	12,668	9/6/2013	299.63	324.46	-24.83	1
7	48224_6743607	Confined	12,786	1/2/2014	308.07	321.38	-13.31	1
7	48224_6743607	Confined	12,938	6/3/2014	295.99	317.02	-21.03	1
7	48224_6743607	Confined	13,029	9/2/2014	291.08	314.41	-23.33	1
7	48224_6743607	Confined	13,148	12/30/2014	278.81	310.99	-32.18	1
7	48224_6743607	Confined	13,301	6/1/2015	286.39	305.07	-18.68	1
7	48224_6743607	Confined	13,518	1/4/2016	278.19	296.84	-18.65	1
7	48224_6743607	Confined	13,667	6/1/2016	277.07	297.81	-20.74	1
7	48227_6743304	Confined	9,021	9/12/2003	332.48	340.61	-8.13	1
7	48227_6743304	Confined	11,693	1/5/2011	332.12	337.83	-5.71	1
7	48227_6743304	Confined	11,840	6/1/2011	324.94	337.14	-12.20	1
7	48227_6743304	Confined	11,938	9/7/2011	316.69	336.68	-19.99	1
7	48227_6743304	Confined	12,210	6/5/2012	324.70	333.98	-9.28	1
7	48227_6743304	Confined	12,302	9/5/2012	313.65	332.71	-19.06	1
7	48227_6743304	Confined	12,668	9/6/2013	305.95	324.92	-18.97	1
7	48227_6743304	Confined	12,786	1/2/2014	317.59	321.98	-4.39	1
7	48227_6743304	Confined	12,938	6/3/2014	297.23	317.82	-20.59	1
7	48227_6743304	Confined	13,029	9/2/2014	298.46	315.34	-16.88	1
7	48227_6743304	Confined	13,148	12/30/2014	285.61	312.08	-26.47	1
7	48227_6743304	Confined	13,301	6/1/2015	294.41	306.44	-12.03	1
7	48227_6743304	Confined	13,518	1/4/2016	277.95	298.60	-20.65	1
7	48227_6743304	Confined	13,667	6/1/2016	274.38	299.51	-25.13	1
7	48227_6743304	Confined	14,036	6/5/2017	273.01	299.48	-26.47	1
7	48235_6735805	Confined	8,993	8/15/2003	341.45	338.13	3.32	1
7	48235_6735805	Confined	11,693	1/5/2011	342.07	335.99	6.08	1
7	48235_6735805	Confined	11,840	6/1/2011	335.75	335.38	0.37	1
7	48235_6735805	Confined	11,938	9/7/2011	328.28	334.98	-6.70	1
7	48235_6735805	Confined	12,064	1/11/2012	335.53	334.39	1.14	1
7	48235_6735805	Confined	12,210	6/5/2012	335.91	332.82	3.09	1
7	48235_6735805	Confined	12,302	9/5/2012	326.79	331.83	-5.04	1
7	48235_6735805	Confined	12,668	9/6/2013	322.73	325.77	-3.04	1
7	48235_6735805	Confined	12,786	1/2/2014	328.27	323.50	4.77	1
7	48235_6735805	Confined	12,938	6/3/2014	316.12	320.22	-4.10	1
7	48235_6735805	Confined	13,029	9/2/2014	308.65	318.27	-9.62	1
7	48235_6735805	Confined	13,148	12/30/2014	302.65	315.70	-13.05	1
7	48235_6735805	Confined	13,301	6/1/2015	304.30	311.33	-7.03	1
7	48235_6735805	Confined	13,518	1/4/2016	299.51	305.25	-5.74	1
7	48238_6735908	Confined	9,053	10/14/2003	340.34	337.39	2.95	1
7	48238_6735908	Confined	11,693	1/5/2011	339.00	334.95	4.05	1
7	48238_6735908	Confined	11,840	6/1/2011	333.50	334.30	-0.80	1
7	48238_6735908	Confined	11,938	9/7/2011	326.85	333.87	-7.02	1
7	48238_6735908	Confined	12,064	1/11/2012	332.36	333.22	-0.86	1
7	48238_6735908	Confined	12,210	6/5/2012	333.52	331.36	2.16	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	48238_6735908	Confined	12,786	1/2/2014	325.60	320.31	5.29	1
7	48238_6735908	Confined	12,938	6/3/2014	311.67	316.46	-4.79	1
7	48238_6735908	Confined	13,029	9/2/2014	301.79	314.16	-12.37	1
7	48238_6735908	Confined	13,148	12/30/2014	293.45	311.14	-17.69	1
7	48238_6735908	Confined	13,301	6/1/2015	291.82	305.96	-14.14	1
7	48238_6735908	Confined	13,518	1/4/2016	293.00	298.75	-5.75	1
7	48238_6735908	Confined	13,667	6/1/2016	285.86	299.43	-13.57	1
7	48238_6735908	Confined	14,036	6/5/2017	283.77	299.18	-15.41	1
7	48248_0	Confined	12,300	9/3/2012	314.99	331.25	-16.26	1
7	48249_0	Confined	12,365	11/7/2012	315.21	329.81	-14.60	1
7	48253_0	Confined	12,325	9/28/2012	307.47	331.89	-24.42	1
7	48255_0	Confined	12,276	8/10/2012	317.83	332.27	-14.44	1
7	48257_0	Confined	12,255	7/20/2012	283.80	332.41	-48.61	1
7	48258_0	Confined	11,665	12/8/2010	352.88	369.38	-16.50	1
7	48263_0	Confined	11,806	4/28/2011	321.45	343.58	-22.13	1
7	48404_0	Confined	12,440	1/21/2013	408.26	368.54	3.97	0.1
7	48405_0	Unconfined	12,196	5/22/2012	364.34	380.36	-16.02	1
7	48406_0	Unconfined	12,115	3/2/2012	380.11	381.00	-0.89	1
7	48407_0	Unconfined	12,091	2/7/2012	389.04	386.36	0.27	0.1
7	48408_0	Unconfined	12,232	6/27/2012	394.46	391.88	2.58	1
7	48427_0	Confined	11,941	9/10/2011	297.50	282.85	14.65	1
7	48428_0	Confined	11,261	10/30/2009	357.90	287.30	70.60	1
7	48429_0	Confined	12,150	4/6/2012	288.87	271.14	17.73	1
7	48434_0	Confined	12,829	2/14/2014	292.19	303.93	-11.74	1
7	48436_0	Confined	12,249	7/14/2012	289.21	325.42	-36.21	1
7	48438_0	Confined	11,674	12/17/2010	348.10	328.86	19.24	1
7	48440_0	Confined	12,663	9/1/2013	329.55	325.63	3.92	1
7	48441_0	Confined	10,013	5/31/2006	370.06	388.54	-18.48	1
7	48442_0	Confined	12,070	1/17/2012	317.02	317.15	-0.13	1
7	48446_0	Confined	11,827	5/19/2011	384.51	385.53	-1.02	1
7	48447_0	Confined	12,793	1/9/2014	303.49	324.41	-20.92	1
7	48448_0	Confined	12,409	12/21/2012	389.12	383.05	6.07	1
7	48461_6736106	Confined	9,206	3/15/2004	337.27	333.20	2.04	0.5
7	48463_0	Confined	12,447	1/28/2013	326.33	325.83	0.50	1
7	48464_0	Confined	12,799	1/15/2014	302.29	311.84	-9.55	1
7	48466_0	Confined	11,932	9/1/2011	315.62	319.62	-4.00	1
7	48470_0	Confined	8,924	6/7/2003	344.86	348.67	-3.81	1
7	48472_0	Confined	12,635	8/4/2013	336.13	349.22	-1.31	0.1
7	48612_0	Confined	11,821	5/13/2011	362.41	365.44	-3.03	1
7	48613_0	Confined	11,829	5/21/2011	405.09	362.03	43.06	1
7	48638_0	Confined	11,883	7/14/2011	462.47	352.63	109.84	1
7	48641_0	Confined	11,301	12/9/2009	297.59	373.15	-75.56	1
7	48642_0	Confined	11,908	8/8/2011	444.42	381.55	62.87	1
7	48643_0	Confined	11,241	10/10/2009	292.70	372.68	-79.98	1
7	48645_0	Confined	12,618	7/18/2013	266.80	364.46	-97.66	1
7	48647_0	Confined	12,640	8/9/2013	503.74	360.18	143.56	1
7	48680_0	Confined	11,715	1/27/2011	499.88	341.65	158.23	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	48684_0	Confined	11,713	1/25/2011	369.80	367.70	2.10	1
7	48685_0	Confined	11,538	8/3/2010	353.82	373.28	-19.46	1
7	48686_0	Confined	11,489	6/15/2010	286.01	376.18	-90.17	1
7	48687_0	Confined	10,494	9/24/2007	221.16	380.12	-158.96	1
7	48689_0	Confined	11,083	5/5/2009	435.57	409.69	25.88	1
7	48690_0	Confined	11,391	3/9/2010	501.25	391.52	109.73	1
7	48691_0	Confined	11,381	2/27/2010	501.74	390.32	111.42	1
7	48692_0	Confined	11,550	8/15/2010	467.56	386.48	81.08	1
7	48693_0	Confined	11,611	10/15/2010	255.25	385.71	-130.46	1
7	48694_0	Confined	11,645	11/18/2010	186.75	380.15	-193.40	1
7	48695_0	Confined	11,526	7/22/2010	338.54	380.61	-42.07	1
7	48697_0	Confined	11,453	5/10/2010	283.84	377.21	-93.37	1
7	48698_0	Confined	11,428	4/15/2010	296.23	374.66	-78.43	1
7	48699_0	Confined	11,568	9/2/2010	437.15	371.27	65.88	1
7	48705_0	Confined	11,779	4/1/2011	360.15	356.85	3.30	1
7	48708_0	Confined	11,655	11/28/2010	409.79	342.03	67.76	1
7	48709_0	Confined	11,806	4/28/2011	344.71	331.59	13.12	1
7	48712_0	Confined	11,436	4/23/2010	382.22	308.66	73.56	1
7	48714_0	Confined	11,456	5/13/2010	358.26	305.65	52.61	1
7	48721_0	Confined	11,889	7/20/2011	120.24	85.93	34.31	1
7	48730_0	Confined	11,968	10/7/2011	442.23	282.99	159.24	1
7	48734_0	Confined	11,314	12/22/2009	372.70	333.04	39.66	1
7	48741_0	Confined	11,271	11/9/2009	414.07	360.01	54.06	1
7	48743_0	Confined	11,632	11/5/2010	370.50	369.74	0.76	1
7	48744_0	Confined	11,982	10/21/2011	245.59	375.06	-129.47	1
7	48745_0	Confined	11,628	11/1/2010	416.70	377.10	39.60	1
7	48746_0	Confined	11,586	9/20/2010	367.06	383.41	-16.35	1
7	48747_0	Confined	11,910	8/10/2011	306.81	395.22	-88.41	1
7	48748_0	Confined	11,615	10/19/2010	272.34	393.75	-121.41	1
7	48749_0	Confined	11,920	8/20/2011	336.46	391.61	-55.15	1
7	48751_0	Confined	8,934	6/17/2003	347.16	393.46	-46.30	1
7	48752_0	Confined	11,817	5/9/2011	494.66	370.16	124.50	1
7	48754_0	Confined	11,833	5/25/2011	336.24	358.21	-21.97	1
7	48756_0	Confined	11,420	4/7/2010	318.39	335.24	-16.85	1
7	48758_0	Confined	11,298	12/6/2009	440.24	287.99	152.25	1
7	48760_0	Confined	11,367	2/13/2010	349.77	293.87	55.90	1
7	48762_0	Confined	11,747	2/28/2011	325.66	190.03	135.63	1
7	48771_0	Confined	11,767	3/20/2011	302.43	160.92	141.51	1
7	48774_0	Confined	11,954	9/23/2011	260.89	80.25	180.64	1
7	48778_0	Confined	12,041	12/19/2011	231.78	69.02	162.76	1
7	48779_0	Confined	11,205	9/4/2009	304.81	125.48	179.33	1
7	48785_0	Confined	11,965	10/4/2011	235.28	74.88	160.40	1
7	48788_0	Confined	11,731	2/12/2011	284.99	102.89	182.10	1
7	48800_0	Confined	11,849	6/10/2011	181.20	135.12	46.08	1
7	48807_0	Confined	11,825	5/17/2011	283.50	334.67	-51.17	1
7	48808_0	Confined	11,894	7/25/2011	495.04	359.49	135.55	1
7	48809_0	Confined	9,981	4/29/2006	453.44	386.64	66.80	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	48810_0	Confined	9,936	3/15/2006	366.40	414.77	-48.37	1
7	48811_0	Confined	11,867	6/28/2011	457.62	429.53	28.09	1
7	48813_0	Confined	9,708	7/30/2005	553.22	456.34	96.88	1
7	48814_0	Confined	10,977	1/19/2009	491.63	479.36	12.27	1
7	48815_0	Confined	11,315	12/23/2009	397.70	482.50	-84.80	1
7	48816_0	Confined	11,453	5/10/2010	538.73	465.94	72.79	1
7	48817_0	Confined	11,982	10/21/2011	386.06	458.91	-72.85	1
7	48818_0	Confined	12,878	4/4/2014	468.75	444.29	24.46	1
7	48819_0	Confined	11,357	2/3/2010	456.73	421.86	34.87	1
7	48820_0	Confined	11,429	4/16/2010	540.12	350.32	189.80	1
7	48821_0	Confined	10,098	8/24/2006	300.54	357.67	-57.13	1
7	48824_0	Confined	11,879	7/10/2011	242.52	207.18	35.34	1
7	48832_0	Confined	11,500	6/26/2010	238.95	232.73	6.22	1
7	48835_0	Confined	11,777	3/30/2011	152.04	358.01	-205.97	1
7	48836_0	Confined	11,673	12/16/2010	403.14	381.78	21.36	1
7	48837_0	Confined	11,381	2/27/2010	306.49	397.53	-91.04	1
7	48838_0	Confined	11,923	8/23/2011	425.69	411.69	14.00	1
7	48839_0	Confined	11,337	1/14/2010	452.48	432.45	20.03	1
7	48840_0	Confined	11,163	7/24/2009	467.55	447.97	19.58	1
7	48841_0	Confined	11,341	1/18/2010	476.51	461.09	15.42	1
7	48842_0	Confined	11,940	9/9/2011	472.08	459.06	13.02	1
7	48843_0	Confined	11,672	12/15/2010	490.18	478.99	11.19	1
7	48844_0	Confined	11,331	1/8/2010	481.70	490.76	-9.06	1
7	48846_0	Unconfined	11,174	8/4/2009	549.64	540.71	8.93	1
7	48865_0	Confined	11,997	11/5/2011	419.53	500.55	-81.02	1
7	48866_0	Confined	12,260	7/25/2012	513.54	472.35	41.19	1
7	48867_0	Confined	11,541	8/6/2010	417.29	440.55	-23.26	1
7	48868_0	Confined	11,496	6/22/2010	371.12	390.35	-19.23	1
7	48869_0	Confined	12,048	12/26/2011	358.31	347.83	10.48	1
7	48870_0	Confined	11,677	12/20/2010	363.09	340.69	22.40	1
7	48871_0	Confined	12,062	1/9/2012	35.85	341.53	-305.68	1
7	48874_0	Confined	10,323	4/6/2007	446.05	208.18	237.87	1
7	48880_0	Confined	12,013	11/21/2011	4.89	288.16	-283.27	1
7	48881_0	Confined	12,318	9/21/2012	229.91	291.14	-61.23	1
7	48883_0	Confined	11,657	11/30/2010	390.22	358.79	31.43	1
7	48887_0	Confined	11,351	1/28/2010	439.79	500.65	-60.86	1
7	48888_0	Confined	11,446	5/3/2010	579.24	564.38	7.43	0.5
7	48940_0	Confined	12,794	1/10/2014	333.77	344.56	-10.79	1
7	48955_0	Confined	10,385	6/7/2007	391.27	383.33	7.94	1
7	48960_0	Confined	10,625	2/2/2008	409.89	401.27	8.62	1
7	48961_0	Confined	9,095	11/25/2003	292.18	391.09	-98.91	1
7	48972_0	Confined	11,545	8/10/2010	351.60	332.46	19.14	1
7	48975_0	Confined	12,449	1/30/2013	393.40	402.63	-9.23	1
7	48976_0	Confined	12,780	12/27/2013	369.23	393.64	-24.41	1
7	48978_0	Confined	11,568	9/2/2010	338.87	321.50	17.37	1
7	48981_0	Confined	12,123	3/10/2012	249.37	345.55	-9.62	0.1
7	49068_0	Confined	9,741	9/1/2005	362.89	351.11	11.78	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	49069_0	Confined	9,782	10/12/2005	351.59	351.54	0.05	1
7	49116_0	Confined	11,983	10/22/2011	327.96	334.41	-6.45	1
7	49122_0	Confined	12,077	1/24/2012	242.79	318.75	-75.96	1
7	49124_0	Confined	12,092	2/8/2012	327.25	315.65	11.60	1
7	49125_0	Confined	12,107	2/23/2012	359.51	317.53	41.98	1
7	49128_0	Confined	11,998	11/6/2011	353.77	338.66	15.11	1
7	49129_0	Confined	12,143	3/30/2012	369.56	361.03	8.53	1
7	49134_0	Confined	12,218	6/13/2012	246.22	378.74	-132.52	1
7	49135_0	Confined	12,101	2/17/2012	286.04	347.93	-6.19	0.1
7	49145_0	Confined	12,371	11/13/2012	357.98	375.92	-1.79	0.1
7	49148_0	Confined	12,416	12/28/2012	418.41	371.79	46.62	1
7	49154_0	Confined	12,493	3/15/2013	110.35	342.76	-232.41	1
7	49181_0	Confined	12,803	1/19/2014	380.71	392.78	-12.07	1
7	49189_0	Confined	12,745	11/22/2013	401.23	395.26	0.60	0.1
7	49215_0	Confined	10,818	8/13/2008	387.39	392.03	-0.46	0.1
7	49216_0	Confined	10,845	9/9/2008	397.74	399.54	-0.18	0.1
7	49217_0	Confined	9,410	10/5/2004	384.63	384.82	-0.19	1
7	49222_0	Confined	11,628	11/1/2010	332.83	344.41	-11.58	1
7	49410_0	Confined	9,779	10/9/2005	442.22	400.03	4.22	0.1
7	49411_0	Confined	9,771	10/1/2005	449.04	397.46	51.58	1
7	49412_0	Confined	9,623	5/6/2005	406.12	404.20	0.19	0.1
7	49442_0	Confined	12,370	11/12/2012	410.88	360.88	5.00	0.1
7	49443_0	Confined	10,928	12/1/2008	378.71	388.03	-0.93	0.1
7	49445_0	Confined	12,252	7/17/2012	315.62	351.63	-3.60	0.1
7	50008_6961609	Confined	11,120	6/11/2009	412.67	331.88	8.08	0.1
7	50017_0	Confined	10,956	12/29/2008	376.89	385.43	-0.85	0.1
7	50018_6963605	Confined	1,516	2/24/1983	502.97	530.99	-2.80	0.1
7	50018_6963605	Confined	2,601	2/13/1986	495.47	533.45	-3.80	0.1
7	50018_6963605	Confined	3,007	3/26/1987	493.67	536.70	-4.30	0.1
7	50018_6963605	Confined	3,342	2/24/1988	492.97	538.32	-4.53	0.1
7	50018_6963605	Confined	4,777	1/29/1992	482.47	523.27	-4.08	0.1
7	50018_6963605	Confined	8,411	1/10/2002	462.07	462.80	-0.07	0.1
7	50018_6963605	Confined	8,773	1/7/2003	461.87	460.09	0.18	0.1
7	50018_6963605	Confined	9,145	1/14/2004	460.97	456.66	0.43	0.1
7	50018_6963605	Confined	9,517	1/20/2005	463.67	458.43	0.52	0.1
7	50018_6963605	Confined	9,866	1/4/2006	459.37	454.07	0.53	0.1
7	50018_6963605	Confined	10,271	2/13/2007	455.97	451.74	0.42	0.1
7	50018_6963605	Confined	10,624	2/1/2008	456.87	455.49	0.14	0.1
7	50018_6963605	Confined	11,019	3/2/2009	455.67	444.00	1.17	0.1
7	50018_6963605	Confined	11,332	1/9/2010	455.27	430.44	2.48	0.1
7	50019_0	Confined	11,565	8/30/2010	335.74	374.69	-3.89	0.1
7	50020_6964104	Unconfined	5,483	1/4/1994	448.47	532.53	-42.03	0.5
7	50020_6964104	Unconfined	5,849	1/5/1995	448.12	526.55	-39.22	0.5
7	50020_6964104	Unconfined	6,212	1/3/1996	447.27	518.51	-35.62	0.5
7	50020_6964104	Unconfined	6,638	3/4/1997	447.32	509.76	-31.22	0.5
7	50020_6964104	Unconfined	6,974	2/3/1998	446.97	511.93	-32.48	0.5
7	50020_6964104	Unconfined	7,319	1/14/1999	446.42	510.68	-32.13	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50020_6964104	Unconfined	7,680	1/10/2000	446.17	502.60	-28.22	0.5
7	50020_6964104	Unconfined	8,415	1/14/2002	446.12	491.92	-22.90	0.5
7	50020_6964104	Unconfined	8,773	1/7/2003	445.52	493.62	-24.05	0.5
7	50020_6964104	Unconfined	9,143	1/12/2004	446.42	490.35	-21.96	0.5
7	50020_6964104	Unconfined	9,517	1/20/2005	446.72	492.70	-22.99	0.5
7	50020_6964104	Unconfined	9,866	1/4/2006	446.37	486.13	-19.88	0.5
7	50020_6964104	Unconfined	10,264	2/6/2007	446.22	481.64	-17.71	0.5
7	50020_6964104	Unconfined	10,595	1/3/2008	446.72	488.91	-21.10	0.5
7	50020_6964104	Unconfined	10,993	2/4/2009	446.52	478.83	-16.15	0.5
7	50020_6964104	Unconfined	11,334	1/11/2010	446.12	470.39	-12.13	0.5
7	50021_0	Confined	10,762	6/18/2008	371.89	385.22	-1.33	0.1
7	50024_0	Confined	11,885	7/16/2011	405.34	289.32	11.60	0.1
7	50025_0	Confined	11,448	5/5/2010	342.61	315.03	2.76	0.1
7	50027_6857623	Confined	8,488	3/28/2002	385.66	366.60	1.91	0.1
7	50028_0	Confined	12,500	3/22/2013	535.16	283.02	252.14	1
7	50029_0	Confined	9,854	12/23/2005	578.70	377.20	20.15	0.1
7	50030_0	Confined	12,209	6/4/2012	506.33	328.13	178.20	1
7	50034_6857918	Confined	8,272	8/24/2001	381.61	368.28	13.33	1
7	50039_0	Confined	10,035	6/22/2006	423.78	366.90	56.88	1
7	50041_0	Confined	10,791	7/17/2008	406.89	365.82	4.11	0.1
7	50042_0	Confined	12,193	5/19/2012	522.90	278.58	244.32	1
7	50043_0	Confined	10,918	11/21/2008	486.69	368.51	11.82	0.1
7	50044_0	Confined	11,272	11/10/2009	357.83	320.14	37.69	1
7	50050_6962902	Confined	1,138	2/11/1982	456.77	506.95	-50.18	1
7	50050_6962902	Confined	1,516	2/24/1983	462.71	507.97	-45.26	1
7	50050_6962902	Confined	1,871	2/14/1984	452.95	512.19	-59.24	1
7	50050_6962902	Confined	2,237	2/14/1985	449.49	504.63	-55.14	1
7	50050_6962902	Confined	3,007	3/26/1987	452.51	515.43	-62.92	1
7	50050_6962902	Confined	3,344	2/26/1988	444.95	514.77	-69.82	1
7	50050_6962902	Confined	3,698	2/14/1989	438.52	506.03	-67.51	1
7	50050_6962902	Confined	4,056	2/7/1990	439.44	499.40	-59.96	1
7	50050_6962902	Confined	4,483	4/10/1991	448.89	493.22	-44.33	1
7	50050_6962902	Confined	4,765	1/17/1992	428.59	464.91	-36.32	1
7	50050_6962902	Confined	4,789	2/10/1992	497.19	464.19	33.00	1
7	50050_6962902	Confined	5,140	1/26/1993	450.09	453.39	-3.30	1
7	50050_6962902	Confined	5,857	1/13/1995	442.34	424.23	18.11	1
7	50050_6962902	Confined	6,644	3/10/1997	423.14	426.02	-2.88	1
7	50050_6962902	Confined	6,983	2/12/1998	425.34	441.78	-16.44	1
7	50050_6962902	Confined	7,323	1/18/1999	422.54	418.34	4.20	1
7	50050_6962902	Confined	8,411	1/10/2002	412.34	387.35	24.99	1
7	50050_6962902	Confined	8,788	1/22/2003	399.84	369.95	29.89	1
7	50050_6962902	Confined	9,133	1/2/2004	400.34	372.19	28.15	1
7	50050_6962902	Confined	9,536	2/8/2005	420.84	380.96	39.88	1
7	50050_6962902	Confined	9,882	1/20/2006	403.44	383.06	20.38	1
7	50050_6962902	Confined	10,280	2/22/2007	396.34	393.93	2.41	1
7	50050_6962902	Confined	10,656	3/4/2008	405.34	387.85	17.49	1
7	50050_6962902	Confined	11,035	3/18/2009	403.04	353.02	50.02	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50050_6962902	Confined	11,426	4/13/2010	375.84	306.70	69.14	1
7	50051_0	Confined	9,653	6/5/2005	464.36	363.87	10.05	0.1
7	50055_0	Confined	11,886	7/17/2011	424.33	164.26	26.01	0.1
7	50058_0	Confined	9,006	8/28/2003	193.96	216.42	-2.25	0.1
7	50060_7706205	Confined	1,138	2/11/1982	415.03	434.21	-19.18	1
7	50060_7706205	Confined	1,516	2/24/1983	417.69	435.46	-17.77	1
7	50060_7706205	Confined	1,871	2/14/1984	407.54	438.42	-30.88	1
7	50060_7706205	Confined	2,237	2/14/1985	399.04	434.18	-35.14	1
7	50060_7706205	Confined	2,607	2/19/1986	402.53	440.32	-37.79	1
7	50060_7706205	Confined	3,007	3/26/1987	405.32	443.61	-38.29	1
7	50060_7706205	Confined	3,344	2/26/1988	403.76	447.26	-43.50	1
7	50060_7706205	Confined	4,063	2/14/1990	381.28	439.17	-57.89	1
7	50060_7706205	Confined	4,483	4/10/1991	378.76	433.64	-54.88	1
7	50060_7706205	Confined	4,777	1/29/1992	383.76	414.61	-30.85	1
7	50061_0	Confined	12,210	6/5/2012	302.17	307.34	-5.17	1
7	50062_7706301	Confined	1,871	2/14/1984	378.93	459.52	-40.30	0.5
7	50062_7706301	Confined	2,607	2/19/1986	378.18	470.70	-46.26	0.5
7	50062_7706301	Confined	3,007	3/26/1987	413.51	461.91	-24.20	0.5
7	50062_7706301	Confined	3,344	2/26/1988	380.69	459.65	-39.48	0.5
7	50062_7706301	Confined	3,698	2/14/1989	401.85	442.21	-20.18	0.5
7	50062_7706301	Confined	4,481	4/8/1991	407.81	420.43	-6.31	0.5
7	50062_7706301	Confined	4,777	1/29/1992	393.38	357.46	17.96	0.5
7	50065_7707201	Confined	1,516	2/24/1983	419.35	464.96	-22.81	0.5
7	50065_7707201	Confined	1,871	2/14/1984	403.36	469.96	-33.30	0.5
7	50065_7707201	Confined	2,607	2/19/1986	403.17	476.01	-36.42	0.5
7	50065_7707201	Confined	4,063	2/14/1990	367.69	456.76	-44.53	0.5
7	50065_7707201	Confined	6,651	3/17/1997	373.64	373.09	0.28	0.5
7	50065_7707201	Confined	6,983	2/12/1998	370.74	393.69	-11.48	0.5
7	50065_7707201	Confined	7,319	1/14/1999	363.74	363.42	0.16	0.5
7	50065_7707201	Confined	8,073	2/6/2001	365.44	319.05	23.19	0.5
7	50065_7707201	Confined	8,411	1/10/2002	351.64	322.80	14.42	0.5
7	50065_7707201	Confined	8,779	1/13/2003	359.14	302.08	28.53	0.5
7	50065_7707201	Confined	9,145	1/14/2004	356.04	305.71	25.16	0.5
7	50065_7707201	Confined	9,517	1/20/2005	358.44	318.04	20.20	0.5
7	50065_7707201	Confined	9,881	1/19/2006	357.14	322.11	17.52	0.5
7	50065_7707201	Confined	10,271	2/13/2007	354.84	336.66	9.09	0.5
7	50065_7707201	Confined	10,609	1/17/2008	367.64	334.65	16.49	0.5
7	50065_7707201	Confined	11,015	2/26/2009	362.74	288.79	36.97	0.5
7	50065_7707201	Confined	11,331	1/8/2010	365.44	230.69	67.38	0.5
7	50066_0	Confined	11,724	2/5/2011	328.72	241.55	87.17	1
7	50069_7708201	Confined	1,516	2/24/1983	421.96	452.50	-30.54	1
7	50069_7708201	Confined	1,873	2/16/1984	410.16	455.11	-44.95	1
7	50069_7708201	Confined	2,237	2/14/1985	406.04	451.99	-45.95	1
7	50069_7708201	Confined	2,602	2/14/1986	413.99	459.18	-45.19	1
7	50069_7708201	Confined	3,697	2/13/1989	396.86	457.57	-60.71	1
7	50069_7708201	Confined	4,061	2/12/1990	388.89	454.01	-65.12	1
7	50069_7708201	Confined	4,460	3/18/1991	389.39	450.83	-61.44	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50069_7708201	Confined	4,777	1/29/1992	395.49	436.63	-41.14	1
7	50070_0	Confined	9,700	7/22/2005	296.93	357.32	-60.39	1
7	50072_0	Confined	11,044	3/27/2009	290.71	343.09	-52.38	1
7	50075_0	Confined	12,003	11/11/2011	258.28	276.83	-18.55	1
7	50078_0	Confined	11,915	8/15/2011	406.84	273.93	132.91	1
7	50084_7802402	Confined	1,517	2/25/1983	390.64	413.40	-22.76	1
7	50084_7802402	Confined	1,874	2/17/1984	380.21	417.36	-37.15	1
7	50084_7802402	Confined	2,236	2/13/1985	368.94	414.71	-45.77	1
7	50084_7802402	Confined	4,062	2/13/1990	340.89	416.97	-76.08	1
7	50084_7802402	Confined	4,420	2/6/1991	362.24	416.81	-54.57	1
7	50087_0	Confined	10,249	1/22/2007	297.68	337.34	-39.66	1
7	50089_7801501	Confined	1,139	2/12/1982	401.97	433.11	-31.14	1
7	50089_7801501	Confined	1,516	2/24/1983	403.47	434.19	-30.72	1
7	50089_7801501	Confined	2,235	2/12/1985	386.87	434.19	-47.32	1
7	50089_7801501	Confined	2,601	2/13/1986	400.07	441.60	-41.53	1
7	50089_7801501	Confined	3,007	3/26/1987	404.87	442.99	-38.12	1
7	50089_7801501	Confined	3,342	2/24/1988	396.52	444.40	-47.88	1
7	50089_7801501	Confined	3,700	2/16/1989	376.90	439.89	-62.99	1
7	50089_7801501	Confined	4,062	2/13/1990	355.92	436.28	-80.36	1
7	50089_7801501	Confined	4,476	4/3/1991	358.47	433.30	-74.83	1
7	50089_7801501	Confined	6,983	2/12/1998	369.32	397.02	-27.70	1
7	50089_7801501	Confined	7,317	1/12/1999	368.27	385.00	-16.73	1
7	50089_7801501	Confined	8,410	1/9/2002	361.67	358.66	3.01	1
7	50089_7801501	Confined	8,781	1/15/2003	363.07	347.95	15.12	1
7	50089_7801501	Confined	9,153	1/22/2004	363.97	347.26	16.71	1
7	50089_7801501	Confined	9,543	2/15/2005	366.57	351.67	14.90	1
7	50089_7801501	Confined	9,881	1/19/2006	362.37	350.76	11.61	1
7	50089_7801501	Confined	10,270	2/12/2007	360.87	355.81	5.06	1
7	50089_7801501	Confined	10,624	2/1/2008	362.97	356.65	6.32	1
7	50089_7801501	Confined	11,008	2/19/2009	347.57	335.02	12.55	1
7	50089_7801501	Confined	11,446	5/3/2010	343.37	297.03	46.34	1
7	50094_0	Confined	12,160	4/16/2012	250.51	237.89	12.62	1
7	50098_7708406	Confined	9,952	3/31/2006	294.66	318.80	-24.14	1
7	50100_0	Confined	11,077	4/29/2009	209.50	247.76	-38.26	1
7	50101_7707501	Confined	1,138	2/11/1982	385.13	432.44	-23.65	0.5
7	50101_7707501	Confined	1,516	2/24/1983	381.23	432.94	-25.85	0.5
7	50101_7707501	Confined	2,607	2/19/1986	371.08	444.92	-36.92	0.5
7	50101_7707501	Confined	3,007	3/26/1987	373.10	444.10	-35.50	0.5
7	50101_7707501	Confined	3,698	2/14/1989	347.14	432.72	-42.79	0.5
7	50101_7707501	Confined	4,056	2/7/1990	328.72	425.97	-48.62	0.5
7	50101_7707501	Confined	4,481	4/8/1991	320.08	418.58	-49.25	0.5
7	50101_7707501	Confined	4,789	2/10/1992	340.88	384.93	-22.03	0.5
7	50101_7707501	Confined	5,140	1/26/1993	358.93	375.25	-8.16	0.5
7	50101_7707501	Confined	5,499	1/20/1994	323.88	356.63	-16.38	0.5
7	50101_7707501	Confined	5,857	1/13/1995	342.88	339.81	1.53	0.5
7	50101_7707501	Confined	6,246	2/6/1996	312.88	337.96	-12.54	0.5
7	50101_7707501	Confined	6,644	3/10/1997	308.03	344.37	-18.17	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50101_7707501	Confined	6,983	2/12/1998	306.88	365.14	-29.13	0.5
7	50101_7707501	Confined	8,065	1/29/2001	308.78	287.96	10.41	0.5
7	50101_7707501	Confined	8,415	1/14/2002	296.58	294.35	1.12	0.5
7	50101_7707501	Confined	8,788	1/22/2003	298.38	271.22	13.58	0.5
7	50101_7707501	Confined	9,145	1/14/2004	297.18	277.25	9.96	0.5
7	50101_7707501	Confined	9,517	1/20/2005	298.88	291.78	3.55	0.5
7	50101_7707501	Confined	9,882	1/20/2006	292.78	295.38	-1.30	0.5
7	50101_7707501	Confined	10,280	2/22/2007	286.38	311.48	-12.55	0.5
7	50101_7707501	Confined	10,609	1/17/2008	290.58	309.03	-9.22	0.5
7	50101_7707501	Confined	11,014	2/25/2009	284.88	256.31	14.28	0.5
7	50101_7707501	Confined	11,426	4/13/2010	287.08	179.11	53.98	0.5
7	50103_0	Confined	11,951	9/20/2011	195.05	307.17	-112.12	1
7	50105_0	Confined	12,720	10/28/2013	553.26	365.37	187.89	1
7	50112_0	Confined	11,939	9/8/2011	169.04	64.77	104.27	1
7	50113_7708716	Confined	1,138	2/11/1982	380.79	409.40	-28.61	1
7	50113_7708716	Confined	1,508	2/16/1983	373.19	407.51	-34.32	1
7	50113_7708716	Confined	1,873	2/16/1984	363.21	414.61	-51.40	1
7	50113_7708716	Confined	2,237	2/14/1985	354.34	407.72	-53.38	1
7	50113_7708716	Confined	4,476	4/3/1991	298.99	395.64	-96.65	1
7	50113_7708716	Confined	4,776	1/28/1992	290.89	359.61	-68.72	1
7	50113_7708716	Confined	5,134	1/20/1993	322.29	357.80	-35.51	1
7	50113_7708716	Confined	5,503	1/24/1994	291.99	334.94	-42.95	1
7	50113_7708716	Confined	5,860	1/16/1995	321.49	320.79	0.70	1
7	50113_7708716	Confined	6,233	1/24/1996	277.29	324.76	-47.47	1
7	50113_7708716	Confined	6,653	3/19/1997	275.24	322.15	-46.91	1
7	50113_7708716	Confined	6,989	2/18/1998	325.29	339.75	-14.46	1
7	50113_7708716	Confined	7,339	2/3/1999	306.69	314.96	-8.27	1
7	50113_7708716	Confined	8,411	1/10/2002	236.49	275.90	-39.41	1
7	50113_7708716	Confined	8,500	4/9/2002	257.03	269.40	-12.37	1
7	50113_7708716	Confined	8,781	1/15/2003	254.49	250.27	4.22	1
7	50113_7708716	Confined	9,145	1/14/2004	245.99	257.74	-11.75	1
7	50113_7708716	Confined	9,504	1/7/2005	262.19	271.75	-9.56	1
7	50113_7708716	Confined	9,882	1/20/2006	255.19	272.73	-17.54	1
7	50113_7708716	Confined	10,270	2/12/2007	251.99	288.37	-36.38	1
7	50113_7708716	Confined	10,609	1/17/2008	273.69	285.59	-11.90	1
7	50113_7708716	Confined	10,993	2/4/2009	225.29	234.40	-9.11	1
7	50113_7708716	Confined	11,426	4/13/2010	183.99	151.56	32.43	1
7	50114_0	Confined	12,634	8/3/2013	138.86	210.45	-71.59	1
7	50118_7708814	Confined	7,716	2/15/2000	246.05	319.41	-73.36	1
7	50124_7801801	Confined	1,139	2/12/1982	373.27	403.65	-30.38	1
7	50124_7801801	Confined	1,516	2/24/1983	372.31	404.82	-32.51	1
7	50124_7801801	Confined	1,873	2/16/1984	362.57	407.75	-45.18	1
7	50124_7801801	Confined	2,235	2/12/1985	344.67	404.88	-60.21	1
7	50124_7801801	Confined	2,601	2/13/1986	359.88	412.39	-52.51	1
7	50124_7801801	Confined	3,007	3/26/1987	362.06	413.16	-51.10	1
7	50124_7801801	Confined	3,342	2/24/1988	361.26	414.23	-52.97	1
7	50124_7801801	Confined	3,700	2/16/1989	337.52	409.98	-72.46	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50124_7801801	Confined	4,475	4/2/1991	324.40	402.70	-78.30	1
7	50124_7801801	Confined	4,776	1/28/1992	325.55	388.06	-62.51	1
7	50124_7801801	Confined	5,136	1/22/1993	348.55	381.63	-33.08	1
7	50124_7801801	Confined	6,260	2/20/1996	312.60	355.64	-43.04	1
7	50125_0	Confined	12,449	1/30/2013	183.24	245.93	-62.69	1
7	50127_0	Confined	12,109	2/25/2012	265.07	208.78	56.29	1
7	50128_7802701	Confined	1,135	2/8/1982	377.25	401.29	-12.02	0.5
7	50128_7802701	Confined	1,517	2/25/1983	378.86	403.44	-12.29	0.5
7	50128_7802701	Confined	2,601	2/13/1986	370.25	414.52	-22.13	0.5
7	50128_7802701	Confined	3,000	3/19/1987	366.71	414.85	-24.07	0.5
7	50128_7802701	Confined	3,342	2/24/1988	365.39	416.79	-25.70	0.5
7	50128_7802701	Confined	3,700	2/16/1989	329.46	411.22	-40.88	0.5
7	50128_7802701	Confined	4,419	2/5/1991	345.05	406.28	-30.62	0.5
7	50131_0	Confined	12,168	4/24/2012	218.07	186.30	31.77	1
7	50140_7716201	Confined	1,137	2/10/1982	345.84	356.85	-11.01	1
7	50140_7716201	Confined	1,872	2/15/1984	328.06	361.29	-33.23	1
7	50142_0	Confined	11,946	9/15/2011	218.74	86.09	132.65	1
7	50149_0	Confined	12,682	9/20/2013	266.34	227.18	39.16	1
7	50156_0	Confined	12,597	6/27/2013	259.04	169.51	89.53	1
7	50159_7714601	Confined	1,138	2/11/1982	332.60	319.86	12.74	1
7	50159_7714601	Confined	1,515	2/23/1983	325.68	321.38	4.30	1
7	50159_7714601	Confined	1,872	2/15/1984	317.83	325.40	-7.57	1
7	50159_7714601	Confined	2,606	2/18/1986	316.26	329.65	-13.39	1
7	50159_7714601	Confined	3,001	3/20/1987	317.64	330.14	-12.50	1
7	50159_7714601	Confined	3,343	2/25/1988	320.32	331.91	-11.59	1
7	50159_7714601	Confined	3,699	2/15/1989	282.02	327.68	-45.66	1
7	50159_7714601	Confined	4,461	3/19/1991	295.53	319.16	-23.63	1
7	50159_7714601	Confined	4,775	1/27/1992	290.53	293.70	-3.17	1
7	50159_7714601	Confined	5,142	1/28/1993	294.18	279.76	14.42	1
7	50164_0	Confined	9,803	11/2/2005	205.63	166.54	39.09	1
7	50168_0	Confined	9,738	8/29/2005	242.65	176.73	65.92	1
7	50171_7716603	Confined	1,137	2/10/1982	331.29	324.34	6.95	1
7	50171_7716603	Confined	1,872	2/15/1984	313.81	329.02	-15.21	1
7	50171_7716603	Confined	2,236	2/13/1985	298.19	325.37	-27.18	1
7	50171_7716603	Confined	2,605	2/17/1986	319.13	333.65	-14.52	1
7	50171_7716603	Confined	3,000	3/19/1987	321.63	333.97	-12.34	1
7	50171_7716603	Confined	3,343	2/25/1988	320.20	335.03	-14.83	1
7	50171_7716603	Confined	3,699	2/15/1989	297.47	331.22	-33.75	1
7	50171_7716603	Confined	4,455	3/13/1991	289.34	324.35	-35.01	1
7	50171_7716603	Confined	4,770	1/22/1992	292.59	304.34	-11.75	1
7	50171_7716603	Confined	5,141	1/27/1993	332.69	294.25	38.44	1
7	50171_7716603	Confined	5,511	2/1/1994	341.69	280.66	61.03	1
7	50171_7716603	Confined	5,857	1/13/1995	321.59	268.27	53.32	1
7	50171_7716603	Confined	6,226	1/17/1996	319.29	261.29	58.00	1
7	50171_7716603	Confined	6,989	2/18/1998	318.34	267.78	50.56	1
7	50171_7716603	Confined	7,319	1/14/1999	316.09	248.75	67.34	1
7	50171_7716603	Confined	8,415	1/14/2002	285.09	213.29	71.80	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50171_7716603	Confined	8,782	1/16/2003	297.99	195.27	102.72	1
7	50171_7716603	Confined	9,161	1/30/2004	304.09	193.05	111.04	1
7	50171_7716603	Confined	9,518	1/21/2005	304.69	195.76	108.93	1
7	50171_7716603	Confined	9,896	2/3/2006	299.49	194.40	105.09	1
7	50171_7716603	Confined	10,280	2/22/2007	294.79	200.26	94.53	1
7	50171_7716603	Confined	10,596	1/4/2008	299.05	198.10	100.95	1
7	50171_7716603	Confined	11,007	2/18/2009	283.59	166.83	116.76	1
7	50171_7716603	Confined	11,341	1/18/2010	291.59	123.13	168.46	1
7	50175_0	Confined	12,615	7/15/2013	149.26	198.02	-48.76	1
7	50179_0	Confined	12,549	5/10/2013	82.63	91.22	-8.59	1
7	50181_0	Confined	12,065	1/12/2012	121.91	33.34	88.57	1
7	50186_0	Confined	12,307	9/10/2012	86.94	-1.62	88.56	1
7	50188_0	Confined	12,142	3/29/2012	149.73	-4.13	153.86	1
7	50189_0	Confined	11,947	9/16/2011	355.25	13.23	342.02	1
7	50192_0	Confined	11,134	6/25/2009	79.43	105.33	-25.90	1
7	50194_0	Confined	12,093	2/9/2012	165.62	38.90	126.72	1
7	50195_0	Confined	11,890	7/21/2011	177.21	54.21	123.00	1
7	50197_0	Confined	11,925	8/25/2011	157.81	62.21	95.60	1
7	50198_0	Confined	10,762	6/18/2008	180.22	164.20	16.02	1
7	50203_0	Confined	12,818	2/3/2014	32.94	184.30	-151.36	1
7	50207_0	Confined	12,442	1/23/2013	265.52	72.86	192.66	1
7	50208_0	Confined	11,487	6/13/2010	192.22	87.31	104.91	1
7	50210_0	Confined	12,511	4/2/2013	-15.57	50.54	-66.11	1
7	50212_0	Confined	12,157	4/13/2012	201.29	38.37	162.92	1
7	50215_0	Confined	12,152	4/8/2012	89.51	17.55	71.96	1
7	50218_0	Confined	12,327	9/30/2012	118.50	49.19	69.31	1
7	50219_0	Confined	12,127	3/14/2012	278.39	43.33	235.06	1
7	50223_0	Confined	12,654	8/23/2013	142.04	166.70	-24.66	1
7	50227_7809503	Confined	8,773	1/7/2003	270.38	248.19	11.09	0.5
7	50227_7809503	Confined	9,165	2/3/2004	274.66	246.89	13.88	0.5
7	50227_7809503	Confined	9,880	1/18/2006	269.28	249.79	9.74	0.5
7	50227_7809503	Confined	9,903	2/10/2006	257.18	250.21	3.48	0.5
7	50227_7809503	Confined	10,264	2/6/2007	249.28	256.11	-3.41	0.5
7	50227_7809503	Confined	10,596	1/4/2008	280.88	255.49	12.69	0.5
7	50227_7809503	Confined	10,993	2/4/2009	245.28	228.38	8.45	0.5
7	50227_7809503	Confined	11,342	1/19/2010	260.08	185.87	37.10	0.5
7	50227_7809503	Confined	12,059	1/6/2012	203.58	141.73	30.93	0.5
7	50227_7809503	Confined	12,090	2/6/2012	207.28	144.44	31.42	0.5
7	50227_7809503	Confined	12,114	3/1/2012	218.28	146.54	35.87	0.5
7	50227_7809503	Confined	12,149	4/5/2012	215.88	149.60	33.14	0.5
7	50227_7809503	Confined	12,176	5/2/2012	188.68	151.97	18.36	0.5
7	50227_7809503	Confined	12,210	6/5/2012	193.08	154.94	19.07	0.5
7	50227_7809503	Confined	12,237	7/2/2012	176.08	157.30	9.39	0.5
7	50227_7809503	Confined	12,265	7/30/2012	176.78	159.75	8.51	0.5
7	50227_7809503	Confined	12,307	9/10/2012	150.08	163.43	-6.67	0.5
7	50227_7809503	Confined	12,346	10/19/2012	165.48	166.84	-0.68	0.5
7	50227_7809503	Confined	12,367	11/9/2012	173.58	168.68	2.45	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50227_7809503	Confined	12,391	12/3/2012	187.98	170.78	8.60	0.5
7	50227_7809503	Confined	12,425	1/6/2013	202.08	173.34	14.37	0.5
7	50227_7809503	Confined	12,456	2/6/2013	207.38	173.94	16.72	0.5
7	50227_7809503	Confined	12,479	3/1/2013	202.28	174.39	13.95	0.5
7	50227_7809503	Confined	12,514	4/5/2013	175.08	175.07	0.01	0.5
7	50227_7809503	Confined	12,541	5/2/2013	176.38	175.59	0.39	0.5
7	50227_7809503	Confined	12,575	6/5/2013	167.48	176.25	-4.39	0.5
7	50227_7809503	Confined	12,602	7/2/2013	165.08	176.77	-5.85	0.5
7	50227_7809503	Confined	12,632	8/1/2013	158.18	177.36	-9.59	0.5
7	50227_7809503	Confined	12,672	9/10/2013	139.08	178.13	-19.53	0.5
7	50227_7809503	Confined	12,711	10/19/2013	150.28	178.89	-14.30	0.5
7	50227_7809503	Confined	12,732	11/9/2013	164.68	179.30	-7.31	0.5
7	50227_7809503	Confined	12,756	12/3/2013	183.78	179.76	2.01	0.5
7	50227_7809503	Confined	12,785	1/1/2014	194.18	180.33	6.92	0.5
7	50227_7809503	Confined	12,816	2/1/2014	195.68	181.14	7.27	0.5
7	50227_7809503	Confined	12,844	3/1/2014	196.48	181.88	7.30	0.5
7	50227_7809503	Confined	12,875	4/1/2014	183.38	182.69	0.35	0.5
7	50227_7809503	Confined	12,905	5/1/2014	158.48	183.48	-12.50	0.5
7	50227_7809503	Confined	12,936	6/1/2014	151.28	184.29	-16.50	0.5
7	50227_7809503	Confined	12,966	7/1/2014	151.28	185.07	-16.90	0.5
7	50227_7809503	Confined	12,997	8/1/2014	144.58	185.89	-20.65	0.5
7	50227_7809503	Confined	13,028	9/1/2014	130.28	186.70	-28.21	0.5
7	50227_7809503	Confined	13,058	10/1/2014	132.88	187.48	-27.30	0.5
7	50227_7809503	Confined	13,089	11/1/2014	132.68	188.30	-27.81	0.5
7	50227_7809503	Confined	13,119	12/1/2014	150.08	189.08	-19.50	0.5
7	50227_7809503	Confined	13,150	1/1/2015	167.48	189.91	-11.22	0.5
7	50227_7809503	Confined	13,181	2/1/2015	183.68	191.23	-3.78	0.5
7	50227_7809503	Confined	13,209	3/1/2015	181.68	192.42	-5.37	0.5
7	50227_7809503	Confined	13,240	4/1/2015	184.38	193.74	-4.68	0.5
7	50227_7809503	Confined	13,270	5/1/2015	192.88	195.02	-1.07	0.5
7	50227_7809503	Confined	13,301	6/1/2015	200.88	196.34	2.27	0.5
7	50227_7809503	Confined	13,331	7/1/2015	200.08	197.61	1.23	0.5
7	50227_7809503	Confined	13,362	8/1/2015	183.68	198.93	-7.63	0.5
7	50227_7809503	Confined	13,393	9/1/2015	154.68	200.25	-22.79	0.5
7	50227_7809503	Confined	13,423	10/1/2015	151.68	201.53	-24.92	0.5
7	50227_7809503	Confined	13,454	11/1/2015	150.68	202.85	-26.08	0.5
7	50227_7809503	Confined	13,484	12/1/2015	173.98	204.12	-15.07	0.5
7	50227_7809503	Confined	13,515	1/1/2016	187.68	205.42	-8.87	0.5
7	50227_7809503	Confined	13,546	2/1/2016	182.08	206.02	-11.97	0.5
7	50227_7809503	Confined	13,575	3/1/2016	185.08	206.59	-10.75	0.5
7	50227_7809503	Confined	13,606	4/1/2016	182.68	207.19	-12.25	0.5
7	50227_7809503	Confined	13,636	5/1/2016	179.08	207.77	-14.35	0.5
7	50227_7809503	Confined	13,667	6/1/2016	179.08	208.38	-14.65	0.5
7	50227_7809503	Confined	13,697	7/1/2016	179.48	208.96	-14.74	0.5
7	50227_7809503	Confined	13,728	8/1/2016	166.28	209.56	-21.64	0.5
7	50227_7809503	Confined	13,759	9/1/2016	171.58	210.17	-19.29	0.5
7	50227_7809503	Confined	13,789	10/1/2016	174.48	210.75	-18.13	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50227_7809503	Confined	13,820	11/1/2016	181.08	211.35	-15.14	0.5
7	50227_7809503	Confined	13,850	12/1/2016	187.88	211.94	-12.03	0.5
7	50227_7809503	Confined	13,881	1/1/2017	192.38	212.53	-10.07	0.5
7	50227_7809503	Confined	13,912	2/1/2017	195.28	212.81	-8.77	0.5
7	50227_7809503	Confined	13,940	3/1/2017	189.78	213.07	-11.64	0.5
7	50227_7809503	Confined	13,971	4/1/2017	201.28	213.35	-6.03	0.5
7	50227_7809503	Confined	14,001	5/1/2017	184.98	213.62	-14.32	0.5
7	50227_7809503	Confined	14,032	6/1/2017	178.88	213.90	-17.51	0.5
7	50229_7809602	Confined	1,873	2/16/1984	337.50	361.89	-24.39	1
7	50229_7809602	Confined	2,601	2/13/1986	333.68	366.94	-33.26	1
7	50233_7716801	Confined	1,137	2/10/1982	318.91	302.44	8.23	0.5
7	50233_7716801	Confined	1,514	2/22/1983	317.65	303.74	6.96	0.5
7	50233_7716801	Confined	1,872	2/15/1984	310.15	307.16	1.49	0.5
7	50233_7716801	Confined	2,238	2/15/1985	284.90	303.49	-9.29	0.5
7	50233_7716801	Confined	2,605	2/17/1986	306.40	311.70	-2.65	0.5
7	50233_7716801	Confined	3,000	3/19/1987	320.07	312.00	4.04	0.5
7	50233_7716801	Confined	3,343	2/25/1988	304.80	313.14	-4.17	0.5
7	50233_7716801	Confined	3,699	2/15/1989	280.14	309.65	-14.76	0.5
7	50233_7716801	Confined	4,069	2/20/1990	249.03	306.23	-28.60	0.5
7	50233_7716801	Confined	4,455	3/13/1991	247.80	303.00	-27.60	0.5
7	50233_7716801	Confined	4,770	1/22/1992	249.35	282.69	-16.67	0.5
7	50233_7716801	Confined	5,141	1/27/1993	279.45	271.95	3.75	0.5
7	50233_7716801	Confined	5,344	8/18/1993	242.80	264.22	-10.71	0.5
7	50233_7716801	Confined	5,358	9/1/1993	168.80	263.69	-47.44	0.5
7	50233_7716801	Confined	5,388	10/1/1993	163.65	262.55	-49.45	0.5
7	50233_7716801	Confined	5,420	11/2/1993	216.40	261.33	-22.46	0.5
7	50233_7716801	Confined	5,483	1/4/1994	245.10	258.93	-6.92	0.5
7	50233_7716801	Confined	5,513	2/3/1994	237.90	257.79	-9.95	0.5
7	50233_7716801	Confined	5,539	3/1/1994	250.50	256.81	-3.15	0.5
7	50233_7716801	Confined	5,574	4/5/1994	252.80	255.48	-1.34	0.5
7	50233_7716801	Confined	5,602	5/3/1994	257.90	254.42	1.74	0.5
7	50233_7716801	Confined	5,646	6/16/1994	236.80	252.76	-7.98	0.5
7	50233_7716801	Confined	5,665	7/5/1994	226.20	252.04	-12.92	0.5
7	50233_7716801	Confined	5,849	1/5/1995	231.50	245.15	-6.83	0.5
7	50233_7716801	Confined	6,212	1/3/1996	239.20	237.60	0.80	0.5
7	50233_7716801	Confined	6,638	3/4/1997	213.25	235.61	-11.18	0.5
7	50233_7716801	Confined	6,974	2/3/1998	283.55	243.29	20.13	0.5
7	50233_7716801	Confined	7,319	1/14/1999	244.20	222.70	10.75	0.5
7	50233_7716801	Confined	8,415	1/14/2002	208.30	185.77	11.27	0.5
7	50233_7716801	Confined	8,782	1/16/2003	253.00	166.64	43.18	0.5
7	50233_7716801	Confined	9,158	1/27/2004	245.90	163.56	41.17	0.5
7	50233_7716801	Confined	9,523	1/26/2005	256.48	165.31	45.58	0.5
7	50233_7716801	Confined	9,866	1/4/2006	220.80	162.98	28.91	0.5
7	50233_7716801	Confined	10,264	2/6/2007	206.60	169.14	18.73	0.5
7	50233_7716801	Confined	10,599	1/7/2008	227.80	166.02	30.89	0.5
7	50233_7716801	Confined	10,993	2/4/2009	183.20	136.59	23.31	0.5
7	50233_7716801	Confined	11,342	1/19/2010	219.00	90.39	64.30	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50233_7716801	Confined	12,059	1/6/2012	113.00	41.75	35.63	0.5
7	50233_7716801	Confined	12,114	3/1/2012	143.80	46.47	48.66	0.5
7	50233_7716801	Confined	12,149	4/5/2012	146.10	49.48	48.31	0.5
7	50233_7716801	Confined	12,210	6/5/2012	67.40	54.73	6.34	0.5
7	50233_7716801	Confined	12,237	7/2/2012	72.50	57.05	7.73	0.5
7	50233_7716801	Confined	12,265	7/30/2012	72.60	59.45	6.57	0.5
7	50233_7716801	Confined	12,346	10/19/2012	78.20	66.41	5.89	0.5
7	50233_7716801	Confined	12,367	11/9/2012	97.30	68.22	14.54	0.5
7	50233_7716801	Confined	12,391	12/3/2012	122.60	70.28	26.16	0.5
7	50233_7716801	Confined	12,425	1/6/2013	142.30	72.74	34.78	0.5
7	50233_7716801	Confined	12,456	2/6/2013	143.40	73.01	35.19	0.5
7	50233_7716801	Confined	12,479	3/1/2013	138.60	73.22	32.69	0.5
7	50233_7716801	Confined	12,514	4/5/2013	83.60	73.53	5.04	0.5
7	50233_7716801	Confined	12,541	5/2/2013	64.70	73.76	-4.53	0.5
7	50233_7716801	Confined	12,575	6/5/2013	22.30	74.06	-25.88	0.5
7	50233_7716801	Confined	12,602	7/2/2013	34.60	74.30	-19.85	0.5
7	50233_7716801	Confined	12,632	8/1/2013	28.60	74.57	-22.98	0.5
7	50233_7716801	Confined	12,672	9/10/2013	12.20	74.92	-31.36	0.5
7	50233_7716801	Confined	12,711	10/19/2013	62.70	75.26	-6.28	0.5
7	50233_7716801	Confined	12,732	11/9/2013	76.00	75.45	0.28	0.5
7	50233_7716801	Confined	12,756	12/3/2013	113.40	75.66	18.87	0.5
7	50233_7716801	Confined	12,785	1/1/2014	129.50	75.93	26.78	0.5
7	50233_7716801	Confined	12,816	2/1/2014	135.60	76.61	29.49	0.5
7	50233_7716801	Confined	12,844	3/1/2014	121.60	77.23	22.19	0.5
7	50233_7716801	Confined	12,875	4/1/2014	94.40	77.91	8.25	0.5
7	50233_7716801	Confined	12,905	5/1/2014	20.00	78.57	-29.28	0.5
7	50233_7716801	Confined	12,936	6/1/2014	17.60	79.25	-30.82	0.5
7	50233_7716801	Confined	12,966	7/1/2014	36.80	79.91	-21.55	0.5
7	50233_7716801	Confined	12,997	8/1/2014	33.40	80.59	-23.60	0.5
7	50233_7716801	Confined	13,028	9/1/2014	-11.19	81.27	-46.23	0.5
7	50233_7716801	Confined	13,058	10/1/2014	21.70	81.93	-30.12	0.5
7	50233_7716801	Confined	13,089	11/1/2014	42.70	82.61	-19.96	0.5
7	50233_7716801	Confined	13,119	12/1/2014	77.00	83.27	-3.14	0.5
7	50233_7716801	Confined	13,150	1/1/2015	90.20	83.97	3.11	0.5
7	50233_7716801	Confined	13,181	2/1/2015	122.40	85.20	18.60	0.5
7	50233_7716801	Confined	13,209	3/1/2015	121.40	86.30	17.55	0.5
7	50233_7716801	Confined	13,240	4/1/2015	117.70	87.52	15.09	0.5
7	50233_7716801	Confined	13,270	5/1/2015	118.00	88.71	14.65	0.5
7	50233_7716801	Confined	13,301	6/1/2015	183.40	89.93	46.73	0.5
7	50233_7716801	Confined	13,331	7/1/2015	139.30	91.12	24.09	0.5
7	50233_7716801	Confined	13,362	8/1/2015	66.80	92.34	-12.77	0.5
7	50233_7716801	Confined	13,393	9/1/2015	12.70	93.56	-40.43	0.5
7	50233_7716801	Confined	13,454	11/1/2015	72.80	95.97	-11.59	0.5
7	50233_7716801	Confined	13,484	12/1/2015	108.00	97.15	5.42	0.5
7	50233_7716801	Confined	13,515	1/1/2016	125.80	98.35	13.72	0.5
7	50233_7716801	Confined	13,546	2/1/2016	155.20	98.82	28.19	0.5
7	50233_7716801	Confined	13,575	3/1/2016	135.10	99.26	17.92	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50233_7716801	Confined	13,636	5/1/2016	111.00	100.17	5.41	0.5
7	50233_7716801	Confined	13,667	6/1/2016	103.00	100.64	1.18	0.5
7	50233_7716801	Confined	13,697	7/1/2016	64.20	101.09	-18.45	0.5
7	50233_7716801	Confined	13,728	8/1/2016	39.10	101.56	-31.23	0.5
7	50233_7716801	Confined	13,759	9/1/2016	74.00	102.02	-14.01	0.5
7	50233_7716801	Confined	13,789	10/1/2016	80.80	102.47	-10.84	0.5
7	50233_7716801	Confined	13,820	11/1/2016	66.80	102.94	-18.07	0.5
7	50233_7716801	Confined	13,850	12/1/2016	123.40	103.39	10.00	0.5
7	50233_7716801	Confined	13,881	1/1/2017	172.40	103.85	34.27	0.5
7	50233_7716801	Confined	13,912	2/1/2017	137.20	104.09	16.56	0.5
7	50233_7716801	Confined	13,940	3/1/2017	169.20	104.30	32.45	0.5
7	50233_7716801	Confined	13,971	4/1/2017	126.20	104.54	10.83	0.5
7	50233_7716801	Confined	14,001	5/1/2017	83.20	104.77	-10.78	0.5
7	50233_7716801	Confined	14,032	6/1/2017	66.90	105.01	-19.05	0.5
7	50233_7716801	Confined	14,124	9/1/2017	20.60	105.71	-42.55	0.5
7	50233_7716801	Confined	14,154	10/1/2017	32.20	105.94	-36.87	0.5
7	50233_7716801	Confined	14,185	11/1/2017	69.40	106.17	-18.39	0.5
7	50233_7716801	Confined	14,215	12/1/2017	93.10	106.40	-6.65	0.5
7	50251_7721301	Confined	1,515	2/23/1983	284.55	276.99	7.56	1
7	50251_7721301	Confined	1,872	2/15/1984	287.44	280.55	6.89	1
7	50251_7721301	Confined	2,238	2/15/1985	248.90	275.20	-26.30	1
7	50251_7721301	Confined	2,606	2/18/1986	277.75	281.08	-3.33	1
7	50251_7721301	Confined	4,483	4/10/1991	252.45	284.80	-32.35	1
7	50251_7721301	Confined	4,789	2/10/1992	349.25	264.18	85.07	1
7	50251_7721301	Confined	5,860	1/16/1995	303.95	225.88	78.07	1
7	50251_7721301	Confined	6,226	1/17/1996	305.25	218.02	87.23	1
7	50251_7721301	Confined	6,654	3/20/1997	296.20	216.30	79.90	1
7	50251_7721301	Confined	6,988	2/17/1998	302.70	223.26	79.44	1
7	50251_7721301	Confined	7,323	1/18/1999	301.30	209.05	92.25	1
7	50251_7721301	Confined	8,409	1/8/2002	286.75	181.15	105.60	1
7	50251_7721301	Confined	8,782	1/16/2003	276.25	163.10	113.15	1
7	50251_7721301	Confined	9,145	1/14/2004	278.35	160.61	117.74	1
7	50251_7721301	Confined	9,516	1/19/2005	280.85	164.56	116.29	1
7	50251_7721301	Confined	9,886	1/24/2006	262.35	165.61	96.74	1
7	50251_7721301	Confined	10,280	2/22/2007	251.05	174.94	76.11	1
7	50251_7721301	Confined	10,627	2/4/2008	255.85	174.09	81.76	1
7	50251_7721301	Confined	11,008	2/19/2009	231.35	145.74	85.61	1
7	50251_7721301	Confined	11,428	4/15/2010	227.95	89.90	138.05	1
7	50257_7723106	Confined	1,872	2/15/1984	253.70	281.90	-28.20	1
7	50257_7723106	Confined	2,238	2/15/1985	262.48	277.59	-15.11	1
7	50267_7724202	Confined	1,137	2/10/1982	322.38	290.72	31.66	1
7	50267_7724202	Confined	1,514	2/22/1983	316.68	291.88	24.80	1
7	50267_7724202	Confined	1,872	2/15/1984	316.61	294.82	21.79	1
7	50267_7724202	Confined	2,238	2/15/1985	284.51	292.21	-7.70	1
7	50267_7724202	Confined	2,605	2/17/1986	308.32	298.59	9.73	1
7	50267_7724202	Confined	3,000	3/19/1987	312.57	299.71	12.86	1
7	50267_7724202	Confined	3,343	2/25/1988	307.28	301.13	6.15	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50267_7724202	Confined	3,699	2/15/1989	269.86	298.95	-29.09	1
7	50267_7724202	Confined	4,071	2/22/1990	253.33	296.10	-42.77	1
7	50267_7724202	Confined	4,484	4/11/1991	253.38	291.58	-38.20	1
7	50267_7724202	Confined	5,141	1/27/1993	292.38	265.87	26.51	1
7	50267_7724202	Confined	5,860	1/16/1995	288.58	240.56	48.02	1
7	50267_7724202	Confined	6,226	1/17/1996	284.28	232.14	52.14	1
7	50267_7724202	Confined	6,988	2/17/1998	268.48	231.58	36.90	1
7	50267_7724202	Confined	7,319	1/14/1999	266.63	215.87	50.76	1
7	50267_7724202	Confined	8,409	1/8/2002	263.58	179.65	83.93	1
7	50267_7724202	Confined	8,776	1/10/2003	268.28	162.18	106.10	1
7	50267_7724202	Confined	9,158	1/27/2004	265.38	156.49	108.89	1
7	50267_7724202	Confined	9,524	1/27/2005	267.28	155.72	111.56	1
7	50267_7724202	Confined	9,882	1/20/2006	259.78	153.01	106.77	1
7	50267_7724202	Confined	10,260	2/2/2007	256.68	156.72	99.96	1
7	50267_7724202	Confined	10,643	2/20/2008	261.08	151.72	109.36	1
7	50267_7724202	Confined	11,008	2/19/2009	249.78	128.77	121.01	1
7	50267_7724202	Confined	11,392	3/10/2010	239.38	87.87	151.51	1
7	50291_6861107	Confined	5,638	6/8/1994	380.17	387.19	-0.70	0.1
7	50294_6848401	Unconfined	6,637	3/3/1997	448.95	418.03	30.92	1
7	50294_6848401	Unconfined	6,973	2/2/1998	447.95	419.07	28.88	1
7	50295_6848510	Confined	7,750	3/20/2000	378.96	405.49	-26.53	1
7	50303_0	Confined	731	12/31/1980	340.03	348.47	-8.44	1
7	50319_6861416	Confined	10,055	7/12/2006	336.04	365.20	-29.16	1
7	50426_6855907	Confined	8,903	5/17/2003	338.08	347.90	-9.82	1
7	50426_6855907	Confined	9,136	1/5/2004	356.98	348.73	8.25	1
7	50426_6855907	Confined	9,532	2/4/2005	362.58	351.40	11.18	1
7	50426_6855907	Confined	9,872	1/10/2006	359.08	351.46	7.62	1
7	50426_6855907	Confined	10,229	1/2/2007	352.08	353.37	-1.29	1
7	50426_6855907	Confined	10,600	1/8/2008	361.08	358.11	2.97	1
7	50426_6855907	Confined	10,992	2/3/2009	360.08	354.45	5.63	1
7	50426_6855907	Confined	11,343	1/20/2010	354.58	347.67	6.91	1
7	50426_6855907	Confined	12,059	1/6/2012	343.78	332.36	11.42	1
7	50426_6855907	Confined	12,090	2/6/2012	349.58	332.91	16.67	1
7	50426_6855907	Confined	12,114	3/1/2012	350.08	333.33	16.75	1
7	50426_6855907	Confined	12,149	4/5/2012	353.28	333.95	19.33	1
7	50426_6855907	Confined	12,176	5/2/2012	347.08	334.43	12.65	1
7	50426_6855907	Confined	12,236	7/1/2012	342.38	335.49	6.89	1
7	50426_6855907	Confined	12,328	10/1/2012	343.58	337.11	6.47	1
7	50426_6855907	Confined	12,359	11/1/2012	345.38	337.66	7.72	1
7	50426_6855907	Confined	12,393	12/5/2012	336.58	338.26	-1.68	1
7	50426_6855907	Confined	12,425	1/6/2013	344.18	338.75	5.43	1
7	50426_6855907	Confined	12,456	2/6/2013	347.18	338.91	8.27	1
7	50426_6855907	Confined	12,479	3/1/2013	343.08	339.02	4.06	1
7	50426_6855907	Confined	12,576	6/6/2013	345.38	339.51	5.87	1
7	50426_6855907	Confined	12,632	8/1/2013	344.88	339.79	5.09	1
7	50426_6855907	Confined	12,724	11/1/2013	338.08	340.25	-2.17	1
7	50474_0	Confined	11,982	10/21/2011	212.02	273.05	-61.03	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50476_0	Confined	12,274	8/8/2012	190.98	260.67	-69.69	1
7	50477_0	Confined	12,458	2/8/2013	230.53	261.72	-31.19	1
7	50478_0	Confined	12,458	2/8/2013	204.84	273.09	-68.25	1
7	50479_0	Confined	11,337	1/14/2010	305.55	309.26	-3.71	1
7	50489_0	Confined	12,251	7/16/2012	374.66	335.16	39.50	1
7	50493_0	Unconfined	12,345	10/18/2012	422.47	409.42	13.05	1
7	50512_0	Confined	8,172	5/16/2001	339.12	343.28	-0.42	0.1
7	50531_0	Confined	8,537	5/16/2002	334.71	340.20	-0.55	0.1
7	50596_0	Confined	9,280	5/28/2004	352.77	373.10	-2.03	0.1
7	50599_0	Confined	9,413	10/8/2004	403.81	397.61	6.20	1
7	50602_0	Confined	8,970	7/23/2003	433.50	404.36	2.91	0.1
7	50632_0	Unconfined	9,546	2/18/2005	410.61	438.70	-28.09	1
7	50649_0	Confined	9,713	8/4/2005	361.62	364.19	-0.26	0.1
7	50659_0	Confined	9,259	5/7/2004	366.13	383.00	-16.87	1
7	50671_0	Confined	9,999	5/17/2006	358.98	378.47	-1.95	0.1
7	50676_0	Confined	10,038	6/25/2006	342.79	338.02	0.48	0.1
7	50686_0	Confined	10,131	9/26/2006	374.27	348.06	26.21	1
7	50693_0	Confined	9,012	9/3/2003	323.34	344.95	-21.61	1
7	50698_0	Confined	9,250	4/28/2004	330.59	367.43	-36.84	1
7	50703_0	Confined	10,238	1/11/2007	372.83	408.65	-3.58	0.1
7	50710_0	Confined	9,579	3/23/2005	354.26	340.76	6.75	0.5
7	50718_0	Confined	9,522	1/25/2005	352.01	365.27	-1.33	0.1
7	50732_0	Confined	9,532	2/4/2005	377.44	394.23	-8.40	0.5
7	50733_0	Confined	9,055	10/16/2003	378.07	413.87	-3.58	0.1
7	50734_0	Confined	10,575	12/14/2007	401.63	423.17	-21.54	1
7	50737_0	Confined	10,620	1/28/2008	338.46	334.19	2.13	0.5
7	50741_0	Confined	10,488	9/18/2007	354.44	399.98	-22.77	0.5
7	50743_0	Unconfined	10,692	4/9/2008	394.61	405.48	-10.87	1
7	50748_0	Confined	10,306	3/20/2007	366.76	392.78	-13.01	0.5
7	50750_0	Confined	10,553	11/22/2007	389.73	372.38	1.74	0.1
7	50781_0	Confined	10,021	6/8/2006	333.02	373.02	-4.00	0.1
7	50785_0	Confined	10,951	12/24/2008	388.02	402.21	-14.19	1
7	50790_0	Confined	10,135	9/30/2006	362.41	369.58	-7.17	1
7	50792_0	Confined	10,972	1/14/2009	355.66	355.85	-0.02	0.1
7	50796_0	Confined	10,991	2/2/2009	380.81	362.37	18.44	1
7	50798_0	Unconfined	10,936	12/9/2008	356.89	378.52	-21.63	1
7	50802_0	Confined	10,963	1/5/2009	412.80	392.02	2.08	0.1
7	50810_0	Confined	9,361	8/17/2004	396.48	428.01	-3.15	0.1
7	50820_0	Confined	11,098	5/20/2009	376.66	371.44	5.22	1
7	50827_0	Confined	10,098	8/24/2006	330.91	342.06	-1.11	0.1
7	50833_0	Confined	11,072	4/24/2009	343.90	393.72	-49.82	1
7	50834_0	Confined	9,894	2/1/2006	382.69	346.28	3.64	0.1
7	50835_0	Unconfined	9,886	1/24/2006	406.95	474.88	-67.93	1
7	50842_0	Confined	11,095	5/17/2009	261.94	359.33	-9.74	0.1
7	50855_0	Confined	9,609	4/22/2005	346.14	417.23	-7.11	0.1
7	50871_0	Confined	10,890	10/24/2008	390.85	400.70	-4.92	0.5
7	50875_0	Confined	10,911	11/14/2008	344.86	355.46	-1.06	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	50877_0	Confined	9,985	5/3/2006	361.58	338.40	23.18	1
7	50888_0	Confined	10,715	5/2/2008	353.99	365.65	-5.83	0.5
7	50907_0	Unconfined	11,675	12/18/2010	489.15	413.77	75.38	1
7	50912_0	Confined	9,657	6/9/2005	423.25	400.55	22.70	1
7	50915_0	Confined	9,630	5/13/2005	360.54	336.31	12.12	0.5
7	50939_0	Confined	10,854	9/18/2008	352.69	391.15	-38.46	1
7	50952_0	Confined	10,021	6/8/2006	325.95	355.67	-14.86	0.5
7	50960_0	Confined	11,559	8/24/2010	368.86	393.29	-12.21	0.5
7	50967_0	Confined	11,622	10/26/2010	402.38	403.97	-1.59	1
7	50972_0	Unconfined	11,655	11/28/2010	343.67	381.65	-37.98	1
7	50984_0	Confined	11,695	1/7/2011	369.83	397.80	-27.97	1
7	50993_0	Confined	11,740	2/21/2011	384.34	393.43	-4.55	0.5
7	51001_0	Confined	11,785	4/7/2011	439.45	400.55	38.90	1
7	51004_0	Confined	11,517	7/13/2010	449.68	393.34	5.63	0.1
7	51005_0	Unconfined	11,784	4/6/2011	400.59	414.08	-6.75	0.5
7	51015_0	Confined	11,819	5/11/2011	391.80	394.38	-2.58	1
7	51016_0	Confined	11,820	5/12/2011	378.11	398.28	-20.17	1
7	51018_0	Confined	11,834	5/26/2011	386.65	397.63	-5.49	0.5
7	51022_0	Confined	11,842	6/3/2011	345.11	350.29	-5.18	1
7	51030_0	Unconfined	11,913	8/13/2011	415.21	418.93	-1.86	0.5
7	51040_0	Confined	11,930	8/30/2011	410.72	392.84	8.94	0.5
7	51050_0	Unconfined	11,932	9/1/2011	452.16	435.25	16.91	1
7	51055_0	Confined	11,994	11/2/2011	347.71	369.78	-22.07	1
7	51105_0	Confined	12,184	5/10/2012	426.05	398.64	27.41	1
7	51115_0	Confined	12,192	5/18/2012	379.94	371.10	0.88	0.1
7	51117_0	Unconfined	12,224	6/19/2012	419.82	429.77	-4.97	0.5
7	51130_0	Confined	12,255	7/20/2012	269.79	328.93	-59.14	1
7	51138_0	Confined	12,273	8/7/2012	371.54	394.84	-23.30	1
7	51142_0	Confined	12,316	9/19/2012	398.92	423.16	-2.42	0.1
7	51145_0	Confined	12,283	8/17/2012	331.30	330.52	0.39	0.5
7	51152_0	Confined	12,262	7/27/2012	351.66	391.84	-40.18	1
7	51157_0	Confined	12,324	9/27/2012	373.43	392.94	-19.51	1
7	51159_0	Unconfined	12,373	11/15/2012	389.45	374.62	14.83	1
7	51173_0	Unconfined	12,347	10/20/2012	368.87	403.65	-34.78	1
7	51175_0	Confined	12,416	12/28/2012	228.93	389.64	-160.71	1
7	51181_0	Confined	12,457	2/7/2013	316.60	397.57	-80.97	1
7	51189_0	Unconfined	12,484	3/6/2013	416.80	424.54	-7.74	1
7	51249_0	Confined	12,583	6/13/2013	365.04	382.52	-8.74	0.5
7	51271_0	Confined	10,119	9/14/2006	318.21	415.68	-9.75	0.1
7	51273_0	Confined	9,872	1/10/2006	365.35	334.67	15.34	0.5
7	51285_0	Confined	9,991	5/9/2006	423.88	409.94	6.97	0.5
7	51289_0	Confined	10,157	10/22/2006	467.28	411.07	5.62	0.1
7	51300_0	Confined	12,639	8/8/2013	359.25	403.53	-4.43	0.1
7	51305_0	Confined	12,672	9/10/2013	401.18	404.62	-0.34	0.1
7	51308_0	Confined	12,674	9/12/2013	358.70	351.61	0.71	0.1
7	51314_0	Unconfined	12,694	10/2/2013	423.71	437.17	-13.46	1
7	51336_0	Confined	12,722	10/30/2013	392.06	391.80	0.13	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	51356_0	Unconfined	12,768	12/15/2013	400.49	396.17	2.16	0.5
7	51381_0	Confined	12,924	5/20/2014	341.72	333.51	4.10	0.5
7	51444_0	Confined	11,608	10/12/2010	280.43	185.24	95.19	1
7	51636_6706611	Confined	3,153	8/19/1987	537.92	391.92	73.00	0.5
7	51921_0	Confined	13,090	11/2/2014	320.57	375.83	-5.53	0.1
7	52950_6713805	Unconfined	11,224	9/23/2009	431.36	412.36	19.00	1
7	52950_6713805	Unconfined	11,330	1/7/2010	431.35	412.02	19.33	1
7	52950_6713805	Unconfined	11,492	6/18/2010	431.55	412.67	18.88	1
7	52950_6713805	Unconfined	11,692	1/4/2011	431.63	413.36	18.27	1
7	52950_6713805	Unconfined	11,848	6/9/2011	431.28	409.91	21.37	1
7	52950_6713805	Unconfined	11,945	9/14/2011	430.81	407.77	23.04	1
7	52950_6713805	Unconfined	12,077	1/24/2012	430.97	405.44	25.53	1
7	52950_6713805	Unconfined	12,225	6/20/2012	430.72	405.79	24.93	1
7	52950_6713805	Unconfined	12,325	9/28/2012	430.56	406.02	24.54	1
7	52950_6713805	Unconfined	12,679	9/17/2013	428.97	407.23	21.74	1
7	52950_6713805	Unconfined	12,793	1/9/2014	429.79	407.57	22.22	1
7	52950_6713805	Unconfined	12,952	6/17/2014	429.60	406.66	22.94	1
7	52950_6713805	Unconfined	13,043	9/16/2014	427.38	406.14	21.24	1
7	52950_6713805	Unconfined	13,168	1/19/2015	428.98	405.86	23.12	1
7	52950_6713805	Unconfined	13,322	6/22/2015	428.81	408.54	20.27	1
7	52950_6713805	Unconfined	13,533	1/19/2016	428.35	412.03	16.32	1
7	52950_6713805	Unconfined	13,682	6/16/2016	429.28	413.26	16.02	1
7	52950_6713805	Unconfined	13,889	1/9/2017	428.45	414.84	13.61	1
7	52950_6713805	Unconfined	14,045	6/14/2017	429.14	413.93	15.21	1
7	52963_6861310	Confined	773	2/11/1981	407.06	320.65	43.21	0.5
7	52963_6861310	Confined	1,167	3/12/1982	386.82	342.39	22.22	0.5
7	52963_6861310	Confined	1,501	2/9/1983	391.15	348.00	21.58	0.5
7	52963_6861310	Confined	1,878	2/21/1984	389.51	356.09	16.71	0.5
7	52963_6861310	Confined	2,229	2/6/1985	383.52	359.51	12.01	0.5
7	52963_6861310	Confined	2,598	2/10/1986	385.62	366.96	9.33	0.5
7	52963_6861310	Confined	2,997	3/16/1987	386.26	366.12	10.07	0.5
7	52963_6861310	Confined	3,335	2/17/1988	383.37	374.41	4.48	0.5
7	52963_6861310	Confined	4,083	3/6/1990	374.68	354.96	9.86	0.5
7	52975_7804508	Confined	10,784	7/10/2008	314.19	320.80	-6.61	1
7	52975_7804508	Confined	10,789	7/15/2008	315.08	320.71	-5.63	1
7	52975_7804508	Confined	10,794	7/20/2008	313.27	320.61	-7.34	1
7	52975_7804508	Confined	10,799	7/25/2008	312.75	320.52	-7.77	1
7	52975_7804508	Confined	10,804	7/30/2008	314.59	320.43	-5.84	1
7	52975_7804508	Confined	10,810	8/5/2008	313.13	320.32	-7.19	1
7	52975_7804508	Confined	10,815	8/10/2008	309.90	320.22	-10.32	1
7	52975_7804508	Confined	10,820	8/15/2008	308.73	320.13	-11.40	1
7	52975_7804508	Confined	10,825	8/20/2008	309.14	320.03	-10.89	1
7	52975_7804508	Confined	10,830	8/25/2008	313.94	319.94	-6.00	1
7	52975_7804508	Confined	10,835	8/30/2008	316.92	319.85	-2.93	1
7	52975_7804508	Confined	10,841	9/5/2008	316.86	319.73	-2.87	1
7	52975_7804508	Confined	10,846	9/10/2008	314.05	319.64	-5.59	1
7	52975_7804508	Confined	10,851	9/15/2008	314.49	319.55	-5.06	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	10,856	9/20/2008	312.05	319.45	-7.40	1
7	52975_7804508	Confined	10,861	9/25/2008	310.70	319.36	-8.66	1
7	52975_7804508	Confined	10,866	9/30/2008	307.98	319.27	-11.29	1
7	52975_7804508	Confined	10,871	10/5/2008	306.69	319.17	-12.48	1
7	52975_7804508	Confined	10,876	10/10/2008	306.32	319.08	-12.76	1
7	52975_7804508	Confined	10,881	10/15/2008	307.16	318.99	-11.83	1
7	52975_7804508	Confined	10,886	10/20/2008	309.82	318.89	-9.07	1
7	52975_7804508	Confined	10,891	10/25/2008	308.74	318.80	-10.06	1
7	52975_7804508	Confined	10,896	10/30/2008	308.89	318.70	-9.81	1
7	52975_7804508	Confined	10,902	11/5/2008	310.81	318.59	-7.78	1
7	52975_7804508	Confined	10,968	1/10/2009	320.54	317.17	3.37	1
7	52975_7804508	Confined	10,973	1/15/2009	321.41	316.98	4.43	1
7	52975_7804508	Confined	10,978	1/20/2009	321.08	316.80	4.28	1
7	52975_7804508	Confined	10,983	1/25/2009	320.24	316.61	3.63	1
7	52975_7804508	Confined	10,987	1/29/2009	320.27	316.46	3.81	1
7	52975_7804508	Confined	10,988	1/30/2009	320.37	316.43	3.94	1
7	52975_7804508	Confined	10,994	2/5/2009	318.88	316.20	2.68	1
7	52975_7804508	Confined	10,999	2/10/2009	319.77	316.02	3.75	1
7	52975_7804508	Confined	11,004	2/15/2009	314.93	315.83	-0.90	1
7	52975_7804508	Confined	11,009	2/20/2009	317.47	315.64	1.83	1
7	52975_7804508	Confined	11,014	2/25/2009	318.51	315.46	3.05	1
7	52975_7804508	Confined	11,017	2/28/2009	318.51	315.34	3.17	1
7	52975_7804508	Confined	11,022	3/5/2009	317.27	315.16	2.11	1
7	52975_7804508	Confined	11,027	3/10/2009	312.78	314.97	-2.19	1
7	52975_7804508	Confined	11,032	3/15/2009	313.89	314.78	-0.89	1
7	52975_7804508	Confined	11,037	3/20/2009	316.41	314.60	1.81	1
7	52975_7804508	Confined	11,042	3/25/2009	316.38	314.41	1.97	1
7	52975_7804508	Confined	11,047	3/30/2009	316.67	314.23	2.44	1
7	52975_7804508	Confined	11,053	4/5/2009	315.02	314.00	1.02	1
7	52975_7804508	Confined	11,058	4/10/2009	312.08	313.82	-1.74	1
7	52975_7804508	Confined	11,063	4/15/2009	311.62	313.63	-2.01	1
7	52975_7804508	Confined	11,068	4/20/2009	310.77	313.44	-2.67	1
7	52975_7804508	Confined	11,073	4/25/2009	304.71	313.26	-8.55	1
7	52975_7804508	Confined	11,078	4/30/2009	314.10	313.07	1.03	1
7	52975_7804508	Confined	11,083	5/5/2009	313.12	312.88	0.24	1
7	52975_7804508	Confined	11,088	5/10/2009	309.29	312.70	-3.41	1
7	52975_7804508	Confined	11,093	5/15/2009	302.05	312.51	-10.46	1
7	52975_7804508	Confined	11,098	5/20/2009	310.68	312.32	-1.64	1
7	52975_7804508	Confined	11,103	5/25/2009	311.60	312.14	-0.54	1
7	52975_7804508	Confined	11,108	5/30/2009	313.06	311.95	1.11	1
7	52975_7804508	Confined	11,114	6/5/2009	310.97	311.73	-0.76	1
7	52975_7804508	Confined	11,119	6/10/2009	307.86	311.54	-3.68	1
7	52975_7804508	Confined	11,124	6/15/2009	303.58	311.35	-7.77	1
7	52975_7804508	Confined	11,129	6/20/2009	294.57	311.17	-16.60	1
7	52975_7804508	Confined	11,134	6/25/2009	294.29	310.98	-16.69	1
7	52975_7804508	Confined	11,139	6/30/2009	292.25	310.79	-18.54	1
7	52975_7804508	Confined	11,144	7/5/2009	289.12	310.61	-21.49	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	11,149	7/10/2009	291.32	310.42	-19.10	1
7	52975_7804508	Confined	11,154	7/15/2009	281.45	310.24	-28.79	1
7	52975_7804508	Confined	11,159	7/20/2009	289.13	310.05	-20.92	1
7	52975_7804508	Confined	11,164	7/25/2009	285.79	309.86	-24.07	1
7	52975_7804508	Confined	11,169	7/30/2009	284.40	309.68	-25.28	1
7	52975_7804508	Confined	11,175	8/5/2009	277.43	309.45	-32.02	1
7	52975_7804508	Confined	11,180	8/10/2009	283.41	309.27	-25.86	1
7	52975_7804508	Confined	11,185	8/15/2009	279.90	309.08	-29.18	1
7	52975_7804508	Confined	11,190	8/20/2009	279.29	308.89	-29.60	1
7	52975_7804508	Confined	11,195	8/25/2009	269.38	308.71	-39.33	1
7	52975_7804508	Confined	11,200	8/30/2009	269.38	308.52	-39.14	1
7	52975_7804508	Confined	11,206	9/5/2009	276.81	308.30	-31.49	1
7	52975_7804508	Confined	11,211	9/10/2009	279.05	308.11	-29.06	1
7	52975_7804508	Confined	11,216	9/15/2009	283.67	307.92	-24.25	1
7	52975_7804508	Confined	11,221	9/20/2009	286.78	307.74	-20.96	1
7	52975_7804508	Confined	11,226	9/25/2009	289.04	307.55	-18.51	1
7	52975_7804508	Confined	11,231	9/30/2009	291.92	307.36	-15.44	1
7	52975_7804508	Confined	11,236	10/5/2009	294.83	307.18	-12.35	1
7	52975_7804508	Confined	11,241	10/10/2009	297.40	306.99	-9.59	1
7	52975_7804508	Confined	11,246	10/15/2009	298.61	306.80	-8.19	1
7	52975_7804508	Confined	11,251	10/20/2009	298.87	306.62	-7.75	1
7	52975_7804508	Confined	11,256	10/25/2009	304.28	306.43	-2.15	1
7	52975_7804508	Confined	11,261	10/30/2009	306.04	306.25	-0.21	1
7	52975_7804508	Confined	11,267	11/5/2009	307.25	306.02	1.23	1
7	52975_7804508	Confined	11,272	11/10/2009	309.47	305.83	3.64	1
7	52975_7804508	Confined	11,277	11/15/2009	311.06	305.65	5.41	1
7	52975_7804508	Confined	11,282	11/20/2009	312.35	305.46	6.89	1
7	52975_7804508	Confined	11,287	11/25/2009	313.87	305.28	8.59	1
7	52975_7804508	Confined	11,292	11/30/2009	315.65	305.09	10.56	1
7	52975_7804508	Confined	11,297	12/5/2009	314.66	304.90	9.76	1
7	52975_7804508	Confined	11,302	12/10/2009	309.52	304.72	4.80	1
7	52975_7804508	Confined	11,307	12/15/2009	318.85	304.53	14.32	1
7	52975_7804508	Confined	11,312	12/20/2009	319.43	304.34	15.09	1
7	52975_7804508	Confined	11,317	12/25/2009	320.95	304.16	16.79	1
7	52975_7804508	Confined	11,322	12/30/2009	320.73	303.97	16.76	1
7	52975_7804508	Confined	11,327	1/4/2010	314.67	303.65	11.02	1
7	52975_7804508	Confined	11,328	1/5/2010	322.64	303.59	19.05	1
7	52975_7804508	Confined	11,333	1/10/2010	322.45	303.24	19.21	1
7	52975_7804508	Confined	11,338	1/15/2010	323.79	302.89	20.90	1
7	52975_7804508	Confined	11,343	1/20/2010	325.29	302.54	22.75	1
7	52975_7804508	Confined	11,348	1/25/2010	326.14	302.19	23.95	1
7	52975_7804508	Confined	11,353	1/30/2010	326.14	301.84	24.30	1
7	52975_7804508	Confined	11,359	2/5/2010	327.91	301.43	26.48	1
7	52975_7804508	Confined	11,364	2/10/2010	328.84	301.08	27.76	1
7	52975_7804508	Confined	11,369	2/15/2010	330.08	300.73	29.35	1
7	52975_7804508	Confined	11,374	2/20/2010	330.63	300.38	30.25	1
7	52975_7804508	Confined	11,379	2/25/2010	331.52	300.03	31.49	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	11,382	2/28/2010	331.86	299.83	32.03	1
7	52975_7804508	Confined	11,387	3/5/2010	331.67	299.48	32.19	1
7	52975_7804508	Confined	11,392	3/10/2010	331.98	299.13	32.85	1
7	52975_7804508	Confined	11,397	3/15/2010	331.98	298.78	33.20	1
7	52975_7804508	Confined	11,402	3/20/2010	332.03	298.43	33.60	1
7	52975_7804508	Confined	11,407	3/25/2010	323.34	298.09	25.25	1
7	52975_7804508	Confined	11,412	3/30/2010	324.76	297.74	27.02	1
7	52975_7804508	Confined	11,418	4/5/2010	328.24	297.32	30.92	1
7	52975_7804508	Confined	11,423	4/10/2010	330.47	296.97	33.50	1
7	52975_7804508	Confined	11,428	4/15/2010	322.19	296.62	25.57	1
7	52975_7804508	Confined	11,433	4/20/2010	331.28	296.28	35.00	1
7	52975_7804508	Confined	11,438	4/25/2010	332.27	295.93	36.34	1
7	52975_7804508	Confined	11,443	4/30/2010	332.38	295.58	36.80	1
7	52975_7804508	Confined	11,448	5/5/2010	330.96	295.23	35.73	1
7	52975_7804508	Confined	11,453	5/10/2010	328.48	294.88	33.60	1
7	52975_7804508	Confined	11,458	5/15/2010	327.65	294.54	33.11	1
7	52975_7804508	Confined	11,463	5/20/2010	329.48	294.19	35.29	1
7	52975_7804508	Confined	11,468	5/25/2010	330.02	293.84	36.18	1
7	52975_7804508	Confined	11,473	5/30/2010	329.34	293.49	35.85	1
7	52975_7804508	Confined	11,479	6/5/2010	327.88	293.07	34.81	1
7	52975_7804508	Confined	11,484	6/10/2010	329.09	292.73	36.36	1
7	52975_7804508	Confined	11,489	6/15/2010	329.67	292.38	37.29	1
7	52975_7804508	Confined	11,494	6/20/2010	329.23	292.03	37.20	1
7	52975_7804508	Confined	11,499	6/25/2010	318.95	291.68	27.27	1
7	52975_7804508	Confined	11,504	6/30/2010	323.59	291.33	32.26	1
7	52975_7804508	Confined	11,509	7/5/2010	325.72	290.99	34.73	1
7	52975_7804508	Confined	11,514	7/10/2010	323.51	290.64	32.87	1
7	52975_7804508	Confined	11,519	7/15/2010	324.73	290.29	34.44	1
7	52975_7804508	Confined	11,524	7/20/2010	321.75	289.94	31.81	1
7	52975_7804508	Confined	11,529	7/25/2010	322.41	289.59	32.82	1
7	52975_7804508	Confined	11,534	7/30/2010	324.66	289.25	35.41	1
7	52975_7804508	Confined	11,540	8/5/2010	321.20	288.83	32.37	1
7	52975_7804508	Confined	11,545	8/10/2010	312.77	288.48	24.29	1
7	52975_7804508	Confined	11,550	8/15/2010	314.40	288.13	26.27	1
7	52975_7804508	Confined	11,555	8/20/2010	311.23	287.78	23.45	1
7	52975_7804508	Confined	11,560	8/25/2010	300.81	287.44	13.37	1
7	52975_7804508	Confined	11,565	8/30/2010	299.85	287.09	12.76	1
7	52975_7804508	Confined	11,571	9/5/2010	308.76	286.67	22.09	1
7	52975_7804508	Confined	11,576	9/10/2010	312.16	286.32	25.84	1
7	52975_7804508	Confined	11,581	9/15/2010	314.22	285.97	28.25	1
7	52975_7804508	Confined	11,586	9/20/2010	315.68	285.63	30.05	1
7	52975_7804508	Confined	11,591	9/25/2010	317.76	285.28	32.48	1
7	52975_7804508	Confined	11,596	9/30/2010	318.52	284.93	33.59	1
7	52975_7804508	Confined	11,601	10/5/2010	319.47	284.58	34.89	1
7	52975_7804508	Confined	11,606	10/10/2010	317.58	284.23	33.35	1
7	52975_7804508	Confined	11,611	10/15/2010	317.77	283.89	33.88	1
7	52975_7804508	Confined	11,616	10/20/2010	318.10	283.54	34.56	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	11,621	10/25/2010	314.94	283.19	31.75	1
7	52975_7804508	Confined	11,626	10/30/2010	316.78	282.84	33.94	1
7	52975_7804508	Confined	11,632	11/5/2010	317.29	282.42	34.87	1
7	52975_7804508	Confined	11,637	11/10/2010	318.08	282.08	36.00	1
7	52975_7804508	Confined	11,642	11/15/2010	318.74	281.73	37.01	1
7	52975_7804508	Confined	11,647	11/20/2010	319.47	281.38	38.09	1
7	52975_7804508	Confined	11,652	11/25/2010	320.60	281.03	39.57	1
7	52975_7804508	Confined	11,657	11/30/2010	321.47	280.68	40.79	1
7	52975_7804508	Confined	11,662	12/5/2010	321.75	280.34	41.41	1
7	52975_7804508	Confined	11,667	12/10/2010	322.34	279.99	42.35	1
7	52975_7804508	Confined	11,672	12/15/2010	322.74	279.64	43.10	1
7	52975_7804508	Confined	11,677	12/20/2010	323.07	279.29	43.78	1
7	52975_7804508	Confined	11,682	12/25/2010	321.25	278.94	42.31	1
7	52975_7804508	Confined	11,687	12/30/2010	324.27	278.59	45.68	1
7	52975_7804508	Confined	11,693	1/5/2011	325.08	278.31	46.77	1
7	52975_7804508	Confined	11,698	1/10/2011	325.61	278.10	47.51	1
7	52975_7804508	Confined	11,703	1/15/2011	326.40	277.89	48.51	1
7	52975_7804508	Confined	11,708	1/20/2011	327.23	277.68	49.55	1
7	52975_7804508	Confined	11,713	1/25/2011	328.55	277.47	51.08	1
7	52975_7804508	Confined	11,718	1/30/2011	329.55	277.25	52.30	1
7	52975_7804508	Confined	11,724	2/5/2011	329.40	277.00	52.40	1
7	52975_7804508	Confined	11,729	2/10/2011	330.18	276.79	53.39	1
7	52975_7804508	Confined	11,744	2/25/2011	328.51	276.15	52.36	1
7	52975_7804508	Confined	11,752	3/5/2011	328.32	275.81	52.51	1
7	52975_7804508	Confined	11,757	3/10/2011	327.07	275.60	51.47	1
7	52975_7804508	Confined	11,762	3/15/2011	325.48	275.39	50.09	1
7	52975_7804508	Confined	11,767	3/20/2011	322.99	275.17	47.82	1
7	52975_7804508	Confined	11,772	3/25/2011	322.59	274.96	47.63	1
7	52975_7804508	Confined	11,777	3/30/2011	320.93	274.75	46.18	1
7	52975_7804508	Confined	11,783	4/5/2011	319.44	274.50	44.94	1
7	52975_7804508	Confined	11,788	4/10/2011	307.94	274.28	33.66	1
7	52975_7804508	Confined	11,793	4/15/2011	315.03	274.07	40.96	1
7	52975_7804508	Confined	11,798	4/20/2011	311.92	273.86	38.06	1
7	52975_7804508	Confined	11,803	4/25/2011	308.61	273.65	34.96	1
7	52975_7804508	Confined	11,808	4/30/2011	306.13	273.44	32.69	1
7	52975_7804508	Confined	11,813	5/5/2011	305.26	273.22	32.04	1
7	52975_7804508	Confined	11,818	5/10/2011	303.41	273.01	30.40	1
7	52975_7804508	Confined	11,823	5/15/2011	304.70	272.80	31.90	1
7	52975_7804508	Confined	11,828	5/20/2011	305.90	272.59	33.31	1
7	52975_7804508	Confined	11,833	5/25/2011	297.04	272.38	24.66	1
7	52975_7804508	Confined	11,838	5/30/2011	297.63	272.16	25.47	1
7	52975_7804508	Confined	11,844	6/5/2011	296.82	271.91	24.91	1
7	52975_7804508	Confined	11,849	6/10/2011	291.88	271.70	20.18	1
7	52975_7804508	Confined	11,854	6/15/2011	289.59	271.49	18.10	1
7	52975_7804508	Confined	11,859	6/20/2011	285.68	271.27	14.41	1
7	52975_7804508	Confined	11,864	6/25/2011	280.50	271.06	9.44	1
7	52975_7804508	Confined	11,869	6/30/2011	280.34	270.85	9.49	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	11,874	7/5/2011	286.95	270.64	16.31	1
7	52975_7804508	Confined	11,879	7/10/2011	284.65	270.42	14.23	1
7	52975_7804508	Confined	11,884	7/15/2011	281.24	270.21	11.03	1
7	52975_7804508	Confined	11,889	7/20/2011	281.74	270.00	11.74	1
7	52975_7804508	Confined	11,894	7/25/2011	282.25	269.79	12.46	1
7	52975_7804508	Confined	11,899	7/30/2011	281.92	269.58	12.34	1
7	52975_7804508	Confined	11,905	8/5/2011	278.10	269.32	8.78	1
7	52975_7804508	Confined	11,910	8/10/2011	276.40	269.11	7.29	1
7	52975_7804508	Confined	11,915	8/15/2011	270.53	268.90	1.63	1
7	52975_7804508	Confined	11,920	8/20/2011	272.46	268.69	3.77	1
7	52975_7804508	Confined	11,925	8/25/2011	272.34	268.47	3.87	1
7	52975_7804508	Confined	11,930	8/30/2011	268.05	268.26	-0.21	1
7	52975_7804508	Confined	11,936	9/5/2011	269.76	268.01	1.75	1
7	52975_7804508	Confined	11,941	9/10/2011	268.67	267.80	0.87	1
7	52975_7804508	Confined	11,946	9/15/2011	265.34	267.58	-2.24	1
7	52975_7804508	Confined	11,951	9/20/2011	268.94	267.37	1.57	1
7	52975_7804508	Confined	11,956	9/25/2011	271.22	267.16	4.06	1
7	52975_7804508	Confined	11,961	9/30/2011	269.80	266.95	2.85	1
7	52975_7804508	Confined	11,966	10/5/2011	261.44	266.74	-5.30	1
7	52975_7804508	Confined	11,971	10/10/2011	270.13	266.52	3.61	1
7	52975_7804508	Confined	11,976	10/15/2011	274.28	266.31	7.97	1
7	52975_7804508	Confined	11,981	10/20/2011	275.82	266.10	9.72	1
7	52975_7804508	Confined	11,986	10/25/2011	275.51	265.89	9.62	1
7	52975_7804508	Confined	11,991	10/30/2011	275.83	265.67	10.16	1
7	52975_7804508	Confined	11,997	11/5/2011	276.33	265.42	10.91	1
7	52975_7804508	Confined	12,002	11/10/2011	279.13	265.21	13.92	1
7	52975_7804508	Confined	12,007	11/15/2011	280.88	265.00	15.88	1
7	52975_7804508	Confined	12,012	11/20/2011	283.16	264.78	18.38	1
7	52975_7804508	Confined	12,017	11/25/2011	283.93	264.57	19.36	1
7	52975_7804508	Confined	12,022	11/30/2011	287.39	264.36	23.03	1
7	52975_7804508	Confined	12,027	12/5/2011	288.85	264.15	24.70	1
7	52975_7804508	Confined	12,032	12/10/2011	290.49	263.94	26.55	1
7	52975_7804508	Confined	12,037	12/15/2011	289.77	263.72	26.05	1
7	52975_7804508	Confined	12,042	12/20/2011	293.60	263.51	30.09	1
7	52975_7804508	Confined	12,047	12/25/2011	296.43	263.30	33.13	1
7	52975_7804508	Confined	12,052	12/30/2011	298.47	263.09	35.38	1
7	52975_7804508	Confined	12,058	1/5/2012	300.12	263.42	36.70	1
7	52975_7804508	Confined	12,063	1/10/2012	301.60	263.80	37.80	1
7	52975_7804508	Confined	12,068	1/15/2012	302.31	264.17	38.14	1
7	52975_7804508	Confined	12,073	1/20/2012	302.22	264.55	37.67	1
7	52975_7804508	Confined	12,078	1/25/2012	302.97	264.93	38.04	1
7	52975_7804508	Confined	12,083	1/30/2012	303.48	265.30	38.18	1
7	52975_7804508	Confined	12,089	2/5/2012	305.06	265.75	39.31	1
7	52975_7804508	Confined	12,091	2/7/2012	307.53	265.90	41.63	1
7	52975_7804508	Confined	12,094	2/10/2012	306.38	266.13	40.25	1
7	52975_7804508	Confined	12,099	2/15/2012	307.44	266.50	40.94	1
7	52975_7804508	Confined	12,104	2/20/2012	307.37	266.88	40.49	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	12,109	2/25/2012	302.57	267.26	35.31	1
7	52975_7804508	Confined	12,112	2/28/2012	302.57	267.48	35.09	1
7	52975_7804508	Confined	12,123	3/10/2012	310.14	268.31	41.83	1
7	52975_7804508	Confined	12,128	3/15/2012	311.19	268.68	42.51	1
7	52975_7804508	Confined	12,138	3/25/2012	310.58	269.44	41.14	1
7	52975_7804508	Confined	12,149	4/5/2012	312.17	270.26	41.91	1
7	52975_7804508	Confined	12,154	4/10/2012	310.37	270.64	39.73	1
7	52975_7804508	Confined	12,159	4/15/2012	309.43	271.01	38.42	1
7	52975_7804508	Confined	12,164	4/20/2012	304.41	271.39	33.02	1
7	52975_7804508	Confined	12,169	4/25/2012	304.17	271.77	32.40	1
7	52975_7804508	Confined	12,174	4/30/2012	298.83	272.14	26.69	1
7	52975_7804508	Confined	12,179	5/5/2012	297.47	272.52	24.95	1
7	52975_7804508	Confined	12,184	5/10/2012	300.88	272.89	27.99	1
7	52975_7804508	Confined	12,189	5/15/2012	303.51	273.27	30.24	1
7	52975_7804508	Confined	12,194	5/20/2012	304.79	273.65	31.14	1
7	52975_7804508	Confined	12,199	5/25/2012	304.18	274.02	30.16	1
7	52975_7804508	Confined	12,204	5/30/2012	299.99	274.40	25.59	1
7	52975_7804508	Confined	12,210	6/5/2012	296.72	274.85	21.87	1
7	52975_7804508	Confined	12,215	6/10/2012	287.60	275.23	12.37	1
7	52975_7804508	Confined	12,220	6/15/2012	291.73	275.60	16.13	1
7	52975_7804508	Confined	12,225	6/20/2012	288.69	275.98	12.71	1
7	52975_7804508	Confined	12,230	6/25/2012	285.23	276.35	8.88	1
7	52975_7804508	Confined	12,235	6/30/2012	285.23	276.73	8.50	1
7	52975_7804508	Confined	12,240	7/5/2012	278.47	277.10	1.37	1
7	52975_7804508	Confined	12,245	7/10/2012	285.71	277.48	8.23	1
7	52975_7804508	Confined	12,250	7/15/2012	288.53	277.86	10.67	1
7	52975_7804508	Confined	12,255	7/20/2012	288.52	278.23	10.29	1
7	52975_7804508	Confined	12,260	7/25/2012	287.41	278.61	8.80	1
7	52975_7804508	Confined	12,265	7/30/2012	277.45	278.98	-1.53	1
7	52975_7804508	Confined	12,271	8/5/2012	274.68	279.44	-4.76	1
7	52975_7804508	Confined	12,276	8/10/2012	277.64	279.81	-2.17	1
7	52975_7804508	Confined	12,281	8/15/2012	275.80	280.19	-4.39	1
7	52975_7804508	Confined	12,286	8/20/2012	276.38	280.56	-4.18	1
7	52975_7804508	Confined	12,291	8/25/2012	277.22	280.94	-3.72	1
7	52975_7804508	Confined	12,296	8/30/2012	271.20	281.31	-10.11	1
7	52975_7804508	Confined	12,302	9/5/2012	269.32	281.77	-12.45	1
7	52975_7804508	Confined	12,307	9/10/2012	272.12	282.14	-10.02	1
7	52975_7804508	Confined	12,312	9/15/2012	271.42	282.52	-11.10	1
7	52975_7804508	Confined	12,317	9/20/2012	276.35	282.89	-6.54	1
7	52975_7804508	Confined	12,322	9/25/2012	279.42	283.27	-3.85	1
7	52975_7804508	Confined	12,327	9/30/2012	280.89	283.65	-2.76	1
7	52975_7804508	Confined	12,332	10/5/2012	284.02	284.02	0.00	1
7	52975_7804508	Confined	12,337	10/10/2012	286.35	284.40	1.95	1
7	52975_7804508	Confined	12,342	10/15/2012	287.64	284.77	2.87	1
7	52975_7804508	Confined	12,347	10/20/2012	286.76	285.15	1.61	1
7	52975_7804508	Confined	12,352	10/25/2012	286.79	285.53	1.26	1
7	52975_7804508	Confined	12,357	10/30/2012	288.05	285.90	2.15	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	12,363	11/5/2012	290.45	286.35	4.10	1
7	52975_7804508	Confined	12,368	11/10/2012	292.64	286.73	5.91	1
7	52975_7804508	Confined	12,373	11/15/2012	290.64	287.10	3.54	1
7	52975_7804508	Confined	12,383	11/25/2012	294.00	287.86	6.14	1
7	52975_7804508	Confined	12,388	11/30/2012	293.80	288.23	5.57	1
7	52975_7804508	Confined	12,393	12/5/2012	294.67	288.61	6.06	1
7	52975_7804508	Confined	12,398	12/10/2012	293.63	288.98	4.65	1
7	52975_7804508	Confined	12,403	12/15/2012	296.33	289.36	6.97	1
7	52975_7804508	Confined	12,408	12/20/2012	289.18	289.74	-0.56	1
7	52975_7804508	Confined	12,413	12/25/2012	290.63	290.11	0.52	1
7	52975_7804508	Confined	12,418	12/30/2012	296.74	290.49	6.25	1
7	52975_7804508	Confined	12,424	1/5/2013	298.06	290.66	7.40	1
7	52975_7804508	Confined	12,429	1/10/2013	298.30	290.75	7.55	1
7	52975_7804508	Confined	12,433	1/14/2013	299.30	290.83	8.47	1
7	52975_7804508	Confined	12,434	1/15/2013	299.21	290.85	8.36	1
7	52975_7804508	Confined	12,439	1/20/2013	299.87	290.95	8.92	1
7	52975_7804508	Confined	12,444	1/25/2013	300.26	291.04	9.22	1
7	52975_7804508	Confined	12,449	1/30/2013	293.02	291.14	1.88	1
7	52975_7804508	Confined	12,455	2/5/2013	300.24	291.25	8.99	1
7	52975_7804508	Confined	12,460	2/10/2013	300.85	291.35	9.50	1
7	52975_7804508	Confined	12,465	2/15/2013	301.12	291.45	9.67	1
7	52975_7804508	Confined	12,470	2/20/2013	301.16	291.54	9.62	1
7	52975_7804508	Confined	12,475	2/25/2013	301.34	291.64	9.70	1
7	52975_7804508	Confined	12,478	2/28/2013	301.34	291.69	9.65	1
7	52975_7804508	Confined	12,483	3/5/2013	298.61	291.79	6.82	1
7	52975_7804508	Confined	12,488	3/10/2013	298.12	291.89	6.23	1
7	52975_7804508	Confined	12,493	3/15/2013	287.49	291.98	-4.49	1
7	52975_7804508	Confined	12,498	3/20/2013	289.88	292.08	-2.20	1
7	52975_7804508	Confined	12,503	3/25/2013	289.92	292.17	-2.25	1
7	52975_7804508	Confined	12,508	3/30/2013	289.37	292.27	-2.90	1
7	52975_7804508	Confined	12,514	4/5/2013	288.78	292.39	-3.61	1
7	52975_7804508	Confined	12,519	4/10/2013	288.90	292.48	-3.58	1
7	52975_7804508	Confined	12,524	4/15/2013	289.53	292.58	-3.05	1
7	52975_7804508	Confined	12,529	4/20/2013	288.62	292.67	-4.05	1
7	52975_7804508	Confined	12,534	4/25/2013	287.75	292.77	-5.02	1
7	52975_7804508	Confined	12,539	4/30/2013	287.45	292.87	-5.42	1
7	52975_7804508	Confined	12,544	5/5/2013	287.89	292.96	-5.07	1
7	52975_7804508	Confined	12,549	5/10/2013	280.44	293.06	-12.62	1
7	52975_7804508	Confined	12,554	5/15/2013	287.53	293.15	-5.62	1
7	52975_7804508	Confined	12,559	5/20/2013	283.18	293.25	-10.07	1
7	52975_7804508	Confined	12,564	5/25/2013	279.05	293.35	-14.30	1
7	52975_7804508	Confined	12,569	5/30/2013	282.32	293.44	-11.12	1
7	52975_7804508	Confined	12,575	6/5/2013	279.09	293.56	-14.47	1
7	52975_7804508	Confined	12,580	6/10/2013	279.03	293.65	-14.62	1
7	52975_7804508	Confined	12,585	6/15/2013	280.71	293.75	-13.04	1
7	52975_7804508	Confined	12,590	6/20/2013	283.33	293.84	-10.51	1
7	52975_7804508	Confined	12,595	6/25/2013	282.09	293.94	-11.85	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	12,600	6/30/2013	278.29	294.04	-15.75	1
7	52975_7804508	Confined	12,605	7/5/2013	279.30	294.13	-14.83	1
7	52975_7804508	Confined	12,610	7/10/2013	276.80	294.23	-17.43	1
7	52975_7804508	Confined	12,615	7/15/2013	275.07	294.32	-19.25	1
7	52975_7804508	Confined	12,620	7/20/2013	276.62	294.42	-17.80	1
7	52975_7804508	Confined	12,625	7/25/2013	277.36	294.52	-17.16	1
7	52975_7804508	Confined	12,630	7/30/2013	273.22	294.61	-21.39	1
7	52975_7804508	Confined	12,636	8/5/2013	261.94	294.73	-32.79	1
7	52975_7804508	Confined	12,641	8/10/2013	258.24	294.82	-36.58	1
7	52975_7804508	Confined	12,646	8/15/2013	255.46	294.92	-39.46	1
7	52975_7804508	Confined	12,651	8/20/2013	254.84	295.02	-40.18	1
7	52975_7804508	Confined	12,656	8/25/2013	255.46	295.11	-39.65	1
7	52975_7804508	Confined	12,661	8/30/2013	262.62	295.21	-32.59	1
7	52975_7804508	Confined	12,667	9/5/2013	260.05	295.32	-35.27	1
7	52975_7804508	Confined	12,672	9/10/2013	251.94	295.42	-43.48	1
7	52975_7804508	Confined	12,677	9/15/2013	261.61	295.51	-33.90	1
7	52975_7804508	Confined	12,682	9/20/2013	263.33	295.61	-32.28	1
7	52975_7804508	Confined	12,687	9/25/2013	266.55	295.71	-29.16	1
7	52975_7804508	Confined	12,692	9/30/2013	266.03	295.80	-29.77	1
7	52975_7804508	Confined	12,697	10/5/2013	268.01	295.90	-27.89	1
7	52975_7804508	Confined	12,702	10/10/2013	272.02	295.99	-23.97	1
7	52975_7804508	Confined	12,707	10/15/2013	268.81	296.09	-27.28	1
7	52975_7804508	Confined	12,712	10/20/2013	275.87	296.19	-20.32	1
7	52975_7804508	Confined	12,717	10/25/2013	277.97	296.28	-18.31	1
7	52975_7804508	Confined	12,722	10/30/2013	278.37	296.38	-18.01	1
7	52975_7804508	Confined	12,728	11/5/2013	279.33	296.49	-17.16	1
7	52975_7804508	Confined	12,730	11/7/2013	280.28	296.53	-16.25	1
7	52975_7804508	Confined	12,733	11/10/2013	275.46	296.59	-21.13	1
7	52975_7804508	Confined	12,738	11/15/2013	280.82	296.69	-15.87	1
7	52975_7804508	Confined	12,743	11/20/2013	275.32	296.78	-21.46	1
7	52975_7804508	Confined	12,748	11/25/2013	282.53	296.88	-14.35	1
7	52975_7804508	Confined	12,753	11/30/2013	283.68	296.97	-13.29	1
7	52975_7804508	Confined	12,758	12/5/2013	282.44	297.07	-14.63	1
7	52975_7804508	Confined	12,763	12/10/2013	286.50	297.17	-10.67	1
7	52975_7804508	Confined	12,768	12/15/2013	287.63	297.26	-9.63	1
7	52975_7804508	Confined	12,773	12/20/2013	288.68	297.36	-8.68	1
7	52975_7804508	Confined	12,778	12/25/2013	289.38	297.45	-8.07	1
7	52975_7804508	Confined	12,783	12/30/2013	290.39	297.55	-7.16	1
7	52975_7804508	Confined	12,789	1/5/2014	291.50	297.66	-6.16	1
7	52975_7804508	Confined	12,794	1/10/2014	292.53	297.75	-5.22	1
7	52975_7804508	Confined	12,799	1/15/2014	291.75	297.84	-6.09	1
7	52975_7804508	Confined	12,804	1/20/2014	290.81	297.93	-7.12	1
7	52975_7804508	Confined	12,809	1/25/2014	290.66	298.02	-7.36	1
7	52975_7804508	Confined	12,814	1/30/2014	290.09	298.11	-8.02	1
7	52975_7804508	Confined	12,820	2/5/2014	282.92	298.22	-15.30	1
7	52975_7804508	Confined	12,825	2/10/2014	285.72	298.31	-12.59	1
7	52975_7804508	Confined	12,830	2/15/2014	291.00	298.40	-7.40	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	12,835	2/20/2014	285.84	298.49	-12.65	1
7	52975_7804508	Confined	12,840	2/25/2014	288.02	298.58	-10.56	1
7	52975_7804508	Confined	12,843	2/28/2014	288.86	298.63	-9.77	1
7	52975_7804508	Confined	12,848	3/5/2014	288.96	298.72	-9.76	1
7	52975_7804508	Confined	12,853	3/10/2014	288.96	298.81	-9.85	1
7	52975_7804508	Confined	12,858	3/15/2014	288.72	298.90	-10.18	1
7	52975_7804508	Confined	12,863	3/20/2014	288.24	298.99	-10.75	1
7	52975_7804508	Confined	12,868	3/25/2014	287.55	299.08	-11.53	1
7	52975_7804508	Confined	12,873	3/30/2014	286.00	299.17	-13.17	1
7	52975_7804508	Confined	12,879	4/5/2014	284.41	299.28	-14.87	1
7	52975_7804508	Confined	12,884	4/10/2014	284.09	299.37	-15.28	1
7	52975_7804508	Confined	12,889	4/15/2014	281.25	299.46	-18.21	1
7	52975_7804508	Confined	12,894	4/20/2014	279.41	299.55	-20.14	1
7	52975_7804508	Confined	12,899	4/25/2014	277.60	299.64	-22.04	1
7	52975_7804508	Confined	12,904	4/30/2014	275.49	299.73	-24.24	1
7	52975_7804508	Confined	12,909	5/5/2014	273.17	299.82	-26.65	1
7	52975_7804508	Confined	12,914	5/10/2014	272.81	299.91	-27.10	1
7	52975_7804508	Confined	12,919	5/15/2014	274.71	300.00	-25.29	1
7	52975_7804508	Confined	12,924	5/20/2014	275.63	300.09	-24.46	1
7	52975_7804508	Confined	12,929	5/25/2014	274.29	300.18	-25.89	1
7	52975_7804508	Confined	12,934	5/30/2014	275.65	300.27	-24.62	1
7	52975_7804508	Confined	12,940	6/5/2014	276.61	300.38	-23.77	1
7	52975_7804508	Confined	12,945	6/10/2014	274.52	300.47	-25.95	1
7	52975_7804508	Confined	12,950	6/15/2014	273.51	300.55	-27.04	1
7	52975_7804508	Confined	12,955	6/20/2014	271.68	300.64	-28.96	1
7	52975_7804508	Confined	12,960	6/25/2014	263.36	300.73	-37.37	1
7	52975_7804508	Confined	12,965	6/30/2014	244.47	300.82	-56.35	1
7	52975_7804508	Confined	12,970	7/5/2014	251.93	300.91	-48.98	1
7	52975_7804508	Confined	12,975	7/10/2014	193.97	301.00	-107.03	1
7	52975_7804508	Confined	12,980	7/15/2014	183.22	301.09	-117.87	1
7	52975_7804508	Confined	12,989	7/24/2014	263.13	301.26	-38.13	1
7	52975_7804508	Confined	12,990	7/25/2014	262.96	301.27	-38.31	1
7	52975_7804508	Confined	12,995	7/30/2014	229.30	301.36	-72.06	1
7	52975_7804508	Confined	13,001	8/5/2014	220.56	301.47	-80.91	1
7	52975_7804508	Confined	13,006	8/10/2014	254.93	301.56	-46.63	1
7	52975_7804508	Confined	13,011	8/15/2014	188.18	301.65	-113.47	1
7	52975_7804508	Confined	13,016	8/20/2014	248.30	301.74	-53.44	1
7	52975_7804508	Confined	13,021	8/25/2014	246.17	301.83	-55.66	1
7	52975_7804508	Confined	13,026	8/30/2014	243.45	301.92	-58.47	1
7	52975_7804508	Confined	13,032	9/5/2014	242.26	302.03	-59.77	1
7	52975_7804508	Confined	13,037	9/10/2014	244.96	302.12	-57.16	1
7	52975_7804508	Confined	13,042	9/15/2014	246.44	302.21	-55.77	1
7	52975_7804508	Confined	13,047	9/20/2014	248.68	302.30	-53.62	1
7	52975_7804508	Confined	13,052	9/25/2014	248.64	302.39	-53.75	1
7	52975_7804508	Confined	13,057	9/30/2014	251.02	302.48	-51.46	1
7	52975_7804508	Confined	13,062	10/5/2014	251.01	302.57	-51.56	1
7	52975_7804508	Confined	13,066	10/9/2014	251.02	302.64	-51.62	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	13,067	10/10/2014	253.78	302.66	-48.88	1
7	52975_7804508	Confined	13,072	10/15/2014	253.71	302.75	-49.04	1
7	52975_7804508	Confined	13,077	10/20/2014	260.43	302.84	-42.41	1
7	52975_7804508	Confined	13,082	10/25/2014	260.43	302.93	-42.50	1
7	52975_7804508	Confined	13,087	10/30/2014	260.40	303.02	-42.62	1
7	52975_7804508	Confined	13,093	11/5/2014	265.43	303.13	-37.70	1
7	52975_7804508	Confined	13,098	11/10/2014	273.62	303.22	-29.60	1
7	52975_7804508	Confined	13,103	11/15/2014	278.85	303.31	-24.46	1
7	52975_7804508	Confined	13,108	11/20/2014	283.16	303.40	-20.24	1
7	52975_7804508	Confined	13,113	11/25/2014	287.95	303.49	-15.54	1
7	52975_7804508	Confined	13,118	11/30/2014	293.06	303.58	-10.52	1
7	52975_7804508	Confined	13,123	12/5/2014	296.82	303.67	-6.85	1
7	52975_7804508	Confined	13,128	12/10/2014	300.28	303.76	-3.48	1
7	52975_7804508	Confined	13,133	12/15/2014	304.69	303.85	0.84	1
7	52975_7804508	Confined	13,138	12/20/2014	307.21	303.94	3.27	1
7	52975_7804508	Confined	13,143	12/25/2014	311.87	304.03	7.84	1
7	52975_7804508	Confined	13,148	12/30/2014	315.64	304.12	11.52	1
7	52975_7804508	Confined	13,154	1/5/2015	319.26	304.30	14.96	1
7	52975_7804508	Confined	13,159	1/10/2015	322.76	304.46	18.30	1
7	52975_7804508	Confined	13,164	1/15/2015	325.77	304.62	21.15	1
7	52975_7804508	Confined	13,169	1/20/2015	328.03	304.78	23.25	1
7	52975_7804508	Confined	13,174	1/25/2015	330.41	304.94	25.47	1
7	52975_7804508	Confined	13,179	1/30/2015	331.00	305.10	25.90	1
7	52975_7804508	Confined	13,185	2/5/2015	332.45	305.29	27.16	1
7	52975_7804508	Confined	13,190	2/10/2015	334.76	305.45	29.31	1
7	52975_7804508	Confined	13,205	2/25/2015	279.22	305.94	-26.72	1
7	52975_7804508	Confined	13,208	2/28/2015	279.00	306.03	-27.03	1
7	52975_7804508	Confined	13,213	3/5/2015	279.37	306.19	-26.82	1
7	52975_7804508	Confined	13,218	3/10/2015	279.47	306.35	-26.88	1
7	52975_7804508	Confined	13,223	3/15/2015	280.24	306.52	-26.28	1
7	52975_7804508	Confined	13,228	3/20/2015	281.06	306.68	-25.62	1
7	52975_7804508	Confined	13,233	3/25/2015	281.81	306.84	-25.03	1
7	52975_7804508	Confined	13,238	3/30/2015	282.10	307.00	-24.90	1
7	52975_7804508	Confined	13,244	4/5/2015	282.33	307.19	-24.86	1
7	52975_7804508	Confined	13,249	4/10/2015	281.96	307.35	-25.39	1
7	52975_7804508	Confined	13,254	4/15/2015	282.03	307.51	-25.48	1
7	52975_7804508	Confined	13,259	4/20/2015	283.01	307.67	-24.66	1
7	52975_7804508	Confined	13,264	4/25/2015	284.27	307.83	-23.56	1
7	52975_7804508	Confined	13,269	4/30/2015	284.87	308.00	-23.13	1
7	52975_7804508	Confined	13,274	5/5/2015	285.07	308.16	-23.09	1
7	52975_7804508	Confined	13,279	5/10/2015	285.35	308.32	-22.97	1
7	52975_7804508	Confined	13,284	5/15/2015	285.76	308.48	-22.72	1
7	52975_7804508	Confined	13,289	5/20/2015	286.63	308.64	-22.01	1
7	52975_7804508	Confined	13,294	5/25/2015	287.77	308.80	-21.03	1
7	52975_7804508	Confined	13,299	5/30/2015	288.35	308.96	-20.61	1
7	52975_7804508	Confined	13,305	6/5/2015	288.51	309.15	-20.64	1
7	52975_7804508	Confined	13,310	6/10/2015	288.07	309.31	-21.24	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	13,315	6/15/2015	286.50	309.48	-22.98	1
7	52975_7804508	Confined	13,320	6/20/2015	286.56	309.64	-23.08	1
7	52975_7804508	Confined	13,325	6/25/2015	287.39	309.80	-22.41	1
7	52975_7804508	Confined	13,330	6/30/2015	287.74	309.96	-22.22	1
7	52975_7804508	Confined	13,335	7/5/2015	288.04	310.12	-22.08	1
7	52975_7804508	Confined	13,340	7/10/2015	287.28	310.28	-23.00	1
7	52975_7804508	Confined	13,345	7/15/2015	285.34	310.44	-25.10	1
7	52975_7804508	Confined	13,350	7/20/2015	282.76	310.60	-27.84	1
7	52975_7804508	Confined	13,355	7/25/2015	278.95	310.76	-31.81	1
7	52975_7804508	Confined	13,360	7/30/2015	276.04	310.92	-34.88	1
7	52975_7804508	Confined	13,366	8/5/2015	272.33	311.12	-38.79	1
7	52975_7804508	Confined	13,371	8/10/2015	267.71	311.28	-43.57	1
7	52975_7804508	Confined	13,376	8/15/2015	264.35	311.44	-47.09	1
7	52975_7804508	Confined	13,381	8/20/2015	264.09	311.60	-47.51	1
7	52975_7804508	Confined	13,386	8/25/2015	264.75	311.76	-47.01	1
7	52975_7804508	Confined	13,391	8/30/2015	264.69	311.92	-47.23	1
7	52975_7804508	Confined	13,397	9/5/2015	262.50	312.11	-49.61	1
7	52975_7804508	Confined	13,402	9/10/2015	260.95	312.27	-51.32	1
7	52975_7804508	Confined	13,407	9/15/2015	264.24	312.43	-48.19	1
7	52975_7804508	Confined	13,412	9/20/2015	264.82	312.60	-47.78	1
7	52975_7804508	Confined	13,417	9/25/2015	264.26	312.76	-48.50	1
7	52975_7804508	Confined	13,422	9/30/2015	264.30	312.92	-48.62	1
7	52975_7804508	Confined	13,427	10/5/2015	264.52	313.08	-48.56	1
7	52975_7804508	Confined	13,432	10/10/2015	264.74	313.24	-48.50	1
7	52975_7804508	Confined	13,437	10/15/2015	264.46	313.40	-48.94	1
7	52975_7804508	Confined	13,442	10/20/2015	264.27	313.56	-49.29	1
7	52975_7804508	Confined	13,447	10/25/2015	267.09	313.72	-46.63	1
7	52975_7804508	Confined	13,452	10/30/2015	270.21	313.88	-43.67	1
7	52975_7804508	Confined	13,458	11/5/2015	272.92	314.08	-41.16	1
7	52975_7804508	Confined	13,463	11/10/2015	275.29	314.24	-38.95	1
7	52975_7804508	Confined	13,468	11/15/2015	276.45	314.40	-37.95	1
7	52975_7804508	Confined	13,473	11/20/2015	277.30	314.56	-37.26	1
7	52975_7804508	Confined	13,478	11/25/2015	277.67	314.72	-37.05	1
7	52975_7804508	Confined	13,483	11/30/2015	280.08	314.88	-34.80	1
7	52975_7804508	Confined	13,488	12/5/2015	281.41	315.04	-33.63	1
7	52975_7804508	Confined	13,493	12/10/2015	282.88	315.20	-32.32	1
7	52975_7804508	Confined	13,498	12/15/2015	283.77	315.36	-31.59	1
7	52975_7804508	Confined	13,503	12/20/2015	284.53	315.52	-30.99	1
7	52975_7804508	Confined	13,508	12/25/2015	285.81	315.68	-29.87	1
7	52975_7804508	Confined	13,513	12/30/2015	286.92	315.84	-28.92	1
7	52975_7804508	Confined	13,519	1/5/2016	288.31	315.99	-27.68	1
7	52975_7804508	Confined	13,524	1/10/2016	289.18	316.10	-26.92	1
7	52975_7804508	Confined	13,529	1/15/2016	290.13	316.21	-26.08	1
7	52975_7804508	Confined	13,534	1/20/2016	290.68	316.32	-25.64	1
7	52975_7804508	Confined	13,539	1/25/2016	291.31	316.43	-25.12	1
7	52975_7804508	Confined	13,544	1/30/2016	291.46	316.54	-25.08	1
7	52975_7804508	Confined	13,550	2/5/2016	291.33	316.67	-25.34	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	13,555	2/10/2016	290.87	316.78	-25.91	1
7	52975_7804508	Confined	13,560	2/15/2016	289.83	316.90	-27.07	1
7	52975_7804508	Confined	13,565	2/20/2016	288.43	317.01	-28.58	1
7	52975_7804508	Confined	13,570	2/25/2016	289.20	317.12	-27.92	1
7	52975_7804508	Confined	13,579	3/5/2016	291.27	317.32	-26.05	1
7	52975_7804508	Confined	13,584	3/10/2016	292.43	317.43	-25.00	1
7	52975_7804508	Confined	13,589	3/15/2016	293.65	317.54	-23.89	1
7	52975_7804508	Confined	13,594	3/20/2016	294.85	317.65	-22.80	1
7	52975_7804508	Confined	13,599	3/25/2016	295.78	317.76	-21.98	1
7	52975_7804508	Confined	13,604	3/30/2016	296.17	317.87	-21.70	1
7	52975_7804508	Confined	13,610	4/5/2016	295.21	318.00	-22.79	1
7	52975_7804508	Confined	13,615	4/10/2016	293.74	318.11	-24.37	1
7	52975_7804508	Confined	13,620	4/15/2016	293.78	318.22	-24.44	1
7	52975_7804508	Confined	13,625	4/20/2016	295.26	318.33	-23.07	1
7	52975_7804508	Confined	13,630	4/25/2016	295.95	318.44	-22.49	1
7	52975_7804508	Confined	13,635	4/30/2016	296.04	318.56	-22.52	1
7	52975_7804508	Confined	13,640	5/5/2016	295.97	318.67	-22.70	1
7	52975_7804508	Confined	13,645	5/10/2016	293.13	318.78	-25.65	1
7	52975_7804508	Confined	13,650	5/15/2016	290.83	318.89	-28.06	1
7	52975_7804508	Confined	13,655	5/20/2016	292.92	319.00	-26.08	1
7	52975_7804508	Confined	13,660	5/25/2016	294.51	319.11	-24.60	1
7	52975_7804508	Confined	13,665	5/30/2016	294.70	319.22	-24.52	1
7	52975_7804508	Confined	13,671	6/5/2016	296.19	319.35	-23.16	1
7	52975_7804508	Confined	13,676	6/10/2016	296.87	319.46	-22.59	1
7	52975_7804508	Confined	13,681	6/15/2016	296.28	319.57	-23.29	1
7	52975_7804508	Confined	13,686	6/20/2016	292.48	319.68	-27.20	1
7	52975_7804508	Confined	13,691	6/25/2016	290.46	319.80	-29.34	1
7	52975_7804508	Confined	13,696	6/30/2016	289.30	319.91	-30.61	1
7	52975_7804508	Confined	13,701	7/5/2016	285.56	320.02	-34.46	1
7	52975_7804508	Confined	13,706	7/10/2016	282.06	320.13	-38.07	1
7	52975_7804508	Confined	13,711	7/15/2016	278.50	320.24	-41.74	1
7	52975_7804508	Confined	13,716	7/20/2016	275.40	320.35	-44.95	1
7	52975_7804508	Confined	13,721	7/25/2016	273.57	320.46	-46.89	1
7	52975_7804508	Confined	13,726	7/30/2016	276.86	320.57	-43.71	1
7	52975_7804508	Confined	13,732	8/5/2016	278.35	320.70	-42.35	1
7	52975_7804508	Confined	13,737	8/10/2016	275.71	320.81	-45.10	1
7	52975_7804508	Confined	13,742	8/15/2016	274.05	320.92	-46.87	1
7	52975_7804508	Confined	13,747	8/20/2016	277.93	321.04	-43.11	1
7	52975_7804508	Confined	13,752	8/25/2016	280.46	321.15	-40.69	1
7	52975_7804508	Confined	13,763	9/5/2016	284.67	321.39	-36.72	1
7	52975_7804508	Confined	13,768	9/10/2016	285.68	321.50	-35.82	1
7	52975_7804508	Confined	13,773	9/15/2016	285.45	321.61	-36.16	1
7	52975_7804508	Confined	13,778	9/20/2016	284.21	321.72	-37.51	1
7	52975_7804508	Confined	13,783	9/25/2016	283.56	321.83	-38.27	1
7	52975_7804508	Confined	13,788	9/30/2016	284.82	321.94	-37.12	1
7	52975_7804508	Confined	13,793	10/5/2016	286.09	322.05	-35.96	1
7	52975_7804508	Confined	13,798	10/10/2016	285.87	322.16	-36.29	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	13,800	10/12/2016	285.95	322.21	-36.26	1
7	52975_7804508	Confined	13,803	10/15/2016	285.41	322.27	-36.86	1
7	52975_7804508	Confined	13,808	10/20/2016	284.16	322.39	-38.23	1
7	52975_7804508	Confined	13,813	10/25/2016	284.30	322.50	-38.20	1
7	52975_7804508	Confined	13,818	10/30/2016	283.80	322.61	-38.81	1
7	52975_7804508	Confined	13,824	11/5/2016	285.22	322.74	-37.52	1
7	52975_7804508	Confined	13,829	11/10/2016	286.82	322.85	-36.03	1
7	52975_7804508	Confined	13,834	11/15/2016	288.65	322.96	-34.31	1
7	52975_7804508	Confined	13,839	11/20/2016	288.61	323.07	-34.46	1
7	52975_7804508	Confined	13,844	11/25/2016	287.76	323.18	-35.42	1
7	52975_7804508	Confined	13,849	11/30/2016	288.30	323.29	-34.99	1
7	52975_7804508	Confined	13,854	12/5/2016	289.49	323.40	-33.91	1
7	52975_7804508	Confined	13,859	12/10/2016	290.57	323.51	-32.94	1
7	52975_7804508	Confined	13,864	12/15/2016	291.69	323.63	-31.94	1
7	52975_7804508	Confined	13,869	12/20/2016	292.42	323.74	-31.32	1
7	52975_7804508	Confined	13,874	12/25/2016	293.20	323.85	-30.65	1
7	52975_7804508	Confined	13,879	12/30/2016	293.55	323.96	-30.41	1
7	52975_7804508	Confined	13,885	1/5/2017	293.87	323.99	-30.12	1
7	52975_7804508	Confined	13,890	1/10/2017	294.08	324.01	-29.93	1
7	52975_7804508	Confined	13,895	1/15/2017	294.38	324.02	-29.64	1
7	52975_7804508	Confined	13,900	1/20/2017	295.08	324.04	-28.96	1
7	52975_7804508	Confined	13,905	1/25/2017	295.15	324.05	-28.90	1
7	52975_7804508	Confined	13,910	1/30/2017	295.15	324.07	-28.92	1
7	52975_7804508	Confined	13,916	2/5/2017	294.57	324.09	-29.52	1
7	52975_7804508	Confined	13,921	2/10/2017	294.10	324.10	-30.00	1
7	52975_7804508	Confined	13,926	2/15/2017	293.27	324.12	-30.85	1
7	52975_7804508	Confined	13,931	2/20/2017	294.11	324.13	-30.02	1
7	52975_7804508	Confined	13,936	2/25/2017	294.98	324.15	-29.17	1
7	52975_7804508	Confined	13,944	3/5/2017	296.33	324.17	-27.84	1
7	52975_7804508	Confined	13,949	3/10/2017	297.11	324.19	-27.08	1
7	52975_7804508	Confined	13,954	3/15/2017	297.73	324.20	-26.47	1
7	52975_7804508	Confined	13,959	3/20/2017	297.70	324.22	-26.52	1
7	52975_7804508	Confined	13,964	3/25/2017	297.80	324.23	-26.43	1
7	52975_7804508	Confined	13,969	3/30/2017	297.24	324.25	-27.01	1
7	52975_7804508	Confined	13,975	4/5/2017	296.69	324.27	-27.58	1
7	52975_7804508	Confined	13,980	4/10/2017	296.74	324.28	-27.54	1
7	52975_7804508	Confined	13,985	4/15/2017	297.20	324.30	-27.10	1
7	52975_7804508	Confined	13,990	4/20/2017	297.62	324.31	-26.69	1
7	52975_7804508	Confined	13,995	4/25/2017	296.69	324.33	-27.64	1
7	52975_7804508	Confined	14,000	4/30/2017	294.42	324.34	-29.92	1
7	52975_7804508	Confined	14,005	5/5/2017	290.94	324.36	-33.42	1
7	52975_7804508	Confined	14,010	5/10/2017	289.55	324.37	-34.82	1
7	52975_7804508	Confined	14,015	5/15/2017	288.32	324.39	-36.07	1
7	52975_7804508	Confined	14,020	5/20/2017	287.36	324.40	-37.04	1
7	52975_7804508	Confined	14,025	5/25/2017	288.67	324.42	-35.75	1
7	52975_7804508	Confined	14,030	5/30/2017	289.29	324.43	-35.14	1
7	52975_7804508	Confined	14,036	6/5/2017	289.48	324.45	-34.97	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	52975_7804508	Confined	14,041	6/10/2017	288.77	324.46	-35.69	1
7	52975_7804508	Confined	14,046	6/15/2017	287.23	324.48	-37.25	1
7	52975_7804508	Confined	14,051	6/20/2017	282.50	324.49	-41.99	1
7	52975_7804508	Confined	14,056	6/25/2017	280.15	324.51	-44.36	1
7	52975_7804508	Confined	14,061	6/30/2017	280.73	324.52	-43.79	1
7	52975_7804508	Confined	14,066	7/5/2017	278.39	324.54	-46.15	1
7	52975_7804508	Confined	14,071	7/10/2017	275.50	324.55	-49.05	1
7	52975_7804508	Confined	14,076	7/15/2017	272.08	324.57	-52.49	1
7	52975_7804508	Confined	14,081	7/20/2017	270.51	324.58	-54.07	1
7	52975_7804508	Confined	14,086	7/25/2017	267.49	324.60	-57.11	1
7	52975_7804508	Confined	14,091	7/30/2017	264.59	324.61	-60.02	1
7	52975_7804508	Confined	14,097	8/5/2017	263.35	324.63	-61.28	1
7	52975_7804508	Confined	14,102	8/10/2017	266.70	324.65	-57.95	1
7	52975_7804508	Confined	14,107	8/15/2017	268.17	324.66	-56.49	1
7	52975_7804508	Confined	14,112	8/20/2017	265.43	324.68	-59.25	1
7	52975_7804508	Confined	14,117	8/25/2017	265.49	324.69	-59.20	1
7	52975_7804508	Confined	14,122	8/30/2017	269.48	324.71	-55.23	1
7	52975_7804508	Confined	14,128	9/5/2017	268.66	324.73	-56.07	1
7	52975_7804508	Confined	14,133	9/10/2017	267.56	324.74	-57.18	1
7	52975_7804508	Confined	14,138	9/15/2017	266.64	324.76	-58.12	1
7	52975_7804508	Confined	14,143	9/20/2017	264.71	324.77	-60.06	1
7	52975_7804508	Confined	14,148	9/25/2017	264.01	324.79	-60.78	1
7	52975_7804508	Confined	14,153	9/30/2017	267.73	324.80	-57.07	1
7	52975_7804508	Confined	14,158	10/5/2017	271.41	324.82	-53.41	1
7	52975_7804508	Confined	14,163	10/10/2017	274.51	324.83	-50.32	1
7	52975_7804508	Confined	14,168	10/15/2017	275.24	324.85	-49.61	1
7	52975_7804508	Confined	14,169	10/16/2017	276.08	324.85	-48.77	1
7	52975_7804508	Confined	14,173	10/20/2017	276.61	324.86	-48.25	1
7	52975_7804508	Confined	14,178	10/25/2017	277.38	324.88	-47.50	1
7	52975_7804508	Confined	14,183	10/30/2017	278.40	324.89	-46.49	1
7	52975_7804508	Confined	14,189	11/5/2017	279.22	324.91	-45.69	1
7	52975_7804508	Confined	14,194	11/10/2017	279.13	324.93	-45.80	1
7	52975_7804508	Confined	14,199	11/15/2017	280.78	324.94	-44.16	1
7	52975_7804508	Confined	14,204	11/20/2017	281.89	324.96	-43.07	1
7	52975_7804508	Confined	14,209	11/25/2017	282.65	324.97	-42.32	1
7	52975_7804508	Confined	14,214	11/30/2017	281.60	324.99	-43.39	1
7	52975_7804508	Confined	14,219	12/5/2017	281.90	325.00	-43.10	1
7	52975_7804508	Confined	14,224	12/10/2017	284.12	325.02	-40.90	1
7	52975_7804508	Confined	14,229	12/15/2017	286.11	325.03	-38.92	1
7	52975_7804508	Confined	14,234	12/20/2017	287.59	325.05	-37.46	1
7	52975_7804508	Confined	14,239	12/25/2017	289.14	325.06	-35.92	1
7	52975_7804508	Confined	14,244	12/30/2017	290.62	325.08	-34.46	1
7	56000_0	Confined	11,713	1/25/2011	248.04	319.87	-71.83	1
7	56003_0	Confined	12,889	4/15/2014	324.95	289.26	35.69	1
7	56005_0	Confined	11,896	7/27/2011	270.91	275.19	-4.28	1
7	56008_0	Confined	13,046	9/19/2014	180.69	258.30	-38.80	0.5
7	56011_0	Confined	11,712	1/24/2011	308.22	296.08	6.07	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	56015_0	Confined	11,677	12/20/2010	371.48	330.92	40.56	1
7	56016_0	Confined	11,392	3/10/2010	242.71	321.76	-39.52	0.5
7	56017_0	Confined	11,708	1/20/2011	379.27	259.68	119.59	1
7	56020_0	Confined	13,230	3/22/2015	259.49	267.98	-8.49	1
7	56021_0	Confined	11,849	6/10/2011	369.77	265.51	52.13	0.5
7	56022_6745203	Confined	7,837	6/15/2000	309.29	321.84	-6.27	0.5
7	56022_6745203	Confined	8,193	6/6/2001	309.29	321.64	-6.17	0.5
7	56022_6745203	Confined	8,592	7/10/2002	309.29	321.52	-6.12	0.5
7	56022_6745203	Confined	8,908	5/22/2003	309.29	321.44	-6.08	0.5
7	56022_6745203	Confined	9,342	7/29/2004	309.29	321.63	-6.17	0.5
7	56026_6723801	Confined	8,606	7/24/2002	386.32	356.99	14.67	0.5
7	56052_0	Confined	11,400	3/18/2010	265.66	262.63	3.03	1
7	56126_0	Confined	12,233	6/28/2012	123.39	252.31	-128.92	1
7	56151_0	Confined	12,297	8/31/2012	238.48	248.30	-9.82	1
7	56163_0	Confined	12,818	2/3/2014	-116.60	256.68	-373.28	1
7	56169_0	Confined	12,291	8/25/2012	133.81	232.03	-98.22	1
7	56170_0	Confined	13,259	4/20/2015	64.40	258.59	-194.19	1
7	56171_0	Confined	13,131	12/13/2014	183.99	259.63	-75.64	1
7	59526_0	Unconfined	13,352	7/22/2015	618.29	627.44	-4.57	0.5
7	59530_0	Unconfined	12,922	5/18/2014	389.70	405.44	-7.87	0.5
7	59531_0	Confined	12,745	11/22/2013	609.78	490.16	11.96	0.1
7	59539_0	Unconfined	12,134	3/21/2012	392.50	359.32	33.18	1
7	59546_0	Unconfined	11,583	9/17/2010	535.11	527.37	3.87	0.5
7	59551_0	Unconfined	9,424	10/19/2004	459.68	413.82	45.86	1
7	59552_0	Unconfined	11,110	6/1/2009	501.80	404.55	97.25	1
7	59560_0	Unconfined	9,777	10/7/2005	450.52	389.57	30.47	0.5
7	59564_0	Unconfined	9,419	10/14/2004	440.44	442.72	-2.28	1
7	59581_0	Confined	11,828	5/20/2011	295.25	249.26	45.99	1
7	59583_0	Confined	11,800	4/22/2011	336.35	249.40	43.48	0.5
7	59584_0	Confined	11,896	7/27/2011	320.01	270.65	49.36	1
7	59585_0	Confined	12,489	3/11/2013	191.65	249.01	-57.36	1
7	59597_0	Confined	11,677	12/20/2010	324.58	331.55	-6.97	1
7	59741_0	Confined	11,784	4/6/2011	266.58	254.15	6.21	0.5
7	59743_0	Confined	12,245	7/10/2012	237.17	251.94	-14.77	1
7	59905_0	Confined	12,537	4/28/2013	236.45	283.63	-47.18	1
7	59908_0	Confined	13,197	2/17/2015	288.36	303.84	-15.48	1
7	59911_0	Confined	12,100	2/16/2012	213.66	285.50	-35.92	0.5
7	59913_0	Confined	12,792	1/8/2014	167.92	234.93	-33.50	0.5
7	59918_0	Confined	12,980	7/15/2014	77.36	198.45	-121.09	1
7	59923_0	Confined	12,529	4/20/2013	195.58	224.45	-28.87	1
7	59925_0	Confined	12,859	3/16/2014	59.80	86.91	-27.11	1
7	59926_0	Confined	12,171	4/27/2012	201.83	231.37	-29.54	1
7	59930_0	Confined	12,162	4/18/2012	247.46	219.91	27.55	1
7	59937_0	Confined	11,891	7/22/2011	167.72	212.36	-44.64	1
7	59939_0	Confined	11,272	11/10/2009	295.37	114.55	90.41	0.5
7	59941_0	Confined	13,119	12/1/2014	53.69	65.15	-11.46	1
7	59944_0	Confined	12,160	4/16/2012	224.46	193.06	31.40	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	59946_0	Confined	13,078	10/21/2014	197.20	77.60	119.60	1
7	59950_0	Confined	12,661	8/30/2013	34.67	59.58	-24.91	1
7	59951_0	Confined	12,790	1/6/2014	36.13	60.91	-24.78	1
7	59954_0	Confined	11,864	6/25/2011	84.57	72.41	6.08	0.5
7	59962_0	Confined	11,989	10/28/2011	231.01	169.33	61.68	1
7	59964_0	Confined	13,070	10/13/2014	20.81	76.83	-56.02	1
7	59978_0	Confined	13,030	9/3/2014	148.20	251.55	-103.35	1
7	59980_0	Confined	12,987	7/22/2014	242.56	289.93	-23.68	0.5
7	59981_0	Confined	12,496	3/18/2013	145.57	164.02	-18.45	1
7	59983_0	Confined	12,988	7/23/2014	282.53	298.45	-7.96	0.5
7	59984_0	Confined	12,849	3/6/2014	245.03	298.95	-53.92	1
7	59991_0	Confined	12,802	1/18/2014	160.29	229.38	-69.09	1
7	59993_0	Confined	13,088	10/31/2014	40.38	181.01	-140.63	1
7	61776_0	Confined	12,696	10/4/2013	217.78	318.71	-50.47	0.5
7	68251_6864403	Confined	7,563	9/15/1999	346.30	345.46	0.84	1
7	68252_6859519	Confined	8,772	1/6/2003	409.01	422.22	-1.32	0.1
7	68252_6859519	Confined	9,136	1/5/2004	406.01	420.86	-1.48	0.1
7	68252_6859519	Confined	9,528	1/31/2005	402.51	425.26	-2.28	0.1
7	68252_6859519	Confined	9,865	1/3/2006	404.51	422.40	-1.79	0.1
7	68252_6859519	Confined	10,229	1/2/2007	400.51	422.16	-2.16	0.1
7	68252_6859519	Confined	10,594	1/2/2008	403.51	434.40	-3.09	0.1
7	68252_6859519	Confined	10,988	1/30/2009	399.51	427.78	-2.83	0.1
7	68252_6859519	Confined	11,323	12/31/2009	398.31	415.75	-1.74	0.1
7	68252_6859519	Confined	12,090	2/6/2012	405.01	374.61	3.04	0.1
7	68252_6859519	Confined	12,149	4/5/2012	409.51	376.05	3.35	0.1
7	68252_6859519	Confined	12,176	5/2/2012	392.51	376.71	1.58	0.1
7	68252_6859519	Confined	12,241	7/6/2012	399.81	378.29	2.15	0.1
7	68252_6859519	Confined	12,269	8/3/2012	390.51	378.97	1.15	0.1
7	68252_6859519	Confined	12,347	10/20/2012	391.51	380.87	1.06	0.1
7	68252_6859519	Confined	12,386	11/28/2012	392.51	381.82	1.07	0.1
7	68252_6859519	Confined	12,394	12/6/2012	392.51	382.02	1.05	0.1
7	68252_6859519	Confined	12,425	1/6/2013	393.51	382.75	1.08	0.1
7	68252_6859519	Confined	12,456	2/6/2013	392.51	383.37	0.91	0.1
7	68252_6859519	Confined	12,479	3/1/2013	390.51	383.84	0.67	0.1
7	68252_6859519	Confined	12,514	4/5/2013	392.51	384.55	0.80	0.1
7	68252_6859519	Confined	12,541	5/2/2013	397.01	385.09	1.19	0.1
7	68252_6859519	Confined	12,634	8/3/2013	386.91	386.98	-0.01	0.1
7	68252_6859519	Confined	12,673	9/11/2013	384.51	387.76	-0.33	0.1
7	68252_6859519	Confined	12,816	2/1/2014	384.51	390.59	-0.61	0.1
7	68252_6859519	Confined	12,844	3/1/2014	389.51	391.11	-0.16	0.1
7	86408_6855505	Confined	6,611	2/5/1997	378.69	382.07	-3.38	1
7	86408_6855505	Confined	6,681	4/16/1997	370.69	382.27	-11.58	1
7	86408_6855505	Confined	6,976	2/5/1998	378.69	383.02	-4.33	1
7	86408_6855505	Confined	7,334	1/29/1999	387.69	383.03	4.66	1
7	86408_6855505	Confined	7,719	2/18/2000	375.49	382.01	-6.52	1
7	86408_6855505	Confined	8,089	2/22/2001	377.69	381.56	-3.87	1
7	86408_6855505	Confined	8,430	1/29/2002	374.89	381.86	-6.97	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
7	86408_6855505	Confined	8,794	1/28/2003	376.19	382.34	-6.15	1
7	86408_6855505	Confined	9,181	2/19/2004	377.69	382.39	-4.70	1
7	86408_6855505	Confined	9,565	3/9/2005	380.19	383.11	-2.92	1
7	86408_6855505	Confined	9,907	2/14/2006	378.19	382.25	-4.06	1
7	86408_6855505	Confined	10,294	3/8/2007	375.69	382.71	-7.02	1
7	86408_6855505	Confined	10,658	3/6/2008	377.79	384.36	-6.57	1
7	86408_6855505	Confined	11,020	3/3/2009	376.59	382.56	-5.97	1
7	86408_6855505	Confined	11,454	5/11/2010	372.39	380.69	-8.30	1
7	9630_7826802	Confined	2,237	2/14/1985	298.44	276.14	22.30	1
7	9630_7826802	Confined	3,700	2/16/1989	281.01	281.58	-0.57	1
7	9630_7826802	Confined	5,534	2/24/1994	291.26	259.79	31.47	1
8	0_5861801	Unconfined	835	4/14/1981	364.41	382.76	-18.35	1
8	0_5861801	Unconfined	1,419	11/19/1982	363.05	382.64	-19.59	1
8	0_5861801	Unconfined	1,783	11/18/1983	364.10	382.38	-18.28	1
8	0_5861801	Unconfined	2,136	11/5/1984	362.05	382.01	-19.96	1
8	0_5861801	Unconfined	2,963	2/10/1987	364.44	382.91	-18.47	1
8	0_5861801	Unconfined	3,239	11/13/1987	366.88	383.01	-16.13	1
8	0_5861801	Unconfined	3,720	3/8/1989	362.15	381.74	-19.59	1
8	0_5861801	Unconfined	3,972	11/15/1989	361.37	381.61	-20.24	1
8	0_5861801	Unconfined	4,699	11/12/1991	360.61	382.79	-22.18	1
8	0_5862707	Unconfined	9,740	8/31/2005	327.36	381.94	-27.29	0.5
8	0_5862707	Unconfined	9,847	12/16/2005	327.62	381.81	-27.09	0.5
8	0_5862707	Unconfined	9,850	12/19/2005	327.31	381.81	-27.25	0.5
8	0_6705609	Unconfined	3,152	8/18/1987	580.76	400.09	90.34	0.5
8	0_6705801	Confined	12,793	1/9/2014	606.20	405.90	20.03	0.1
8	0_6705801	Confined	12,952	6/17/2014	605.83	405.31	20.05	0.1
8	0_6705801	Confined	13,043	9/16/2014	605.78	404.97	20.08	0.1
8	0_6705801	Confined	13,324	6/24/2015	616.30	407.17	20.91	0.1
8	0_6705801	Confined	13,533	1/19/2016	616.57	410.09	20.65	0.1
8	0_6705801	Confined	13,667	6/1/2016	618.54	410.78	20.78	0.1
8	0_6705801	Confined	13,777	9/19/2016	613.79	411.35	20.24	0.1
8	0_6705801	Confined	13,889	1/9/2017	611.96	411.84	20.01	0.1
8	0_6705801	Confined	14,048	6/17/2017	612.48	410.94	20.15	0.1
8	0_6705802	Confined	12,801	1/17/2014	504.82	405.88	9.89	0.1
8	0_6705802	Confined	13,043	9/16/2014	504.59	404.99	9.96	0.1
8	0_6705802	Confined	13,324	6/24/2015	508.24	407.19	10.11	0.1
8	0_6705802	Confined	13,533	1/19/2016	509.80	410.11	9.97	0.1
8	0_6705802	Confined	13,667	6/1/2016	512.60	410.80	10.18	0.1
8	0_6705802	Confined	13,774	9/16/2016	512.12	411.36	10.08	0.1
8	0_6705802	Confined	13,889	1/9/2017	512.31	411.86	10.04	0.1
8	0_6706205	Confined	11,188	8/18/2009	291.07	394.88	-103.81	1
8	0_6706205	Confined	11,516	7/12/2010	299.44	395.10	-95.66	1
8	0_6706612	Confined	3,153	8/19/1987	336.78	396.11	-29.67	0.5
8	0_6711307	Unconfined	782	2/20/1981	459.64	403.50	28.07	0.5
8	0_6711307	Unconfined	1,145	2/18/1982	460.08	404.37	27.86	0.5
8	0_6711307	Unconfined	1,551	3/31/1983	460.55	403.02	28.76	0.5
8	0_6711307	Unconfined	1,871	2/14/1984	460.19	402.65	28.77	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6711307	Unconfined	2,236	2/13/1985	458.42	402.12	28.15	0.5
8	0_6711307	Unconfined	2,619	3/3/1986	457.69	403.41	27.14	0.5
8	0_6711307	Unconfined	2,903	12/12/1986	459.30	403.51	27.89	0.5
8	0_6711307	Unconfined	3,704	2/20/1989	457.26	402.04	27.61	0.5
8	0_6711307	Unconfined	4,429	2/15/1991	456.80	401.92	27.44	0.5
8	0_6711307	Unconfined	4,796	2/17/1992	461.05	403.50	28.78	0.5
8	0_6711307	Unconfined	5,094	12/11/1992	461.70	403.50	29.10	0.5
8	0_6711307	Unconfined	5,483	1/4/1994	460.75	402.68	29.03	0.5
8	0_6711307	Unconfined	5,829	12/16/1994	458.59	403.00	27.79	0.5
8	0_6711307	Unconfined	6,273	3/4/1996	458.60	402.03	28.28	0.5
8	0_6711307	Unconfined	6,556	12/12/1996	456.72	400.78	27.97	0.5
8	0_6712303	Unconfined	782	2/20/1981	438.90	409.56	14.67	0.5
8	0_6712303	Unconfined	1,144	2/17/1982	440.61	411.92	14.35	0.5
8	0_6712901	Confined	12,801	1/17/2014	407.57	402.42	0.51	0.1
8	0_6712901	Confined	13,043	9/16/2014	408.51	401.06	0.74	0.1
8	0_6712901	Confined	13,170	1/21/2015	412.36	400.89	1.15	0.1
8	0_6712901	Confined	13,324	6/24/2015	414.20	403.99	1.02	0.1
8	0_6712901	Confined	13,540	1/26/2016	412.20	408.05	0.42	0.1
8	0_6712901	Confined	13,672	6/6/2016	412.49	409.19	0.33	0.1
8	0_6712901	Confined	13,777	9/19/2016	412.49	410.10	0.24	0.1
8	0_6712901	Confined	13,889	1/9/2017	411.49	410.94	0.06	0.1
8	0_6712901	Confined	14,050	6/19/2017	408.39	409.97	-0.16	0.1
8	0_6713205	Confined	10,650	2/27/2008	460.77	412.30	24.24	0.5
8	0_6713205	Confined	11,007	2/18/2009	460.67	406.89	26.89	0.5
8	0_6713205	Confined	11,224	9/23/2009	458.27	406.63	25.82	0.5
8	0_6713205	Confined	11,330	1/7/2010	461.10	406.54	27.28	0.5
8	0_6713205	Confined	11,492	6/18/2010	460.98	407.14	26.92	0.5
8	0_6713205	Confined	11,581	9/15/2010	459.68	407.47	26.10	0.5
8	0_6713205	Confined	11,692	1/4/2011	460.92	407.80	26.56	0.5
8	0_6713205	Confined	11,848	6/9/2011	460.73	405.30	27.72	0.5
8	0_6713205	Confined	11,952	9/21/2011	460.16	403.62	28.27	0.5
8	0_6713205	Confined	12,065	1/12/2012	460.10	402.03	29.04	0.5
8	0_6713205	Confined	12,225	6/20/2012	460.11	402.37	28.87	0.5
8	0_6713205	Confined	12,330	10/3/2012	459.86	402.59	28.63	0.5
8	0_6713205	Confined	12,679	9/17/2013	457.02	403.58	26.72	0.5
8	0_6713205	Confined	12,793	1/9/2014	458.74	403.87	27.43	0.5
8	0_6713205	Confined	12,952	6/17/2014	458.06	403.26	27.40	0.5
8	0_6713205	Confined	13,042	9/15/2014	455.79	402.92	26.44	0.5
8	0_6713205	Confined	13,168	1/19/2015	458.35	402.76	27.79	0.5
8	0_6713205	Confined	13,322	6/22/2015	458.28	404.85	26.72	0.5
8	0_6713205	Confined	13,533	1/19/2016	458.00	407.54	25.23	0.5
8	0_6713205	Confined	13,682	6/16/2016	455.71	408.29	23.71	0.5
8	0_6713205	Confined	13,778	9/20/2016	456.01	408.78	23.62	0.5
8	0_6713205	Confined	13,903	1/23/2017	458.48	409.17	24.66	0.5
8	0_6713205	Confined	14,045	6/14/2017	459.68	408.38	25.65	0.5
8	0_6714706	Confined	11,224	9/23/2009	389.04	391.73	-1.34	0.5
8	0_6714706	Confined	11,330	1/7/2010	391.29	391.52	-0.12	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6714706	Confined	11,492	6/18/2010	391.72	391.55	0.08	0.5
8	0_6714706	Confined	11,581	9/15/2010	390.91	391.57	-0.33	0.5
8	0_6714706	Confined	11,692	1/4/2011	390.68	391.56	-0.44	0.5
8	0_6714706	Confined	11,845	6/6/2011	389.76	390.56	-0.40	0.5
8	0_6714706	Confined	11,952	9/21/2011	387.43	389.86	-1.21	0.5
8	0_6714706	Confined	12,065	1/12/2012	388.62	389.17	-0.27	0.5
8	0_6714706	Confined	12,225	6/20/2012	389.78	388.84	0.47	0.5
8	0_6714706	Confined	12,315	9/18/2012	388.61	388.65	-0.02	0.5
8	0_6714706	Confined	12,675	9/13/2013	388.57	388.00	0.28	0.5
8	0_6714706	Confined	12,794	1/10/2014	389.38	387.77	0.81	0.5
8	0_6714706	Confined	12,952	6/17/2014	388.17	386.97	0.60	0.5
8	0_6714706	Confined	13,042	9/15/2014	386.30	386.51	-0.11	0.5
8	0_6714706	Confined	13,168	1/19/2015	386.49	385.98	0.26	0.5
8	0_6714706	Confined	13,527	1/13/2016	386.62	386.22	0.20	0.5
8	0_6714706	Confined	13,682	6/16/2016	387.31	386.53	0.39	0.5
8	0_6714706	Confined	13,778	9/20/2016	386.39	386.73	-0.17	0.5
8	0_6714706	Confined	13,903	1/23/2017	387.60	386.87	0.37	0.5
8	0_6714706	Confined	14,045	6/14/2017	386.41	386.44	-0.02	0.5
8	0_6719904	Unconfined	11,229	9/28/2009	345.49	340.20	2.65	0.5
8	0_6719904	Unconfined	11,342	1/19/2010	347.86	340.04	3.91	0.5
8	0_6719904	Unconfined	11,593	9/27/2010	348.27	339.98	4.14	0.5
8	0_6719904	Unconfined	11,700	1/12/2011	348.20	339.88	4.16	0.5
8	0_6719904	Unconfined	11,845	6/6/2011	346.77	338.93	3.92	0.5
8	0_6719904	Unconfined	11,951	9/20/2011	341.33	338.24	1.55	0.5
8	0_6719904	Unconfined	12,066	1/13/2012	346.35	337.59	4.38	0.5
8	0_6719904	Unconfined	12,206	6/1/2012	346.95	337.85	4.55	0.5
8	0_6719904	Unconfined	12,314	9/17/2012	343.05	338.04	2.50	0.5
8	0_6719904	Unconfined	12,685	9/23/2013	345.08	338.38	3.35	0.5
8	0_6719904	Unconfined	12,794	1/10/2014	346.54	338.41	4.07	0.5
8	0_6719904	Unconfined	13,039	9/12/2014	345.24	337.75	3.74	0.5
8	0_6719904	Unconfined	13,170	1/21/2015	346.70	337.52	4.59	0.5
8	0_6719904	Unconfined	13,312	6/12/2015	348.75	337.93	5.41	0.5
8	0_6719904	Unconfined	13,529	1/15/2016	348.67	338.55	5.06	0.5
8	0_6719904	Unconfined	13,672	6/6/2016	349.21	338.77	5.22	0.5
8	0_6719904	Unconfined	13,777	9/19/2016	348.46	338.93	4.76	0.5
8	0_6719904	Unconfined	13,890	1/10/2017	348.99	339.07	4.96	0.5
8	0_6719904	Unconfined	14,051	6/20/2017	350.67	338.72	5.98	0.5
8	0_6720502	Confined	11,229	9/28/2009	347.24	370.10	-11.43	0.5
8	0_6720502	Confined	11,593	9/27/2010	353.26	370.47	-8.61	0.5
8	0_6720502	Confined	11,702	1/14/2011	353.62	370.45	-8.41	0.5
8	0_6720502	Confined	11,845	6/6/2011	352.56	367.81	-7.62	0.5
8	0_6720502	Confined	11,951	9/20/2011	344.32	365.85	-10.77	0.5
8	0_6720502	Confined	12,066	1/13/2012	348.30	364.00	-7.85	0.5
8	0_6720502	Confined	12,218	6/13/2012	352.01	364.33	-6.16	0.5
8	0_6720502	Confined	12,314	9/17/2012	349.08	364.54	-7.73	0.5
8	0_6720502	Confined	12,675	9/13/2013	346.91	365.12	-9.10	0.5
8	0_6720502	Confined	12,801	1/17/2014	351.65	365.13	-6.74	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6720502	Confined	13,043	9/16/2014	349.49	363.19	-6.85	0.5
8	0_6720502	Confined	13,170	1/21/2015	351.34	362.57	-5.62	0.5
8	0_6720502	Confined	13,324	6/24/2015	353.89	364.20	-5.15	0.5
8	0_6720503	Unconfined	11,229	9/28/2009	346.07	364.68	-9.31	0.5
8	0_6720503	Unconfined	11,496	6/22/2010	351.43	364.78	-6.68	0.5
8	0_6720503	Unconfined	11,593	9/27/2010	348.59	364.99	-8.20	0.5
8	0_6720503	Unconfined	11,702	1/14/2011	352.26	364.97	-6.35	0.5
8	0_6720503	Unconfined	11,845	6/6/2011	348.93	362.59	-6.83	0.5
8	0_6720503	Unconfined	11,951	9/20/2011	340.05	360.83	-10.39	0.5
8	0_6720503	Unconfined	12,066	1/13/2012	347.14	359.17	-6.01	0.5
8	0_6720503	Unconfined	12,218	6/13/2012	350.47	359.49	-4.51	0.5
8	0_6720503	Unconfined	12,314	9/17/2012	346.60	359.70	-6.55	0.5
8	0_6720503	Unconfined	12,675	9/13/2013	345.07	360.28	-7.61	0.5
8	0_6720503	Unconfined	12,801	1/17/2014	350.05	360.31	-5.13	0.5
8	0_6720503	Unconfined	13,043	9/16/2014	348.18	358.59	-5.21	0.5
8	0_6720503	Unconfined	13,170	1/21/2015	349.25	358.04	-4.40	0.5
8	0_6720503	Unconfined	13,324	6/24/2015	352.56	359.53	-3.48	0.5
8	0_6720503	Unconfined	13,529	1/15/2016	352.15	361.42	-4.63	0.5
8	0_6720503	Unconfined	13,690	6/24/2016	352.24	362.03	-4.90	0.5
8	0_6720503	Unconfined	13,889	1/9/2017	352.62	362.71	-5.04	0.5
8	0_6720503	Unconfined	14,050	6/19/2017	349.04	361.79	-6.37	0.5
8	0_6727606	Confined	11,223	9/22/2009	351.14	357.46	-3.16	0.5
8	0_6727606	Confined	11,328	1/5/2010	352.00	357.17	-2.59	0.5
8	0_6727606	Confined	11,488	6/14/2010	352.06	357.36	-2.65	0.5
8	0_6727606	Confined	11,589	9/23/2010	351.90	357.47	-2.79	0.5
8	0_6727606	Confined	11,700	1/12/2011	351.35	357.42	-3.03	0.5
8	0_6727606	Confined	11,845	6/6/2011	350.94	355.38	-2.22	0.5
8	0_6727606	Confined	11,951	9/20/2011	349.67	353.88	-2.11	0.5
8	0_6727606	Confined	12,066	1/13/2012	350.00	352.42	-1.21	0.5
8	0_6727606	Confined	12,206	6/1/2012	350.11	352.11	-1.00	0.5
8	0_6727606	Confined	12,314	9/17/2012	349.63	351.87	-1.12	0.5
8	0_6727606	Confined	12,673	9/11/2013	348.14	350.62	-1.24	0.5
8	0_6727606	Confined	12,801	1/17/2014	348.05	350.00	-0.97	0.5
8	0_6727606	Confined	13,039	9/12/2014	346.44	347.61	-0.58	0.5
8	0_6727606	Confined	13,170	1/21/2015	346.44	346.49	-0.03	0.5
8	0_6727606	Confined	13,312	6/12/2015	345.47	346.45	-0.49	0.5
8	0_6727606	Confined	13,529	1/15/2016	345.47	346.41	-0.47	0.5
8	0_6727606	Confined	13,689	6/23/2016	343.89	346.78	-1.45	0.5
8	0_6727606	Confined	13,774	9/16/2016	343.97	346.98	-1.50	0.5
8	0_6727606	Confined	13,891	1/11/2017	344.10	347.16	-1.53	0.5
8	0_6727606	Confined	14,058	6/27/2017	341.51	346.15	-2.32	0.5
8	0_6727707	Confined	11,958	9/27/2011	358.74	354.03	2.35	0.5
8	0_6727707	Confined	12,078	1/25/2012	362.16	353.05	4.56	0.5
8	0_6727707	Confined	12,227	6/22/2012	362.31	353.26	4.53	0.5
8	0_6727707	Confined	12,310	9/13/2012	360.62	353.38	3.62	0.5
8	0_6727707	Confined	12,685	9/23/2013	357.20	353.33	1.93	0.5
8	0_6727707	Confined	12,801	1/17/2014	359.04	353.17	2.93	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6727707	Confined	13,029	9/2/2014	356.89	352.03	2.43	0.5
8	0_6727707	Confined	13,043	9/16/2014	356.89	351.96	2.47	0.5
8	0_6727707	Confined	13,148	12/30/2014	356.47	351.43	2.52	0.5
8	0_6727707	Confined	13,305	6/5/2015	357.35	351.79	2.78	0.5
8	0_6727707	Confined	13,519	1/5/2016	356.36	352.30	2.03	0.5
8	0_6727707	Confined	13,668	6/2/2016	357.83	352.73	2.55	0.5
8	0_6727707	Confined	13,891	1/11/2017	355.98	353.31	1.33	0.5
8	0_6727707	Confined	14,036	6/5/2017	357.02	352.80	2.11	0.5
8	0_6727708	Confined	9,881	1/19/2006	397.51	366.78	15.37	0.5
8	0_6727708	Confined	10,018	6/5/2006	396.63	365.81	15.41	0.5
8	0_6727708	Confined	10,256	1/29/2007	396.96	364.78	16.09	0.5
8	0_6727708	Confined	10,389	6/11/2007	397.42	366.82	15.30	0.5
8	0_6727708	Confined	10,487	9/17/2007	397.70	368.33	14.68	0.5
8	0_6727708	Confined	10,606	1/14/2008	397.20	369.79	13.70	0.5
8	0_6727708	Confined	10,847	9/11/2008	396.14	367.10	14.52	0.5
8	0_6727708	Confined	10,966	1/8/2009	395.93	365.84	15.05	0.5
8	0_6727708	Confined	11,226	9/25/2009	395.83	364.97	15.43	0.5
8	0_6727708	Confined	11,232	10/1/2009	395.28	364.95	15.17	0.5
8	0_6727708	Confined	11,343	1/20/2010	397.05	364.63	16.21	0.5
8	0_6727708	Confined	11,586	9/20/2010	395.78	364.48	15.65	0.5
8	0_6727708	Confined	11,855	6/16/2011	392.14	362.24	14.95	0.5
8	0_6727708	Confined	11,952	9/21/2011	393.86	360.97	16.44	0.5
8	0_6727708	Confined	12,085	2/1/2012	395.66	359.77	17.95	0.5
8	0_6727708	Confined	12,205	5/31/2012	395.08	360.20	17.44	0.5
8	0_6727708	Confined	12,440	1/21/2013	395.60	360.99	17.31	0.5
8	0_6727708	Confined	12,589	6/19/2013	394.78	361.11	16.83	0.5
8	0_6727708	Confined	12,687	9/25/2013	394.33	361.19	16.57	0.5
8	0_6727708	Confined	12,806	1/22/2014	394.74	361.18	16.78	0.5
8	0_6727708	Confined	12,944	6/9/2014	392.31	360.60	15.86	0.5
8	0_6727708	Confined	13,038	9/11/2014	393.87	360.20	16.83	0.5
8	0_6727708	Confined	13,163	1/14/2015	391.92	359.81	16.05	0.5
8	0_6727708	Confined	13,311	6/11/2015	396.81	360.66	18.07	0.5
8	0_6727708	Confined	13,409	9/17/2015	395.53	361.23	17.15	0.5
8	0_6727708	Confined	13,527	1/13/2016	396.93	361.88	17.53	0.5
8	0_6727708	Confined	13,688	6/22/2016	396.18	362.48	16.85	0.5
8	0_6727708	Confined	13,775	9/17/2016	397.31	362.81	17.25	0.5
8	0_6733509	Confined	3,894	8/29/1989	493.70	439.12	5.46	0.1
8	0_6733509	Confined	12,440	1/21/2013	479.87	433.05	4.68	0.1
8	0_6733509	Confined	12,944	6/9/2014	481.82	436.56	4.53	0.1
8	0_6733509	Confined	13,038	9/11/2014	482.50	436.62	4.59	0.1
8	0_6733509	Confined	13,163	1/14/2015	480.79	436.95	4.38	0.1
8	0_6733509	Confined	13,311	6/11/2015	479.48	439.64	3.98	0.1
8	0_6733509	Confined	13,688	6/22/2016	467.67	445.03	2.26	0.1
8	0_6733706	Confined	9,866	1/4/2006	495.15	444.48	5.07	0.1
8	0_6733706	Confined	11,187	8/17/2009	481.24	442.83	3.84	0.1
8	0_6733706	Confined	11,504	6/30/2010	484.52	441.71	4.28	0.1
8	0_6733706	Confined	11,831	5/23/2011	480.60	438.32	4.23	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6733706	Confined	12,189	5/15/2012	482.40	435.05	4.74	0.1
8	0_6734407	Confined	2,463	9/28/1985	420.16	417.38	0.28	0.1
8	0_6734407	Confined	12,589	6/19/2013	413.36	403.66	0.97	0.1
8	0_6734407	Confined	12,687	9/25/2013	412.83	404.79	0.80	0.1
8	0_6734407	Confined	12,806	1/22/2014	412.47	405.93	0.65	0.1
8	0_6734407	Confined	12,944	6/9/2014	411.68	406.02	0.57	0.1
8	0_6734407	Confined	13,038	9/11/2014	411.30	406.08	0.52	0.1
8	0_6734407	Confined	13,163	1/14/2015	410.75	406.35	0.44	0.1
8	0_6734407	Confined	13,312	6/12/2015	423.51	408.46	1.50	0.1
8	0_6734407	Confined	13,331	7/1/2015	411.06	408.74	0.23	0.1
8	0_6734407	Confined	13,409	9/17/2015	411.21	409.84	0.14	0.1
8	0_6734407	Confined	13,528	1/14/2016	410.16	411.48	-0.13	0.1
8	0_6734407	Confined	13,688	6/22/2016	424.02	413.15	1.09	0.1
8	0_6734407	Confined	13,911	1/31/2017	423.59	415.01	0.86	0.1
8	0_6734407	Confined	14,050	6/19/2017	423.93	414.36	0.96	0.1
8	0_6734407	Confined	14,141	9/18/2017	423.75	413.93	0.98	0.1
8	0_6734505	Confined	8,633	8/20/2002	445.88	401.34	22.27	0.5
8	0_6734505	Confined	9,033	9/24/2003	444.42	403.45	20.48	0.5
8	0_6734505	Confined	9,152	1/21/2004	444.34	403.80	20.27	0.5
8	0_6734505	Confined	9,398	9/23/2004	443.53	406.86	18.34	0.5
8	0_6734505	Confined	9,523	1/26/2005	443.97	407.76	18.11	0.5
8	0_6734505	Confined	9,749	9/9/2005	442.63	404.86	18.88	0.5
8	0_6734505	Confined	9,878	1/16/2006	442.97	403.26	19.85	0.5
8	0_6734505	Confined	10,013	5/31/2006	441.97	402.00	19.99	0.5
8	0_6734505	Confined	10,124	9/19/2006	441.08	400.96	20.06	0.5
8	0_6734505	Confined	10,249	1/22/2007	441.47	400.52	20.47	0.5
8	0_6734505	Confined	10,392	6/14/2007	441.34	403.99	18.68	0.5
8	0_6734505	Confined	10,488	9/18/2007	441.23	406.31	17.46	0.5
8	0_6734505	Confined	10,607	1/15/2008	440.97	408.60	16.18	0.5
8	0_6734505	Confined	10,774	6/30/2008	439.86	406.03	16.92	0.5
8	0_6734505	Confined	10,858	9/22/2008	439.48	404.73	17.38	0.5
8	0_6734505	Confined	11,111	6/2/2009	439.51	401.67	18.92	0.5
8	0_6734505	Confined	11,203	9/2/2009	436.97	400.76	18.11	0.5
8	0_6734505	Confined	11,327	1/4/2010	438.34	399.53	19.40	0.5
8	0_6734505	Confined	12,210	6/5/2012	431.72	390.30	20.71	0.5
8	0_6734505	Confined	12,302	9/5/2012	430.77	391.42	19.68	0.5
8	0_6734505	Confined	12,422	1/3/2013	427.79	392.86	17.47	0.5
8	0_6734505	Confined	12,584	6/14/2013	428.84	394.19	17.32	0.5
8	0_6734505	Confined	12,668	9/6/2013	427.36	394.89	16.24	0.5
8	0_6734505	Confined	12,786	1/2/2014	424.19	395.84	14.17	0.5
8	0_6734505	Confined	12,938	6/3/2014	425.42	395.73	14.84	0.5
8	0_6734505	Confined	13,029	9/2/2014	421.96	395.66	13.15	0.5
8	0_6734505	Confined	13,148	12/30/2014	422.85	395.57	13.64	0.5
8	0_6734505	Confined	13,305	6/5/2015	418.17	397.37	10.40	0.5
8	0_6734505	Confined	13,402	9/10/2015	419.84	398.49	10.68	0.5
8	0_6734505	Confined	13,519	1/5/2016	416.47	399.82	8.32	0.5
8	0_6734505	Confined	13,668	6/2/2016	416.87	401.13	7.87	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6734505	Confined	13,759	9/1/2016	414.27	401.93	6.17	0.5
8	0_6734505	Confined	13,882	1/2/2017	413.07	402.98	5.04	0.5
8	0_6734505	Confined	14,037	6/6/2017	412.67	402.32	5.17	0.5
8	0_6734505	Confined	14,128	9/5/2017	410.17	401.93	4.12	0.5
8	0_6742106	Confined	13,157	1/8/2015	378.12	387.11	-8.99	1
8	0_6742106	Confined	13,312	6/12/2015	380.19	386.45	-6.26	1
8	0_6742106	Confined	13,534	1/20/2016	375.01	385.68	-10.67	1
8	0_6742106	Confined	13,680	6/14/2016	379.11	386.36	-7.25	1
8	0_6742106	Confined	13,772	9/14/2016	374.99	386.79	-11.80	1
8	0_6742106	Confined	13,903	1/23/2017	379.68	387.19	-7.51	1
8	0_6742106	Confined	14,052	6/21/2017	377.89	386.53	-8.64	1
8	0_6848305	Confined	6,301	4/1/1996	548.02	431.52	116.50	1
8	0_6849902	Confined	771	2/9/1981	578.40	569.67	8.73	1
8	0_6849902	Confined	1,144	2/17/1982	578.52	575.21	3.31	1
8	0_6849902	Confined	1,507	2/15/1983	579.09	576.11	2.98	1
8	0_6849902	Confined	1,880	2/23/1984	578.37	575.41	2.96	1
8	0_6849902	Confined	2,607	2/19/1986	577.48	576.10	1.38	1
8	0_6849902	Confined	3,008	3/27/1987	569.87	583.29	-13.42	1
8	0_6849902	Confined	3,363	3/16/1988	576.37	586.75	-10.38	1
8	0_6849902	Confined	3,687	2/3/1989	577.00	584.61	-7.61	1
8	0_6849902	Confined	4,056	2/7/1990	572.27	582.89	-10.62	1
8	0_6849902	Confined	4,408	1/25/1991	575.97	585.05	-9.08	1
8	0_6849902	Confined	4,785	2/6/1992	572.87	587.04	-14.17	1
8	0_6849902	Confined	5,176	3/3/1993	575.52	588.11	-12.59	1
8	0_6849902	Confined	5,619	5/20/1994	575.92	582.31	-6.39	1
8	0_6849902	Confined	5,790	11/7/1994	574.47	579.50	-5.03	1
8	0_6849902	Confined	6,282	3/13/1996	576.35	569.12	7.23	1
8	0_6849902	Confined	6,619	2/13/1997	574.37	562.70	11.67	1
8	0_6849902	Confined	6,998	2/27/1998	570.19	565.61	4.58	1
8	0_6849902	Confined	7,379	3/15/1999	573.17	564.94	8.23	1
8	0_6849902	Confined	7,717	2/16/2000	572.95	559.77	13.18	1
8	0_6849902	Confined	8,065	1/29/2001	574.59	554.95	19.64	1
8	0_6849902	Confined	8,443	2/11/2002	571.24	553.32	17.92	1
8	0_6849902	Confined	8,822	2/25/2003	566.07	554.02	12.05	1
8	0_6849902	Confined	9,172	2/10/2004	569.57	553.64	15.93	1
8	0_6849902	Confined	9,528	1/31/2005	570.99	557.03	13.96	1
8	0_6849902	Confined	9,927	3/6/2006	571.30	552.64	18.66	1
8	0_6849902	Confined	10,264	2/6/2007	570.32	551.83	18.49	1
8	0_6849902	Confined	10,648	2/25/2008	564.52	558.97	5.55	1
8	0_6849902	Confined	11,009	2/20/2009	561.92	550.94	10.98	1
8	0_6849902	Confined	11,366	2/12/2010	563.18	540.48	22.70	1
8	0_6849902	Confined	11,772	3/25/2011	565.38	526.86	38.52	1
8	0_6849902	Confined	11,989	10/28/2011	562.22	518.62	43.60	1
8	0_6849902	Confined	12,714	10/22/2013	565.57	528.92	36.65	1
8	0_6849902	Confined	13,072	10/15/2014	564.36	532.01	32.35	1
8	0_6849902	Confined	13,802	10/14/2016	560.05	550.25	9.80	1
8	0_6849902	Confined	14,176	10/23/2017	559.97	554.43	5.54	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6850709	Confined	5,177	3/4/1993	540.24	593.89	-5.36	0.1
8	0_6851602	Confined	773	2/11/1981	589.30	519.84	6.95	0.1
8	0_6851602	Confined	1,166	3/11/1982	587.43	523.67	6.38	0.1
8	0_6851602	Confined	1,502	2/10/1983	586.21	523.04	6.32	0.1
8	0_6851602	Confined	1,879	2/22/1984	588.83	523.77	6.51	0.1
8	0_6851602	Confined	2,235	2/12/1985	587.64	523.77	6.39	0.1
8	0_6851602	Confined	2,600	2/12/1986	588.18	529.01	5.92	0.1
8	0_6851602	Confined	2,999	3/18/1987	588.73	531.66	5.71	0.1
8	0_6851602	Confined	3,335	2/17/1988	588.58	533.30	5.53	0.1
8	0_6851602	Confined	3,705	2/21/1989	588.56	528.32	6.02	0.1
8	0_6851602	Confined	4,082	3/5/1990	580.92	526.63	5.43	0.1
8	0_6851602	Confined	4,407	1/24/1991	586.09	528.38	5.77	0.1
8	0_6851801	Confined	773	2/11/1981	542.71	546.18	-0.35	0.1
8	0_6851801	Confined	1,502	2/10/1983	546.81	550.22	-0.34	0.1
8	0_6852410	Confined	5,702	8/11/1994	533.97	505.72	2.82	0.1
8	0_6852410	Confined	6,941	1/1/1998	435.97	501.94	-6.60	0.1
8	0_6852601	Confined	1,775	11/10/1983	473.64	453.01	10.32	0.5
8	0_6852721	Confined	7,172	8/20/1998	454.68	483.04	-14.18	0.5
8	0_6852903	Confined	3,731	3/19/1989	435.17	445.70	-1.05	0.1
8	0_6852904	Confined	5,608	5/9/1994	401.76	446.14	-4.44	0.1
8	0_6852905	Confined	3,784	5/11/1989	449.76	445.34	0.44	0.1
8	0_6854402	Confined	781	2/19/1981	398.60	403.59	-4.99	1
8	0_6854402	Confined	1,503	2/11/1983	398.10	403.80	-5.70	1
8	0_6854402	Confined	1,880	2/23/1984	394.96	403.77	-8.81	1
8	0_6854402	Confined	2,236	2/13/1985	394.91	403.61	-8.70	1
8	0_6854402	Confined	2,896	12/5/1986	395.79	404.64	-8.85	1
8	0_6854402	Confined	3,363	3/16/1988	396.49	404.55	-8.06	1
8	0_6854402	Confined	3,676	1/23/1989	393.88	403.53	-9.65	1
8	0_6854402	Confined	4,042	1/24/1990	393.49	403.40	-9.91	1
8	0_6854402	Confined	4,405	1/22/1991	392.79	403.74	-10.95	1
8	0_6854402	Confined	4,777	1/29/1992	395.79	403.40	-7.61	1
8	0_6854402	Confined	5,176	3/3/1993	396.94	403.59	-6.65	1
8	0_6854402	Confined	5,948	4/14/1995	393.59	403.09	-9.50	1
8	0_6854402	Confined	6,287	3/18/1996	384.47	402.41	-17.94	1
8	0_6854402	Confined	10,950	12/23/2008	391.17	402.61	-11.44	1
8	0_6854402	Confined	11,343	1/20/2010	391.64	401.33	-9.69	1
8	0_6854402	Confined	11,772	3/25/2011	391.99	399.08	-7.09	1
8	0_6854402	Confined	11,981	10/20/2011	390.29	397.83	-7.54	1
8	0_6854402	Confined	12,357	10/30/2012	390.40	400.74	-10.34	1
8	0_6854402	Confined	12,709	10/17/2013	381.24	402.46	-21.22	1
8	0_6854402	Confined	13,085	10/28/2014	388.12	402.91	-14.79	1
8	0_6854402	Confined	13,443	10/21/2015	388.24	404.38	-16.14	1
8	0_6854402	Confined	13,798	10/10/2016	392.82	405.17	-12.35	1
8	0_6854402	Confined	14,180	10/27/2017	389.58	404.96	-15.38	1
8	0_6954903	Unconfined	4,639	9/13/1991	664.43	723.67	-59.24	1
8	0_6958707	Confined	2,229	2/6/1985	634.63	591.28	4.34	0.1
8	0_6958707	Confined	2,965	2/12/1987	617.70	598.63	1.91	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6958707	Confined	3,354	3/7/1988	618.26	605.87	1.24	0.1
8	0_6958707	Confined	3,698	2/14/1989	616.33	603.76	1.26	0.1
8	0_6958707	Confined	4,069	2/20/1990	620.53	600.01	2.05	0.1
8	0_6958707	Confined	4,434	2/20/1991	632.55	598.91	3.36	0.1
8	0_6958707	Confined	4,800	2/21/1992	633.53	592.81	4.07	0.1
8	0_6958707	Confined	5,161	2/16/1993	633.58	590.52	4.31	0.1
8	0_6958707	Confined	5,534	2/24/1994	634.58	589.12	4.55	0.1
8	0_6958707	Confined	5,792	11/9/1994	633.53	588.37	4.52	0.1
8	0_6958707	Confined	6,246	2/6/1996	634.23	585.61	4.86	0.1
8	0_6958707	Confined	6,632	2/26/1997	634.33	582.71	5.16	0.1
8	0_6958707	Confined	6,996	2/25/1998	635.04	584.62	5.04	0.1
8	0_6958707	Confined	7,345	2/9/1999	634.73	586.29	4.84	0.1
8	0_6958707	Confined	7,753	3/23/2000	633.68	585.86	4.78	0.1
8	0_6958707	Confined	8,082	2/15/2001	635.13	584.86	5.03	0.1
8	0_6958707	Confined	8,445	2/13/2002	634.68	584.89	4.98	0.1
8	0_6958707	Confined	8,810	2/13/2003	635.68	584.71	5.10	0.1
8	0_6958707	Confined	9,178	2/16/2004	636.24	584.88	5.14	0.1
8	0_6958707	Confined	9,533	2/5/2005	636.54	586.76	4.98	0.1
8	0_6958707	Confined	9,937	3/16/2006	636.25	586.91	4.93	0.1
8	0_6958707	Confined	10,270	2/12/2007	635.44	588.38	4.71	0.1
8	0_6958707	Confined	10,652	2/29/2008	634.98	591.27	4.37	0.1
8	0_6958707	Confined	11,001	2/12/2009	634.63	586.70	4.79	0.1
8	0_6958707	Confined	11,349	1/26/2010	629.43	577.74	5.17	0.1
8	0_6958707	Confined	11,720	2/1/2011	631.44	569.22	6.22	0.1
8	0_6958707	Confined	12,078	1/25/2012	633.56	559.21	7.43	0.1
8	0_6958707	Confined	12,447	1/28/2013	628.38	557.78	7.06	0.1
8	0_6958707	Confined	12,819	2/4/2014	627.52	558.74	6.88	0.1
8	0_6958707	Confined	13,112	11/24/2014	624.59	559.03	6.56	0.1
8	0_6959302	Unconfined	9,396	9/21/2004	758.72	741.90	8.41	0.5
8	0_6959302	Unconfined	11,189	8/19/2009	754.05	738.88	7.58	0.5
8	0_6959302	Unconfined	11,512	7/8/2010	757.92	736.14	10.89	0.5
8	0_6959302	Unconfined	12,192	5/18/2012	755.91	728.51	13.70	0.5
8	0_6959401	Confined	772	2/10/1981	716.98	669.41	47.57	1
8	0_6959401	Confined	1,501	2/9/1983	716.11	672.82	43.29	1
8	0_6959401	Confined	1,878	2/21/1984	715.98	673.26	42.72	1
8	0_6959401	Confined	2,228	2/5/1985	715.42	672.67	42.75	1
8	0_6959401	Confined	2,593	2/5/1986	714.89	674.21	40.68	1
8	0_6959401	Confined	2,966	2/13/1987	714.22	679.78	34.44	1
8	0_6959401	Confined	3,355	3/8/1988	714.47	684.98	29.49	1
8	0_6959401	Confined	3,693	2/9/1989	713.77	683.59	30.18	1
8	0_6959401	Confined	4,069	2/20/1990	713.52	681.79	31.73	1
8	0_6959401	Confined	4,435	2/21/1991	712.88	682.10	30.78	1
8	0_6959401	Confined	4,800	2/21/1992	712.93	679.22	33.71	1
8	0_6959401	Confined	5,160	2/15/1993	707.87	677.69	30.18	1
8	0_6959401	Confined	5,534	2/24/1994	710.57	675.09	35.48	1
8	0_6960201	Confined	2,593	2/5/1986	690.95	670.06	2.09	0.1
8	0_6960201	Confined	2,966	2/13/1987	696.16	674.52	2.16	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_6960201	Confined	3,355	3/8/1988	686.15	677.49	0.87	0.1
8	0_6960201	Confined	3,693	2/9/1989	696.11	673.70	2.24	0.1
8	0_6960201	Confined	4,069	2/20/1990	695.98	672.48	2.35	0.1
8	0_6960201	Confined	4,436	2/22/1991	697.90	675.56	2.23	0.1
8	0_6960201	Confined	4,801	2/22/1992	696.97	678.93	1.80	0.1
8	0_6960201	Confined	5,157	2/12/1993	696.15	681.64	1.45	0.1
8	0_6960201	Confined	5,534	2/24/1994	697.35	678.87	1.85	0.1
8	0_6960201	Confined	5,791	11/8/1994	696.25	678.60	1.76	0.1
8	0_6960201	Confined	6,634	2/28/1997	689.93	669.60	2.03	0.1
8	0_6960201	Confined	7,381	3/17/1999	696.55	672.10	2.44	0.1
8	0_6960201	Confined	7,718	2/17/2000	690.40	668.73	2.17	0.1
8	0_6960201	Confined	8,067	1/31/2001	708.67	668.57	4.01	0.1
8	0_6960201	Confined	8,438	2/6/2002	695.95	668.35	2.76	0.1
8	0_6960201	Confined	8,810	2/13/2003	685.25	673.31	1.19	0.1
8	0_6960201	Confined	9,923	3/2/2006	680.89	670.91	1.00	0.1
8	0_6960202	Confined	2,013	7/5/1984	700.96	667.59	3.34	0.1
8	0_6963102	Unconfined	4,639	9/13/1991	634.79	668.44	-33.65	1
8	0_6964411	Confined	1,516	2/24/1983	485.77	535.16	-49.39	1
8	0_6964411	Confined	1,873	2/16/1984	485.32	535.10	-49.78	1
8	0_6964411	Confined	2,235	2/12/1985	482.97	531.39	-48.42	1
8	0_6964411	Confined	2,601	2/13/1986	480.36	536.36	-56.00	1
8	0_6964411	Confined	3,007	3/26/1987	475.12	540.22	-65.10	1
8	0_7615303	Confined	3,669	1/16/1989	641.34	598.94	4.24	0.1
8	0_7615303	Confined	5,623	5/24/1994	639.74	598.21	4.15	0.1
8	0_7624201	Confined	774	2/12/1981	479.55	436.15	21.70	0.5
8	0_7624201	Confined	1,502	2/10/1983	472.50	439.62	16.44	0.5
8	0_7624801	Confined	1,502	2/10/1983	575.59	528.88	4.67	0.1
8	0_7624801	Confined	2,596	2/8/1986	565.67	528.55	3.71	0.1
8	0_7624801	Confined	3,693	2/9/1989	582.19	530.51	5.17	0.1
8	0_7624801	Confined	4,064	2/15/1990	554.47	530.41	2.41	0.1
8	0_7624801	Confined	4,434	2/20/1991	569.95	531.61	3.83	0.1
8	0_7624801	Confined	4,799	2/20/1992	577.82	533.14	4.47	0.1
8	0_7624801	Confined	5,171	2/26/1993	573.07	534.57	3.85	0.1
8	0_7624801	Confined	5,549	3/11/1994	545.47	534.94	1.05	0.1
8	0_7624801	Confined	6,246	2/6/1996	576.37	534.94	4.14	0.1
8	0_7624801	Confined	6,619	2/13/1997	578.67	533.88	4.48	0.1
8	0_7624801	Confined	7,349	2/13/1999	578.67	534.51	4.42	0.1
8	0_7624801	Confined	7,725	2/24/2000	578.07	533.87	4.42	0.1
8	0_7624801	Confined	8,082	2/15/2001	579.17	533.78	4.54	0.1
8	0_7624801	Confined	8,438	2/6/2002	582.39	533.65	4.87	0.1
8	0_7624801	Confined	8,808	2/11/2003	593.34	534.65	5.87	0.1
8	0_7624801	Confined	9,153	1/22/2004	582.77	535.02	4.78	0.1
8	0_7624801	Confined	9,535	2/7/2005	585.02	535.90	4.91	0.1
8	0_7624801	Confined	9,935	3/14/2006	577.62	535.34	4.23	0.1
8	0_7624801	Confined	10,265	2/7/2007	580.67	534.82	4.59	0.1
8	0_7624801	Confined	11,001	2/12/2009	581.34	535.51	4.58	0.1
8	0_7624801	Confined	12,080	1/27/2012	580.38	531.88	4.85	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7624801	Confined	12,443	1/24/2013	562.77	530.20	3.26	0.1
8	0_7624801	Confined	12,819	2/4/2014	576.19	528.78	4.74	0.1
8	0_7624801	Confined	13,072	10/15/2014	581.21	527.68	5.35	0.1
8	0_7624801	Confined	13,450	10/28/2015	553.32	527.39	2.59	0.1
8	0_7624801	Confined	13,813	10/25/2016	574.96	527.59	4.74	0.1
8	0_7624906	Confined	774	2/12/1981	400.10	426.69	-2.66	0.1
8	0_7624906	Confined	1,502	2/10/1983	399.06	429.18	-3.01	0.1
8	0_7624906	Confined	1,877	2/20/1984	397.44	429.32	-3.19	0.1
8	0_7624906	Confined	2,230	2/7/1985	396.56	427.68	-3.11	0.1
8	0_7624906	Confined	2,596	2/8/1986	397.56	427.07	-2.95	0.1
8	0_7624906	Confined	2,964	2/11/1987	396.98	435.05	-3.81	0.1
8	0_7624906	Confined	3,354	3/7/1988	400.11	442.56	-4.25	0.1
8	0_7624906	Confined	3,693	2/9/1989	398.46	442.45	-4.40	0.1
8	0_7624906	Confined	4,064	2/15/1990	398.59	440.92	-4.23	0.1
8	0_7624906	Confined	4,434	2/20/1991	399.45	444.22	-4.48	0.1
8	0_7624906	Confined	4,799	2/20/1992	399.59	441.36	-4.18	0.1
8	0_7624906	Confined	5,171	2/26/1993	401.16	440.09	-3.89	0.1
8	0_7624906	Confined	5,549	3/11/1994	397.96	439.27	-4.13	0.1
8	0_7624906	Confined	5,793	11/10/1994	399.86	438.47	-3.86	0.1
8	0_7624906	Confined	6,246	2/6/1996	394.46	436.05	-4.16	0.1
8	0_7624906	Confined	6,632	2/26/1997	396.56	433.73	-3.72	0.1
8	0_7624906	Confined	6,996	2/25/1998	394.60	433.46	-3.89	0.1
8	0_7624906	Confined	7,345	2/9/1999	395.86	433.90	-3.80	0.1
8	0_7624906	Confined	7,753	3/23/2000	394.56	433.72	-3.92	0.1
8	0_7624906	Confined	8,082	2/15/2001	393.66	431.94	-3.83	0.1
8	0_7624906	Confined	8,439	2/7/2002	391.16	431.52	-4.04	0.1
8	0_7624906	Confined	8,809	2/12/2003	393.96	429.75	-3.58	0.1
8	0_7624906	Confined	9,176	2/14/2004	389.26	429.47	-4.02	0.1
8	0_7624906	Confined	9,533	2/5/2005	390.99	430.63	-3.96	0.1
8	0_7624906	Confined	9,936	3/15/2006	388.69	431.82	-4.31	0.1
8	0_7624906	Confined	10,266	2/8/2007	387.66	433.78	-4.61	0.1
8	0_7624906	Confined	10,649	2/26/2008	386.34	435.96	-4.96	0.1
8	0_7624906	Confined	11,001	2/12/2009	386.46	433.51	-4.70	0.1
8	0_7624906	Confined	11,349	1/26/2010	379.97	426.09	-4.61	0.1
8	0_7624906	Confined	12,080	1/27/2012	381.06	408.31	-2.72	0.1
8	0_7624906	Confined	12,444	1/25/2013	377.67	404.47	-2.68	0.1
8	0_7624906	Confined	12,819	2/4/2014	372.67	401.41	-2.87	0.1
8	0_7624906	Confined	13,112	11/24/2014	371.45	399.13	-2.77	0.1
8	0_7624906	Confined	13,437	10/15/2015	371.86	399.05	-2.72	0.1
8	0_7624906	Confined	13,813	10/25/2016	371.31	400.04	-2.87	0.1
8	0_7624906	Confined	14,176	10/23/2017	368.31	401.02	-3.27	0.1
8	0_7640901	Confined	771	2/9/1981	660.03	656.77	3.26	1
8	0_7640901	Confined	1,495	2/3/1983	659.22	657.36	1.86	1
8	0_7648401	Unconfined	2,963	2/10/1987	595.31	633.64	-38.33	1
8	0_7648401	Unconfined	3,357	3/10/1988	587.58	633.47	-45.89	1
8	0_7648401	Unconfined	3,692	2/8/1989	602.76	631.02	-28.26	1
8	0_7648401	Unconfined	4,797	2/18/1992	581.79	633.38	-51.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648401	Unconfined	5,164	2/19/1993	599.46	635.87	-36.41	1
8	0_7648401	Unconfined	5,532	2/22/1994	628.06	635.76	-7.70	1
8	0_7648401	Unconfined	5,804	11/21/1994	631.98	636.49	-4.51	1
8	0_7648401	Unconfined	6,238	1/29/1996	631.36	635.90	-4.54	1
8	0_7648401	Unconfined	6,616	2/10/1997	634.46	634.46	0.00	1
8	0_7648401	Unconfined	6,995	2/24/1998	633.67	636.13	-2.46	1
8	0_7648601	Confined	11,953	9/22/2011	602.71	621.96	-19.25	1
8	0_7648601	Confined	12,027	12/5/2011	621.01	621.67	-0.66	1
8	0_7648601	Confined	12,058	1/5/2012	621.01	621.56	-0.55	1
8	0_7648601	Confined	12,123	3/10/2012	620.71	621.39	-0.68	1
8	0_7648601	Confined	12,149	4/5/2012	621.11	621.32	-0.21	1
8	0_7648601	Confined	12,175	5/1/2012	620.71	621.25	-0.54	1
8	0_7648601	Confined	12,210	6/5/2012	620.91	621.16	-0.25	1
8	0_7648601	Confined	12,236	7/1/2012	614.11	621.09	-6.98	1
8	0_7648601	Confined	12,260	7/25/2012	617.01	621.03	-4.02	1
8	0_7648601	Confined	12,296	8/30/2012	620.61	620.94	-0.33	1
8	0_7648601	Confined	12,332	10/5/2012	621.41	620.84	0.57	1
8	0_7648601	Confined	12,455	2/5/2013	621.01	620.57	0.44	1
8	0_7648601	Confined	12,479	3/1/2013	619.11	620.54	-1.43	1
8	0_7648601	Confined	12,508	3/30/2013	619.01	620.51	-1.50	1
8	0_7648601	Confined	12,534	4/25/2013	621.04	620.47	0.57	1
8	0_7648601	Confined	12,539	4/30/2013	620.72	620.47	0.25	1
8	0_7648601	Confined	12,540	5/1/2013	620.73	620.47	0.26	1
8	0_7648601	Confined	12,544	5/5/2013	618.76	620.46	-1.70	1
8	0_7648601	Confined	12,549	5/10/2013	618.76	620.46	-1.70	1
8	0_7648601	Confined	12,554	5/15/2013	618.66	620.45	-1.79	1
8	0_7648601	Confined	12,559	5/20/2013	619.18	620.44	-1.26	1
8	0_7648601	Confined	12,564	5/25/2013	618.59	620.44	-1.85	1
8	0_7648601	Confined	12,569	5/30/2013	618.59	620.43	-1.84	1
8	0_7648601	Confined	12,571	6/1/2013	618.51	620.43	-1.92	1
8	0_7648601	Confined	12,575	6/5/2013	618.41	620.42	-2.01	1
8	0_7648601	Confined	12,580	6/10/2013	618.33	620.42	-2.09	1
8	0_7648601	Confined	12,585	6/15/2013	618.74	620.41	-1.67	1
8	0_7648601	Confined	12,590	6/20/2013	619.14	620.41	-1.27	1
8	0_7648601	Confined	12,595	6/25/2013	619.51	620.40	-0.89	1
8	0_7648601	Confined	12,600	6/30/2013	619.51	620.39	-0.88	1
8	0_7648601	Confined	12,601	7/1/2013	619.56	620.39	-0.83	1
8	0_7648601	Confined	12,605	7/5/2013	619.68	620.39	-0.71	1
8	0_7648601	Confined	12,610	7/10/2013	619.77	620.38	-0.61	1
8	0_7648601	Confined	12,615	7/15/2013	619.80	620.37	-0.57	1
8	0_7648601	Confined	12,620	7/20/2013	619.89	620.37	-0.48	1
8	0_7648601	Confined	12,625	7/25/2013	619.94	620.36	-0.42	1
8	0_7648601	Confined	12,630	7/30/2013	619.95	620.36	-0.41	1
8	0_7648601	Confined	12,632	8/1/2013	619.93	620.35	-0.42	1
8	0_7648601	Confined	12,636	8/5/2013	619.94	620.35	-0.41	1
8	0_7648601	Confined	12,641	8/10/2013	620.03	620.34	-0.31	1
8	0_7648601	Confined	12,646	8/15/2013	620.01	620.34	-0.33	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	12,651	8/20/2013	619.90	620.33	-0.43	1
8	0_7648601	Confined	12,656	8/25/2013	619.90	620.32	-0.42	1
8	0_7648601	Confined	12,661	8/30/2013	619.85	620.32	-0.47	1
8	0_7648601	Confined	12,663	9/1/2013	619.84	620.32	-0.48	1
8	0_7648601	Confined	12,667	9/5/2013	619.89	620.31	-0.42	1
8	0_7648601	Confined	12,672	9/10/2013	619.91	620.30	-0.39	1
8	0_7648601	Confined	12,677	9/15/2013	619.85	620.30	-0.45	1
8	0_7648601	Confined	12,682	9/20/2013	619.79	620.29	-0.50	1
8	0_7648601	Confined	12,687	9/25/2013	619.80	620.29	-0.49	1
8	0_7648601	Confined	12,692	9/30/2013	619.78	620.28	-0.50	1
8	0_7648601	Confined	12,693	10/1/2013	619.69	620.28	-0.59	1
8	0_7648601	Confined	12,697	10/5/2013	619.71	620.27	-0.56	1
8	0_7648601	Confined	12,702	10/10/2013	619.78	620.27	-0.49	1
8	0_7648601	Confined	12,707	10/15/2013	619.83	620.26	-0.43	1
8	0_7648601	Confined	12,712	10/20/2013	619.84	620.25	-0.41	1
8	0_7648601	Confined	12,717	10/25/2013	619.90	620.25	-0.35	1
8	0_7648601	Confined	12,722	10/30/2013	619.89	620.24	-0.35	1
8	0_7648601	Confined	12,724	11/1/2013	619.92	620.24	-0.32	1
8	0_7648601	Confined	12,728	11/5/2013	619.94	620.23	-0.29	1
8	0_7648601	Confined	12,733	11/10/2013	620.01	620.23	-0.22	1
8	0_7648601	Confined	12,738	11/15/2013	619.98	620.22	-0.24	1
8	0_7648601	Confined	12,743	11/20/2013	620.04	620.22	-0.18	1
8	0_7648601	Confined	12,748	11/25/2013	620.08	620.21	-0.13	1
8	0_7648601	Confined	12,753	11/30/2013	620.10	620.20	-0.10	1
8	0_7648601	Confined	12,754	12/1/2013	620.09	620.20	-0.11	1
8	0_7648601	Confined	12,758	12/5/2013	620.11	620.20	-0.09	1
8	0_7648601	Confined	12,763	12/10/2013	620.23	620.19	0.04	1
8	0_7648601	Confined	12,768	12/15/2013	620.22	620.19	0.03	1
8	0_7648601	Confined	12,773	12/20/2013	620.15	620.18	-0.03	1
8	0_7648601	Confined	12,778	12/25/2013	620.19	620.17	0.02	1
8	0_7648601	Confined	12,783	12/30/2013	620.24	620.17	0.07	1
8	0_7648601	Confined	12,785	1/1/2014	620.20	620.16	0.04	1
8	0_7648601	Confined	12,789	1/5/2014	620.20	620.16	0.04	1
8	0_7648601	Confined	12,794	1/10/2014	620.24	620.15	0.09	1
8	0_7648601	Confined	12,799	1/15/2014	620.29	620.14	0.15	1
8	0_7648601	Confined	12,804	1/20/2014	620.12	620.13	-0.01	1
8	0_7648601	Confined	12,809	1/25/2014	620.17	620.12	0.05	1
8	0_7648601	Confined	12,814	1/30/2014	620.02	620.12	-0.10	1
8	0_7648601	Confined	12,816	2/1/2014	620.03	620.11	-0.08	1
8	0_7648601	Confined	12,820	2/5/2014	620.02	620.11	-0.09	1
8	0_7648601	Confined	12,825	2/10/2014	619.92	620.10	-0.18	1
8	0_7648601	Confined	12,830	2/15/2014	619.86	620.09	-0.23	1
8	0_7648601	Confined	12,835	2/20/2014	619.79	620.08	-0.29	1
8	0_7648601	Confined	12,840	2/25/2014	619.78	620.07	-0.29	1
8	0_7648601	Confined	12,843	2/28/2014	619.76	620.07	-0.31	1
8	0_7648601	Confined	12,844	3/1/2014	619.80	620.07	-0.27	1
8	0_7648601	Confined	12,848	3/5/2014	619.82	620.06	-0.24	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	12,853	3/10/2014	619.85	620.05	-0.20	1
8	0_7648601	Confined	12,858	3/15/2014	619.83	620.04	-0.21	1
8	0_7648601	Confined	12,863	3/20/2014	619.89	620.03	-0.14	1
8	0_7648601	Confined	12,868	3/25/2014	619.88	620.03	-0.15	1
8	0_7648601	Confined	12,873	3/30/2014	619.82	620.02	-0.20	1
8	0_7648601	Confined	12,875	4/1/2014	619.82	620.01	-0.19	1
8	0_7648601	Confined	12,879	4/5/2014	619.83	620.01	-0.18	1
8	0_7648601	Confined	12,884	4/10/2014	619.78	620.00	-0.22	1
8	0_7648601	Confined	12,889	4/15/2014	619.86	619.99	-0.13	1
8	0_7648601	Confined	12,894	4/20/2014	619.81	619.98	-0.17	1
8	0_7648601	Confined	12,899	4/25/2014	619.79	619.97	-0.18	1
8	0_7648601	Confined	12,904	4/30/2014	619.74	619.97	-0.23	1
8	0_7648601	Confined	12,905	5/1/2014	619.75	619.96	-0.21	1
8	0_7648601	Confined	12,909	5/5/2014	619.66	619.96	-0.30	1
8	0_7648601	Confined	12,914	5/10/2014	619.68	619.95	-0.27	1
8	0_7648601	Confined	12,919	5/15/2014	619.69	619.94	-0.25	1
8	0_7648601	Confined	12,924	5/20/2014	619.69	619.93	-0.24	1
8	0_7648601	Confined	12,929	5/25/2014	619.64	619.92	-0.28	1
8	0_7648601	Confined	12,934	5/30/2014	619.53	619.92	-0.39	1
8	0_7648601	Confined	12,936	6/1/2014	619.58	619.91	-0.33	1
8	0_7648601	Confined	12,940	6/5/2014	619.52	619.91	-0.39	1
8	0_7648601	Confined	12,945	6/10/2014	619.45	619.90	-0.45	1
8	0_7648601	Confined	12,950	6/15/2014	619.42	619.89	-0.47	1
8	0_7648601	Confined	12,955	6/20/2014	619.48	619.88	-0.40	1
8	0_7648601	Confined	12,960	6/25/2014	619.47	619.87	-0.40	1
8	0_7648601	Confined	12,965	6/30/2014	619.50	619.86	-0.36	1
8	0_7648601	Confined	12,966	7/1/2014	619.49	619.86	-0.37	1
8	0_7648601	Confined	12,970	7/5/2014	619.48	619.86	-0.38	1
8	0_7648601	Confined	12,975	7/10/2014	619.37	619.85	-0.48	1
8	0_7648601	Confined	12,980	7/15/2014	619.30	619.84	-0.54	1
8	0_7648601	Confined	12,985	7/20/2014	618.41	619.83	-1.42	1
8	0_7648601	Confined	12,990	7/25/2014	619.17	619.82	-0.65	1
8	0_7648601	Confined	12,995	7/30/2014	619.24	619.81	-0.57	1
8	0_7648601	Confined	12,997	8/1/2014	619.26	619.81	-0.55	1
8	0_7648601	Confined	13,001	8/5/2014	619.30	619.80	-0.50	1
8	0_7648601	Confined	13,006	8/10/2014	619.31	619.80	-0.49	1
8	0_7648601	Confined	13,011	8/15/2014	619.04	619.79	-0.75	1
8	0_7648601	Confined	13,016	8/20/2014	619.31	619.78	-0.47	1
8	0_7648601	Confined	13,021	8/25/2014	619.34	619.77	-0.43	1
8	0_7648601	Confined	13,026	8/30/2014	619.33	619.76	-0.43	1
8	0_7648601	Confined	13,028	9/1/2014	619.35	619.76	-0.41	1
8	0_7648601	Confined	13,032	9/5/2014	619.31	619.75	-0.44	1
8	0_7648601	Confined	13,037	9/10/2014	619.27	619.74	-0.47	1
8	0_7648601	Confined	13,042	9/15/2014	619.32	619.73	-0.41	1
8	0_7648601	Confined	13,047	9/20/2014	618.76	619.73	-0.97	1
8	0_7648601	Confined	13,052	9/25/2014	618.89	619.72	-0.83	1
8	0_7648601	Confined	13,057	9/30/2014	619.10	619.71	-0.61	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	13,058	10/1/2014	619.09	619.71	-0.62	1
8	0_7648601	Confined	13,062	10/5/2014	619.10	619.70	-0.60	1
8	0_7648601	Confined	13,067	10/10/2014	619.14	619.69	-0.55	1
8	0_7648601	Confined	13,072	10/15/2014	619.15	619.68	-0.53	1
8	0_7648601	Confined	13,077	10/20/2014	619.13	619.68	-0.55	1
8	0_7648601	Confined	13,082	10/25/2014	619.12	619.67	-0.55	1
8	0_7648601	Confined	13,087	10/30/2014	619.16	619.66	-0.50	1
8	0_7648601	Confined	13,089	11/1/2014	619.19	619.66	-0.47	1
8	0_7648601	Confined	13,093	11/5/2014	619.16	619.65	-0.49	1
8	0_7648601	Confined	13,098	11/10/2014	619.16	619.64	-0.48	1
8	0_7648601	Confined	13,103	11/15/2014	619.22	619.63	-0.41	1
8	0_7648601	Confined	13,108	11/20/2014	619.22	619.62	-0.40	1
8	0_7648601	Confined	13,113	11/25/2014	619.29	619.62	-0.33	1
8	0_7648601	Confined	13,118	11/30/2014	619.28	619.61	-0.33	1
8	0_7648601	Confined	13,119	12/1/2014	619.29	619.61	-0.32	1
8	0_7648601	Confined	13,123	12/5/2014	619.24	619.60	-0.36	1
8	0_7648601	Confined	13,128	12/10/2014	618.25	619.59	-1.34	1
8	0_7648601	Confined	13,133	12/15/2014	619.15	619.58	-0.43	1
8	0_7648601	Confined	13,138	12/20/2014	619.24	619.57	-0.33	1
8	0_7648601	Confined	13,143	12/25/2014	619.21	619.57	-0.36	1
8	0_7648601	Confined	13,148	12/30/2014	619.15	619.56	-0.41	1
8	0_7648601	Confined	13,150	1/1/2015	619.17	619.56	-0.39	1
8	0_7648601	Confined	13,154	1/5/2015	619.23	619.57	-0.34	1
8	0_7648601	Confined	13,159	1/10/2015	619.22	619.58	-0.36	1
8	0_7648601	Confined	13,164	1/15/2015	619.18	619.59	-0.41	1
8	0_7648601	Confined	13,169	1/20/2015	619.12	619.60	-0.48	1
8	0_7648601	Confined	13,174	1/25/2015	619.16	619.62	-0.46	1
8	0_7648601	Confined	13,179	1/30/2015	619.17	619.63	-0.46	1
8	0_7648601	Confined	13,181	2/1/2015	619.16	619.63	-0.47	1
8	0_7648601	Confined	13,185	2/5/2015	619.21	619.64	-0.43	1
8	0_7648601	Confined	13,190	2/10/2015	619.24	619.65	-0.41	1
8	0_7648601	Confined	13,195	2/15/2015	619.21	619.67	-0.46	1
8	0_7648601	Confined	13,200	2/20/2015	619.15	619.68	-0.53	1
8	0_7648601	Confined	13,205	2/25/2015	619.11	619.69	-0.58	1
8	0_7648601	Confined	13,208	2/28/2015	619.09	619.70	-0.61	1
8	0_7648601	Confined	13,209	3/1/2015	618.54	619.70	-1.16	1
8	0_7648601	Confined	13,213	3/5/2015	619.05	619.71	-0.66	1
8	0_7648601	Confined	13,218	3/10/2015	618.99	619.72	-0.73	1
8	0_7648601	Confined	13,223	3/15/2015	619.00	619.73	-0.73	1
8	0_7648601	Confined	13,228	3/20/2015	618.93	619.75	-0.82	1
8	0_7648601	Confined	13,233	3/25/2015	618.95	619.76	-0.81	1
8	0_7648601	Confined	13,238	3/30/2015	618.84	619.77	-0.93	1
8	0_7648601	Confined	13,240	4/1/2015	618.84	619.78	-0.94	1
8	0_7648601	Confined	13,244	4/5/2015	618.92	619.78	-0.86	1
8	0_7648601	Confined	13,249	4/10/2015	619.01	619.80	-0.79	1
8	0_7648601	Confined	13,254	4/15/2015	619.04	619.81	-0.77	1
8	0_7648601	Confined	13,259	4/20/2015	619.09	619.82	-0.73	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	13,264	4/25/2015	619.10	619.83	-0.73	1
8	0_7648601	Confined	13,269	4/30/2015	619.10	619.85	-0.75	1
8	0_7648601	Confined	13,270	5/1/2015	619.11	619.85	-0.74	1
8	0_7648601	Confined	13,274	5/5/2015	619.12	619.86	-0.74	1
8	0_7648601	Confined	13,279	5/10/2015	619.13	619.87	-0.74	1
8	0_7648601	Confined	13,284	5/15/2015	619.11	619.88	-0.77	1
8	0_7648601	Confined	13,289	5/20/2015	619.11	619.89	-0.78	1
8	0_7648601	Confined	13,294	5/25/2015	619.12	619.91	-0.79	1
8	0_7648601	Confined	13,330	6/30/2015	617.51	619.99	-2.48	1
8	0_7648601	Confined	13,360	7/30/2015	617.91	620.06	-2.15	1
8	0_7648601	Confined	13,362	8/1/2015	619.03	620.07	-1.04	1
8	0_7648601	Confined	13,366	8/5/2015	619.06	620.08	-1.02	1
8	0_7648601	Confined	13,371	8/10/2015	619.03	620.09	-1.06	1
8	0_7648601	Confined	13,376	8/15/2015	619.02	620.10	-1.08	1
8	0_7648601	Confined	13,381	8/20/2015	619.03	620.11	-1.08	1
8	0_7648601	Confined	13,386	8/25/2015	619.01	620.13	-1.12	1
8	0_7648601	Confined	13,391	8/30/2015	618.98	620.14	-1.16	1
8	0_7648601	Confined	13,393	9/1/2015	618.99	620.14	-1.15	1
8	0_7648601	Confined	13,397	9/5/2015	618.84	620.15	-1.31	1
8	0_7648601	Confined	13,402	9/10/2015	618.90	620.17	-1.27	1
8	0_7648601	Confined	13,407	9/15/2015	618.90	620.18	-1.28	1
8	0_7648601	Confined	13,412	9/20/2015	618.86	620.19	-1.33	1
8	0_7648601	Confined	13,417	9/25/2015	618.87	620.20	-1.33	1
8	0_7648601	Confined	13,422	9/30/2015	618.90	620.21	-1.31	1
8	0_7648601	Confined	13,423	10/1/2015	618.91	620.22	-1.31	1
8	0_7648601	Confined	13,427	10/5/2015	618.91	620.23	-1.32	1
8	0_7648601	Confined	13,432	10/10/2015	618.93	620.24	-1.31	1
8	0_7648601	Confined	13,437	10/15/2015	618.88	620.25	-1.37	1
8	0_7648601	Confined	13,442	10/20/2015	618.86	620.26	-1.40	1
8	0_7648601	Confined	13,447	10/25/2015	618.88	620.27	-1.39	1
8	0_7648601	Confined	13,452	10/30/2015	618.83	620.29	-1.46	1
8	0_7648601	Confined	13,454	11/1/2015	618.89	620.29	-1.40	1
8	0_7648601	Confined	13,458	11/5/2015	618.87	620.30	-1.43	1
8	0_7648601	Confined	13,463	11/10/2015	618.87	620.31	-1.44	1
8	0_7648601	Confined	13,468	11/15/2015	618.87	620.32	-1.45	1
8	0_7648601	Confined	13,473	11/20/2015	618.91	620.34	-1.43	1
8	0_7648601	Confined	13,478	11/25/2015	618.85	620.35	-1.50	1
8	0_7648601	Confined	13,483	11/30/2015	618.90	620.36	-1.46	1
8	0_7648601	Confined	13,484	12/1/2015	618.92	620.36	-1.44	1
8	0_7648601	Confined	13,513	12/30/2015	612.31	620.43	-8.12	1
8	0_7648601	Confined	13,544	1/30/2016	618.20	620.53	-2.33	1
8	0_7648601	Confined	13,546	2/1/2016	618.21	620.54	-2.33	1
8	0_7648601	Confined	13,550	2/5/2016	618.22	620.55	-2.33	1
8	0_7648601	Confined	13,555	2/10/2016	618.22	620.57	-2.35	1
8	0_7648601	Confined	13,560	2/15/2016	618.08	620.58	-2.50	1
8	0_7648601	Confined	13,565	2/20/2016	618.18	620.60	-2.42	1
8	0_7648601	Confined	13,570	2/25/2016	618.20	620.62	-2.42	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	13,574	2/29/2016	618.24	620.63	-2.39	1
8	0_7648601	Confined	13,575	3/1/2016	617.34	620.63	-3.29	1
8	0_7648601	Confined	13,579	3/5/2016	618.06	620.64	-2.58	1
8	0_7648601	Confined	13,584	3/10/2016	618.09	620.66	-2.57	1
8	0_7648601	Confined	13,589	3/15/2016	618.09	620.68	-2.59	1
8	0_7648601	Confined	13,594	3/20/2016	618.13	620.69	-2.56	1
8	0_7648601	Confined	13,599	3/25/2016	618.09	620.71	-2.62	1
8	0_7648601	Confined	13,604	3/30/2016	611.89	620.73	-8.84	1
8	0_7648601	Confined	13,606	4/1/2016	611.85	620.73	-8.88	1
8	0_7648601	Confined	13,610	4/5/2016	611.81	620.74	-8.93	1
8	0_7648601	Confined	13,615	4/10/2016	611.79	620.76	-8.97	1
8	0_7648601	Confined	13,620	4/15/2016	611.75	620.78	-9.03	1
8	0_7648601	Confined	13,625	4/20/2016	611.70	620.79	-9.09	1
8	0_7648601	Confined	13,630	4/25/2016	611.67	620.81	-9.14	1
8	0_7648601	Confined	13,635	4/30/2016	611.62	620.83	-9.21	1
8	0_7648601	Confined	13,636	5/1/2016	611.63	620.83	-9.20	1
8	0_7648601	Confined	13,640	5/5/2016	617.90	620.84	-2.94	1
8	0_7648601	Confined	13,645	5/10/2016	617.85	620.86	-3.01	1
8	0_7648601	Confined	13,650	5/15/2016	617.84	620.87	-3.03	1
8	0_7648601	Confined	13,655	5/20/2016	617.78	620.89	-3.11	1
8	0_7648601	Confined	13,660	5/25/2016	617.79	620.91	-3.12	1
8	0_7648601	Confined	13,665	5/30/2016	617.76	620.92	-3.16	1
8	0_7648601	Confined	13,667	6/1/2016	617.76	620.93	-3.17	1
8	0_7648601	Confined	13,671	6/5/2016	617.72	620.94	-3.22	1
8	0_7648601	Confined	13,676	6/10/2016	617.72	620.96	-3.24	1
8	0_7648601	Confined	13,681	6/15/2016	617.69	620.97	-3.28	1
8	0_7648601	Confined	13,686	6/20/2016	617.68	620.99	-3.31	1
8	0_7648601	Confined	13,691	6/25/2016	617.66	621.01	-3.35	1
8	0_7648601	Confined	13,696	6/30/2016	617.61	621.02	-3.41	1
8	0_7648601	Confined	13,697	7/1/2016	617.61	621.03	-3.42	1
8	0_7648601	Confined	13,701	7/5/2016	617.57	621.04	-3.47	1
8	0_7648601	Confined	13,706	7/10/2016	617.57	621.06	-3.49	1
8	0_7648601	Confined	13,711	7/15/2016	617.52	621.07	-3.55	1
8	0_7648601	Confined	13,716	7/20/2016	617.50	621.09	-3.59	1
8	0_7648601	Confined	13,721	7/25/2016	617.52	621.10	-3.58	1
8	0_7648601	Confined	13,728	8/1/2016	617.42	621.13	-3.71	1
8	0_7648601	Confined	13,732	8/5/2016	617.40	621.14	-3.74	1
8	0_7648601	Confined	13,737	8/10/2016	616.43	621.16	-4.73	1
8	0_7648601	Confined	13,742	8/15/2016	617.23	621.17	-3.94	1
8	0_7648601	Confined	13,747	8/20/2016	617.28	621.19	-3.91	1
8	0_7648601	Confined	13,752	8/25/2016	617.35	621.20	-3.85	1
8	0_7648601	Confined	13,757	8/30/2016	617.37	621.22	-3.85	1
8	0_7648601	Confined	13,759	9/1/2016	617.37	621.23	-3.86	1
8	0_7648601	Confined	13,763	9/5/2016	617.49	621.24	-3.75	1
8	0_7648601	Confined	13,768	9/10/2016	616.72	621.26	-4.54	1
8	0_7648601	Confined	13,773	9/15/2016	617.37	621.27	-3.90	1
8	0_7648601	Confined	13,778	9/20/2016	617.46	621.29	-3.83	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	13,783	9/25/2016	617.45	621.30	-3.85	1
8	0_7648601	Confined	13,788	9/30/2016	617.44	621.32	-3.88	1
8	0_7648601	Confined	13,789	10/1/2016	617.41	621.32	-3.91	1
8	0_7648601	Confined	13,793	10/5/2016	617.45	621.34	-3.89	1
8	0_7648601	Confined	13,798	10/10/2016	617.45	621.35	-3.90	1
8	0_7648601	Confined	13,803	10/15/2016	617.44	621.37	-3.93	1
8	0_7648601	Confined	13,808	10/20/2016	616.53	621.38	-4.85	1
8	0_7648601	Confined	13,813	10/25/2016	617.32	621.40	-4.08	1
8	0_7648601	Confined	13,818	10/30/2016	617.41	621.42	-4.01	1
8	0_7648601	Confined	13,820	11/1/2016	617.41	621.42	-4.01	1
8	0_7648601	Confined	13,824	11/5/2016	617.46	621.44	-3.98	1
8	0_7648601	Confined	13,829	11/10/2016	617.47	621.45	-3.98	1
8	0_7648601	Confined	13,834	11/15/2016	617.44	621.47	-4.03	1
8	0_7648601	Confined	13,839	11/20/2016	617.50	621.48	-3.98	1
8	0_7648601	Confined	13,844	11/25/2016	617.48	621.50	-4.02	1
8	0_7648601	Confined	13,849	11/30/2016	617.46	621.52	-4.06	1
8	0_7648601	Confined	13,850	12/1/2016	617.47	621.52	-4.05	1
8	0_7648601	Confined	13,854	12/5/2016	617.46	621.53	-4.07	1
8	0_7648601	Confined	13,859	12/10/2016	617.46	621.55	-4.09	1
8	0_7648601	Confined	13,864	12/15/2016	617.28	621.57	-4.29	1
8	0_7648601	Confined	13,869	12/20/2016	617.12	621.58	-4.46	1
8	0_7648601	Confined	13,874	12/25/2016	617.03	621.60	-4.57	1
8	0_7648601	Confined	13,879	12/30/2016	616.58	621.61	-5.03	1
8	0_7648601	Confined	13,881	1/1/2017	616.79	621.62	-4.83	1
8	0_7648601	Confined	13,885	1/5/2017	616.88	621.63	-4.75	1
8	0_7648601	Confined	13,890	1/10/2017	616.81	621.64	-4.83	1
8	0_7648601	Confined	13,895	1/15/2017	616.52	621.65	-5.13	1
8	0_7648601	Confined	13,900	1/20/2017	616.76	621.66	-4.90	1
8	0_7648601	Confined	13,905	1/25/2017	616.65	621.67	-5.02	1
8	0_7648601	Confined	13,910	1/30/2017	616.73	621.67	-4.94	1
8	0_7648601	Confined	13,912	2/1/2017	616.69	621.68	-4.99	1
8	0_7648601	Confined	13,916	2/5/2017	616.65	621.69	-5.04	1
8	0_7648601	Confined	13,921	2/10/2017	616.04	621.70	-5.66	1
8	0_7648601	Confined	13,926	2/15/2017	616.58	621.71	-5.13	1
8	0_7648601	Confined	13,931	2/20/2017	616.55	621.71	-5.16	1
8	0_7648601	Confined	13,936	2/25/2017	616.57	621.72	-5.15	1
8	0_7648601	Confined	13,939	2/28/2017	616.60	621.73	-5.13	1
8	0_7648601	Confined	13,940	3/1/2017	616.56	621.73	-5.17	1
8	0_7648601	Confined	13,944	3/5/2017	615.81	621.74	-5.93	1
8	0_7648601	Confined	13,949	3/10/2017	616.45	621.75	-5.30	1
8	0_7648601	Confined	13,954	3/15/2017	616.48	621.76	-5.28	1
8	0_7648601	Confined	13,959	3/20/2017	616.48	621.77	-5.29	1
8	0_7648601	Confined	13,964	3/25/2017	616.41	621.78	-5.37	1
8	0_7648601	Confined	13,969	3/30/2017	616.32	621.79	-5.47	1
8	0_7648601	Confined	13,971	4/1/2017	616.33	621.79	-5.46	1
8	0_7648601	Confined	13,975	4/5/2017	616.31	621.80	-5.49	1
8	0_7648601	Confined	13,980	4/10/2017	616.28	621.81	-5.53	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	13,985	4/15/2017	616.28	621.82	-5.54	1
8	0_7648601	Confined	13,990	4/20/2017	616.27	621.83	-5.56	1
8	0_7648601	Confined	13,995	4/25/2017	616.12	621.84	-5.72	1
8	0_7648601	Confined	14,000	4/30/2017	616.26	621.85	-5.59	1
8	0_7648601	Confined	14,001	5/1/2017	616.16	621.85	-5.69	1
8	0_7648601	Confined	14,005	5/5/2017	616.17	621.86	-5.69	1
8	0_7648601	Confined	14,010	5/10/2017	616.10	621.87	-5.77	1
8	0_7648601	Confined	14,015	5/15/2017	616.04	621.88	-5.84	1
8	0_7648601	Confined	14,020	5/20/2017	616.03	621.88	-5.85	1
8	0_7648601	Confined	14,025	5/25/2017	615.93	621.89	-5.96	1
8	0_7648601	Confined	14,030	5/30/2017	615.14	621.90	-6.76	1
8	0_7648601	Confined	14,032	6/1/2017	615.14	621.91	-6.77	1
8	0_7648601	Confined	14,036	6/5/2017	615.78	621.92	-6.14	1
8	0_7648601	Confined	14,041	6/10/2017	615.80	621.92	-6.12	1
8	0_7648601	Confined	14,046	6/15/2017	615.77	621.93	-6.16	1
8	0_7648601	Confined	14,051	6/20/2017	615.74	621.94	-6.20	1
8	0_7648601	Confined	14,056	6/25/2017	615.67	621.95	-6.28	1
8	0_7648601	Confined	14,061	6/30/2017	614.89	621.96	-7.07	1
8	0_7648601	Confined	14,062	7/1/2017	614.82	621.96	-7.14	1
8	0_7648601	Confined	14,066	7/5/2017	614.64	621.97	-7.33	1
8	0_7648601	Confined	14,071	7/10/2017	614.61	621.98	-7.37	1
8	0_7648601	Confined	14,076	7/15/2017	615.33	621.99	-6.66	1
8	0_7648601	Confined	14,081	7/20/2017	615.31	622.00	-6.69	1
8	0_7648601	Confined	14,086	7/25/2017	615.29	622.01	-6.72	1
8	0_7648601	Confined	14,091	7/30/2017	615.34	622.02	-6.68	1
8	0_7648601	Confined	14,093	8/1/2017	615.35	622.02	-6.67	1
8	0_7648601	Confined	14,097	8/5/2017	615.31	622.03	-6.72	1
8	0_7648601	Confined	14,102	8/10/2017	615.32	622.04	-6.72	1
8	0_7648601	Confined	14,107	8/15/2017	615.29	622.05	-6.76	1
8	0_7648601	Confined	14,112	8/20/2017	615.28	622.06	-6.78	1
8	0_7648601	Confined	14,117	8/25/2017	615.34	622.07	-6.73	1
8	0_7648601	Confined	14,122	8/30/2017	615.36	622.08	-6.72	1
8	0_7648601	Confined	14,124	9/1/2017	615.36	622.08	-6.72	1
8	0_7648601	Confined	14,128	9/5/2017	615.37	622.09	-6.72	1
8	0_7648601	Confined	14,133	9/10/2017	615.28	622.10	-6.82	1
8	0_7648601	Confined	14,138	9/15/2017	615.25	622.11	-6.86	1
8	0_7648601	Confined	14,143	9/20/2017	614.63	622.12	-7.49	1
8	0_7648601	Confined	14,148	9/25/2017	614.66	622.13	-7.47	1
8	0_7648601	Confined	14,153	9/30/2017	615.24	622.14	-6.90	1
8	0_7648601	Confined	14,154	10/1/2017	615.24	622.14	-6.90	1
8	0_7648601	Confined	14,158	10/5/2017	615.21	622.15	-6.94	1
8	0_7648601	Confined	14,163	10/10/2017	615.26	622.16	-6.90	1
8	0_7648601	Confined	14,168	10/15/2017	615.25	622.17	-6.92	1
8	0_7648601	Confined	14,173	10/20/2017	615.29	622.18	-6.89	1
8	0_7648601	Confined	14,178	10/25/2017	615.30	622.19	-6.89	1
8	0_7648601	Confined	14,183	10/30/2017	615.22	622.20	-6.98	1
8	0_7648601	Confined	14,185	11/1/2017	615.26	622.20	-6.94	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648601	Confined	14,189	11/5/2017	615.26	622.21	-6.95	1
8	0_7648601	Confined	14,194	11/10/2017	615.27	622.22	-6.95	1
8	0_7648601	Confined	14,199	11/15/2017	615.21	622.23	-7.02	1
8	0_7648601	Confined	14,204	11/20/2017	615.25	622.24	-6.99	1
8	0_7648601	Confined	14,209	11/25/2017	615.21	622.25	-7.04	1
8	0_7648601	Confined	14,214	11/30/2017	615.24	622.25	-7.01	1
8	0_7648601	Confined	14,215	12/1/2017	615.25	622.26	-7.01	1
8	0_7648601	Confined	14,219	12/5/2017	615.23	622.26	-7.03	1
8	0_7648601	Confined	14,224	12/10/2017	615.28	622.27	-6.99	1
8	0_7648601	Confined	14,229	12/15/2017	615.25	622.28	-7.03	1
8	0_7648601	Confined	14,234	12/20/2017	614.56	622.29	-7.73	1
8	0_7648601	Confined	14,239	12/25/2017	615.14	622.30	-7.16	1
8	0_7648601	Confined	14,244	12/30/2017	615.15	622.31	-7.16	1
8	0_7648702	Unconfined	8,438	2/6/2002	598.88	615.85	-16.97	1
8	0_7648702	Unconfined	8,808	2/11/2003	611.18	618.86	-7.68	1
8	0_7648702	Unconfined	9,152	1/21/2004	620.53	619.69	0.84	1
8	0_7648702	Unconfined	9,536	2/8/2005	620.02	621.88	-1.86	1
8	0_7648702	Unconfined	9,936	3/15/2006	619.18	620.44	-1.26	1
8	0_7648702	Unconfined	10,266	2/8/2007	619.33	619.79	-0.46	1
8	0_7648702	Unconfined	10,649	2/26/2008	604.78	622.59	-17.81	1
8	0_7648702	Unconfined	11,013	2/24/2009	604.56	621.00	-16.44	1
8	0_7648702	Unconfined	11,350	1/27/2010	614.53	620.96	-6.43	1
8	0_7648702	Unconfined	12,079	1/26/2012	615.48	619.39	-3.91	1
8	0_7648702	Unconfined	12,820	2/5/2014	617.48	619.74	-2.26	1
8	0_7648702	Unconfined	13,450	10/28/2015	608.48	621.61	-13.13	1
8	0_7648702	Unconfined	14,170	10/17/2017	595.20	623.99	-28.79	1
8	0_7648801	Confined	771	2/9/1981	657.05	609.03	4.80	0.1
8	0_7648801	Confined	1,495	2/3/1983	658.89	609.28	4.96	0.1
8	0_7648801	Confined	1,874	2/17/1984	658.75	608.42	5.03	0.1
8	0_7648801	Confined	2,231	2/8/1985	658.52	607.32	5.12	0.1
8	0_7648801	Confined	2,601	2/13/1986	659.20	608.51	5.07	0.1
8	0_7648801	Confined	2,963	2/10/1987	659.31	609.13	5.02	0.1
8	0_7648801	Confined	3,357	3/10/1988	658.98	609.11	4.99	0.1
8	0_7648801	Confined	3,692	2/8/1989	658.61	606.73	5.19	0.1
8	0_7648801	Confined	4,062	2/13/1990	658.19	605.44	5.27	0.1
8	0_7648801	Confined	4,797	2/18/1992	658.73	608.14	5.06	0.1
8	0_7648801	Confined	5,164	2/19/1993	657.69	610.29	4.74	0.1
8	0_7648801	Confined	5,804	11/21/1994	648.80	610.95	3.79	0.1
8	0_7648801	Confined	6,616	2/10/1997	657.59	608.76	4.88	0.1
8	0_7648801	Confined	6,995	2/24/1998	657.64	610.30	4.73	0.1
8	0_7648801	Confined	7,346	2/10/1999	657.39	611.11	4.63	0.1
8	0_7648801	Confined	7,725	2/24/2000	656.99	609.78	4.72	0.1
8	0_7648801	Confined	8,081	2/14/2001	656.79	610.22	4.66	0.1
8	0_7648801	Confined	8,438	2/6/2002	656.51	610.51	4.60	0.1
8	0_7648801	Confined	9,536	2/8/2005	657.52	616.71	4.08	0.1
8	0_7648801	Confined	9,936	3/15/2006	656.96	615.30	4.17	0.1
8	0_7648801	Confined	10,266	2/8/2007	656.71	614.59	4.21	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7648801	Confined	10,649	2/26/2008	656.29	617.37	3.89	0.1
8	0_7648801	Confined	11,013	2/24/2009	657.39	615.76	4.16	0.1
8	0_7648801	Confined	11,350	1/27/2010	656.76	615.68	4.11	0.1
8	0_7648801	Confined	11,722	2/3/2011	656.33	616.22	4.01	0.1
8	0_7648801	Confined	12,079	1/26/2012	646.24	613.97	3.23	0.1
8	0_7648801	Confined	12,442	1/23/2013	655.99	613.77	4.22	0.1
8	0_7648801	Confined	12,820	2/5/2014	656.52	613.89	4.26	0.1
8	0_7648801	Confined	13,070	10/13/2014	655.89	613.59	4.23	0.1
8	0_7648801	Confined	13,450	10/28/2015	655.56	615.58	4.00	0.1
8	0_7648801	Confined	13,813	10/25/2016	655.39	617.47	3.79	0.1
8	0_7648801	Confined	14,170	10/17/2017	655.40	618.10	3.73	0.1
8	0_7648802	Confined	11,188	8/18/2009	669.95	612.75	5.72	0.1
8	0_7648802	Confined	12,193	5/19/2012	669.38	610.99	5.84	0.1
8	0_7648805	Confined	10,266	2/8/2007	663.35	618.97	4.44	0.1
8	0_7701501	Confined	773	2/11/1981	469.71	457.74	11.97	1
8	0_7701501	Confined	1,501	2/9/1983	472.87	462.76	10.11	1
8	0_7701501	Confined	2,229	2/6/1985	460.60	457.32	3.28	1
8	0_7701501	Confined	2,965	2/12/1987	471.60	478.29	-6.69	1
8	0_7701501	Confined	3,693	2/9/1989	469.79	486.19	-16.40	1
8	0_7701501	Confined	4,068	2/19/1990	464.22	476.35	-12.13	1
8	0_7701501	Confined	4,434	2/20/1991	479.72	474.48	5.24	1
8	0_7701501	Confined	4,799	2/20/1992	483.74	451.20	32.54	1
8	0_7701501	Confined	5,161	2/16/1993	480.52	446.81	33.71	1
8	0_7704603	Confined	2,227	2/4/1985	385.49	312.89	36.30	0.5
8	0_7704603	Confined	2,594	2/6/1986	347.08	311.19	17.94	0.5
8	0_7704603	Confined	2,966	2/13/1987	394.88	350.12	22.38	0.5
8	0_7704603	Confined	3,355	3/8/1988	383.78	368.25	7.77	0.5
8	0_7704603	Confined	3,697	2/13/1989	399.83	352.77	23.53	0.5
8	0_7704603	Confined	4,800	2/21/1992	417.60	297.18	60.21	0.5
8	0_7704603	Confined	5,157	2/12/1993	386.03	294.37	45.83	0.5
8	0_7704603	Confined	5,549	3/11/1994	342.38	293.95	24.21	0.5
8	0_7704603	Confined	5,792	11/9/1994	390.88	288.76	51.06	0.5
8	0_7704603	Confined	6,246	2/6/1996	340.68	278.25	31.22	0.5
8	0_7704603	Confined	6,633	2/27/1997	332.98	273.23	29.88	0.5
8	0_7704603	Confined	6,996	2/25/1998	340.93	279.53	30.70	0.5
8	0_7704603	Confined	7,344	2/8/1999	334.28	284.22	25.03	0.5
8	0_7704603	Confined	7,724	2/23/2000	327.38	284.80	21.29	0.5
8	0_7704603	Confined	8,439	2/7/2002	315.18	272.85	21.17	0.5
8	0_7704603	Confined	8,810	2/13/2003	326.08	257.95	34.06	0.5
8	0_7709101	Confined	773	2/11/1981	371.12	414.04	-42.92	1
8	0_7709101	Confined	1,877	2/20/1984	357.19	418.95	-61.76	1
8	0_7709101	Confined	2,230	2/7/1985	351.96	413.76	-61.80	1
8	0_7709101	Confined	2,592	2/4/1986	379.54	411.92	-32.38	1
8	0_7709101	Confined	2,965	2/12/1987	391.93	436.17	-44.24	1
8	0_7709101	Confined	3,358	3/11/1988	399.21	452.52	-53.31	1
8	0_7709101	Confined	3,698	2/14/1989	391.64	444.88	-53.24	1
8	0_7709101	Confined	4,068	2/19/1990	378.41	435.01	-56.60	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7709101	Confined	4,435	2/21/1991	396.92	433.39	-36.47	1
8	0_7709101	Confined	4,799	2/20/1992	407.71	409.31	-1.60	1
8	0_7709101	Confined	5,170	2/25/1993	407.31	404.98	2.33	1
8	0_7709101	Confined	5,560	3/22/1994	400.96	404.58	-3.62	1
8	0_7709101	Confined	5,793	11/10/1994	398.96	402.55	-3.59	1
8	0_7709101	Confined	7,345	2/9/1999	384.56	400.17	-15.61	1
8	0_7709101	Confined	7,754	3/24/2000	370.51	400.51	-30.00	1
8	0_7709101	Confined	8,082	2/15/2001	374.06	393.16	-19.10	1
8	0_7709101	Confined	8,445	2/13/2002	352.96	394.49	-41.53	1
8	0_7709101	Confined	8,809	2/12/2003	364.01	387.08	-23.07	1
8	0_7709101	Confined	9,532	2/4/2005	382.56	393.56	-11.00	1
8	0_7709101	Confined	9,937	3/16/2006	358.35	398.34	-39.99	1
8	0_7709101	Confined	10,270	2/12/2007	354.86	406.12	-51.26	1
8	0_7709101	Confined	10,651	2/28/2008	370.83	407.45	-36.62	1
8	0_7709101	Confined	11,001	2/12/2009	359.81	391.42	-31.61	1
8	0_7709101	Confined	11,349	1/26/2010	351.14	360.94	-9.80	1
8	0_7709101	Confined	12,078	1/25/2012	341.73	323.56	18.17	1
8	0_7709101	Confined	12,444	1/25/2013	339.35	326.19	13.16	1
8	0_7709101	Confined	12,819	2/4/2014	330.37	329.30	1.07	1
8	0_7709101	Confined	13,112	11/24/2014	326.18	329.98	-3.80	1
8	0_7709101	Confined	13,438	10/16/2015	325.36	338.57	-13.21	1
8	0_7709101	Confined	13,814	10/26/2016	330.31	347.72	-17.41	1
8	0_7709101	Confined	14,177	10/24/2017	323.14	352.49	-29.35	1
8	0_7709102	Confined	773	2/11/1981	489.18	414.04	7.51	0.1
8	0_7709102	Confined	1,136	2/9/1982	488.63	418.59	7.00	0.1
8	0_7709102	Confined	1,877	2/20/1984	493.20	418.95	7.43	0.1
8	0_7709102	Confined	2,230	2/7/1985	494.77	413.76	8.10	0.1
8	0_7709102	Confined	2,592	2/4/1986	495.42	411.92	8.35	0.1
8	0_7709102	Confined	2,965	2/12/1987	494.86	436.17	5.87	0.1
8	0_7709102	Confined	3,698	2/14/1989	494.54	444.88	4.97	0.1
8	0_7709102	Confined	4,068	2/19/1990	495.51	435.01	6.05	0.1
8	0_7709102	Confined	4,799	2/20/1992	484.30	409.31	7.50	0.1
8	0_7709102	Confined	5,170	2/25/1993	492.96	404.98	8.80	0.1
8	0_7709102	Confined	5,560	3/22/1994	484.16	404.58	7.96	0.1
8	0_7709102	Confined	5,793	11/10/1994	482.26	402.55	7.97	0.1
8	0_7709102	Confined	6,996	2/25/1998	472.78	396.66	7.61	0.1
8	0_7709102	Confined	7,753	3/23/2000	421.76	400.54	2.12	0.1
8	0_7709102	Confined	8,082	2/15/2001	373.36	393.16	-1.98	0.1
8	0_7709102	Confined	8,445	2/13/2002	343.86	394.49	-5.06	0.1
8	0_7709102	Confined	9,179	2/17/2004	377.46	388.27	-1.08	0.1
8	0_7709102	Confined	9,532	2/4/2005	380.53	393.56	-1.30	0.1
8	0_7709102	Confined	9,937	3/16/2006	364.55	398.34	-3.38	0.1
8	0_7709102	Confined	10,270	2/12/2007	353.86	406.12	-5.23	0.1
8	0_7709102	Confined	10,651	2/28/2008	368.96	407.45	-3.85	0.1
8	0_7709102	Confined	11,001	2/12/2009	354.01	391.42	-3.74	0.1
8	0_7709102	Confined	11,349	1/26/2010	345.57	360.94	-1.54	0.1
8	0_7709102	Confined	12,078	1/25/2012	320.28	323.56	-0.33	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	0_7709102	Confined	12,444	1/25/2013	316.10	326.19	-1.01	0.1
8	0_7709102	Confined	12,819	2/4/2014	290.66	329.30	-3.86	0.1
8	0_7709102	Confined	13,814	10/26/2016	318.86	347.72	-2.89	0.1
8	0_7709102	Confined	14,177	10/24/2017	315.07	352.49	-3.74	0.1
8	0_7709704	Confined	774	2/12/1981	300.30	393.74	-9.34	0.1
8	0_7709704	Confined	1,502	2/10/1983	293.65	399.48	-10.58	0.1
8	0_7709704	Confined	1,877	2/20/1984	297.92	398.82	-10.09	0.1
8	0_7709704	Confined	2,964	2/11/1987	356.23	417.03	-6.08	0.1
8	0_7709704	Confined	3,693	2/9/1989	343.93	426.03	-8.21	0.1
8	0_7709704	Confined	4,064	2/15/1990	335.68	415.66	-8.00	0.1
8	0_7717707	Confined	1,502	2/10/1983	371.17	392.49	-10.66	0.5
8	0_7722502	Confined	1,136	2/9/1982	261.94	274.96	-1.30	0.1
8	0_7722502	Confined	1,515	2/23/1983	251.99	276.44	-2.44	0.1
8	0_7722502	Confined	1,872	2/15/1984	256.05	279.90	-2.38	0.1
8	0_7722502	Confined	2,238	2/15/1985	239.94	276.08	-3.61	0.1
8	0_7722502	Confined	2,606	2/18/1986	267.88	283.68	-1.58	0.1
8	0_7722502	Confined	4,460	3/18/1991	202.74	277.29	-7.45	0.1
8	0_7725401	Unconfined	772	2/10/1981	629.70	528.80	100.90	1
8	0_7725401	Unconfined	1,499	2/7/1983	631.23	530.39	100.84	1
8	0_7725401	Unconfined	2,598	2/10/1986	633.12	530.46	102.66	1
8	0_7725401	Unconfined	3,692	2/8/1989	627.57	534.06	93.51	1
8	0_7725401	Unconfined	4,063	2/14/1990	632.50	534.92	97.58	1
8	0_7725401	Unconfined	4,433	2/19/1991	633.61	537.12	96.49	1
8	0_7725401	Unconfined	4,798	2/19/1992	628.83	540.16	88.67	1
8	14270_0	Confined	11,776	3/29/2011	342.19	396.23	-27.02	0.5
8	14361_6714410	Confined	10,013	5/31/2006	378.88	394.04	-1.52	0.1
8	14362_6713311	Confined	8,415	1/14/2002	484.01	410.88	7.31	0.1
8	14371_0	Unconfined	10,755	6/11/2008	340.84	396.81	-27.98	0.5
8	14375_0	Unconfined	11,440	4/27/2010	306.75	393.89	-43.57	0.5
8	14377_0	Unconfined	11,656	11/29/2010	309.18	396.12	-43.47	0.5
8	14379_0	Unconfined	9,892	1/30/2006	328.19	391.86	-31.83	0.5
8	14380_0	Confined	9,645	5/28/2005	385.85	394.30	-0.84	0.1
8	14381_0	Unconfined	11,819	5/11/2011	309.29	393.86	-42.29	0.5
8	14387_0	Confined	9,030	9/21/2003	291.19	392.65	-50.73	0.5
8	14464_0	Unconfined	9,279	5/27/2004	404.53	393.65	5.44	0.5
8	14465_0	Unconfined	11,128	6/19/2009	438.89	393.65	22.62	0.5
8	14466_0	Unconfined	11,596	9/30/2010	354.36	390.95	-18.30	0.5
8	14472_0	Confined	11,663	12/6/2010	376.09	392.40	-1.63	0.1
8	15094_6705409	Unconfined	731	12/31/1980	413.11	398.56	7.27	0.5
8	16241_7818201	Confined	6,673	4/8/1997	371.00	265.36	105.64	1
8	16241_7818201	Confined	7,317	1/12/1999	370.25	260.16	110.09	1
8	16241_7818201	Confined	7,677	1/7/2000	370.40	257.56	112.84	1
8	16241_7818201	Confined	8,061	1/25/2001	370.15	252.19	117.96	1
8	16241_7818201	Confined	8,417	1/16/2002	369.80	250.54	119.26	1
8	16241_7818201	Confined	8,782	1/16/2003	375.40	245.70	129.70	1
8	16241_7818201	Confined	9,150	1/19/2004	375.70	243.15	132.55	1
8	16241_7818201	Confined	9,538	2/10/2005	375.50	242.24	133.26	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	16241_7818201	Confined	9,881	1/19/2006	376.00	241.24	134.76	1
8	16241_7818201	Confined	10,266	2/8/2007	376.50	242.40	134.10	1
8	16241_7818201	Confined	10,603	1/11/2008	377.20	244.34	132.86	1
8	16241_7818201	Confined	11,000	2/11/2009	376.40	239.88	136.52	1
8	16241_7818201	Confined	11,434	4/21/2010	375.80	225.74	150.06	1
8	16290_0	Confined	8,840	3/15/2003	403.66	402.68	0.49	0.5
8	16293_0	Unconfined	9,161	1/30/2004	477.20	453.75	11.73	0.5
8	16320_0	Confined	10,033	6/20/2006	404.77	428.09	-11.66	0.5
8	16325_0	Confined	10,329	4/12/2007	419.81	410.97	8.84	1
8	16329_0	Confined	11,448	5/5/2010	416.66	404.98	5.84	0.5
8	16392_6727201	Unconfined	779	2/17/1981	384.15	371.65	6.25	0.5
8	16392_6727201	Unconfined	1,167	3/12/1982	383.17	373.19	4.99	0.5
8	16392_6727201	Unconfined	1,517	2/25/1983	381.49	371.28	5.10	0.5
8	16392_6727201	Unconfined	1,871	2/14/1984	386.92	369.73	8.59	0.5
8	16392_6727201	Unconfined	2,234	2/11/1985	389.07	367.52	10.78	0.5
8	16392_6727201	Unconfined	2,608	2/20/1986	387.72	370.38	8.67	0.5
8	16392_6727201	Unconfined	2,893	12/2/1986	390.90	371.57	9.66	0.5
8	16392_6727201	Unconfined	3,705	2/21/1989	384.93	367.65	8.64	0.5
8	16392_6727201	Unconfined	4,058	2/9/1990	391.06	365.75	12.65	0.5
8	16392_6727201	Unconfined	4,426	2/12/1991	389.60	367.33	11.13	0.5
8	16392_6727201	Unconfined	4,798	2/19/1992	390.90	370.67	10.12	0.5
8	16392_6727201	Unconfined	5,164	2/19/1993	391.20	373.58	8.81	0.5
8	16392_6727201	Unconfined	5,464	12/16/1993	391.47	372.37	9.55	0.5
8	16392_6727201	Unconfined	5,892	2/17/1995	390.75	373.01	8.87	0.5
8	16392_6727201	Unconfined	6,263	2/23/1996	390.10	370.97	9.57	0.5
8	16392_6727201	Unconfined	6,617	2/11/1997	391.52	368.11	11.70	0.5
8	16392_6727201	Unconfined	6,940	12/31/1997	390.50	370.67	9.91	0.5
8	16392_6727201	Unconfined	7,396	4/1/1999	392.00	371.99	10.00	0.5
8	16392_6727201	Unconfined	7,723	2/22/2000	392.70	369.53	11.59	0.5
8	16392_6727201	Unconfined	7,926	9/12/2000	392.95	369.78	11.59	0.5
8	16392_6727201	Unconfined	8,073	2/6/2001	392.00	369.88	11.06	0.5
8	16392_6727201	Unconfined	8,438	2/6/2002	392.01	370.13	10.94	0.5
8	16392_6727201	Unconfined	8,815	2/18/2003	392.64	375.17	8.73	0.5
8	16392_6727201	Unconfined	9,180	2/18/2004	391.30	375.86	7.72	0.5
8	16392_6727201	Unconfined	9,508	1/11/2005	391.84	378.86	6.49	0.5
8	16392_6727201	Unconfined	9,916	2/23/2006	391.85	374.11	8.87	0.5
8	16392_6727201	Unconfined	10,265	2/7/2007	392.03	371.63	10.20	0.5
8	16392_6727201	Unconfined	10,650	2/27/2008	391.74	376.87	7.43	0.5
8	16392_6727201	Unconfined	11,007	2/18/2009	392.00	372.72	9.64	0.5
8	16392_6727201	Unconfined	11,415	4/2/2010	391.98	371.55	10.22	0.5
8	16392_6727201	Unconfined	11,694	1/6/2011	390.38	371.66	9.36	0.5
8	16392_6727201	Unconfined	11,973	10/12/2011	391.80	367.13	12.33	0.5
8	16392_6727201	Unconfined	12,701	10/9/2013	390.90	367.02	11.94	0.5
8	16392_6727201	Unconfined	13,078	10/21/2014	390.58	366.06	12.26	0.5
8	16392_6727201	Unconfined	13,424	10/2/2015	390.63	368.40	11.12	0.5
8	16392_6727201	Unconfined	13,798	10/10/2016	390.35	370.76	9.79	0.5
8	16392_6727201	Unconfined	14,180	10/27/2017	390.31	370.09	10.11	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	16400_6733401	Unconfined	779	2/17/1981	507.81	456.43	25.69	0.5
8	16400_6733401	Unconfined	1,167	3/12/1982	508.65	458.01	25.32	0.5
8	16400_6733401	Unconfined	1,517	2/25/1983	507.58	455.82	25.88	0.5
8	16400_6733401	Unconfined	1,872	2/15/1984	507.25	454.09	26.58	0.5
8	16400_6733401	Unconfined	2,234	2/11/1985	508.26	451.71	28.28	0.5
8	16400_6733401	Unconfined	2,607	2/19/1986	508.86	454.64	27.11	0.5
8	16400_6733401	Unconfined	2,893	12/2/1986	508.10	455.86	26.12	0.5
8	16400_6733401	Unconfined	3,705	2/21/1989	507.70	451.46	28.12	0.5
8	16400_6733401	Unconfined	4,058	2/9/1990	507.96	449.48	29.24	0.5
8	16400_6733401	Unconfined	4,426	2/12/1991	506.98	451.50	27.74	0.5
8	16400_6733401	Unconfined	4,798	2/19/1992	507.01	454.77	26.12	0.5
8	16400_6733401	Unconfined	5,164	2/19/1993	506.64	457.52	24.56	0.5
8	16400_6733401	Unconfined	5,464	12/16/1993	507.35	455.67	25.84	0.5
8	16400_6733401	Unconfined	5,892	2/17/1995	508.38	455.92	26.23	0.5
8	16400_6733401	Unconfined	6,263	2/23/1996	507.38	453.46	26.96	0.5
8	16400_6733401	Unconfined	6,617	2/11/1997	506.78	450.22	28.28	0.5
8	16400_6733401	Unconfined	6,940	12/31/1997	505.50	452.94	26.28	0.5
8	16400_6733401	Unconfined	7,396	4/1/1999	504.78	454.11	25.33	0.5
8	16400_6733401	Unconfined	7,723	2/22/2000	504.58	451.13	26.72	0.5
8	16400_6733401	Unconfined	7,926	9/12/2000	502.38	450.99	25.69	0.5
8	16400_6733401	Unconfined	8,073	2/6/2001	505.08	450.87	27.10	0.5
8	16400_6733401	Unconfined	8,438	2/6/2002	504.98	451.05	26.96	0.5
8	16400_6733401	Unconfined	8,815	2/18/2003	505.49	455.89	24.80	0.5
8	16400_6733401	Unconfined	9,180	2/18/2004	505.88	456.39	24.74	0.5
8	16400_6733401	Unconfined	9,508	1/11/2005	505.33	459.68	22.83	0.5
8	16400_6733401	Unconfined	9,916	2/23/2006	507.48	454.61	26.44	0.5
8	16400_6733401	Unconfined	10,265	2/7/2007	507.08	452.46	27.31	0.5
8	16400_6733401	Unconfined	10,650	2/27/2008	506.58	458.84	23.87	0.5
8	16400_6733401	Unconfined	11,006	2/17/2009	507.48	454.09	26.69	0.5
8	16400_6733401	Unconfined	11,415	4/2/2010	506.66	451.52	27.57	0.5
8	16400_6733401	Unconfined	11,694	1/6/2011	504.48	450.14	27.17	0.5
8	16400_6733401	Unconfined	11,973	10/12/2011	506.85	444.33	31.26	0.5
8	16400_6733401	Unconfined	12,346	10/19/2012	506.61	445.18	30.72	0.5
8	16400_6733401	Unconfined	12,701	10/9/2013	505.96	448.23	28.87	0.5
8	16400_6733401	Unconfined	13,078	10/21/2014	505.78	449.39	28.20	0.5
8	16400_6733401	Unconfined	13,424	10/2/2015	503.63	453.68	24.97	0.5
8	16400_6733401	Unconfined	13,798	10/10/2016	504.37	457.61	23.38	0.5
8	16400_6733401	Unconfined	14,180	10/27/2017	504.97	457.55	23.71	0.5
8	16410_6734402	Confined	779	2/17/1981	443.05	422.58	10.24	0.5
8	16410_6734402	Confined	1,167	3/12/1982	442.89	424.57	9.16	0.5
8	16410_6734402	Confined	1,517	2/25/1983	440.66	421.98	9.34	0.5
8	16410_6734402	Confined	1,872	2/15/1984	441.16	419.88	10.64	0.5
8	16410_6734402	Confined	2,234	2/11/1985	441.31	417.25	12.03	0.5
8	16410_6734402	Confined	2,607	2/19/1986	438.76	420.68	9.04	0.5
8	16410_6734402	Confined	2,893	12/2/1986	439.87	422.02	8.92	0.5
8	16410_6734402	Confined	4,058	2/9/1990	437.05	413.90	11.57	0.5
8	35759_6850710	Confined	5,244	5/10/1993	493.88	576.38	-8.25	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	36177_6850717	Confined	4,650	9/24/1991	540.24	592.69	-5.24	0.1
8	38956_6734503	Confined	4,854	4/15/1992	451.71	414.55	3.72	0.1
8	38957_6734406	Confined	4,717	11/30/1991	465.25	416.00	4.92	0.1
8	38957_6734406	Confined	4,840	4/1/1992	472.25	416.95	5.53	0.1
8	38958_6734405	Confined	4,840	4/1/1992	437.32	417.46	1.99	0.1
8	38958_6734405	Confined	8,993	8/15/2003	426.82	411.51	1.53	0.1
8	38958_6734405	Confined	9,398	9/23/2004	426.72	415.47	1.13	0.1
8	38958_6734405	Confined	9,522	1/25/2005	426.82	416.52	1.03	0.1
8	38958_6734405	Confined	9,748	9/8/2005	424.82	413.40	1.14	0.1
8	38958_6734405	Confined	9,881	1/19/2006	426.82	411.64	1.52	0.1
8	38958_6734405	Confined	10,019	6/6/2006	430.82	410.38	2.04	0.1
8	38958_6734405	Confined	10,131	9/26/2006	427.82	409.36	1.85	0.1
8	38958_6734405	Confined	10,258	1/31/2007	427.82	409.34	1.85	0.1
8	38958_6734405	Confined	10,389	6/11/2007	423.82	412.95	1.09	0.1
8	38958_6734405	Confined	10,489	9/19/2007	438.82	415.71	2.31	0.1
8	38958_6734405	Confined	10,763	6/19/2008	423.82	415.51	0.83	0.1
8	38958_6734405	Confined	10,848	9/12/2008	423.82	413.99	0.98	0.1
8	38958_6734405	Confined	10,966	1/8/2009	423.82	411.92	1.19	0.1
8	38958_6734405	Confined	11,121	6/12/2009	420.82	409.92	1.09	0.1
8	38958_6734405	Confined	11,232	10/1/2009	421.82	408.49	1.33	0.1
8	38958_6734405	Confined	11,345	1/22/2010	420.57	407.01	1.36	0.1
8	38958_6734405	Confined	11,579	9/13/2010	421.72	403.85	1.79	0.1
8	38958_6734405	Confined	11,699	1/11/2011	422.32	402.12	2.02	0.1
8	38958_6734405	Confined	11,850	6/11/2011	421.22	398.63	2.26	0.1
8	38958_6734405	Confined	11,952	9/21/2011	422.22	396.27	2.59	0.1
8	38958_6734405	Confined	12,085	2/1/2012	422.22	394.55	2.77	0.1
8	38958_6734405	Confined	12,205	5/31/2012	421.92	396.86	2.51	0.1
8	38958_6734405	Confined	12,440	1/21/2013	421.32	401.21	2.01	0.1
8	38958_6734405	Confined	12,594	6/24/2013	414.82	402.94	1.19	0.1
8	38958_6734405	Confined	12,688	9/26/2013	418.82	404.00	1.48	0.1
8	38958_6734405	Confined	12,807	1/23/2014	422.82	405.08	1.77	0.1
8	38958_6734405	Confined	12,944	6/9/2014	417.99	405.11	1.29	0.1
8	38958_6734405	Confined	13,038	9/11/2014	415.64	405.13	1.05	0.1
8	38958_6734405	Confined	13,163	1/14/2015	415.60	405.33	1.03	0.1
8	38958_6734405	Confined	13,312	6/12/2015	416.07	407.27	0.88	0.1
8	38958_6734405	Confined	13,409	9/17/2015	412.20	408.54	0.37	0.1
8	38958_6734405	Confined	13,528	1/14/2016	412.06	410.05	0.20	0.1
8	38958_6734405	Confined	13,688	6/22/2016	411.94	411.67	0.03	0.1
8	38958_6734405	Confined	13,778	9/20/2016	411.53	412.58	-0.11	0.1
8	38958_6734405	Confined	13,911	1/31/2017	413.95	413.47	0.05	0.1
8	38958_6734405	Confined	14,036	6/5/2017	413.82	412.85	0.10	0.1
8	39169_6713102	Confined	782	2/20/1981	409.56	412.05	-0.25	0.1
8	39169_6713102	Confined	1,144	2/17/1982	413.03	414.56	-0.15	0.1
8	39169_6713102	Confined	1,870	2/13/1984	417.86	410.10	0.78	0.1
8	39169_6713102	Confined	2,235	2/12/1985	419.58	408.42	1.12	0.1
8	39169_6713102	Confined	2,619	3/3/1986	422.18	412.28	0.99	0.1
8	39169_6713102	Confined	2,903	12/12/1986	422.42	413.23	0.92	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	39169_6713102	Confined	3,125	7/22/1987	425.84	413.79	1.21	0.1
8	39169_6713102	Confined	3,704	2/20/1989	416.08	407.16	0.89	0.1
8	39169_6713102	Confined	4,051	2/2/1990	422.32	406.19	1.61	0.1
8	39169_6713102	Confined	4,428	2/14/1991	419.77	409.38	1.04	0.1
8	39169_6713102	Confined	5,101	12/18/1992	425.43	416.56	0.89	0.1
8	39169_6713102	Confined	5,484	1/5/1994	425.62	412.99	1.26	0.1
8	39169_6713102	Confined	5,829	12/16/1994	425.42	413.88	1.15	0.1
8	39169_6713102	Confined	11,224	9/23/2009	428.54	410.97	1.76	0.1
8	39169_6713102	Confined	11,341	1/18/2010	434.03	410.83	2.32	0.1
8	39169_6713102	Confined	11,496	6/22/2010	435.32	411.43	2.39	0.1
8	39169_6713102	Confined	11,593	9/27/2010	434.20	411.80	2.24	0.1
8	39169_6713102	Confined	11,692	1/4/2011	431.78	412.08	1.97	0.1
8	39169_6713102	Confined	12,077	1/24/2012	434.50	405.05	2.95	0.1
8	39169_6713102	Confined	12,216	6/11/2012	432.90	405.59	2.73	0.1
8	39169_6713102	Confined	12,325	9/28/2012	434.88	406.01	2.89	0.1
8	39192_6720802	Confined	781	2/19/1981	368.64	355.52	6.56	0.5
8	39192_6720802	Confined	1,144	2/17/1982	369.58	357.17	6.21	0.5
8	39192_6720802	Confined	1,550	3/30/1983	369.81	355.16	7.32	0.5
8	39192_6720802	Confined	1,870	2/13/1984	369.47	354.11	7.68	0.5
8	39192_6720802	Confined	2,235	2/12/1985	367.82	352.79	7.52	0.5
8	39192_6720802	Confined	2,615	2/27/1986	369.66	355.28	7.19	0.5
8	39192_6720802	Confined	2,903	12/12/1986	369.84	356.08	6.88	0.5
8	39192_6720802	Confined	3,124	7/21/1987	371.33	356.53	7.40	0.5
8	39192_6720802	Confined	3,706	2/22/1989	368.78	351.98	8.40	0.5
8	39192_6720802	Confined	4,072	2/23/1990	368.49	351.06	8.71	0.5
8	39192_6720802	Confined	4,428	2/14/1991	369.14	352.95	8.10	0.5
8	39192_6720802	Confined	4,796	2/17/1992	371.13	355.86	7.64	0.5
8	39192_6720802	Confined	5,101	12/18/1992	371.21	358.30	6.46	0.5
8	39192_6720802	Confined	5,829	12/16/1994	377.28	356.97	10.16	0.5
8	39192_6720802	Confined	6,270	3/1/1996	372.34	354.78	8.78	0.5
8	39192_6720802	Confined	6,556	12/12/1996	372.82	352.24	10.29	0.5
8	39192_6720802	Confined	6,940	12/31/1997	376.84	355.09	10.87	0.5
8	39192_6720802	Confined	7,723	2/22/2000	378.17	353.83	12.17	0.5
8	39192_6720802	Confined	7,925	9/11/2000	377.39	354.18	11.60	0.5
8	39192_6720802	Confined	8,073	2/6/2001	377.24	354.36	11.44	0.5
8	39192_6720802	Confined	8,438	2/6/2002	379.10	354.69	12.21	0.5
8	39192_6720802	Confined	8,816	2/19/2003	380.12	359.17	10.48	0.5
8	39192_6720802	Confined	9,180	2/18/2004	375.69	359.35	8.17	0.5
8	39192_6720802	Confined	9,509	1/12/2005	378.69	361.84	8.43	0.5
8	39192_6720802	Confined	9,900	2/7/2006	380.44	357.33	11.56	0.5
8	39192_6720802	Confined	10,265	2/7/2007	379.32	355.17	12.08	0.5
8	39192_6720802	Confined	10,649	2/26/2008	377.99	360.06	8.96	0.5
8	39192_6720802	Confined	11,007	2/18/2009	377.42	355.90	10.76	0.5
8	39192_6720802	Confined	11,223	9/22/2009	377.63	355.28	11.18	0.5
8	39192_6720802	Confined	11,342	1/19/2010	378.18	355.01	11.58	0.5
8	39192_6720802	Confined	11,488	6/14/2010	378.79	355.21	11.79	0.5
8	39192_6720802	Confined	11,582	9/16/2010	378.37	355.34	11.52	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	39192_6720802	Confined	11,702	1/14/2011	378.56	355.29	11.64	0.5
8	39192_6720802	Confined	11,845	6/6/2011	379.63	353.32	13.16	0.5
8	39192_6720802	Confined	11,951	9/20/2011	379.38	351.86	13.76	0.5
8	39192_6720802	Confined	12,066	1/13/2012	378.78	350.47	14.15	0.5
8	39192_6720802	Confined	12,218	6/13/2012	378.99	350.74	14.13	0.5
8	39192_6720802	Confined	12,314	9/17/2012	378.13	350.90	13.61	0.5
8	39192_6720802	Confined	12,675	9/13/2013	376.64	351.23	12.70	0.5
8	39192_6720802	Confined	12,801	1/17/2014	377.12	351.17	12.97	0.5
8	39192_6720802	Confined	13,043	9/16/2014	376.41	349.45	13.48	0.5
8	39192_6720802	Confined	13,170	1/21/2015	373.52	348.83	12.34	0.5
8	39192_6720802	Confined	13,324	6/24/2015	378.77	349.87	14.45	0.5
8	39192_6720802	Confined	13,529	1/15/2016	378.65	351.20	13.72	0.5
8	39192_6720802	Confined	13,672	6/6/2016	379.36	351.61	13.87	0.5
8	39192_6720802	Confined	13,777	9/19/2016	379.37	351.91	13.73	0.5
8	39192_6720802	Confined	13,889	1/9/2017	379.14	352.16	13.49	0.5
8	39192_6720802	Confined	14,050	6/19/2017	379.35	351.32	14.02	0.5
8	39275_5861908	Unconfined	9,734	8/25/2005	341.14	381.54	-20.20	0.5
8	39275_5861908	Unconfined	9,848	12/17/2005	343.84	381.39	-18.77	0.5
8	39275_5861908	Unconfined	9,850	12/19/2005	343.44	381.38	-18.97	0.5
8	39319_6705509	Unconfined	8,803	2/6/2003	430.06	405.79	12.14	0.5
8	39319_6705509	Unconfined	11,188	8/18/2009	414.85	401.76	6.54	0.5
8	39319_6705509	Unconfined	11,835	5/27/2011	422.70	401.06	10.82	0.5
8	39590_6846903	Confined	3,330	2/12/1988	419.47	411.89	0.76	0.1
8	39591_6846904	Confined	4,199	6/30/1990	414.86	411.16	1.85	0.5
8	39617_6848302	Confined	2,678	5/1/1986	438.66	430.30	0.84	0.1
8	39618_6848303	Confined	6,196	12/18/1995	438.61	428.99	0.96	0.1
8	39622_6848408	Confined	9,340	7/27/2004	424.84	420.65	0.42	0.1
8	43042_6720205	Unconfined	782	2/20/1981	388.49	387.55	0.47	0.5
8	43042_6720205	Unconfined	1,144	2/17/1982	389.53	389.54	-0.01	0.5
8	43042_6720205	Unconfined	1,551	3/31/1983	392.09	387.57	2.26	0.5
8	43042_6720205	Unconfined	1,870	2/13/1984	388.81	386.30	1.26	0.5
8	43042_6720205	Unconfined	2,235	2/12/1985	388.45	384.61	1.92	0.5
8	43042_6720205	Unconfined	3,124	7/21/1987	389.19	388.86	0.17	0.5
8	43042_6720205	Unconfined	3,706	2/22/1989	387.95	384.09	1.93	0.5
8	43042_6720205	Unconfined	4,072	2/23/1990	387.73	382.56	2.58	0.5
8	43042_6720205	Unconfined	4,428	2/14/1991	387.79	384.41	1.69	0.5
8	43042_6720205	Unconfined	4,796	2/17/1992	389.22	387.71	0.76	0.5
8	43042_6720205	Unconfined	5,101	12/18/1992	388.87	390.68	-0.91	0.5
8	43042_6720205	Unconfined	5,484	1/5/1994	389.59	388.90	0.34	0.5
8	43042_6720205	Unconfined	5,829	12/16/1994	389.51	389.41	0.05	0.5
8	43042_6720205	Unconfined	6,270	3/1/1996	387.89	386.92	0.49	0.5
8	43042_6720205	Unconfined	6,556	12/12/1996	389.03	383.88	2.57	0.5
8	43103_6853502	Confined	2,865	11/4/1986	438.26	425.43	1.28	0.1
8	43108_6853605	Confined	6,541	11/27/1996	420.97	408.86	1.21	0.1
8	48260_0	Confined	11,727	2/8/2011	347.74	370.37	-2.26	0.1
8	48456_0	Confined	10,764	6/20/2008	362.87	383.48	-2.06	0.1
8	48460_0	Confined	12,790	1/6/2014	267.85	309.94	-42.09	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	48475_0	Confined	9,845	12/14/2005	374.99	371.78	1.60	0.5
8	48552_0	Confined	10,070	7/27/2006	337.32	395.47	-29.07	0.5
8	48850_0	Confined	12,101	2/17/2012	282.96	394.61	-11.17	0.1
8	48957_0	Confined	11,176	8/6/2009	394.31	394.60	-0.03	0.1
8	48970_0	Confined	12,287	8/21/2012	397.86	388.97	0.89	0.1
8	49076_0	Confined	10,635	2/12/2008	403.60	427.47	-23.87	1
8	49219_6734504	Confined	8,333	10/24/2001	400.08	392.48	7.60	1
8	49219_6734504	Confined	8,633	8/20/2002	399.12	395.25	3.87	1
8	49219_6734504	Confined	8,635	8/22/2002	399.12	395.28	3.84	1
8	49219_6734504	Confined	8,928	6/11/2003	397.98	397.05	0.93	1
8	49219_6734504	Confined	9,033	9/24/2003	397.66	397.15	0.51	1
8	49219_6734504	Confined	9,152	1/21/2004	397.58	397.47	0.11	1
8	49219_6734504	Confined	9,398	9/23/2004	396.77	400.10	-3.33	1
8	49219_6734504	Confined	9,749	9/9/2005	395.87	398.46	-2.59	1
8	49219_6734504	Confined	9,878	1/16/2006	396.21	397.12	-0.91	1
8	49219_6734504	Confined	11,327	1/4/2010	393.78	393.90	-0.12	1
8	49219_6734504	Confined	12,786	1/2/2014	379.43	389.09	-9.66	1
8	49219_6734504	Confined	12,938	6/3/2014	380.66	388.75	-8.09	1
8	49219_6734504	Confined	13,029	9/2/2014	377.20	388.54	-11.34	1
8	49219_6734504	Confined	13,148	12/30/2014	378.09	388.27	-10.18	1
8	49219_6734504	Confined	13,305	6/5/2015	376.01	389.48	-13.47	1
8	49219_6734504	Confined	13,519	1/5/2016	371.71	391.14	-19.43	1
8	49219_6734504	Confined	13,668	6/2/2016	372.11	392.23	-20.12	1
8	49219_6734504	Confined	13,883	1/3/2017	368.31	393.76	-25.45	1
8	49219_6734504	Confined	14,037	6/6/2017	367.91	393.17	-25.26	1
8	50012_0	Confined	9,585	3/29/2005	554.88	616.53	-30.82	0.5
8	50016_0	Confined	10,958	12/31/2008	390.36	453.54	-31.59	0.5
8	50022_0	Confined	9,763	9/23/2005	462.84	475.52	-6.34	0.5
8	50047_0	Confined	11,493	6/19/2010	409.80	394.71	1.51	0.1
8	50049_0	Confined	9,983	5/1/2006	370.79	424.78	-5.40	0.1
8	50052_0	Confined	12,157	4/13/2012	489.70	190.23	29.95	0.1
8	50498_0	Confined	10,518	10/18/2007	472.34	441.00	15.67	0.5
8	50499_0	Confined	11,559	8/24/2010	383.22	432.32	-24.55	0.5
8	50500_0	Confined	12,868	3/25/2014	397.65	413.35	-1.57	0.1
8	50535_0	Unconfined	8,590	7/8/2002	326.11	385.28	-29.59	0.5
8	50547_0	Confined	8,727	11/22/2002	451.19	424.86	13.16	0.5
8	50548_0	Confined	8,724	11/19/2002	560.43	447.52	56.45	0.5
8	50566_0	Confined	8,986	8/8/2003	506.25	402.20	52.02	0.5
8	50569_0	Confined	9,005	8/27/2003	364.27	379.64	-7.68	0.5
8	50578_0	Confined	9,100	11/30/2003	449.87	418.84	15.52	0.5
8	50583_0	Confined	9,092	11/22/2003	378.06	380.10	-0.20	0.1
8	50589_0	Unconfined	9,194	3/3/2004	397.72	395.42	1.15	0.5
8	50590_0	Confined	9,192	3/1/2004	542.34	441.81	100.53	1
8	50606_0	Confined	9,279	5/27/2004	279.46	395.74	-11.63	0.1
8	50608_0	Confined	9,257	5/5/2004	439.87	397.38	21.25	0.5
8	50635_0	Unconfined	9,562	3/6/2005	504.29	413.69	45.30	0.5
8	50637_0	Unconfined	9,572	3/16/2005	501.46	414.04	43.71	0.5

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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	50639_0	Confined	9,646	5/29/2005	440.11	400.15	4.00	0.1
8	50655_0	Confined	9,769	9/29/2005	395.13	398.83	-0.37	0.1
8	50683_0	Confined	10,090	8/16/2006	452.14	416.22	3.59	0.1
8	50695_0	Confined	10,212	12/16/2006	350.43	397.31	-4.69	0.1
8	50705_0	Confined	10,266	2/8/2007	357.18	407.29	-25.05	0.5
8	50715_0	Unconfined	10,365	5/18/2007	320.79	366.86	-23.04	0.5
8	50724_0	Confined	9,670	6/22/2005	499.14	481.68	8.73	0.5
8	50742_0	Confined	10,398	6/20/2007	497.39	544.01	-23.31	0.5
8	50753_0	Confined	10,653	3/1/2008	474.06	408.58	6.55	0.1
8	50777_0	Unconfined	10,368	5/21/2007	313.59	391.28	-38.85	0.5
8	50783_0	Confined	9,977	4/25/2006	290.80	400.48	-54.84	0.5
8	50829_0	Confined	9,452	11/16/2004	285.70	396.24	-55.27	0.5
8	50841_0	Confined	11,151	7/12/2009	314.87	339.23	-12.18	0.5
8	50850_0	Unconfined	11,132	6/23/2009	419.00	371.52	23.74	0.5
8	50910_0	Confined	9,480	12/14/2004	422.87	447.00	-12.07	0.5
8	50914_0	Confined	9,644	5/27/2005	347.11	356.44	-9.33	1
8	50935_0	Unconfined	11,181	8/11/2009	301.27	390.59	-44.66	0.5
8	50976_0	Confined	10,830	8/25/2008	464.43	431.92	32.51	1
8	50978_0	Confined	10,947	12/20/2008	348.29	358.65	-10.36	1
8	51003_0	Unconfined	11,769	3/22/2011	317.92	394.94	-38.51	0.5
8	51076_0	Confined	12,056	1/3/2012	298.96	394.25	-47.64	0.5
8	51089_0	Unconfined	12,087	2/3/2012	292.42	389.71	-48.64	0.5
8	51090_0	Confined	12,112	2/28/2012	431.54	399.87	15.83	0.5
8	51094_0	Confined	12,108	2/24/2012	486.86	542.14	-55.28	1
8	51121_0	Confined	12,241	7/6/2012	285.49	393.90	-54.20	0.5
8	51125_0	Confined	12,266	7/31/2012	439.24	405.35	3.39	0.1
8	51136_0	Confined	12,240	7/5/2012	436.69	397.40	19.64	0.5
8	51148_0	Confined	12,316	9/19/2012	491.48	401.28	9.02	0.1
8	51183_0	Confined	12,477	2/27/2013	373.12	378.36	-2.62	0.5
8	51187_0	Confined	12,438	1/19/2013	293.29	393.12	-9.98	0.1
8	51190_0	Confined	12,491	3/13/2013	330.59	396.49	-32.95	0.5
8	51217_0	Confined	12,549	5/10/2013	423.73	424.49	-0.38	0.5
8	51278_0	Confined	9,018	9/9/2003	475.67	406.38	34.64	0.5
8	51279_0	Confined	12,626	7/26/2013	361.11	353.07	4.02	0.5
8	51301_0	Confined	12,648	8/17/2013	411.90	419.66	-0.78	0.1
8	51316_0	Confined	12,682	9/20/2013	422.60	396.25	13.17	0.5
8	51319_0	Confined	12,662	8/31/2013	481.83	439.22	21.30	0.5
8	51325_0	Confined	12,696	10/4/2013	407.30	395.58	5.86	0.5
8	51366_0	Confined	12,862	3/19/2014	461.55	477.67	-16.12	1
8	51376_0	Confined	12,874	3/31/2014	391.48	427.89	-18.21	0.5
8	51378_0	Confined	12,891	4/17/2014	376.77	409.49	-16.36	0.5
8	51621_0	Unconfined	9,992	5/10/2006	377.57	376.86	0.36	0.5
8	51789_0	Confined	8,506	4/15/2002	428.97	410.82	9.07	0.5
8	52951_6727805	Confined	753	1/22/1981	356.92	347.74	4.59	0.5
8	52951_6727805	Confined	754	1/23/1981	356.92	347.74	4.59	0.5
8	52951_6727805	Confined	838	4/17/1981	356.57	347.98	4.30	0.5
8	52951_6727805	Confined	877	5/26/1981	356.77	348.08	4.34	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	899	6/17/1981	357.41	348.15	4.63	0.5
8	52951_6727805	Confined	928	7/16/1981	357.35	348.23	4.56	0.5
8	52951_6727805	Confined	962	8/19/1981	357.02	348.32	4.35	0.5
8	52951_6727805	Confined	990	9/16/1981	357.11	348.40	4.35	0.5
8	52951_6727805	Confined	1,024	10/20/1981	356.93	348.50	4.22	0.5
8	52951_6727805	Confined	1,054	11/19/1981	357.41	348.58	4.41	0.5
8	52951_6727805	Confined	1,081	12/16/1981	357.37	348.66	4.36	0.5
8	52951_6727805	Confined	1,116	1/20/1982	357.26	348.65	4.31	0.5
8	52951_6727805	Confined	1,143	2/16/1982	357.27	348.57	4.35	0.5
8	52951_6727805	Confined	1,167	3/12/1982	357.22	348.51	4.36	0.5
8	52951_6727805	Confined	1,206	4/20/1982	357.02	348.40	4.31	0.5
8	52951_6727805	Confined	1,230	5/14/1982	357.15	348.34	4.41	0.5
8	52951_6727805	Confined	1,265	6/18/1982	356.85	348.25	4.30	0.5
8	52951_6727805	Confined	1,292	7/15/1982	356.50	348.17	4.16	0.5
8	52951_6727805	Confined	1,334	8/26/1982	356.00	348.06	3.97	0.5
8	52951_6727805	Confined	1,359	9/20/1982	355.82	347.99	3.91	0.5
8	52951_6727805	Confined	1,389	10/20/1982	355.72	347.91	3.90	0.5
8	52951_6727805	Confined	1,419	11/19/1982	355.96	347.83	4.07	0.5
8	52951_6727805	Confined	1,446	12/16/1982	355.85	347.76	4.05	0.5
8	52951_6727805	Confined	1,478	1/17/1983	355.80	347.69	4.06	0.5
8	52951_6727805	Confined	1,515	2/23/1983	356.15	347.62	4.26	0.5
8	52951_6727805	Confined	1,542	3/22/1983	356.06	347.58	4.24	0.5
8	52951_6727805	Confined	1,571	4/20/1983	356.27	347.53	4.37	0.5
8	52951_6727805	Confined	1,596	5/15/1983	356.17	347.48	4.34	0.5
8	52951_6727805	Confined	1,627	6/15/1983	356.20	347.43	4.39	0.5
8	52951_6727805	Confined	1,632	6/20/1983	356.17	347.42	4.38	0.5
8	52951_6727805	Confined	1,657	7/15/1983	355.86	347.38	4.24	0.5
8	52951_6727805	Confined	1,699	8/26/1983	356.00	347.30	4.35	0.5
8	52951_6727805	Confined	1,701	8/28/1983	355.57	347.30	4.14	0.5
8	52951_6727805	Confined	1,732	9/28/1983	355.57	347.25	4.16	0.5
8	52951_6727805	Confined	1,749	10/15/1983	355.61	347.22	4.20	0.5
8	52951_6727805	Confined	1,780	11/15/1983	355.83	347.16	4.33	0.5
8	52951_6727805	Confined	1,808	12/13/1983	355.67	347.11	4.28	0.5
8	52951_6727805	Confined	1,810	12/15/1983	355.60	347.11	4.24	0.5
8	52951_6727805	Confined	1,841	1/15/1984	355.50	347.03	4.23	0.5
8	52951_6727805	Confined	1,872	2/15/1984	355.63	346.93	4.35	0.5
8	52951_6727805	Confined	1,901	3/15/1984	355.52	346.84	4.34	0.5
8	52951_6727805	Confined	1,932	4/15/1984	355.41	346.74	4.34	0.5
8	52951_6727805	Confined	1,962	5/15/1984	355.10	346.64	4.23	0.5
8	52951_6727805	Confined	1,993	6/15/1984	355.05	346.54	4.26	0.5
8	52951_6727805	Confined	1,997	6/19/1984	355.22	346.53	4.35	0.5
8	52951_6727805	Confined	2,023	7/15/1984	354.67	346.44	4.11	0.5
8	52951_6727805	Confined	2,054	8/15/1984	354.29	346.34	3.98	0.5
8	52951_6727805	Confined	2,074	9/4/1984	354.12	346.27	3.92	0.5
8	52951_6727805	Confined	2,085	9/15/1984	354.13	346.24	3.95	0.5
8	52951_6727805	Confined	2,115	10/15/1984	354.40	346.14	4.13	0.5
8	52951_6727805	Confined	2,146	11/15/1984	354.35	346.04	4.16	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	2,176	12/15/1984	354.67	345.94	4.36	0.5
8	52951_6727805	Confined	2,178	12/17/1984	354.60	345.93	4.33	0.5
8	52951_6727805	Confined	2,207	1/15/1985	354.82	345.95	4.44	0.5
8	52951_6727805	Confined	2,238	2/15/1985	354.87	346.06	4.40	0.5
8	52951_6727805	Confined	2,263	3/12/1985	355.05	346.16	4.45	0.5
8	52951_6727805	Confined	2,266	3/15/1985	355.10	346.17	4.47	0.5
8	52951_6727805	Confined	2,297	4/15/1985	355.43	346.28	4.57	0.5
8	52951_6727805	Confined	2,327	5/15/1985	355.17	346.40	4.39	0.5
8	52951_6727805	Confined	2,357	6/14/1985	354.92	346.51	4.21	0.5
8	52951_6727805	Confined	2,358	6/15/1985	354.94	346.51	4.21	0.5
8	52951_6727805	Confined	2,388	7/15/1985	355.05	346.62	4.21	0.5
8	52951_6727805	Confined	2,419	8/15/1985	354.67	346.74	3.96	0.5
8	52951_6727805	Confined	2,450	9/15/1985	354.32	346.86	3.73	0.5
8	52951_6727805	Confined	2,480	10/15/1985	354.43	346.97	3.73	0.5
8	52951_6727805	Confined	2,511	11/15/1985	354.74	347.09	3.83	0.5
8	52951_6727805	Confined	2,541	12/15/1985	354.90	347.20	3.85	0.5
8	52951_6727805	Confined	2,570	1/13/1986	354.75	347.28	3.73	0.5
8	52951_6727805	Confined	2,572	1/15/1986	354.87	347.29	3.79	0.5
8	52951_6727805	Confined	2,603	2/15/1986	354.87	347.35	3.76	0.5
8	52951_6727805	Confined	2,631	3/15/1986	354.87	347.41	3.73	0.5
8	52951_6727805	Confined	2,662	4/15/1986	354.49	347.47	3.51	0.5
8	52951_6727805	Confined	2,692	5/15/1986	354.40	347.53	3.43	0.5
8	52951_6727805	Confined	2,723	6/15/1986	354.57	347.60	3.49	0.5
8	52951_6727805	Confined	2,753	7/15/1986	354.21	347.66	3.28	0.5
8	52951_6727805	Confined	2,784	8/15/1986	354.01	347.72	3.14	0.5
8	52951_6727805	Confined	2,815	9/15/1986	353.80	347.79	3.01	0.5
8	52951_6727805	Confined	2,892	12/1/1986	354.35	347.94	3.20	0.5
8	52951_6727805	Confined	3,333	2/15/1988	354.63	348.20	3.21	0.5
8	52951_6727805	Confined	3,705	2/21/1989	353.18	345.90	3.64	0.5
8	52951_6727805	Confined	4,076	2/27/1990	352.38	345.02	3.68	0.5
8	52951_6727805	Confined	4,726	12/9/1991	352.22	346.97	2.63	0.5
8	52951_6727805	Confined	4,806	2/27/1992	354.87	347.33	3.77	0.5
8	52951_6727805	Confined	4,810	3/2/1992	354.97	347.35	3.81	0.5
8	52951_6727805	Confined	4,915	6/15/1992	355.97	347.83	4.07	0.5
8	52951_6727805	Confined	4,985	8/24/1992	354.47	348.15	3.16	0.5
8	52951_6727805	Confined	5,083	11/30/1992	353.32	348.61	2.36	0.5
8	52951_6727805	Confined	5,161	2/16/1993	354.07	348.66	2.70	0.5
8	52951_6727805	Confined	5,524	2/14/1994	352.93	348.13	2.40	0.5
8	52951_6727805	Confined	5,890	2/15/1995	353.67	348.38	2.65	0.5
8	52951_6727805	Confined	6,260	2/20/1996	352.97	347.36	2.81	0.5
8	52951_6727805	Confined	6,626	2/20/1997	352.07	345.96	3.06	0.5
8	52951_6727805	Confined	6,977	2/6/1998	351.88	347.18	2.35	0.5
8	52951_6727805	Confined	7,925	9/11/2000	348.77	346.41	1.18	0.5
8	52951_6727805	Confined	11,203	9/2/2009	341.31	347.38	-3.03	0.5
8	52951_6727805	Confined	11,327	1/4/2010	347.31	347.06	0.12	0.5
8	52951_6727805	Confined	11,337	1/14/2010	347.17	347.05	0.06	0.5
8	52951_6727805	Confined	11,476	6/2/2010	346.90	346.91	-0.01	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	11,587	9/21/2010	347.27	346.80	0.24	0.5
8	52951_6727805	Confined	11,693	1/5/2011	347.18	346.65	0.26	0.5
8	52951_6727805	Confined	11,840	6/1/2011	342.29	345.42	-1.57	0.5
8	52951_6727805	Confined	11,937	9/6/2011	338.04	344.61	-3.29	0.5
8	52951_6727805	Confined	12,070	1/17/2012	344.45	343.61	0.42	0.5
8	52951_6727805	Confined	12,210	6/5/2012	343.69	343.29	0.20	0.5
8	52951_6727805	Confined	12,302	9/5/2012	340.64	343.09	-1.22	0.5
8	52951_6727805	Confined	12,668	9/6/2013	339.04	341.69	-1.33	0.5
8	52951_6727805	Confined	12,786	1/2/2014	341.59	341.15	0.22	0.5
8	52951_6727805	Confined	12,938	6/3/2014	339.14	339.91	-0.38	0.5
8	52951_6727805	Confined	13,029	9/2/2014	336.18	339.17	-1.49	0.5
8	52951_6727805	Confined	13,148	12/30/2014	334.70	338.20	-1.75	0.5
8	52951_6727805	Confined	13,291	5/22/2015	335.17	337.56	-1.20	0.5
8	52951_6727805	Confined	13,305	6/5/2015	336.03	337.50	-0.74	0.5
8	52951_6727805	Confined	13,345	7/15/2015	335.22	337.33	-1.05	0.5
8	52951_6727805	Confined	13,350	7/20/2015	335.10	337.30	-1.10	0.5
8	52951_6727805	Confined	13,355	7/25/2015	335.10	337.28	-1.09	0.5
8	52951_6727805	Confined	13,360	7/30/2015	335.00	337.26	-1.13	0.5
8	52951_6727805	Confined	13,366	8/5/2015	334.85	337.23	-1.19	0.5
8	52951_6727805	Confined	13,371	8/10/2015	334.56	337.21	-1.33	0.5
8	52951_6727805	Confined	13,376	8/15/2015	334.15	337.19	-1.52	0.5
8	52951_6727805	Confined	13,381	8/20/2015	333.94	337.17	-1.61	0.5
8	52951_6727805	Confined	13,386	8/25/2015	333.62	337.14	-1.76	0.5
8	52951_6727805	Confined	13,391	8/30/2015	333.34	337.12	-1.89	0.5
8	52951_6727805	Confined	13,397	9/5/2015	333.14	337.10	-1.98	0.5
8	52951_6727805	Confined	13,402	9/10/2015	332.93	337.07	-2.07	0.5
8	52951_6727805	Confined	13,407	9/15/2015	332.65	337.05	-2.20	0.5
8	52951_6727805	Confined	13,412	9/20/2015	332.46	337.03	-2.28	0.5
8	52951_6727805	Confined	13,417	9/25/2015	332.26	337.01	-2.37	0.5
8	52951_6727805	Confined	13,422	9/30/2015	332.17	336.99	-2.41	0.5
8	52951_6727805	Confined	13,424	10/2/2015	332.19	336.98	-2.39	0.5
8	52951_6727805	Confined	13,427	10/5/2015	331.96	336.96	-2.50	0.5
8	52951_6727805	Confined	13,432	10/10/2015	331.75	336.94	-2.60	0.5
8	52951_6727805	Confined	13,437	10/15/2015	331.72	336.92	-2.60	0.5
8	52951_6727805	Confined	13,442	10/20/2015	331.72	336.90	-2.59	0.5
8	52951_6727805	Confined	13,447	10/25/2015	332.21	336.88	-2.33	0.5
8	52951_6727805	Confined	13,452	10/30/2015	332.53	336.85	-2.16	0.5
8	52951_6727805	Confined	13,458	11/5/2015	333.35	336.83	-1.74	0.5
8	52951_6727805	Confined	13,463	11/10/2015	333.11	336.80	-1.85	0.5
8	52951_6727805	Confined	13,468	11/15/2015	332.91	336.78	-1.94	0.5
8	52951_6727805	Confined	13,473	11/20/2015	332.87	336.76	-1.95	0.5
8	52951_6727805	Confined	13,478	11/25/2015	332.75	336.74	-1.99	0.5
8	52951_6727805	Confined	13,483	11/30/2015	332.74	336.72	-1.99	0.5
8	52951_6727805	Confined	13,488	12/5/2015	332.72	336.69	-1.99	0.5
8	52951_6727805	Confined	13,493	12/10/2015	333.01	336.67	-1.83	0.5
8	52951_6727805	Confined	13,498	12/15/2015	333.22	336.65	-1.72	0.5
8	52951_6727805	Confined	13,503	12/20/2015	333.16	336.63	-1.73	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	13,508	12/25/2015	333.34	336.61	-1.63	0.5
8	52951_6727805	Confined	13,513	12/30/2015	333.37	336.58	-1.61	0.5
8	52951_6727805	Confined	13,519	1/5/2016	333.53	336.59	-1.53	0.5
8	52951_6727805	Confined	13,520	1/6/2016	335.98	336.59	-0.30	0.5
8	52951_6727805	Confined	13,524	1/10/2016	333.70	336.60	-1.45	0.5
8	52951_6727805	Confined	13,529	1/15/2016	333.87	336.61	-1.37	0.5
8	52951_6727805	Confined	13,534	1/20/2016	333.84	336.61	-1.39	0.5
8	52951_6727805	Confined	13,539	1/25/2016	333.87	336.62	-1.38	0.5
8	52951_6727805	Confined	13,544	1/30/2016	333.89	336.63	-1.37	0.5
8	52951_6727805	Confined	13,550	2/5/2016	333.61	336.64	-1.52	0.5
8	52951_6727805	Confined	13,555	2/10/2016	333.58	336.65	-1.53	0.5
8	52951_6727805	Confined	13,560	2/15/2016	333.63	336.66	-1.51	0.5
8	52951_6727805	Confined	13,565	2/20/2016	333.45	336.67	-1.61	0.5
8	52951_6727805	Confined	13,570	2/25/2016	333.45	336.67	-1.61	0.5
8	52951_6727805	Confined	13,579	3/5/2016	333.56	336.69	-1.56	0.5
8	52951_6727805	Confined	13,584	3/10/2016	333.92	336.70	-1.39	0.5
8	52951_6727805	Confined	13,589	3/15/2016	333.93	336.71	-1.39	0.5
8	52951_6727805	Confined	13,594	3/20/2016	333.77	336.71	-1.47	0.5
8	52951_6727805	Confined	13,599	3/25/2016	334.04	336.72	-1.34	0.5
8	52951_6727805	Confined	13,604	3/30/2016	334.06	336.73	-1.34	0.5
8	52951_6727805	Confined	13,610	4/5/2016	333.75	336.74	-1.50	0.5
8	52951_6727805	Confined	13,615	4/10/2016	333.70	336.75	-1.53	0.5
8	52951_6727805	Confined	13,620	4/15/2016	333.66	336.76	-1.55	0.5
8	52951_6727805	Confined	13,625	4/20/2016	333.74	336.77	-1.51	0.5
8	52951_6727805	Confined	13,630	4/25/2016	333.95	336.78	-1.41	0.5
8	52951_6727805	Confined	13,635	4/30/2016	334.05	336.78	-1.37	0.5
8	52951_6727805	Confined	13,640	5/5/2016	333.95	336.79	-1.42	0.5
8	52951_6727805	Confined	13,645	5/10/2016	333.95	336.80	-1.43	0.5
8	52951_6727805	Confined	13,650	5/15/2016	333.85	336.81	-1.48	0.5
8	52951_6727805	Confined	13,655	5/20/2016	335.44	336.82	-0.69	0.5
8	52951_6727805	Confined	13,660	5/25/2016	335.45	336.83	-0.69	0.5
8	52951_6727805	Confined	13,665	5/30/2016	334.96	336.83	-0.94	0.5
8	52951_6727805	Confined	13,671	6/5/2016	338.61	336.84	0.88	0.5
8	52951_6727805	Confined	13,671	6/5/2016	336.11	336.84	-0.37	0.5
8	52951_6727805	Confined	13,676	6/10/2016	336.10	336.85	-0.38	0.5
8	52951_6727805	Confined	13,681	6/15/2016	335.90	336.86	-0.48	0.5
8	52951_6727805	Confined	13,686	6/20/2016	335.90	336.87	-0.49	0.5
8	52951_6727805	Confined	13,691	6/25/2016	335.16	336.88	-0.86	0.5
8	52951_6727805	Confined	13,696	6/30/2016	334.84	336.89	-1.02	0.5
8	52951_6727805	Confined	13,701	7/5/2016	334.47	336.90	-1.21	0.5
8	52951_6727805	Confined	13,706	7/10/2016	334.27	336.90	-1.32	0.5
8	52951_6727805	Confined	13,711	7/15/2016	333.99	336.91	-1.46	0.5
8	52951_6727805	Confined	13,716	7/20/2016	333.64	336.92	-1.64	0.5
8	52951_6727805	Confined	13,721	7/25/2016	333.47	336.93	-1.73	0.5
8	52951_6727805	Confined	13,726	7/30/2016	333.47	336.94	-1.73	0.5
8	52951_6727805	Confined	13,732	8/5/2016	332.94	336.95	-2.00	0.5
8	52951_6727805	Confined	13,737	8/10/2016	331.86	336.96	-2.55	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	13,742	8/15/2016	331.76	336.96	-2.60	0.5
8	52951_6727805	Confined	13,747	8/20/2016	332.86	336.97	-2.06	0.5
8	52951_6727805	Confined	13,752	8/25/2016	333.34	336.98	-1.82	0.5
8	52951_6727805	Confined	13,763	9/5/2016	333.83	337.00	-1.59	0.5
8	52951_6727805	Confined	13,768	9/10/2016	333.90	337.01	-1.55	0.5
8	52951_6727805	Confined	13,771	9/13/2016	336.40	337.01	-0.31	0.5
8	52951_6727805	Confined	13,773	9/15/2016	333.87	337.02	-1.57	0.5
8	52951_6727805	Confined	13,778	9/20/2016	333.77	337.03	-1.63	0.5
8	52951_6727805	Confined	13,783	9/25/2016	333.76	337.03	-1.64	0.5
8	52951_6727805	Confined	13,788	9/30/2016	333.82	337.04	-1.61	0.5
8	52951_6727805	Confined	13,793	10/5/2016	333.92	337.05	-1.57	0.5
8	52951_6727805	Confined	13,798	10/10/2016	333.84	337.06	-1.61	0.5
8	52951_6727805	Confined	13,803	10/15/2016	333.99	337.07	-1.54	0.5
8	52951_6727805	Confined	13,808	10/20/2016	334.01	337.08	-1.53	0.5
8	52951_6727805	Confined	13,813	10/25/2016	333.97	337.08	-1.56	0.5
8	52951_6727805	Confined	13,818	10/30/2016	333.88	337.09	-1.61	0.5
8	52951_6727805	Confined	13,824	11/5/2016	333.65	337.10	-1.73	0.5
8	52951_6727805	Confined	13,829	11/10/2016	333.55	337.11	-1.78	0.5
8	52951_6727805	Confined	13,834	11/15/2016	333.51	337.12	-1.81	0.5
8	52951_6727805	Confined	13,839	11/20/2016	333.22	337.13	-1.95	0.5
8	52951_6727805	Confined	13,844	11/25/2016	333.12	337.14	-2.01	0.5
8	52951_6727805	Confined	13,849	11/30/2016	333.24	337.15	-1.95	0.5
8	52951_6727805	Confined	13,854	12/5/2016	333.99	337.15	-1.58	0.5
8	52951_6727805	Confined	13,859	12/10/2016	333.52	337.16	-1.82	0.5
8	52951_6727805	Confined	13,864	12/15/2016	333.57	337.17	-1.80	0.5
8	52951_6727805	Confined	13,869	12/20/2016	333.47	337.18	-1.85	0.5
8	52951_6727805	Confined	13,874	12/25/2016	333.68	337.19	-1.75	0.5
8	52951_6727805	Confined	13,879	12/30/2016	333.57	337.20	-1.81	0.5
8	52951_6727805	Confined	13,885	1/5/2017	333.69	337.18	-1.74	0.5
8	52951_6727805	Confined	13,890	1/10/2017	333.56	337.16	-1.80	0.5
8	52951_6727805	Confined	13,892	1/12/2017	336.06	337.15	-0.55	0.5
8	52951_6727805	Confined	13,895	1/15/2017	333.61	337.14	-1.77	0.5
8	52951_6727805	Confined	13,900	1/20/2017	333.82	337.12	-1.65	0.5
8	52951_6727805	Confined	13,905	1/25/2017	333.74	337.10	-1.68	0.5
8	52951_6727805	Confined	13,910	1/30/2017	333.56	337.08	-1.76	0.5
8	52951_6727805	Confined	13,916	2/5/2017	333.52	337.06	-1.77	0.5
8	52951_6727805	Confined	13,921	2/10/2017	333.34	337.04	-1.85	0.5
8	52951_6727805	Confined	13,926	2/15/2017	333.34	337.02	-1.84	0.5
8	52951_6727805	Confined	13,931	2/20/2017	333.40	337.00	-1.80	0.5
8	52951_6727805	Confined	13,936	2/25/2017	333.35	336.98	-1.82	0.5
8	52951_6727805	Confined	13,944	3/5/2017	333.48	336.95	-1.74	0.5
8	52951_6727805	Confined	13,949	3/10/2017	334.02	336.93	-1.46	0.5
8	52951_6727805	Confined	13,954	3/15/2017	333.68	336.92	-1.62	0.5
8	52951_6727805	Confined	13,959	3/20/2017	333.62	336.90	-1.64	0.5
8	52951_6727805	Confined	13,964	3/25/2017	333.69	336.88	-1.59	0.5
8	52951_6727805	Confined	13,969	3/30/2017	333.78	336.86	-1.54	0.5
8	52951_6727805	Confined	13,975	4/5/2017	333.69	336.84	-1.57	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	13,980	4/10/2017	333.60	336.82	-1.61	0.5
8	52951_6727805	Confined	13,985	4/15/2017	333.74	336.80	-1.53	0.5
8	52951_6727805	Confined	13,990	4/20/2017	333.76	336.78	-1.51	0.5
8	52951_6727805	Confined	13,995	4/25/2017	333.81	336.76	-1.47	0.5
8	52951_6727805	Confined	14,000	4/30/2017	333.50	336.74	-1.62	0.5
8	52951_6727805	Confined	14,005	5/5/2017	333.26	336.72	-1.73	0.5
8	52951_6727805	Confined	14,010	5/10/2017	333.44	336.70	-1.63	0.5
8	52951_6727805	Confined	14,015	5/15/2017	333.76	336.68	-1.46	0.5
8	52951_6727805	Confined	14,020	5/20/2017	333.66	336.66	-1.50	0.5
8	52951_6727805	Confined	14,025	5/25/2017	333.61	336.64	-1.52	0.5
8	52951_6727805	Confined	14,030	5/30/2017	333.36	336.63	-1.63	0.5
8	52951_6727805	Confined	14,036	6/5/2017	332.66	336.60	-1.97	0.5
8	52951_6727805	Confined	14,041	6/10/2017	332.32	336.58	-2.13	0.5
8	52951_6727805	Confined	14,046	6/15/2017	331.98	336.56	-2.29	0.5
8	52951_6727805	Confined	14,051	6/20/2017	332.09	336.54	-2.23	0.5
8	52951_6727805	Confined	14,056	6/25/2017	332.00	336.53	-2.26	0.5
8	52951_6727805	Confined	14,061	6/30/2017	332.09	336.51	-2.21	0.5
8	52951_6727805	Confined	14,066	7/5/2017	331.78	336.49	-2.35	0.5
8	52951_6727805	Confined	14,071	7/10/2017	331.49	336.47	-2.49	0.5
8	52951_6727805	Confined	14,076	7/15/2017	331.41	336.45	-2.52	0.5
8	52951_6727805	Confined	14,081	7/20/2017	331.20	336.43	-2.62	0.5
8	52951_6727805	Confined	14,086	7/25/2017	331.50	336.41	-2.46	0.5
8	52951_6727805	Confined	14,091	7/30/2017	330.72	336.39	-2.84	0.5
8	52951_6727805	Confined	14,097	8/5/2017	330.44	336.37	-2.96	0.5
8	52951_6727805	Confined	14,102	8/10/2017	330.57	336.35	-2.89	0.5
8	52951_6727805	Confined	14,107	8/15/2017	330.38	336.33	-2.98	0.5
8	52951_6727805	Confined	14,112	8/20/2017	330.08	336.31	-3.12	0.5
8	52951_6727805	Confined	14,117	8/25/2017	330.16	336.29	-3.07	0.5
8	52951_6727805	Confined	14,122	8/30/2017	332.56	336.27	-1.86	0.5
8	52951_6727805	Confined	14,128	9/5/2017	331.86	336.25	-2.20	0.5
8	52951_6727805	Confined	14,133	9/10/2017	331.26	336.23	-2.49	0.5
8	52951_6727805	Confined	14,138	9/15/2017	331.32	336.21	-2.45	0.5
8	52951_6727805	Confined	14,143	9/20/2017	331.36	336.19	-2.42	0.5
8	52951_6727805	Confined	14,148	9/25/2017	331.66	336.17	-2.26	0.5
8	52951_6727805	Confined	14,153	9/30/2017	331.84	336.16	-2.16	0.5
8	52951_6727805	Confined	14,158	10/5/2017	332.11	336.14	-2.01	0.5
8	52951_6727805	Confined	14,163	10/10/2017	331.83	336.12	-2.14	0.5
8	52951_6727805	Confined	14,168	10/15/2017	331.73	336.10	-2.18	0.5
8	52951_6727805	Confined	14,173	10/20/2017	331.77	336.08	-2.15	0.5
8	52951_6727805	Confined	14,178	10/25/2017	331.54	336.06	-2.26	0.5
8	52951_6727805	Confined	14,180	10/27/2017	331.15	336.05	-2.45	0.5
8	52951_6727805	Confined	14,183	10/30/2017	331.29	336.04	-2.38	0.5
8	52951_6727805	Confined	14,189	11/5/2017	331.30	336.02	-2.36	0.5
8	52951_6727805	Confined	14,194	11/10/2017	331.02	336.00	-2.49	0.5
8	52951_6727805	Confined	14,199	11/15/2017	331.15	335.98	-2.41	0.5
8	52951_6727805	Confined	14,204	11/20/2017	331.26	335.96	-2.35	0.5
8	52951_6727805	Confined	14,209	11/25/2017	331.44	335.94	-2.25	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
8	52951_6727805	Confined	14,214	11/30/2017	331.37	335.92	-2.28	0.5
8	52951_6727805	Confined	14,219	12/5/2017	331.54	335.90	-2.18	0.5
8	52951_6727805	Confined	14,224	12/10/2017	331.31	335.88	-2.29	0.5
8	52951_6727805	Confined	14,229	12/15/2017	331.74	335.87	-2.06	0.5
8	52951_6727805	Confined	14,234	12/20/2017	331.78	335.85	-2.03	0.5
8	52951_6727805	Confined	14,239	12/25/2017	331.12	335.83	-2.35	0.5
8	52951_6727805	Confined	14,244	12/30/2017	331.10	335.81	-2.35	0.5
8	56014_0	Confined	11,799	4/21/2011	222.39	270.23	-47.84	1
8	56050_0	Confined	13,220	3/12/2015	-24.73	268.29	-293.02	1
8	56168_0	Confined	13,219	3/11/2015	-48.36	269.05	-317.41	1
8	59536_0	Unconfined	12,309	9/12/2012	629.19	674.51	-45.32	1
8	59538_0	Confined	12,222	6/17/2012	738.07	698.27	19.90	0.5
8	59541_0	Unconfined	11,979	10/18/2011	778.46	706.80	35.83	0.5
8	59542_0	Confined	11,954	9/23/2011	728.63	708.14	20.49	1
8	59543_0	Confined	11,862	6/23/2011	632.68	668.20	-35.52	1
8	59544_0	Confined	11,762	3/15/2011	644.74	605.94	38.80	1
8	59545_0	Confined	11,632	11/5/2010	607.38	660.10	-52.72	1
8	59547_0	Confined	10,504	10/4/2007	465.84	518.97	-53.13	1
8	59549_0	Unconfined	11,071	4/23/2009	322.04	341.37	-9.67	0.5
8	59550_0	Confined	9,997	5/15/2006	565.51	534.56	3.10	0.1
8	59553_0	Confined	11,135	6/26/2009	373.85	416.18	-4.23	0.1
8	59554_0	Unconfined	11,041	3/24/2009	662.94	709.70	-46.76	1
8	59557_0	Confined	10,707	4/24/2008	728.43	609.08	119.35	1
8	59565_0	Confined	9,182	2/20/2004	651.81	674.39	-11.29	0.5
8	59568_0	Unconfined	8,573	6/21/2002	526.25	413.64	56.30	0.5
8	59570_0	Confined	8,323	10/14/2001	612.95	516.52	96.43	1
8	59600_0	Confined	11,849	6/10/2011	367.25	294.33	72.92	1
8	59988_0	Confined	13,106	11/18/2014	76.06	158.27	-41.11	0.5
8	86410_6745102	Confined	13,178	1/29/2015	290.74	307.87	-8.57	0.5
8	86410_6745102	Confined	13,312	6/12/2015	286.12	304.93	-9.41	0.5
8	86410_6745102	Confined	13,532	1/18/2016	279.19	300.32	-10.56	0.5
8	86410_6745102	Confined	13,533	1/19/2016	279.19	300.31	-10.56	0.5
8	86410_6745102	Confined	13,675	6/9/2016	280.92	298.83	-8.96	0.5
9	0_5860902	Confined	836	4/15/1981	440.99	425.67	15.32	1
9	0_5861201	Unconfined	834	4/13/1981	414.62	386.95	27.67	1
9	0_5861201	Unconfined	1,419	11/19/1982	413.10	386.78	26.32	1
9	0_5861201	Unconfined	1,783	11/18/1983	415.30	386.58	28.72	1
9	0_5861201	Unconfined	2,136	11/5/1984	417.36	386.29	31.07	1
9	0_5861201	Unconfined	2,963	2/10/1987	417.33	386.94	30.39	1
9	0_5861201	Unconfined	3,239	11/13/1987	413.32	386.99	26.33	1
9	0_5861201	Unconfined	3,721	3/9/1989	415.60	385.95	29.65	1
9	0_5861201	Unconfined	3,972	11/15/1989	412.93	385.88	27.05	1
9	0_5861201	Unconfined	4,331	11/9/1990	414.75	386.28	28.47	1
9	0_5861201	Unconfined	4,699	11/12/1991	415.72	386.83	28.89	1
9	0_5861201	Unconfined	5,093	12/10/1992	417.98	387.36	30.62	1
9	0_5861201	Unconfined	5,912	3/9/1995	418.95	386.82	32.13	1
9	0_5861201	Unconfined	6,270	3/1/1996	408.81	386.39	22.42	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_5861201	Unconfined	6,549	12/5/1996	418.13	385.93	32.20	1
9	0_6704503	Confined	782	2/20/1981	475.30	443.05	32.25	1
9	0_6704503	Confined	1,145	2/18/1982	473.26	444.49	28.77	1
9	0_6704902	Confined	782	2/20/1981	444.25	411.91	32.34	1
9	0_6704902	Confined	1,145	2/18/1982	442.51	413.51	29.00	1
9	0_6704902	Confined	1,551	3/31/1983	443.22	411.56	31.66	1
9	0_6704902	Confined	1,870	2/13/1984	441.75	410.60	31.15	1
9	0_6704902	Confined	2,236	2/13/1985	442.40	409.45	32.95	1
9	0_6704902	Confined	2,620	3/4/1986	438.72	411.87	26.85	1
9	0_6704902	Confined	2,903	12/12/1986	442.08	412.58	29.50	1
9	0_6704902	Confined	3,704	2/20/1989	435.38	408.82	26.56	1
9	0_6704902	Confined	4,051	2/2/1990	441.58	407.97	33.61	1
9	0_6704902	Confined	4,428	2/14/1991	441.17	409.73	31.44	1
9	0_6704902	Confined	4,793	2/14/1992	441.22	412.54	28.68	1
9	0_6704902	Confined	5,094	12/11/1992	441.37	414.37	27.00	1
9	0_6704902	Confined	5,484	1/5/1994	442.02	412.50	29.52	1
9	0_6704902	Confined	5,829	12/16/1994	448.12	412.95	35.17	1
9	0_6704902	Confined	6,273	3/4/1996	442.48	410.77	31.71	1
9	0_6704902	Confined	6,556	12/12/1996	442.57	408.46	34.11	1
9	0_6705608	Confined	3,152	8/18/1987	576.51	400.61	175.90	1
9	0_6711501	Unconfined	782	2/20/1981	424.50	423.29	1.21	1
9	0_6711501	Unconfined	1,144	2/17/1982	427.56	424.56	3.00	1
9	0_6711501	Unconfined	1,871	2/14/1984	430.00	422.22	7.78	1
9	0_6711501	Unconfined	2,236	2/13/1985	423.10	421.49	1.61	1
9	0_6711501	Unconfined	2,619	3/3/1986	423.65	423.67	-0.02	1
9	0_6711501	Unconfined	2,903	12/12/1986	421.31	424.06	-2.75	1
9	0_6711501	Unconfined	3,706	2/22/1989	414.58	420.66	-6.08	1
9	0_6711501	Unconfined	4,072	2/23/1990	419.37	420.60	-1.23	1
9	0_6711501	Unconfined	4,429	2/15/1991	420.19	422.42	-2.23	1
9	0_6711501	Unconfined	4,796	2/17/1992	421.49	424.37	-2.88	1
9	0_6711501	Unconfined	5,094	12/11/1992	422.50	425.75	-3.25	1
9	0_6711501	Unconfined	5,483	1/4/1994	424.39	423.55	0.84	1
9	0_6711501	Unconfined	5,828	12/15/1994	427.89	424.12	3.77	1
9	0_6711501	Unconfined	6,273	3/4/1996	428.72	422.40	6.32	1
9	0_6711501	Unconfined	6,555	12/11/1996	428.27	420.72	7.55	1
9	0_6711501	Unconfined	6,942	1/2/1998	432.29	423.47	8.82	1
9	0_6711501	Unconfined	7,242	10/29/1998	436.02	424.38	11.64	1
9	0_6711501	Unconfined	7,723	2/22/2000	432.40	421.93	10.47	1
9	0_6711501	Unconfined	7,925	9/11/2000	429.24	422.52	6.72	1
9	0_6711501	Unconfined	8,073	2/6/2001	433.89	422.82	11.07	1
9	0_6711501	Unconfined	8,438	2/6/2002	432.19	423.02	9.17	1
9	0_6711501	Unconfined	8,816	2/19/2003	431.39	426.45	4.94	1
9	0_6711501	Unconfined	9,509	1/12/2005	432.95	427.39	5.56	1
9	0_6711501	Unconfined	9,900	2/7/2006	432.09	423.47	8.62	1
9	0_6711501	Unconfined	10,265	2/7/2007	431.61	422.22	9.39	1
9	0_6711501	Unconfined	10,649	2/26/2008	430.49	426.24	4.25	1
9	0_6711501	Unconfined	11,007	2/18/2009	429.62	422.63	6.99	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6711501	Unconfined	11,327	1/4/2010	430.24	422.66	7.58	1
9	0_6711501	Unconfined	11,694	1/6/2011	429.34	423.79	5.55	1
9	0_6711501	Unconfined	11,972	10/11/2011	427.49	421.04	6.45	1
9	0_6711501	Unconfined	12,345	10/18/2012	431.48	421.28	10.20	1
9	0_6711501	Unconfined	12,701	10/9/2013	430.09	422.38	7.71	1
9	0_6711501	Unconfined	13,078	10/21/2014	431.64	422.22	9.42	1
9	0_6711501	Unconfined	13,441	10/19/2015	425.89	425.07	0.82	1
9	0_6711501	Unconfined	13,809	10/21/2016	429.78	426.66	3.12	1
9	0_6711501	Unconfined	14,199	11/15/2017	432.12	425.89	6.23	1
9	0_6712503	Confined	782	2/20/1981	374.13	384.93	-10.80	1
9	0_6712503	Confined	1,144	2/17/1982	374.01	387.32	-13.31	1
9	0_6712503	Confined	1,550	3/30/1983	372.06	384.65	-12.59	1
9	0_6712503	Confined	1,871	2/14/1984	372.60	383.72	-11.12	1
9	0_6712503	Confined	2,236	2/13/1985	370.52	382.41	-11.89	1
9	0_6712503	Confined	2,619	3/3/1986	368.78	384.38	-15.60	1
9	0_6712503	Confined	2,903	12/12/1986	369.72	384.70	-14.98	1
9	0_6712503	Confined	3,126	7/23/1987	369.92	385.36	-15.44	1
9	0_6712503	Confined	3,704	2/20/1989	366.73	382.64	-15.91	1
9	0_6712503	Confined	4,072	2/23/1990	364.51	381.22	-16.71	1
9	0_6712503	Confined	4,428	2/14/1991	365.23	381.47	-16.24	1
9	0_6712503	Confined	4,796	2/17/1992	367.53	384.61	-17.08	1
9	0_6712503	Confined	5,094	12/11/1992	368.51	386.32	-17.81	1
9	0_6712503	Confined	5,484	1/5/1994	367.21	384.71	-17.50	1
9	0_6712503	Confined	5,829	12/16/1994	366.40	384.63	-18.23	1
9	0_6712503	Confined	6,273	3/4/1996	365.41	382.80	-17.39	1
9	0_6712503	Confined	6,556	12/12/1996	364.59	379.99	-15.40	1
9	0_6712530	Confined	11,188	8/18/2009	355.47	374.05	-1.86	0.1
9	0_6712530	Confined	12,188	5/14/2012	360.46	365.50	-0.50	0.1
9	0_6712533	Confined	8,677	10/3/2002	135.78	383.23	-24.74	0.1
9	0_6712601	Confined	782	2/20/1981	393.25	405.04	-5.90	0.5
9	0_6712601	Confined	1,144	2/17/1982	395.08	407.60	-6.26	0.5
9	0_6712601	Confined	1,551	3/31/1983	392.78	404.77	-6.00	0.5
9	0_6712601	Confined	1,871	2/14/1984	392.96	403.35	-5.19	0.5
9	0_6712601	Confined	2,235	2/12/1985	390.73	401.60	-5.44	0.5
9	0_6712601	Confined	2,619	3/3/1986	389.85	404.67	-7.41	0.5
9	0_6712601	Confined	2,903	12/12/1986	390.82	405.62	-7.40	0.5
9	0_6712601	Confined	3,126	7/23/1987	395.75	406.32	-5.28	0.5
9	0_6712601	Confined	3,704	2/20/1989	387.13	401.15	-7.01	0.5
9	0_6712601	Confined	4,072	2/23/1990	382.94	399.62	-8.34	0.5
9	0_6712601	Confined	4,428	2/14/1991	376.65	401.45	-12.40	0.5
9	0_6712601	Confined	4,796	2/17/1992	380.28	405.46	-12.59	0.5
9	0_6712601	Confined	5,484	1/5/1994	374.25	405.87	-15.81	0.5
9	0_6712902	Confined	12,815	1/31/2014	450.78	397.77	53.01	1
9	0_6718807	Unconfined	9,220	3/29/2004	501.01	450.04	50.97	1
9	0_6719608	Confined	782	2/20/1981	349.52	341.54	7.98	1
9	0_6719608	Confined	1,143	2/16/1982	354.84	341.95	12.89	1
9	0_6719608	Confined	1,550	3/30/1983	355.11	340.90	14.21	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6719608	Confined	1,870	2/13/1984	354.49	340.35	14.14	1
9	0_6719608	Confined	2,235	2/12/1985	353.52	339.54	13.98	1
9	0_6719608	Confined	2,903	12/12/1986	352.75	340.77	11.98	1
9	0_6719608	Confined	3,125	7/22/1987	352.86	340.89	11.97	1
9	0_6719608	Confined	3,706	2/22/1989	346.58	339.03	7.55	1
9	0_6719608	Confined	4,072	2/23/1990	352.38	338.74	13.64	1
9	0_6719608	Confined	4,428	2/14/1991	349.46	339.46	10.00	1
9	0_6719608	Confined	4,796	2/17/1992	351.25	341.45	9.80	1
9	0_6719608	Confined	5,101	12/18/1992	354.31	342.41	11.90	1
9	0_6719608	Confined	5,483	1/4/1994	346.96	341.81	5.15	1
9	0_6719608	Confined	5,828	12/15/1994	347.73	342.16	5.57	1
9	0_6719608	Confined	6,270	3/1/1996	352.22	341.40	10.82	1
9	0_6719608	Confined	6,554	12/10/1996	352.28	339.99	12.29	1
9	0_6719609	Unconfined	781	2/19/1981	354.14	346.17	7.97	1
9	0_6719609	Unconfined	782	2/20/1981	354.14	346.17	7.97	1
9	0_6719609	Unconfined	1,143	2/16/1982	354.67	346.58	8.09	1
9	0_6719609	Unconfined	1,550	3/30/1983	355.33	345.44	9.89	1
9	0_6719609	Unconfined	2,235	2/12/1985	353.60	343.89	9.71	1
9	0_6719609	Unconfined	2,615	2/27/1986	355.56	344.97	10.59	1
9	0_6719609	Unconfined	2,903	12/12/1986	354.83	345.11	9.72	1
9	0_6719609	Unconfined	3,706	2/22/1989	353.21	343.20	10.01	1
9	0_6719609	Unconfined	4,072	2/23/1990	353.05	342.98	10.07	1
9	0_6719609	Unconfined	4,428	2/14/1991	353.71	343.78	9.93	1
9	0_6719609	Unconfined	4,796	2/17/1992	357.08	345.88	11.20	1
9	0_6719609	Unconfined	5,101	12/18/1992	356.03	346.94	9.09	1
9	0_6719609	Unconfined	5,483	1/4/1994	354.88	346.24	8.64	1
9	0_6719609	Unconfined	5,828	12/15/1994	354.82	346.61	8.21	1
9	0_6719609	Unconfined	6,270	3/1/1996	354.08	345.80	8.28	1
9	0_6719609	Unconfined	6,555	12/11/1996	352.97	344.38	8.59	1
9	0_6719610	Unconfined	781	2/19/1981	343.98	344.16	-0.18	1
9	0_6719610	Unconfined	1,143	2/16/1982	345.03	344.52	0.51	1
9	0_6719610	Unconfined	1,871	2/14/1984	342.68	342.99	-0.31	1
9	0_6719610	Unconfined	2,235	2/12/1985	341.58	342.15	-0.57	1
9	0_6719610	Unconfined	2,615	2/27/1986	344.07	343.16	0.91	1
9	0_6719610	Unconfined	2,903	12/12/1986	343.08	343.29	-0.21	1
9	0_6719610	Unconfined	3,706	2/22/1989	342.62	341.62	1.00	1
9	0_6719610	Unconfined	4,072	2/23/1990	341.68	341.40	0.28	1
9	0_6719610	Unconfined	4,428	2/14/1991	343.00	342.09	0.91	1
9	0_6719610	Unconfined	4,796	2/17/1992	346.38	344.05	2.33	1
9	0_6719610	Unconfined	5,101	12/18/1992	343.38	344.96	-1.58	1
9	0_6719610	Unconfined	6,270	3/1/1996	338.28	344.01	-5.73	1
9	0_6719610	Unconfined	6,555	12/11/1996	339.78	342.78	-3.00	1
9	0_6719708	Unconfined	12,944	6/9/2014	379.43	378.84	0.59	1
9	0_6719708	Unconfined	13,038	9/11/2014	376.08	378.82	-2.74	1
9	0_6719708	Unconfined	13,163	1/14/2015	377.41	378.93	-1.52	1
9	0_6719708	Unconfined	13,311	6/11/2015	382.30	380.35	1.95	1
9	0_6719708	Unconfined	13,409	9/17/2015	378.26	381.28	-3.02	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6719708	Unconfined	13,527	1/13/2016	380.86	382.37	-1.51	1
9	0_6719708	Unconfined	13,688	6/22/2016	382.22	383.36	-1.14	1
9	0_6719708	Unconfined	13,778	9/20/2016	380.08	383.92	-3.84	1
9	0_6719708	Unconfined	13,911	1/31/2017	382.16	384.54	-2.38	1
9	0_6719708	Unconfined	14,050	6/19/2017	380.33	384.50	-4.17	1
9	0_6719708	Unconfined	14,141	9/18/2017	381.92	384.48	-2.56	1
9	0_6720409	Confined	11,188	8/18/2009	346.60	341.36	5.24	1
9	0_6720409	Confined	11,504	6/30/2010	350.45	340.65	9.80	1
9	0_6720409	Confined	11,828	5/20/2011	348.36	339.37	8.99	1
9	0_6720409	Confined	12,188	5/14/2012	348.01	338.44	9.57	1
9	0_6725910	Unconfined	11,568	9/2/2010	414.96	409.81	5.15	1
9	0_6725910	Unconfined	11,709	1/21/2011	405.45	408.71	-3.26	1
9	0_6725910	Unconfined	11,855	6/16/2011	393.08	406.63	-13.55	1
9	0_6725910	Unconfined	11,952	9/21/2011	390.16	405.25	-15.09	1
9	0_6725910	Unconfined	12,085	2/1/2012	410.60	404.18	6.42	1
9	0_6725910	Unconfined	12,205	5/31/2012	402.23	405.56	-3.33	1
9	0_6725910	Unconfined	12,440	1/21/2013	409.58	408.20	1.38	1
9	0_6725910	Unconfined	12,589	6/19/2013	410.74	409.35	1.39	1
9	0_6725910	Unconfined	12,687	9/25/2013	409.87	410.10	-0.23	1
9	0_6725910	Unconfined	12,806	1/22/2014	419.50	410.90	8.60	1
9	0_6725910	Unconfined	12,944	6/9/2014	410.30	411.17	-0.87	1
9	0_6725910	Unconfined	13,038	9/11/2014	408.31	411.35	-3.04	1
9	0_6725910	Unconfined	13,163	1/14/2015	412.74	411.70	1.04	1
9	0_6725910	Unconfined	13,312	6/12/2015	418.33	413.09	5.24	1
9	0_6725910	Unconfined	13,331	7/1/2015	420.16	413.27	6.89	1
9	0_6725910	Unconfined	13,527	1/13/2016	417.20	415.06	2.14	1
9	0_6725910	Unconfined	13,688	6/22/2016	419.72	416.05	3.67	1
9	0_6725910	Unconfined	13,778	9/20/2016	419.80	416.60	3.20	1
9	0_6725910	Unconfined	13,911	1/31/2017	422.03	417.17	4.86	1
9	0_6725910	Unconfined	14,050	6/19/2017	417.91	416.95	0.96	1
9	0_6725910	Unconfined	14,141	9/18/2017	418.49	416.80	1.69	1
9	0_6726311	Unconfined	4,127	4/19/1990	400.57	394.37	6.20	1
9	0_6726512	Unconfined	779	2/17/1981	425.19	393.32	31.87	1
9	0_6726512	Unconfined	1,167	3/12/1982	431.95	394.42	37.53	1
9	0_6726512	Unconfined	1,517	2/25/1983	427.17	392.92	34.25	1
9	0_6726512	Unconfined	1,871	2/14/1984	429.90	391.63	38.27	1
9	0_6726512	Unconfined	2,608	2/20/1986	430.41	391.44	38.97	1
9	0_6726512	Unconfined	3,705	2/21/1989	416.16	389.80	26.36	1
9	0_6726512	Unconfined	4,058	2/9/1990	412.87	388.25	24.62	1
9	0_6726512	Unconfined	4,426	2/12/1991	412.46	389.21	23.25	1
9	0_6726512	Unconfined	4,798	2/19/1992	414.69	391.53	23.16	1
9	0_6726512	Unconfined	5,164	2/19/1993	414.06	393.77	20.29	1
9	0_6726512	Unconfined	5,461	12/13/1993	412.32	392.96	19.36	1
9	0_6726512	Unconfined	5,896	2/21/1995	412.82	393.70	19.12	1
9	0_6726512	Unconfined	6,263	2/23/1996	410.96	392.29	18.67	1
9	0_6726512	Unconfined	6,617	2/11/1997	410.08	390.13	19.95	1
9	0_6726512	Unconfined	6,940	12/31/1997	409.01	391.94	17.07	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6726512	Unconfined	7,396	4/1/1999	408.46	392.87	15.59	1
9	0_6726512	Unconfined	7,723	2/22/2000	407.26	390.99	16.27	1
9	0_6726512	Unconfined	7,926	9/12/2000	404.41	391.06	13.35	1
9	0_6726512	Unconfined	8,073	2/6/2001	407.36	391.07	16.29	1
9	0_6726512	Unconfined	8,438	2/6/2002	407.03	391.20	15.83	1
9	0_6726512	Unconfined	9,916	2/23/2006	405.66	395.20	10.46	1
9	0_6726512	Unconfined	10,265	2/7/2007	405.76	393.55	12.21	1
9	0_6726512	Unconfined	11,415	4/2/2010	403.41	393.12	10.29	1
9	0_6726512	Unconfined	11,694	1/6/2011	400.54	392.64	7.90	1
9	0_6726512	Unconfined	11,972	10/11/2011	397.46	388.80	8.66	1
9	0_6726512	Unconfined	12,701	10/9/2013	397.14	389.93	7.21	1
9	0_6726512	Unconfined	13,424	10/2/2015	396.01	393.42	2.59	1
9	0_6726512	Unconfined	13,798	10/10/2016	399.58	396.54	3.04	1
9	0_6726512	Unconfined	14,180	10/27/2017	399.34	397.20	2.14	1
9	0_6726704	Confined	9,150	1/19/2004	400.82	401.25	-0.21	0.5
9	0_6726704	Confined	9,396	9/21/2004	400.71	403.35	-1.32	0.5
9	0_6726704	Confined	9,522	1/25/2005	402.84	403.98	-0.57	0.5
9	0_6726704	Confined	9,747	9/7/2005	400.27	401.79	-0.76	0.5
9	0_6726704	Confined	9,881	1/19/2006	400.24	400.55	-0.15	0.5
9	0_6726704	Confined	10,015	6/2/2006	398.47	399.62	-0.57	0.5
9	0_6726704	Confined	10,130	9/25/2006	395.97	398.82	-1.42	0.5
9	0_6726704	Confined	10,256	1/29/2007	400.25	398.64	0.80	0.5
9	0_6726704	Confined	10,389	6/11/2007	400.76	400.92	-0.08	0.5
9	0_6726704	Confined	10,487	9/17/2007	401.15	402.61	-0.73	0.5
9	0_6726704	Confined	10,606	1/14/2008	401.35	404.25	-1.45	0.5
9	0_6726704	Confined	10,763	6/19/2008	398.56	402.46	-1.95	0.5
9	0_6726704	Confined	10,847	9/11/2008	398.60	401.51	-1.45	0.5
9	0_6726704	Confined	10,966	1/8/2009	398.87	400.20	-0.66	0.5
9	0_6726704	Confined	11,120	6/11/2009	398.86	399.34	-0.24	0.5
9	0_6726704	Confined	11,232	10/1/2009	397.97	398.72	-0.37	0.5
9	0_6727110	Confined	12,107	2/23/2012	368.80	373.58	-4.78	1
9	0_6727110	Confined	12,323	9/26/2012	364.95	373.90	-8.95	1
9	0_6727110	Confined	12,589	6/19/2013	371.67	374.47	-2.80	1
9	0_6727110	Confined	12,687	9/25/2013	370.02	374.71	-4.69	1
9	0_6727110	Confined	12,806	1/22/2014	373.90	374.88	-0.98	1
9	0_6727110	Confined	12,944	6/9/2014	373.24	374.43	-1.19	1
9	0_6727110	Confined	13,038	9/11/2014	367.74	374.13	-6.39	1
9	0_6727110	Confined	13,163	1/14/2015	376.31	373.92	2.39	1
9	0_6727110	Confined	13,311	6/11/2015	378.34	375.51	2.83	1
9	0_6727110	Confined	13,409	9/17/2015	376.38	376.56	-0.18	1
9	0_6727110	Confined	13,527	1/13/2016	379.15	377.77	1.38	1
9	0_6727110	Confined	13,688	6/22/2016	379.96	378.79	1.17	1
9	0_6727110	Confined	13,778	9/20/2016	379.74	379.37	0.37	1
9	0_6727110	Confined	13,911	1/31/2017	379.29	379.92	-0.63	1
9	0_6727110	Confined	14,050	6/19/2017	380.11	379.50	0.61	1
9	0_6727110	Confined	14,141	9/18/2017	379.90	379.23	0.67	1
9	0_6727706	Confined	9,033	9/24/2003	379.38	372.49	6.89	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6727706	Confined	9,152	1/21/2004	379.45	372.65	6.80	1
9	0_6727706	Confined	9,396	9/21/2004	379.44	374.56	4.88	1
9	0_6727706	Confined	9,522	1/25/2005	380.22	375.11	5.11	1
9	0_6727706	Confined	9,747	9/7/2005	378.22	372.90	5.32	1
9	0_6727706	Confined	9,881	1/19/2006	378.90	371.63	7.27	1
9	0_6727706	Confined	10,018	6/5/2006	377.95	370.60	7.35	1
9	0_6727706	Confined	10,130	9/25/2006	376.02	369.75	6.27	1
9	0_6727706	Confined	10,256	1/29/2007	377.42	369.47	7.95	1
9	0_6727706	Confined	10,389	6/11/2007	378.92	371.57	7.35	1
9	0_6727706	Confined	10,487	9/17/2007	378.92	373.11	5.81	1
9	0_6727706	Confined	10,606	1/14/2008	378.55	374.61	3.94	1
9	0_6727706	Confined	10,712	4/29/2008	375.52	373.44	2.08	1
9	0_6727706	Confined	10,847	9/11/2008	375.93	371.94	3.99	1
9	0_6727706	Confined	10,966	1/8/2009	377.32	370.68	6.64	1
9	0_6727706	Confined	11,117	6/8/2009	377.13	370.13	7.00	1
9	0_6727706	Confined	11,120	6/11/2009	376.57	370.12	6.45	1
9	0_6727706	Confined	11,232	10/1/2009	376.43	369.71	6.72	1
9	0_6727706	Confined	11,343	1/20/2010	378.45	369.37	9.08	1
9	0_6727706	Confined	11,490	6/16/2010	378.92	369.26	9.66	1
9	0_6727706	Confined	11,504	6/30/2010	377.92	369.26	8.66	1
9	0_6727706	Confined	11,568	9/2/2010	377.47	369.21	8.26	1
9	0_6727706	Confined	11,709	1/21/2011	377.62	368.84	8.78	1
9	0_6727706	Confined	11,855	6/16/2011	375.32	366.84	8.48	1
9	0_6727706	Confined	12,085	2/1/2012	377.12	364.21	12.91	1
9	0_6727706	Confined	12,189	5/15/2012	375.55	364.51	11.04	1
9	0_6727706	Confined	12,205	5/31/2012	376.15	364.56	11.59	1
9	0_6727706	Confined	12,440	1/21/2013	376.92	365.20	11.72	1
9	0_6727706	Confined	12,589	6/19/2013	376.31	365.34	10.97	1
9	0_6727706	Confined	12,687	9/25/2013	380.31	365.44	14.87	1
9	0_6727706	Confined	12,806	1/22/2014	376.65	365.44	11.21	1
9	0_6727706	Confined	12,944	6/9/2014	376.42	364.85	11.57	1
9	0_6727706	Confined	13,038	9/11/2014	375.28	364.45	10.83	1
9	0_6727706	Confined	13,163	1/14/2015	376.12	364.05	12.07	1
9	0_6727706	Confined	13,311	6/11/2015	378.05	364.92	13.13	1
9	0_6727706	Confined	13,409	9/17/2015	376.41	365.50	10.91	1
9	0_6727706	Confined	13,527	1/13/2016	379.12	366.17	12.95	1
9	0_6727706	Confined	13,688	6/22/2016	380.00	366.84	13.16	1
9	0_6727706	Confined	13,778	9/20/2016	379.84	367.21	12.63	1
9	0_6727706	Confined	13,911	1/31/2017	379.70	367.52	12.18	1
9	0_6727706	Confined	14,050	6/19/2017	379.96	367.00	12.96	1
9	0_6727706	Confined	14,141	9/18/2017	380.35	366.66	13.69	1
9	0_6733407	Confined	779	2/17/1981	430.42	452.55	-22.13	1
9	0_6733407	Confined	1,167	3/12/1982	431.42	454.26	-22.84	1
9	0_6733407	Confined	1,517	2/25/1983	430.90	451.82	-20.92	1
9	0_6733407	Confined	1,872	2/15/1984	431.64	449.72	-18.08	1
9	0_6733407	Confined	2,234	2/11/1985	439.26	446.69	-7.43	1
9	0_6733407	Confined	2,607	2/19/1986	432.25	450.04	-17.79	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6733407	Confined	2,893	12/2/1986	431.96	451.51	-19.55	1
9	0_6733407	Confined	3,705	2/21/1989	422.24	446.74	-24.50	1
9	0_6733407	Confined	4,058	2/9/1990	433.14	444.13	-10.99	1
9	0_6733407	Confined	4,426	2/12/1991	432.94	446.05	-13.11	1
9	0_6734601	Confined	8,333	10/24/2001	379.56	374.62	2.47	0.5
9	0_6734601	Confined	8,635	8/22/2002	378.02	376.59	0.72	0.5
9	0_6734601	Confined	8,928	6/11/2003	374.48	377.87	-1.70	0.5
9	0_6734601	Confined	9,033	9/24/2003	374.85	377.98	-1.56	0.5
9	0_6734601	Confined	9,152	1/21/2004	376.90	378.22	-0.66	0.5
9	0_6734601	Confined	9,398	9/23/2004	373.15	379.99	-3.42	0.5
9	0_6734601	Confined	9,749	9/9/2005	372.05	378.91	-3.43	0.5
9	0_6734601	Confined	9,877	1/15/2006	373.85	378.02	-2.08	0.5
9	0_6734601	Confined	10,392	6/14/2007	374.16	378.06	-1.95	0.5
9	0_6734601	Confined	10,488	9/18/2007	373.95	379.35	-2.70	0.5
9	0_6734601	Confined	10,607	1/15/2008	374.00	380.63	-3.31	0.5
9	0_6734601	Confined	10,774	6/30/2008	370.04	379.31	-4.63	0.5
9	0_6734601	Confined	11,203	9/2/2009	367.12	376.48	-4.68	0.5
9	0_6734601	Confined	11,327	1/4/2010	371.29	375.79	-2.25	0.5
9	0_6734601	Confined	11,476	6/2/2010	370.86	375.08	-2.11	0.5
9	0_6734601	Confined	11,587	9/21/2010	368.29	374.55	-3.13	0.5
9	0_6734601	Confined	11,693	1/5/2011	369.32	374.01	-2.34	0.5
9	0_6734601	Confined	11,840	6/1/2011	363.46	372.03	-4.29	0.5
9	0_6734601	Confined	11,937	9/6/2011	360.00	370.73	-5.37	0.5
9	0_6734601	Confined	12,210	6/5/2012	363.38	369.37	-3.00	0.5
9	0_6734601	Confined	12,302	9/5/2012	360.73	369.49	-4.38	0.5
9	0_6734601	Confined	12,668	9/6/2013	356.41	369.42	-6.51	0.5
9	0_6734601	Confined	12,786	1/2/2014	357.42	369.31	-5.94	0.5
9	0_6734601	Confined	12,938	6/3/2014	353.91	368.33	-7.21	0.5
9	0_6734601	Confined	13,029	9/2/2014	352.38	367.75	-7.68	0.5
9	0_6734601	Confined	13,148	12/30/2014	349.03	366.98	-8.98	0.5
9	0_6734601	Confined	13,305	6/5/2015	347.02	366.85	-9.92	0.5
9	0_6734601	Confined	13,519	1/5/2016	346.53	366.70	-10.09	0.5
9	0_6734601	Confined	13,673	6/7/2016	346.54	367.26	-10.36	0.5
9	0_6734601	Confined	13,884	1/4/2017	345.73	368.00	-11.13	0.5
9	0_6734601	Confined	14,036	6/5/2017	342.58	367.42	-12.42	0.5
9	0_6832801	Unconfined	779	2/17/1981	530.23	528.43	1.80	1
9	0_6832801	Unconfined	1,167	3/12/1982	530.90	529.44	1.46	1
9	0_6832801	Unconfined	1,517	2/25/1983	531.15	527.85	3.30	1
9	0_6832801	Unconfined	1,872	2/15/1984	530.89	526.78	4.11	1
9	0_6832801	Unconfined	2,234	2/11/1985	528.63	525.06	3.57	1
9	0_6832801	Unconfined	2,893	12/2/1986	533.08	528.33	4.75	1
9	0_6832801	Unconfined	3,705	2/21/1989	533.42	525.66	7.76	1
9	0_6832801	Unconfined	4,058	2/9/1990	534.02	524.63	9.39	1
9	0_6832801	Unconfined	4,426	2/12/1991	533.08	526.17	6.91	1
9	0_6832801	Unconfined	4,798	2/19/1992	534.27	528.51	5.76	1
9	0_6832801	Unconfined	5,164	2/19/1993	535.26	530.36	4.90	1
9	0_6832801	Unconfined	5,464	12/16/1993	536.09	529.26	6.83	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6832801	Unconfined	5,892	2/17/1995	534.47	529.86	4.61	1
9	0_6832801	Unconfined	6,263	2/23/1996	534.08	528.35	5.73	1
9	0_6832801	Unconfined	6,940	12/31/1997	532.48	528.59	3.89	1
9	0_6832801	Unconfined	7,396	4/1/1999	534.38	529.35	5.03	1
9	0_6832801	Unconfined	7,723	2/22/2000	549.88	527.40	22.48	1
9	0_6832801	Unconfined	7,926	9/12/2000	550.38	527.73	22.65	1
9	0_6840204	Unconfined	2,469	10/4/1985	526.35	504.41	21.94	1
9	0_6840204	Unconfined	13,038	9/11/2014	525.13	505.00	20.13	1
9	0_6840204	Unconfined	13,163	1/14/2015	522.79	505.27	17.52	1
9	0_6840204	Unconfined	13,311	6/11/2015	522.82	507.26	15.56	1
9	0_6840204	Unconfined	13,409	9/17/2015	524.14	508.58	15.56	1
9	0_6840204	Unconfined	13,527	1/13/2016	524.96	510.08	14.88	1
9	0_6840204	Unconfined	13,688	6/22/2016	524.56	511.14	13.42	1
9	0_6840204	Unconfined	13,778	9/20/2016	524.51	511.74	12.77	1
9	0_6840204	Unconfined	13,911	1/31/2017	524.69	512.35	12.34	1
9	0_6840204	Unconfined	14,050	6/19/2017	524.54	512.09	12.45	1
9	0_6840204	Unconfined	14,141	9/18/2017	524.86	511.92	12.94	1
9	0_6840310	Unconfined	779	2/17/1981	490.40	494.42	-4.02	1
9	0_6840310	Unconfined	1,167	3/12/1982	491.11	495.82	-4.71	1
9	0_6840310	Unconfined	1,517	2/25/1983	491.16	493.69	-2.53	1
9	0_6840310	Unconfined	1,872	2/15/1984	491.65	491.91	-0.26	1
9	0_6840310	Unconfined	2,234	2/11/1985	491.31	489.07	2.24	1
9	0_6840310	Unconfined	2,608	2/20/1986	491.99	492.19	-0.20	1
9	0_6840310	Unconfined	2,893	12/2/1986	491.37	493.66	-2.29	1
9	0_6840310	Unconfined	3,705	2/21/1989	493.62	490.20	3.42	1
9	0_6840310	Unconfined	4,058	2/9/1990	492.28	488.13	4.15	1
9	0_6840310	Unconfined	4,426	2/12/1991	491.97	490.04	1.93	1
9	0_6840310	Unconfined	4,798	2/19/1992	491.84	493.52	-1.68	1
9	0_6840310	Unconfined	5,164	2/19/1993	491.99	496.53	-4.54	1
9	0_6840310	Unconfined	5,464	12/16/1993	492.14	495.28	-3.14	1
9	0_6840310	Unconfined	5,892	2/17/1995	492.39	495.98	-3.59	1
9	0_6840310	Unconfined	6,263	2/23/1996	490.04	493.82	-3.78	1
9	0_6840310	Unconfined	6,617	2/11/1997	492.31	490.79	1.52	1
9	0_6840310	Unconfined	6,940	12/31/1997	493.04	493.40	-0.36	1
9	0_6840310	Unconfined	7,396	4/1/1999	492.44	494.71	-2.27	1
9	0_6840310	Unconfined	7,926	9/12/2000	492.09	492.17	-0.08	1
9	0_6840310	Unconfined	8,073	2/6/2001	492.69	492.19	0.50	1
9	0_6840310	Unconfined	8,438	2/6/2002	492.34	492.32	0.02	1
9	0_6840310	Unconfined	8,815	2/18/2003	492.56	497.32	-4.76	1
9	0_6840310	Unconfined	9,180	2/18/2004	492.04	497.92	-5.88	1
9	0_6840310	Unconfined	9,508	1/11/2005	492.86	501.06	-8.20	1
9	0_6840310	Unconfined	9,916	2/23/2006	492.04	496.13	-4.09	1
9	0_6840310	Unconfined	10,265	2/7/2007	492.66	493.66	-1.00	1
9	0_6840310	Unconfined	10,650	2/27/2008	492.19	499.32	-7.13	1
9	0_6840310	Unconfined	11,006	2/17/2009	492.34	494.99	-2.65	1
9	0_6840310	Unconfined	11,415	4/2/2010	492.59	493.33	-0.74	1
9	0_6840310	Unconfined	11,694	1/6/2011	490.68	492.88	-2.20	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6840310	Unconfined	11,973	10/12/2011	491.63	487.77	3.86	1
9	0_6840310	Unconfined	12,706	10/14/2013	491.57	489.99	1.58	1
9	0_6840310	Unconfined	13,078	10/21/2014	491.79	491.17	0.62	1
9	0_6840310	Unconfined	13,424	10/2/2015	490.84	495.88	-5.04	1
9	0_6840310	Unconfined	13,798	10/10/2016	491.44	500.27	-8.83	1
9	0_6840310	Unconfined	14,180	10/27/2017	491.89	500.93	-9.04	1
9	0_6840607	Unconfined	7,135	7/14/1998	492.69	473.91	18.78	1
9	0_6840607	Unconfined	13,038	9/11/2014	486.85	470.57	16.28	1
9	0_6840607	Unconfined	13,163	1/14/2015	488.70	471.02	17.68	1
9	0_6846801	Confined	3,042	4/30/1987	427.69	439.88	-12.19	1
9	0_6846802	Confined	2,059	8/20/1984	438.78	436.34	2.44	1
9	0_6847301	Unconfined	775	2/13/1981	472.36	451.46	10.45	0.5
9	0_6847301	Unconfined	1,195	4/9/1982	473.66	451.88	10.89	0.5
9	0_6847601	Confined	779	2/17/1981	472.07	425.77	23.15	0.5
9	0_6847601	Confined	1,195	4/9/1982	472.48	426.35	23.07	0.5
9	0_6847601	Confined	1,508	2/16/1983	472.76	425.44	23.66	0.5
9	0_6847601	Confined	1,864	2/7/1984	472.42	425.18	23.62	0.5
9	0_6847601	Confined	2,228	2/5/1985	472.62	424.71	23.96	0.5
9	0_6847601	Confined	2,605	2/17/1986	472.16	426.13	23.01	0.5
9	0_6847601	Confined	2,894	12/3/1986	471.66	426.23	22.72	0.5
9	0_6847601	Confined	3,334	2/16/1988	471.93	426.02	22.96	0.5
9	0_6847601	Confined	3,699	2/15/1989	462.63	424.00	19.31	0.5
9	0_6847601	Confined	4,000	12/13/1989	465.00	423.98	20.51	0.5
9	0_6847601	Confined	4,364	12/12/1990	471.57	424.80	23.39	0.5
9	0_6849605	Confined	7,400	4/5/1999	679.54	638.55	4.10	0.1
9	0_6849707	Confined	11,832	5/24/2011	574.37	672.94	-49.29	0.5
9	0_6849808	Confined	771	2/9/1981	627.00	624.59	1.20	0.5
9	0_6849808	Confined	1,144	2/17/1982	630.31	630.29	0.01	0.5
9	0_6849808	Confined	1,507	2/15/1983	631.14	631.75	-0.30	0.5
9	0_6849808	Confined	1,880	2/23/1984	631.26	630.63	0.32	0.5
9	0_6849808	Confined	2,234	2/11/1985	635.98	619.73	8.13	0.5
9	0_6849808	Confined	2,607	2/19/1986	637.43	630.02	3.71	0.5
9	0_6849808	Confined	3,008	3/27/1987	636.89	637.20	-0.16	0.5
9	0_6849808	Confined	3,687	2/3/1989	626.82	640.41	-6.79	0.5
9	0_6849808	Confined	4,056	2/7/1990	629.98	640.41	-5.22	0.5
9	0_6849808	Confined	4,408	1/25/1991	639.88	642.81	-1.46	0.5
9	0_6849808	Confined	4,785	2/6/1992	643.28	645.99	-1.35	0.5
9	0_6849808	Confined	5,790	11/7/1994	642.58	643.36	-0.39	0.5
9	0_6849808	Confined	6,619	2/13/1997	642.28	629.61	6.33	0.5
9	0_6849808	Confined	6,998	2/27/1998	643.49	631.37	6.06	0.5
9	0_6849808	Confined	7,379	3/15/1999	646.68	631.96	7.36	0.5
9	0_6849808	Confined	7,717	2/16/2000	644.93	629.24	7.84	0.5
9	0_6849808	Confined	8,065	1/29/2001	645.78	627.41	9.18	0.5
9	0_6849808	Confined	8,443	2/11/2002	645.54	626.44	9.55	0.5
9	0_6849808	Confined	8,822	2/25/2003	649.25	628.48	10.38	0.5
9	0_6849808	Confined	9,172	2/10/2004	652.13	628.62	11.75	0.5
9	0_6849808	Confined	9,528	1/31/2005	650.66	631.04	9.81	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6849808	Confined	9,924	3/3/2006	651.21	627.77	11.72	0.5
9	0_6849808	Confined	10,264	2/6/2007	649.51	626.11	11.70	0.5
9	0_6849808	Confined	11,009	2/20/2009	645.65	627.25	9.20	0.5
9	0_6849808	Confined	11,366	2/12/2010	645.86	622.91	11.47	0.5
9	0_6849808	Confined	11,772	3/25/2011	645.17	616.06	14.56	0.5
9	0_6849808	Confined	11,989	10/28/2011	644.12	610.28	16.92	0.5
9	0_6849808	Confined	12,344	10/17/2012	645.58	610.14	17.72	0.5
9	0_6849808	Confined	12,714	10/22/2013	646.48	612.95	16.77	0.5
9	0_6849808	Confined	13,072	10/15/2014	646.04	614.65	15.70	0.5
9	0_6849808	Confined	13,434	10/12/2015	647.68	620.96	13.36	0.5
9	0_6849808	Confined	13,802	10/14/2016	647.91	627.11	10.40	0.5
9	0_6849808	Confined	14,176	10/23/2017	647.96	630.38	8.79	0.5
9	0_6850207	Unconfined	4,642	9/16/1991	700.64	623.07	77.57	1
9	0_6850208	Unconfined	4,644	9/18/1991	701.42	622.92	78.50	1
9	0_6850603	Confined	1,879	2/22/1984	576.04	617.47	-41.43	1
9	0_6850603	Confined	2,231	2/8/1985	573.34	617.32	-43.98	1
9	0_6850603	Confined	2,595	2/7/1986	572.57	617.66	-45.09	1
9	0_6850603	Confined	2,999	3/18/1987	577.06	617.72	-40.66	1
9	0_6850603	Confined	3,335	2/17/1988	576.97	617.85	-40.88	1
9	0_6850603	Confined	3,705	2/21/1989	574.03	617.55	-43.52	1
9	0_6850603	Confined	4,082	3/5/1990	553.77	617.48	-63.71	1
9	0_6850603	Confined	4,412	1/29/1991	569.90	617.52	-47.62	1
9	0_6850603	Confined	4,777	1/29/1992	569.90	617.64	-47.74	1
9	0_6850603	Confined	9,367	8/23/2004	574.43	617.45	-43.02	1
9	0_6852408	Confined	7,170	8/18/1998	440.70	502.64	-6.19	0.1
9	0_6853101	Confined	781	2/19/1981	453.61	452.30	0.13	0.1
9	0_6853101	Confined	1,135	2/8/1982	463.83	452.99	1.08	0.1
9	0_6853814	Confined	10,335	4/18/2007	445.46	390.56	54.90	1
9	0_6854102	Confined	3,334	2/16/1988	418.67	425.27	-6.60	1
9	0_6955801	Confined	4,903	6/3/1992	652.77	687.56	-34.79	1
9	0_6955901	Confined	772	2/10/1981	647.65	662.65	-7.50	0.5
9	0_6955901	Confined	1,144	2/17/1982	647.68	664.78	-8.55	0.5
9	0_6955901	Confined	1,507	2/15/1983	646.12	665.09	-9.49	0.5
9	0_6955901	Confined	1,880	2/23/1984	645.92	664.31	-9.19	0.5
9	0_6955901	Confined	2,235	2/12/1985	646.22	658.31	-6.05	0.5
9	0_6955901	Confined	2,608	2/20/1986	646.82	665.19	-9.18	0.5
9	0_6955901	Confined	3,007	3/26/1987	649.51	667.00	-8.75	0.5
9	0_6955901	Confined	3,363	3/16/1988	650.74	667.89	-8.57	0.5
9	0_6955901	Confined	3,687	2/3/1989	648.31	667.79	-9.74	0.5
9	0_6955901	Confined	4,059	2/10/1990	647.12	668.28	-10.58	0.5
9	0_6955901	Confined	4,406	1/23/1991	648.22	669.23	-10.50	0.5
9	0_6955901	Confined	4,785	2/6/1992	647.72	669.91	-11.10	0.5
9	0_6955901	Confined	5,176	3/3/1993	650.12	670.15	-10.01	0.5
9	0_6955901	Confined	5,619	5/20/1994	648.15	669.18	-10.52	0.5
9	0_6955901	Confined	5,790	11/7/1994	647.02	668.47	-10.73	0.5
9	0_6955901	Confined	6,281	3/12/1996	646.08	666.85	-10.39	0.5
9	0_6955901	Confined	6,619	2/13/1997	645.32	666.03	-10.36	0.5

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	0_6955901	Confined	6,998	2/27/1998	645.77	667.42	-10.83	0.5
9	0_6955901	Confined	7,379	3/15/1999	646.17	667.69	-10.76	0.5
9	0_6955901	Confined	7,717	2/16/2000	645.25	667.13	-10.94	0.5
9	0_6955901	Confined	8,065	1/29/2001	645.32	666.99	-10.84	0.5
9	0_6955901	Confined	8,444	2/12/2002	644.98	667.28	-11.15	0.5
9	0_6955901	Confined	8,822	2/25/2003	649.57	667.89	-9.16	0.5
9	0_6955901	Confined	9,172	2/10/2004	648.66	667.94	-9.64	0.5
9	0_6955901	Confined	9,528	1/31/2005	650.38	668.69	-9.16	0.5
9	0_6955901	Confined	9,927	3/6/2006	645.42	667.84	-11.21	0.5
9	0_6955901	Confined	11,772	3/25/2011	634.51	665.66	-15.57	0.5
9	0_6955901	Confined	11,989	10/28/2011	641.62	664.43	-11.40	0.5
9	0_6955901	Confined	12,343	10/16/2012	637.30	666.18	-14.44	0.5
9	0_6955901	Confined	12,714	10/22/2013	640.55	667.58	-13.52	0.5
9	0_6955901	Confined	13,072	10/15/2014	640.01	668.00	-14.00	0.5
9	0_6955901	Confined	13,434	10/12/2015	639.36	669.55	-15.09	0.5
9	0_6955901	Confined	13,812	10/24/2016	643.54	670.13	-13.29	0.5
9	0_6955901	Confined	14,176	10/23/2017	636.14	669.95	-16.91	0.5
9	0_6956903	Confined	3,713	3/1/1989	618.70	639.71	-21.01	1
9	0_6958301	Confined	11,189	8/19/2009	825.92	701.59	62.16	0.5
9	0_6958301	Confined	12,192	5/18/2012	820.13	687.32	66.40	0.5
9	0_6958402	Unconfined	9,999	5/17/2006	658.18	701.58	-43.40	1
9	0_7648703	Confined	10,378	5/31/2007	610.02	610.30	-0.14	0.5
9	0_7734412	Confined	11,686	12/29/2010	445.53	460.26	-1.47	0.1
9	14313_5861112	Unconfined	2,390	7/17/1985	389.65	403.82	-1.42	0.1
9	14370_0	Confined	9,139	1/8/2004	427.56	402.97	24.59	1
9	14382_0	Unconfined	11,742	2/23/2011	354.65	391.44	-36.79	1
9	15097_6705606	Confined	836	4/15/1981	353.82	398.43	-44.61	1
9	15365_6846702	Confined	781	2/19/1981	428.44	431.01	-2.57	1
9	15365_6846702	Confined	1,136	2/9/1982	428.24	431.14	-2.90	1
9	15365_6846702	Confined	1,503	2/11/1983	428.36	430.71	-2.35	1
9	15365_6846702	Confined	2,896	12/5/1986	428.05	430.77	-2.72	1
9	15365_6846702	Confined	3,363	3/16/1988	442.66	430.59	12.07	1
9	15365_6846702	Confined	3,685	2/1/1989	440.13	430.13	10.00	1
9	15365_6846702	Confined	4,042	1/24/1990	425.77	430.20	-4.43	1
9	15365_6846702	Confined	4,405	1/22/1991	422.27	430.50	-8.23	1
9	15365_6846702	Confined	4,777	1/29/1992	439.77	430.68	9.09	1
9	15365_6846702	Confined	5,176	3/3/1993	425.70	430.85	-5.15	1
9	15365_6846702	Confined	5,618	5/19/1994	415.14	430.48	-15.34	1
9	15365_6846702	Confined	5,948	4/14/1995	405.17	430.56	-25.39	1
9	15365_6846702	Confined	6,288	3/19/1996	394.85	430.11	-35.26	1
9	15365_6846702	Confined	7,928	9/14/2000	441.12	430.02	11.10	1
9	15365_6846702	Confined	10,950	12/23/2008	444.18	430.47	13.71	1
9	15365_6846702	Confined	11,343	1/20/2010	442.42	429.74	12.68	1
9	15365_6846702	Confined	11,772	3/25/2011	443.58	428.58	15.00	1
9	15365_6846702	Confined	11,981	10/20/2011	443.23	428.07	15.16	1
9	15365_6846702	Confined	12,378	11/20/2012	442.42	430.70	11.72	1
9	15365_6846702	Confined	13,085	10/28/2014	443.27	431.39	11.88	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	15365_6846702	Confined	13,799	10/11/2016	445.93	432.37	13.56	1
9	15365_6846702	Confined	14,180	10/27/2017	431.71	432.14	-0.43	1
9	15918_6861508	Confined	10,571	12/10/2007	430.29	368.94	61.35	1
9	15918_6861508	Confined	10,987	1/29/2009	432.29	363.45	68.84	1
9	15918_6861508	Confined	12,059	1/6/2012	432.09	334.47	97.62	1
9	15918_6861508	Confined	12,149	4/5/2012	432.29	339.22	93.07	1
9	15918_6861508	Confined	12,176	5/2/2012	431.99	340.64	91.35	1
9	15918_6861508	Confined	12,206	6/1/2012	432.29	342.22	90.07	1
9	15918_6861508	Confined	12,241	7/6/2012	432.19	344.07	88.12	1
9	15918_6861508	Confined	12,269	8/3/2012	432.29	345.55	86.74	1
9	15918_6861508	Confined	12,308	9/11/2012	432.09	347.60	84.49	1
9	15918_6861508	Confined	12,347	10/20/2012	432.29	349.66	82.63	1
9	15918_6861508	Confined	12,386	11/28/2012	432.19	351.72	80.47	1
9	15918_6861508	Confined	12,394	12/6/2012	431.79	352.14	79.65	1
9	15918_6861508	Confined	12,425	1/6/2013	431.79	353.54	78.25	1
9	15918_6861508	Confined	12,456	2/6/2013	431.89	353.95	77.94	1
9	15918_6861508	Confined	12,479	3/1/2013	431.79	354.26	77.53	1
9	15918_6861508	Confined	12,514	4/5/2013	431.29	354.72	76.57	1
9	15918_6861508	Confined	12,541	5/2/2013	431.79	355.08	76.71	1
9	15918_6861508	Confined	12,571	6/1/2013	431.29	355.48	75.81	1
9	15918_6861508	Confined	12,606	7/6/2013	431.79	355.95	75.84	1
9	15918_6861508	Confined	12,634	8/3/2013	431.29	356.32	74.97	1
9	15918_6861508	Confined	12,673	9/11/2013	431.29	356.84	74.45	1
9	15918_6861508	Confined	12,693	10/1/2013	431.79	357.11	74.68	1
9	15918_6861508	Confined	12,744	11/21/2013	432.29	357.79	74.50	1
9	15918_6861508	Confined	12,754	12/1/2013	431.99	357.92	74.07	1
9	15918_6861508	Confined	12,785	1/1/2014	432.09	358.33	73.76	1
9	15918_6861508	Confined	12,816	2/1/2014	431.19	358.62	72.57	1
9	15918_6861508	Confined	12,844	3/1/2014	431.09	358.88	72.21	1
9	15918_6861508	Confined	12,875	4/1/2014	430.99	359.17	71.82	1
9	15918_6861508	Confined	12,905	5/1/2014	430.99	359.45	71.54	1
9	15918_6861508	Confined	12,936	6/1/2014	430.89	359.74	71.15	1
9	15918_6861508	Confined	12,966	7/1/2014	431.69	360.02	71.67	1
9	15918_6861508	Confined	12,997	8/1/2014	431.49	360.31	71.18	1
9	15918_6861508	Confined	13,028	9/1/2014	431.29	360.60	70.69	1
9	15918_6861508	Confined	13,089	11/1/2014	431.39	361.17	70.22	1
9	15918_6861508	Confined	13,119	12/1/2014	431.49	361.44	70.05	1
9	15918_6861508	Confined	13,150	1/1/2015	431.69	361.74	69.95	1
9	15918_6861508	Confined	13,181	2/1/2015	431.89	362.32	69.57	1
9	15918_6861508	Confined	13,209	3/1/2015	431.49	362.84	68.65	1
9	15918_6861508	Confined	13,240	4/1/2015	431.79	363.41	68.38	1
9	15918_6861508	Confined	13,270	5/1/2015	431.69	363.96	67.73	1
9	15918_6861508	Confined	13,301	6/1/2015	432.39	364.54	67.85	1
9	15918_6861508	Confined	13,331	7/1/2015	432.19	365.09	67.10	1
9	15918_6861508	Confined	13,362	8/1/2015	432.49	365.67	66.82	1
9	15918_6861508	Confined	13,393	9/1/2015	432.69	366.24	66.45	1
9	15918_6861508	Confined	13,423	10/1/2015	432.69	366.80	65.89	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	15918_6861508	Confined	13,454	11/1/2015	432.79	367.37	65.42	1
9	15918_6861508	Confined	13,484	12/1/2015	432.99	367.93	65.06	1
9	15918_6861508	Confined	13,515	1/1/2016	433.09	368.49	64.60	1
9	15918_6861508	Confined	13,546	2/1/2016	433.19	368.79	64.40	1
9	15918_6861508	Confined	13,575	3/1/2016	433.29	369.07	64.22	1
9	15918_6861508	Confined	13,606	4/1/2016	432.39	369.37	63.02	1
9	15918_6861508	Confined	13,636	5/1/2016	432.69	369.66	63.03	1
9	15918_6861508	Confined	13,667	6/1/2016	432.39	369.96	62.43	1
9	15918_6861508	Confined	13,697	7/1/2016	432.59	370.24	62.35	1
9	15918_6861508	Confined	13,728	8/1/2016	432.79	370.54	62.25	1
9	15918_6861508	Confined	13,759	9/1/2016	433.39	370.84	62.55	1
9	15918_6861508	Confined	13,789	10/1/2016	433.69	371.13	62.56	1
9	15918_6861508	Confined	13,820	11/1/2016	432.69	371.43	61.26	1
9	15918_6861508	Confined	13,850	12/1/2016	432.59	371.72	60.87	1
9	15918_6861508	Confined	13,881	1/1/2017	432.49	372.00	60.49	1
9	15918_6861508	Confined	13,912	2/1/2017	431.99	371.90	60.09	1
9	15918_6861508	Confined	13,940	3/1/2017	430.19	371.81	58.38	1
9	15918_6861508	Confined	13,971	4/1/2017	429.19	371.71	57.48	1
9	15918_6861508	Confined	14,001	5/1/2017	427.66	371.61	56.05	1
9	15918_6861508	Confined	14,032	6/1/2017	427.49	371.51	55.98	1
9	15918_6861508	Confined	14,124	9/1/2017	420.39	371.20	49.19	1
9	15918_6861508	Confined	14,154	10/1/2017	418.99	371.10	47.89	1
9	15918_6861508	Confined	14,185	11/1/2017	416.99	371.00	45.99	1
9	16283_0	Confined	9,146	1/15/2004	471.84	441.26	3.06	0.1
9	16291_0	Confined	8,915	5/29/2003	452.01	417.25	34.76	1
9	16294_0	Unconfined	9,316	7/3/2004	368.32	400.50	-32.18	1
9	16295_0	Unconfined	9,645	5/28/2005	485.83	489.66	-3.83	1
9	16296_0	Unconfined	9,153	1/22/2004	411.67	422.56	-10.89	1
9	16298_0	Confined	9,647	5/30/2005	350.45	370.27	-19.82	1
9	16300_0	Unconfined	10,448	8/9/2007	471.28	489.68	-18.40	1
9	16303_0	Unconfined	10,651	2/28/2008	379.88	412.47	-32.59	1
9	16304_0	Confined	10,285	2/27/2007	375.78	394.97	-19.19	1
9	16306_0	Unconfined	10,867	10/1/2008	399.86	410.85	-10.99	1
9	16307_0	Confined	9,706	7/28/2005	375.05	407.42	-32.37	1
9	16309_0	Confined	9,433	10/28/2004	386.42	373.70	1.27	0.1
9	16312_0	Unconfined	9,384	9/9/2004	369.96	375.72	-5.76	1
9	16315_0	Unconfined	11,139	6/30/2009	398.61	442.17	-4.36	0.1
9	16322_0	Unconfined	10,749	6/5/2008	486.93	450.79	36.14	1
9	16323_0	Unconfined	10,746	6/2/2008	381.00	396.97	-15.97	1
9	16324_0	Unconfined	10,378	5/31/2007	528.23	468.45	59.78	1
9	16326_0	Unconfined	9,110	12/10/2003	399.80	415.40	-15.60	1
9	16327_0	Confined	9,612	4/25/2005	373.55	377.34	-3.79	1
9	16328_0	Unconfined	11,497	6/23/2010	410.95	395.53	15.42	1
9	16330_0	Unconfined	11,446	5/3/2010	487.27	491.26	-3.99	1
9	16331_0	Confined	11,547	8/12/2010	437.87	455.16	-1.73	0.1
9	16332_0	Confined	11,539	8/4/2010	455.35	463.32	-7.97	1
9	16333_0	Confined	10,447	8/8/2007	386.66	419.52	-32.86	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	16334_0	Unconfined	10,453	8/14/2007	389.59	415.68	-2.61	0.1
9	16335_0	Unconfined	11,644	11/17/2010	466.10	455.77	10.33	1
9	16337_0	Confined	11,735	2/16/2011	441.80	456.38	-14.58	1
9	16338_0	Unconfined	11,783	4/5/2011	464.38	479.64	-15.26	1
9	16339_0	Unconfined	11,825	5/17/2011	450.27	453.32	-0.31	0.1
9	16413_6840101	Unconfined	10,028	6/15/2006	556.77	506.52	50.25	1
9	16414_6840102	Unconfined	779	2/17/1981	529.40	509.73	9.84	0.5
9	16414_6840102	Unconfined	1,167	3/12/1982	530.77	510.06	10.35	0.5
9	16414_6840102	Unconfined	1,517	2/25/1983	528.83	509.38	9.73	0.5
9	16414_6840102	Unconfined	1,872	2/15/1984	527.93	509.02	9.46	0.5
9	16414_6840102	Unconfined	2,234	2/11/1985	527.27	508.28	9.49	0.5
9	16414_6840102	Unconfined	2,893	12/2/1986	527.47	509.81	8.83	0.5
9	16418_6840401	Unconfined	779	2/17/1981	501.05	494.43	3.31	0.5
9	16418_6840401	Unconfined	1,167	3/12/1982	506.45	494.80	5.82	0.5
9	16418_6840401	Unconfined	1,517	2/25/1983	506.89	494.01	6.44	0.5
9	16418_6840401	Unconfined	2,234	2/11/1985	506.08	492.65	6.72	0.5
9	16418_6840401	Unconfined	2,608	2/20/1986	507.65	494.06	6.79	0.5
9	16418_6840401	Unconfined	2,893	12/2/1986	507.59	494.41	6.59	0.5
9	16418_6840401	Unconfined	3,705	2/21/1989	508.47	493.02	7.73	0.5
9	16418_6840401	Unconfined	4,058	2/9/1990	508.83	492.53	8.15	0.5
9	16418_6840401	Unconfined	4,426	2/12/1991	507.40	493.38	7.01	0.5
9	16418_6840401	Unconfined	4,798	2/19/1992	508.17	494.48	6.84	0.5
9	16418_6840401	Unconfined	5,164	2/19/1993	508.53	495.22	6.66	0.5
9	16418_6840401	Unconfined	5,464	12/16/1993	509.02	494.67	7.17	0.5
9	16418_6840401	Unconfined	6,263	2/23/1996	510.07	494.16	7.96	0.5
9	16418_6840401	Unconfined	6,617	2/11/1997	509.69	493.30	8.20	0.5
9	16418_6840401	Unconfined	6,940	12/31/1997	509.12	494.40	7.36	0.5
9	16418_6840401	Unconfined	7,396	4/1/1999	510.12	494.64	7.74	0.5
9	16418_6840401	Unconfined	7,723	2/22/2000	509.57	493.65	7.96	0.5
9	16418_6840401	Unconfined	7,926	9/12/2000	509.07	493.75	7.66	0.5
9	16418_6840401	Unconfined	8,438	2/6/2002	509.78	493.91	7.94	0.5
9	16418_6840401	Unconfined	8,815	2/18/2003	510.53	495.46	7.53	0.5
9	16418_6840401	Unconfined	9,180	2/18/2004	510.97	495.36	7.80	0.5
9	16418_6840401	Unconfined	9,508	1/11/2005	511.87	496.35	7.76	0.5
9	16418_6840401	Unconfined	9,916	2/23/2006	512.27	494.52	8.87	0.5
9	16418_6840401	Unconfined	10,265	2/7/2007	511.72	494.03	8.85	0.5
9	16418_6840401	Unconfined	10,650	2/27/2008	512.52	496.12	8.20	0.5
9	16418_6840401	Unconfined	11,006	2/17/2009	512.51	494.30	9.11	0.5
9	16418_6840401	Unconfined	11,415	4/2/2010	512.54	493.85	9.35	0.5
9	16418_6840401	Unconfined	11,694	1/6/2011	508.70	493.67	7.52	0.5
9	16418_6840401	Unconfined	12,345	10/18/2012	511.23	492.67	9.28	0.5
9	16418_6840401	Unconfined	12,701	10/9/2013	511.67	493.59	9.04	0.5
9	16418_6840401	Unconfined	13,078	10/21/2014	511.40	493.82	8.79	0.5
9	16418_6840401	Unconfined	13,424	10/2/2015	510.84	495.21	7.82	0.5
9	16418_6840401	Unconfined	13,798	10/10/2016	512.06	496.27	7.89	0.5
9	16418_6840401	Unconfined	14,180	10/27/2017	514.24	496.07	9.09	0.5
9	38966_6718806	Unconfined	8,471	3/11/2002	499.04	474.74	24.30	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39070_0	Confined	9,731	8/22/2005	355.79	413.07	-57.28	1
9	39082_0	Confined	3,121	7/18/1987	365.58	354.28	11.30	1
9	39083_6712532	Confined	8,737	12/2/2002	221.74	383.13	-16.14	0.1
9	39123_6704512	Confined	2,305	4/23/1985	414.03	423.16	-9.13	1
9	39123_6704512	Confined	6,268	2/28/1996	409.65	423.92	-14.27	1
9	39128_6704803	Confined	6,210	1/1/1996	397.96	413.96	-1.60	0.1
9	39129_6704804	Confined	7,913	8/30/2000	304.46	412.93	-10.85	0.1
9	39140_6711623	Confined	1,657	7/15/1983	430.04	409.52	20.52	1
9	39141_6711905	Unconfined	782	2/20/1981	369.77	370.96	-1.19	1
9	39141_6711905	Unconfined	1,144	2/17/1982	371.09	371.49	-0.40	1
9	39141_6711905	Unconfined	1,550	3/30/1983	369.47	370.68	-1.21	1
9	39141_6711905	Unconfined	1,871	2/14/1984	368.18	370.44	-2.26	1
9	39141_6711905	Unconfined	2,236	2/13/1985	367.76	370.11	-2.35	1
9	39141_6711905	Unconfined	2,619	3/3/1986	369.79	371.11	-1.32	1
9	39141_6711905	Unconfined	3,706	2/22/1989	367.82	369.63	-1.81	1
9	39141_6711905	Unconfined	4,429	2/15/1991	368.27	370.43	-2.16	1
9	39141_6711905	Unconfined	5,094	12/11/1992	369.67	371.49	-1.82	1
9	39141_6711905	Unconfined	6,273	3/4/1996	369.00	370.12	-1.12	1
9	39141_6711905	Unconfined	6,555	12/11/1996	367.72	369.39	-1.67	1
9	39148_6712111	Confined	782	2/20/1981	426.57	407.40	19.17	1
9	39148_6712111	Confined	1,145	2/18/1982	425.87	408.48	17.39	1
9	39148_6712111	Confined	1,550	3/30/1983	428.71	407.22	21.49	1
9	39148_6712111	Confined	1,871	2/14/1984	424.57	406.58	17.99	1
9	39148_6712111	Confined	2,236	2/13/1985	423.77	405.79	17.98	1
9	39148_6712111	Confined	2,620	3/4/1986	423.84	407.30	16.54	1
9	39148_6712111	Confined	3,704	2/20/1989	422.42	405.50	16.92	1
9	39148_6712111	Confined	4,051	2/2/1990	421.88	404.90	16.98	1
9	39148_6712111	Confined	4,428	2/14/1991	420.68	405.83	14.85	1
9	39148_6712111	Confined	4,793	2/14/1992	421.93	407.66	14.27	1
9	39148_6712111	Confined	5,094	12/11/1992	424.51	408.83	15.68	1
9	39148_6712111	Confined	5,483	1/4/1994	425.03	407.71	17.32	1
9	39148_6712111	Confined	5,829	12/16/1994	424.31	407.97	16.34	1
9	39148_6712111	Confined	6,556	12/12/1996	422.43	405.08	17.35	1
9	39148_6712111	Confined	6,942	1/2/1998	422.48	406.77	15.71	1
9	39148_6712111	Confined	7,925	9/11/2000	422.33	406.12	16.21	1
9	39148_6712111	Confined	8,068	2/1/2001	421.28	406.17	15.11	1
9	39148_6712111	Confined	8,439	2/7/2002	422.08	406.42	15.66	1
9	39148_6712111	Confined	8,816	2/19/2003	423.65	408.89	14.76	1
9	39148_6712111	Confined	9,180	2/18/2004	424.33	409.02	15.31	1
9	39148_6712111	Confined	9,509	1/12/2005	425.01	410.51	14.50	1
9	39148_6712111	Confined	9,900	2/7/2006	423.13	407.90	15.23	1
9	39148_6712111	Confined	10,265	2/7/2007	422.68	406.78	15.90	1
9	39148_6712111	Confined	10,649	2/26/2008	421.78	409.78	12.00	1
9	39148_6712111	Confined	11,007	2/18/2009	421.48	407.26	14.22	1
9	39148_6712111	Confined	11,327	1/4/2010	420.58	406.45	14.13	1
9	39148_6712111	Confined	11,694	1/6/2011	419.56	406.18	13.38	1
9	39148_6712111	Confined	11,972	10/11/2011	420.43	403.91	16.52	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39148_6712111	Confined	12,702	10/10/2013	418.43	405.23	13.20	1
9	39148_6712111	Confined	13,085	10/28/2014	417.93	404.76	13.17	1
9	39148_6712111	Confined	13,424	10/2/2015	420.16	406.70	13.46	1
9	39148_6712111	Confined	13,809	10/21/2016	421.76	408.52	13.24	1
9	39148_6712111	Confined	14,199	11/15/2017	422.80	408.21	14.59	1
9	39154_6712119	Confined	4,196	6/27/1990	252.87	394.34	-14.15	0.1
9	39160_6712520	Confined	731	12/31/1980	233.73	373.14	-13.94	0.1
9	39160_6712520	Confined	2,112	10/12/1984	277.73	371.02	-9.33	0.1
9	39160_6712520	Confined	2,216	1/24/1985	283.73	370.76	-8.70	0.1
9	39160_6712520	Confined	2,390	7/17/1985	277.73	371.99	-9.43	0.1
9	39160_6712520	Confined	2,542	12/16/1985	340.73	373.06	-3.23	0.1
9	39160_6712520	Confined	2,677	4/30/1986	291.73	372.96	-8.12	0.1
9	39160_6712520	Confined	2,915	12/24/1986	319.73	372.55	-5.28	0.1
9	39160_6712520	Confined	3,070	5/28/1987	319.73	373.27	-5.35	0.1
9	39160_6712520	Confined	3,116	7/13/1987	317.73	373.49	-5.58	0.1
9	39160_6712520	Confined	3,124	7/21/1987	323.73	373.53	-4.98	0.1
9	39162_6712522	Confined	731	12/31/1980	319.21	380.17	-6.10	0.1
9	39162_6712522	Confined	1,370	10/1/1982	312.21	381.55	-6.93	0.1
9	39162_6712522	Confined	1,493	2/1/1983	311.21	380.09	-6.89	0.1
9	39162_6712522	Confined	1,587	5/6/1983	309.21	379.89	-7.07	0.1
9	39162_6712522	Confined	1,802	12/7/1983	307.21	379.42	-7.22	0.1
9	39162_6712522	Confined	2,112	10/12/1984	306.21	377.51	-7.13	0.1
9	39162_6712522	Confined	2,223	1/31/1985	312.21	377.26	-6.51	0.1
9	39162_6712522	Confined	2,353	6/10/1985	321.21	378.40	-5.72	0.1
9	39162_6712522	Confined	2,509	11/13/1985	322.21	379.77	-5.76	0.1
9	39162_6712522	Confined	2,752	7/14/1986	322.21	379.96	-5.77	0.1
9	39162_6712522	Confined	2,921	12/30/1986	324.21	379.76	-5.55	0.1
9	39162_6712522	Confined	2,948	1/26/1987	325.21	379.90	-5.47	0.1
9	39162_6712522	Confined	3,114	7/11/1987	310.21	380.81	-7.06	0.1
9	39162_6712522	Confined	3,124	7/21/1987	320.21	380.86	-6.07	0.1
9	39163_6712524	Confined	4,196	6/27/1990	334.58	370.15	-3.56	0.1
9	39164_6712527	Confined	5,962	4/28/1995	322.12	382.25	-6.01	0.1
9	39165_6712529	Confined	6,942	1/2/1998	313.49	379.48	-65.99	1
9	39166_6712531	Confined	6,338	5/8/1996	320.71	376.14	-5.54	0.1
9	39167_6712705	Confined	852	5/1/1981	375.49	358.62	16.87	1
9	39168_6713101	Confined	11,188	8/18/2009	425.30	410.34	14.96	1
9	39168_6713101	Confined	11,224	9/23/2009	421.41	410.23	11.18	1
9	39168_6713101	Confined	11,341	1/18/2010	427.26	409.97	17.29	1
9	39168_6713101	Confined	11,496	6/22/2010	427.55	410.43	17.12	1
9	39168_6713101	Confined	11,593	9/27/2010	429.85	410.71	19.14	1
9	39168_6713101	Confined	11,855	6/16/2011	424.79	408.08	16.71	1
9	39168_6713101	Confined	12,077	1/24/2012	429.27	404.70	24.57	1
9	39168_6713101	Confined	12,188	5/14/2012	429.14	404.99	24.15	1
9	39168_6713101	Confined	12,216	6/11/2012	427.70	405.06	22.64	1
9	39168_6713101	Confined	12,325	9/28/2012	427.58	405.34	22.24	1
9	39168_6713101	Confined	12,675	9/13/2013	427.76	406.71	21.05	1
9	39168_6713101	Confined	12,801	1/17/2014	428.93	407.13	21.80	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39168_6713101	Confined	13,043	9/16/2014	428.67	406.22	22.45	1
9	39168_6713101	Confined	13,170	1/21/2015	429.70	406.14	23.56	1
9	39168_6713101	Confined	13,324	6/24/2015	430.93	408.47	22.46	1
9	39168_6713101	Confined	13,540	1/26/2016	431.47	411.51	19.96	1
9	39168_6713101	Confined	13,688	6/22/2016	431.92	412.53	19.39	1
9	39168_6713101	Confined	13,781	9/23/2016	433.47	413.17	20.30	1
9	39168_6713101	Confined	13,906	1/26/2017	432.34	413.73	18.61	1
9	39179_6719306	Unconfined	782	2/20/1981	354.64	370.62	-15.98	1
9	39179_6719306	Unconfined	1,144	2/17/1982	353.88	371.77	-17.89	1
9	39179_6719306	Unconfined	1,550	3/30/1983	354.40	370.12	-15.72	1
9	39179_6719306	Unconfined	1,871	2/14/1984	354.11	369.14	-15.03	1
9	39179_6719306	Unconfined	2,235	2/12/1985	353.66	367.84	-14.18	1
9	39179_6719306	Unconfined	2,615	2/27/1986	349.09	369.56	-20.47	1
9	39179_6719306	Unconfined	2,903	12/12/1986	353.06	370.03	-16.97	1
9	39179_6719306	Unconfined	3,706	2/22/1989	347.85	366.75	-18.90	1
9	39179_6719306	Unconfined	4,072	2/23/1990	352.35	366.11	-13.76	1
9	39179_6719306	Unconfined	4,429	2/15/1991	352.69	367.51	-14.82	1
9	39179_6719306	Unconfined	4,796	2/17/1992	353.94	370.22	-16.28	1
9	39179_6719306	Unconfined	5,094	12/11/1992	353.67	372.18	-18.51	1
9	39179_6719306	Unconfined	5,483	1/4/1994	353.74	370.95	-17.21	1
9	39179_6719306	Unconfined	5,828	12/15/1994	354.85	371.48	-16.63	1
9	39179_6719306	Unconfined	6,273	3/4/1996	354.84	369.89	-15.05	1
9	39179_6719306	Unconfined	6,555	12/11/1996	354.14	367.93	-13.79	1
9	39179_6719306	Unconfined	6,940	12/31/1997	355.24	370.13	-14.89	1
9	39179_6719306	Unconfined	7,242	10/29/1998	354.85	371.41	-16.56	1
9	39179_6719306	Unconfined	7,723	2/22/2000	351.00	369.22	-18.22	1
9	39179_6719306	Unconfined	7,925	9/11/2000	353.24	369.23	-15.99	1
9	39179_6719306	Unconfined	8,073	2/6/2001	354.44	369.22	-14.78	1
9	39179_6719306	Unconfined	8,439	2/7/2002	354.16	369.50	-15.34	1
9	39179_6719306	Unconfined	8,816	2/19/2003	355.16	372.67	-17.51	1
9	39179_6719306	Unconfined	9,180	2/18/2004	354.84	372.98	-18.14	1
9	39179_6719306	Unconfined	9,509	1/12/2005	357.31	375.16	-17.85	1
9	39179_6719306	Unconfined	9,900	2/7/2006	354.24	372.02	-17.78	1
9	39179_6719306	Unconfined	10,265	2/7/2007	359.71	370.71	-11.00	1
9	39179_6719306	Unconfined	10,649	2/26/2008	354.44	374.78	-20.34	1
9	39179_6719306	Unconfined	11,007	2/18/2009	354.16	371.46	-17.30	1
9	39179_6719306	Unconfined	11,327	1/4/2010	353.66	370.12	-16.46	1
9	39179_6719306	Unconfined	11,694	1/6/2011	351.82	369.08	-17.26	1
9	39179_6719306	Unconfined	11,972	10/11/2011	351.04	365.59	-14.55	1
9	39179_6719306	Unconfined	12,346	10/19/2012	353.30	366.09	-12.79	1
9	39179_6719306	Unconfined	12,701	10/9/2013	352.94	367.93	-14.99	1
9	39179_6719306	Unconfined	13,078	10/21/2014	352.97	367.33	-14.36	1
9	39179_6719306	Unconfined	13,441	10/19/2015	352.12	370.20	-18.08	1
9	39179_6719306	Unconfined	13,809	10/21/2016	355.13	372.77	-17.64	1
9	39179_6719306	Unconfined	14,199	11/15/2017	351.19	372.70	-21.51	1
9	39190_6720103	Confined	782	2/20/1981	356.54	344.16	12.38	1
9	39190_6720103	Confined	1,144	2/17/1982	357.04	344.58	12.46	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39190_6720103	Confined	1,550	3/30/1983	356.74	344.07	12.67	1
9	39190_6720103	Confined	1,871	2/14/1984	356.64	343.77	12.87	1
9	39190_6720103	Confined	2,235	2/12/1985	355.10	343.36	11.74	1
9	39190_6720103	Confined	2,615	2/27/1986	354.89	343.96	10.93	1
9	39190_6720103	Confined	2,903	12/12/1986	355.26	344.15	11.11	1
9	39190_6720103	Confined	3,706	2/22/1989	354.24	343.13	11.11	1
9	39190_6720103	Confined	4,072	2/23/1990	353.85	342.86	10.99	1
9	39190_6720103	Confined	4,429	2/15/1991	355.55	343.29	12.26	1
9	39190_6720103	Confined	4,796	2/17/1992	357.49	344.10	13.39	1
9	39190_6720103	Confined	5,101	12/18/1992	356.31	344.77	11.54	1
9	39190_6720103	Confined	5,484	1/5/1994	355.59	344.35	11.24	1
9	39190_6720103	Confined	5,829	12/16/1994	356.31	344.52	11.79	1
9	39190_6720103	Confined	6,270	3/1/1996	355.24	343.96	11.28	1
9	39190_6720103	Confined	6,556	12/12/1996	354.88	343.27	11.61	1
9	39232_5853706	Unconfined	837	4/16/1981	355.82	390.77	-34.95	1
9	39273_5861207	Unconfined	8,314	10/5/2001	366.93	379.26	-12.33	1
9	39273_5861207	Unconfined	8,353	11/13/2001	378.55	379.26	-0.71	1
9	39273_5861207	Unconfined	8,356	11/16/2001	375.97	379.26	-3.29	1
9	39294_5862410	Confined	9,775	10/5/2005	302.14	417.99	-11.59	0.1
9	39320_6705803	Confined	731	12/31/1980	450.74	403.82	46.92	1
9	39320_6705803	Confined	834	4/13/1981	450.55	404.43	46.12	1
9	39320_6705803	Confined	1,419	11/19/1982	451.03	404.15	46.88	1
9	39320_6705803	Confined	2,136	11/5/1984	452.34	401.71	50.63	1
9	39320_6705803	Confined	2,481	10/16/1985	451.57	403.62	47.95	1
9	39320_6705803	Confined	2,963	2/10/1987	452.85	405.05	47.80	1
9	39320_6705803	Confined	3,239	11/13/1987	452.80	405.43	47.37	1
9	39320_6705803	Confined	3,720	3/8/1989	452.32	400.87	51.45	1
9	39320_6705803	Confined	3,972	11/15/1989	451.52	400.25	51.27	1
9	39320_6705803	Confined	4,331	11/9/1990	451.63	401.90	49.73	1
9	39320_6705803	Confined	4,699	11/12/1991	452.23	404.44	47.79	1
9	39320_6705803	Confined	5,093	12/10/1992	453.26	407.08	46.18	1
9	39320_6705803	Confined	5,504	1/25/1994	453.01	404.72	48.29	1
9	39320_6705803	Confined	6,550	12/6/1996	451.81	400.86	50.95	1
9	39320_6705803	Confined	6,991	2/20/1998	452.59	404.07	48.52	1
9	39320_6705803	Confined	7,725	2/24/2000	449.31	402.34	46.97	1
9	39320_6705803	Confined	7,927	9/13/2000	447.91	402.88	45.03	1
9	39320_6705803	Confined	8,068	2/1/2001	450.26	403.16	47.10	1
9	39320_6705803	Confined	8,440	2/8/2002	449.63	403.48	46.15	1
9	39320_6705803	Confined	8,837	3/12/2003	451.11	407.64	43.47	1
9	39320_6705803	Confined	9,181	2/19/2004	466.61	407.33	59.28	1
9	39320_6705803	Confined	9,903	2/10/2006	448.71	404.67	44.04	1
9	39320_6705803	Confined	10,264	2/6/2007	445.96	402.83	43.13	1
9	39320_6705803	Confined	10,650	2/27/2008	449.22	407.68	41.54	1
9	39320_6705803	Confined	11,302	12/10/2009	453.61	403.18	50.43	1
9	39362_6719901	Confined	780	2/18/1981	327.71	343.74	-16.03	1
9	39362_6719901	Confined	1,167	3/12/1982	330.11	344.36	-14.25	1
9	39362_6719901	Confined	1,509	2/17/1983	326.76	343.44	-16.68	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
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Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39362_6719901	Confined	1,866	2/9/1984	326.59	342.77	-16.18	1
9	39362_6719901	Confined	2,230	2/7/1985	325.97	341.79	-15.82	1
9	39362_6719901	Confined	2,615	2/27/1986	327.07	343.18	-16.11	1
9	39362_6719901	Confined	2,892	12/1/1986	327.85	343.60	-15.75	1
9	39362_6719901	Confined	3,333	2/15/1988	330.13	343.78	-13.65	1
9	39362_6719901	Confined	3,705	2/21/1989	326.92	341.64	-14.72	1
9	39362_6719901	Confined	4,807	2/28/1992	335.22	343.52	-8.30	1
9	39362_6719901	Confined	5,164	2/19/1993	329.28	344.69	-15.41	1
9	39362_6719901	Confined	5,534	2/24/1994	332.00	344.12	-12.12	1
9	39362_6719901	Confined	5,891	2/16/1995	328.00	344.40	-16.40	1
9	39362_6719901	Confined	6,260	2/20/1996	328.30	343.48	-15.18	1
9	39362_6719901	Confined	7,926	9/12/2000	326.65	342.92	-16.27	1
9	39362_6719901	Confined	11,229	9/28/2009	324.91	343.73	-18.82	1
9	39362_6719901	Confined	11,342	1/19/2010	327.71	343.52	-15.81	1
9	39362_6719901	Confined	11,488	6/14/2010	329.26	343.43	-14.17	1
9	39362_6719901	Confined	11,593	9/27/2010	328.21	343.37	-15.16	1
9	39362_6719901	Confined	11,700	1/12/2011	326.77	343.22	-16.45	1
9	39589_6846902	Confined	5,484	1/5/1994	429.32	419.06	10.26	1
9	39589_6846902	Confined	5,856	1/12/1995	434.32	419.32	15.00	1
9	39589_6846902	Confined	6,220	1/11/1996	434.22	418.85	15.37	1
9	39589_6846902	Confined	6,681	4/16/1997	432.37	418.47	13.90	1
9	39589_6846902	Confined	6,976	2/5/1998	430.72	419.21	11.51	1
9	39589_6846902	Confined	7,334	1/29/1999	431.52	419.28	12.24	1
9	39589_6846902	Confined	7,719	2/18/2000	426.82	418.42	8.40	1
9	39589_6846902	Confined	8,089	2/22/2001	428.12	418.57	9.55	1
9	39589_6846902	Confined	8,430	1/29/2002	428.52	418.67	9.85	1
9	39589_6846902	Confined	8,794	1/28/2003	432.82	419.53	13.29	1
9	39589_6846902	Confined	9,181	2/19/2004	433.52	419.20	14.32	1
9	39589_6846902	Confined	9,565	3/9/2005	433.32	419.62	13.70	1
9	39589_6846902	Confined	9,907	2/14/2006	430.02	418.59	11.43	1
9	39589_6846902	Confined	10,294	3/8/2007	429.22	418.78	10.44	1
9	39589_6846902	Confined	10,658	3/6/2008	430.72	420.08	10.64	1
9	39589_6846902	Confined	11,020	3/3/2009	429.82	418.61	11.21	1
9	39589_6846902	Confined	11,453	5/10/2010	428.82	418.27	10.55	1
9	39589_6846902	Confined	12,090	2/6/2012	428.02	416.83	11.19	1
9	39589_6846902	Confined	12,149	4/5/2012	428.72	417.06	11.66	1
9	39589_6846902	Confined	12,176	5/2/2012	428.22	417.17	11.05	1
9	39589_6846902	Confined	12,211	6/6/2012	428.42	417.31	11.11	1
9	39589_6846902	Confined	12,267	8/1/2012	427.02	417.53	9.49	1
9	39589_6846902	Confined	12,298	9/1/2012	425.52	417.65	7.87	1
9	39589_6846902	Confined	12,328	10/1/2012	425.92	417.77	8.15	1
9	39589_6846902	Confined	12,359	11/1/2012	426.32	417.89	8.43	1
9	39589_6846902	Confined	12,393	12/5/2012	427.72	418.03	9.69	1
9	39589_6846902	Confined	12,425	1/6/2013	428.12	418.14	9.98	1
9	39589_6846902	Confined	12,456	2/6/2013	428.42	418.18	10.24	1
9	39589_6846902	Confined	12,479	3/1/2013	428.42	418.21	10.21	1
9	39589_6846902	Confined	12,514	4/5/2013	428.02	418.25	9.77	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39589_6846902	Confined	12,541	5/2/2013	428.42	418.29	10.13	1
9	39589_6846902	Confined	12,576	6/6/2013	428.92	418.33	10.59	1
9	39589_6846902	Confined	12,601	7/1/2013	428.72	418.36	10.36	1
9	39589_6846902	Confined	12,632	8/1/2013	428.52	418.40	10.12	1
9	39589_6846902	Confined	12,663	9/1/2013	427.02	418.44	8.58	1
9	39589_6846902	Confined	12,724	11/1/2013	428.12	418.52	9.60	1
9	39589_6846902	Confined	12,758	12/5/2013	428.32	418.57	9.75	1
9	39589_6846902	Confined	12,785	1/1/2014	428.72	418.60	10.12	1
9	39589_6846902	Confined	12,844	3/1/2014	432.22	418.57	13.65	1
9	39589_6846902	Confined	12,875	4/1/2014	428.82	418.55	10.27	1
9	39589_6846902	Confined	12,905	5/1/2014	428.72	418.54	10.18	1
9	39589_6846902	Confined	12,936	6/1/2014	429.72	418.52	11.20	1
9	39589_6846902	Confined	12,966	7/1/2014	429.72	418.51	11.21	1
9	39589_6846902	Confined	12,997	8/1/2014	428.42	418.49	9.93	1
9	39589_6846902	Confined	13,028	9/1/2014	427.42	418.48	8.94	1
9	39589_6846902	Confined	13,058	10/1/2014	427.32	418.46	8.86	1
9	39589_6846902	Confined	13,089	11/1/2014	427.32	418.45	8.87	1
9	39589_6846902	Confined	13,119	12/1/2014	427.82	418.43	9.39	1
9	39589_6846902	Confined	13,150	1/1/2015	428.42	418.42	10.00	1
9	39589_6846902	Confined	13,181	2/1/2015	428.82	418.52	10.30	1
9	39589_6846902	Confined	13,209	3/1/2015	429.02	418.61	10.41	1
9	39589_6846902	Confined	13,240	4/1/2015	430.02	418.71	11.31	1
9	39589_6846902	Confined	13,270	5/1/2015	430.12	418.81	11.31	1
9	39589_6846902	Confined	13,301	6/1/2015	431.12	418.91	12.21	1
9	39589_6846902	Confined	13,331	7/1/2015	431.62	419.01	12.61	1
9	39589_6846902	Confined	13,362	8/1/2015	431.02	419.11	11.91	1
9	39589_6846902	Confined	13,393	9/1/2015	430.02	419.21	10.81	1
9	39589_6846902	Confined	13,423	10/1/2015	429.82	419.30	10.52	1
9	39589_6846902	Confined	13,454	11/1/2015	429.82	419.40	10.42	1
9	39589_6846902	Confined	13,484	12/1/2015	430.02	419.50	10.52	1
9	39589_6846902	Confined	13,515	1/1/2016	430.82	419.60	11.22	1
9	39589_6846902	Confined	13,546	2/1/2016	431.12	419.61	11.51	1
9	39589_6846902	Confined	13,575	3/1/2016	431.22	419.61	11.61	1
9	39589_6846902	Confined	13,606	4/1/2016	430.52	419.62	10.90	1
9	39589_6846902	Confined	13,636	5/1/2016	431.42	419.63	11.79	1
9	39589_6846902	Confined	13,667	6/1/2016	430.92	419.64	11.28	1
9	39589_6846902	Confined	13,697	7/1/2016	432.02	419.64	12.38	1
9	39589_6846902	Confined	13,728	8/1/2016	431.22	419.65	11.57	1
9	39589_6846902	Confined	13,759	9/1/2016	431.82	419.66	12.16	1
9	39589_6846902	Confined	13,789	10/1/2016	431.52	419.67	11.85	1
9	39589_6846902	Confined	13,820	11/1/2016	431.52	419.67	11.85	1
9	39589_6846902	Confined	13,881	1/1/2017	431.42	419.69	11.73	1
9	39589_6846902	Confined	13,912	2/1/2017	431.72	419.64	12.08	1
9	39589_6846902	Confined	13,940	3/1/2017	431.42	419.60	11.82	1
9	39589_6846902	Confined	14,124	9/1/2017	426.72	419.32	7.40	1
9	39589_6846902	Confined	14,154	10/1/2017	426.12	419.27	6.85	1
9	39589_6846902	Confined	14,185	11/1/2017	425.82	419.23	6.59	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39589_6846902	Confined	14,215	12/1/2017	424.32	419.18	5.14	1
9	39592_6847303	Confined	8,774	1/8/2003	415.36	451.60	-3.62	0.1
9	39592_6847303	Confined	9,144	1/13/2004	427.46	451.15	-2.37	0.1
9	39592_6847303	Confined	9,532	2/4/2005	436.46	451.87	-1.54	0.1
9	39592_6847303	Confined	9,873	1/11/2006	416.96	450.53	-3.36	0.1
9	39592_6847303	Confined	10,230	1/3/2007	398.46	450.23	-5.18	0.1
9	39592_6847303	Confined	10,600	1/8/2008	418.56	452.50	-3.39	0.1
9	39592_6847303	Confined	10,992	2/3/2009	420.96	450.50	-2.95	0.1
9	39592_6847303	Confined	11,343	1/20/2010	417.96	450.17	-3.22	0.1
9	39592_6847303	Confined	12,059	1/6/2012	412.76	448.26	-3.55	0.1
9	39592_6847303	Confined	12,090	2/6/2012	413.36	448.39	-3.50	0.1
9	39592_6847303	Confined	12,114	3/1/2012	413.96	448.49	-3.45	0.1
9	39592_6847303	Confined	12,149	4/5/2012	411.26	448.63	-3.74	0.1
9	39592_6847303	Confined	12,176	5/2/2012	410.76	448.74	-3.80	0.1
9	39592_6847303	Confined	12,328	10/1/2012	411.16	449.37	-3.82	0.1
9	39592_6847303	Confined	12,359	11/1/2012	412.66	449.49	-3.68	0.1
9	39592_6847303	Confined	12,393	12/5/2012	413.26	449.63	-3.64	0.1
9	39592_6847303	Confined	12,425	1/6/2013	416.16	449.75	-3.36	0.1
9	39592_6847303	Confined	12,456	2/6/2013	414.66	449.80	-3.51	0.1
9	39592_6847303	Confined	12,479	3/1/2013	414.46	449.84	-3.54	0.1
9	39592_6847303	Confined	12,514	4/5/2013	415.86	449.89	-3.40	0.1
9	39592_6847303	Confined	12,541	5/2/2013	416.66	449.94	-3.33	0.1
9	39592_6847303	Confined	12,576	6/6/2013	416.36	449.99	-3.36	0.1
9	39592_6847303	Confined	12,601	7/1/2013	417.16	450.03	-3.29	0.1
9	39592_6847303	Confined	12,632	8/1/2013	415.66	450.08	-3.44	0.1
9	39592_6847303	Confined	12,663	9/1/2013	413.66	450.13	-3.65	0.1
9	39592_6847303	Confined	12,693	10/1/2013	417.16	450.18	-3.30	0.1
9	39592_6847303	Confined	12,724	11/1/2013	419.66	450.23	-3.06	0.1
9	39592_6847303	Confined	12,758	12/5/2013	420.66	450.28	-2.96	0.1
9	39592_6847303	Confined	12,785	1/1/2014	421.36	450.32	-2.90	0.1
9	39592_6847303	Confined	12,816	2/1/2014	422.56	450.30	-2.77	0.1
9	39592_6847303	Confined	12,844	3/1/2014	424.76	450.29	-2.55	0.1
9	39592_6847303	Confined	12,875	4/1/2014	421.36	450.27	-2.89	0.1
9	39592_6847303	Confined	12,905	5/1/2014	419.86	450.25	-3.04	0.1
9	39592_6847303	Confined	12,936	6/1/2014	420.56	450.24	-2.97	0.1
9	39592_6847303	Confined	12,966	7/1/2014	419.66	450.22	-3.06	0.1
9	39592_6847303	Confined	12,997	8/1/2014	417.86	450.20	-3.23	0.1
9	39592_6847303	Confined	13,028	9/1/2014	414.86	450.18	-3.53	0.1
9	39592_6847303	Confined	13,058	10/1/2014	416.46	450.17	-3.37	0.1
9	39592_6847303	Confined	13,089	11/1/2014	417.26	450.15	-3.29	0.1
9	39592_6847303	Confined	13,119	12/1/2014	418.06	450.13	-3.21	0.1
9	39592_6847303	Confined	13,150	1/1/2015	421.26	450.12	-2.89	0.1
9	39592_6847303	Confined	13,181	2/1/2015	423.16	450.24	-2.71	0.1
9	39592_6847303	Confined	13,209	3/1/2015	423.06	450.35	-2.73	0.1
9	39592_6847303	Confined	13,240	4/1/2015	424.56	450.47	-2.59	0.1
9	39592_6847303	Confined	13,270	5/1/2015	424.86	450.58	-2.57	0.1
9	39592_6847303	Confined	13,362	8/1/2015	421.66	450.94	-2.93	0.1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	39592_6847303	Confined	13,393	9/1/2015	421.46	451.06	-2.96	0.1
9	39592_6847303	Confined	13,423	10/1/2015	421.26	451.18	-2.99	0.1
9	39592_6847303	Confined	13,454	11/1/2015	420.86	451.30	-3.04	0.1
9	39592_6847303	Confined	13,484	12/1/2015	422.86	451.41	-2.86	0.1
9	39592_6847303	Confined	13,515	1/1/2016	425.46	451.53	-2.61	0.1
9	39592_6847303	Confined	13,546	2/1/2016	425.06	451.54	-2.65	0.1
9	39592_6847303	Confined	13,575	3/1/2016	424.76	451.56	-2.68	0.1
9	39592_6847303	Confined	13,606	4/1/2016	425.16	451.57	-2.64	0.1
9	39592_6847303	Confined	13,636	5/1/2016	426.26	451.58	-2.53	0.1
9	39592_6847303	Confined	13,667	6/1/2016	426.76	451.60	-2.48	0.1
9	39592_6847303	Confined	13,697	7/1/2016	424.66	451.61	-2.69	0.1
9	39592_6847303	Confined	13,728	8/1/2016	422.56	451.62	-2.91	0.1
9	39592_6847303	Confined	13,759	9/1/2016	425.56	451.64	-2.61	0.1
9	39592_6847303	Confined	13,789	10/1/2016	424.76	451.65	-2.69	0.1
9	39592_6847303	Confined	13,820	11/1/2016	424.06	451.66	-2.76	0.1
9	39592_6847303	Confined	13,850	12/1/2016	426.36	451.67	-2.53	0.1
9	39592_6847303	Confined	13,881	1/1/2017	427.86	451.69	-2.38	0.1
9	39592_6847303	Confined	13,912	2/1/2017	427.76	451.63	-2.39	0.1
9	39592_6847303	Confined	13,940	3/1/2017	427.96	451.58	-2.36	0.1
9	39592_6847303	Confined	14,124	9/1/2017	423.16	451.25	-2.81	0.1
9	39592_6847303	Confined	14,154	10/1/2017	423.06	451.19	-2.81	0.1
9	39592_6847303	Confined	14,185	11/1/2017	423.06	451.14	-2.81	0.1
9	39592_6847303	Confined	14,215	12/1/2017	423.46	451.08	-2.76	0.1
9	39619_6848304	Confined	3,062	5/20/1987	431.71	434.20	-0.25	0.1
9	41935_6864104	Confined	8,065	1/29/2001	261.79	344.95	-41.58	0.5
9	42614_6853813	Confined	10,256	1/29/2007	424.02	384.89	39.13	1
9	42615_6854406	Confined	10,257	1/30/2007	429.42	394.36	35.06	1
9	42626_6853406	Confined	2,475	10/10/1985	443.66	445.11	-0.14	0.1
9	42628_6853408	Confined	6,641	3/7/1997	434.49	436.19	-1.70	1
9	42838_6852502	Confined	6,424	8/2/1996	516.82	478.58	38.24	1
9	43100_6847101	Unconfined	8,947	6/30/2003	524.49	460.01	64.48	1
9	48202_6742611	Confined	8,137	4/11/2001	386.67	366.86	19.81	1
9	48202_6742611	Confined	9,412	10/7/2004	385.94	369.10	16.84	1
9	48202_6742611	Confined	9,698	7/20/2005	386.37	369.12	17.25	1
9	48202_6742611	Confined	10,501	10/1/2007	386.67	370.17	16.50	1
9	48202_6742611	Confined	10,957	12/30/2008	386.14	369.76	16.38	1
9	48202_6742611	Confined	11,112	6/3/2009	385.46	368.88	16.58	1
9	48202_6742611	Confined	11,229	9/28/2009	384.71	368.20	16.51	1
9	48202_6742611	Confined	11,476	6/2/2010	385.64	366.41	19.23	1
9	48202_6742611	Confined	11,587	9/21/2010	385.22	365.49	19.73	1
9	48202_6742611	Confined	11,693	1/5/2011	385.22	364.62	20.60	1
9	48202_6742611	Confined	11,840	6/1/2011	385.35	363.31	22.04	1
9	48202_6742611	Confined	11,937	9/6/2011	384.97	362.44	22.53	1
9	48202_6742611	Confined	12,064	1/11/2012	385.06	361.33	23.73	1
9	48202_6742611	Confined	12,218	6/13/2012	385.64	360.29	25.35	1
9	48202_6742611	Confined	12,309	9/12/2012	385.67	359.67	26.00	1
9	48202_6742611	Confined	12,673	9/11/2013	387.78	355.55	32.23	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation
Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	48202_6742611	Confined	12,786	1/2/2014	388.92	354.03	34.89	1
9	48202_6742611	Confined	12,938	6/3/2014	392.67	351.29	41.38	1
9	48202_6742611	Confined	13,029	9/2/2014	392.30	349.65	42.65	1
9	48202_6742611	Confined	13,148	12/30/2014	393.02	347.51	45.51	1
9	48202_6742611	Confined	13,305	6/5/2015	395.51	344.11	51.40	1
9	48202_6742611	Confined	13,528	1/14/2016	397.46	339.58	57.88	1
9	48202_6742611	Confined	13,680	6/14/2016	397.49	339.63	57.86	1
9	48202_6742611	Confined	13,786	9/28/2016	399.63	339.67	59.96	1
9	48202_6742611	Confined	13,884	1/4/2017	400.29	339.68	60.61	1
9	48202_6742611	Confined	14,036	6/5/2017	400.02	338.80	61.22	1
9	48385_0	Confined	12,204	5/30/2012	408.67	382.02	2.67	0.1
9	48386_0	Confined	12,241	7/6/2012	418.29	384.79	3.35	0.1
9	48387_0	Confined	12,101	2/17/2012	420.82	385.48	35.34	1
9	48388_0	Confined	12,307	9/10/2012	418.68	392.88	25.80	1
9	48389_0	Confined	12,532	4/23/2013	416.78	391.66	25.12	1
9	48390_0	Confined	12,476	2/26/2013	417.38	384.79	3.26	0.1
9	48391_0	Confined	12,441	1/22/2013	421.88	379.30	42.58	1
9	48443_0	Confined	8,662	9/18/2002	362.65	414.08	-51.43	1
9	48851_0	Confined	8,513	4/22/2002	421.00	397.46	2.35	0.1
9	48852_0	Confined	12,716	10/24/2013	368.11	379.15	-11.04	1
9	48889_0	Confined	9,790	10/20/2005	479.66	500.47	-10.41	0.5
9	48958_0	Confined	12,379	11/21/2012	354.97	361.00	-6.03	1
9	48959_0	Confined	8,207	6/20/2001	226.50	406.55	-180.05	1
9	48967_0	Confined	10,150	10/15/2006	265.71	346.21	-80.50	1
9	48968_0	Confined	9,189	2/27/2004	266.09	355.12	-89.03	1
9	48969_0	Confined	10,420	7/12/2007	279.01	358.70	-79.69	1
9	49071_0	Confined	9,852	12/21/2005	438.07	447.81	-9.74	1
9	49091_0	Confined	9,476	12/10/2004	264.02	377.07	-11.30	0.1
9	49112_0	Confined	11,860	6/21/2011	366.31	398.86	-32.55	1
9	49117_0	Confined	12,003	11/11/2011	392.78	407.82	-15.04	1
9	49121_0	Confined	12,008	11/16/2011	451.92	405.35	46.57	1
9	49126_0	Confined	12,112	2/28/2012	406.78	417.25	-10.47	1
9	49168_0	Confined	11,392	3/10/2010	437.97	402.72	35.25	1
9	49169_0	Confined	9,879	1/17/2006	403.16	424.26	-21.10	1
9	49171_0	Confined	12,646	8/15/2013	416.04	429.41	-13.37	1
9	49179_0	Confined	12,806	1/22/2014	434.80	432.00	2.80	1
9	49235_0	Unconfined	11,964	10/3/2011	278.73	388.16	-109.43	1
9	49444_0	Confined	12,378	11/20/2012	416.23	372.64	43.59	1
9	50013_0	Confined	10,856	9/20/2008	444.72	534.40	-8.97	0.1
9	50278_0	Confined	8,566	6/14/2002	358.11	399.37	-4.13	0.1
9	50280_0	Confined	9,689	7/11/2005	355.06	386.70	-31.64	1
9	50293_0	Confined	4,111	4/3/1990	437.40	433.22	4.18	1
9	50335_6712528	Confined	6,778	7/22/1997	332.65	382.00	-49.35	1
9	50336_0	Confined	11,839	5/31/2011	322.29	367.97	-45.68	1
9	50337_0	Confined	11,754	3/7/2011	378.77	416.59	-3.78	0.1
9	50491_0	Confined	11,842	6/3/2011	482.17	438.89	43.28	1
9	50492_0	Confined	10,585	12/24/2007	397.08	416.30	-19.22	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	50495_0	Confined	10,876	10/10/2008	457.92	440.88	17.04	1
9	50496_0	Unconfined	12,149	4/5/2012	412.25	450.69	-38.44	1
9	50497_0	Unconfined	12,555	5/16/2013	528.01	480.72	47.29	1
9	50516_0	Confined	8,233	7/16/2001	403.69	409.93	-6.24	1
9	50518_0	Confined	8,306	9/27/2001	313.40	384.86	-71.46	1
9	50525_0	Unconfined	8,437	2/5/2002	467.72	460.54	7.18	1
9	50529_0	Unconfined	8,515	4/24/2002	456.93	478.94	-22.01	1
9	50533_0	Confined	8,545	5/24/2002	482.88	449.90	3.30	0.1
9	50544_0	Confined	8,710	11/5/2002	341.66	381.91	-40.25	1
9	50546_0	Confined	8,775	1/9/2003	370.65	385.23	-14.58	1
9	50552_0	Confined	8,814	2/17/2003	366.53	409.69	-43.16	1
9	50554_0	Confined	8,809	2/12/2003	352.40	393.07	-4.07	0.1
9	50560_0	Confined	8,935	6/18/2003	405.42	393.82	1.16	0.1
9	50561_0	Confined	8,943	6/26/2003	381.65	384.37	-2.72	1
9	50579_0	Unconfined	9,104	12/4/2003	434.17	426.07	8.10	1
9	50586_0	Confined	8,930	6/13/2003	402.79	391.57	1.12	0.1
9	50603_0	Unconfined	9,287	6/4/2004	441.25	474.27	-33.02	1
9	50617_0	Confined	9,380	9/5/2004	326.11	389.59	-6.35	0.1
9	50620_0	Unconfined	9,082	11/12/2003	459.24	428.19	31.05	1
9	50624_0	Confined	9,467	12/1/2004	309.67	385.19	-75.52	1
9	50625_0	Confined	9,119	12/19/2003	320.55	408.54	-87.99	1
9	50628_0	Confined	9,476	12/10/2004	460.70	436.79	23.91	1
9	50634_0	Unconfined	9,146	1/15/2004	485.73	460.26	25.47	1
9	50636_0	Confined	9,570	3/14/2005	395.77	414.03	-18.26	1
9	50642_0	Unconfined	9,633	5/16/2005	472.08	478.53	-0.65	0.1
9	50645_0	Unconfined	9,393	9/18/2004	340.61	375.05	-34.44	1
9	50654_0	Unconfined	9,731	8/22/2005	496.35	479.83	16.52	1
9	50663_0	Unconfined	9,890	1/28/2006	513.58	539.06	-25.48	1
9	50664_0	Confined	9,880	1/18/2006	362.57	380.06	-17.49	1
9	50665_0	Confined	8,956	7/9/2003	552.48	481.25	7.12	0.1
9	50672_0	Unconfined	9,944	3/23/2006	561.48	516.92	4.46	0.1
9	50680_0	Unconfined	9,944	3/23/2006	407.89	432.06	-24.17	1
9	50681_0	Unconfined	9,941	3/20/2006	411.53	422.14	-10.61	1
9	50682_0	Unconfined	9,984	5/2/2006	458.86	418.12	40.74	1
9	50684_0	Unconfined	10,078	8/4/2006	404.51	401.23	3.28	1
9	50689_0	Confined	10,177	11/11/2006	376.47	430.22	-53.75	1
9	50707_0	Confined	10,281	2/23/2007	472.96	452.96	20.00	1
9	50716_0	Confined	10,392	6/14/2007	450.93	452.17	-1.24	1
9	50729_0	Unconfined	10,168	11/2/2006	406.12	409.04	-2.92	1
9	50730_0	Confined	10,475	9/5/2007	426.91	391.54	35.37	1
9	50740_0	Confined	10,510	10/10/2007	404.33	409.05	-4.72	1
9	50749_0	Unconfined	10,196	11/30/2006	352.63	374.06	-21.43	1
9	50751_0	Unconfined	10,727	5/14/2008	507.33	521.00	-13.67	1
9	50754_0	Confined	10,732	5/19/2008	509.85	411.47	98.38	1
9	50757_0	Unconfined	10,848	9/12/2008	346.99	398.84	-51.85	1
9	50762_0	Unconfined	9,732	8/23/2005	369.41	405.36	-35.95	1
9	50769_0	Confined	10,827	8/22/2008	456.97	453.83	3.14	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	50779_0	Unconfined	9,929	3/8/2006	526.07	604.46	-39.20	0.5
9	50780_0	Unconfined	9,954	4/2/2006	450.37	445.99	4.38	1
9	50784_0	Confined	9,941	3/20/2006	495.58	437.74	28.92	0.5
9	50794_0	Confined	9,243	4/21/2004	424.30	413.42	10.88	1
9	50807_0	Confined	9,306	6/23/2004	449.16	437.42	11.74	1
9	50813_0	Confined	9,242	4/20/2004	350.53	415.60	-6.51	0.1
9	50839_0	Confined	10,038	6/25/2006	547.05	604.88	-5.78	0.1
9	50840_0	Unconfined	11,154	7/15/2009	346.59	359.16	-12.57	1
9	50846_0	Confined	11,120	6/11/2009	449.23	445.90	0.33	0.1
9	50851_0	Confined	11,165	7/26/2009	332.69	408.65	-75.96	1
9	50858_0	Confined	11,124	6/15/2009	434.86	410.10	24.76	1
9	50860_0	Confined	11,161	7/22/2009	461.84	451.20	1.06	0.1
9	50863_0	Confined	9,820	11/19/2005	369.40	392.92	-2.35	0.1
9	50876_0	Unconfined	9,496	12/30/2004	459.32	401.49	57.83	1
9	50883_0	Confined	9,781	10/11/2005	334.61	380.71	-46.10	1
9	50887_0	Unconfined	10,760	6/16/2008	460.63	472.05	-11.42	1
9	50891_0	Confined	10,316	3/30/2007	337.90	367.01	-29.11	1
9	50892_0	Unconfined	11,197	8/27/2009	461.34	466.12	-4.78	1
9	50893_0	Confined	11,238	10/7/2009	462.20	440.33	21.87	1
9	50900_0	Unconfined	11,266	11/4/2009	369.71	378.58	-8.87	1
9	50903_0	Unconfined	9,592	4/5/2005	464.15	477.09	-6.47	0.5
9	50911_0	Unconfined	9,649	6/1/2005	466.42	463.88	2.54	1
9	50913_0	Confined	9,671	6/23/2005	438.54	444.41	-5.87	1
9	50920_0	Unconfined	10,687	4/4/2008	636.25	586.89	49.36	1
9	50921_0	Confined	11,392	3/10/2010	356.86	346.58	10.28	1
9	50925_0	Confined	11,427	4/14/2010	410.48	406.42	4.06	1
9	50927_0	Unconfined	11,407	3/25/2010	372.34	374.93	-2.59	1
9	50951_0	Unconfined	10,704	4/21/2008	524.99	555.62	-30.63	1
9	50992_0	Unconfined	11,755	3/8/2011	345.28	358.95	-13.67	1
9	51006_0	Unconfined	11,760	3/13/2011	371.69	449.42	-77.73	1
9	51008_0	Confined	9,790	10/20/2005	348.86	387.86	-39.00	1
9	51012_0	Confined	11,818	5/10/2011	331.26	337.62	-6.36	1
9	51023_0	Unconfined	11,861	6/22/2011	517.50	512.59	4.91	1
9	51024_0	Unconfined	11,833	5/25/2011	526.39	623.74	-48.67	0.5
9	51026_0	Confined	11,877	7/8/2011	349.71	339.75	9.96	1
9	51029_0	Confined	11,882	7/13/2011	420.97	431.52	-1.06	0.1
9	51036_0	Unconfined	11,848	6/9/2011	508.21	557.38	-49.17	1
9	51037_0	Unconfined	11,825	5/17/2011	423.32	453.25	-29.93	1
9	51043_0	Confined	11,946	9/15/2011	476.77	515.48	-19.36	0.5
9	51058_0	Confined	11,955	9/24/2011	493.11	488.14	4.97	1
9	51059_0	Confined	12,000	11/8/2011	345.89	368.99	-23.10	1
9	51075_0	Confined	11,986	10/25/2011	286.43	404.90	-118.47	1
9	51081_0	Confined	12,050	12/28/2011	423.30	418.11	5.19	1
9	51084_0	Unconfined	11,999	11/7/2011	507.80	489.43	18.37	1
9	51095_0	Unconfined	12,141	3/28/2012	440.69	452.82	-12.13	1
9	51096_0	Confined	12,149	4/5/2012	386.79	386.97	-0.18	1
9	51097_0	Unconfined	12,153	4/9/2012	417.72	416.47	1.25	1

Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

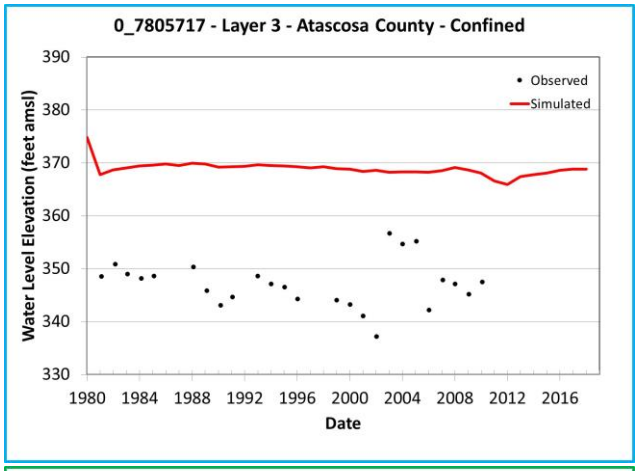
Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	51103_0	Confined	12,144	3/31/2012	297.86	395.31	-97.45	1
9	51104_0	Confined	12,149	4/5/2012	277.64	382.06	-104.42	1
9	51110_0	Confined	12,191	5/17/2012	471.52	440.48	31.04	1
9	51114_0	Confined	12,218	6/13/2012	379.18	405.03	-25.85	1
9	51119_0	Unconfined	12,232	6/27/2012	447.86	468.23	-20.37	1
9	51129_0	Confined	12,279	8/13/2012	311.98	367.90	-55.92	1
9	51135_0	Confined	12,289	8/23/2012	387.16	382.47	4.69	1
9	51151_0	Confined	12,342	10/15/2012	409.80	443.89	-3.41	0.1
9	51153_0	Confined	12,267	8/1/2012	540.39	436.38	104.01	1
9	51156_0	Confined	12,366	11/8/2012	336.20	356.83	-20.63	1
9	51169_0	Confined	12,380	11/22/2012	412.54	478.10	-32.78	0.5
9	51170_0	Unconfined	12,394	12/6/2012	525.10	516.19	8.91	1
9	51177_0	Confined	12,401	12/13/2012	316.63	379.21	-62.58	1
9	51188_0	Confined	12,497	3/19/2013	432.39	441.55	-9.16	1
9	51199_0	Confined	12,331	10/4/2012	361.01	400.51	-39.50	1
9	51211_0	Confined	12,532	4/23/2013	437.84	593.84	-78.00	0.5
9	51221_0	Confined	12,583	6/13/2013	418.30	448.80	-3.05	0.1
9	51223_0	Confined	12,512	4/3/2013	468.44	447.18	21.26	1
9	51225_0	Unconfined	12,541	5/2/2013	688.17	615.38	72.79	1
9	51230_0	Unconfined	12,603	7/3/2013	463.23	434.25	28.98	1
9	51258_0	Confined	12,365	11/7/2012	396.30	432.61	-18.16	0.5
9	51260_0	Confined	12,625	7/25/2013	349.53	358.59	-0.91	0.1
9	51269_0	Confined	10,162	10/27/2006	346.94	379.01	-32.07	1
9	51270_0	Confined	9,886	1/24/2006	342.73	378.77	-36.04	1
9	51272_0	Unconfined	10,132	9/27/2006	582.33	600.43	-18.10	1
9	51274_0	Confined	10,126	9/21/2006	326.08	421.63	-95.55	1
9	51277_0	Unconfined	12,632	8/1/2013	449.12	467.49	-18.37	1
9	51280_0	Unconfined	12,089	2/5/2012	601.52	616.16	-7.32	0.5
9	51283_0	Confined	11,295	12/3/2009	395.24	392.64	0.26	0.1
9	51296_0	Confined	11,267	11/5/2009	364.61	409.34	-44.73	1
9	51309_0	Confined	12,668	9/6/2013	349.97	361.90	-11.93	1
9	51313_0	Unconfined	12,696	10/4/2013	462.00	454.14	7.86	1
9	51324_0	Unconfined	12,682	9/20/2013	453.17	438.66	14.51	1
9	51332_0	Confined	12,712	10/20/2013	393.77	377.55	16.22	1
9	51342_0	Confined	12,699	10/7/2013	472.40	442.60	29.80	1
9	51347_0	Confined	12,776	12/23/2013	399.90	442.53	-4.26	0.1
9	51350_0	Unconfined	12,716	10/24/2013	490.98	463.13	27.85	1
9	51357_0	Unconfined	12,766	12/13/2013	686.23	601.55	84.68	1
9	51367_0	Unconfined	12,753	11/30/2013	480.14	487.27	-7.13	1
9	51369_0	Unconfined	12,848	3/5/2014	328.67	356.40	-27.73	1
9	51380_0	Confined	12,896	4/22/2014	503.08	440.88	62.20	1
9	51778_0	Confined	12,405	12/17/2012	291.81	388.20	-96.39	1
9	51779_0	Confined	9,331	7/18/2004	425.24	408.37	16.87	1
9	51783_0	Confined	8,837	3/12/2003	435.94	426.27	9.67	1
9	51784_0	Confined	9,241	4/19/2004	389.74	400.67	-10.93	1
9	51785_0	Confined	10,075	8/1/2006	386.26	413.75	-27.49	1
9	51788_0	Confined	11,471	5/28/2010	422.85	444.88	-2.20	0.1

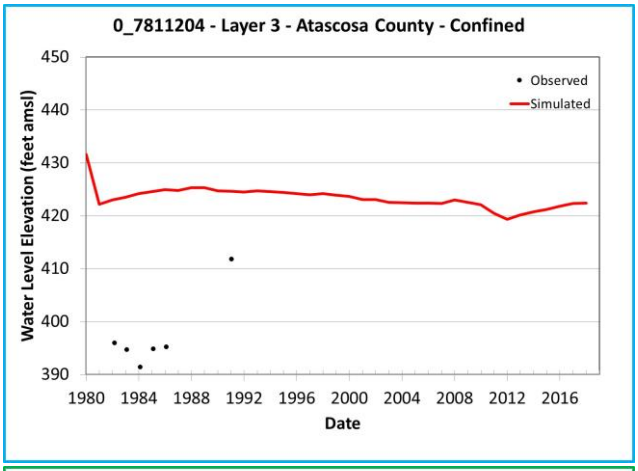
Appendix H Table 1 Model Targets and Weighted Residuals for 1980 to 2017 Transient Simulation Southern Portion of the Queen City, Sparta, and Carizzo-Wilcox Aquifers

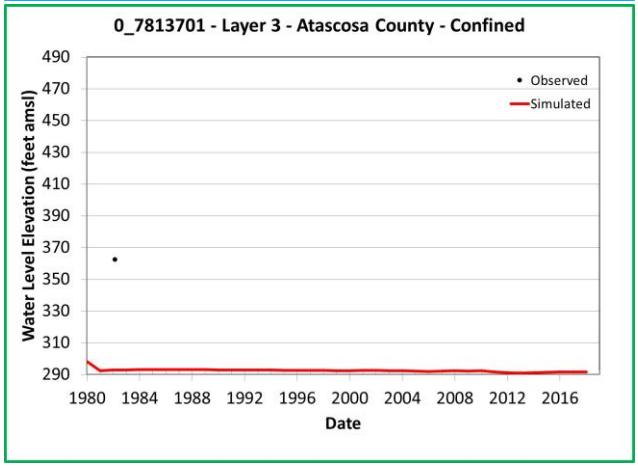
Model Layer	Target Name	Type	Simulation Day	Date	Observed Water Level Elevation (feet amsl)	Simulated Water Level Elevation (feet amsl)	Weighted Residual (feet)	Weight
9	56500_0	Unconfined	7,594	10/16/1999	444.76	383.21	61.55	1
9	56504_0	Confined	6,019	6/24/1995	453.06	395.41	57.65	1
9	59529_0	Confined	12,973	7/8/2014	607.97	582.24	2.57	0.1
9	59533_0	Unconfined	12,500	3/22/2013	450.83	449.57	1.26	1
9	59534_0	Confined	11,966	10/5/2011	610.39	630.96	-10.28	0.5
9	59540_0	Unconfined	12,031	12/9/2011	454.35	462.82	-8.47	1
9	59556_0	Unconfined	10,827	8/22/2008	428.34	461.63	-33.29	1
9	59558_0	Confined	10,482	9/12/2007	462.97	463.16	-0.02	0.1
9	59559_0	Confined	10,254	1/27/2007	653.52	698.25	-44.73	1
9	59562_0	Confined	9,559	3/3/2005	437.61	416.01	21.60	1
9	59563_0	Unconfined	9,502	1/5/2005	403.98	416.09	-12.11	1
9	59566_0	Confined	8,942	6/25/2003	700.65	700.25	0.20	0.5
9	59567_0	Unconfined	8,670	9/26/2002	462.38	441.82	20.56	1
9	59969_0	Confined	12,950	6/15/2014	323.90	284.65	19.62	0.5
9	86418_6726312	Unconfined	7,640	12/1/1999	398.69	407.48	-8.79	1
9	86418_6726312	Unconfined	11,952	9/21/2011	400.39	405.14	-4.75	1
9	86418_6726312	Unconfined	12,085	2/1/2012	404.34	403.30	1.04	1
9	86418_6726312	Unconfined	12,205	5/31/2012	401.01	403.62	-2.61	1
9	86418_6726312	Unconfined	12,440	1/21/2013	403.36	404.29	-0.93	1
9	86418_6726312	Unconfined	12,589	6/19/2013	401.60	405.04	-3.44	1
9	86418_6726312	Unconfined	12,687	9/25/2013	401.94	405.53	-3.59	1
9	86418_6726312	Unconfined	12,806	1/22/2014	406.42	406.02	0.40	1
9	86418_6726312	Unconfined	12,944	6/9/2014	402.93	406.09	-3.16	1
9	86418_6726312	Unconfined	13,038	9/11/2014	401.49	406.14	-4.65	1
9	86418_6726312	Unconfined	13,163	1/14/2015	402.54	406.41	-3.87	1
9	86418_6726312	Unconfined	13,311	6/11/2015	397.89	408.69	-10.80	1
9	86418_6726312	Unconfined	13,409	9/17/2015	400.96	410.20	-9.24	1
9	86418_6726312	Unconfined	13,527	1/13/2016	404.85	411.97	-7.12	1
9	86418_6726312	Unconfined	13,688	6/22/2016	399.52	413.82	-14.30	1
9	86418_6726312	Unconfined	13,778	9/20/2016	403.20	414.86	-11.66	1
9	86418_6726312	Unconfined	13,911	1/31/2017	404.69	416.09	-11.40	1
9	86418_6726312	Unconfined	14,050	6/19/2017	404.80	416.31	-11.51	1
9	86418_6726312	Unconfined	14,141	9/18/2017	404.85	416.45	-11.60	1

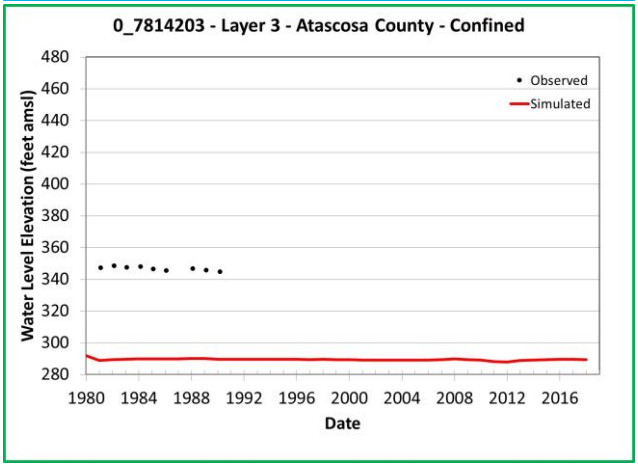
APPENDIX I

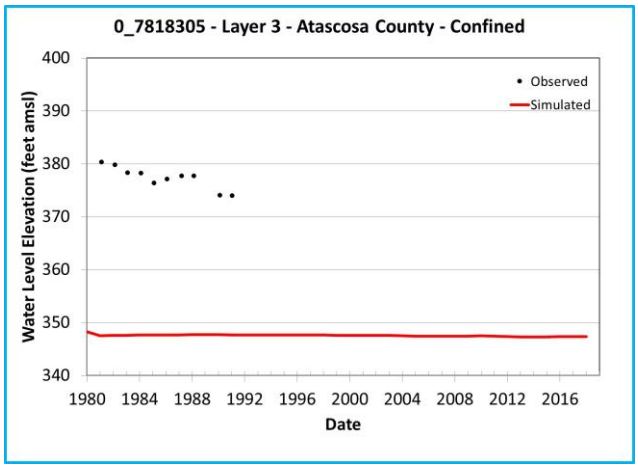
Water Level Elevation Hydrographs for Model Target Wells

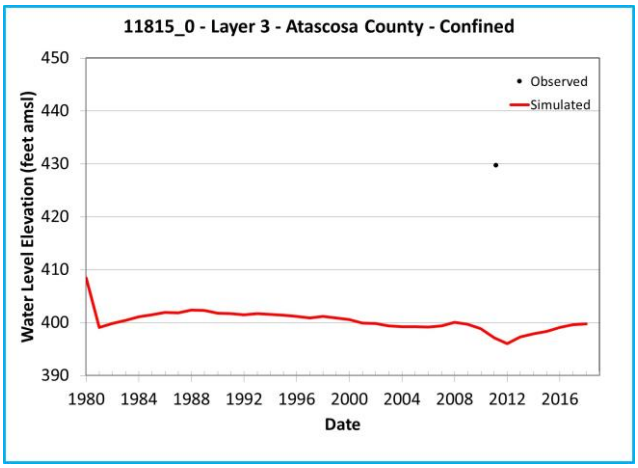












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

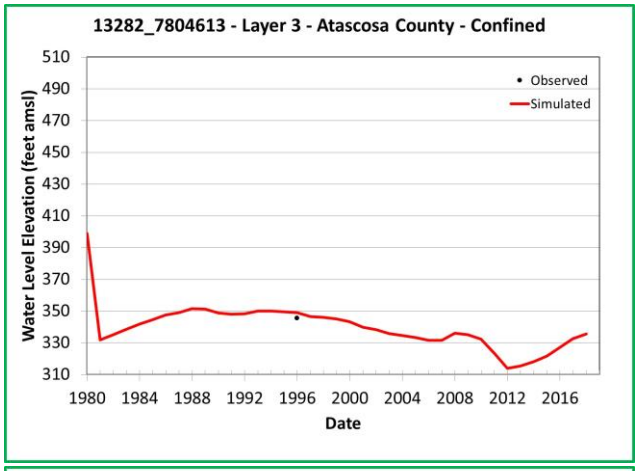
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 3

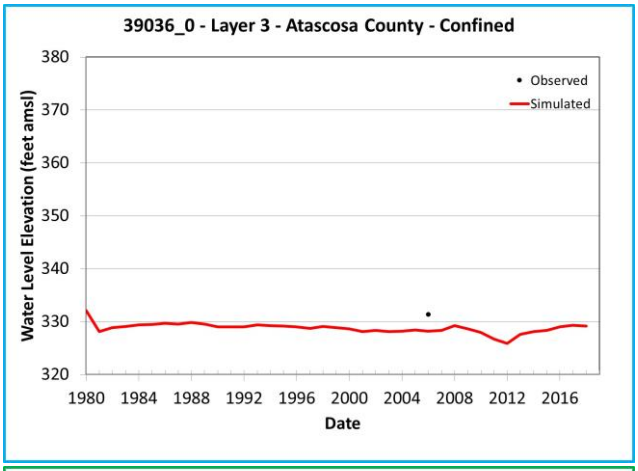
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

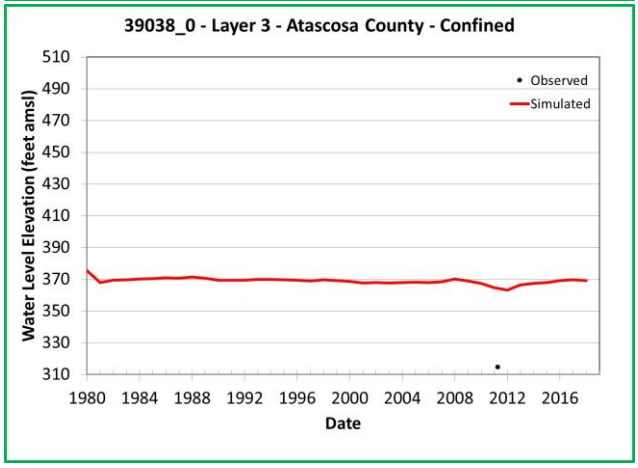
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

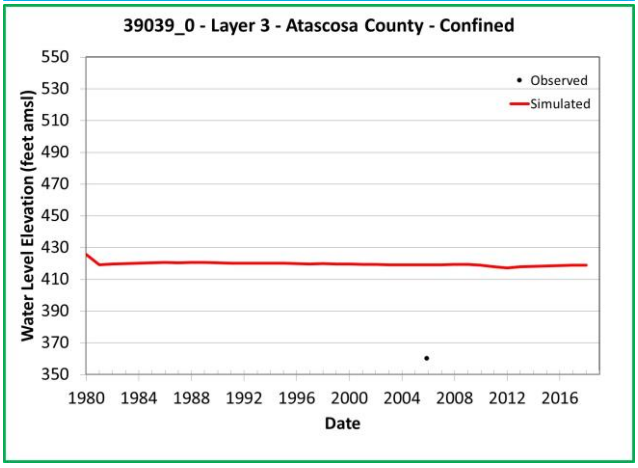
FIGURE I-1.1a

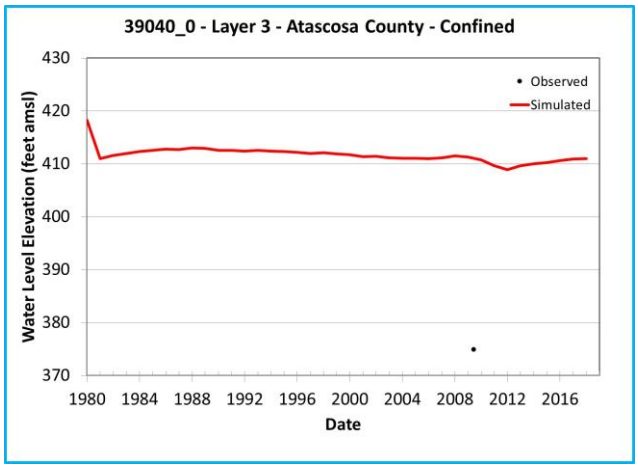
GSI ENVIRONMENTAL

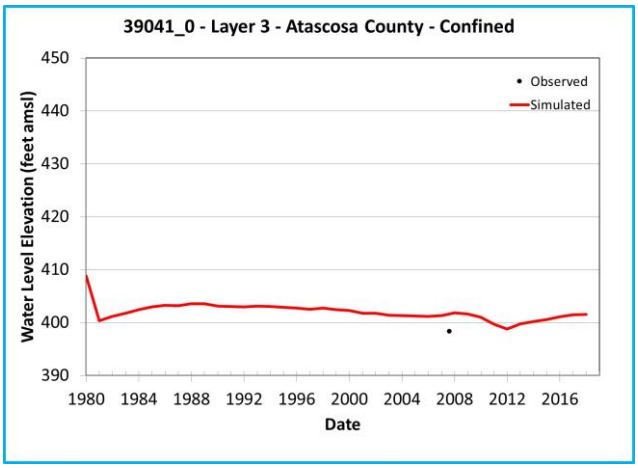












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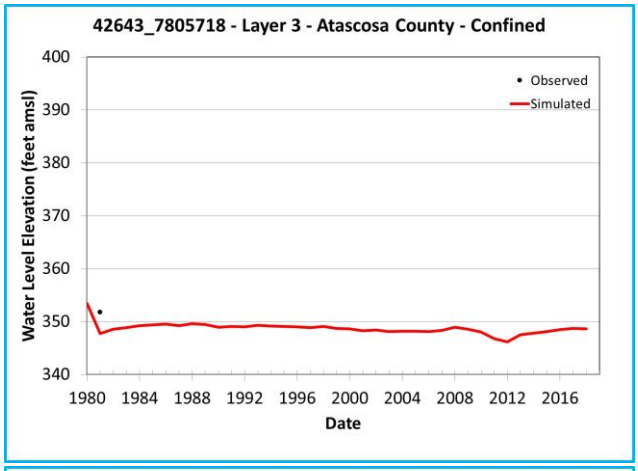
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 3

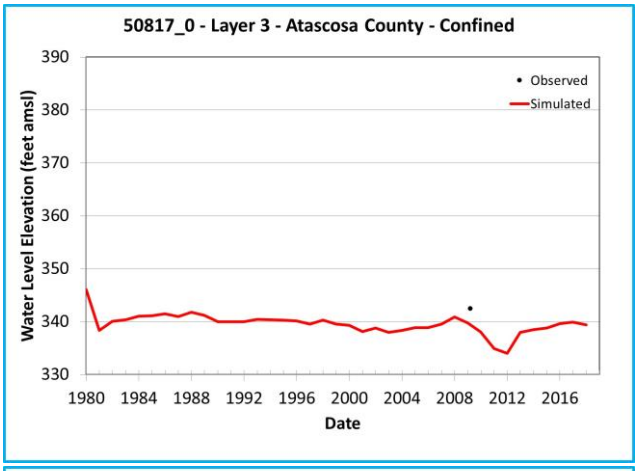
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

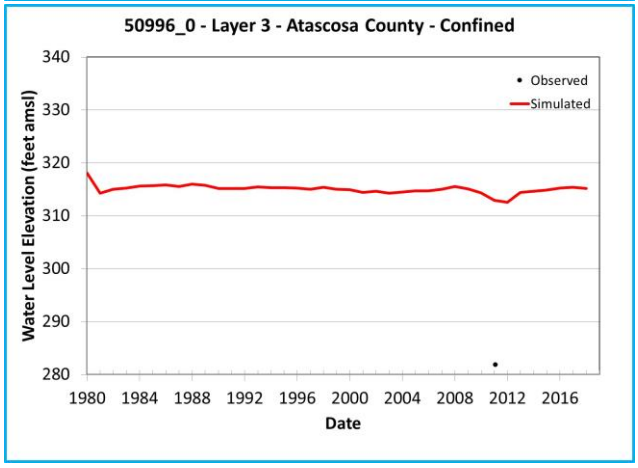
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

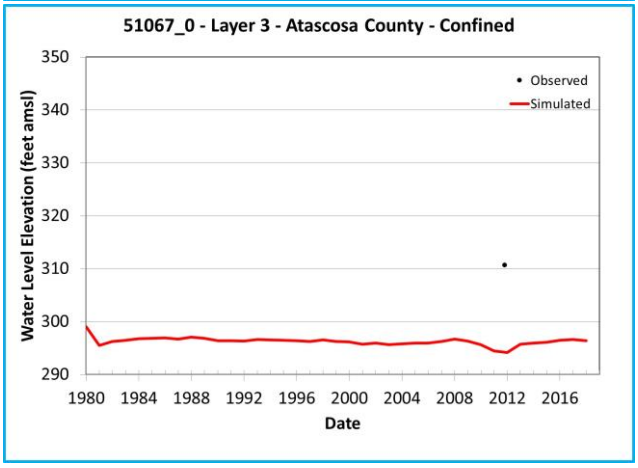
FIGURE I-1.1b

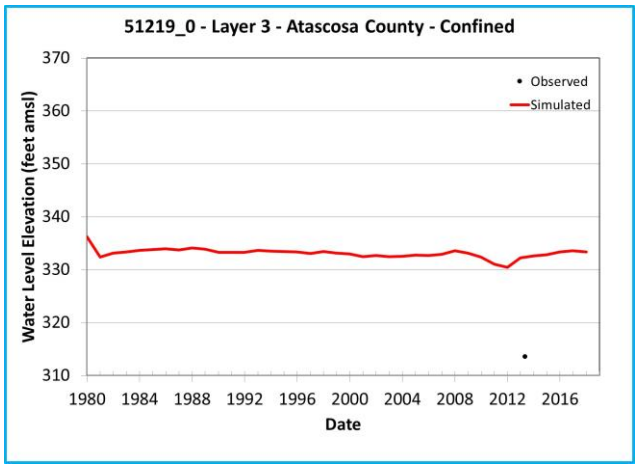
GSI ENVIRONMENTAL











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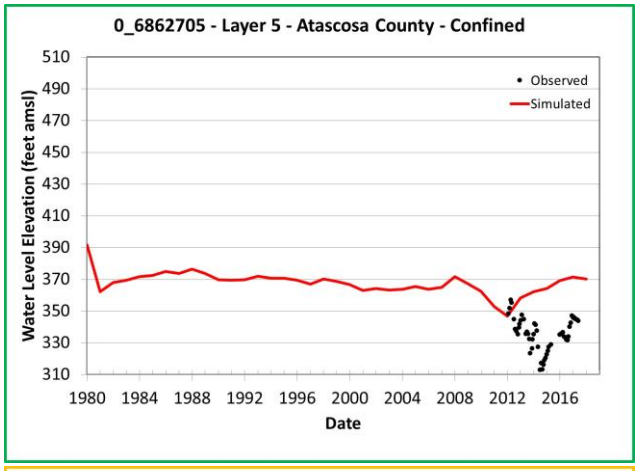
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 3

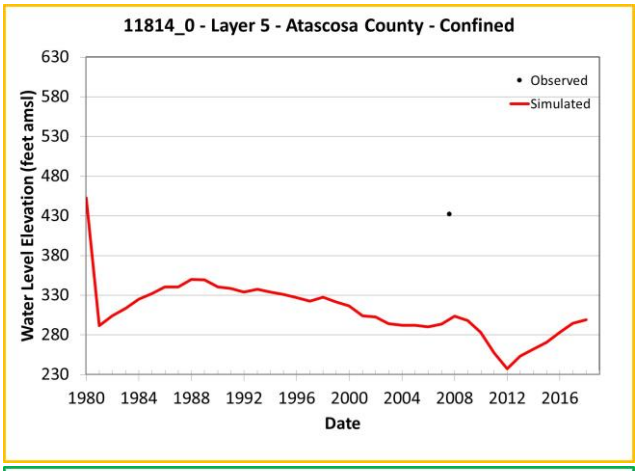
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

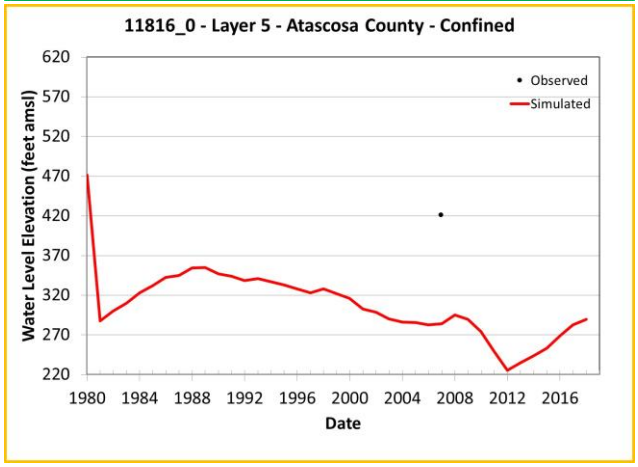
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

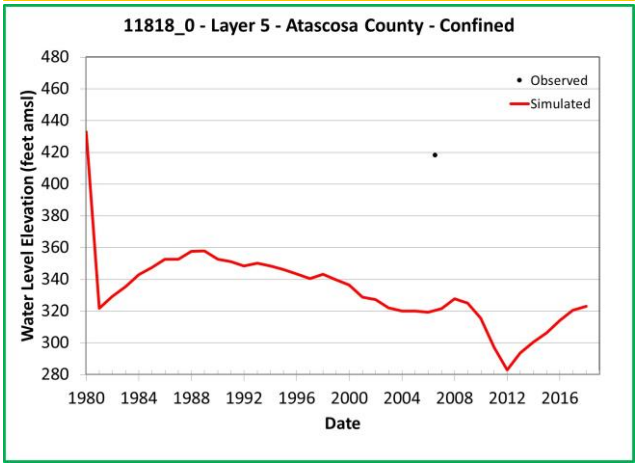
FIGURE I-1.1c

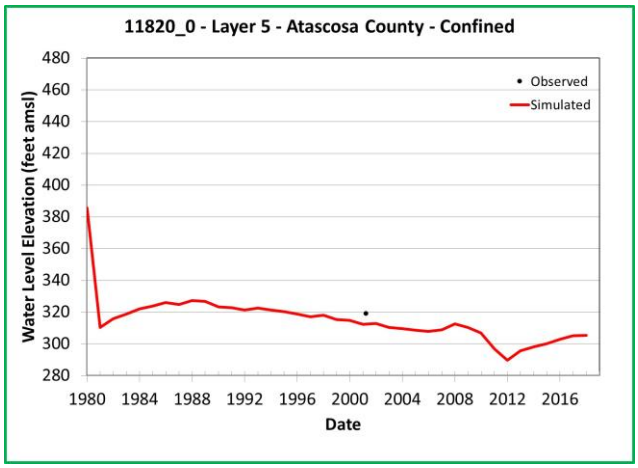
GSI ENVIRONMENTAL

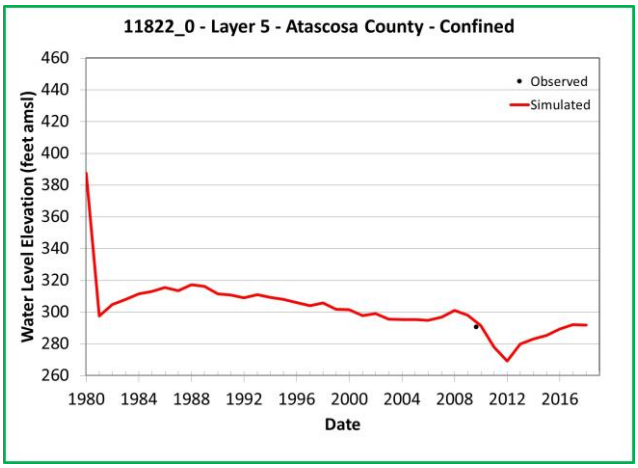












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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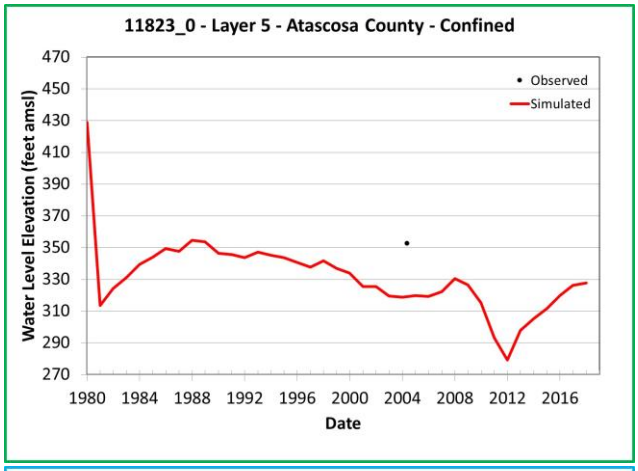
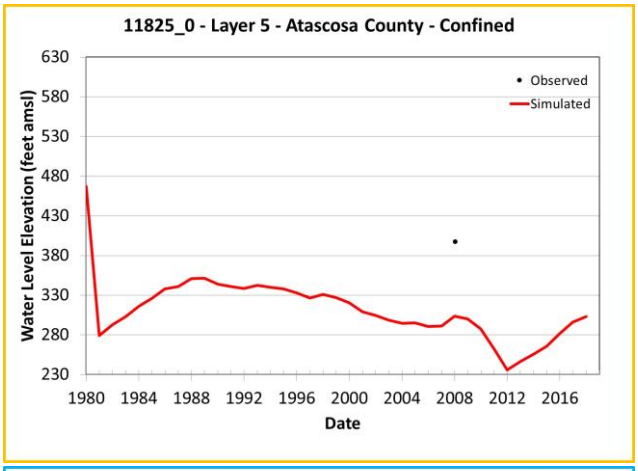
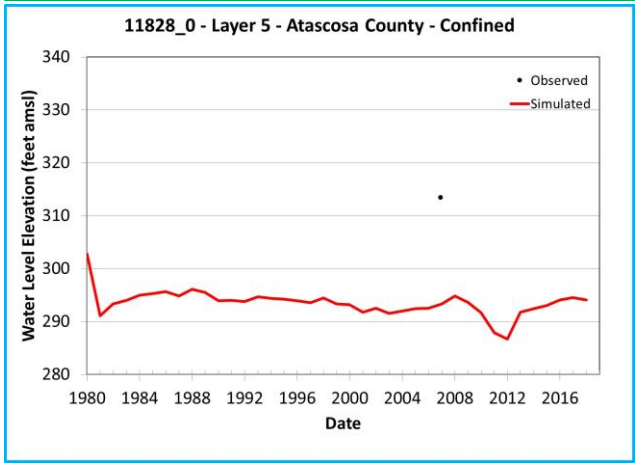
Revised		Aprv'd by	SP

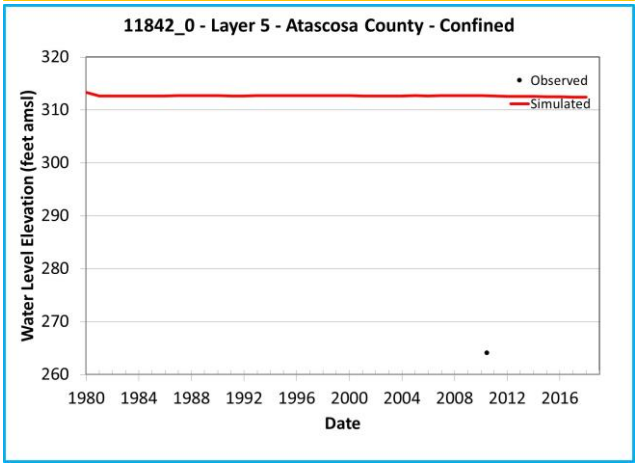
FIGURE I-1.2a

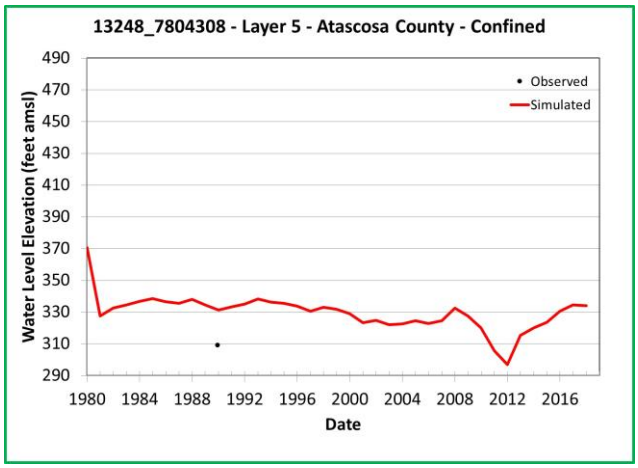
GSI ENVIRONMENTAL

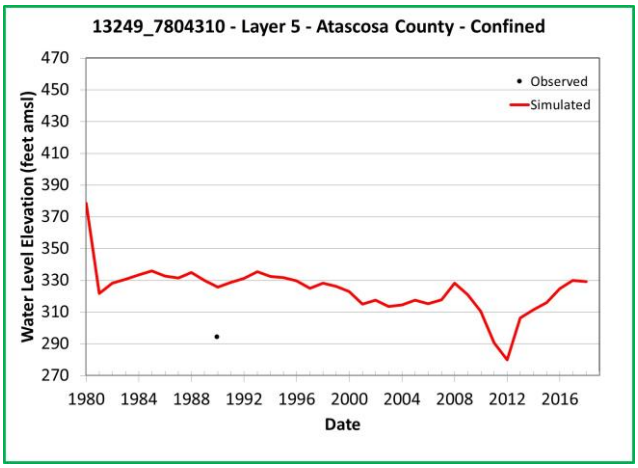












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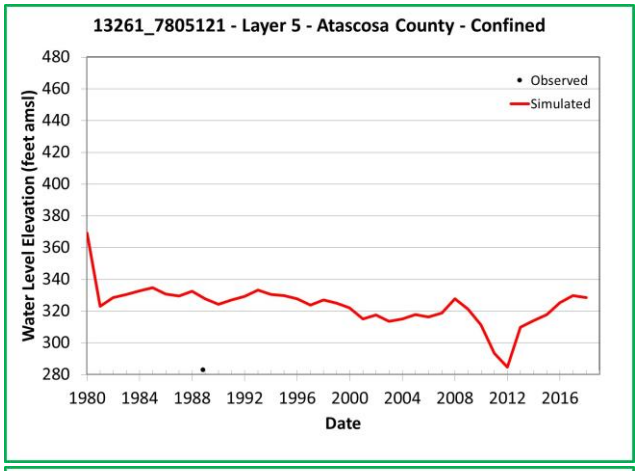
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

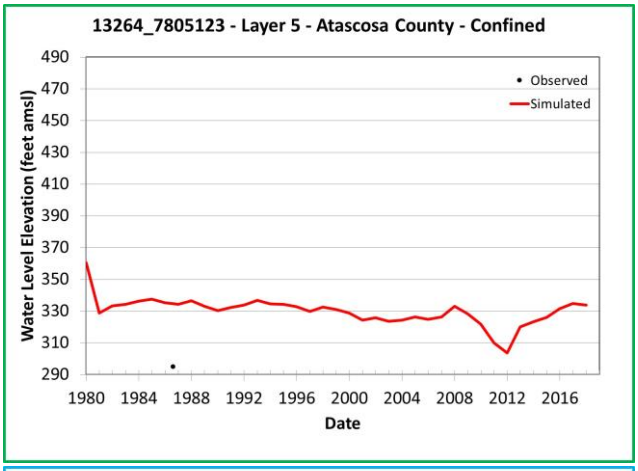
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

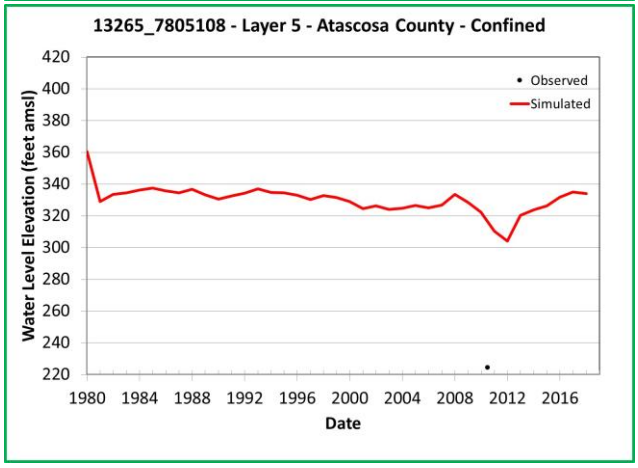
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

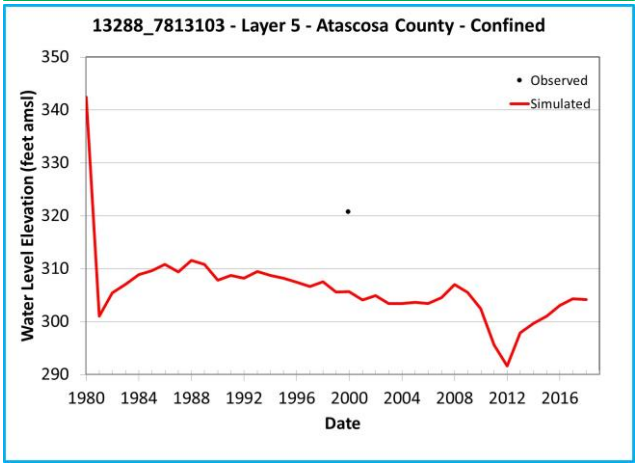
FIGURE I-1.2b

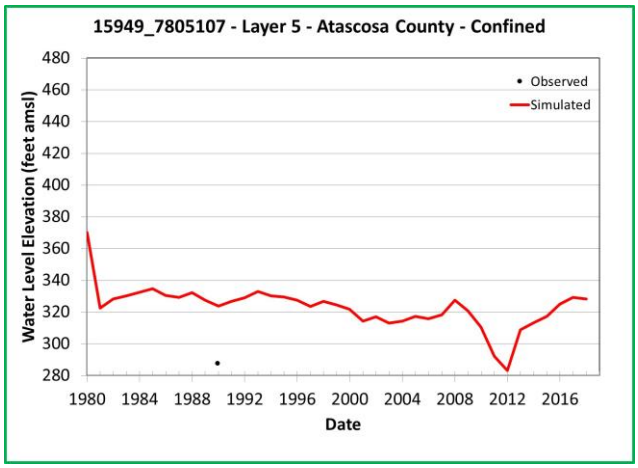
GSI ENVIRONMENTAL

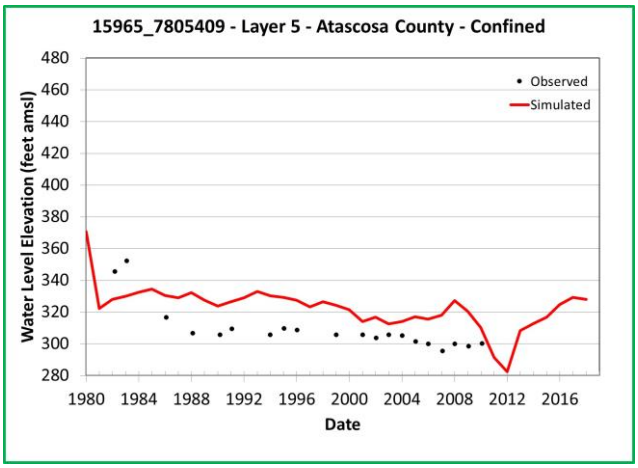












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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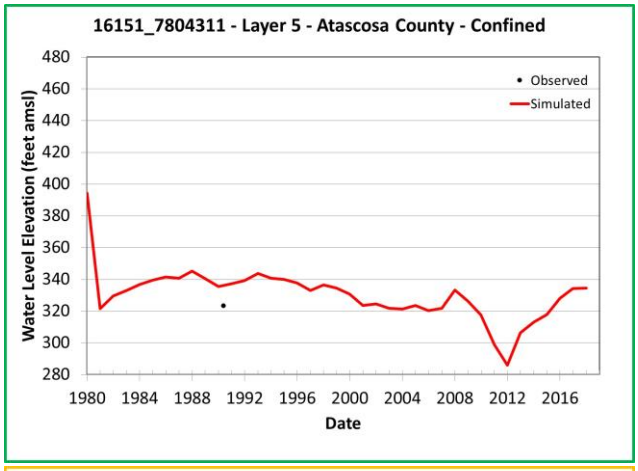
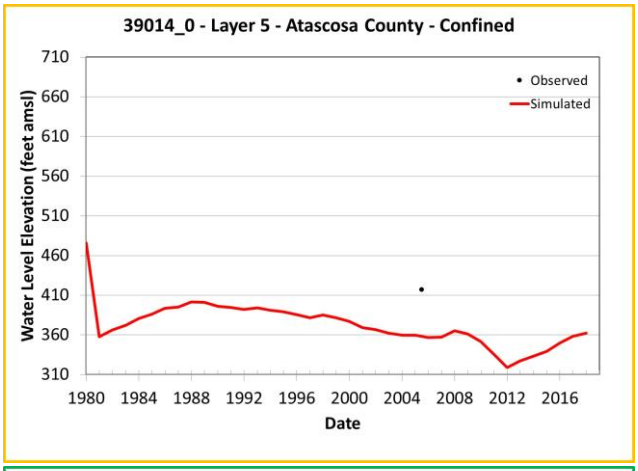
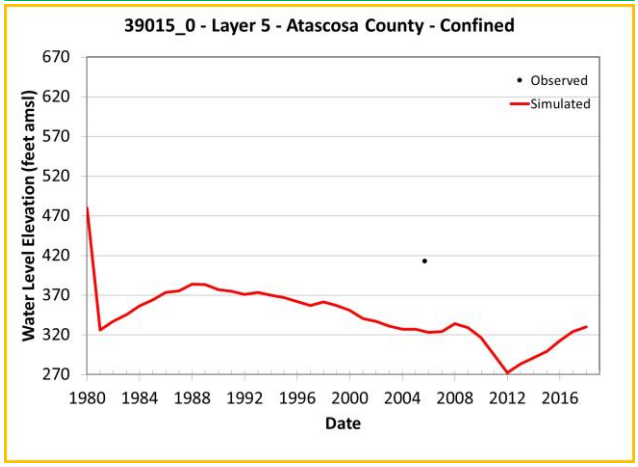
Revised		Aprv'd by	SP

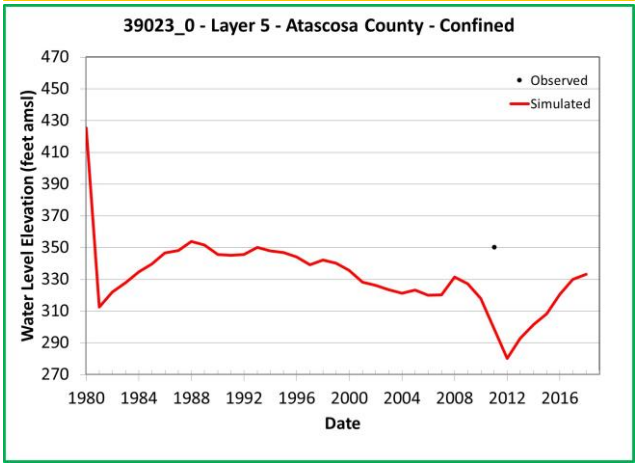
FIGURE I-1.2c

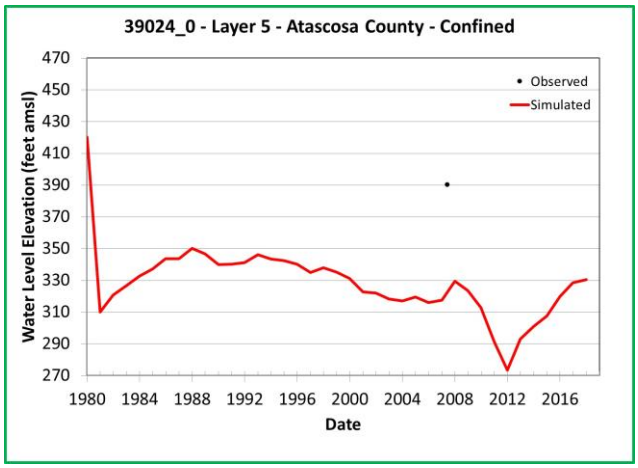
GSI ENVIRONMENTAL

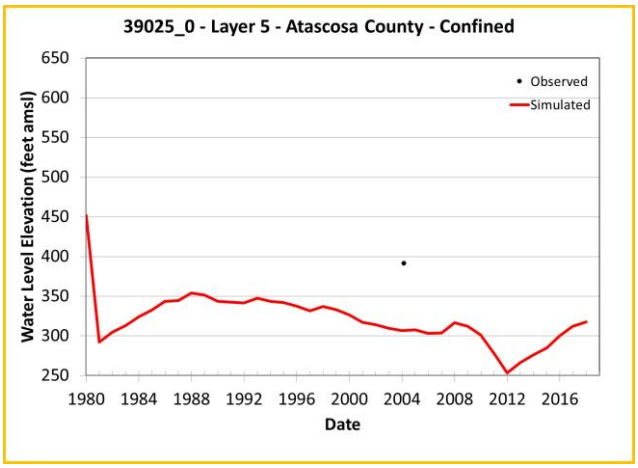












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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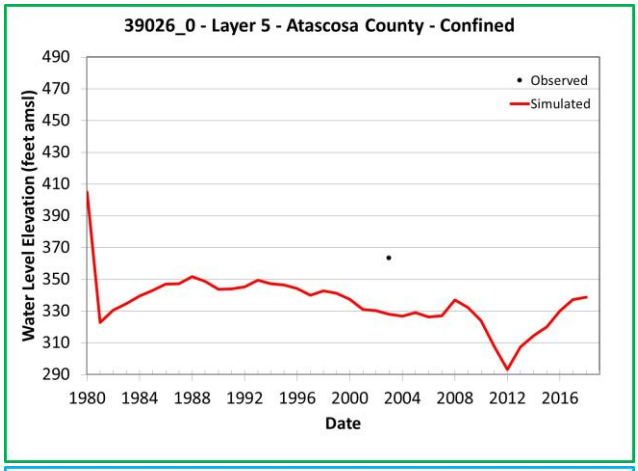
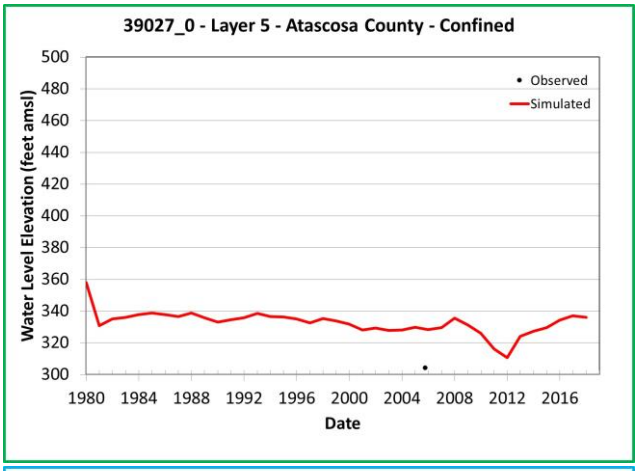
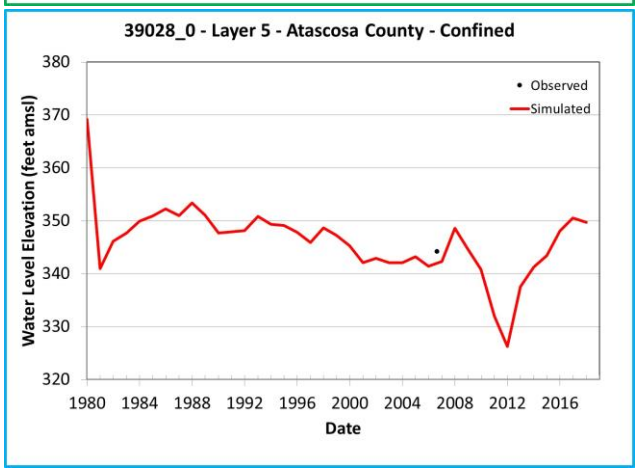
Revised		Aprv'd by	SP

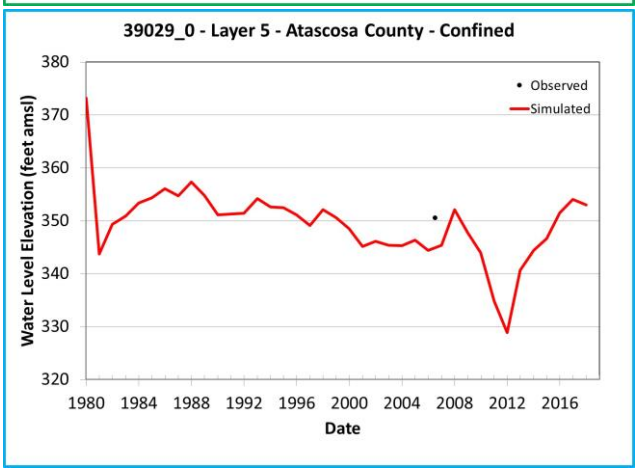
FIGURE I-1.2d

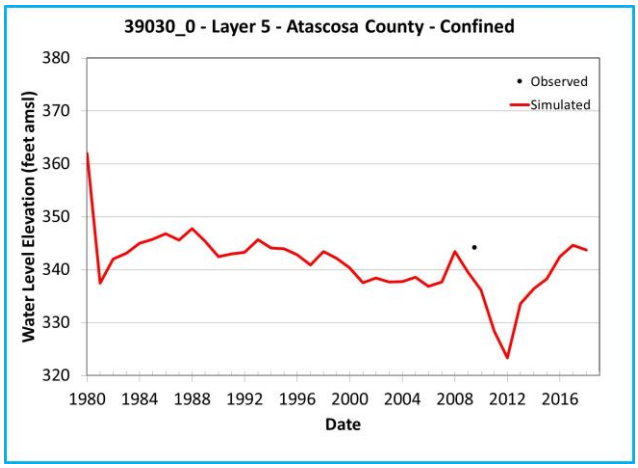
GSI ENVIRONMENTAL

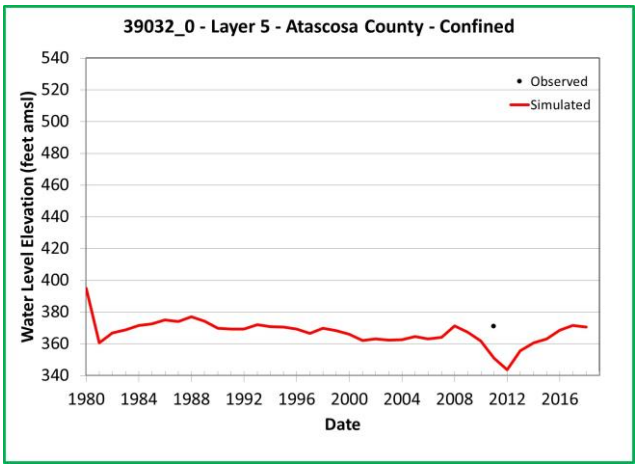












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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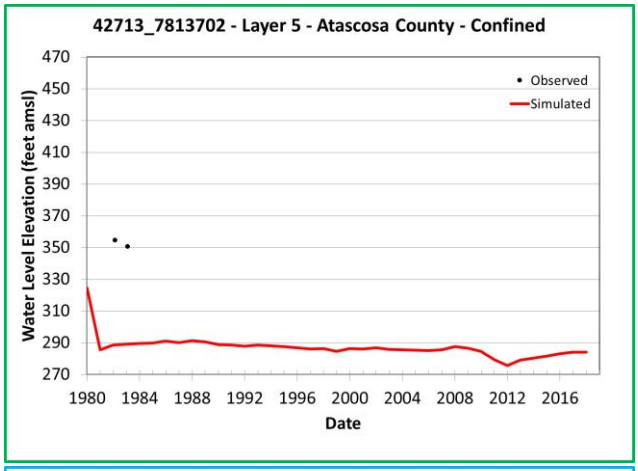
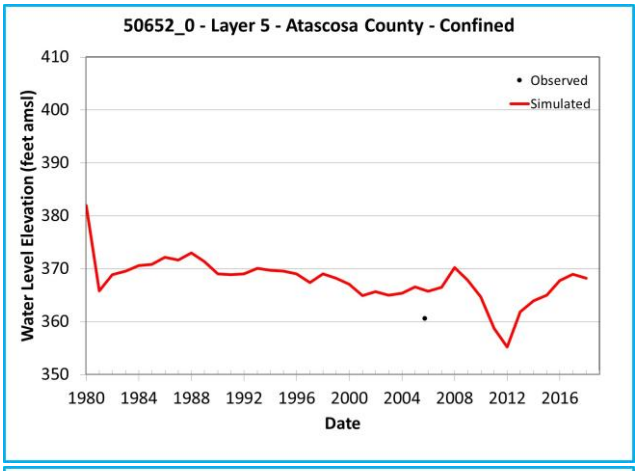
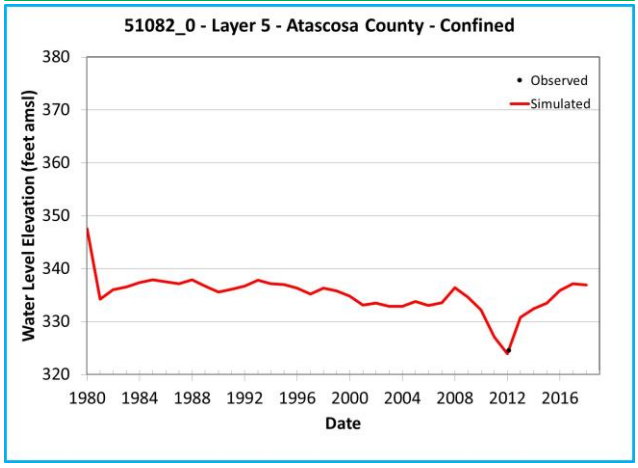
Revised		Aprv'd by	SP

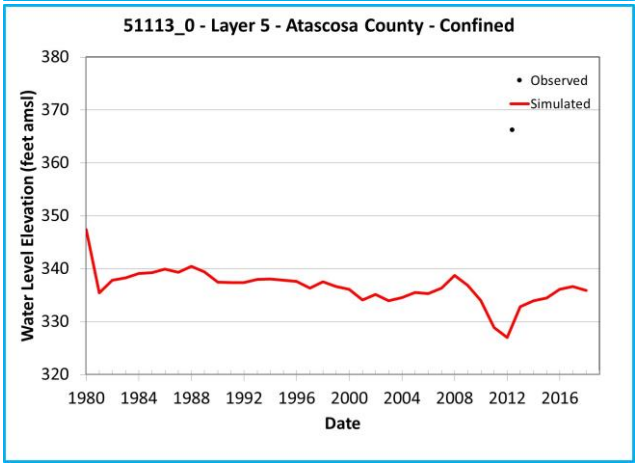
FIGURE I-1.2e

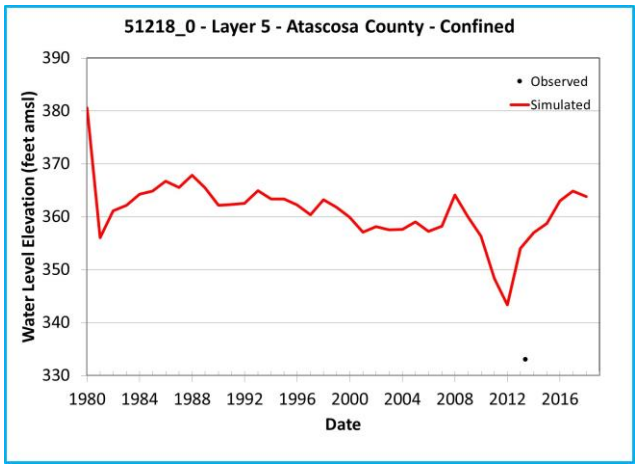
GSI ENVIRONMENTAL

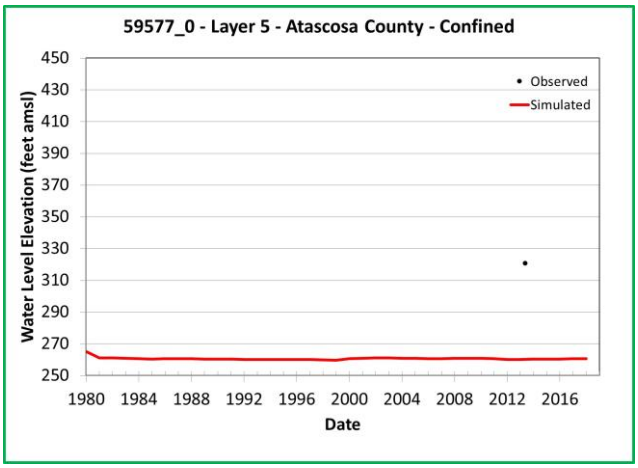












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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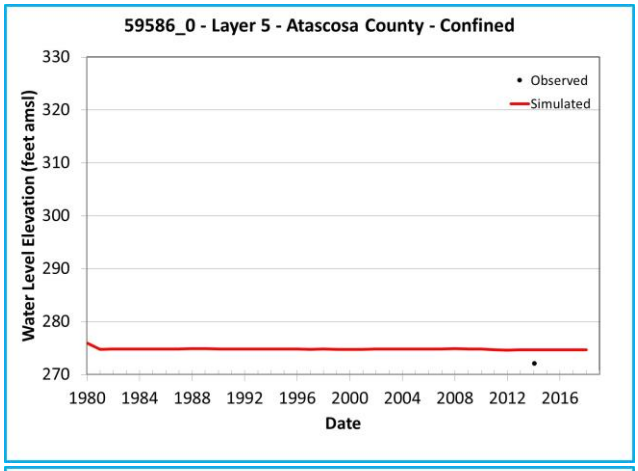
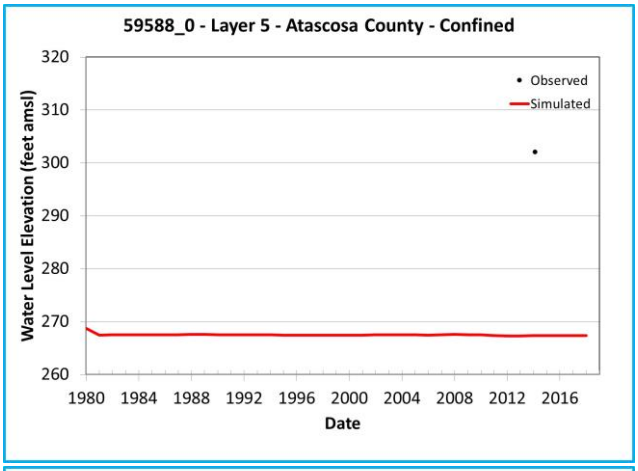
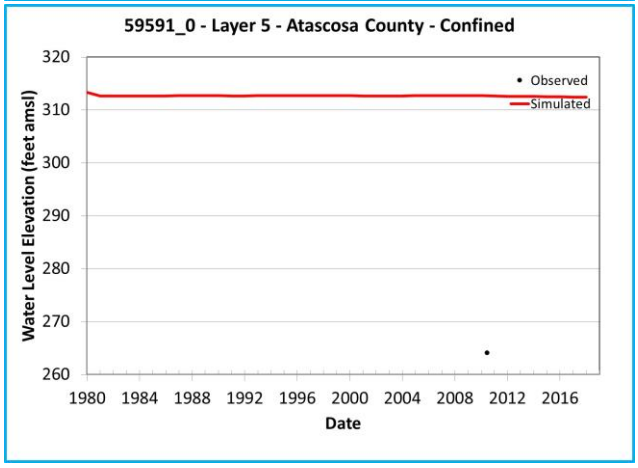
Revised		Aprv'd by	SP

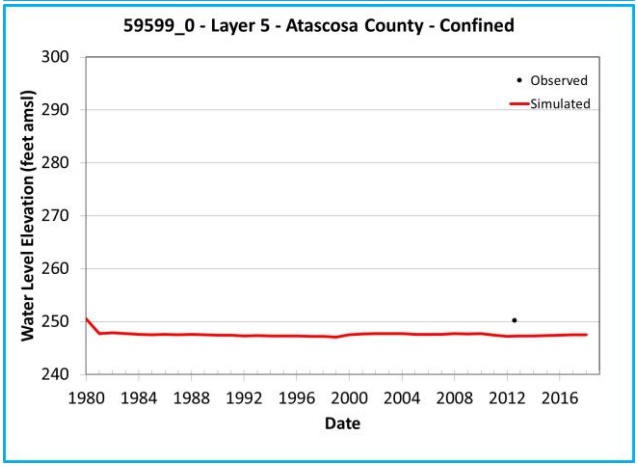
FIGURE I-1.2f

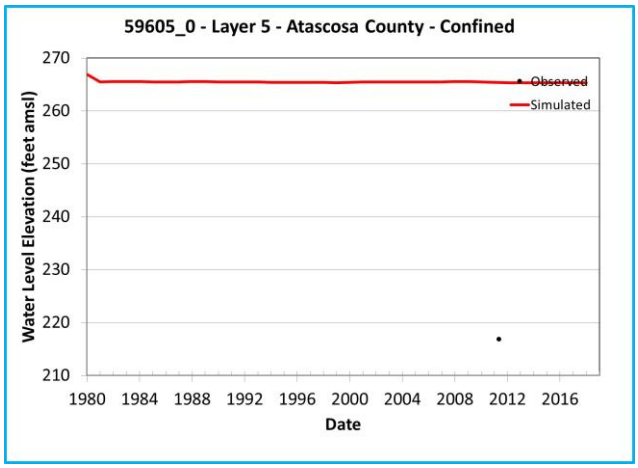
GSI ENVIRONMENTAL

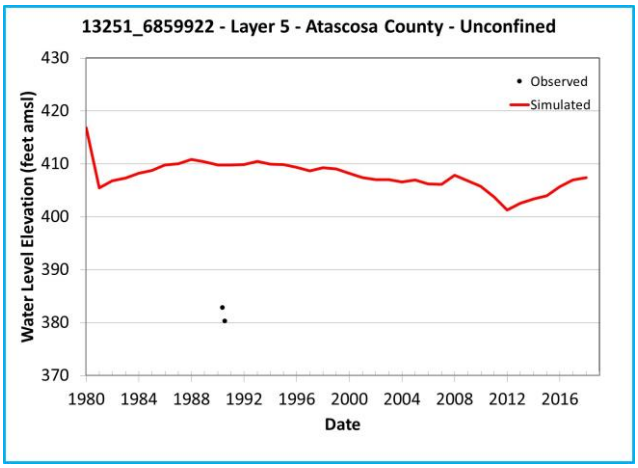












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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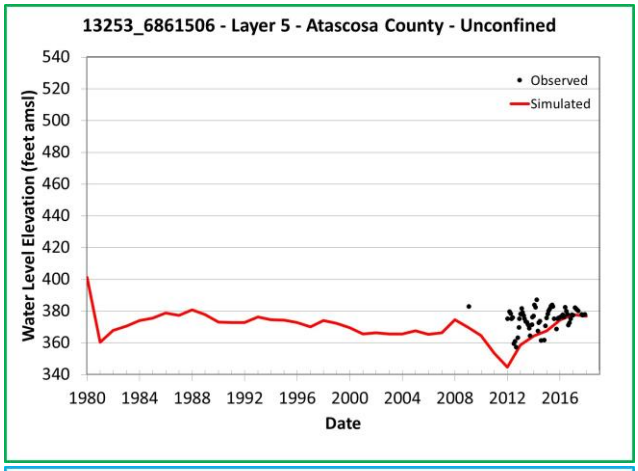
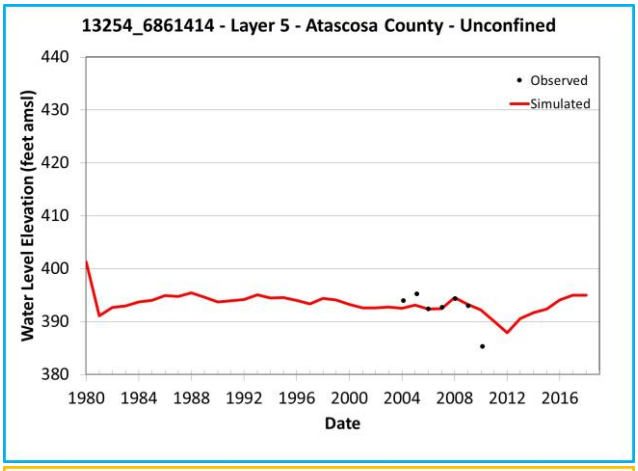
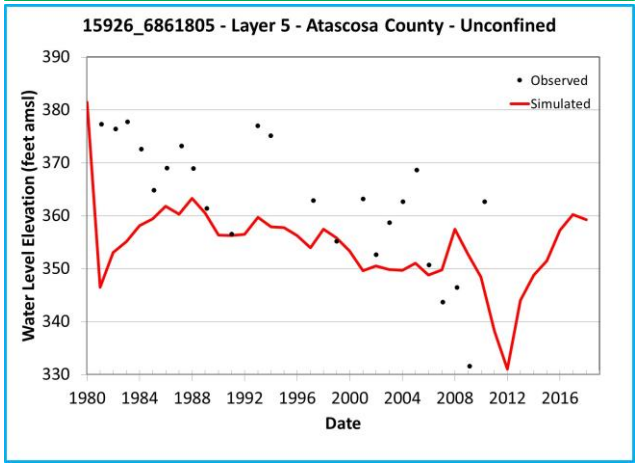
Revised		Aprv'd by	SP

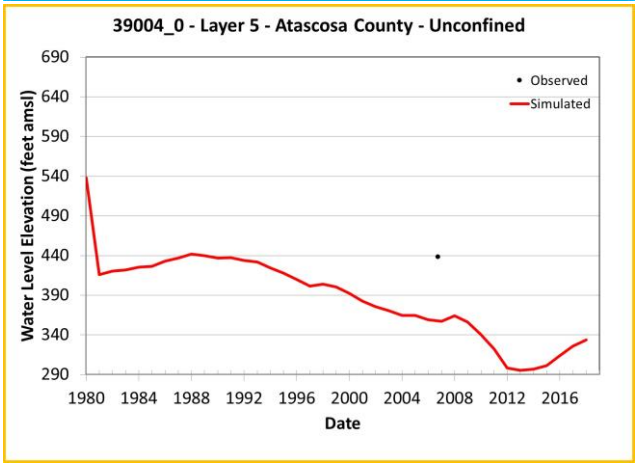
FIGURE I-1.2g

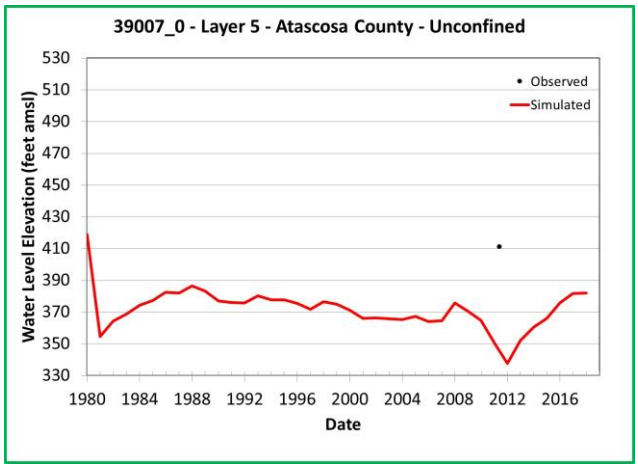
GSI ENVIRONMENTAL

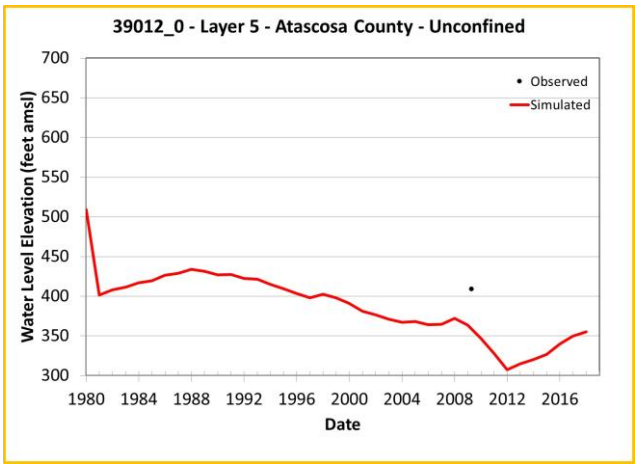












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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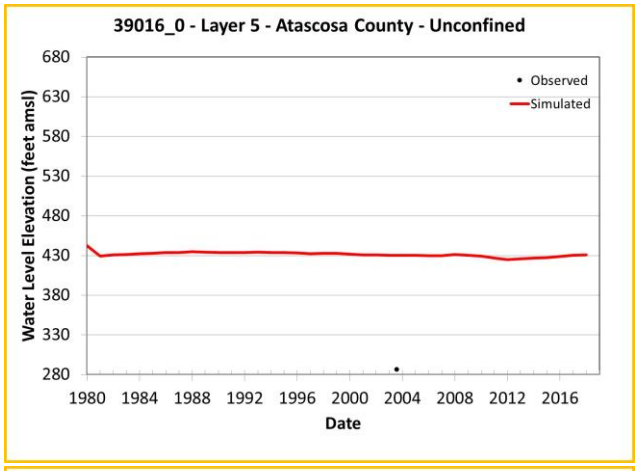
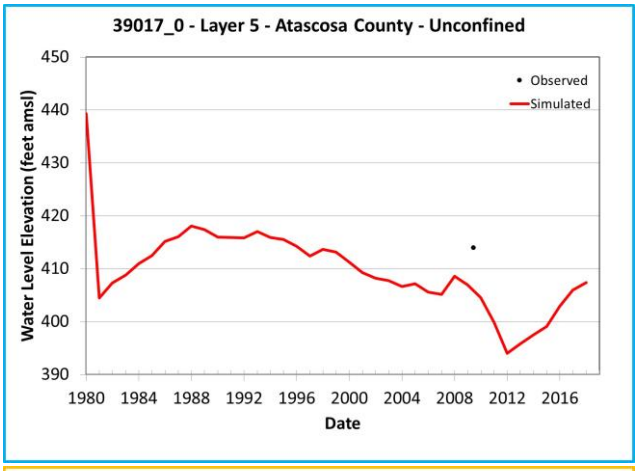
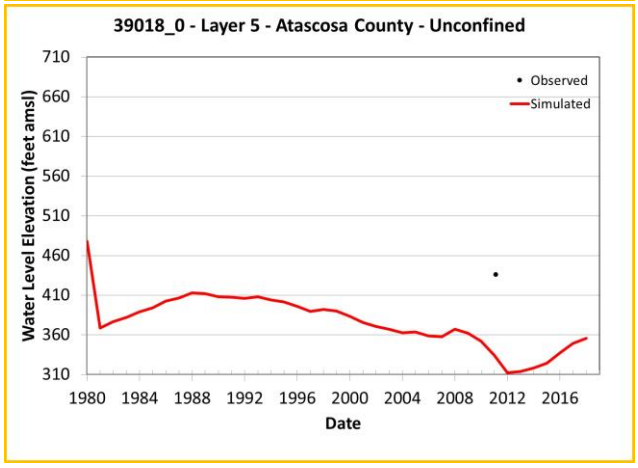
Revised		Aprv'd by	SP

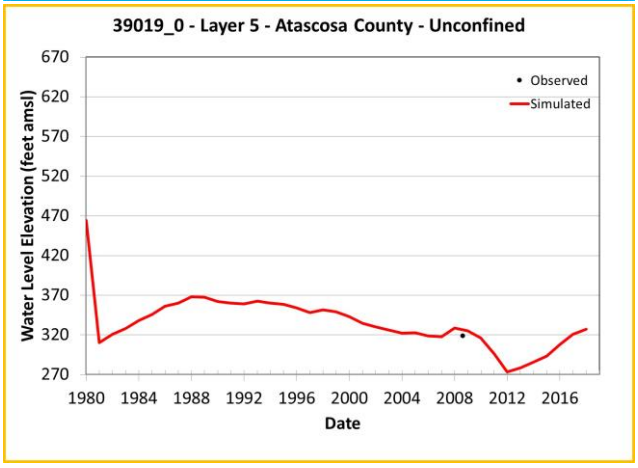
FIGURE I-1.2h

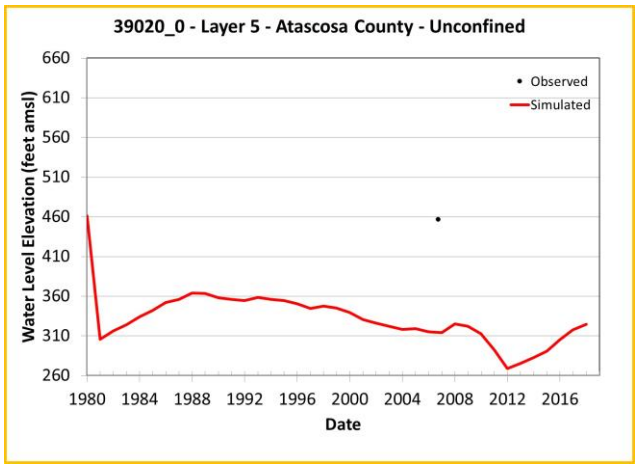
GSI ENVIRONMENTAL

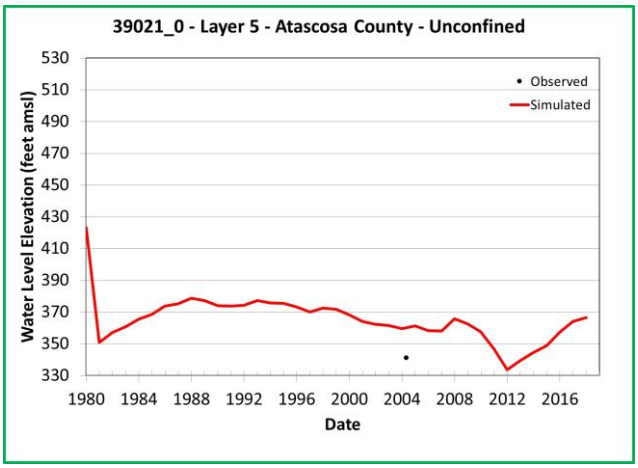












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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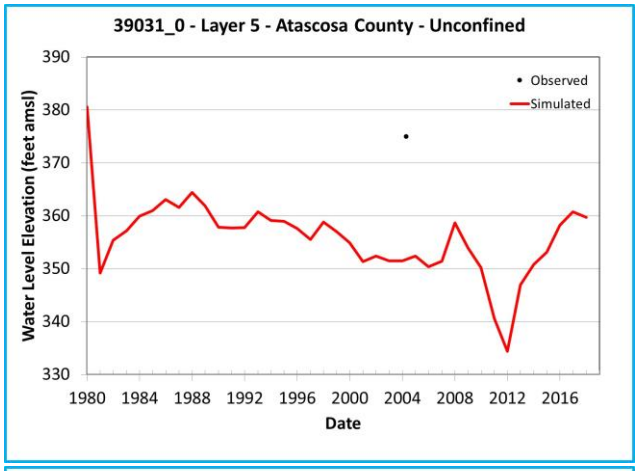
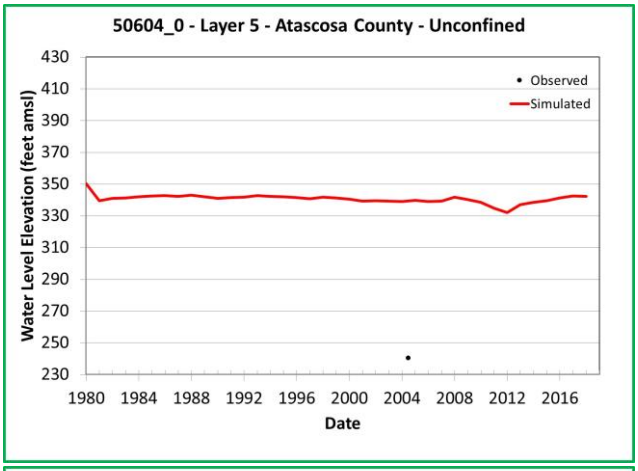
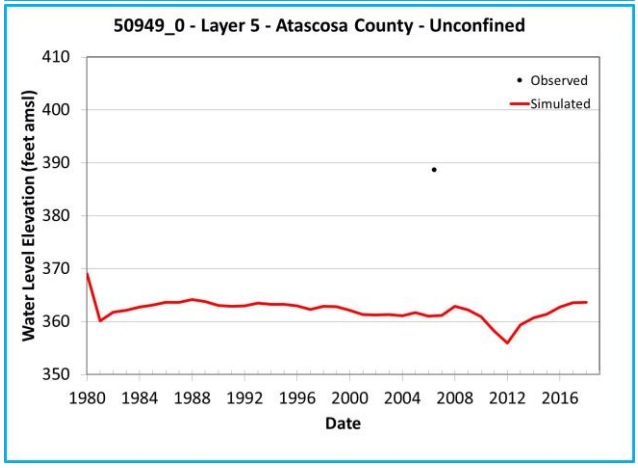
Revised		Aprv'd by	SP

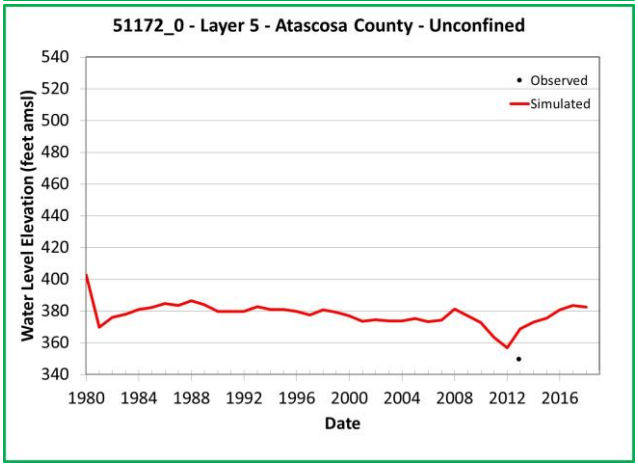
FIGURE I-1.2i

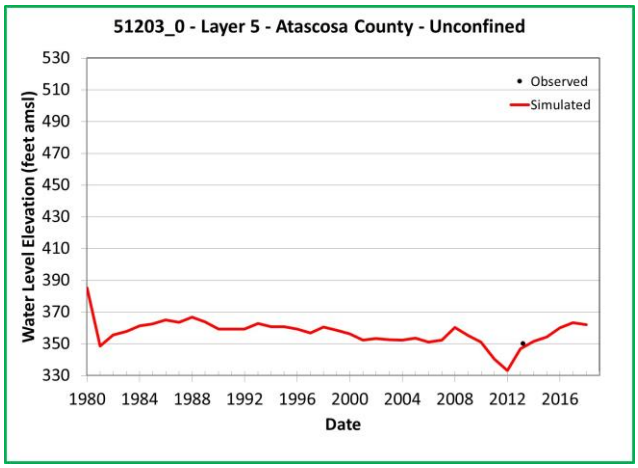
GSI ENVIRONMENTAL

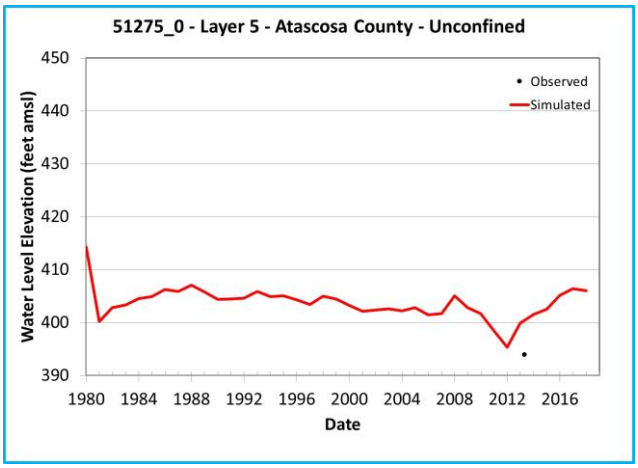












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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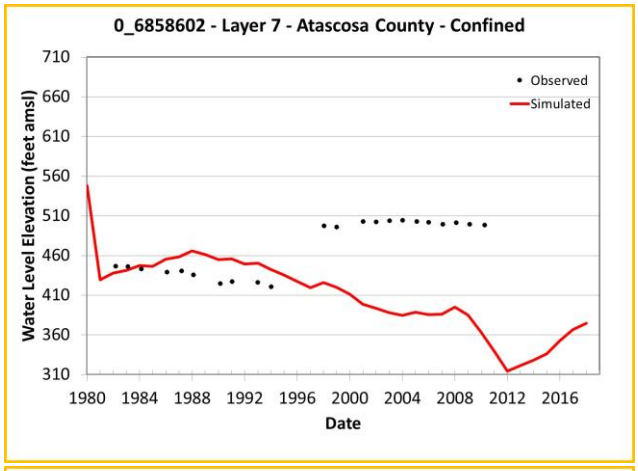
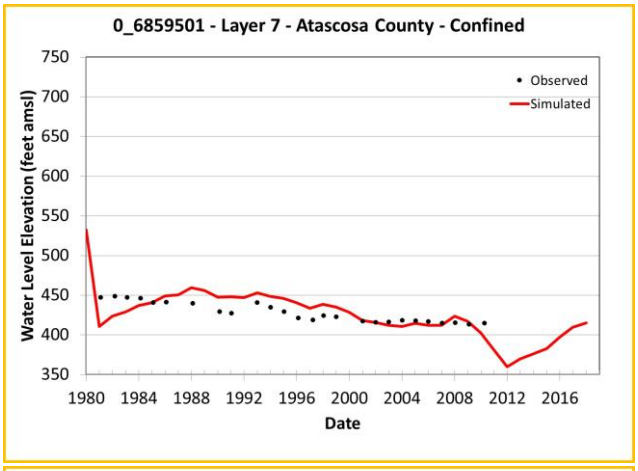
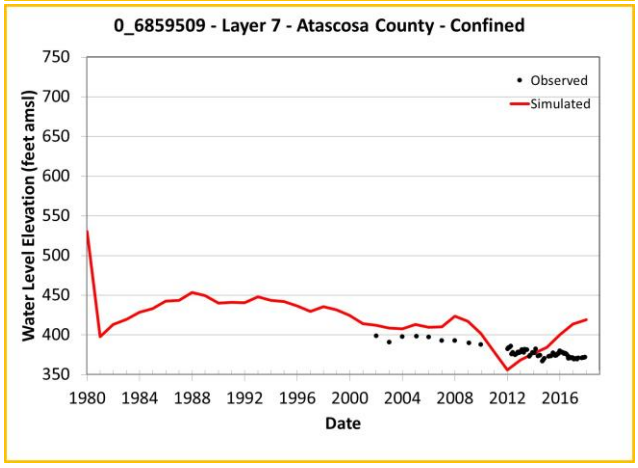
Revised		Aprv'd by	SP

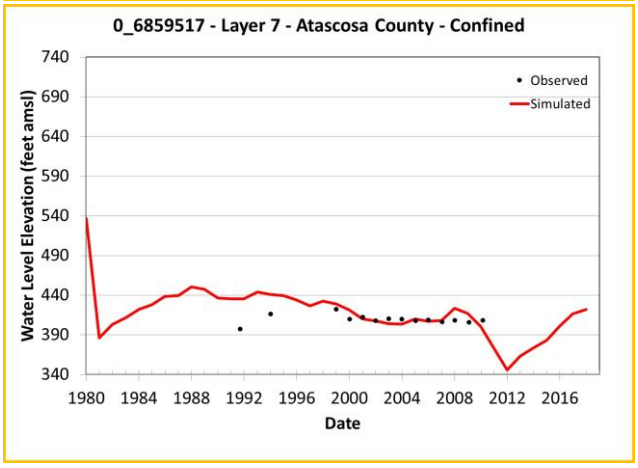
FIGURE I-1.2j

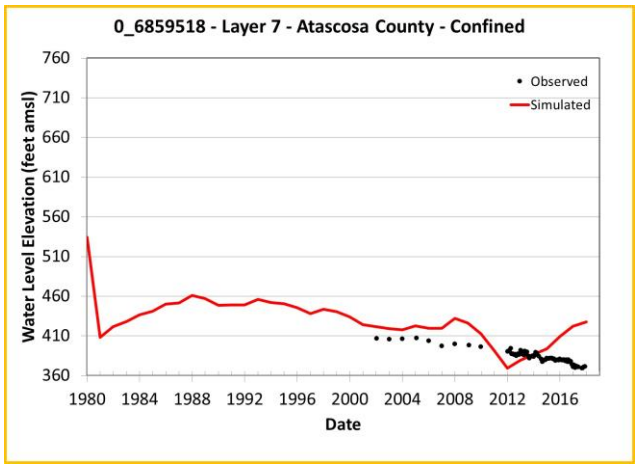
GSI ENVIRONMENTAL

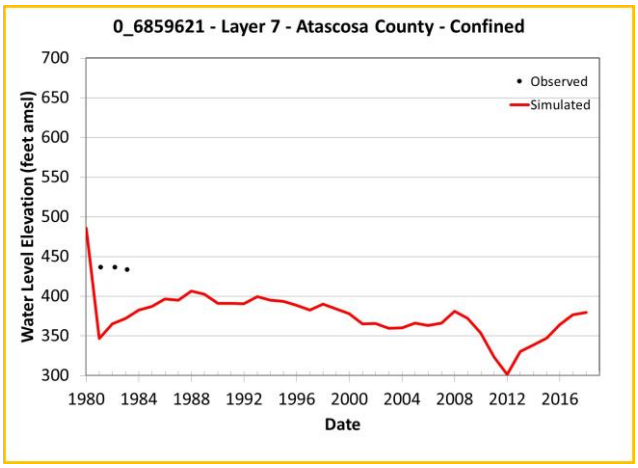












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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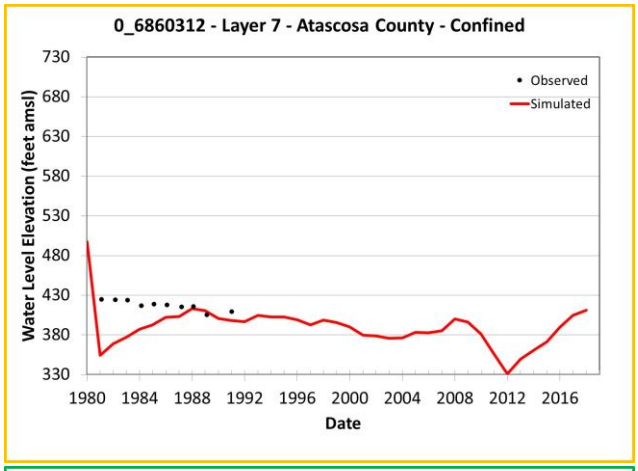
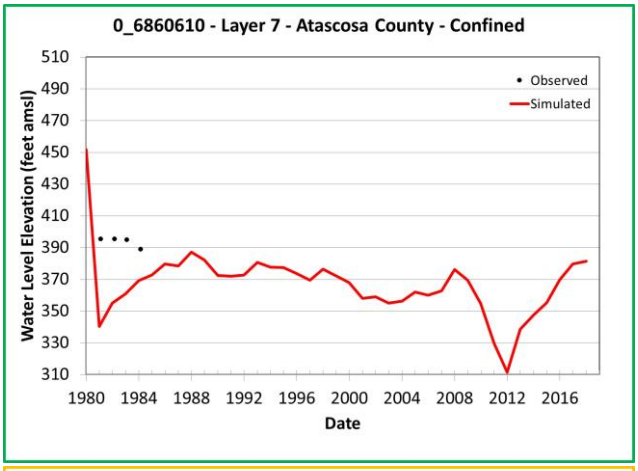
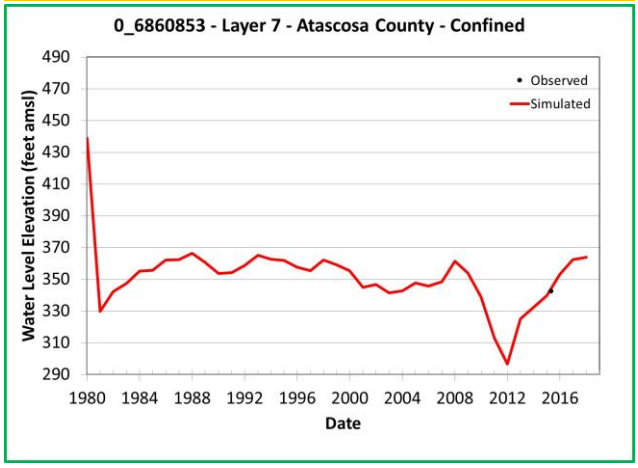
Revised		Aprv'd by	SP

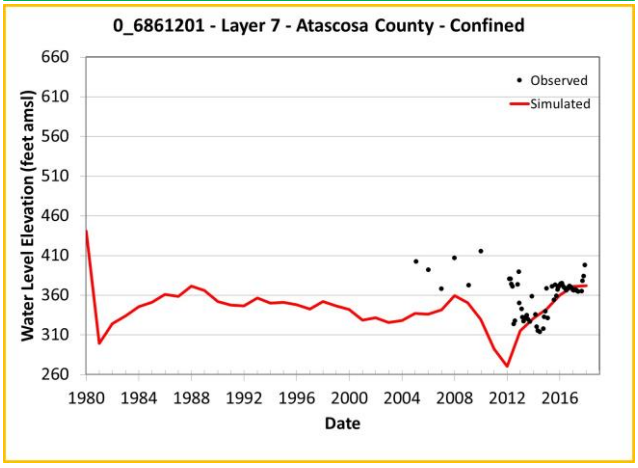
FIGURE I-1.3a

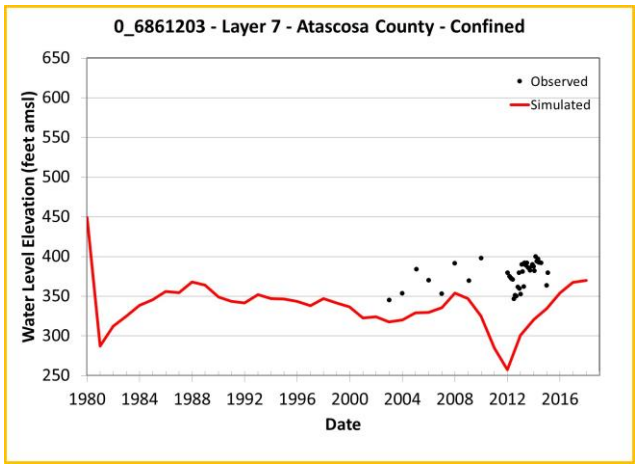
GSI ENVIRONMENTAL

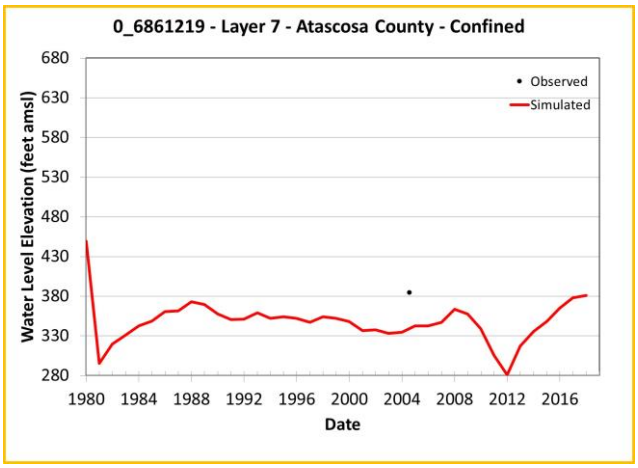












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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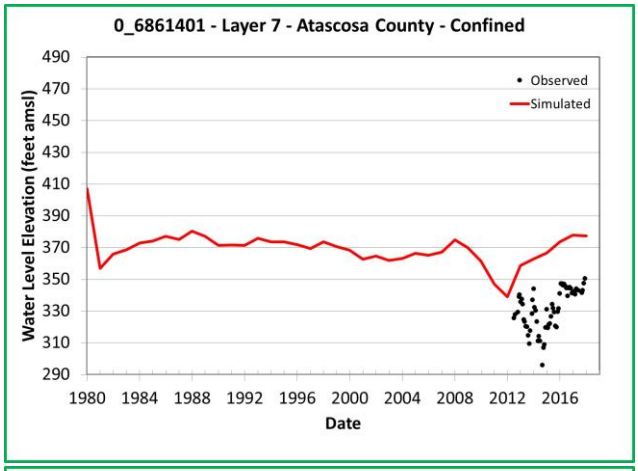
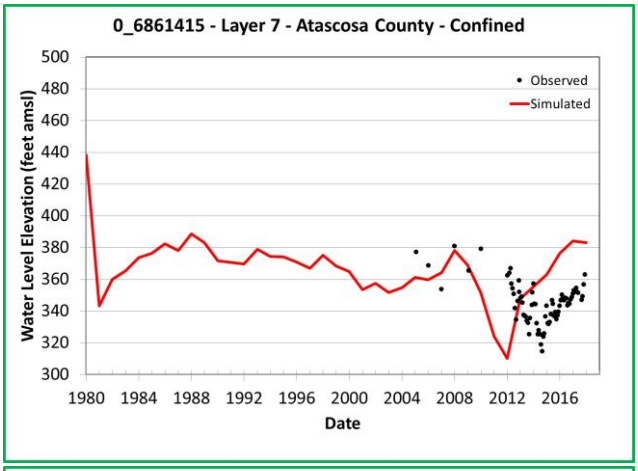
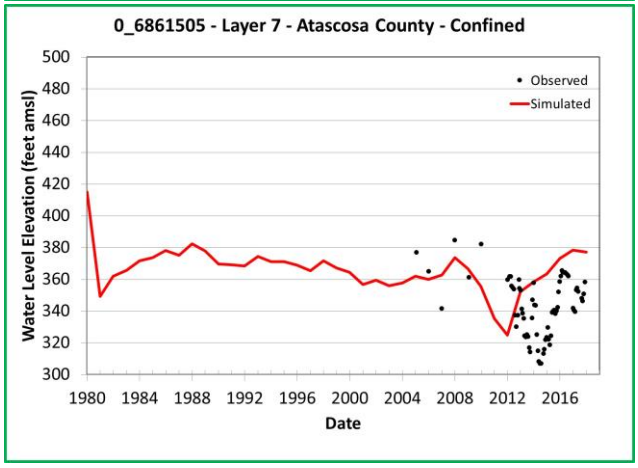
Revised		Aprv'd by	SP

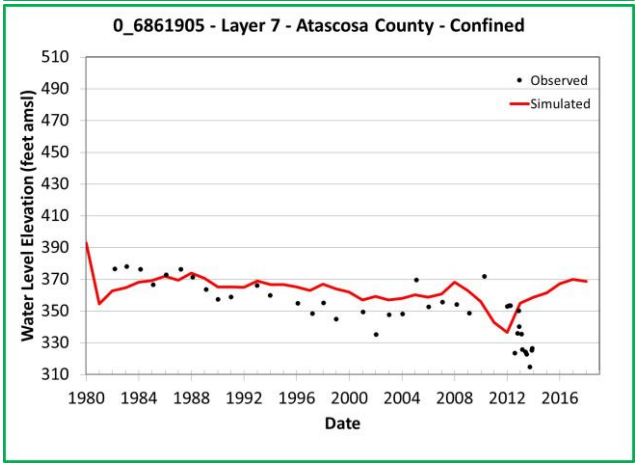
FIGURE I-1.3b

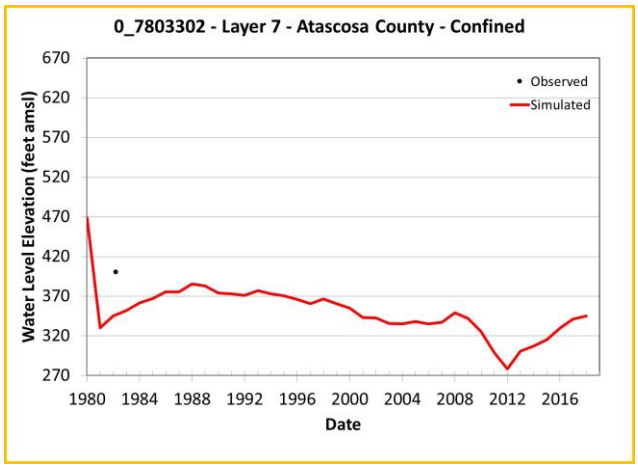
GSI ENVIRONMENTAL

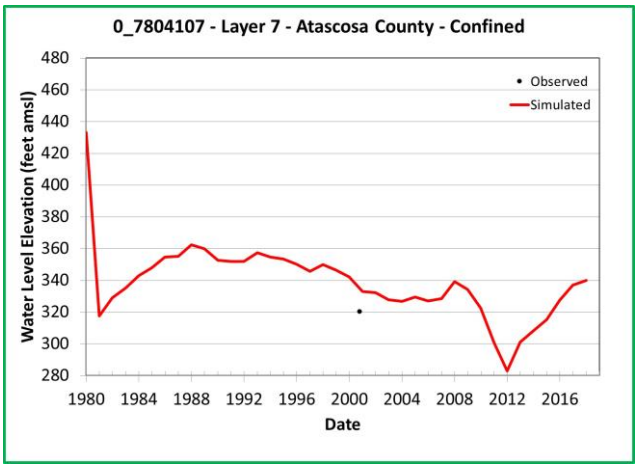












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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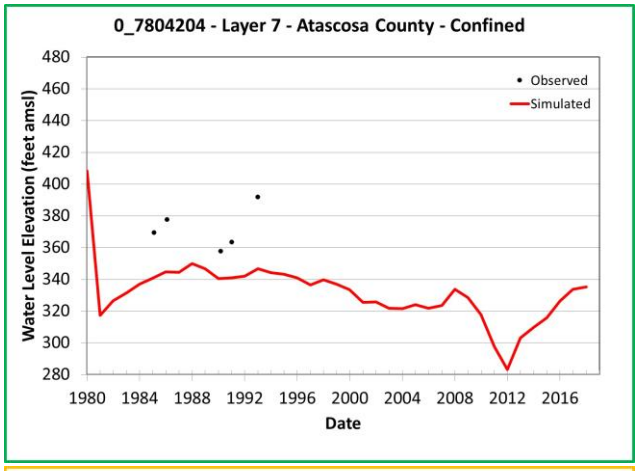
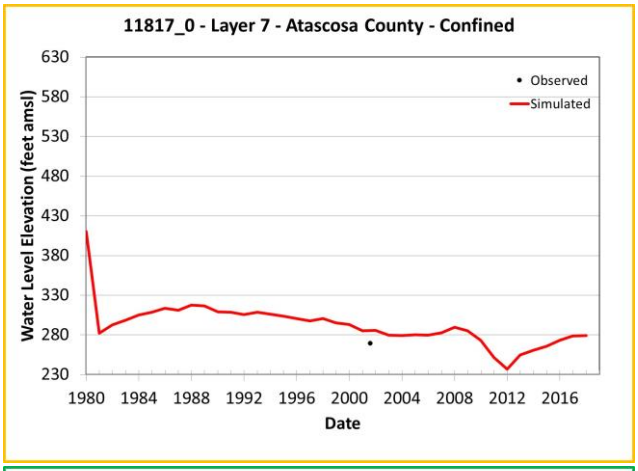
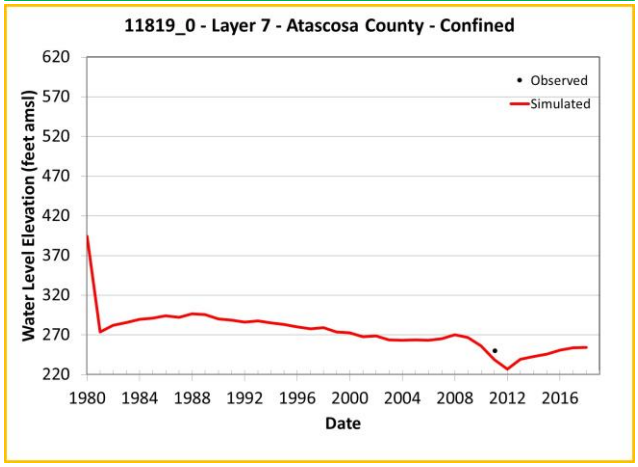
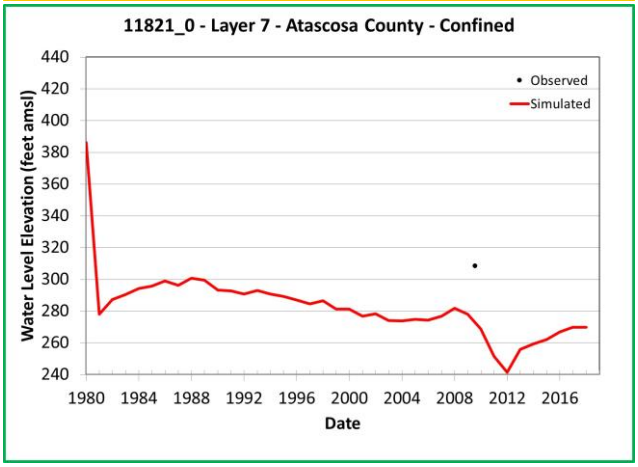
FIGURE I-1.3c

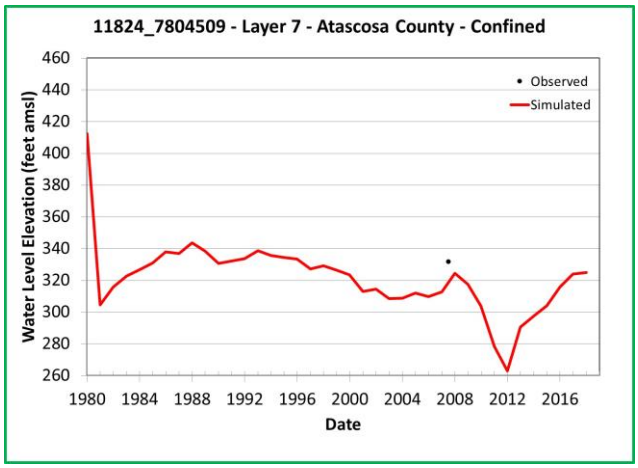
GSI ENVIRONMENTAL

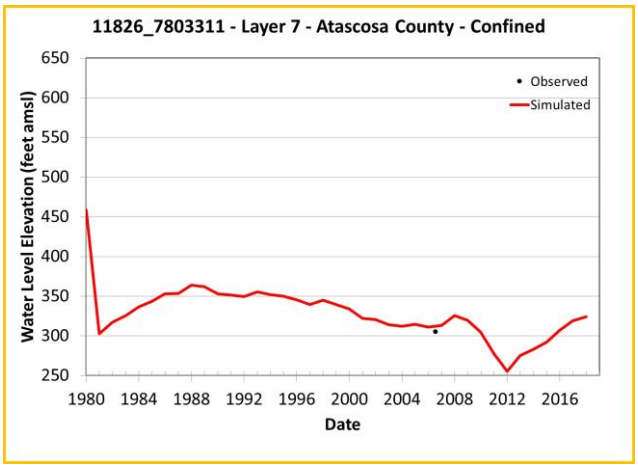












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

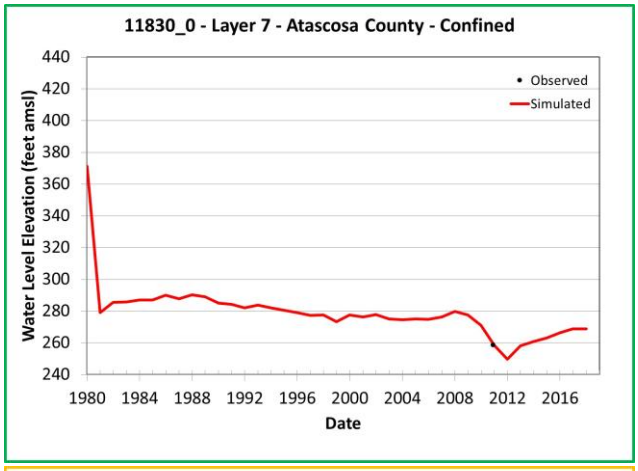
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

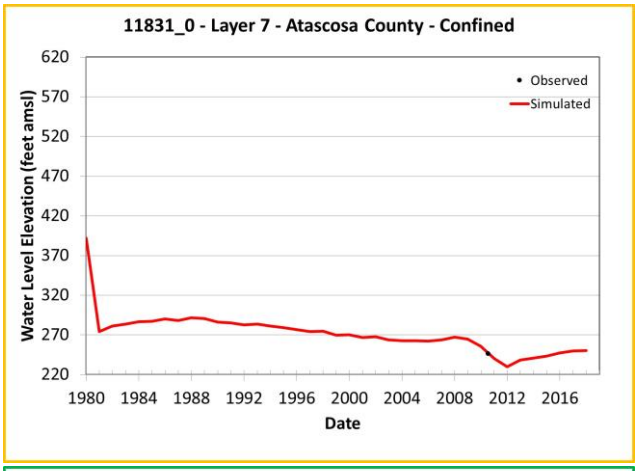
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

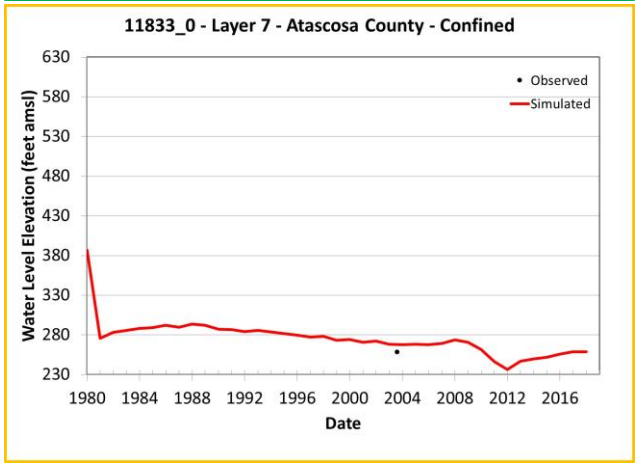
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

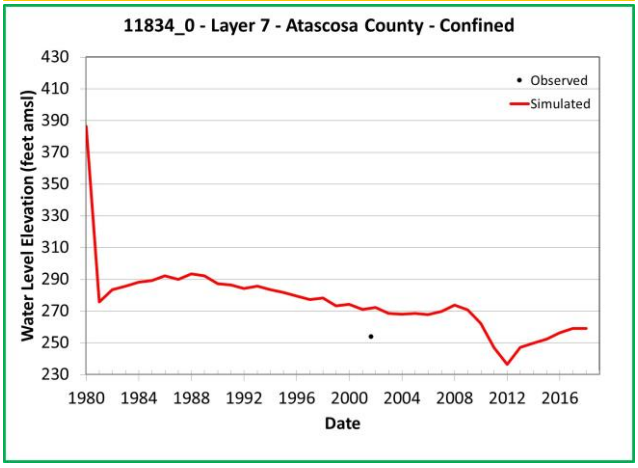
FIGURE I-1.3d

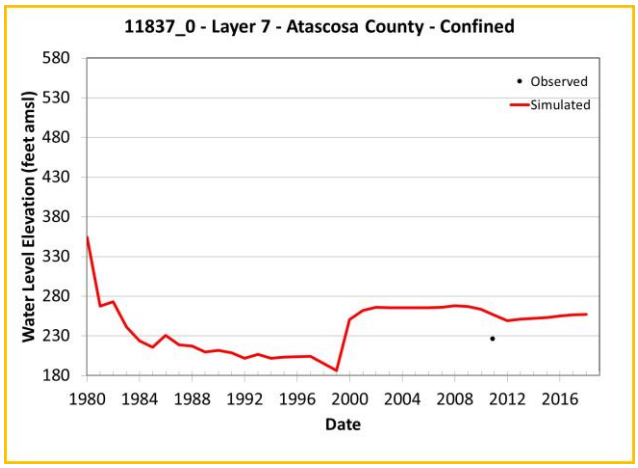
GSI ENVIRONMENTAL

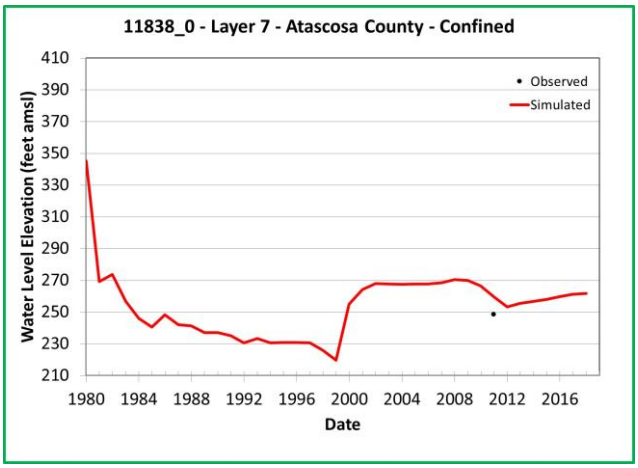












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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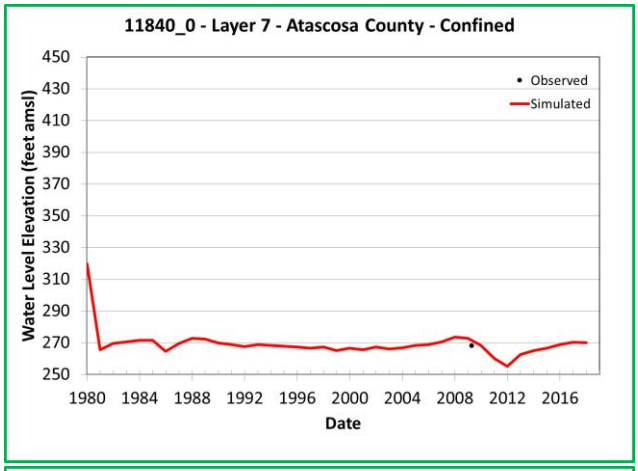
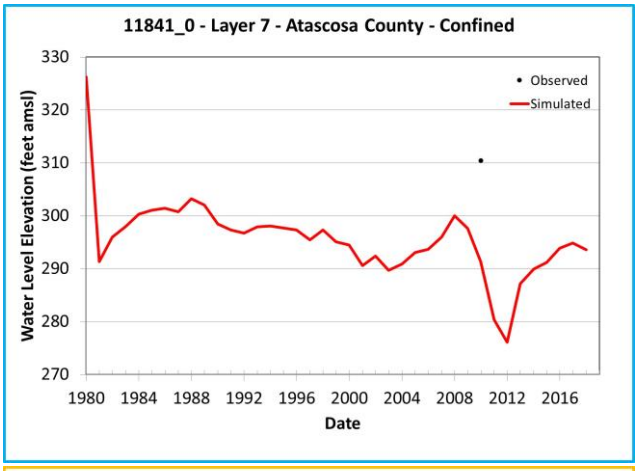
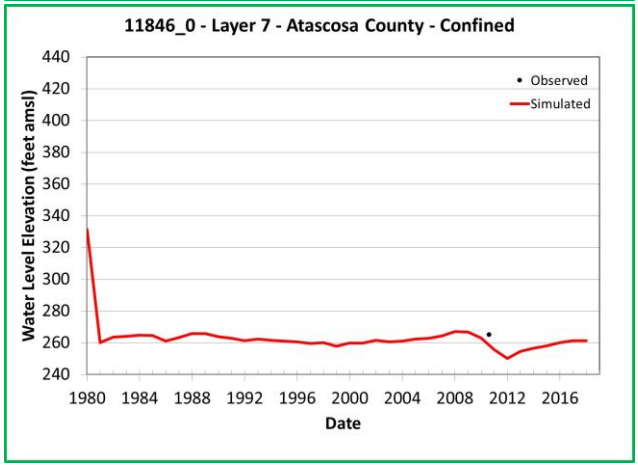
Revised		Aprv'd by	SP

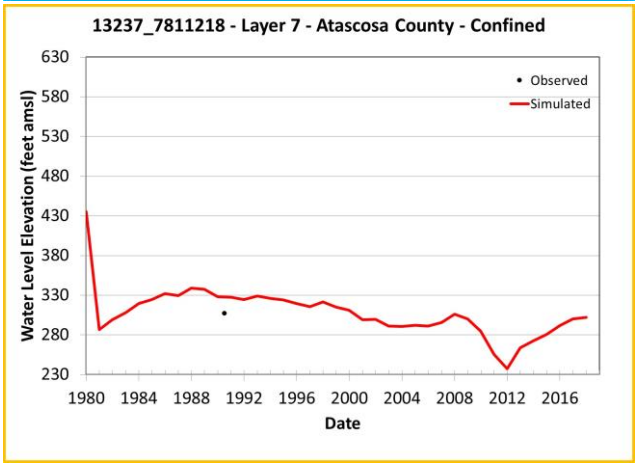
FIGURE I-1.3e

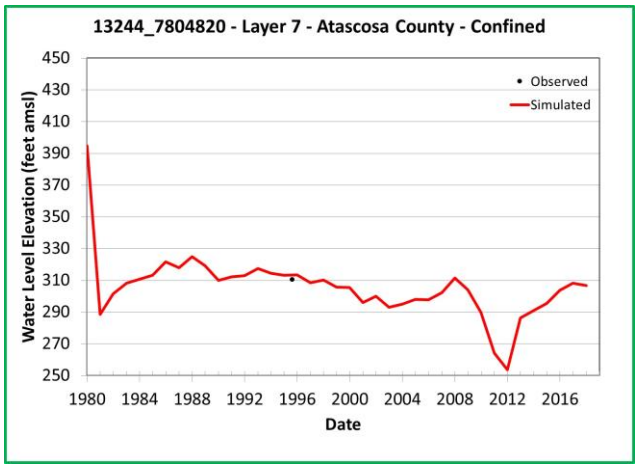
GSI ENVIRONMENTAL

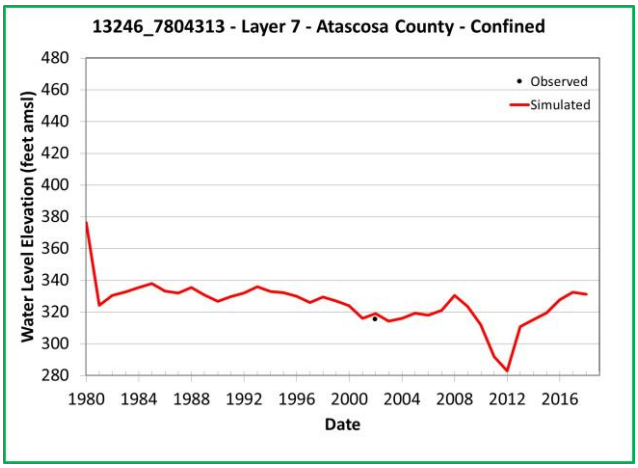












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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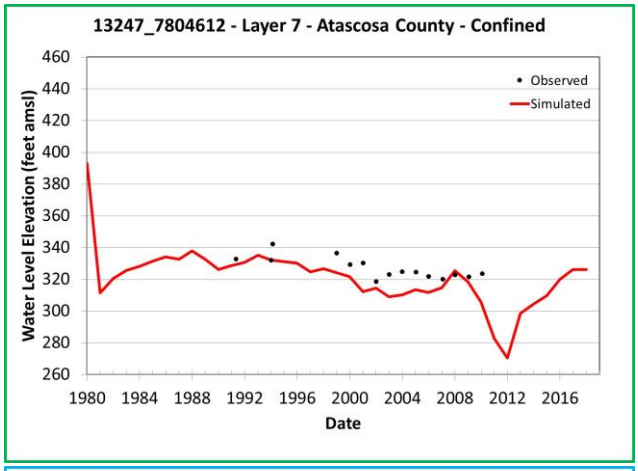
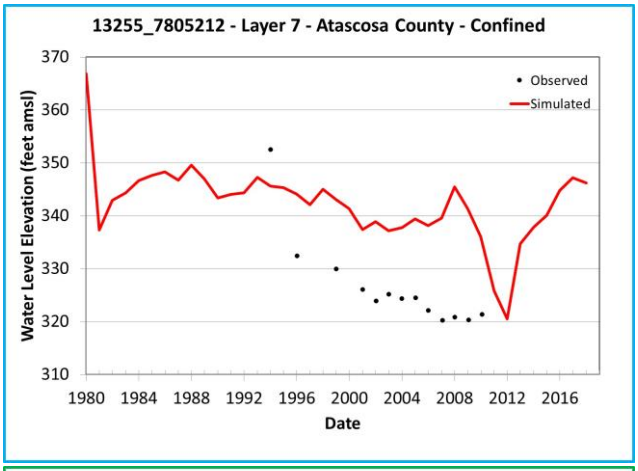
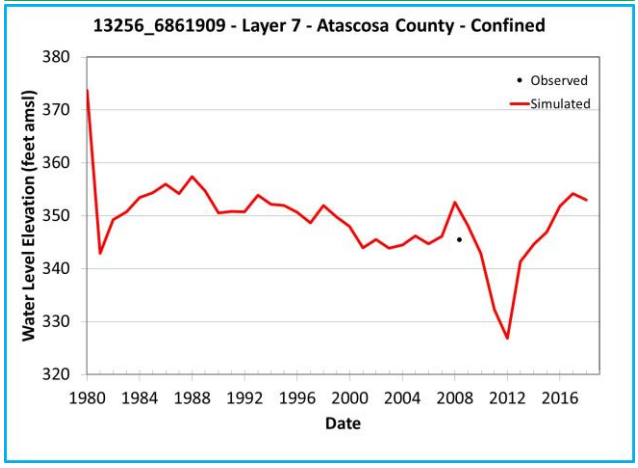
Revised		Aprv'd by	SP

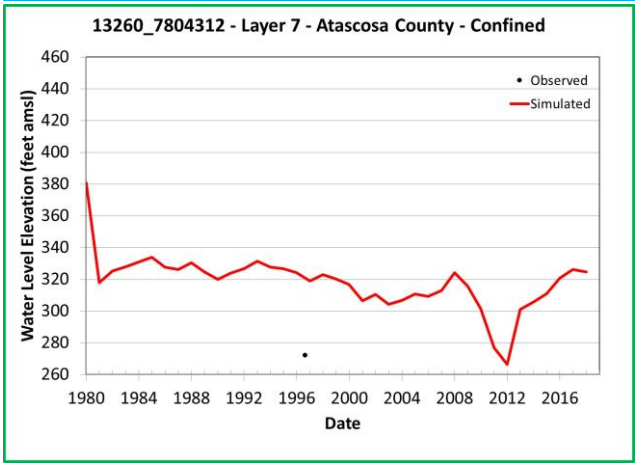
FIGURE I-1.3f

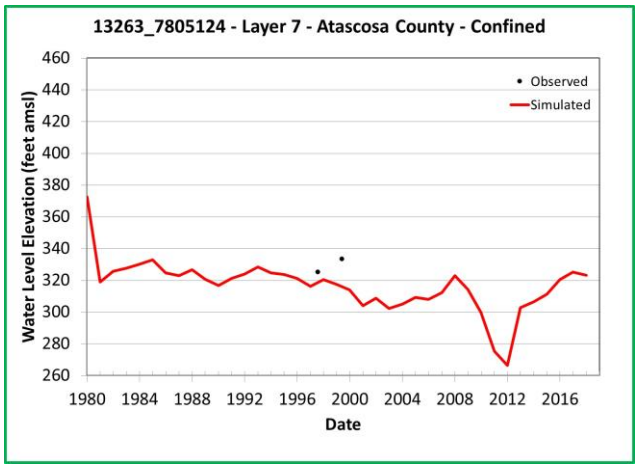
GSI ENVIRONMENTAL

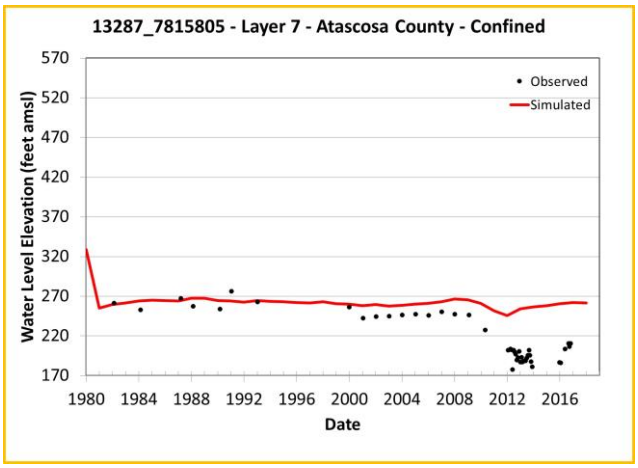












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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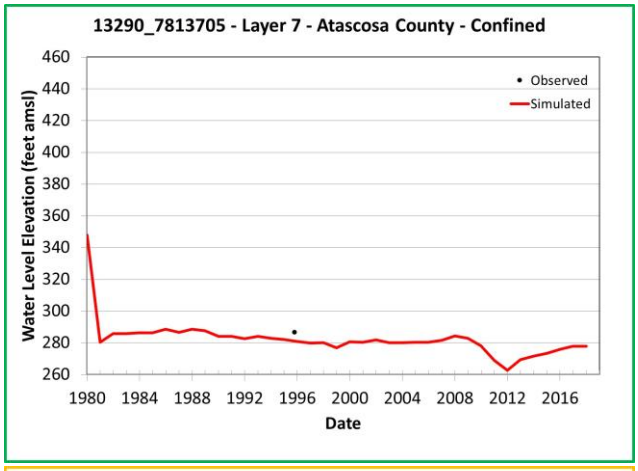
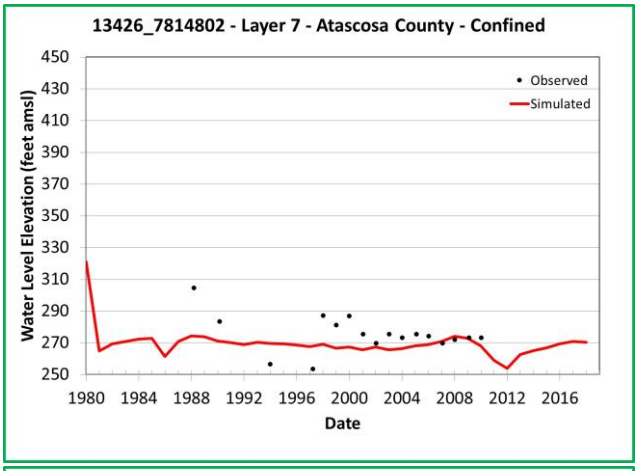
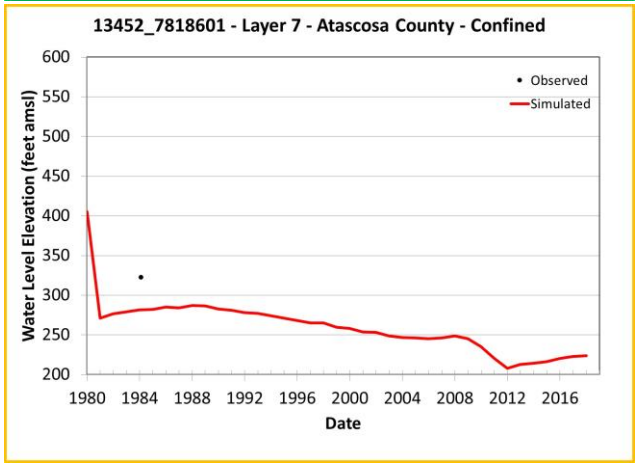
Revised		Aprv'd by	SP

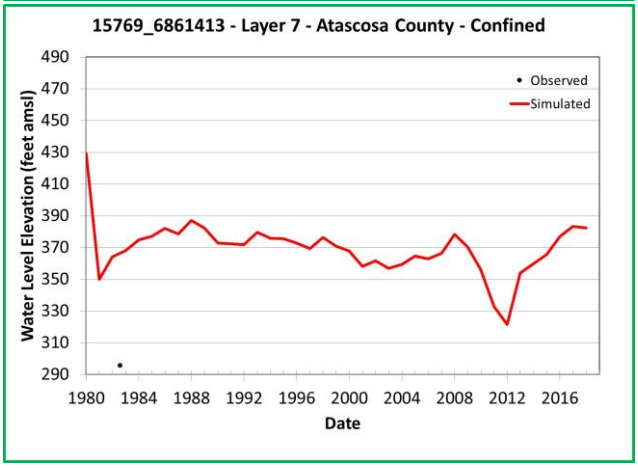
FIGURE I-1.3g

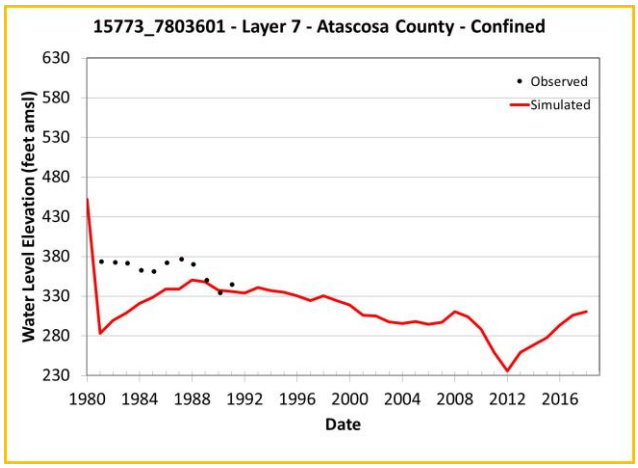
GSI ENVIRONMENTAL

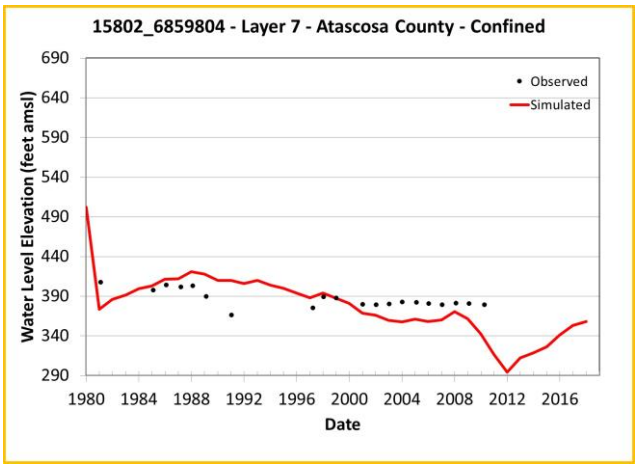












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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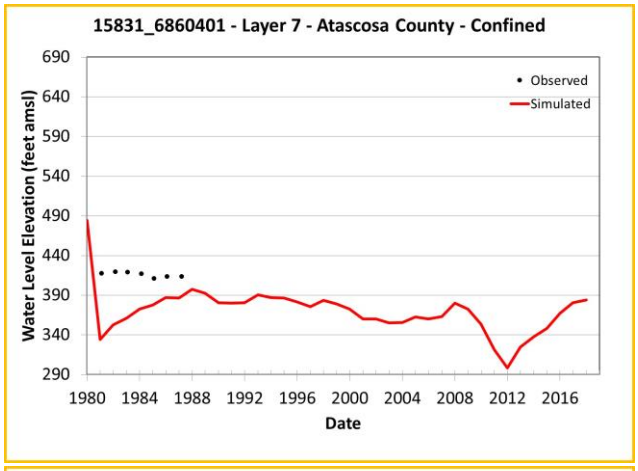
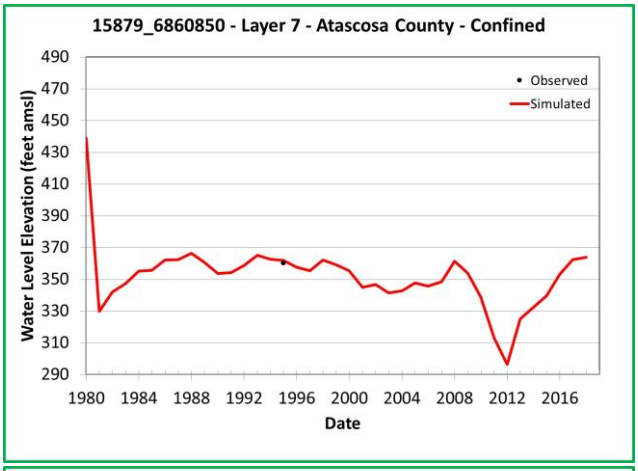
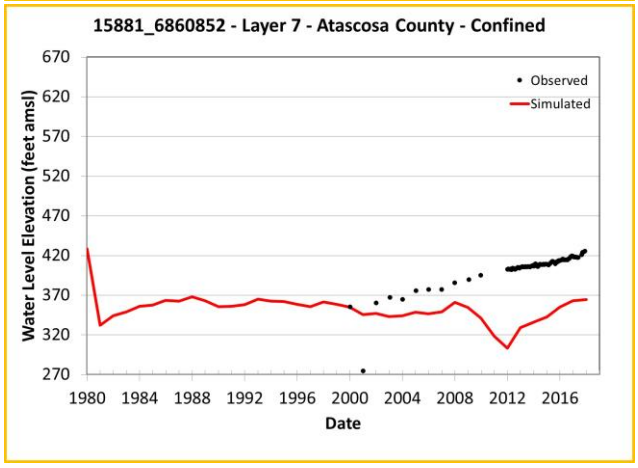
Revised		Aprv'd by	SP

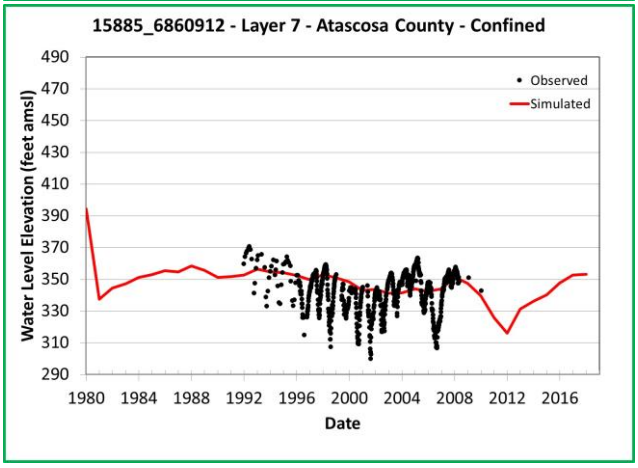
FIGURE I-1.3h

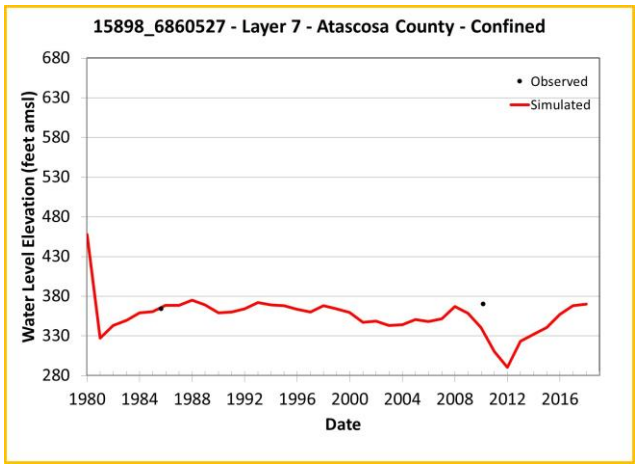
GSI ENVIRONMENTAL

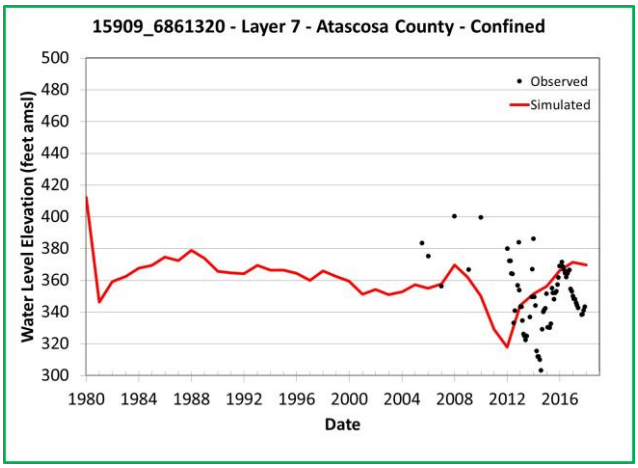












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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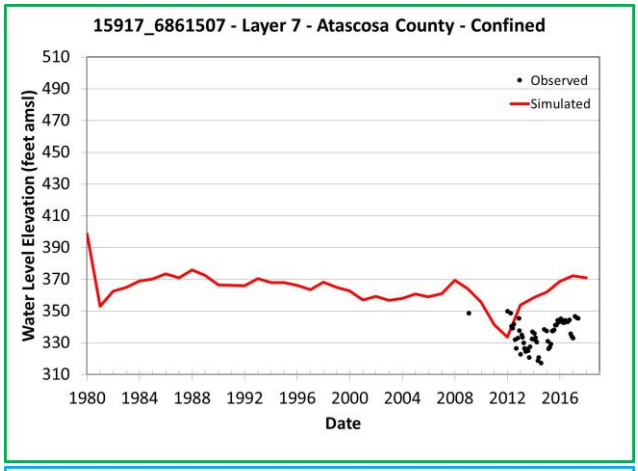
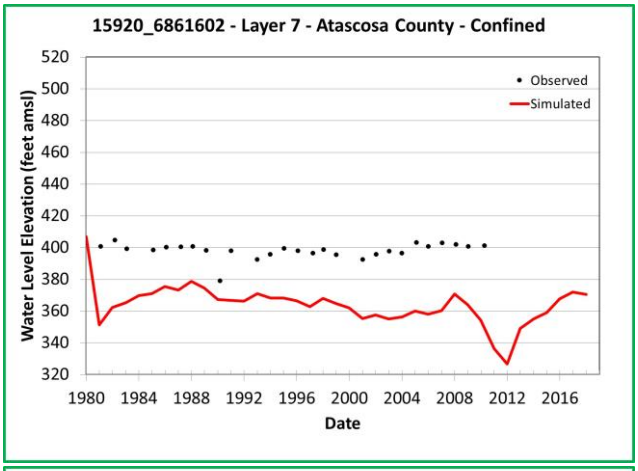
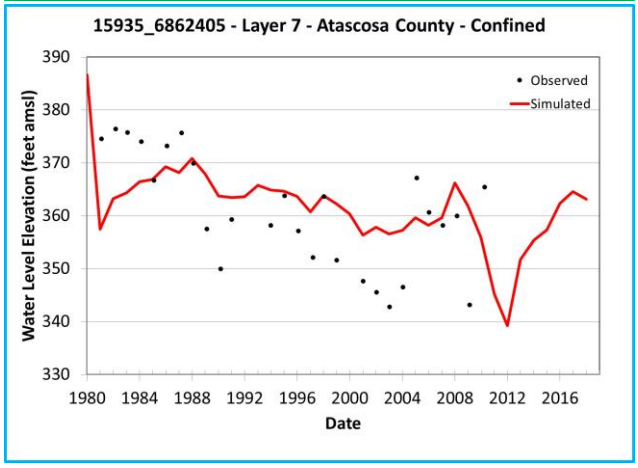
Revised		Aprv'd by	SP

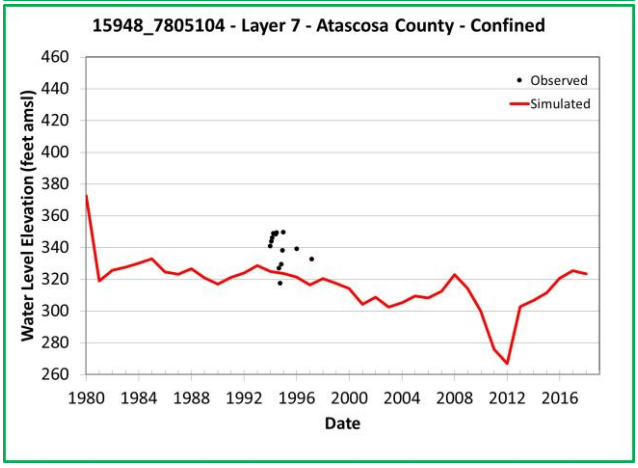
FIGURE I-1.3i

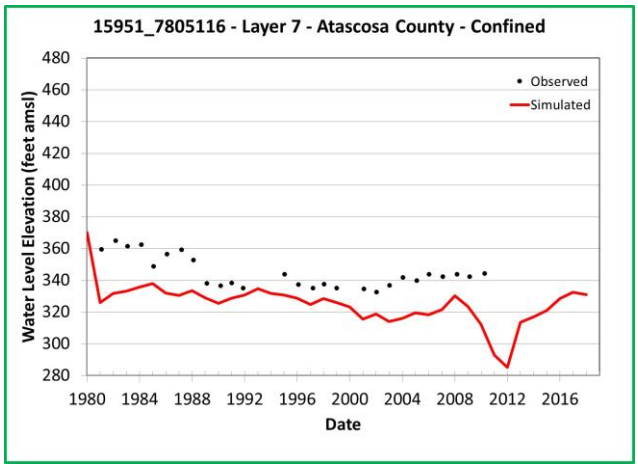
GSI ENVIRONMENTAL

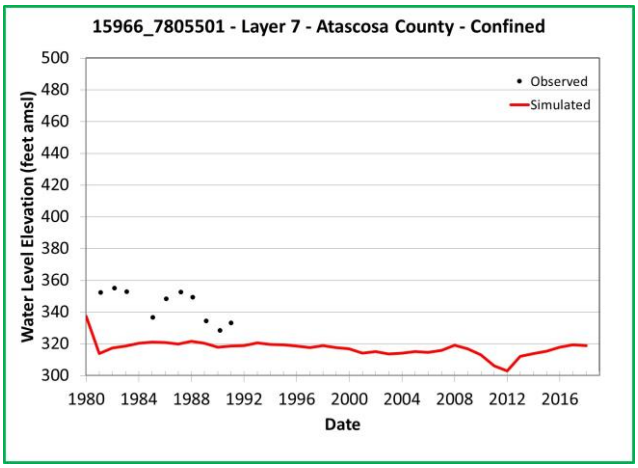












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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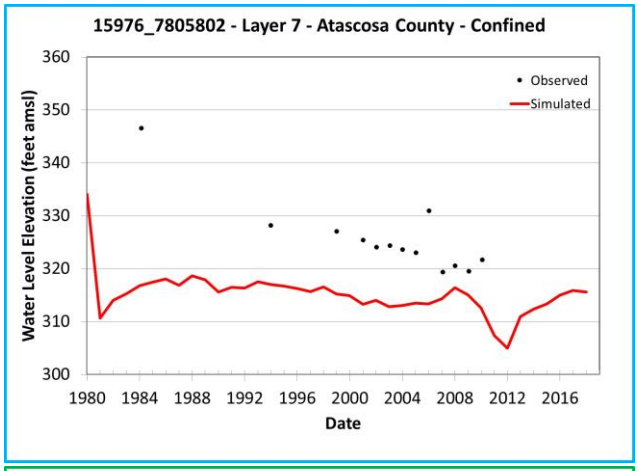
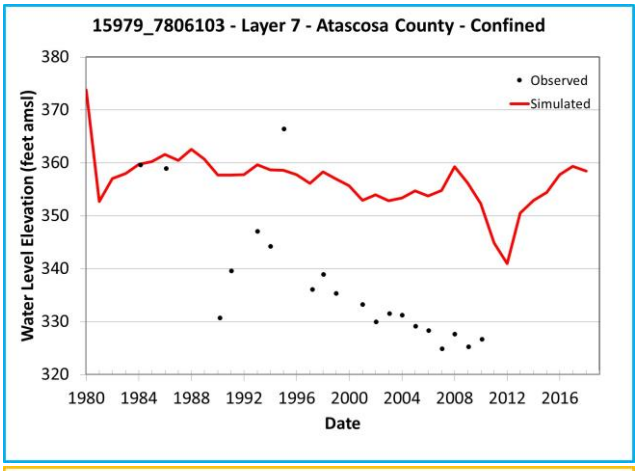
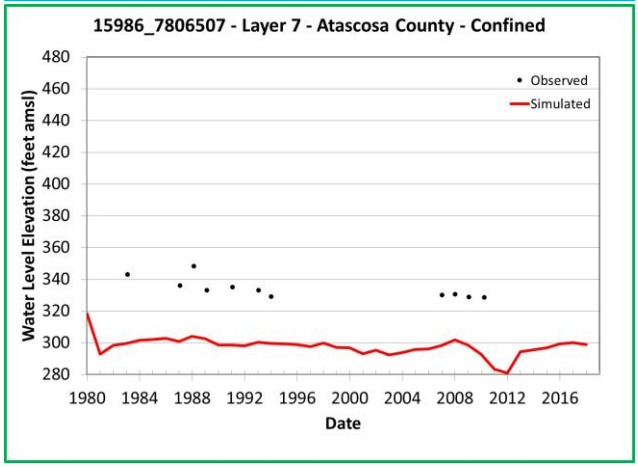
Revised		Aprv'd by	SP

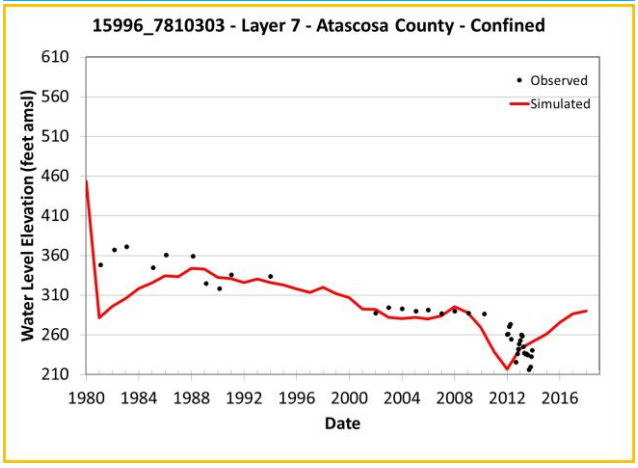
FIGURE I-1.3j

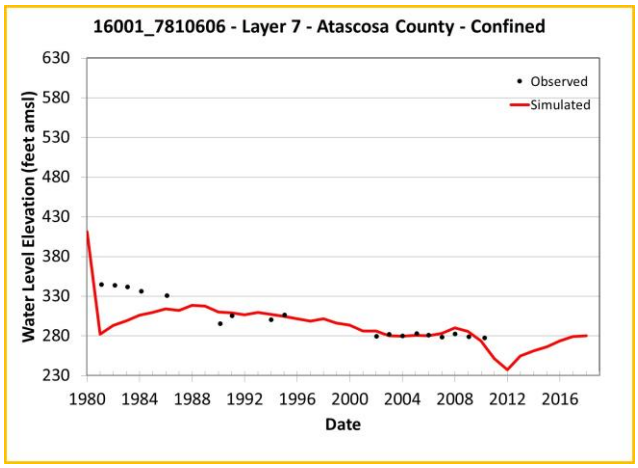
GSI ENVIRONMENTAL

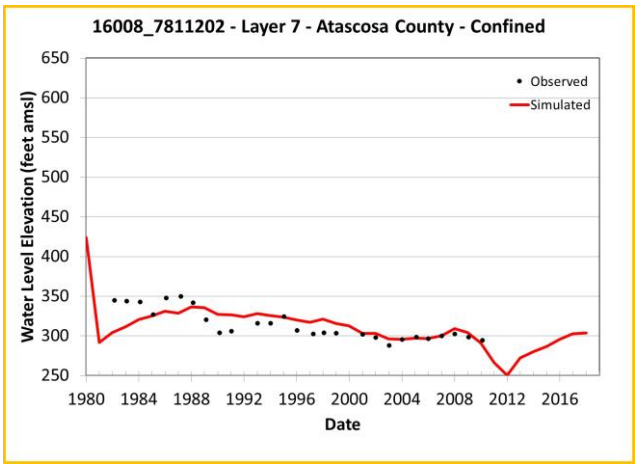












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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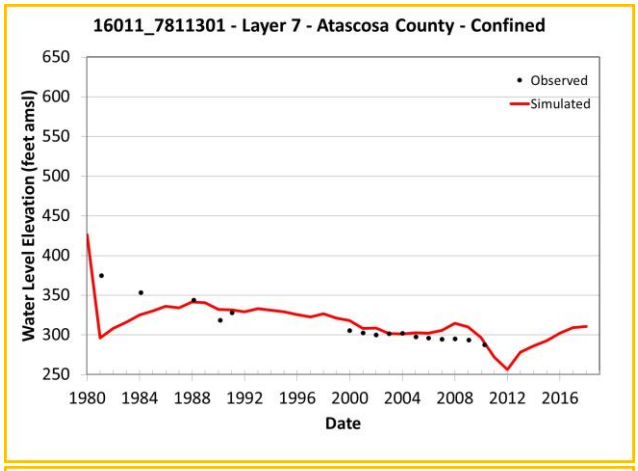
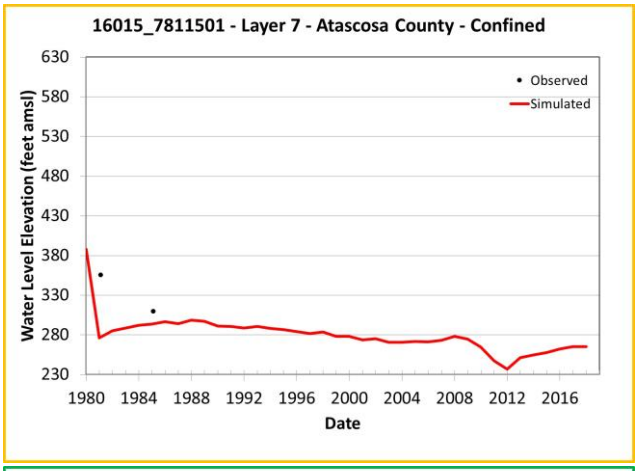
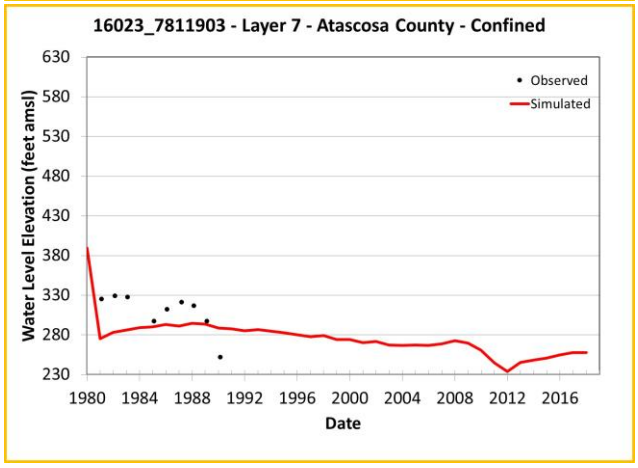
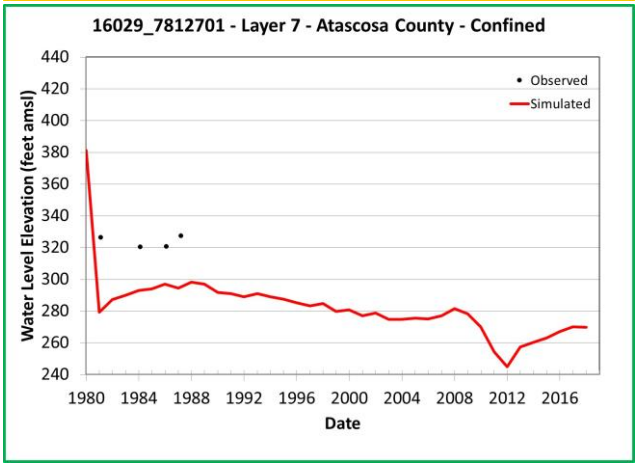
FIGURE I-1.3k

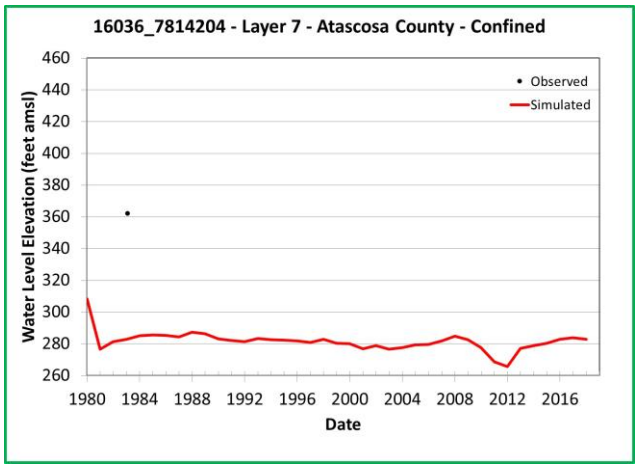
GSI ENVIRONMENTAL

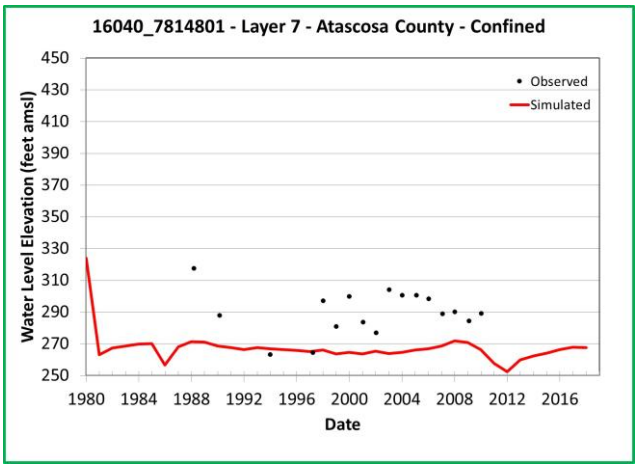












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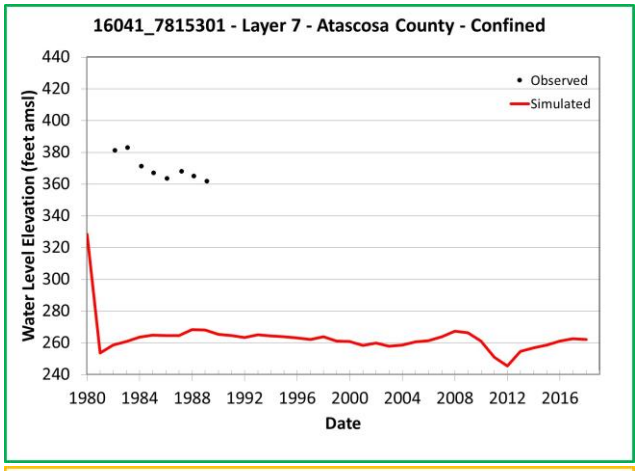
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

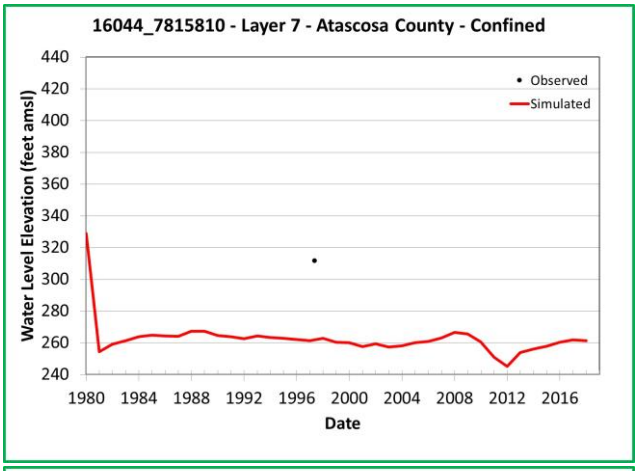
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

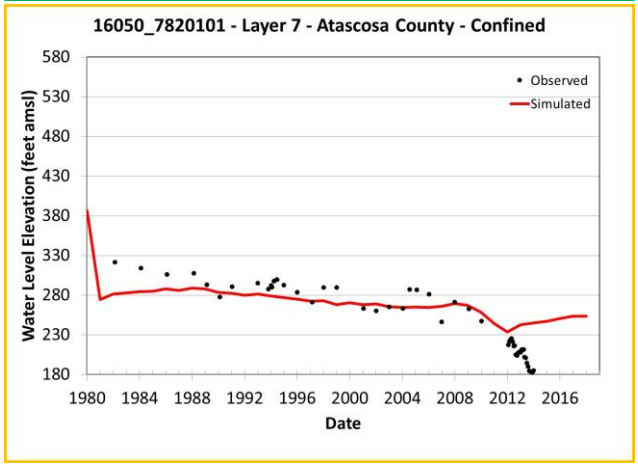
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

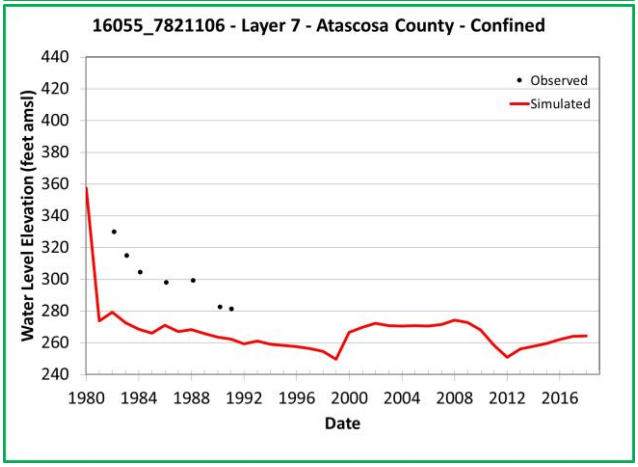
FIGURE I-1.3l

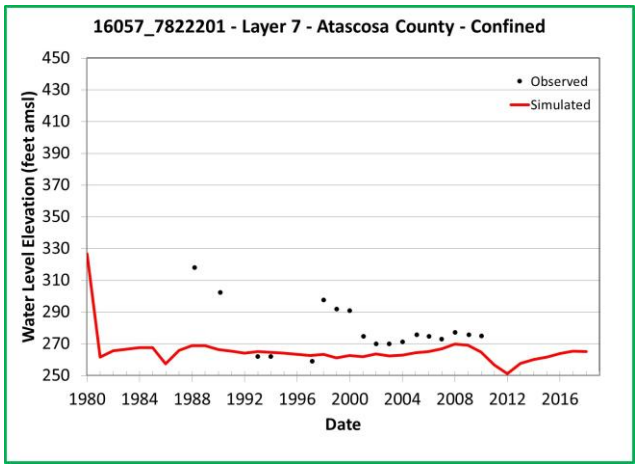
GSI ENVIRONMENTAL

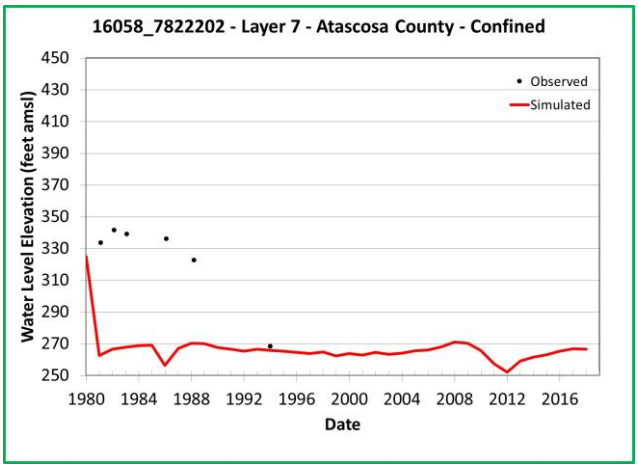












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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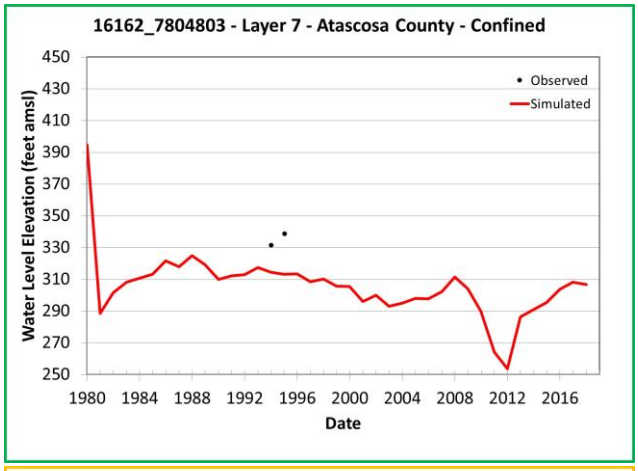
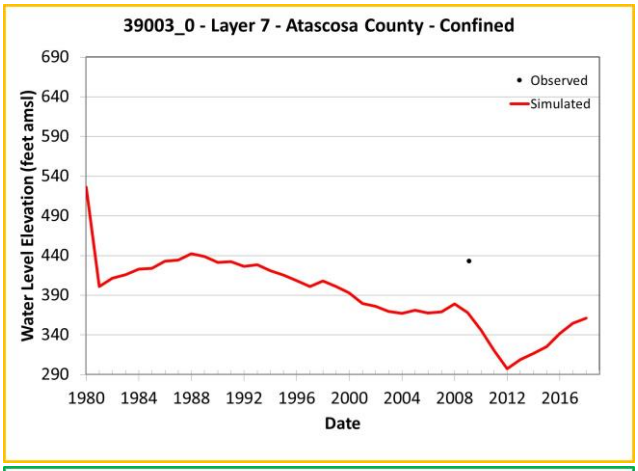
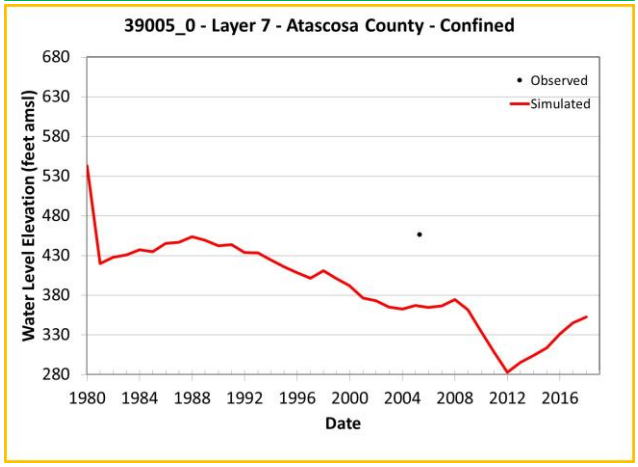
Revised		Aprv'd by	SP

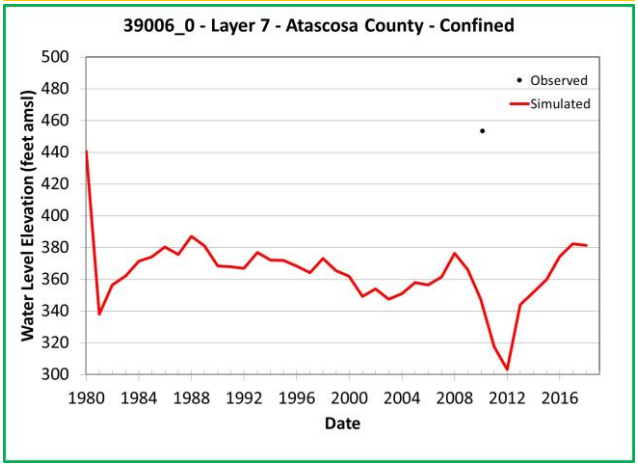
FIGURE I-1.3m

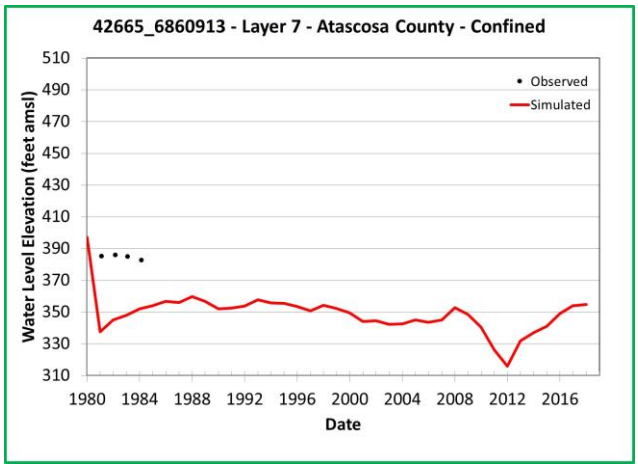
GSI ENVIRONMENTAL

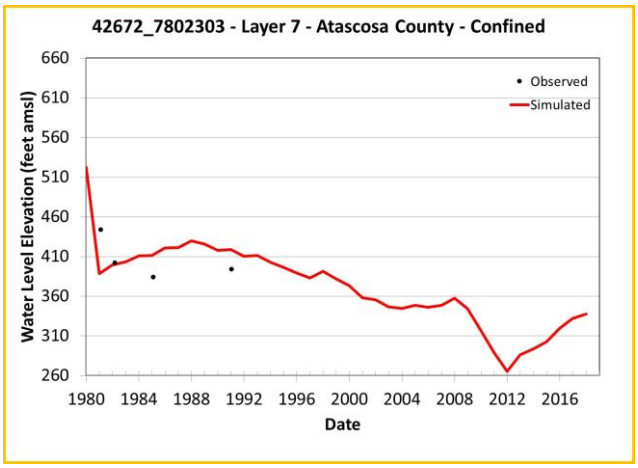












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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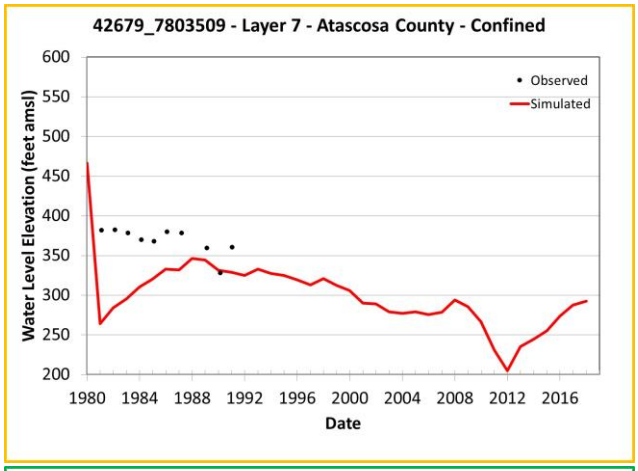
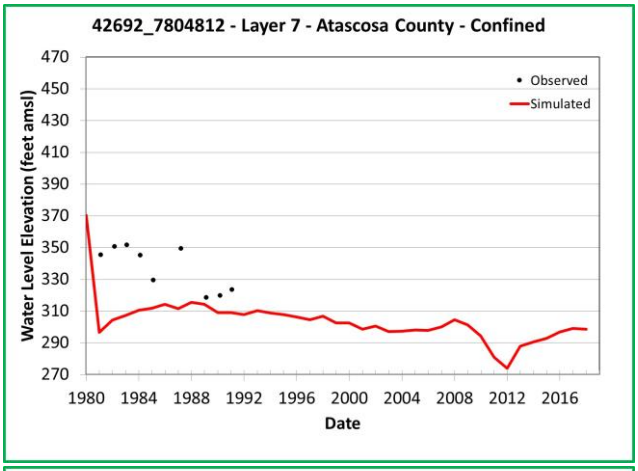
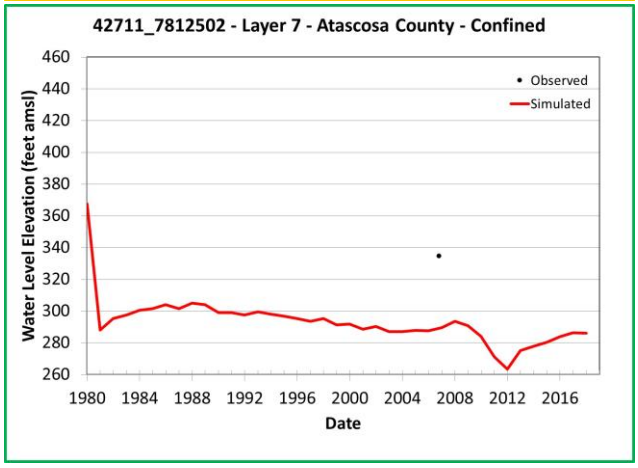
Revised		Aprv'd by	SP

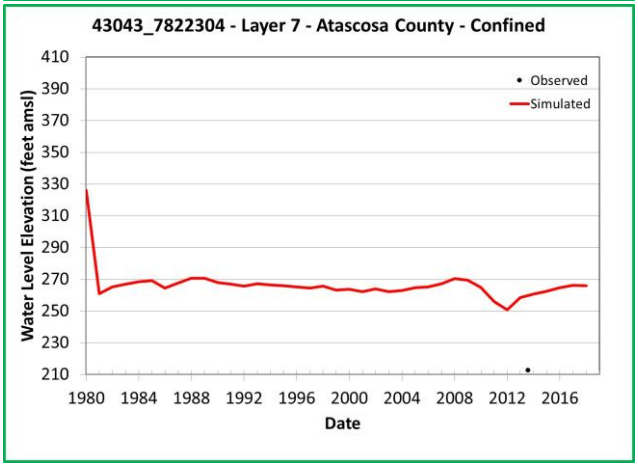
FIGURE I-1.3n

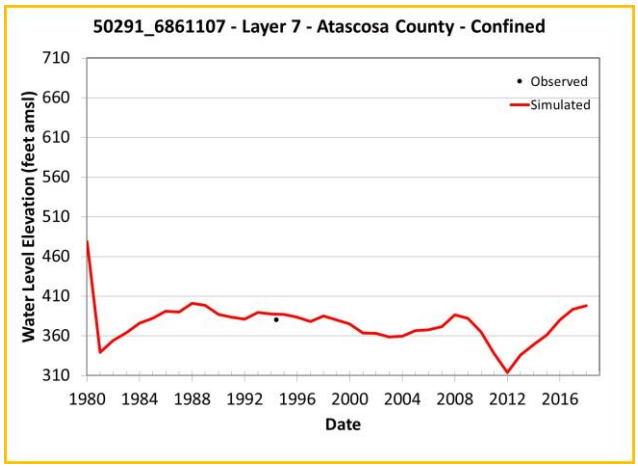
GSI ENVIRONMENTAL

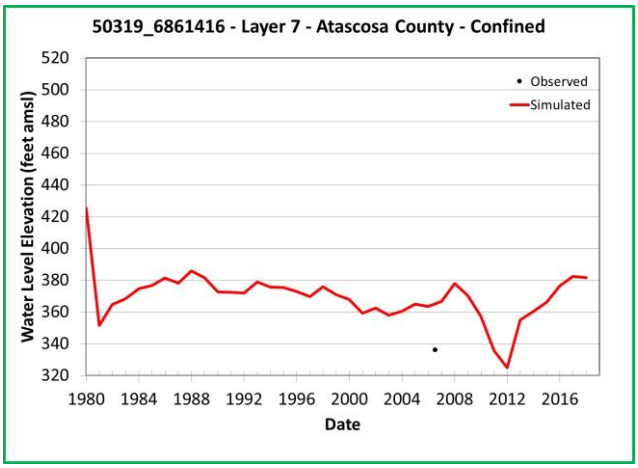












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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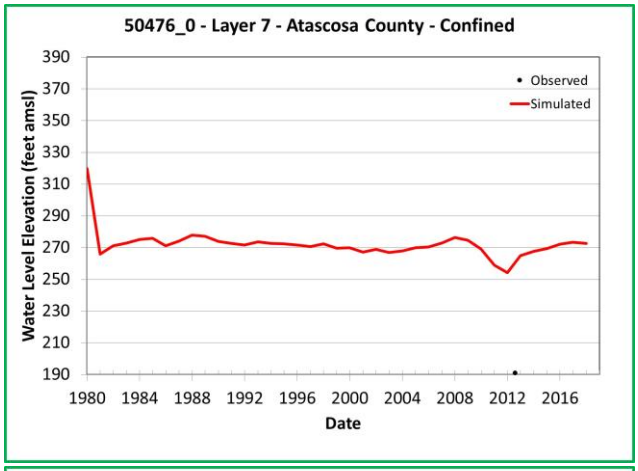
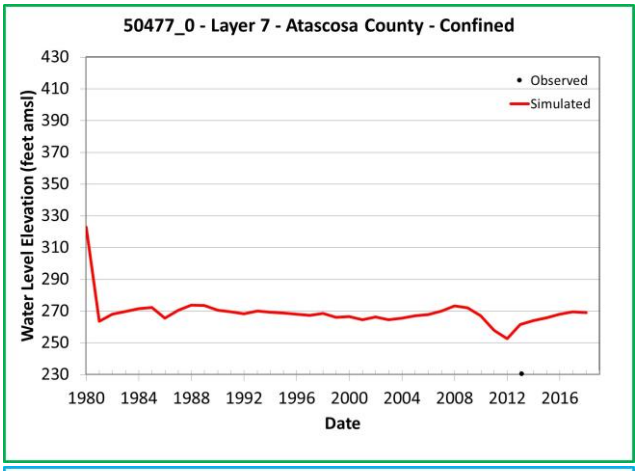
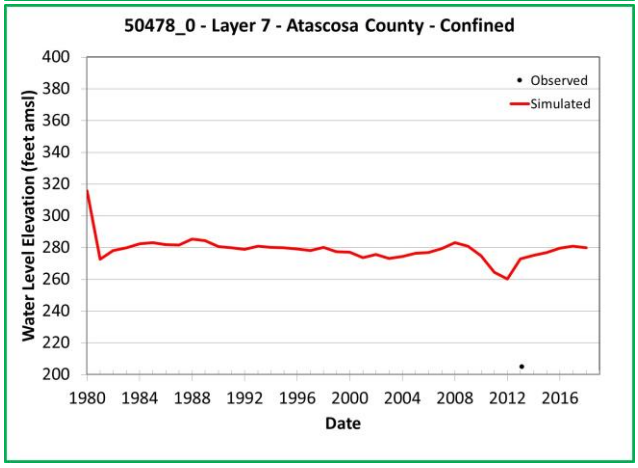
Revised		Aprv'd by	SP

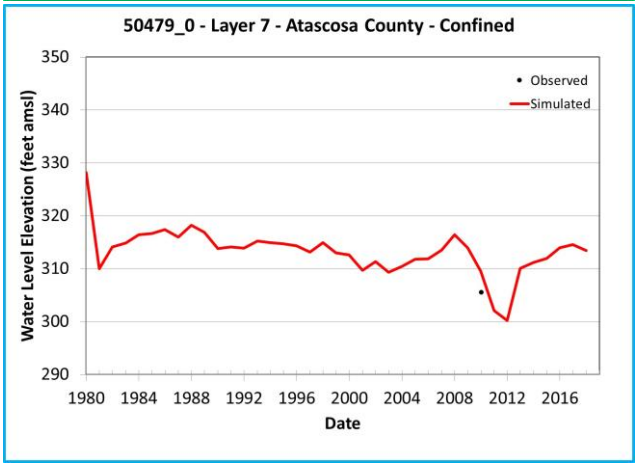
FIGURE I-1.3o

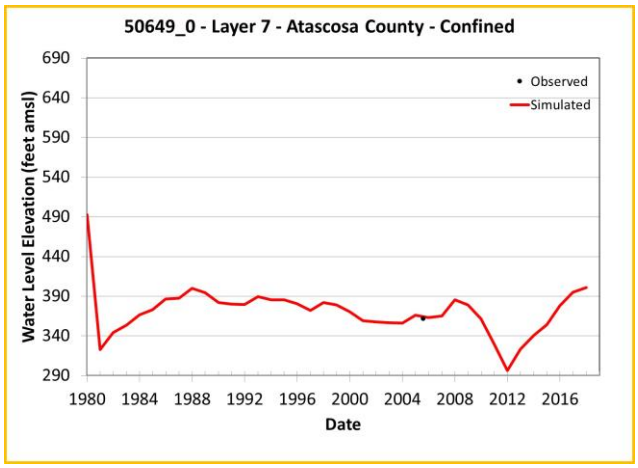
GSI ENVIRONMENTAL

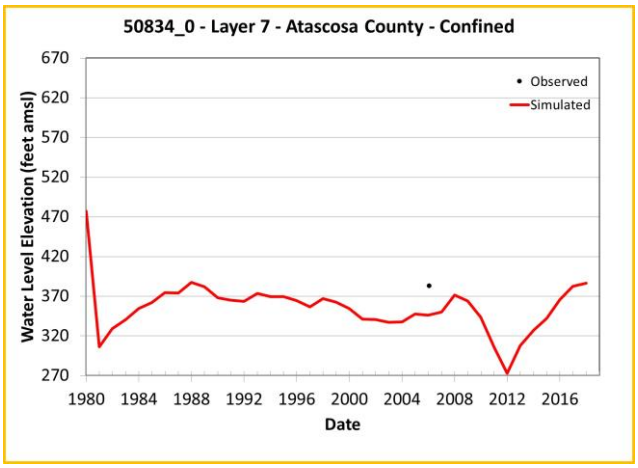












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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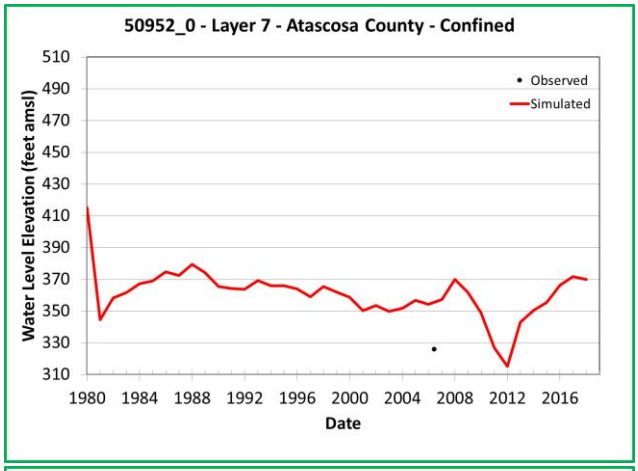
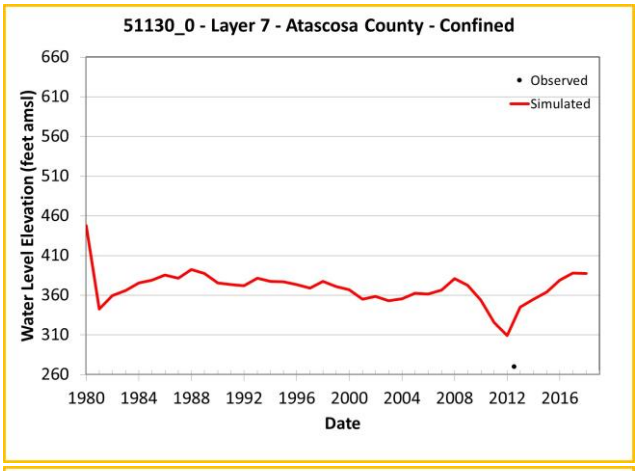
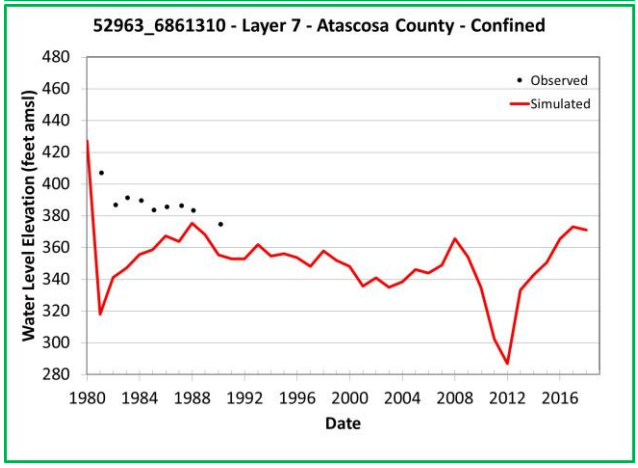
Revised		Aprv'd by	SP

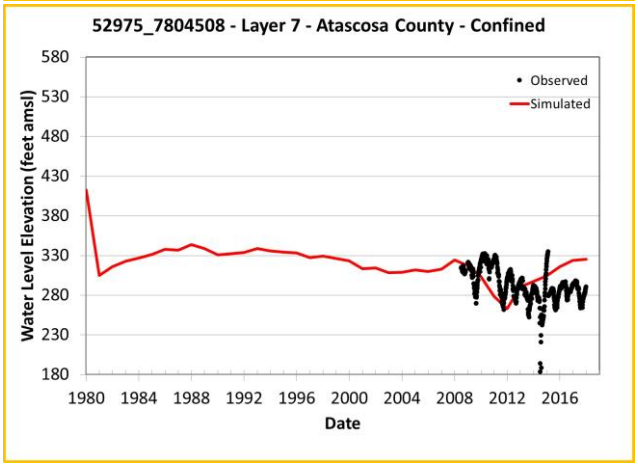
FIGURE I-1.3p

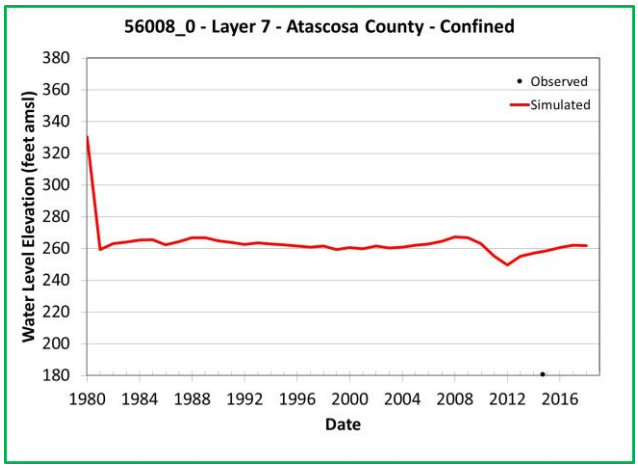
GSI ENVIRONMENTAL

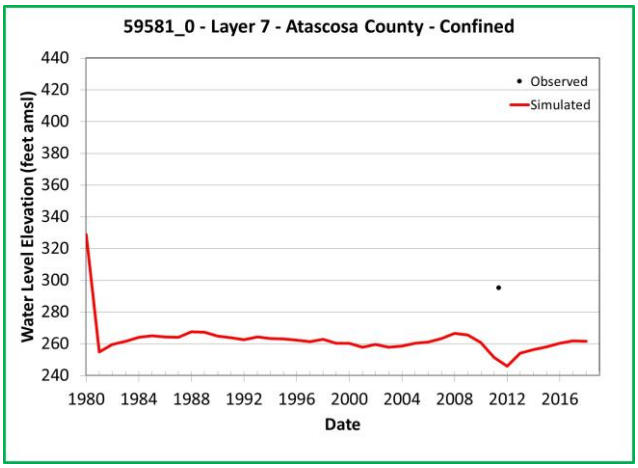












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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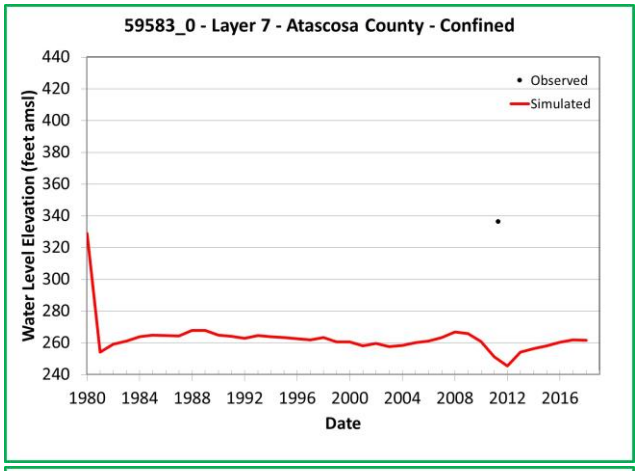
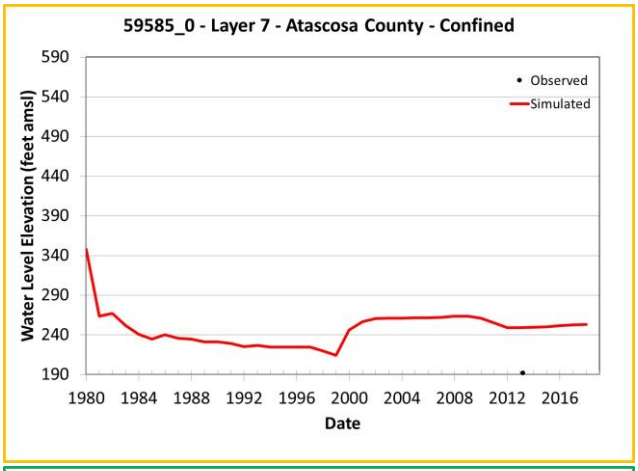
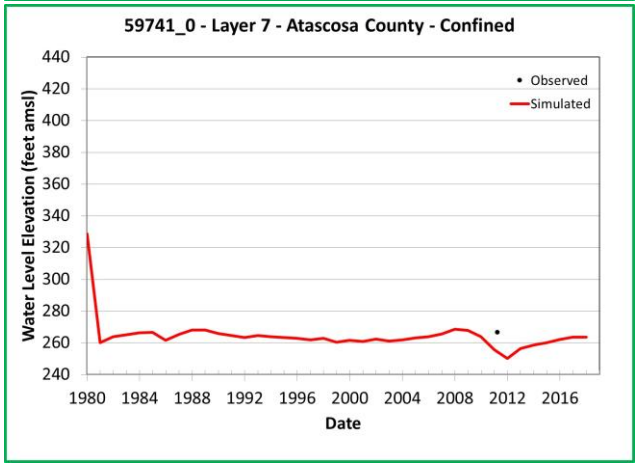
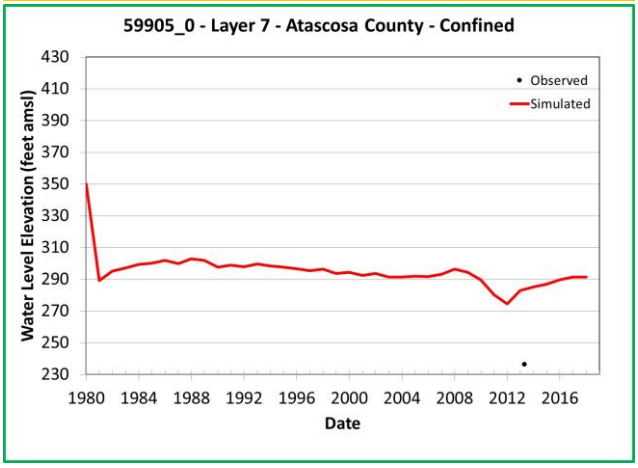
FIGURE I-1.3q

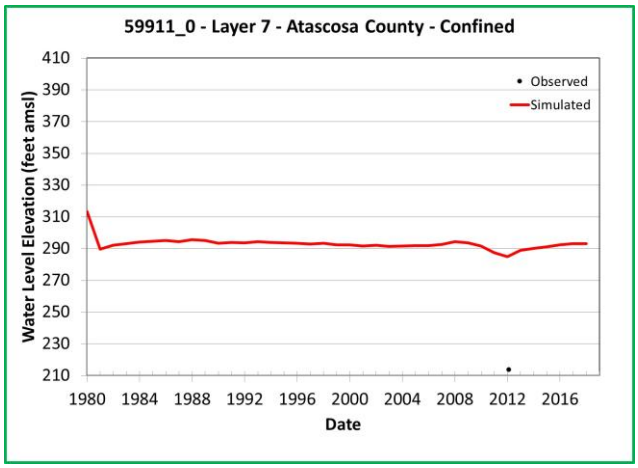
GSI ENVIRONMENTAL

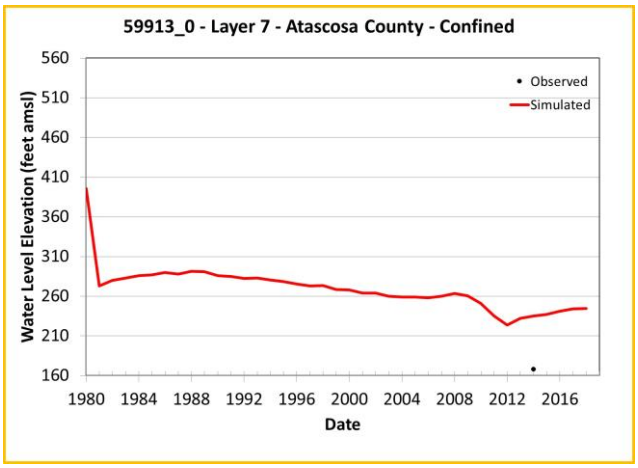












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Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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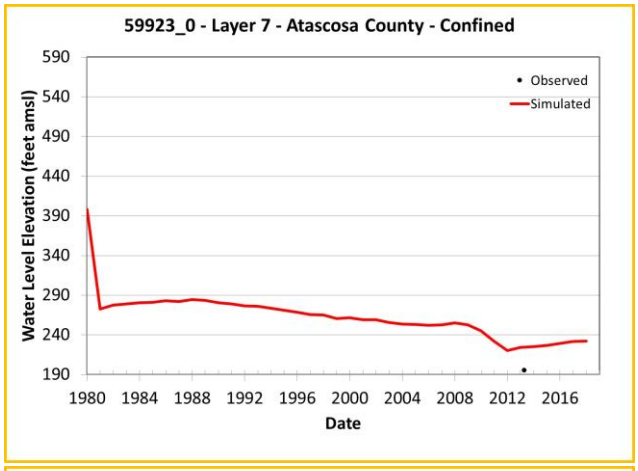
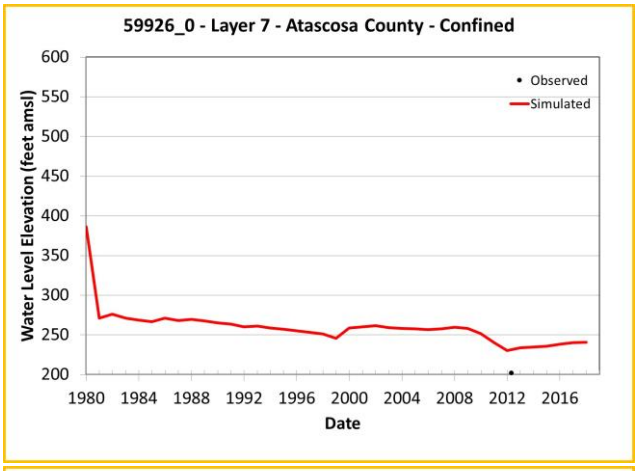
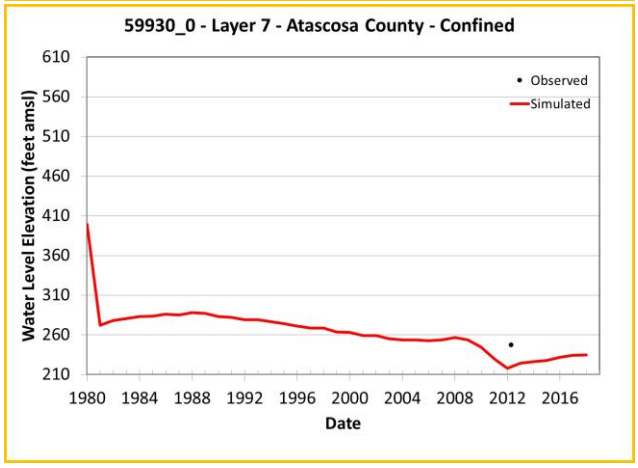
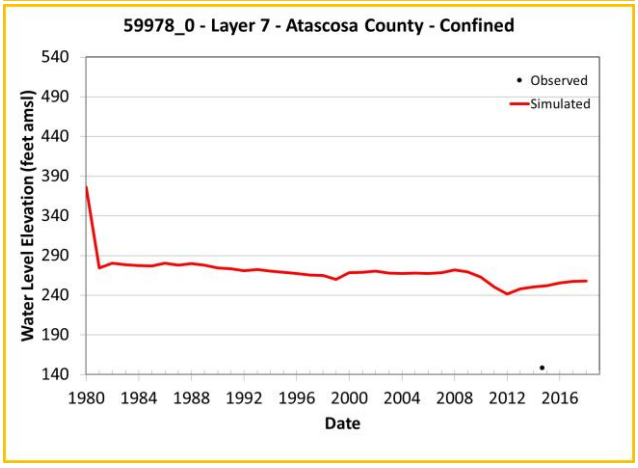
FIGURE I-1.3r

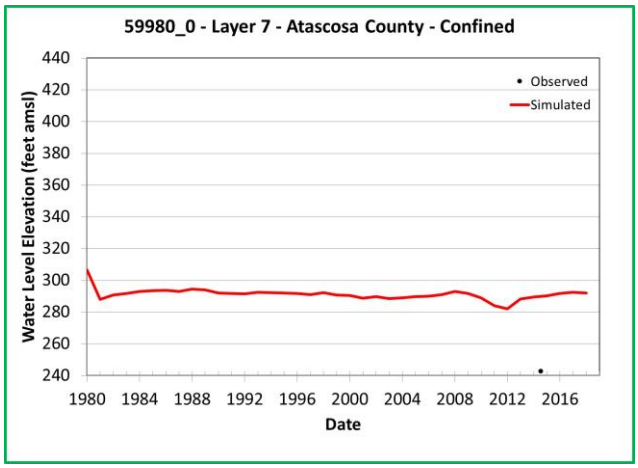
GSI ENVIRONMENTAL

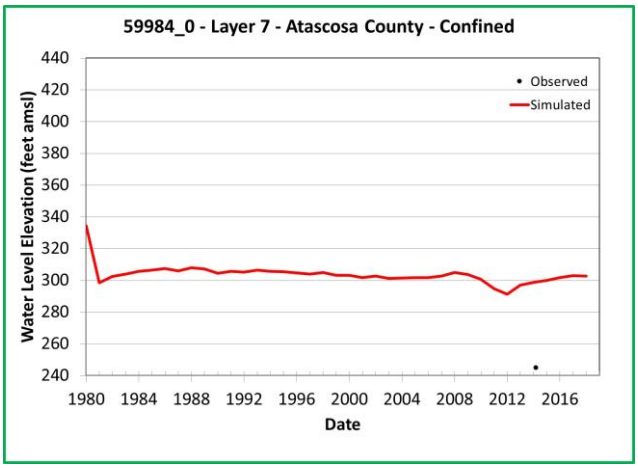












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Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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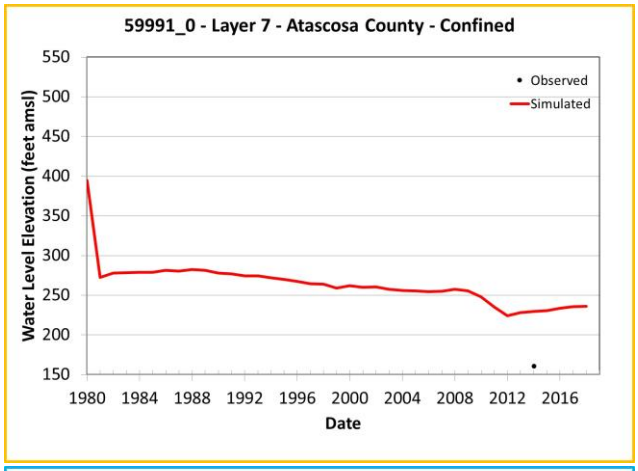
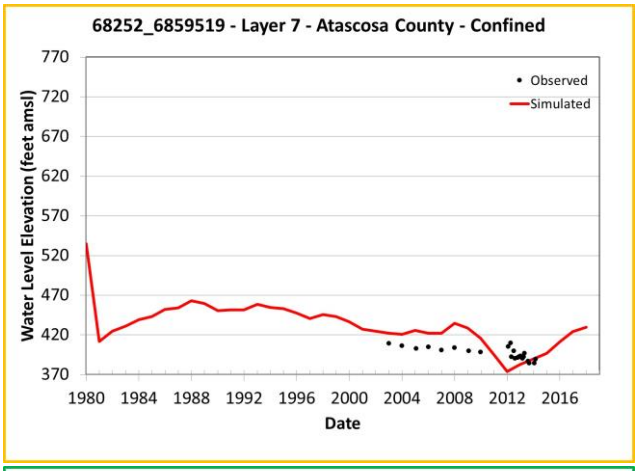
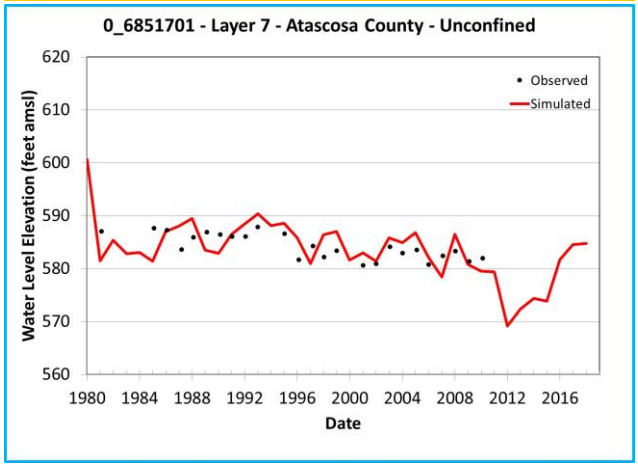
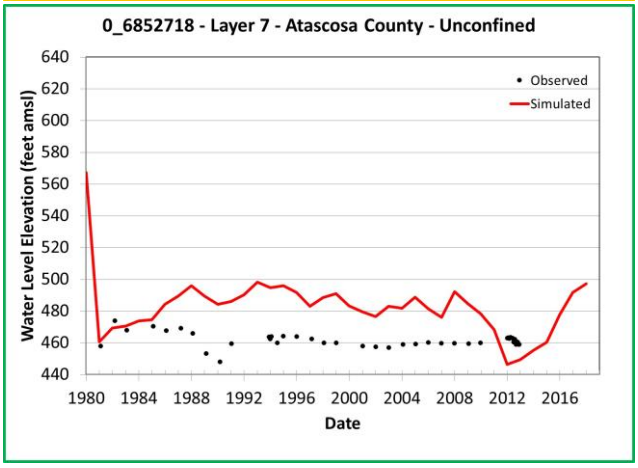
FIGURE I-1.3s

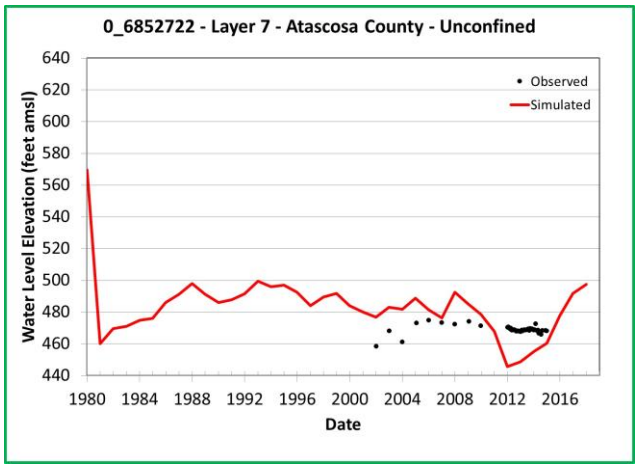
GSI ENVIRONMENTAL

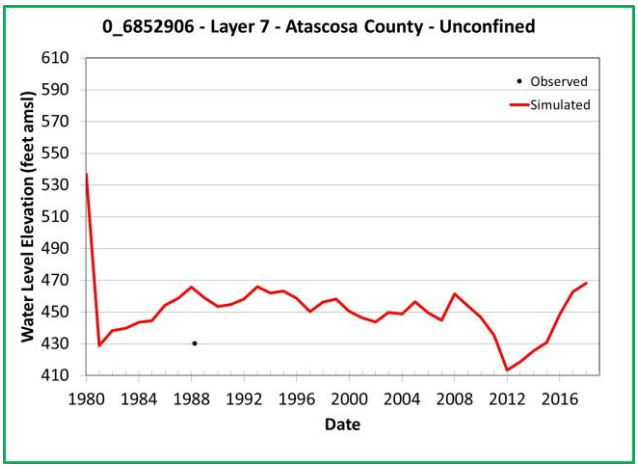












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

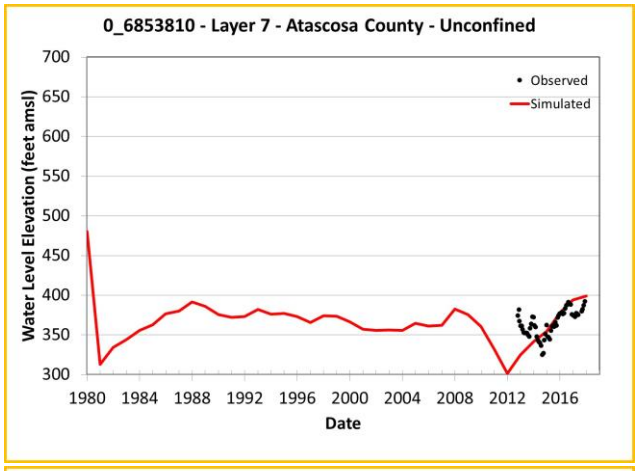
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

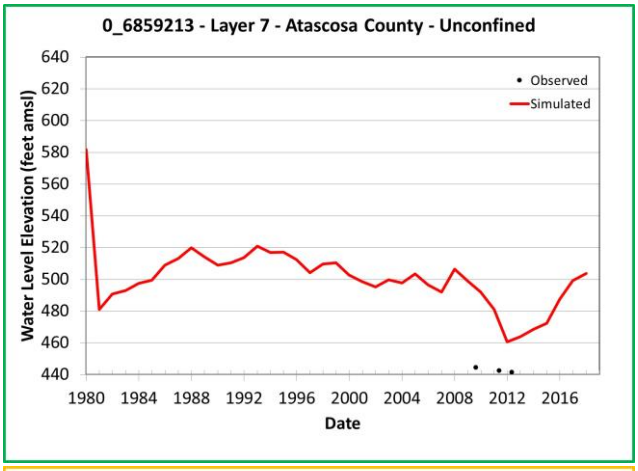
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

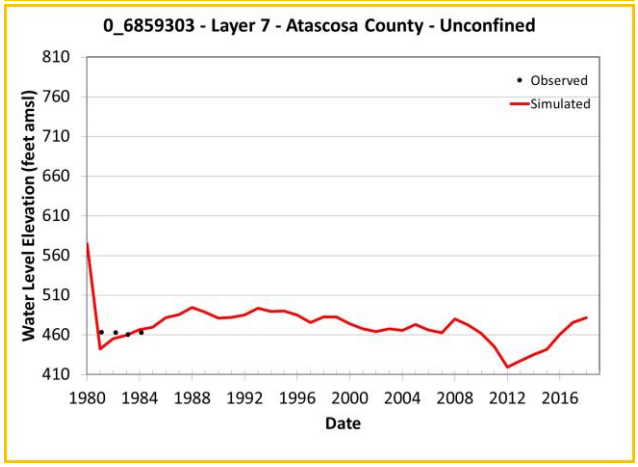
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

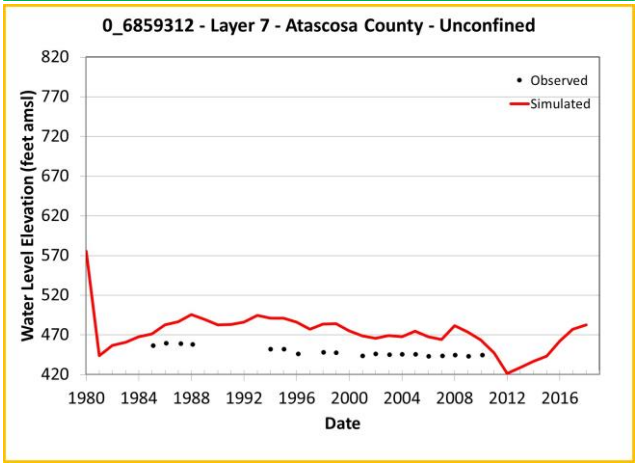
FIGURE I-1.3t

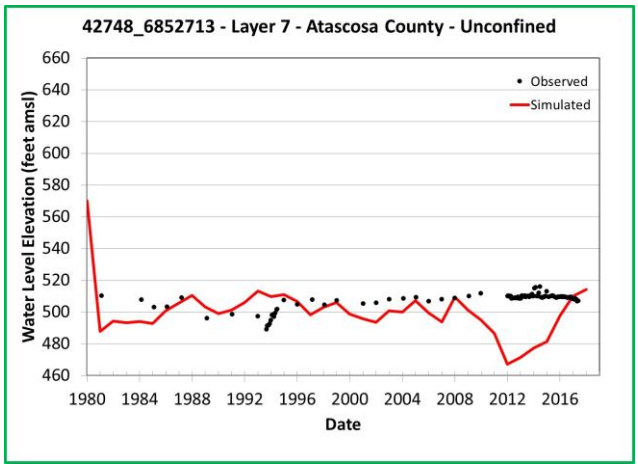
GSI ENVIRONMENTAL

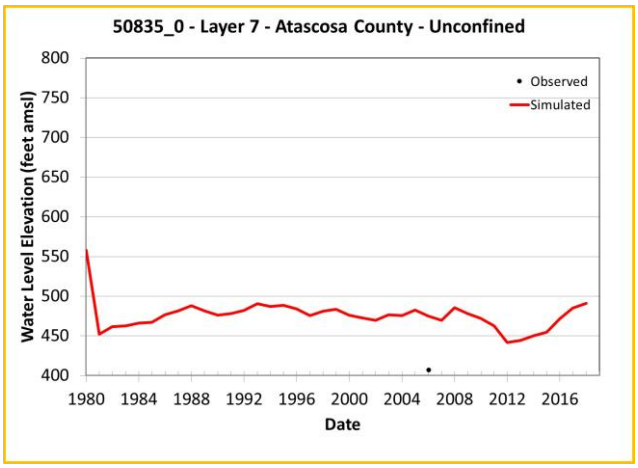












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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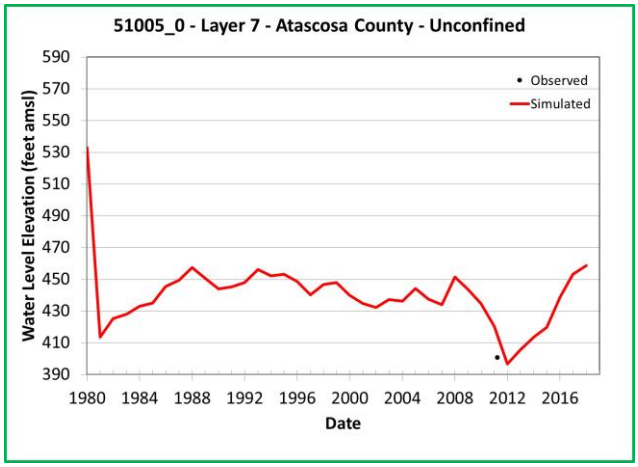
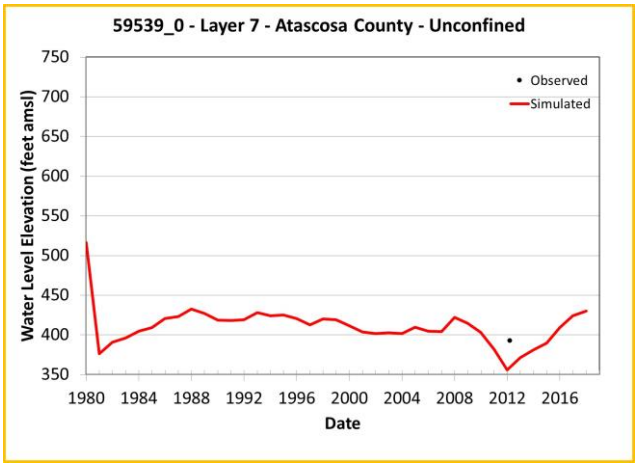
Revised		Aprv'd by	SP

FIGURE I-1.3u

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

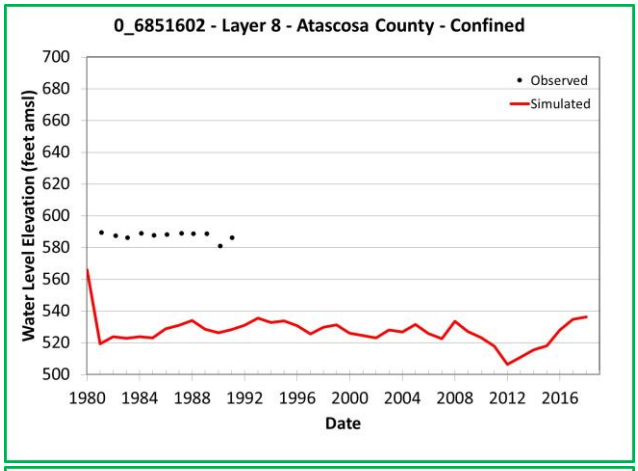
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 7

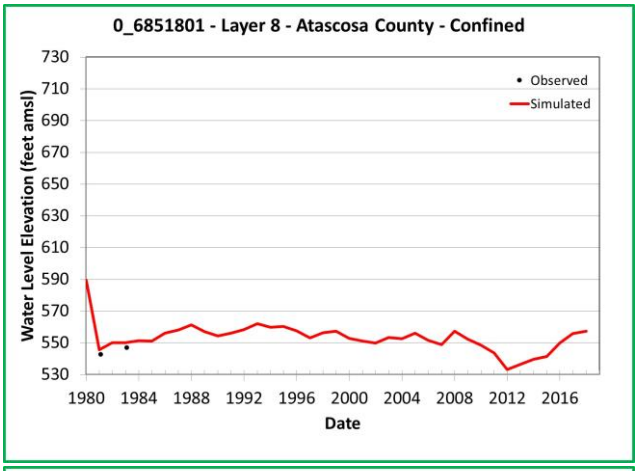
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

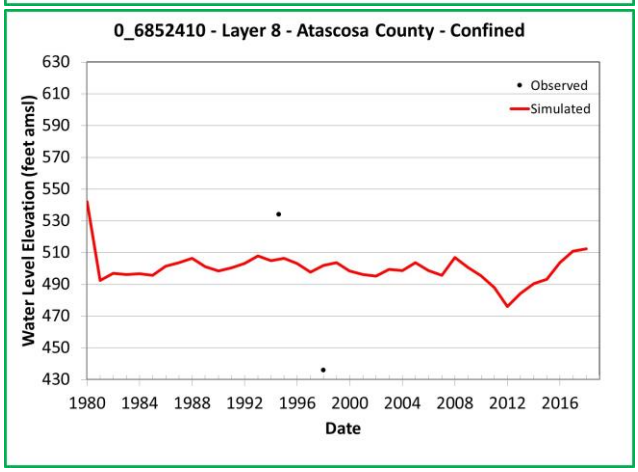
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

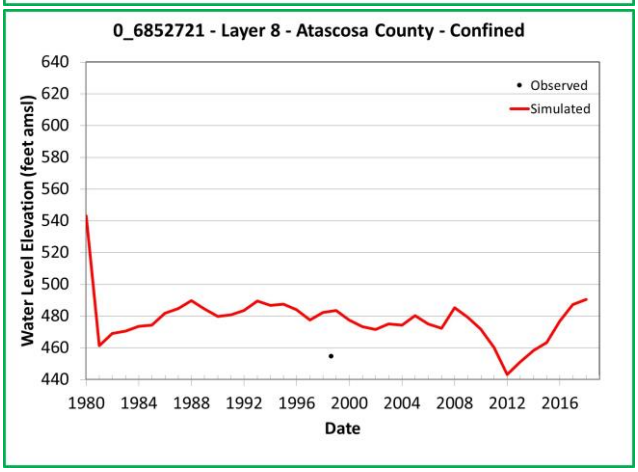
FIGURE I-1.3v

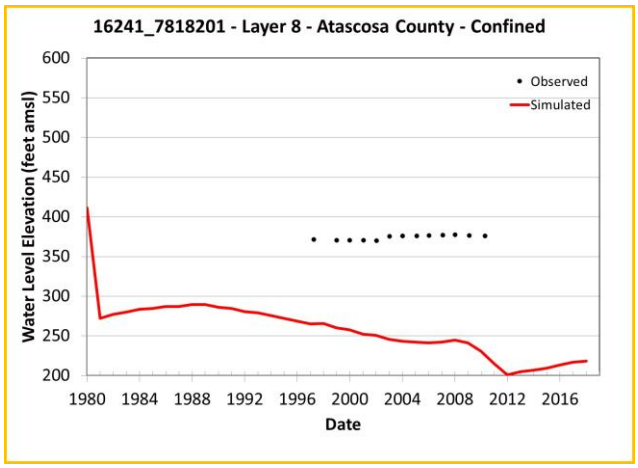
GSI ENVIRONMENTAL

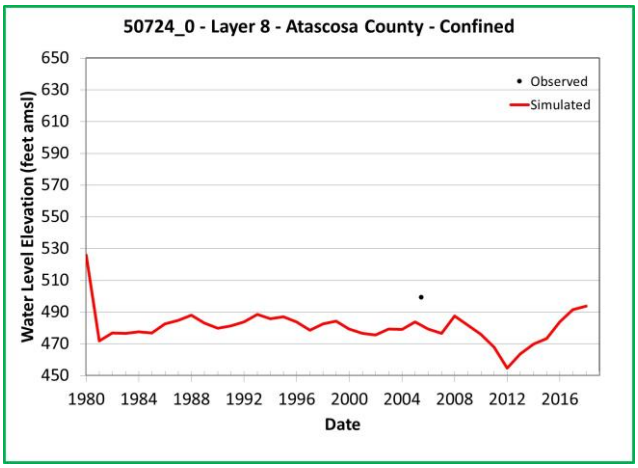












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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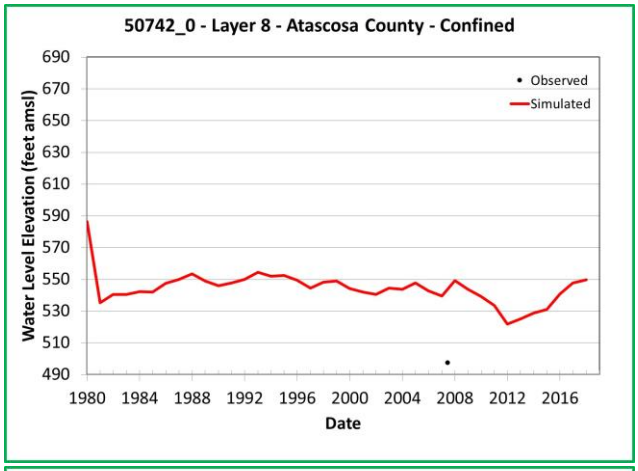
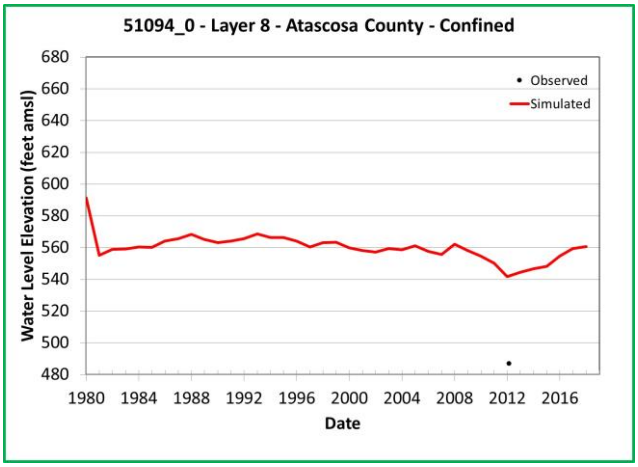
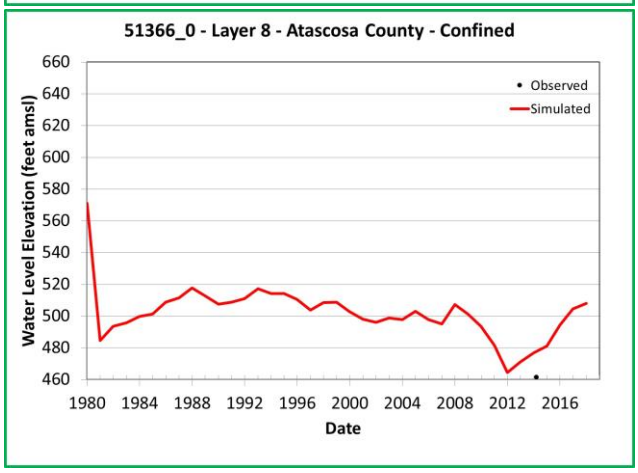
Revised		Aprv'd by	SP

FIGURE I-1.4a

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

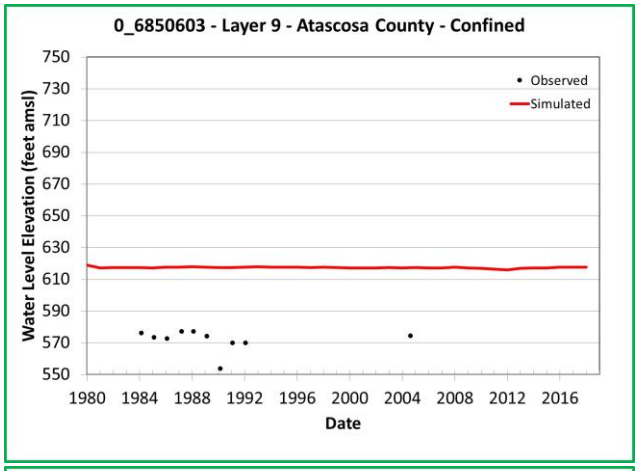
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 8

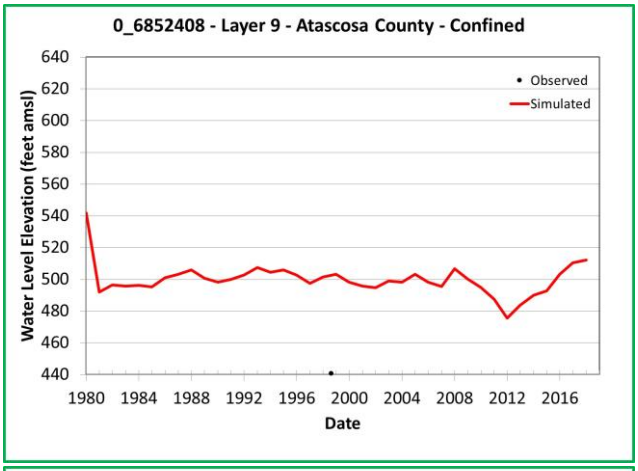
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

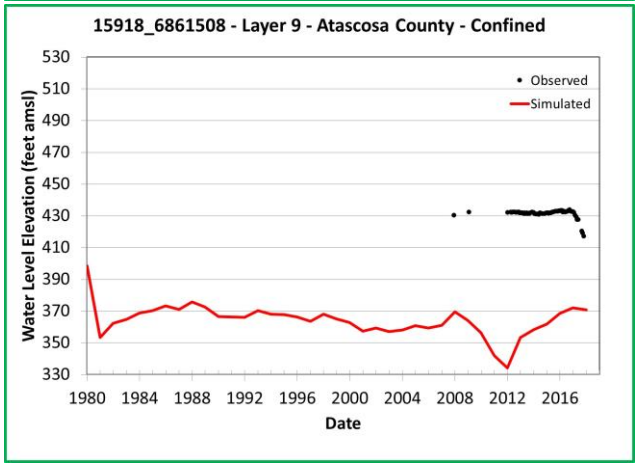
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

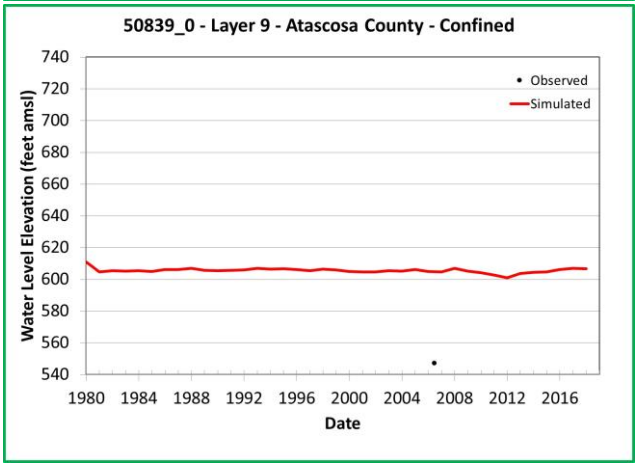
FIGURE I-1.4b

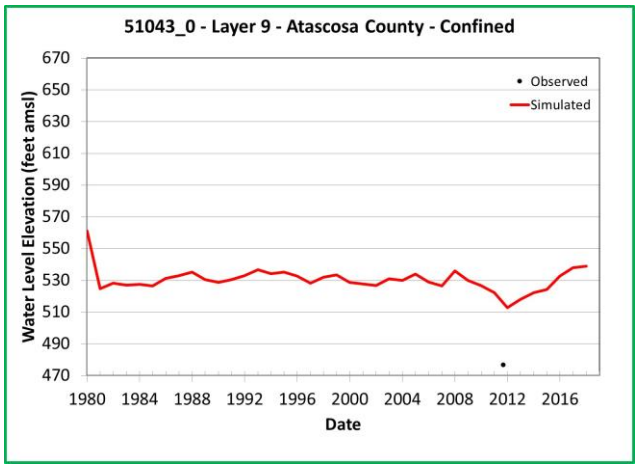
GSI ENVIRONMENTAL

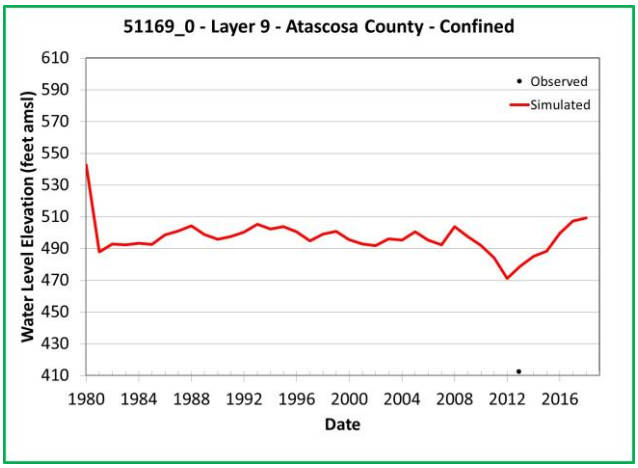












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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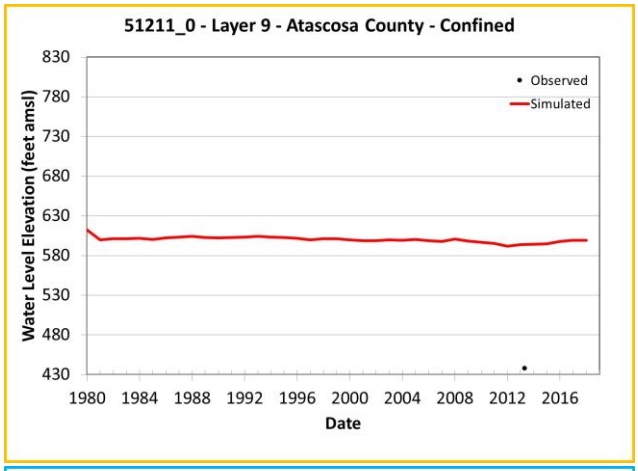
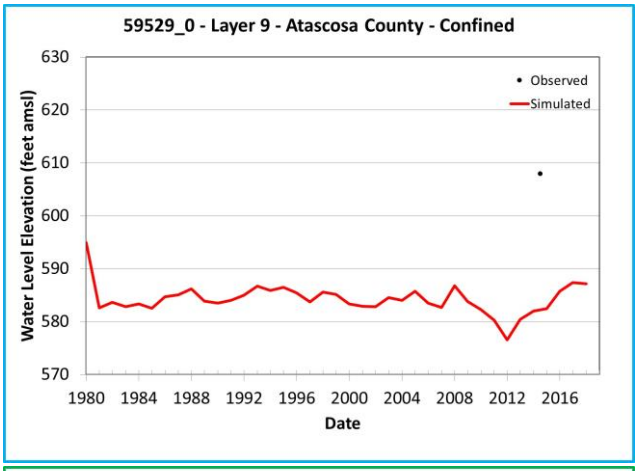
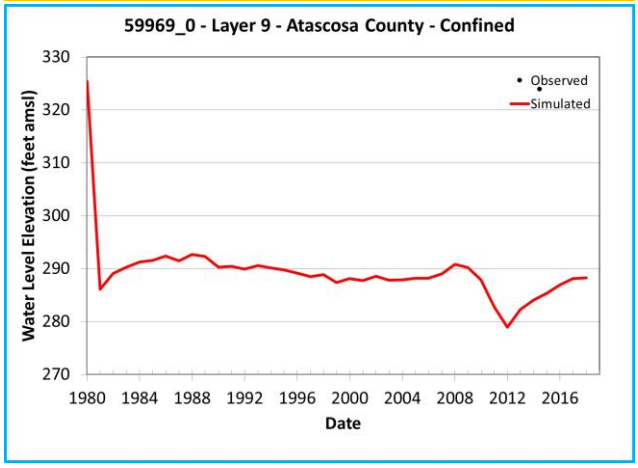
Revised		Aprv'd by	SP

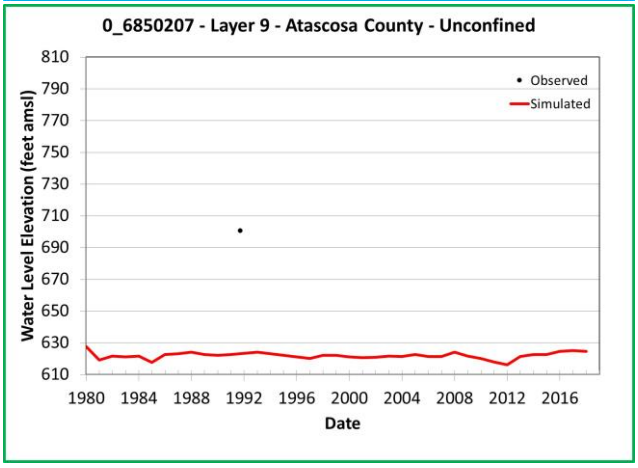
FIGURE I-1.5a

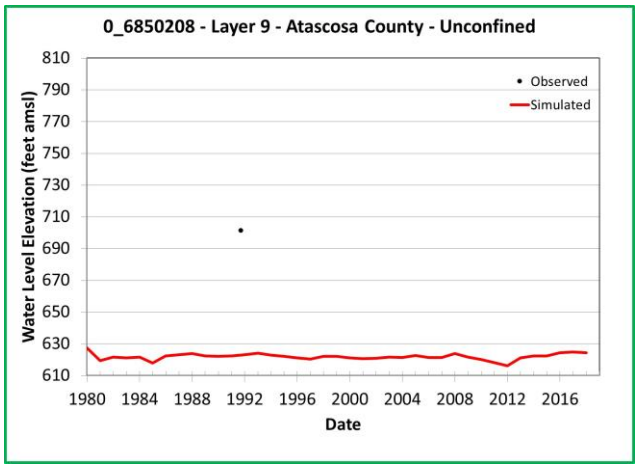
GSI ENVIRONMENTAL

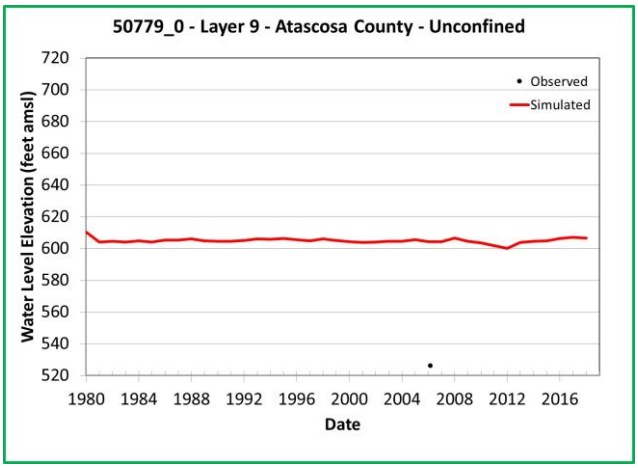












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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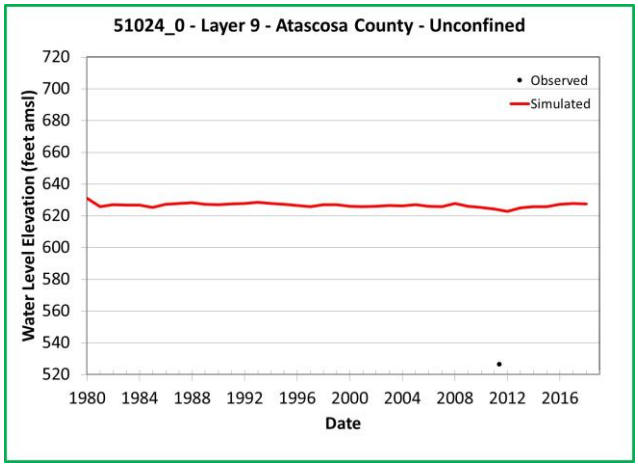
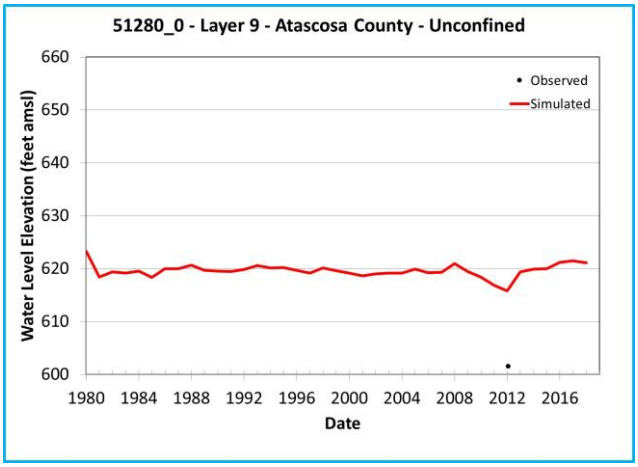
Revised		Aprv'd by	SP

FIGURE I-1.5b

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

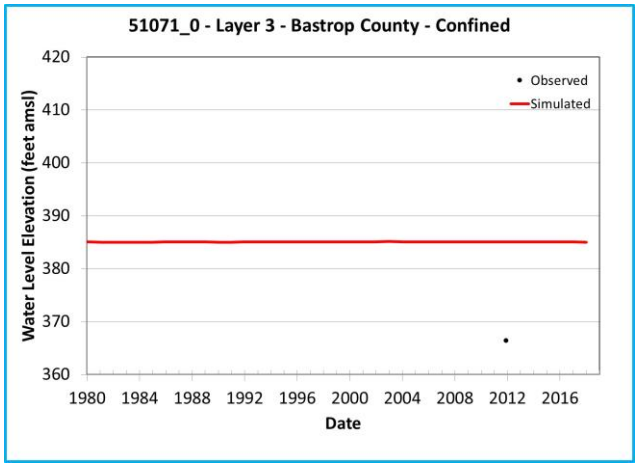
Simulated and Observed Water Level Elevation Hydrographs, Atascosa County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-1.5c

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.

Yellow = 400 feet

Green = 200 feet

Blue = 60 feet

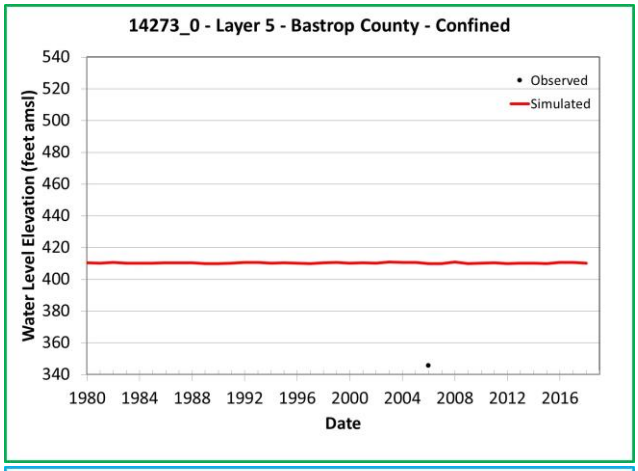
Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 3

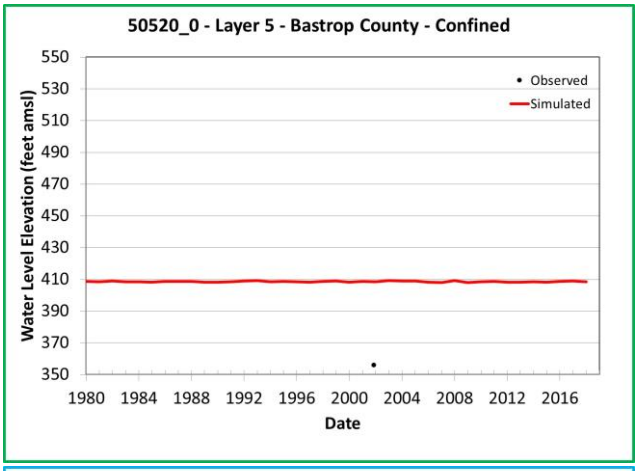
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

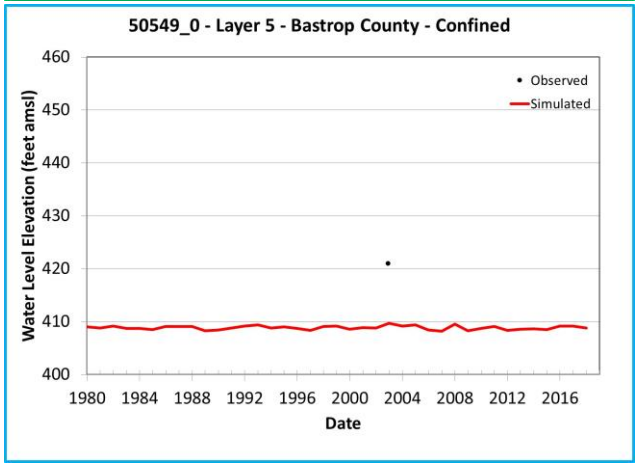
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

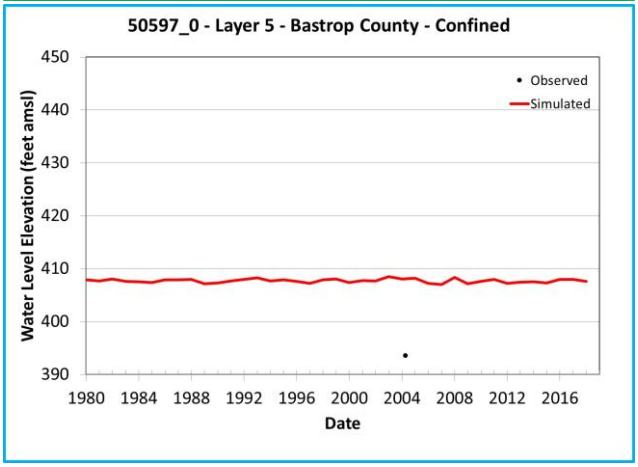
FIGURE I-2.1a

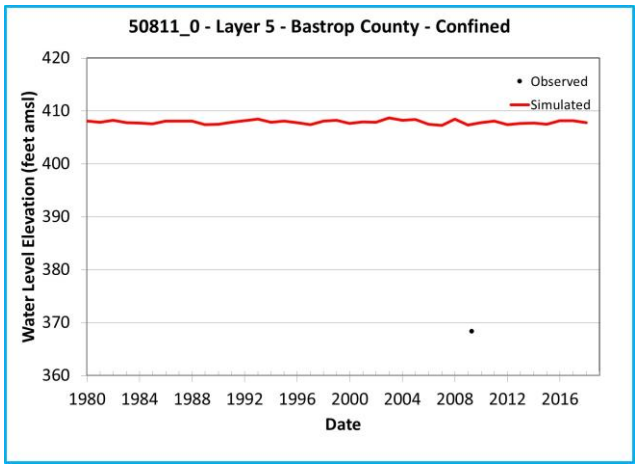
GSI ENVIRONMENTAL

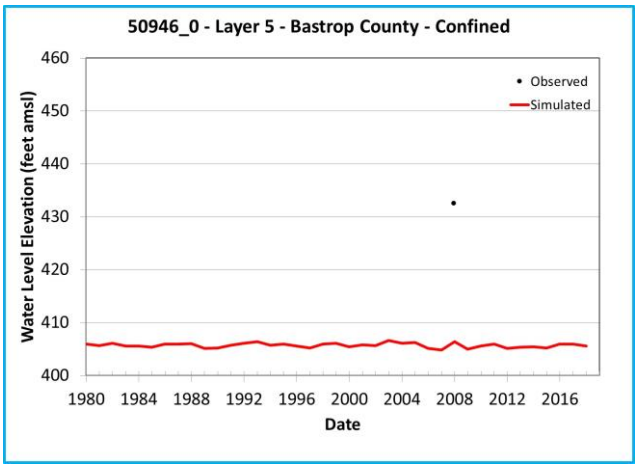












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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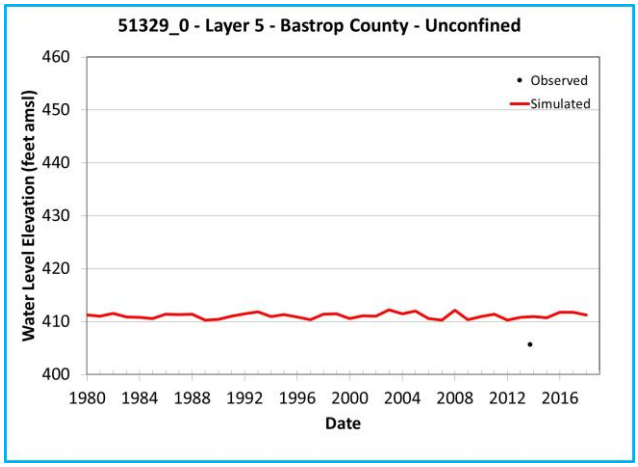
Revised		Aprv'd by	SP

FIGURE I-2.2a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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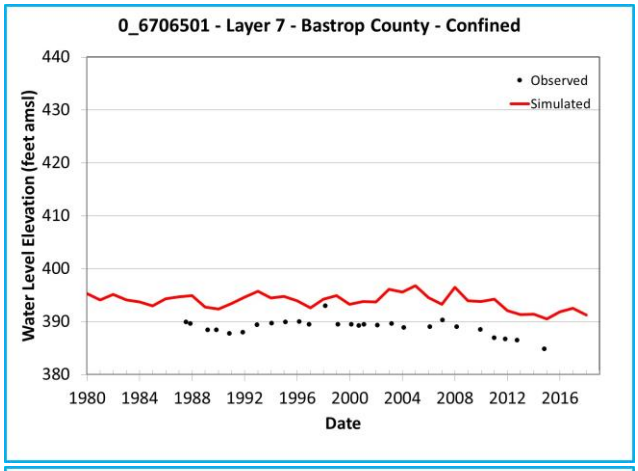
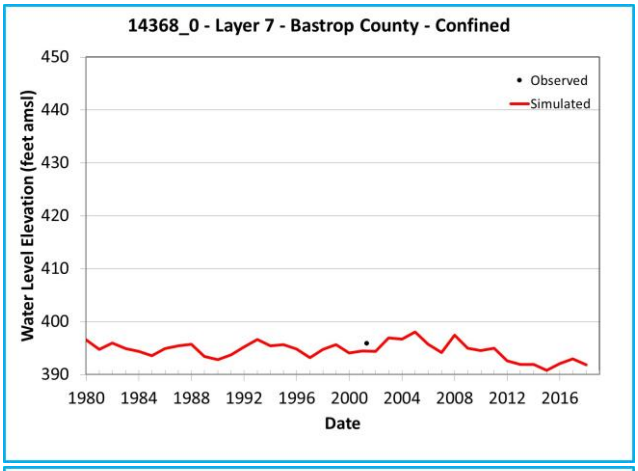
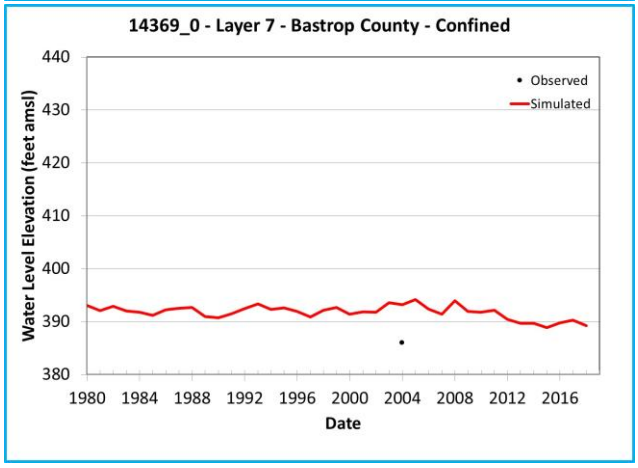
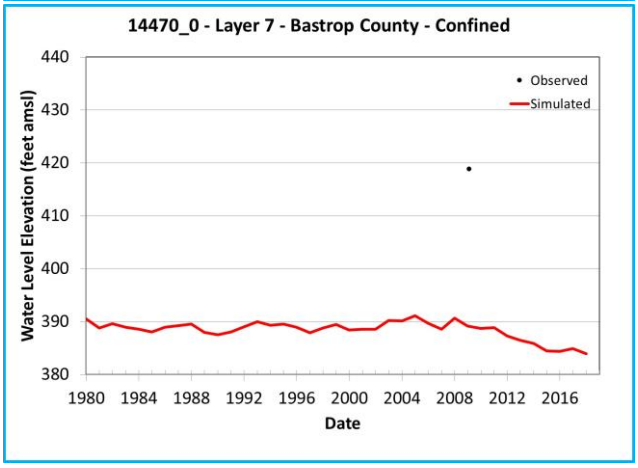
FIGURE I-2.2b

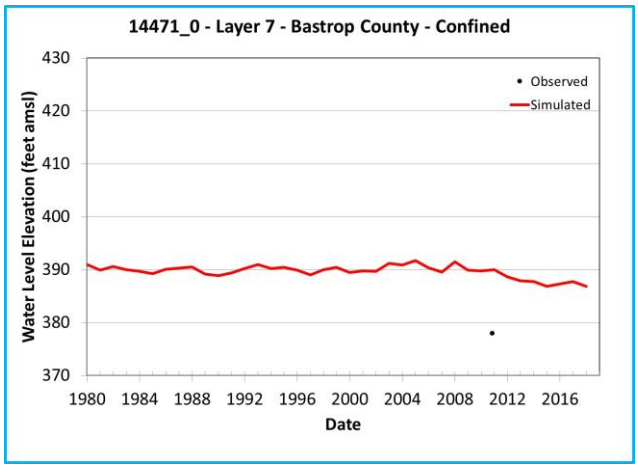
GSI ENVIRONMENTAL

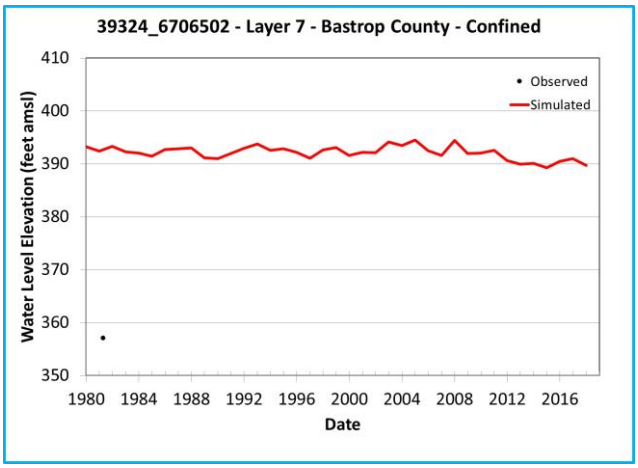












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

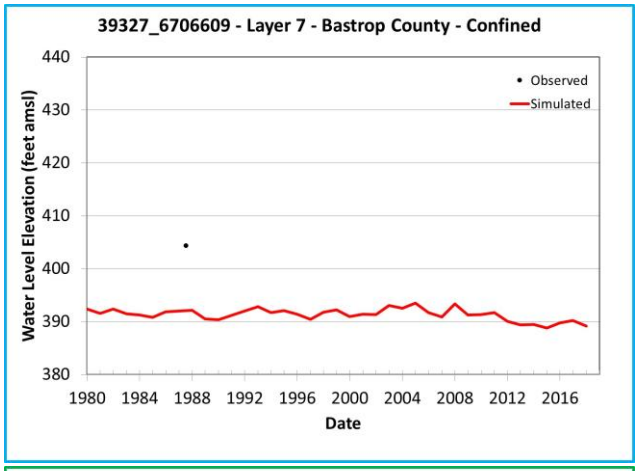
Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 7

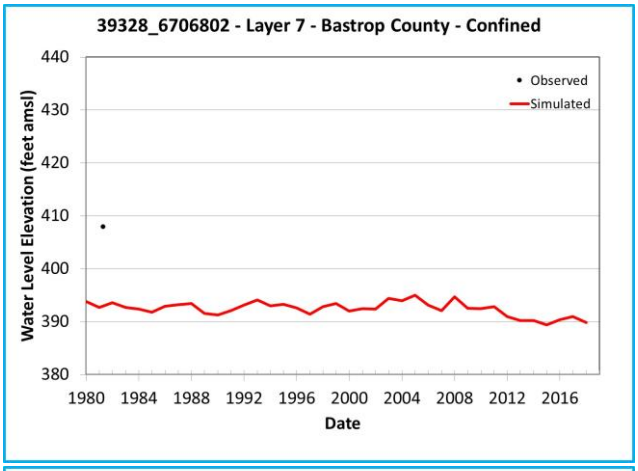
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

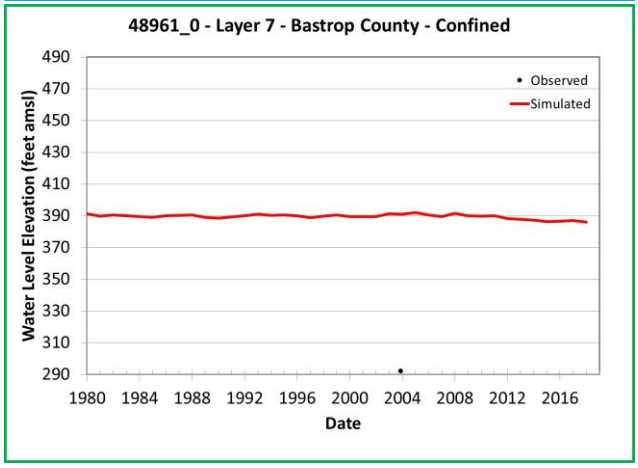
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

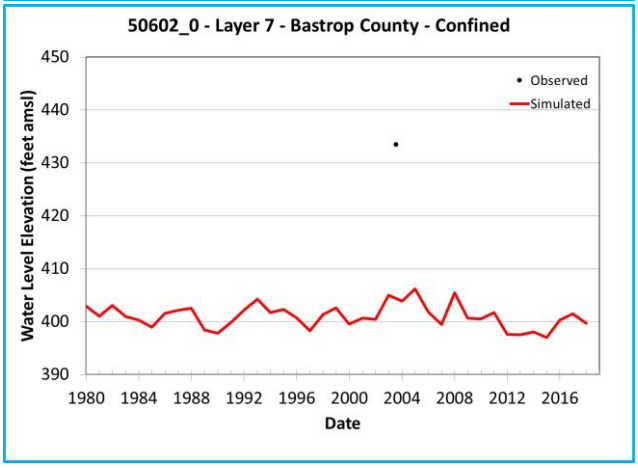
FIGURE I-2.3a

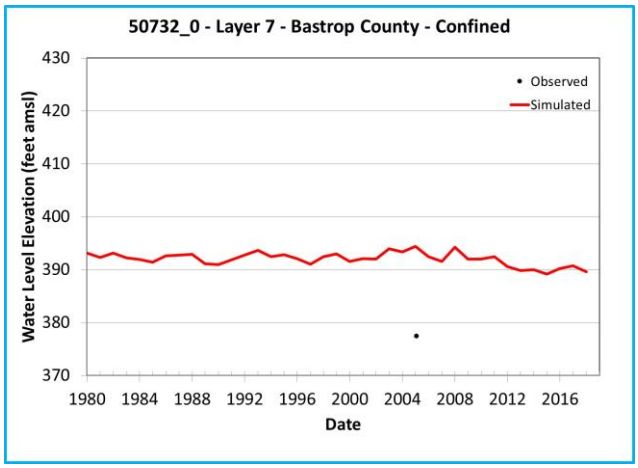
GSI ENVIRONMENTAL

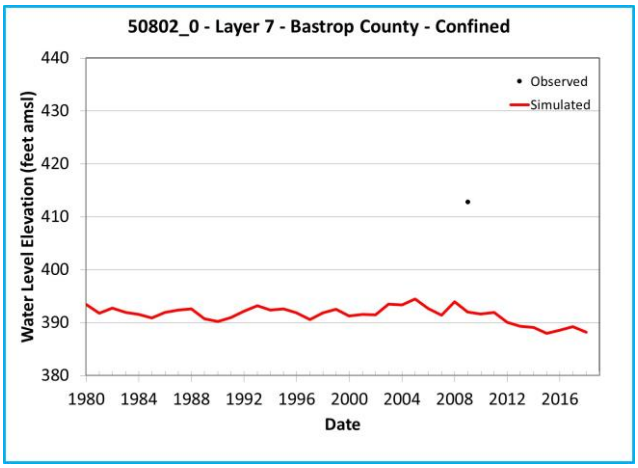












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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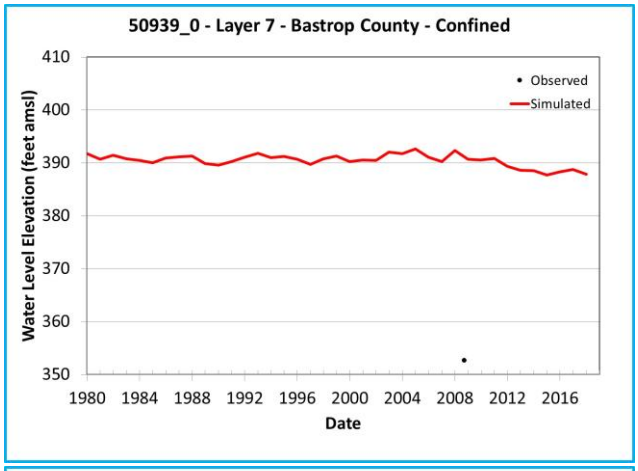
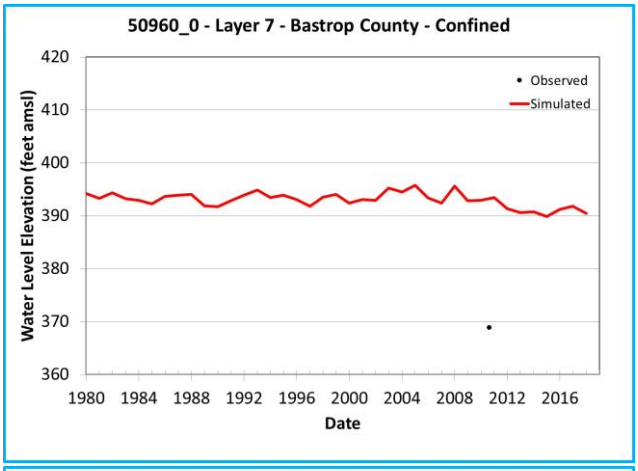
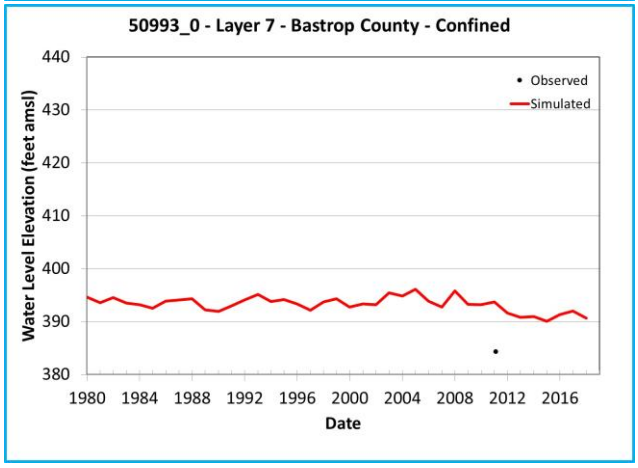
Revised		Aprv'd by	SP

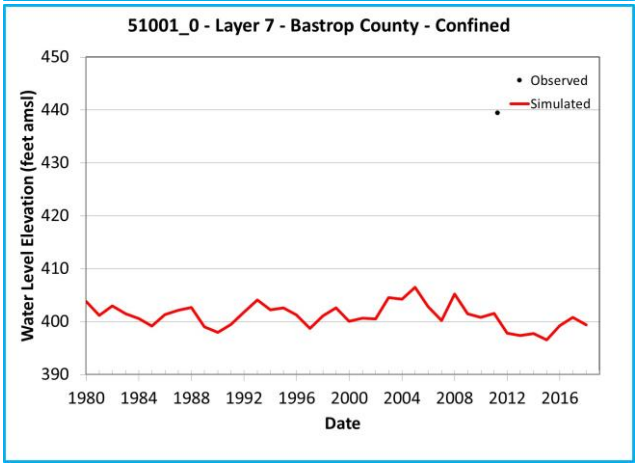
FIGURE I-2.3b

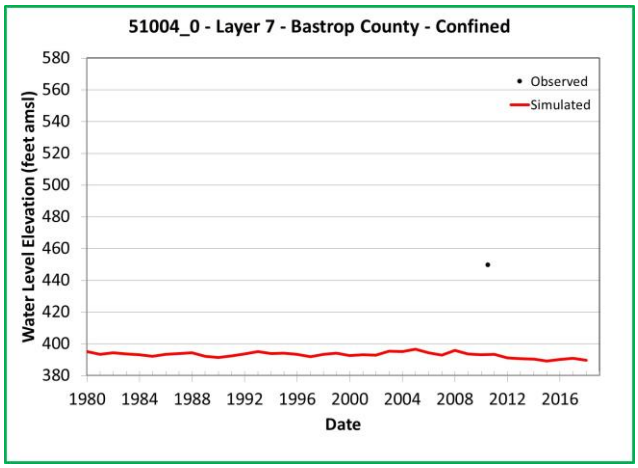
GSI ENVIRONMENTAL

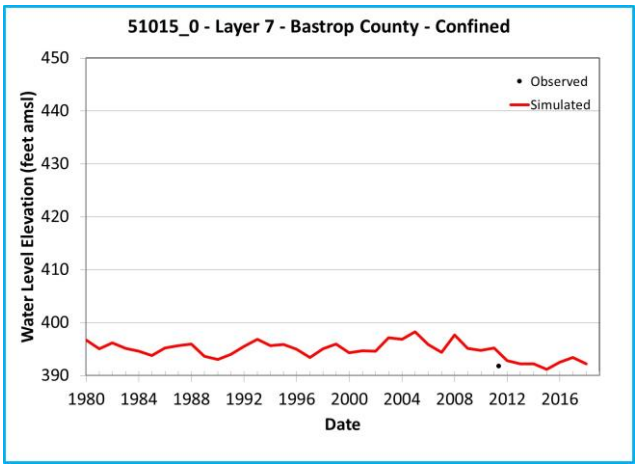












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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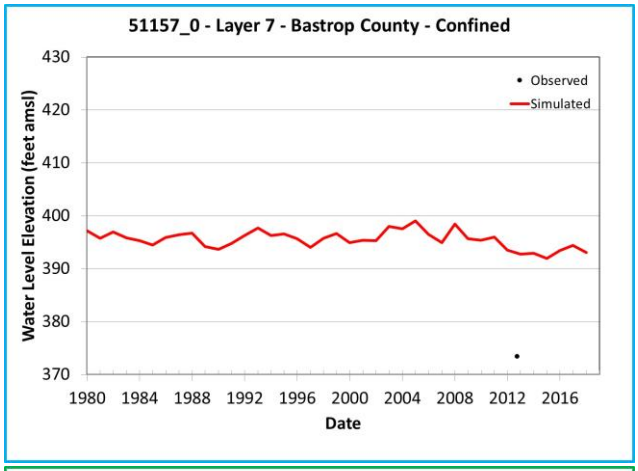
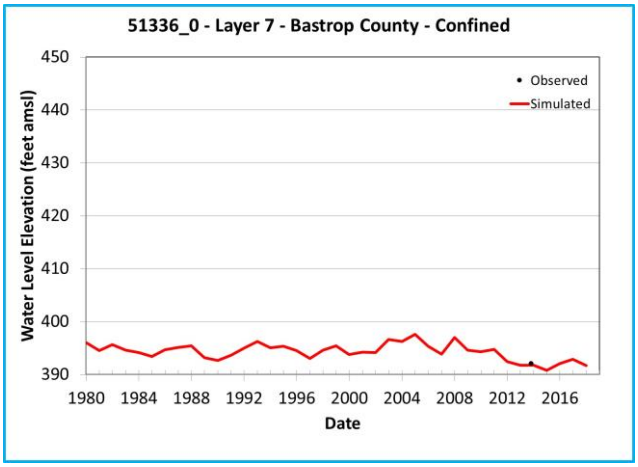
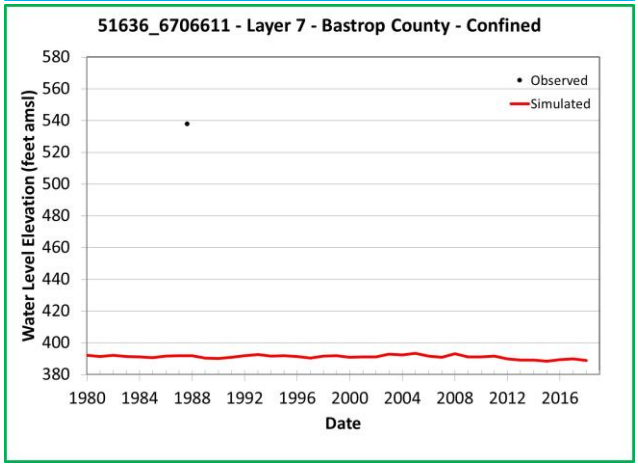
Revised		Aprv'd by	SP

FIGURE I-2.3c

GSI ENVIRONMENTAL







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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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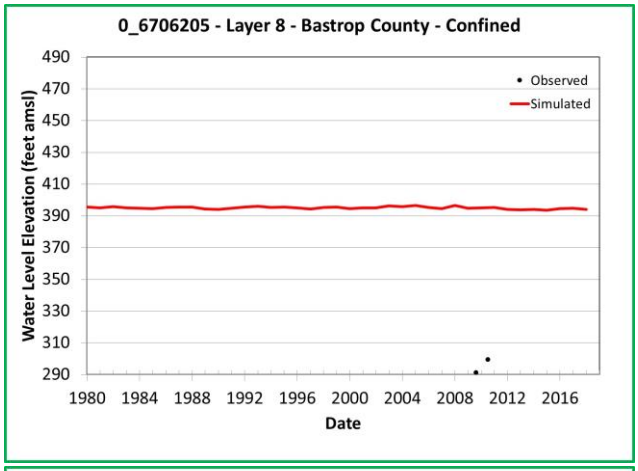
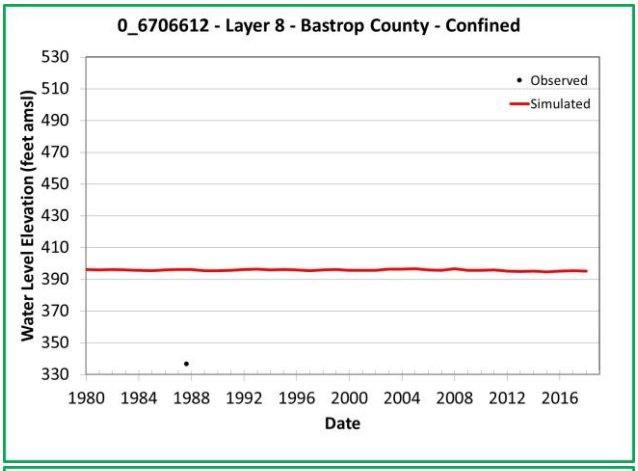
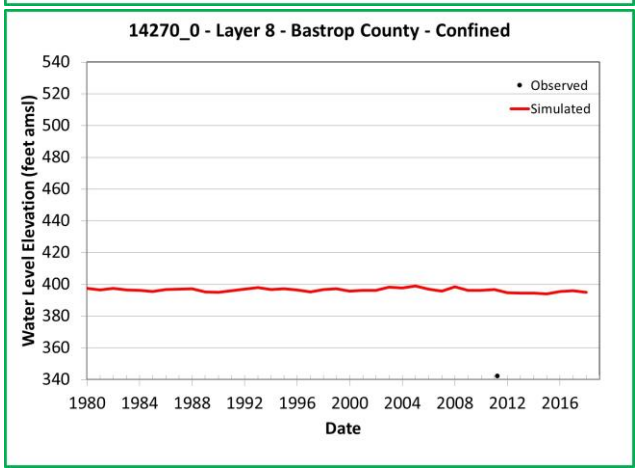
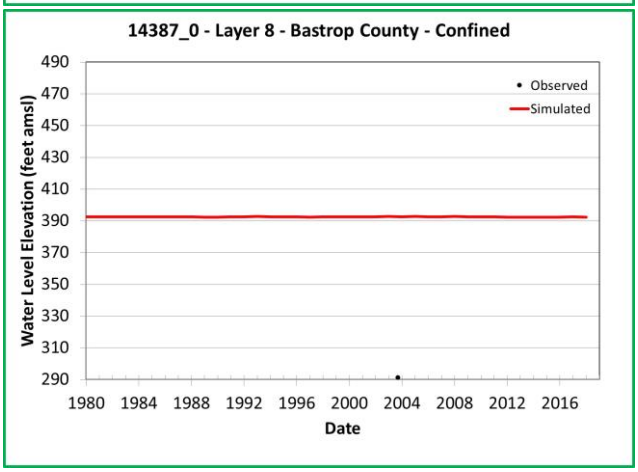
FIGURE I-2.3d

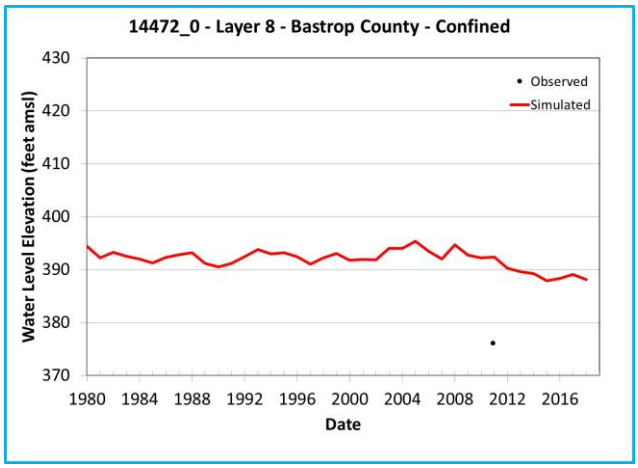
GSI ENVIRONMENTAL

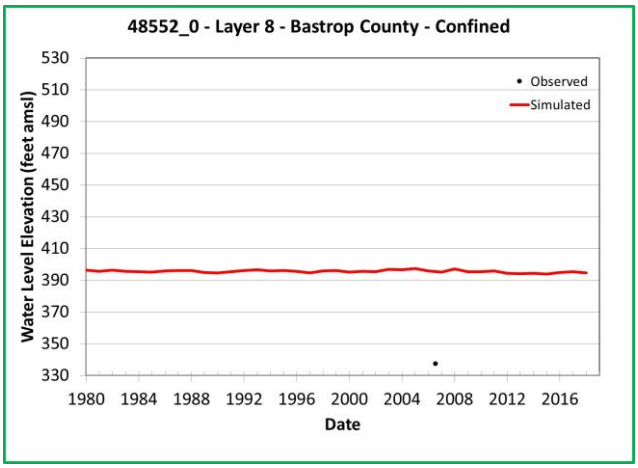












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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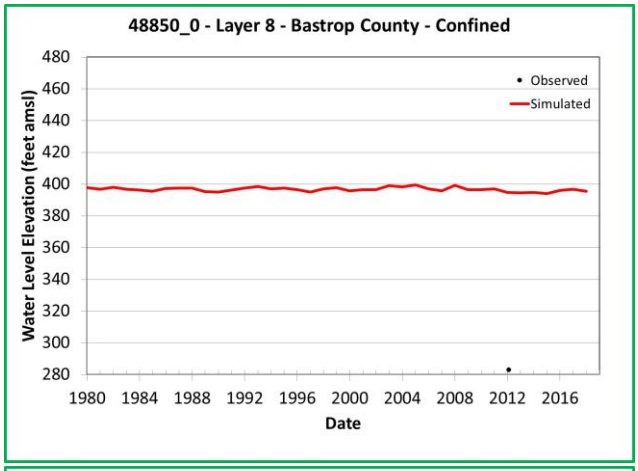
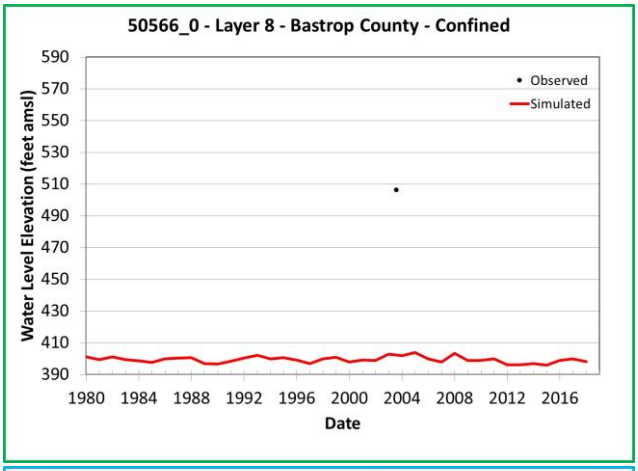
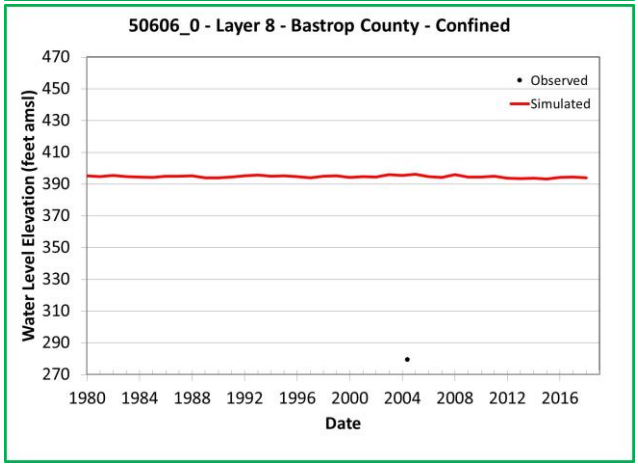
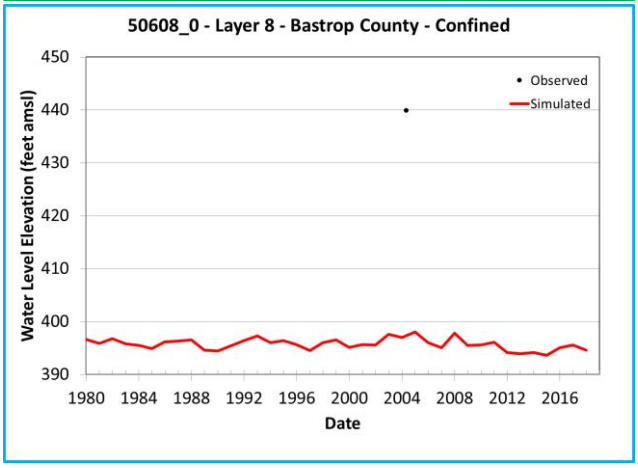
FIGURE I-2.4a

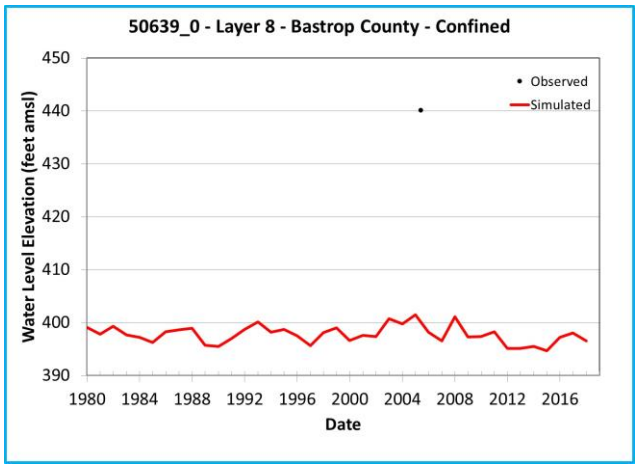
GSI ENVIRONMENTAL

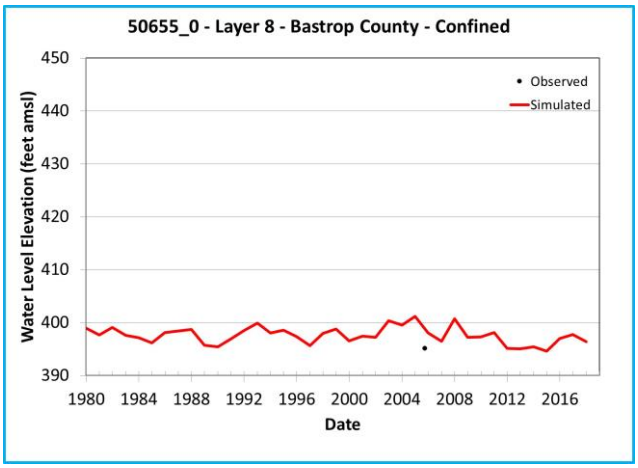












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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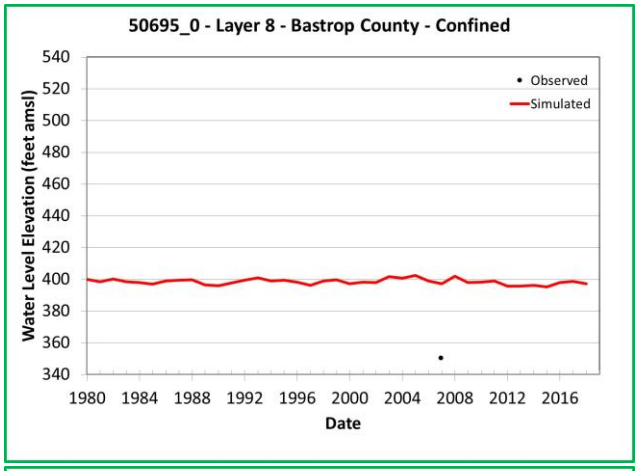
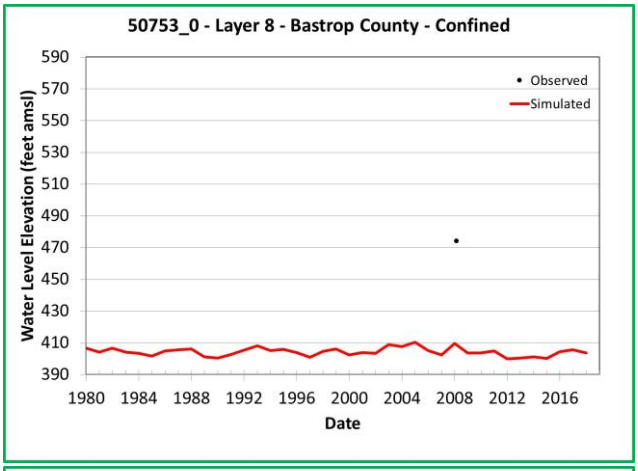
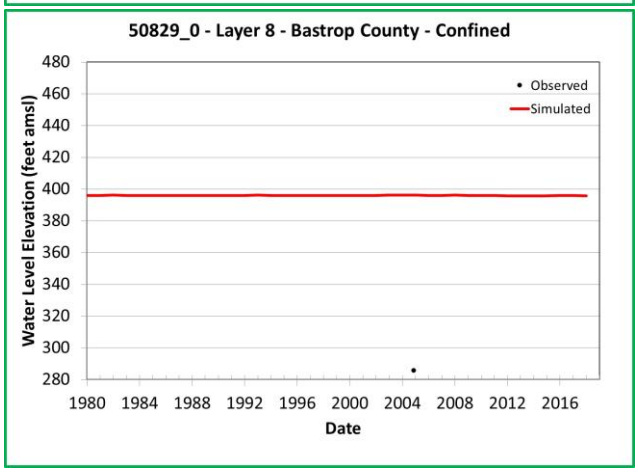
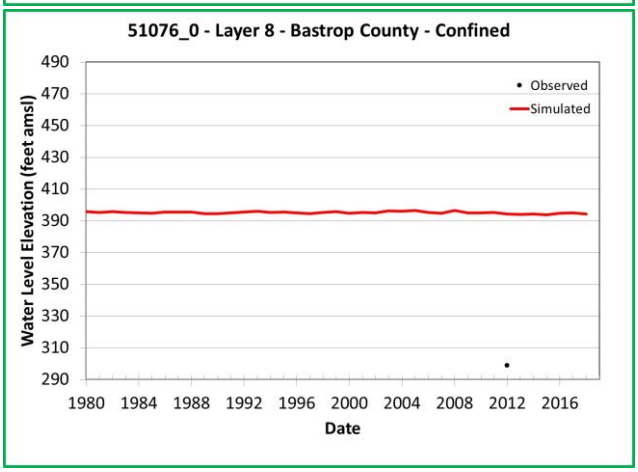
FIGURE I-2.4b

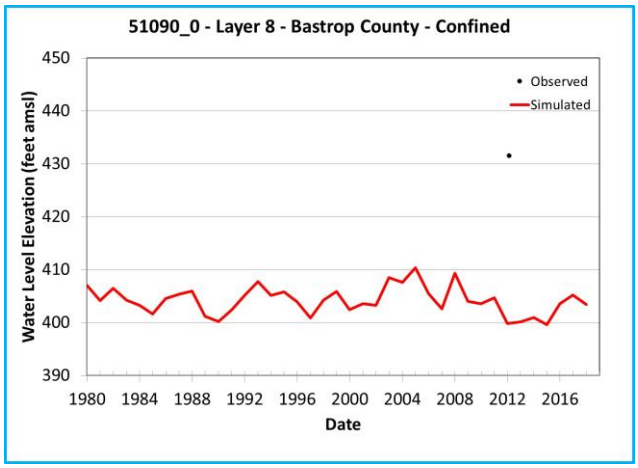
GSI ENVIRONMENTAL

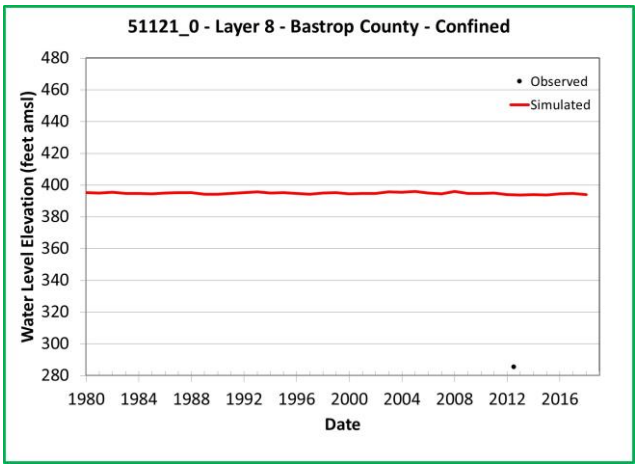












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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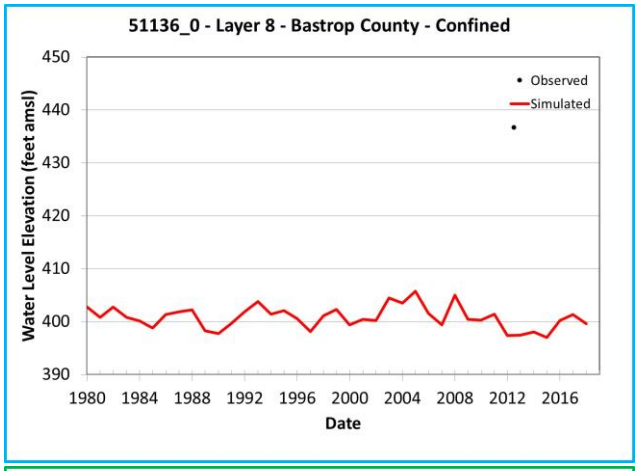
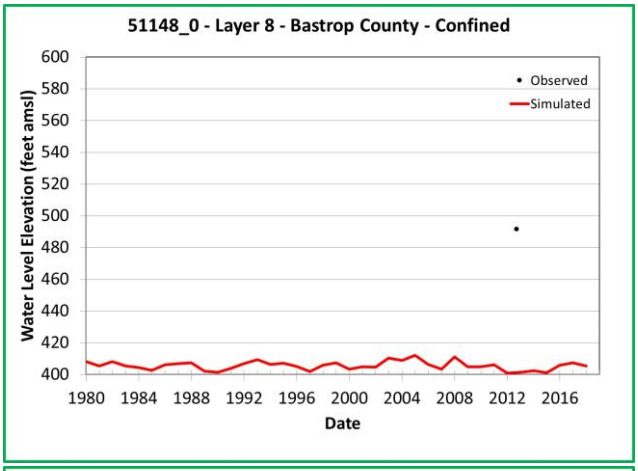
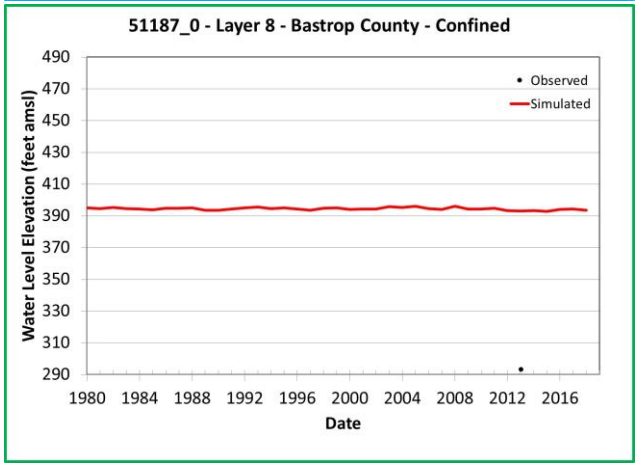
Revised		Aprv'd by	SP

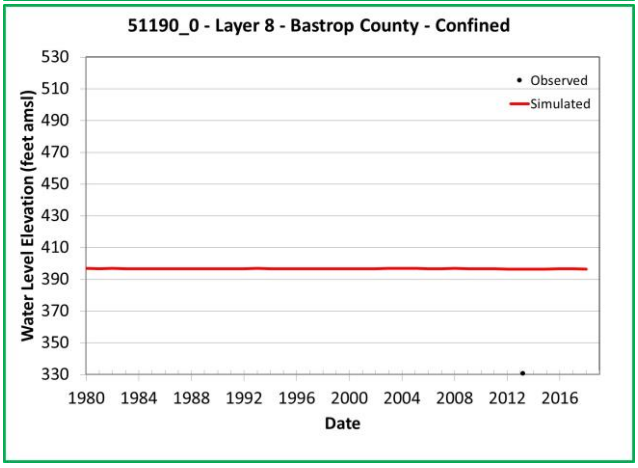
FIGURE I-2.4c

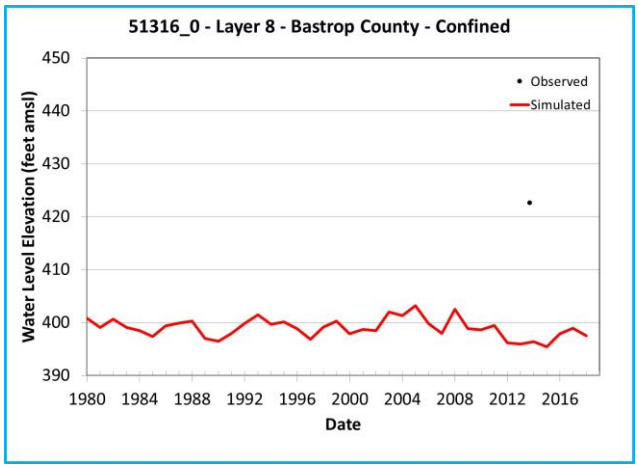
GSI ENVIRONMENTAL

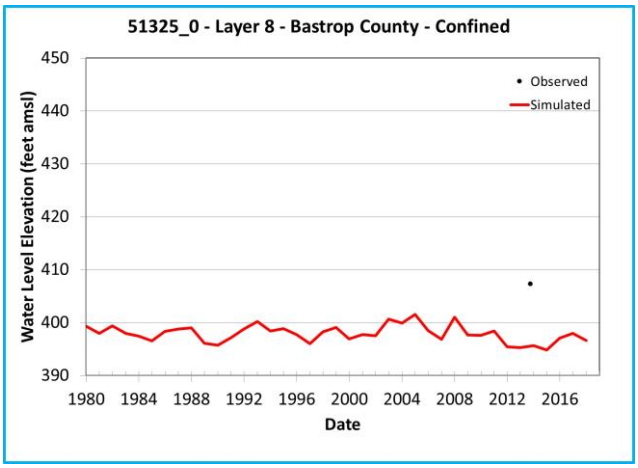












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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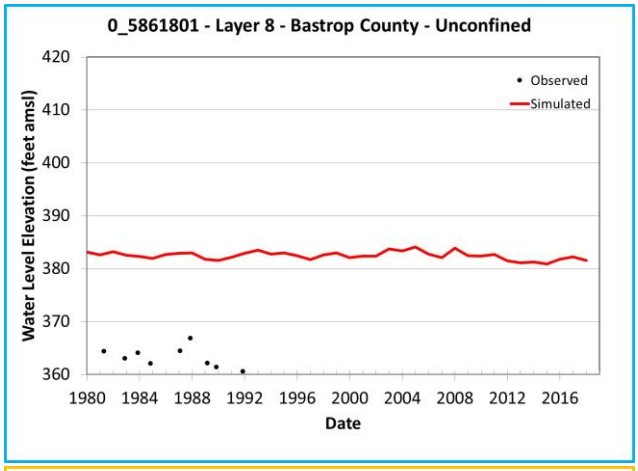
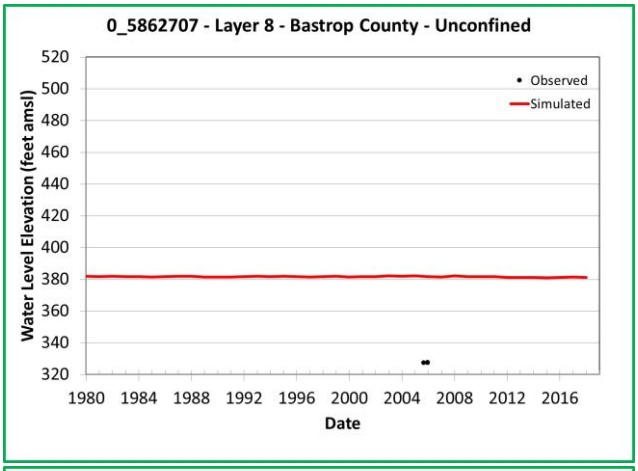
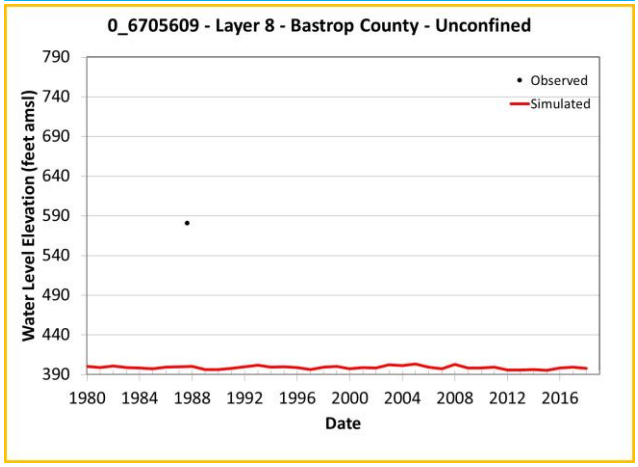
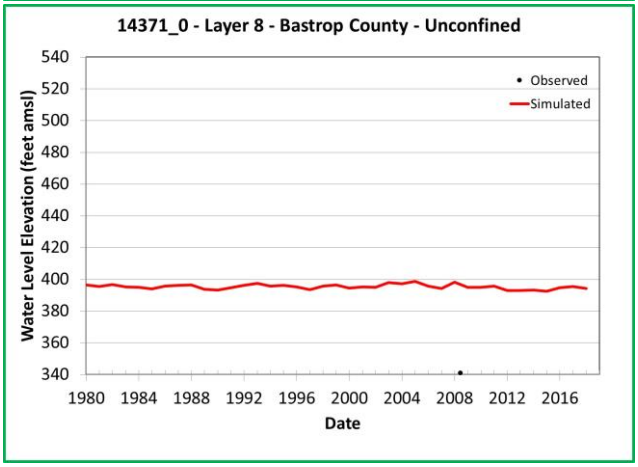
FIGURE I-2.4d

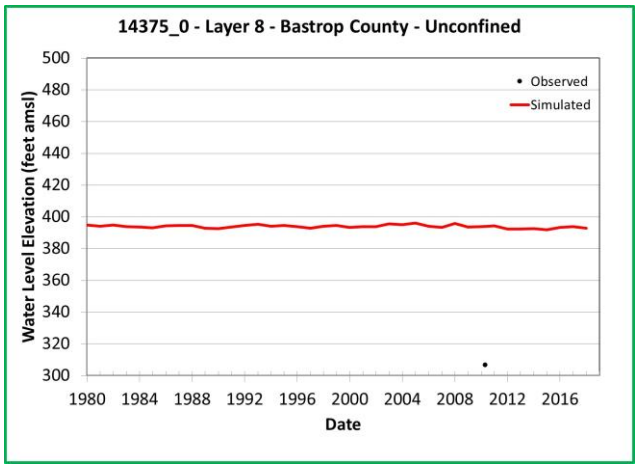
GSI ENVIRONMENTAL

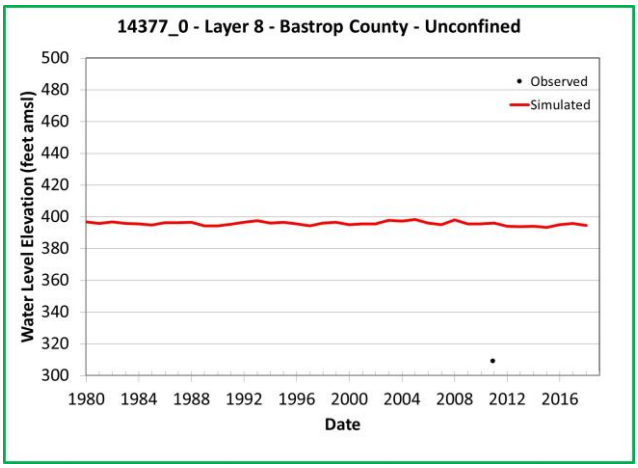












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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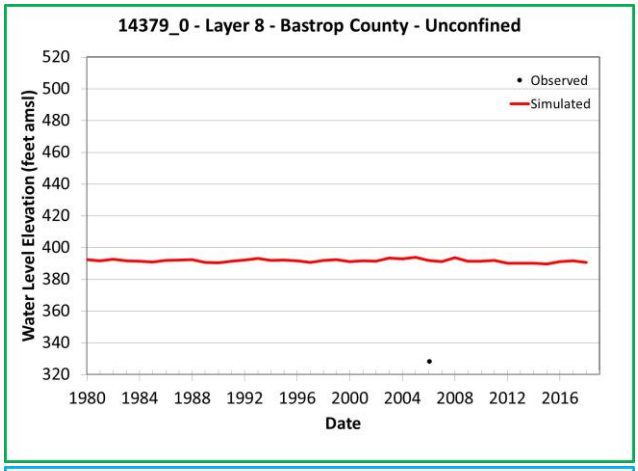
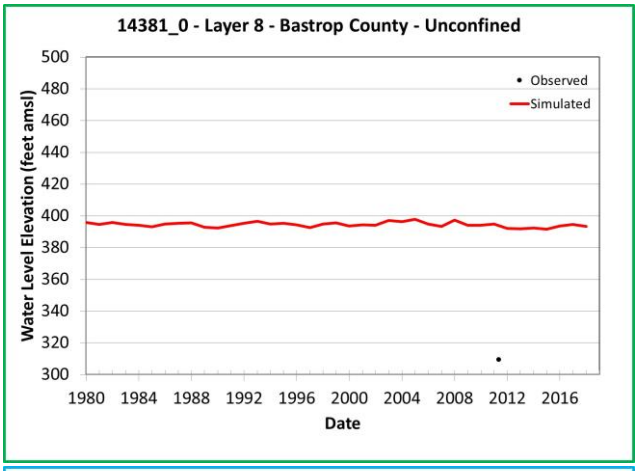
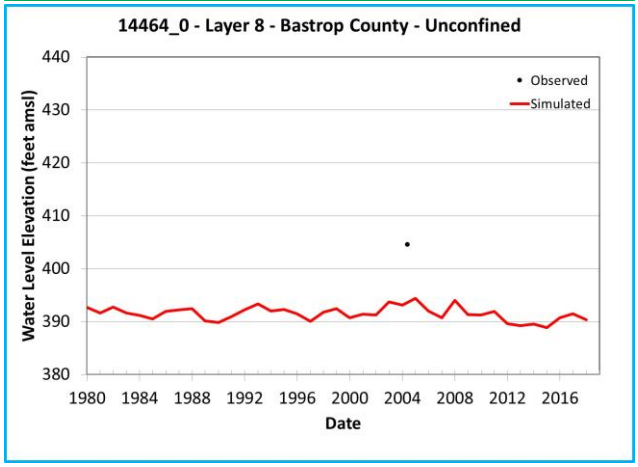
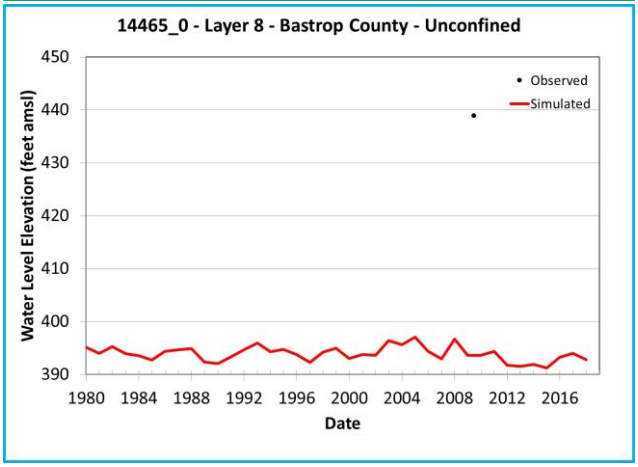
FIGURE I-2.4e

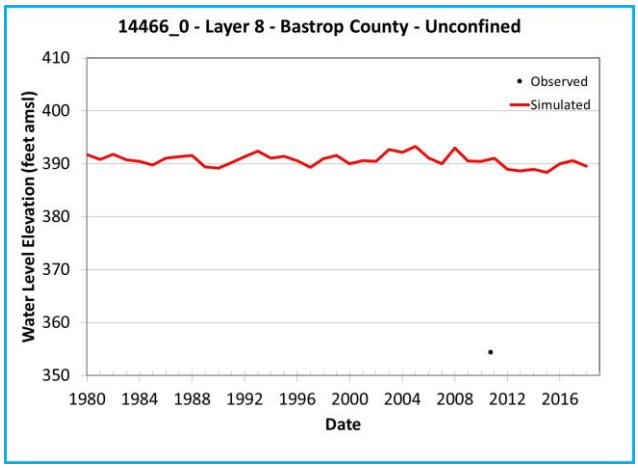
GSI ENVIRONMENTAL

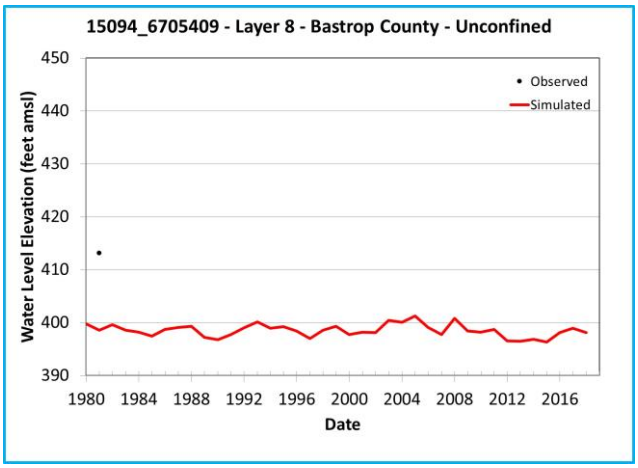












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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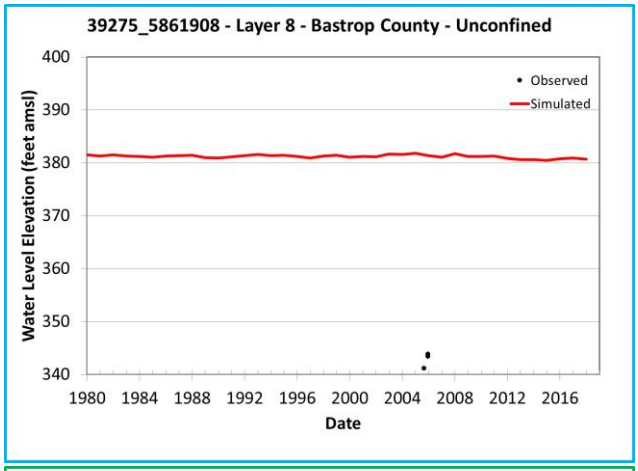
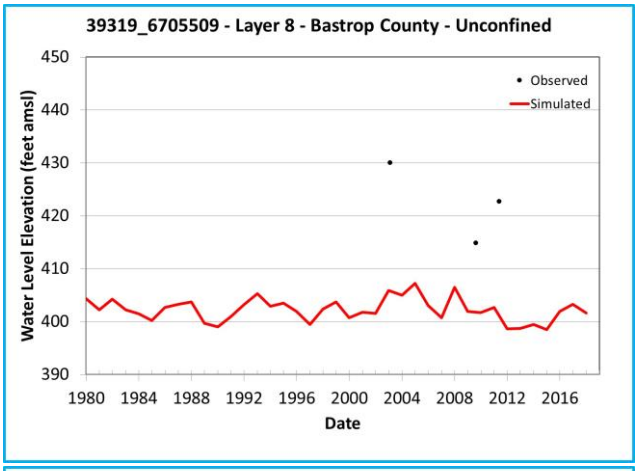
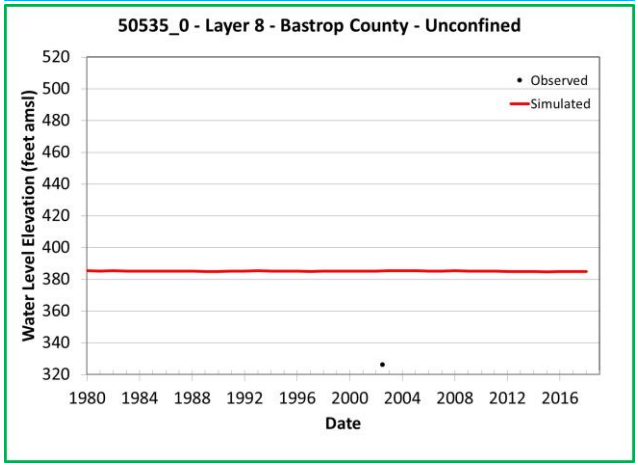
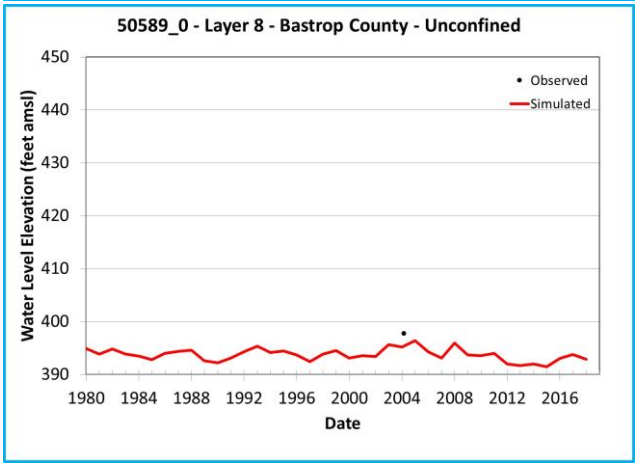
FIGURE I-2.4f

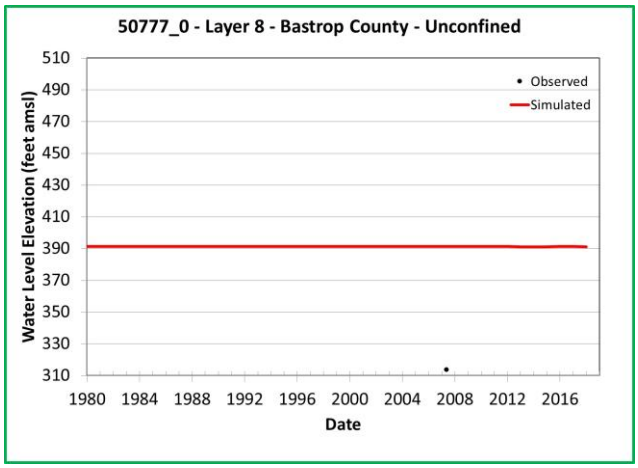
GSI ENVIRONMENTAL

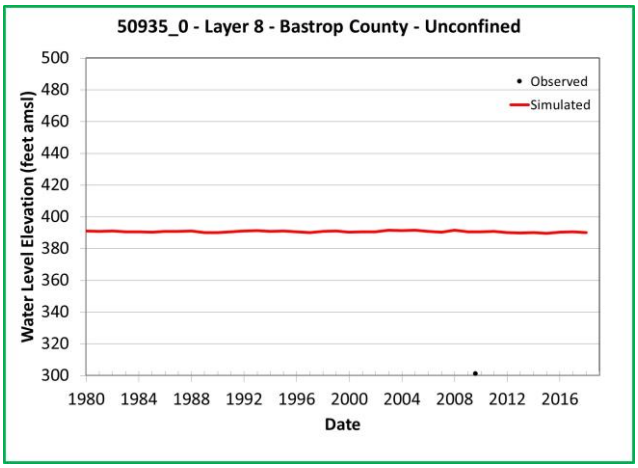












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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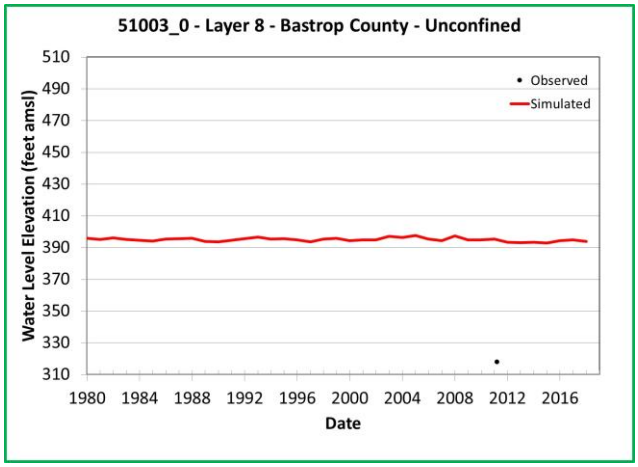
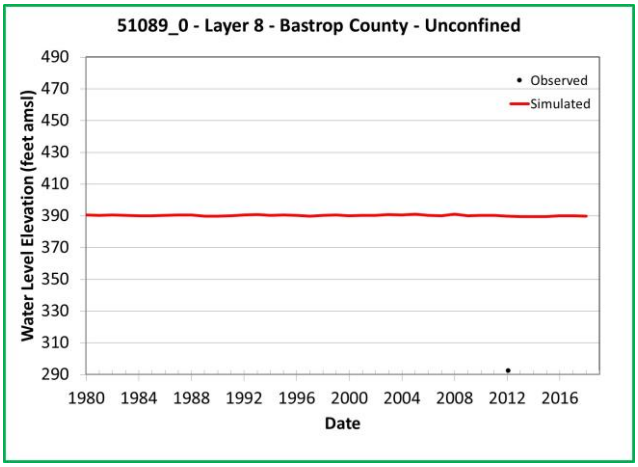
Revised		Aprv'd by	SP

FIGURE I-2.4g

GSI ENVIRONMENTAL





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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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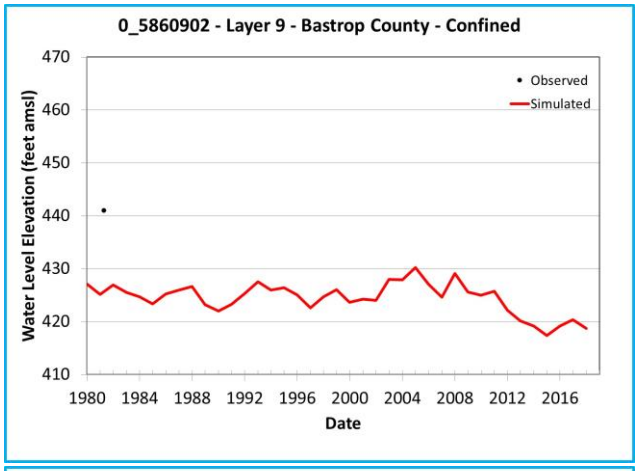
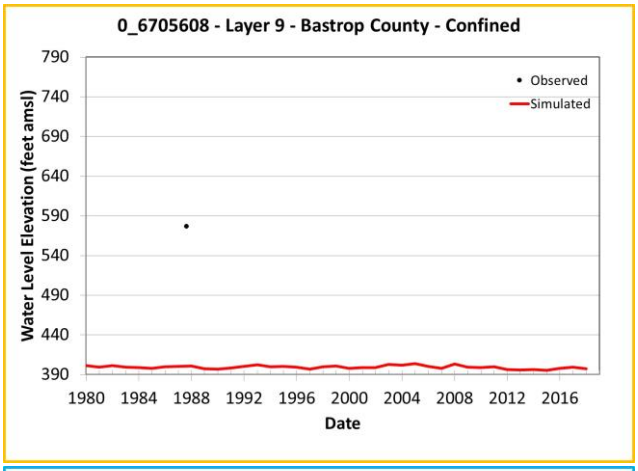
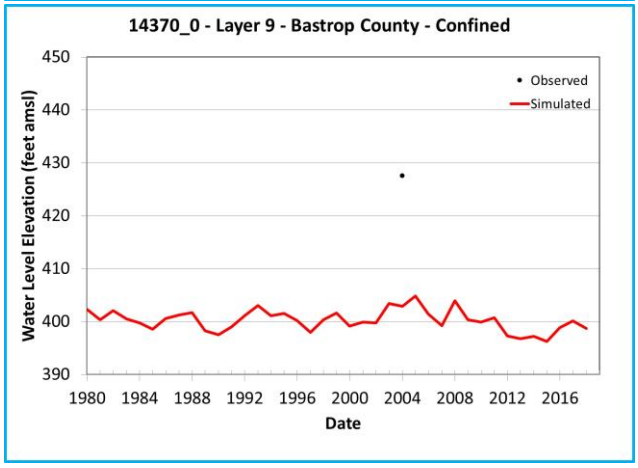
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

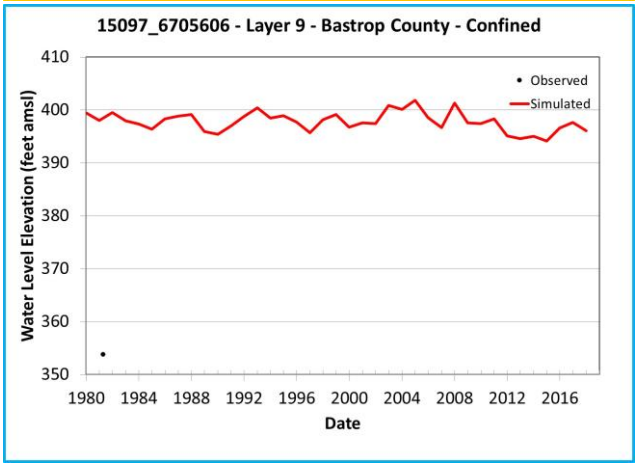
FIGURE I-2.4h

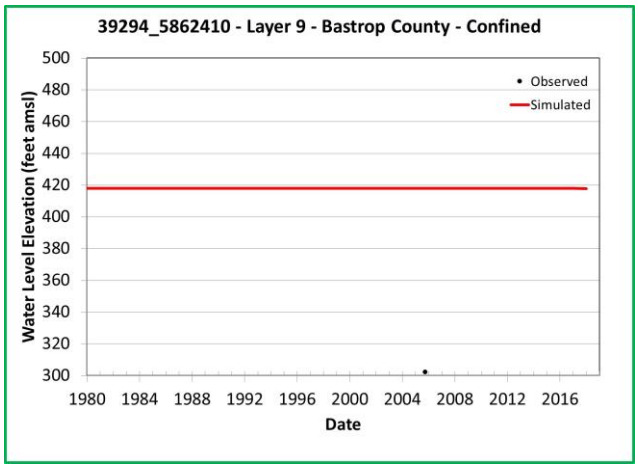
GSI ENVIRONMENTAL

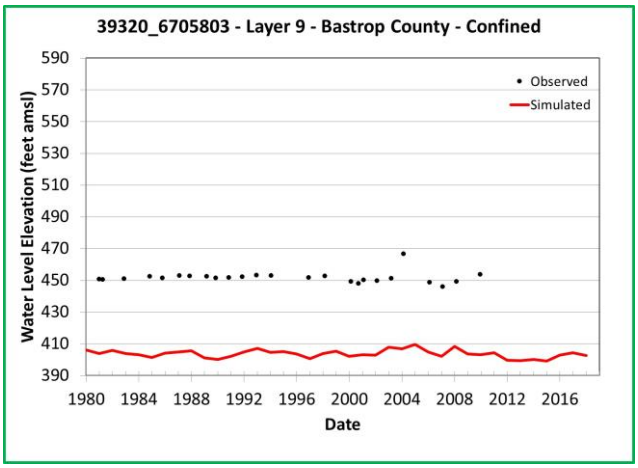












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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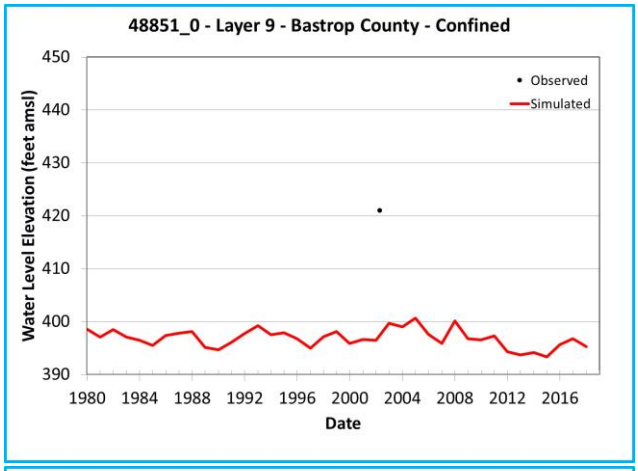
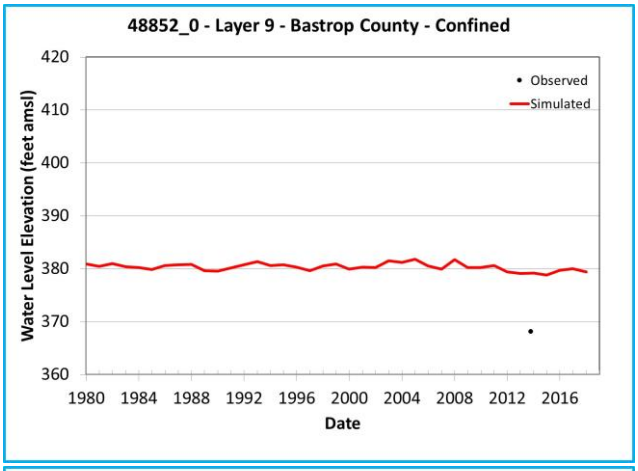
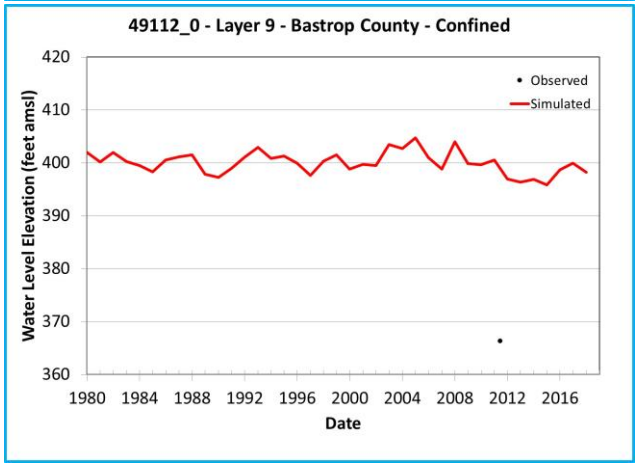
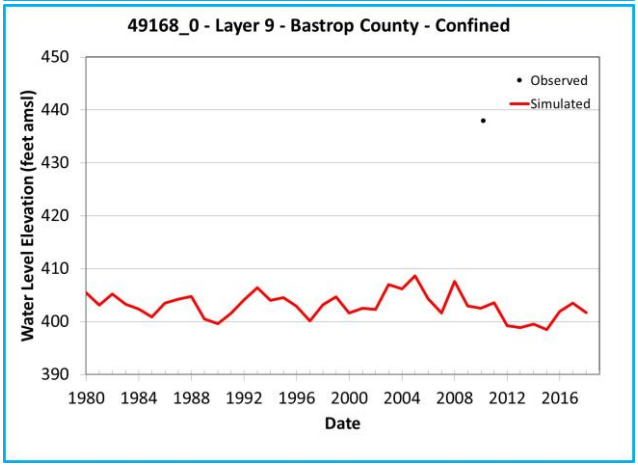
FIGURE I-2.5a

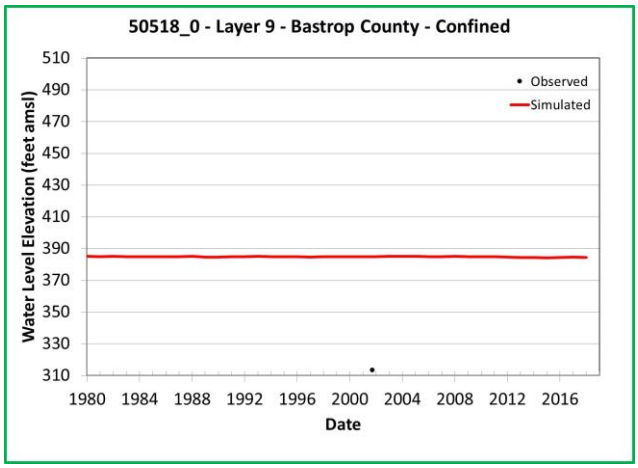
GSI ENVIRONMENTAL

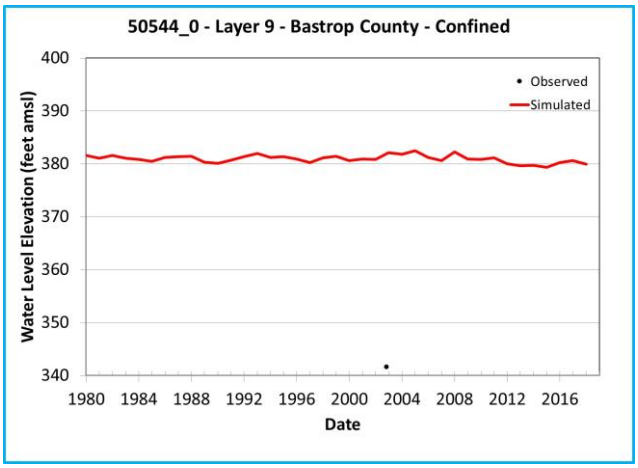












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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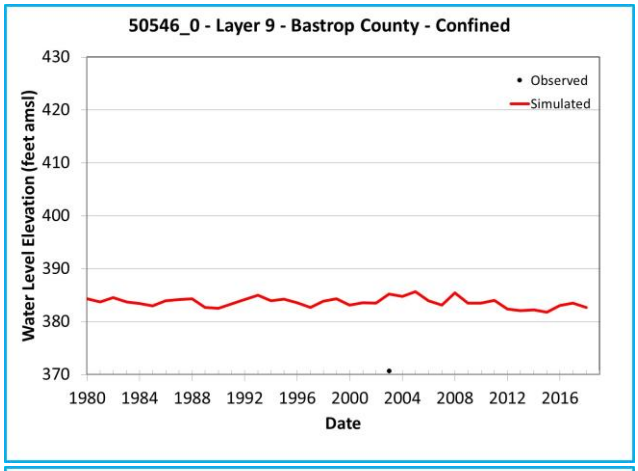
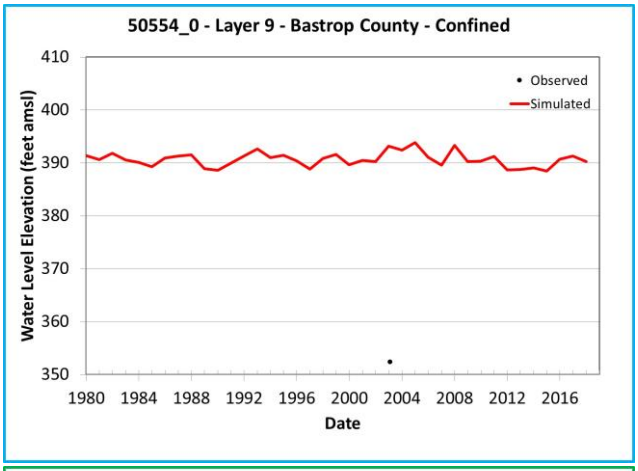
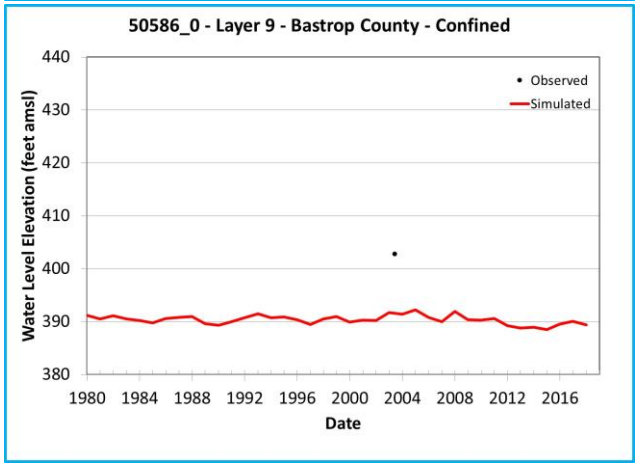
Revised		Aprv'd by	SP

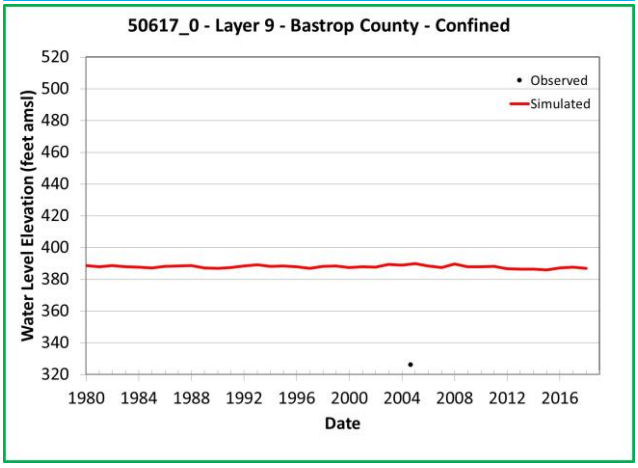
FIGURE I-2.5b

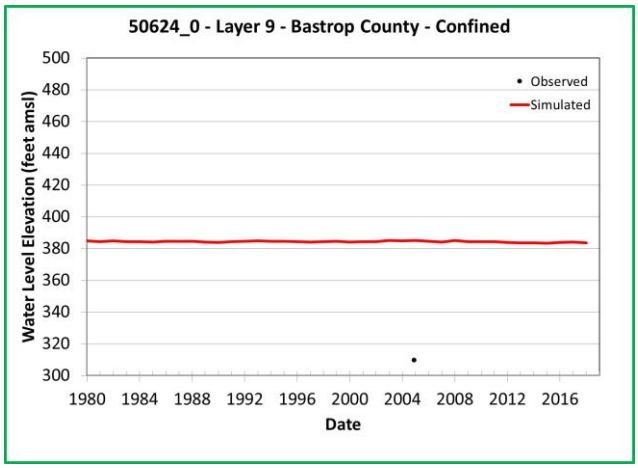
GSI ENVIRONMENTAL

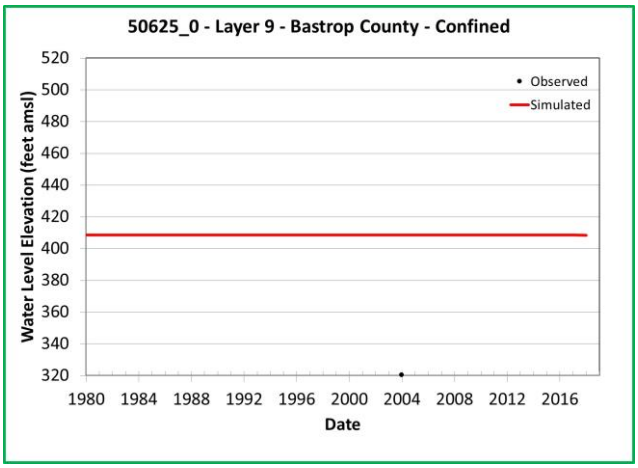












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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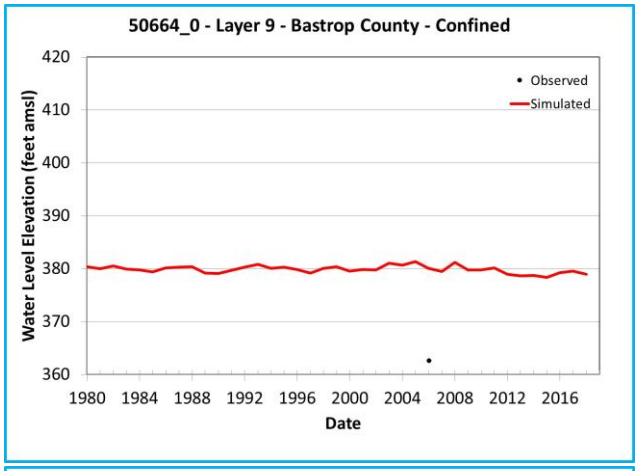
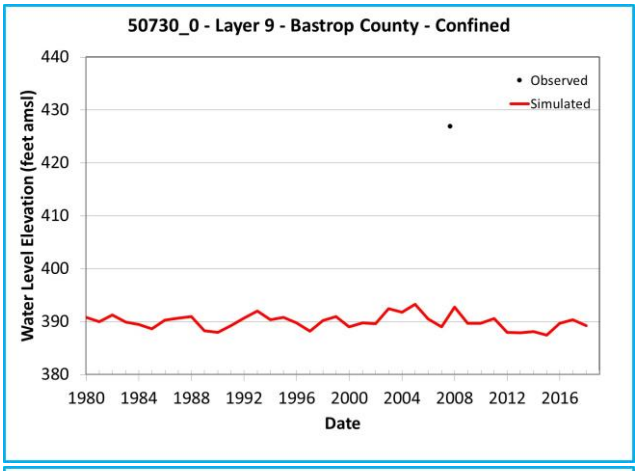
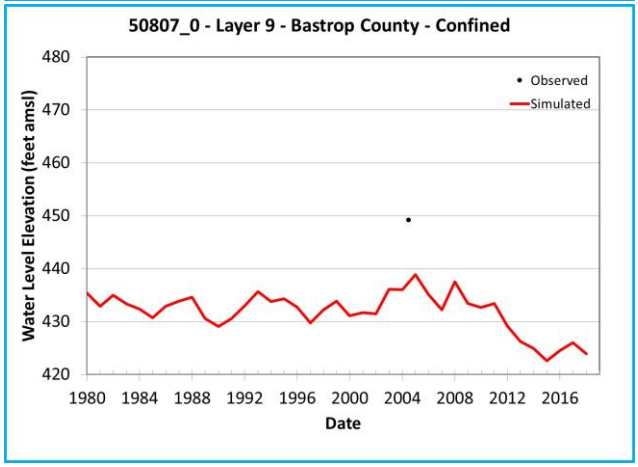
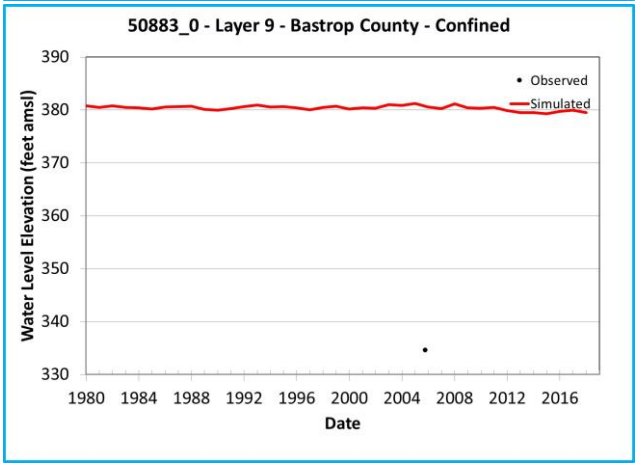
FIGURE I-2.5c

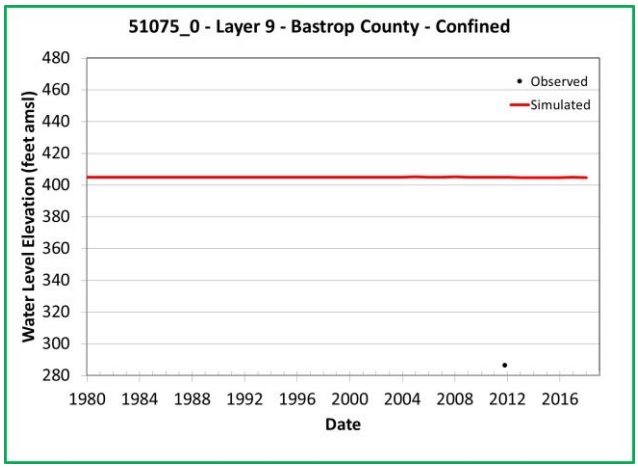
GSI ENVIRONMENTAL

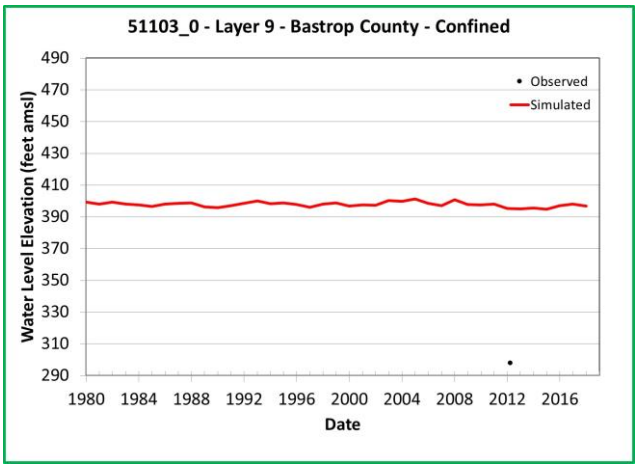












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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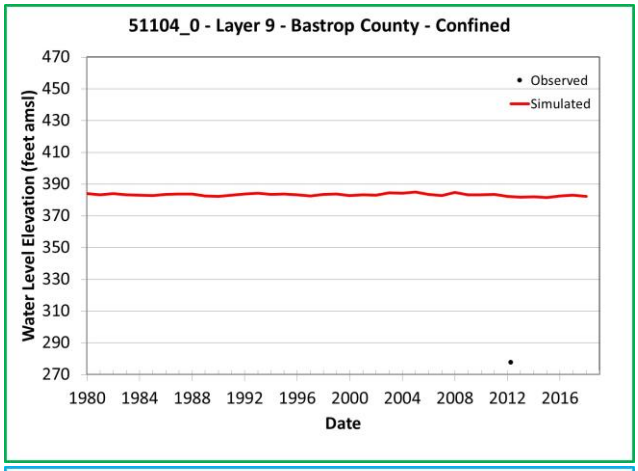
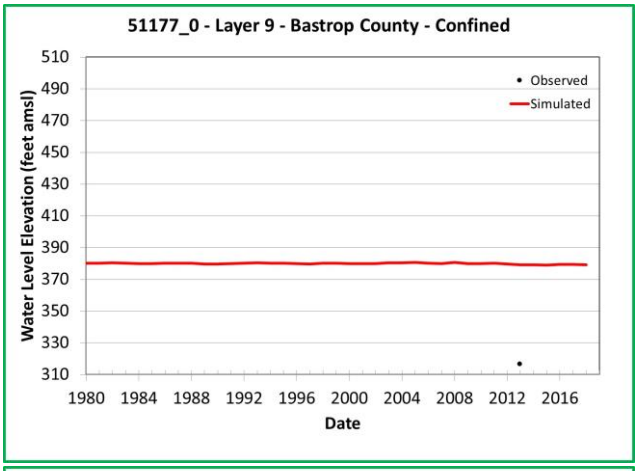
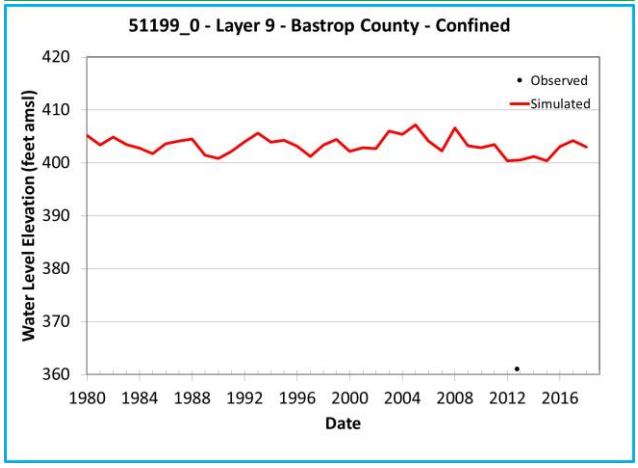
Revised		Aprv'd by	SP

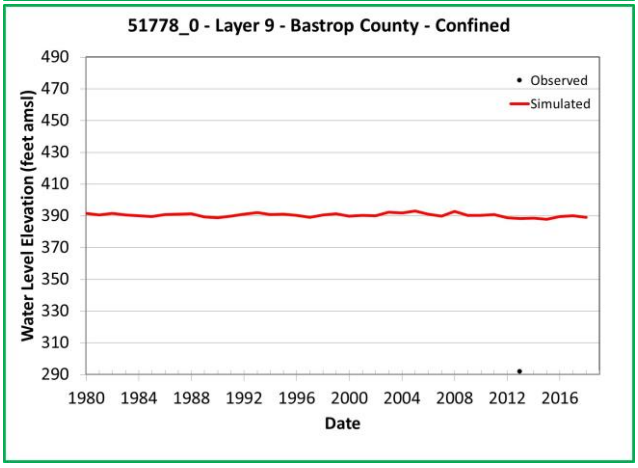
FIGURE I-2.5d

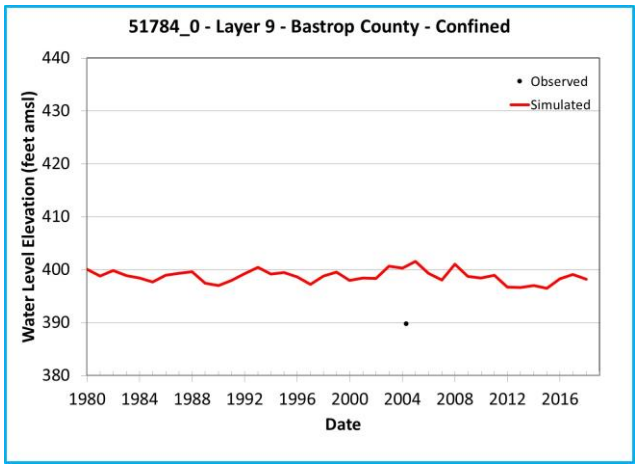
GSI ENVIRONMENTAL

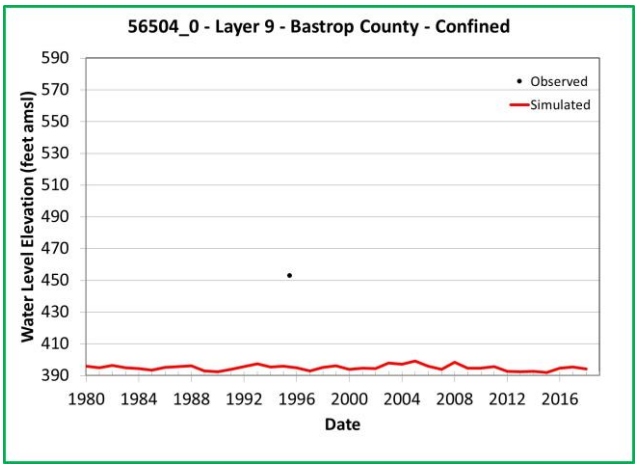












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Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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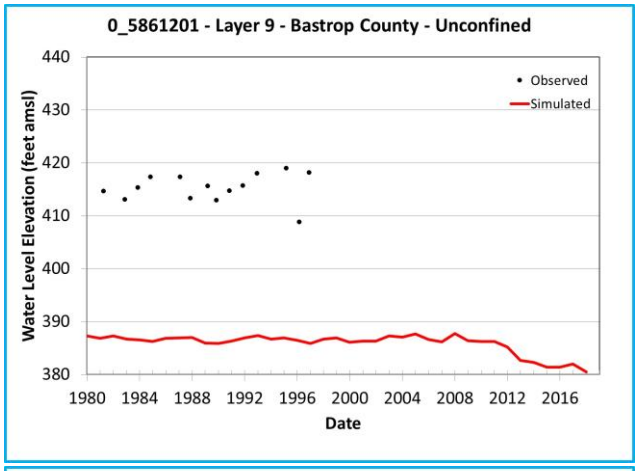
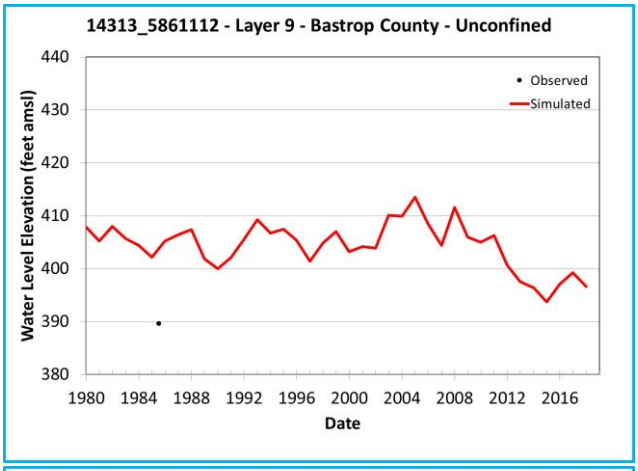
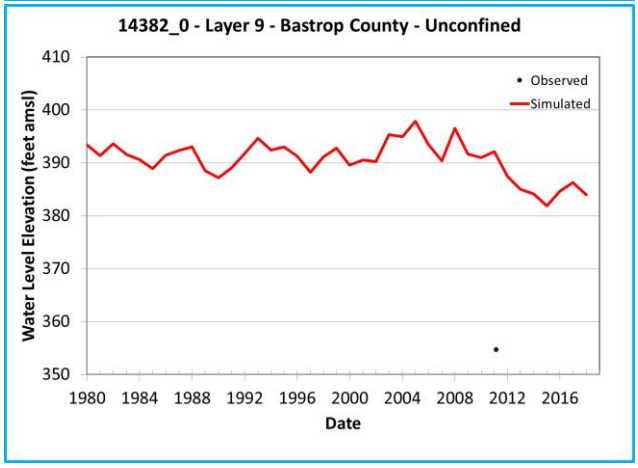
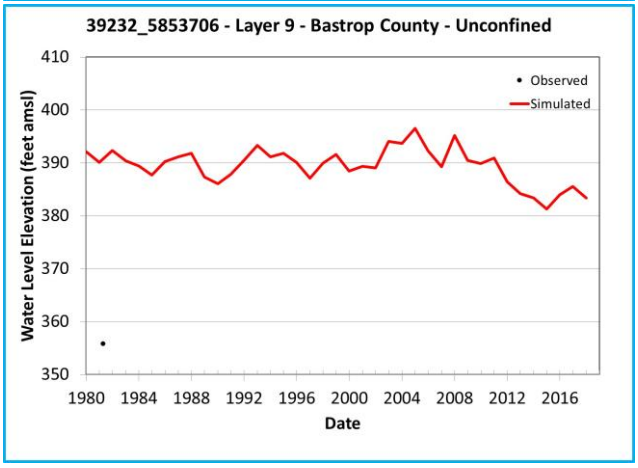
FIGURE I-2.5e

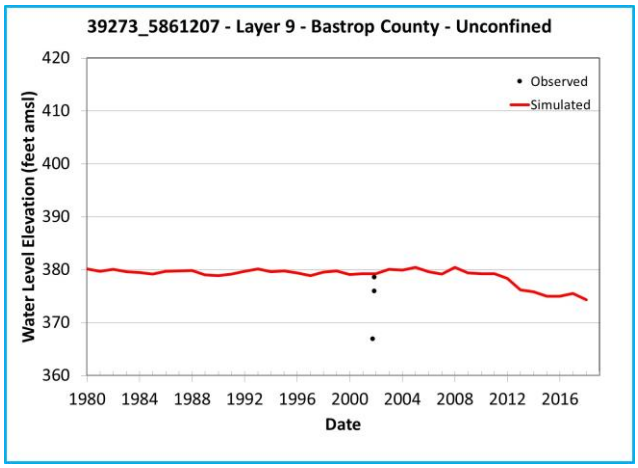
GSI ENVIRONMENTAL

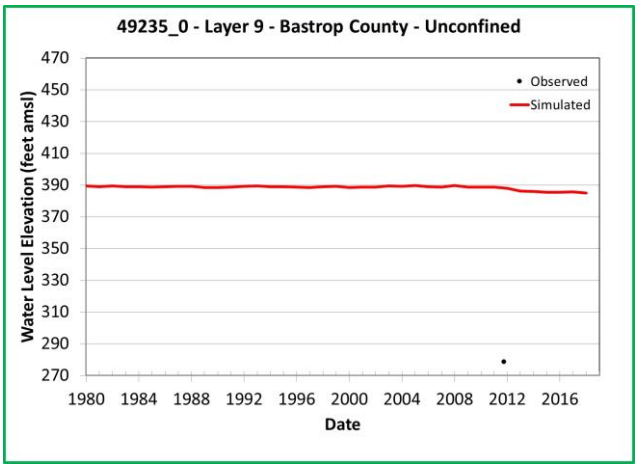












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

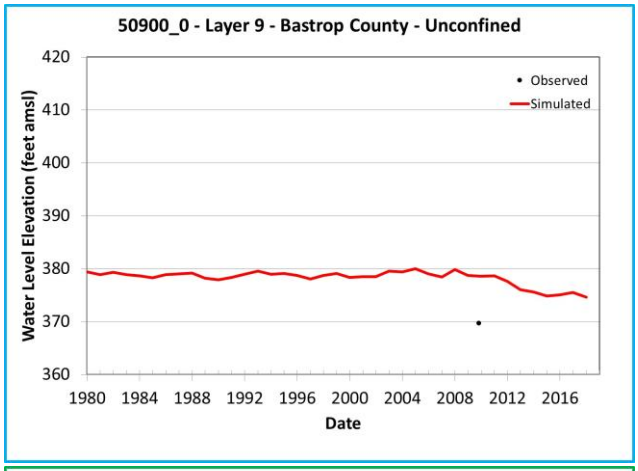
Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

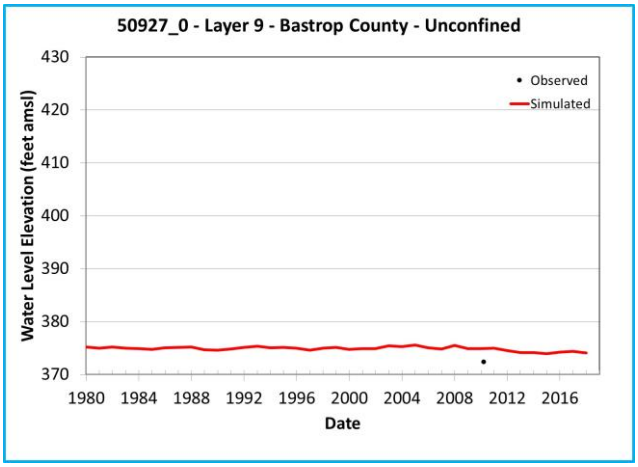
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

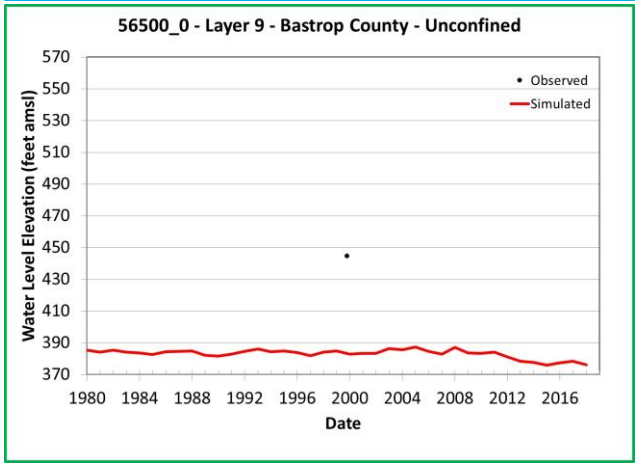
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-2.5f

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bastrop County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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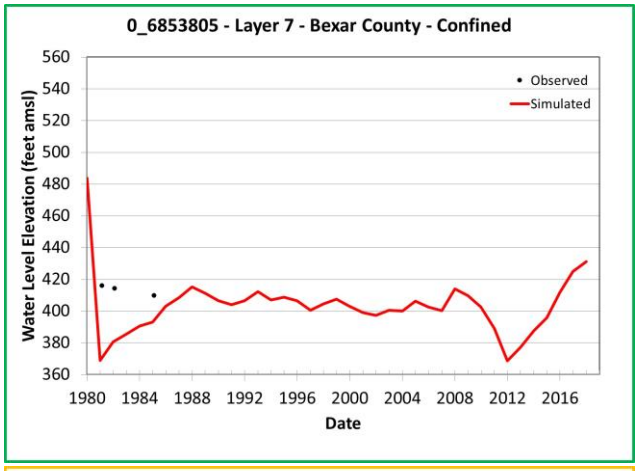
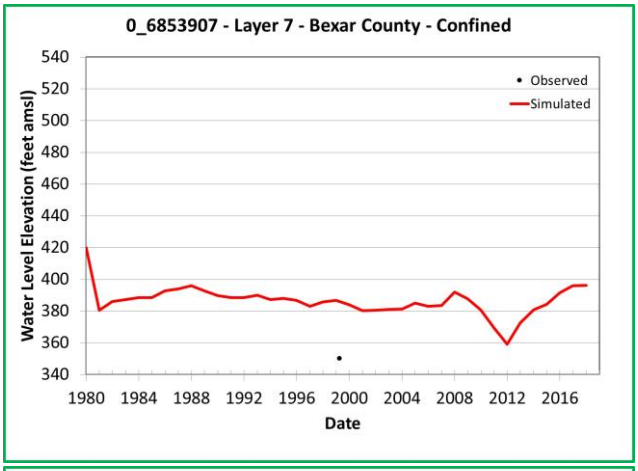
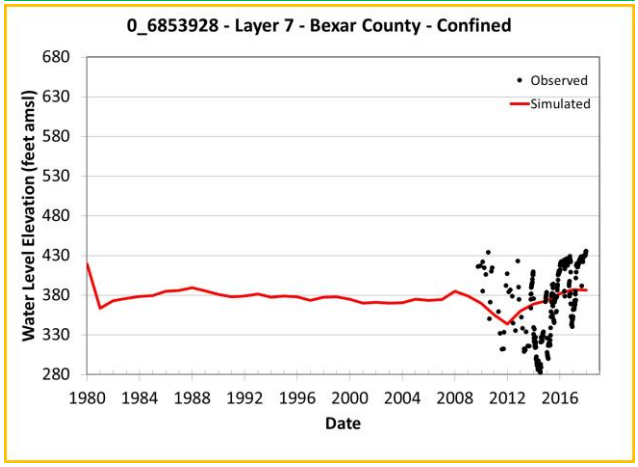
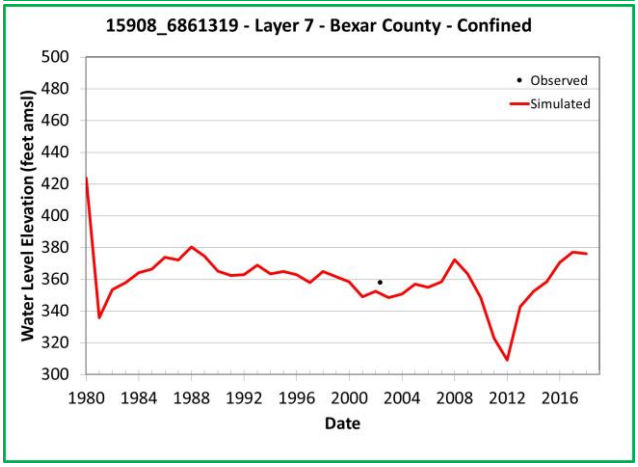
FIGURE I-2.5g

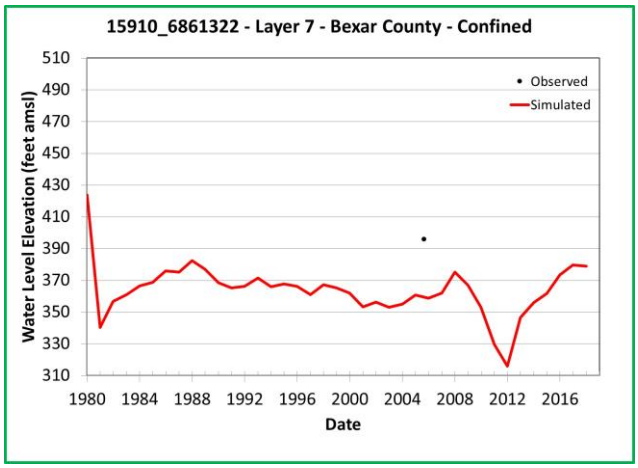
GSI ENVIRONMENTAL

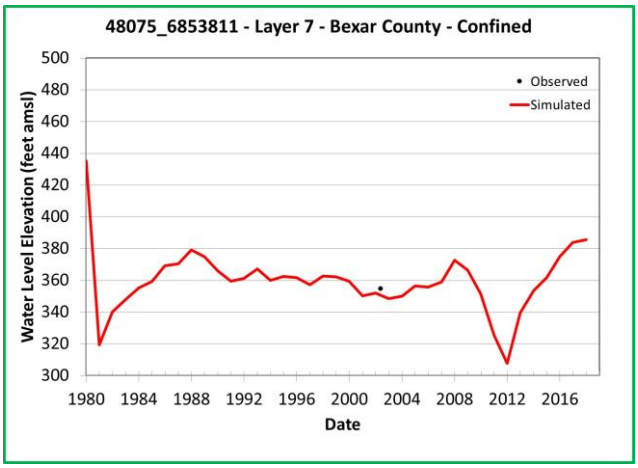












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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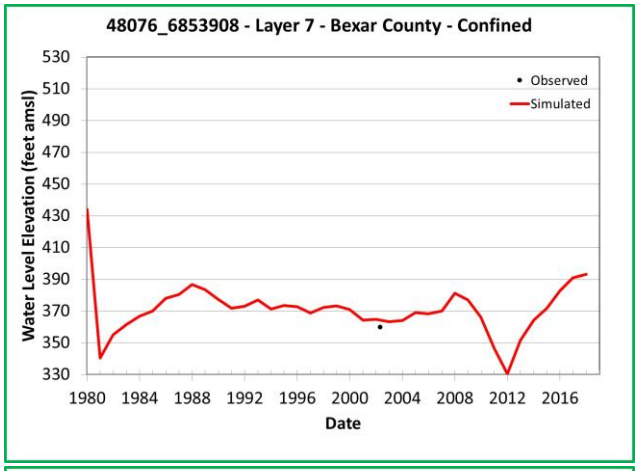
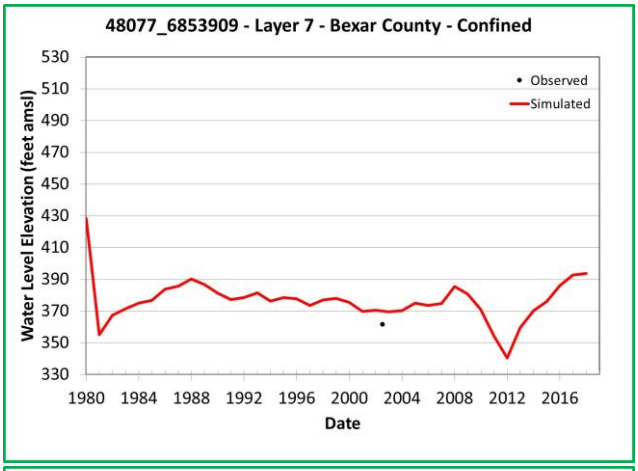
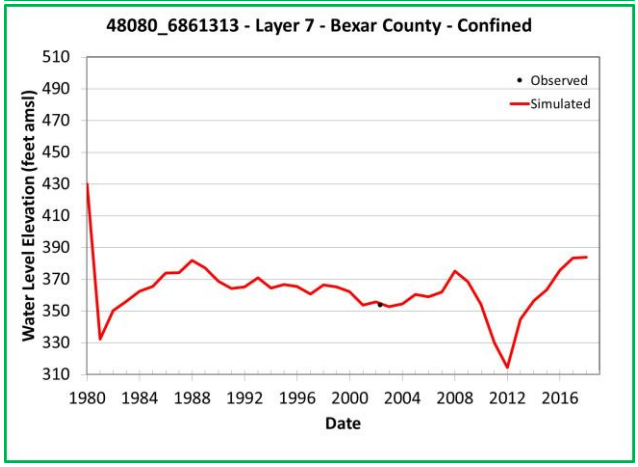
Revised		Aprv'd by	SP

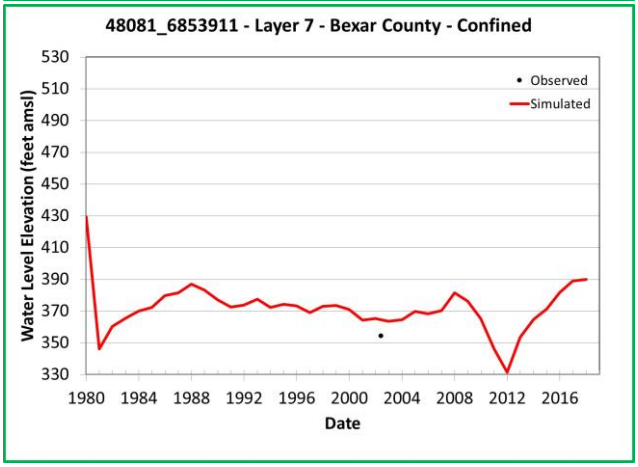
FIGURE I-3.1a

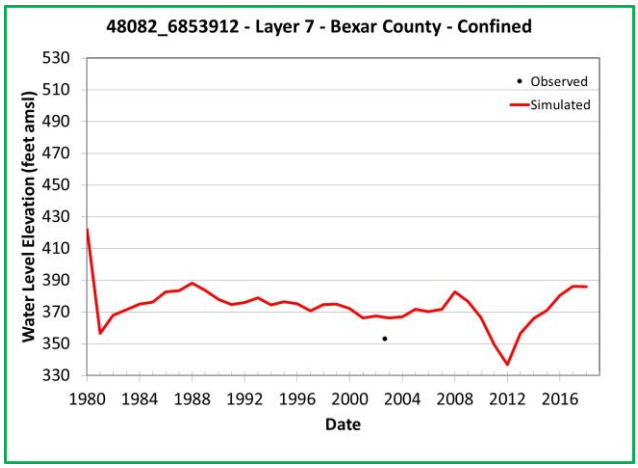
GSI ENVIRONMENTAL

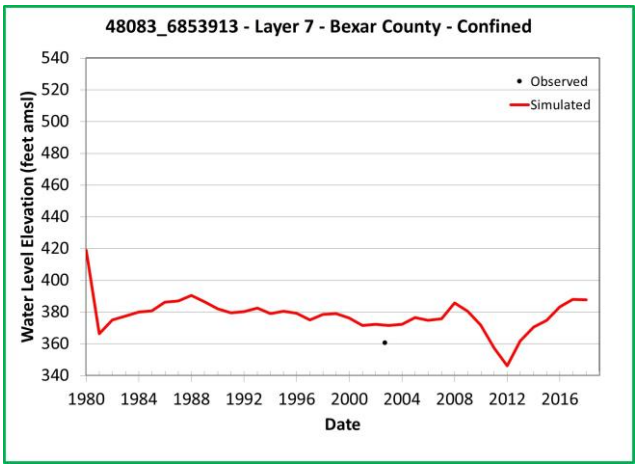












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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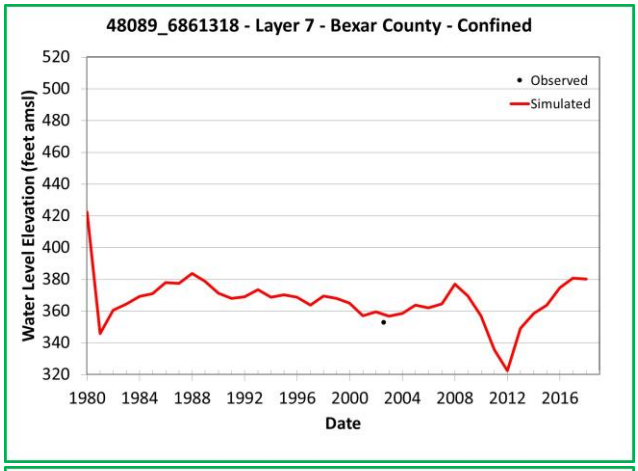
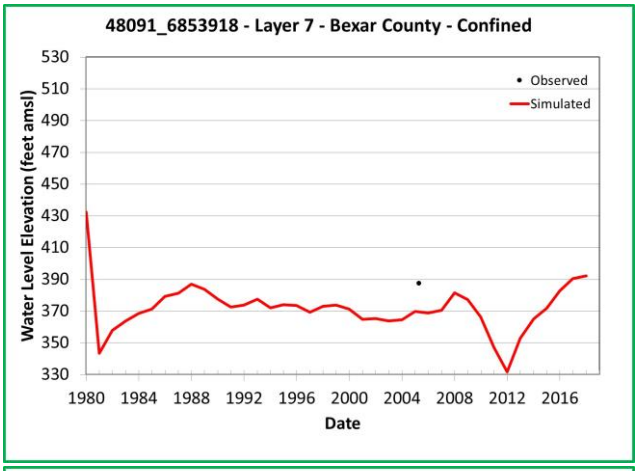
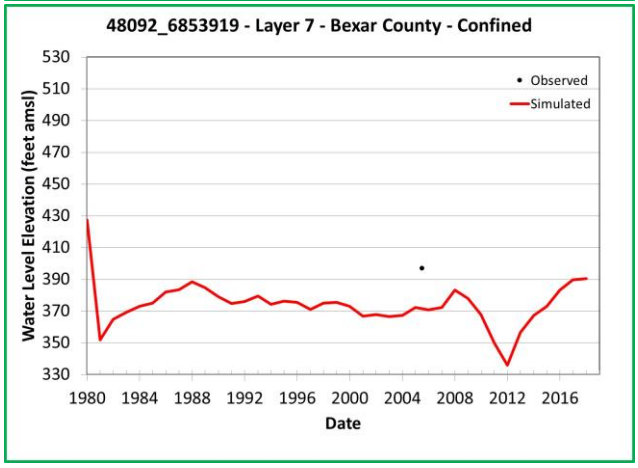
Revised		Aprv'd by	SP

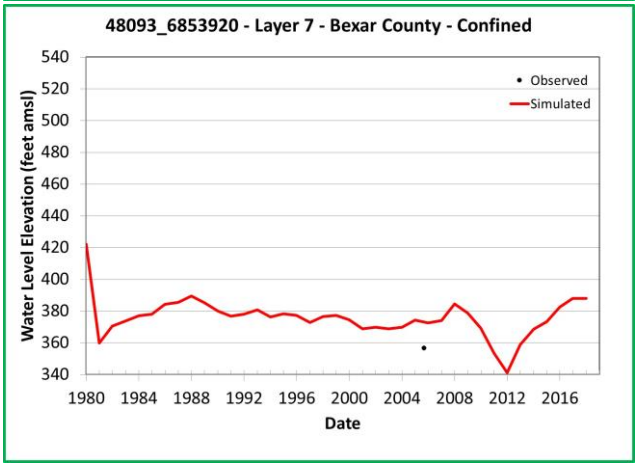
FIGURE I-3.1b

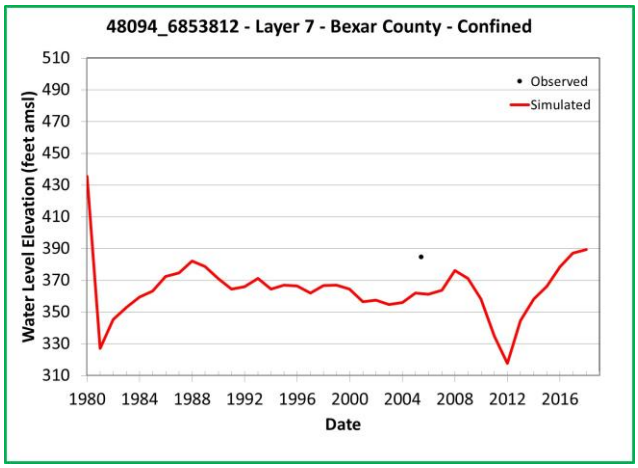
GSI ENVIRONMENTAL

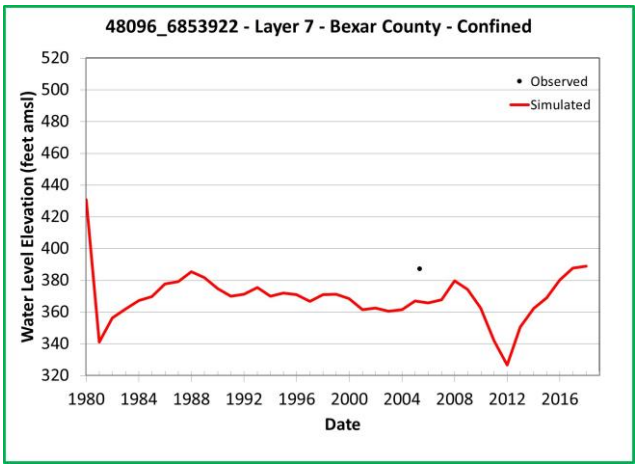












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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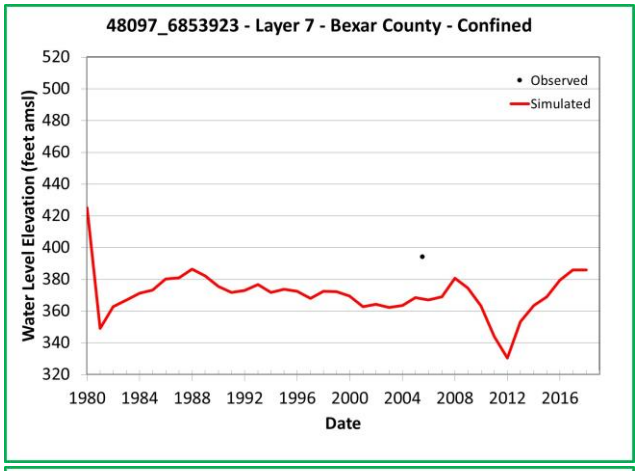
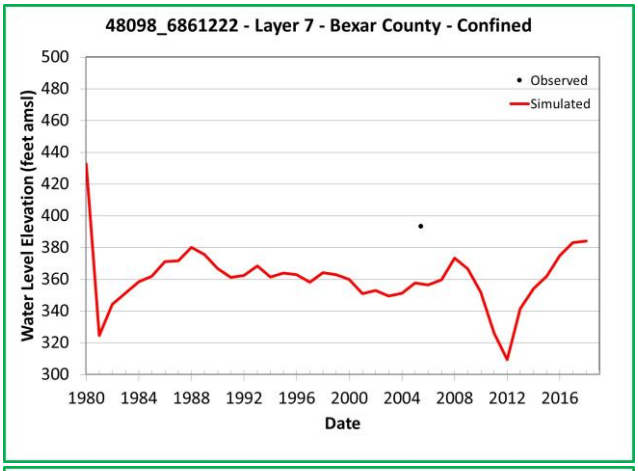
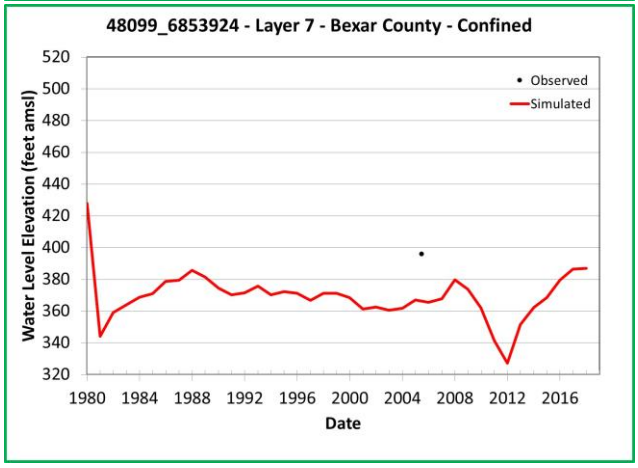
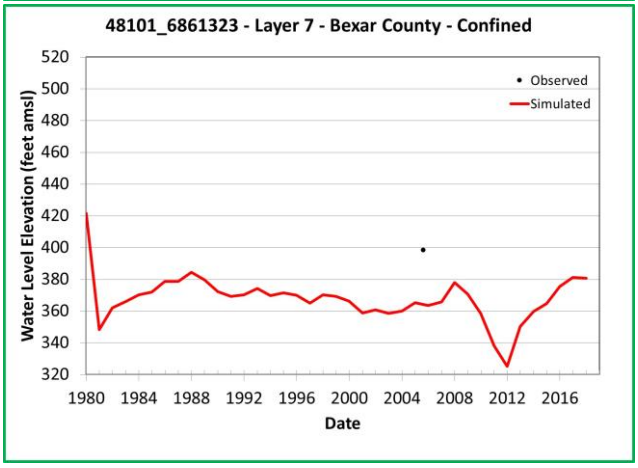
FIGURE I-3.1c

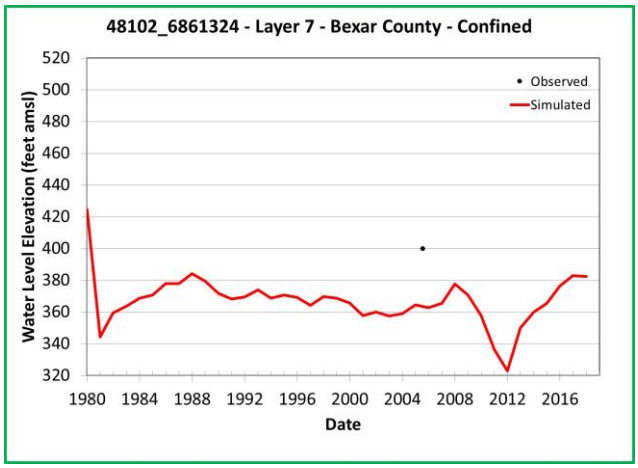
GSI ENVIRONMENTAL

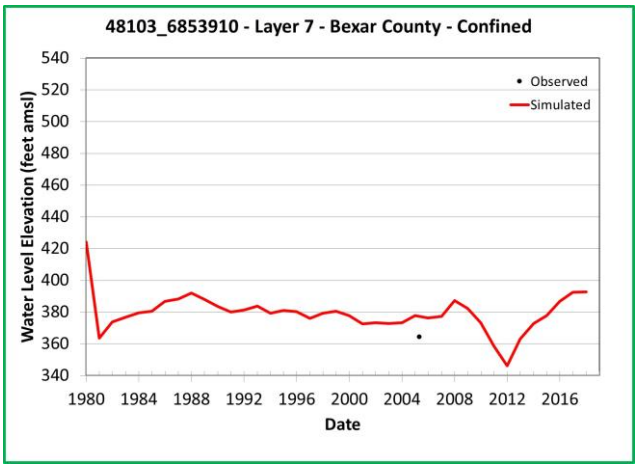












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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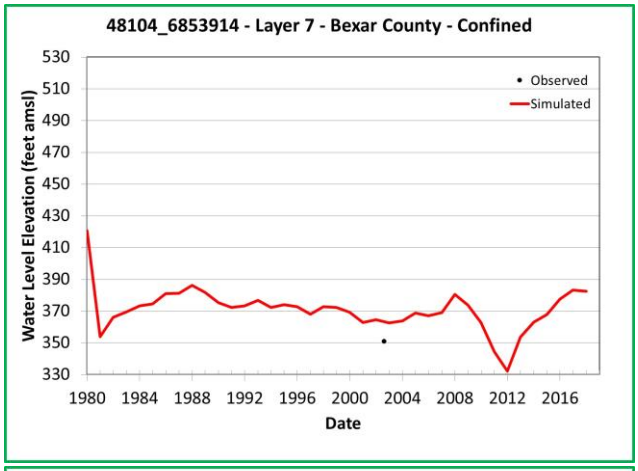
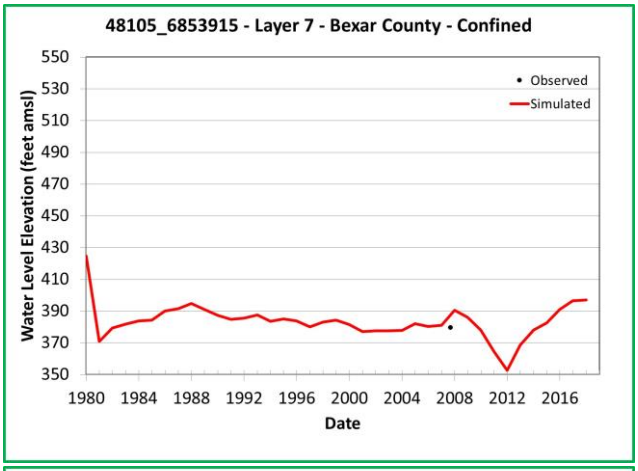
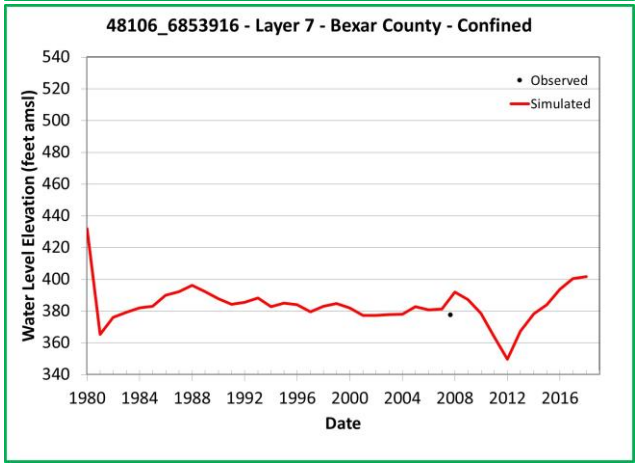
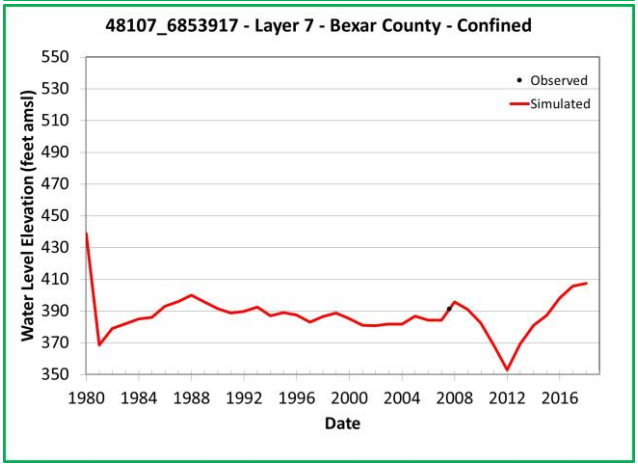
FIGURE I-3.1d

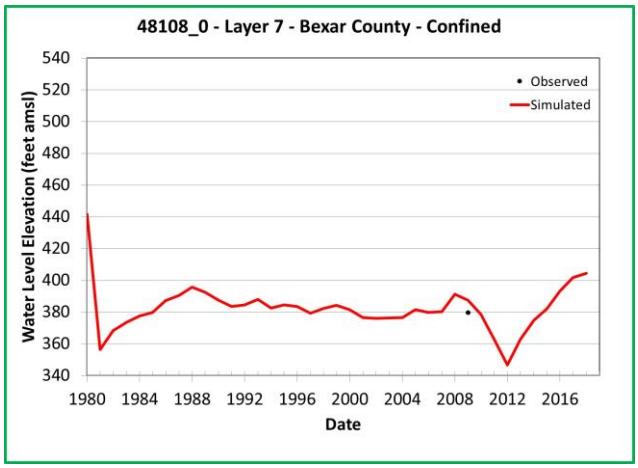
GSI ENVIRONMENTAL

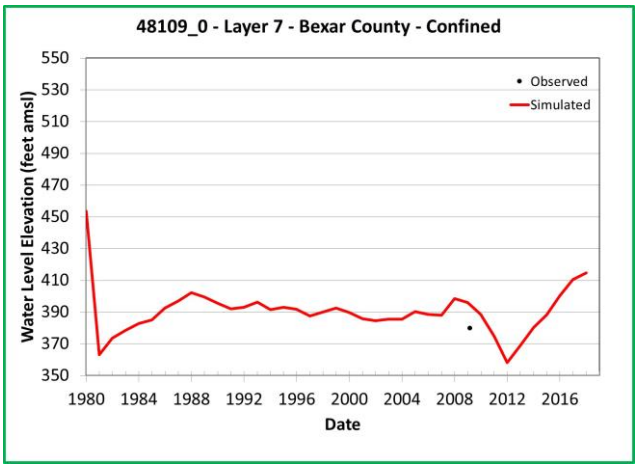












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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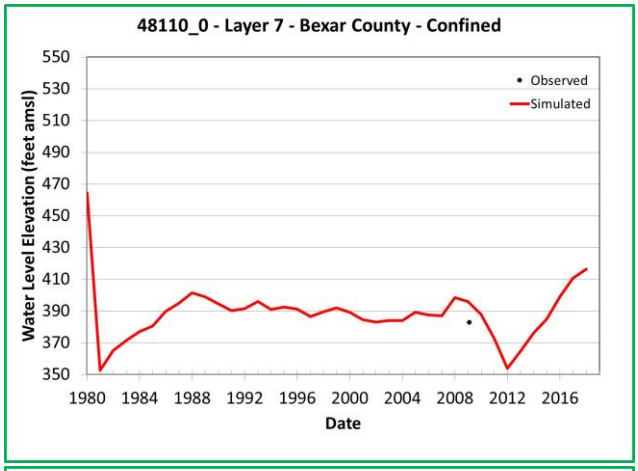
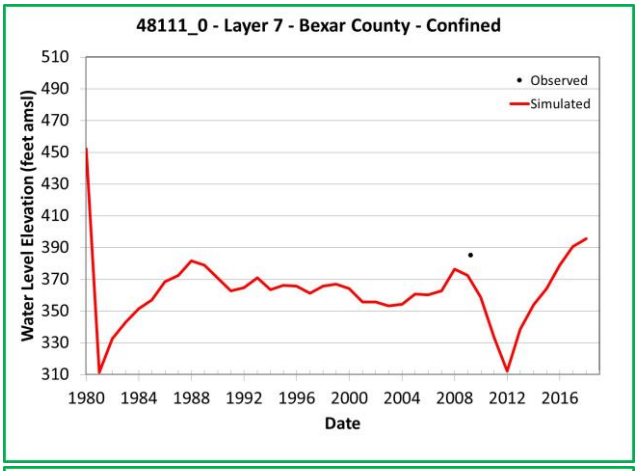
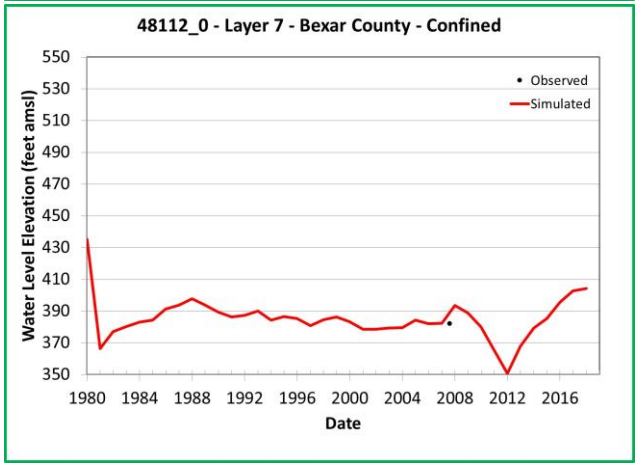
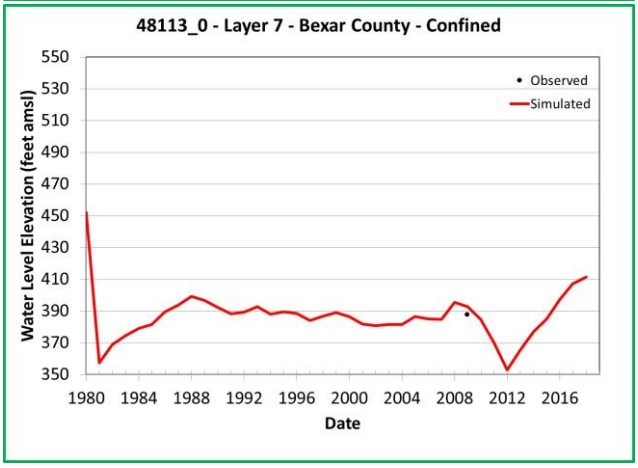
FIGURE I-3.1e

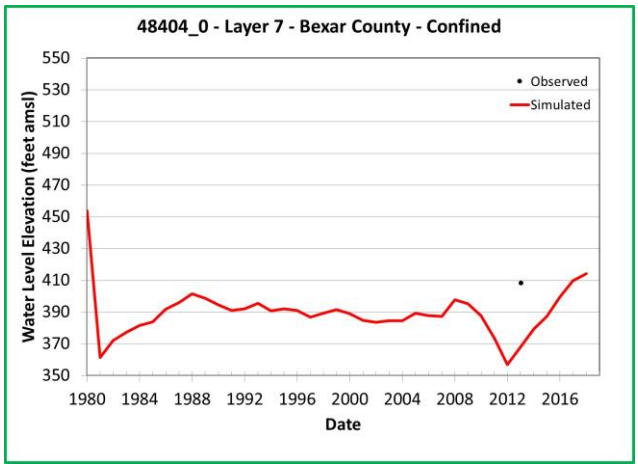
GSI ENVIRONMENTAL

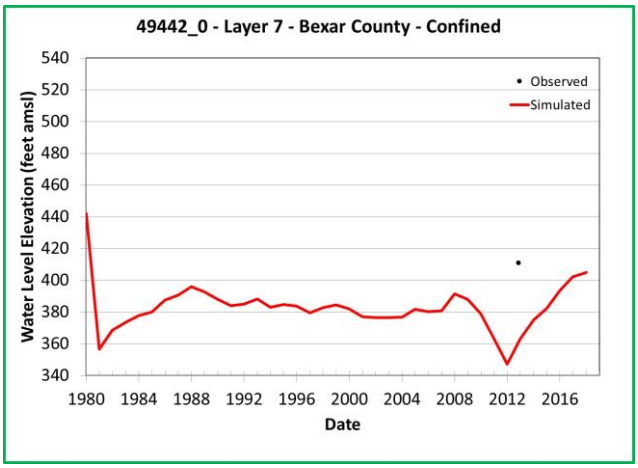












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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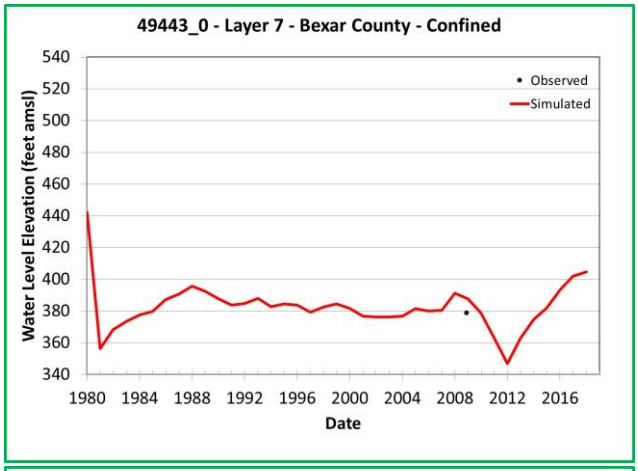
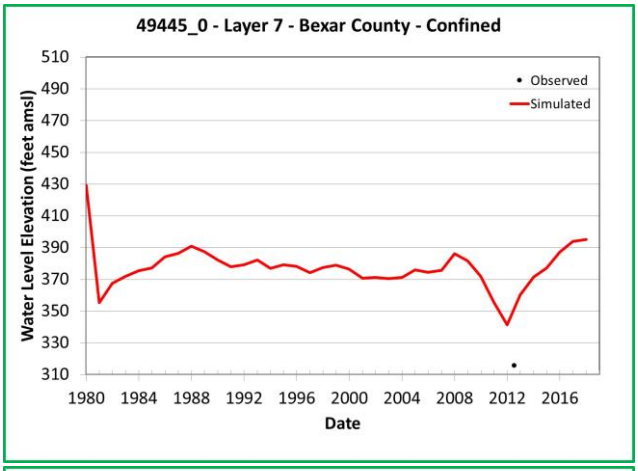
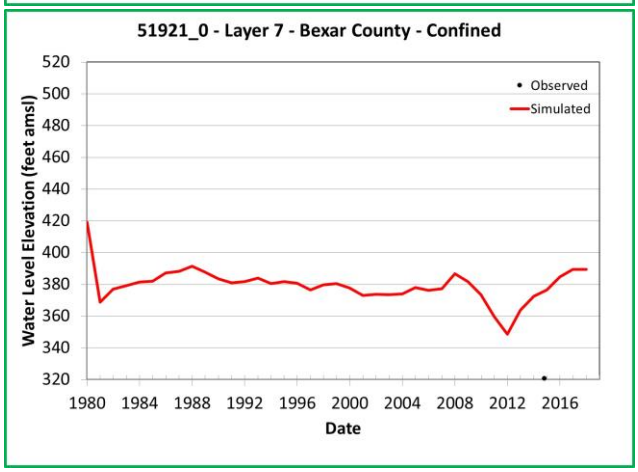
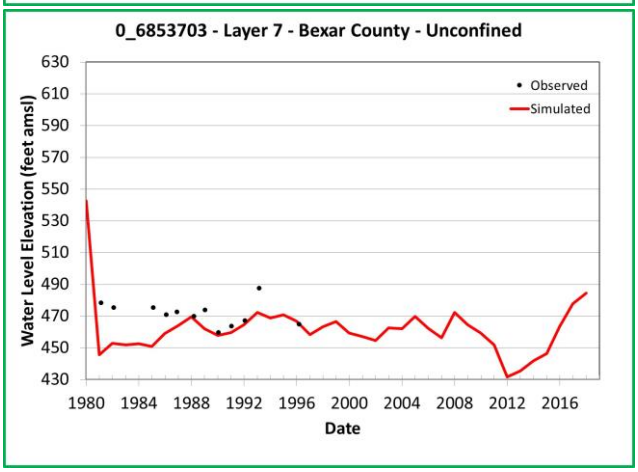
FIGURE I-3.1f

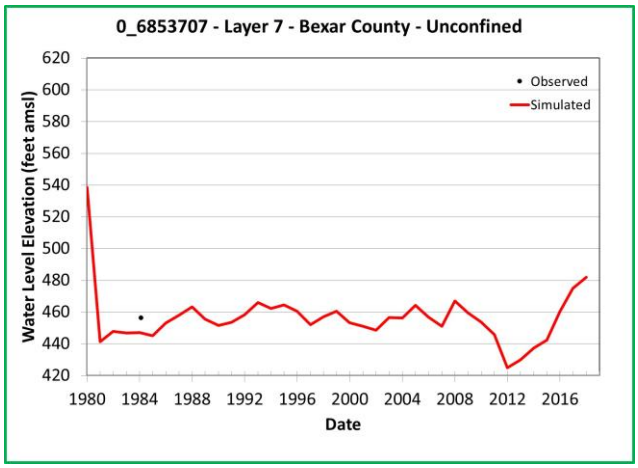
GSI ENVIRONMENTAL

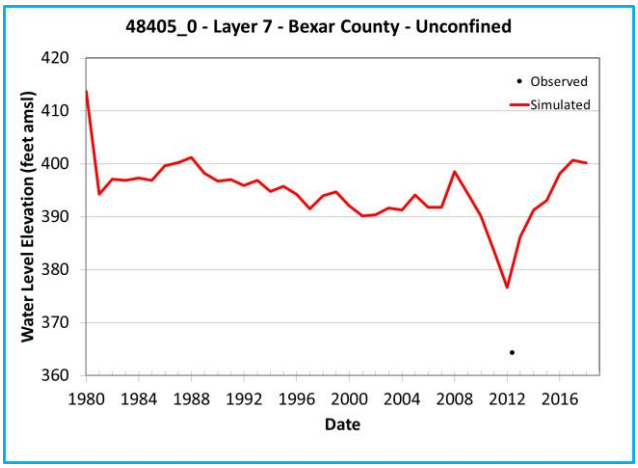












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

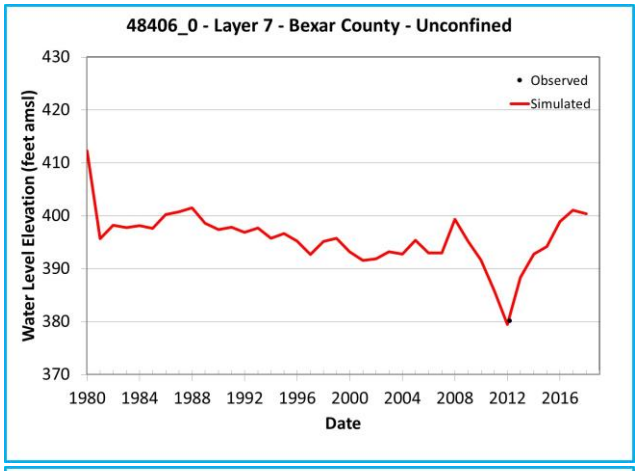
Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

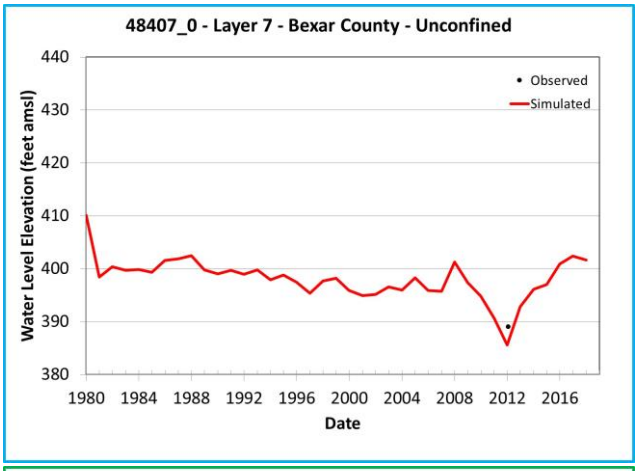
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

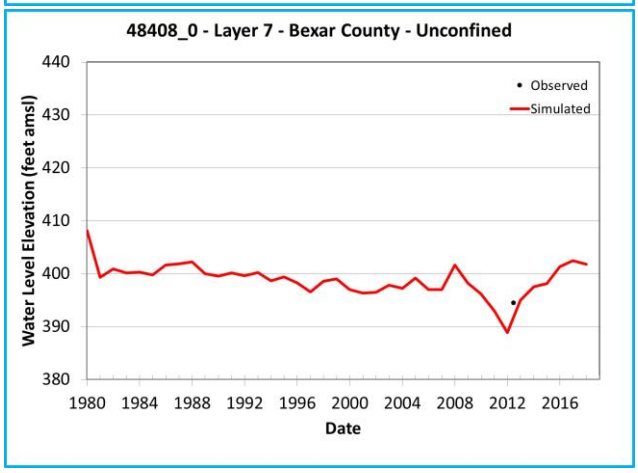
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

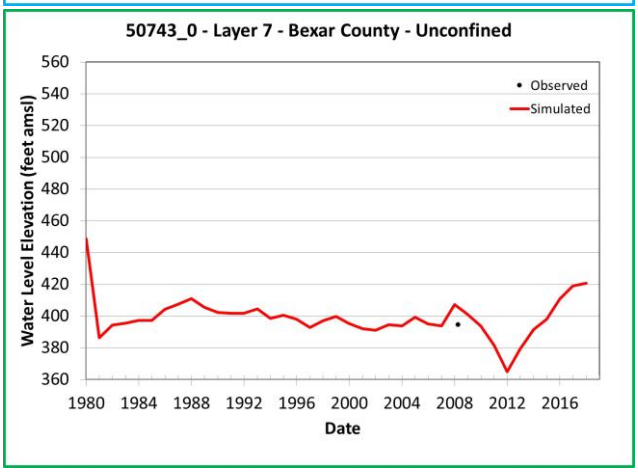
FIGURE I-3.1g

GSI ENVIRONMENTAL









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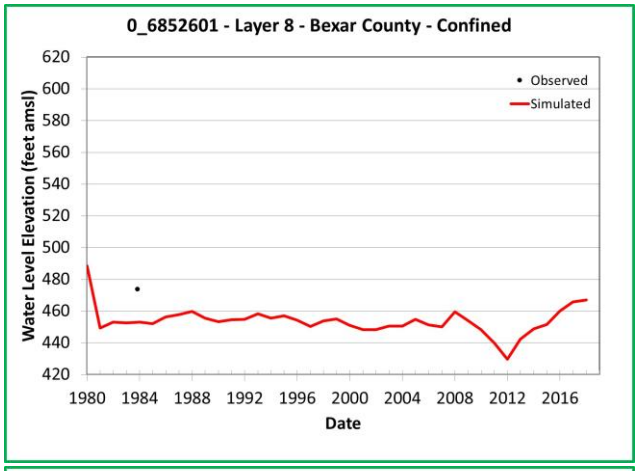
Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 7

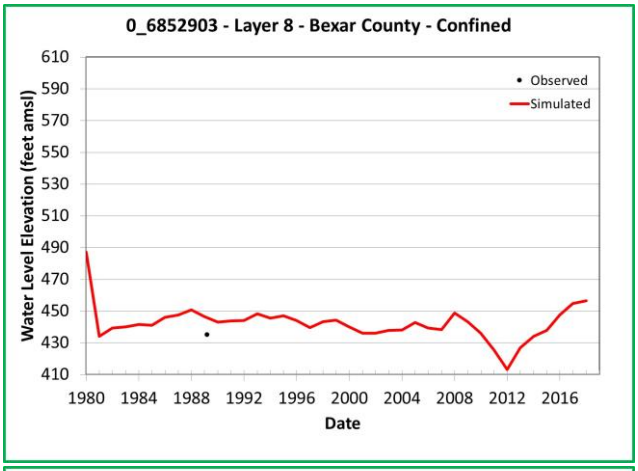
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

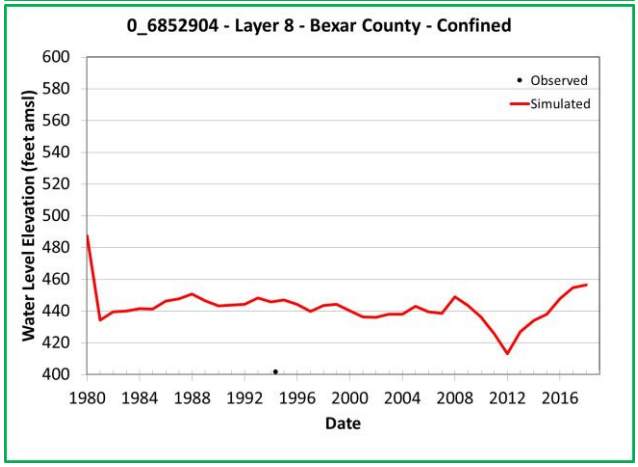
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

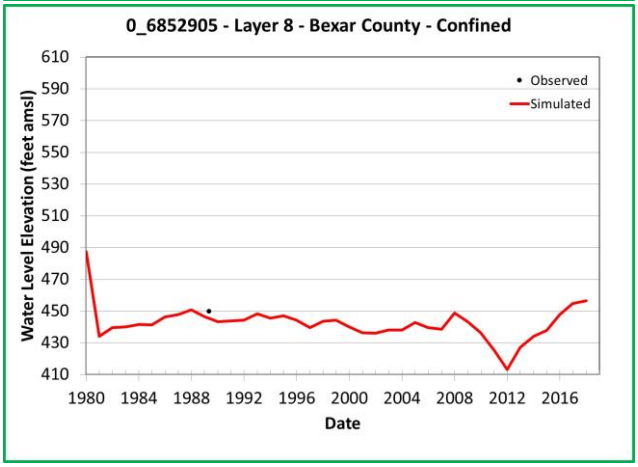
FIGURE I-3.1h

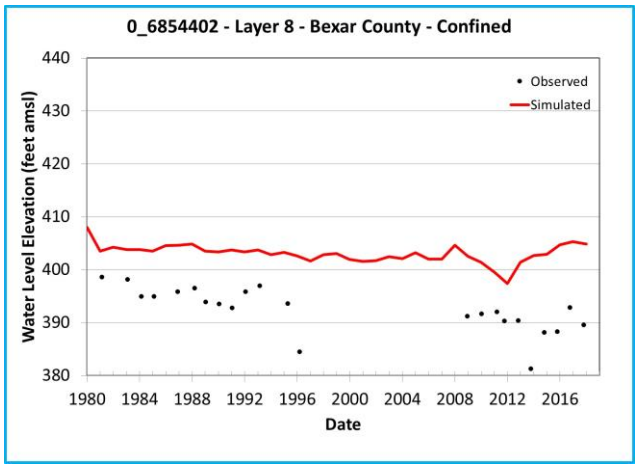
GSI ENVIRONMENTAL

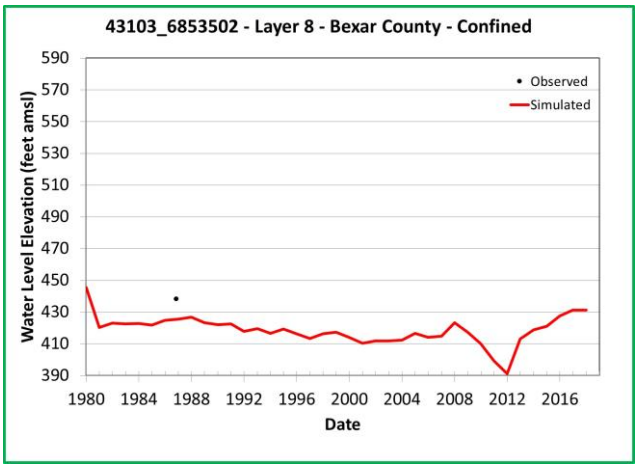












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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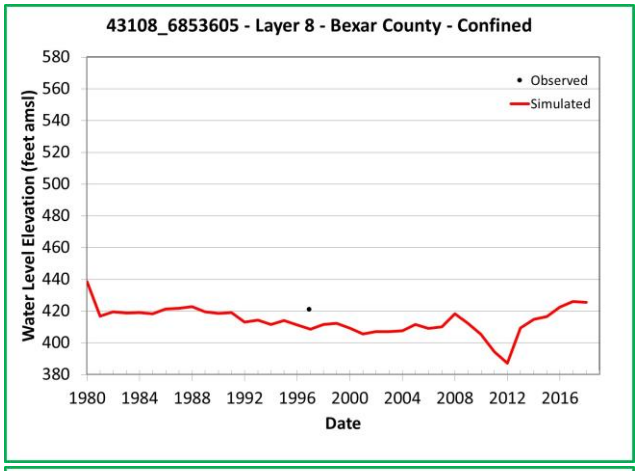
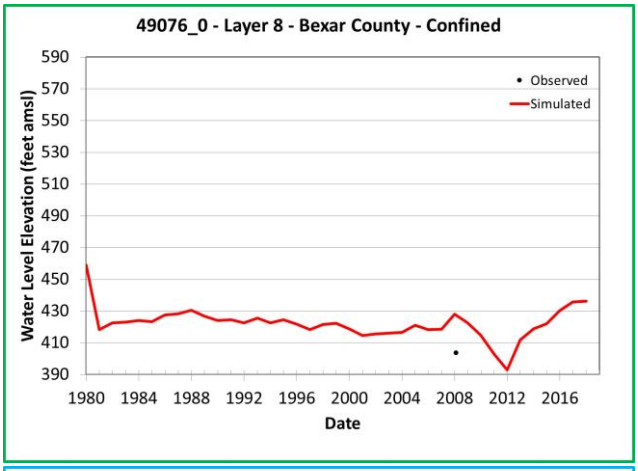
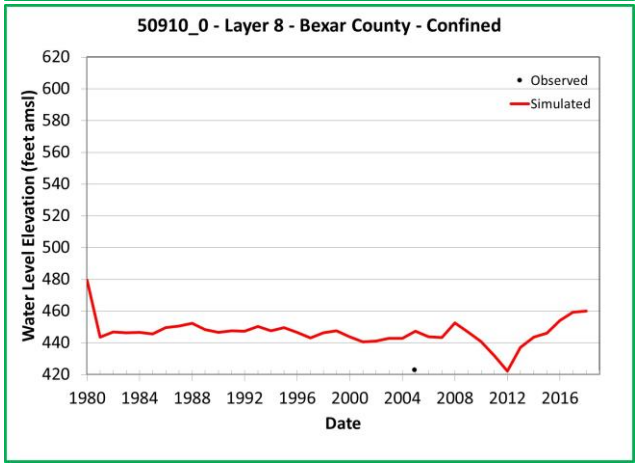
Revised		Aprv'd by	SP

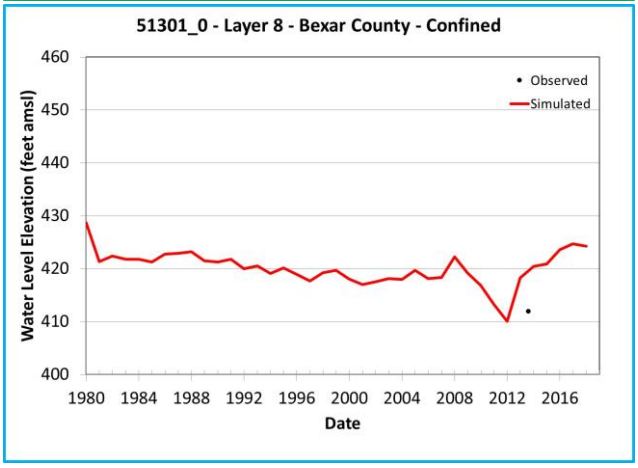
FIGURE I-3.2a

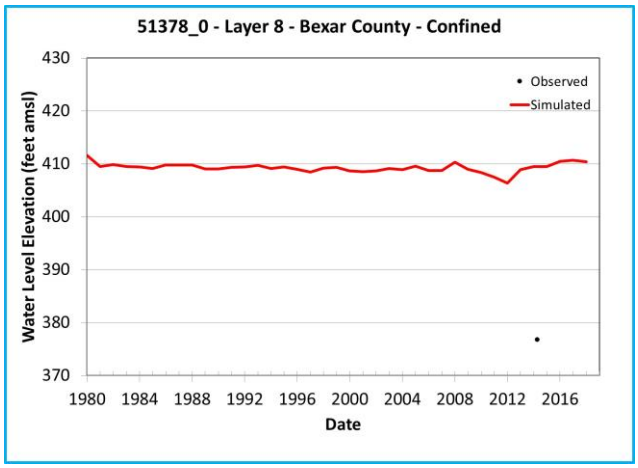
GSI ENVIRONMENTAL

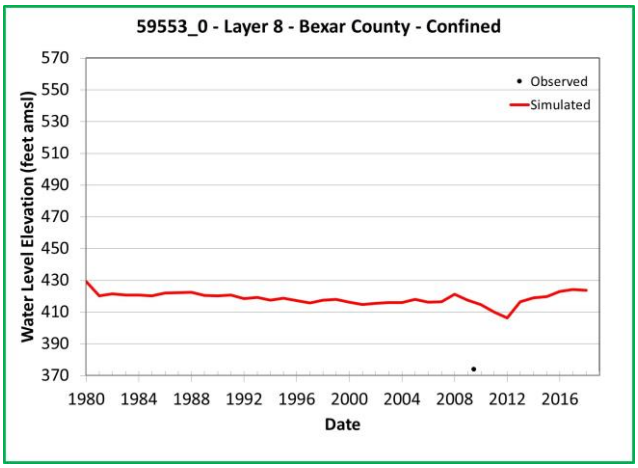












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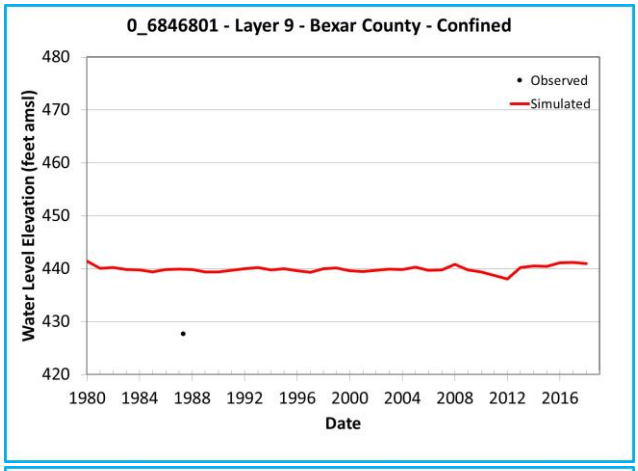
Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 8

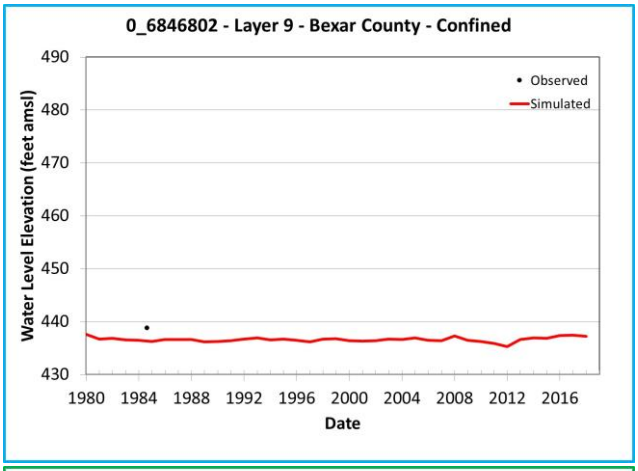
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

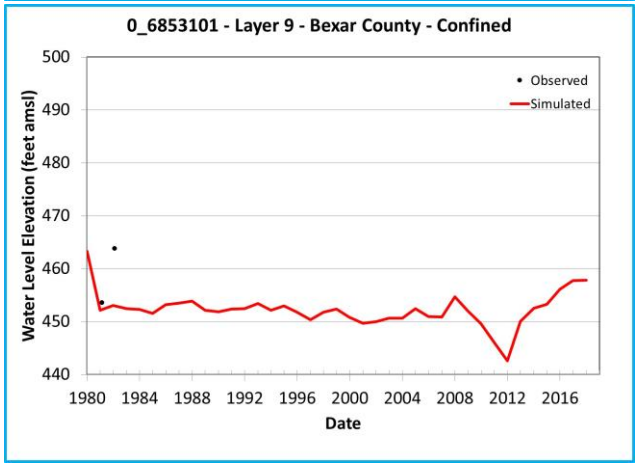
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

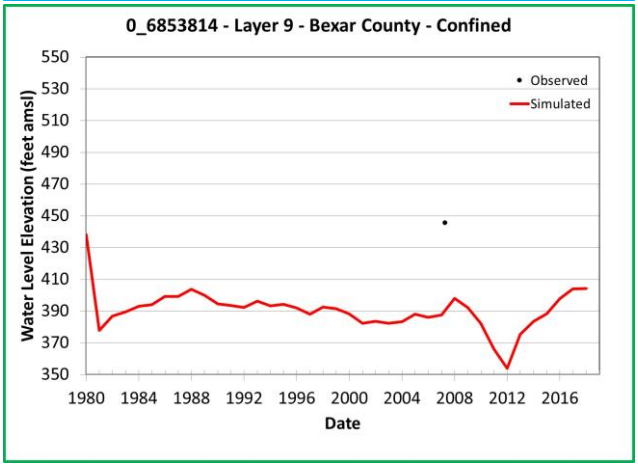
FIGURE I-3.2b

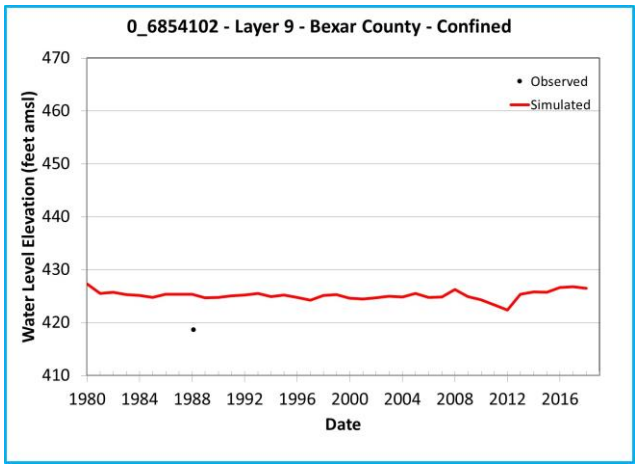
GSI ENVIRONMENTAL

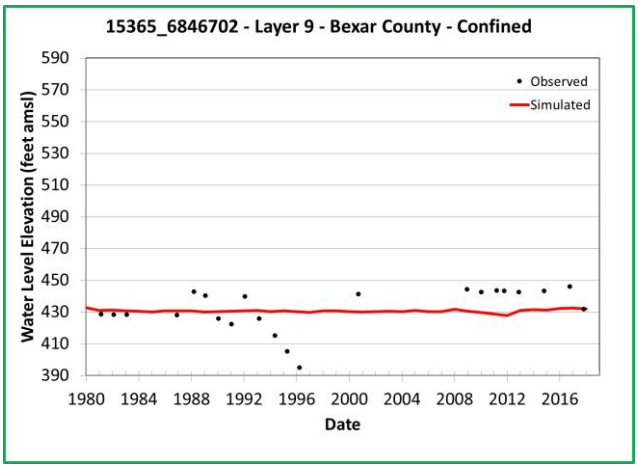












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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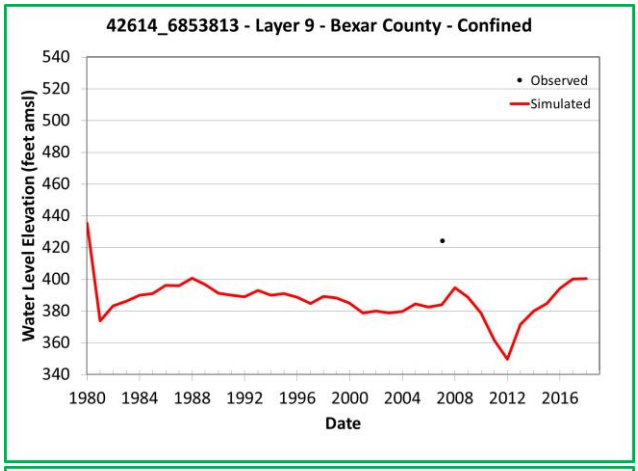
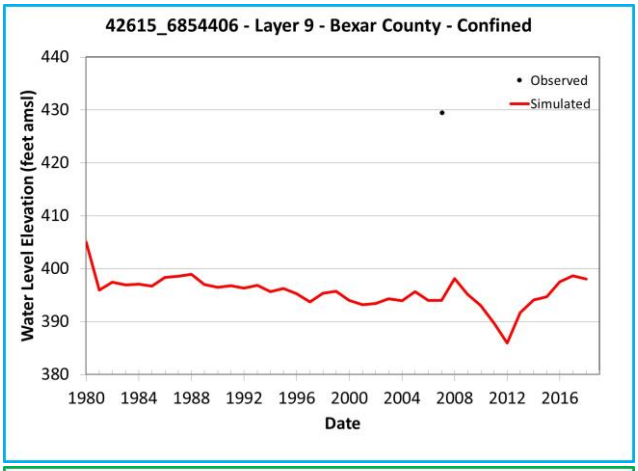
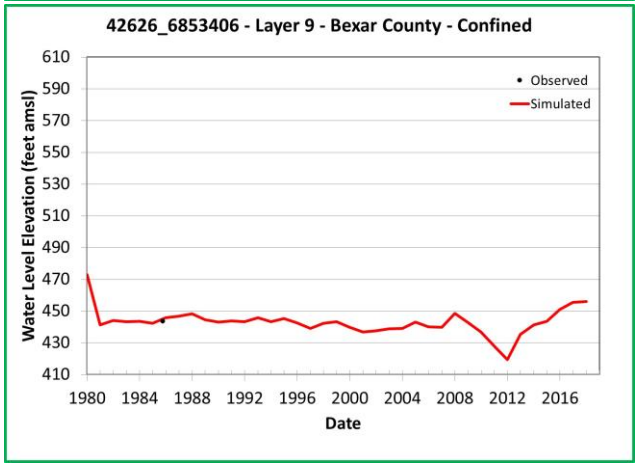
Revised		Aprv'd by	SP

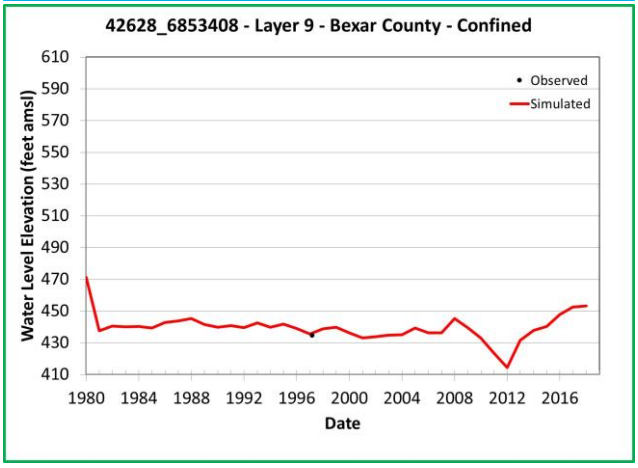
FIGURE I-3.3a

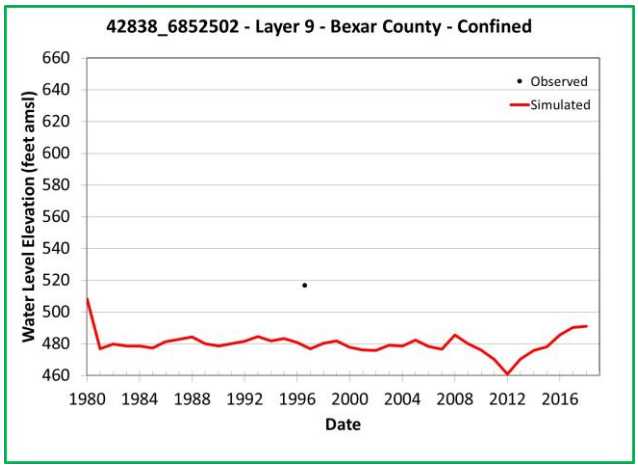
GSI ENVIRONMENTAL

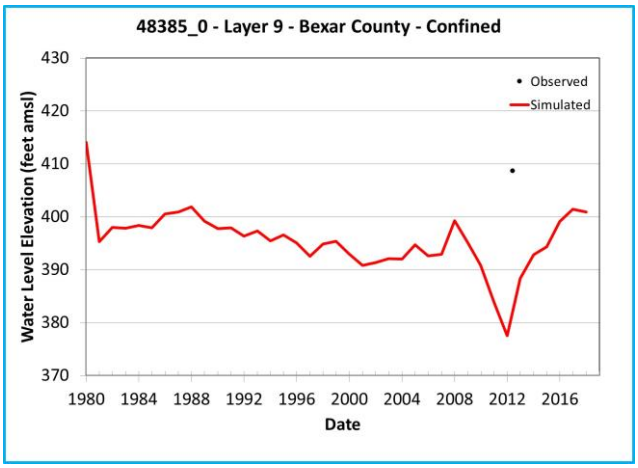












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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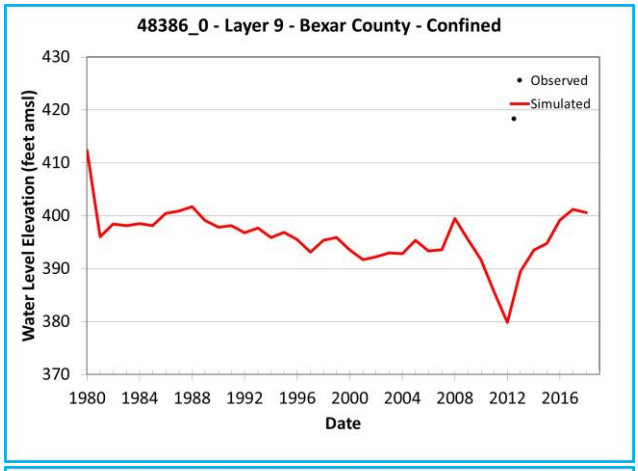
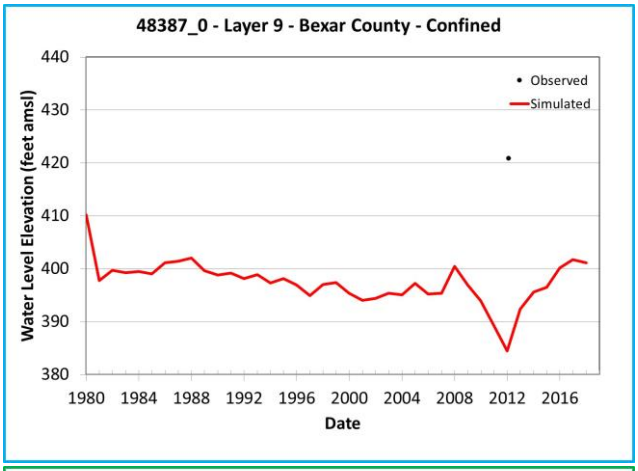
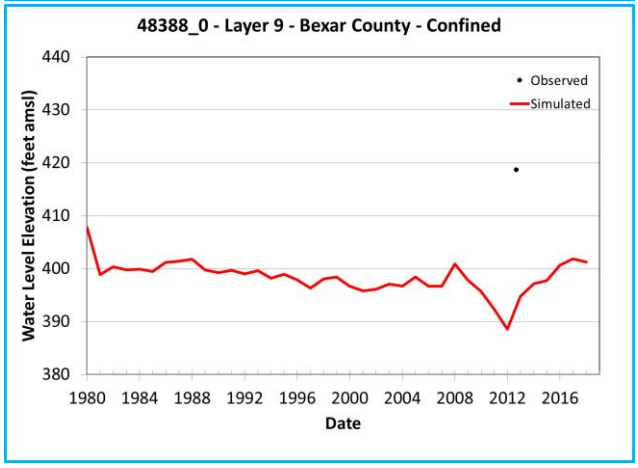
Revised		Aprv'd by	SP

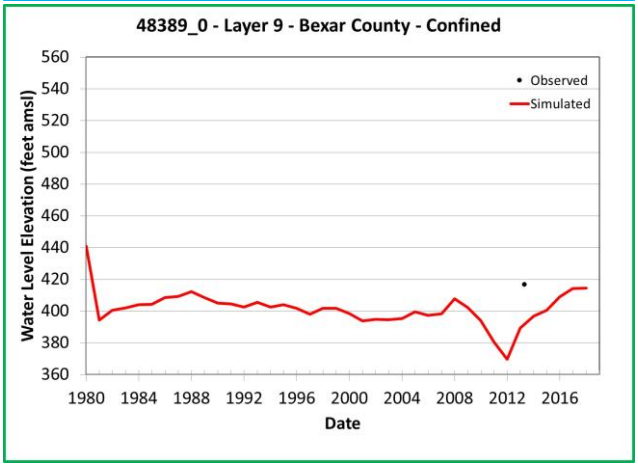
FIGURE I-3.3b

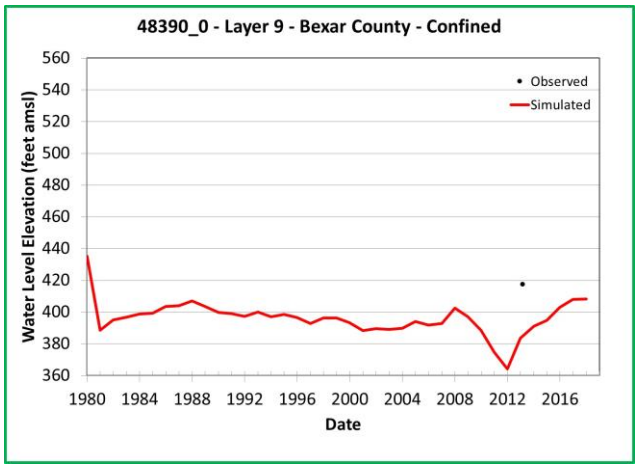
GSI ENVIRONMENTAL

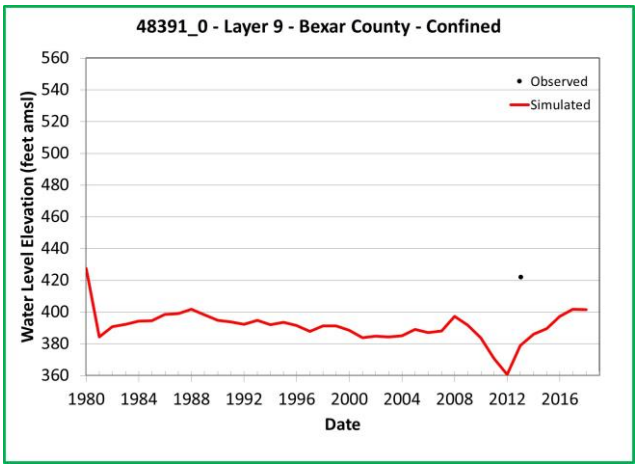












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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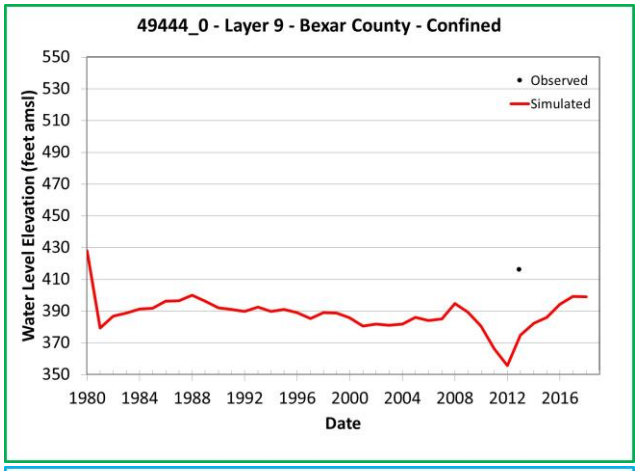
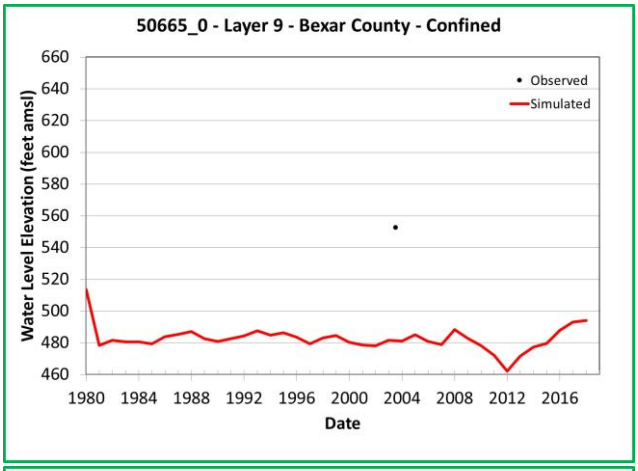
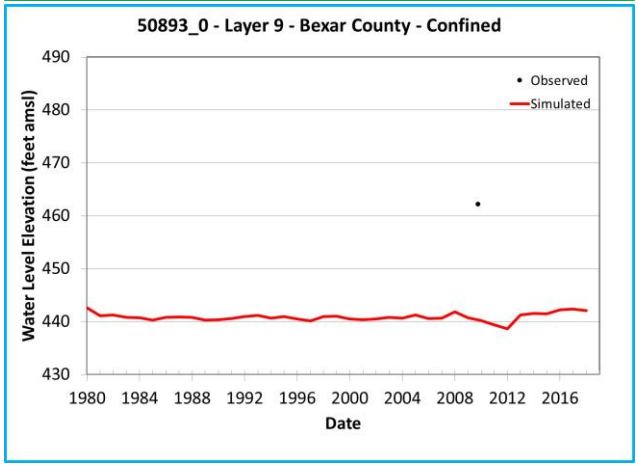
Revised		Aprv'd by	SP

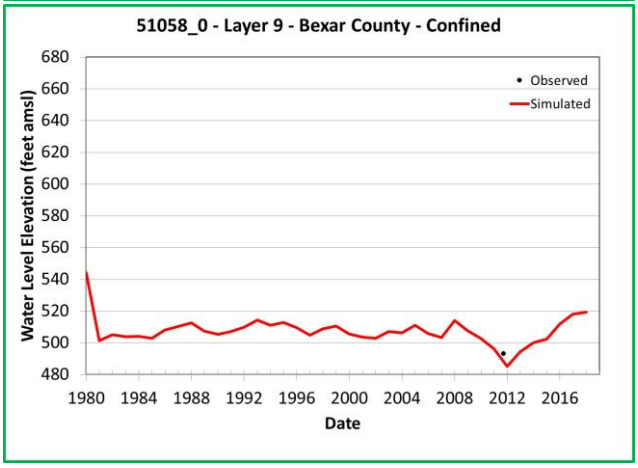
FIGURE I-3.3c

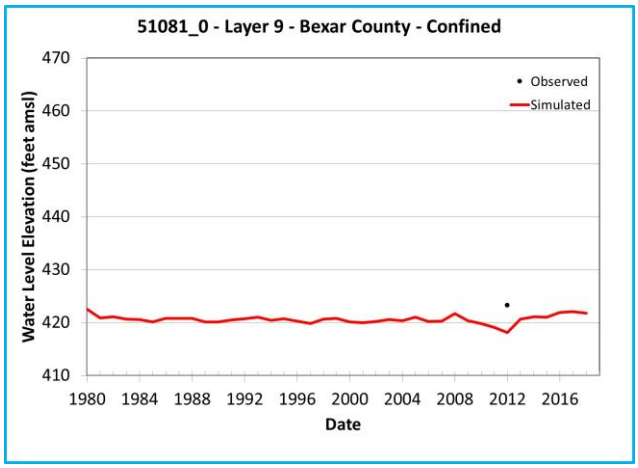
GSI ENVIRONMENTAL

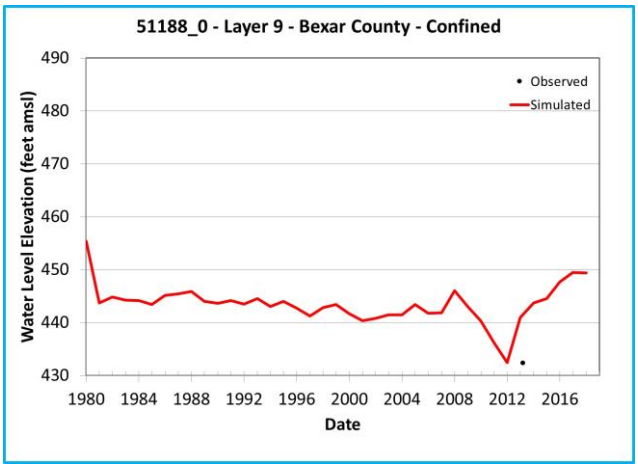












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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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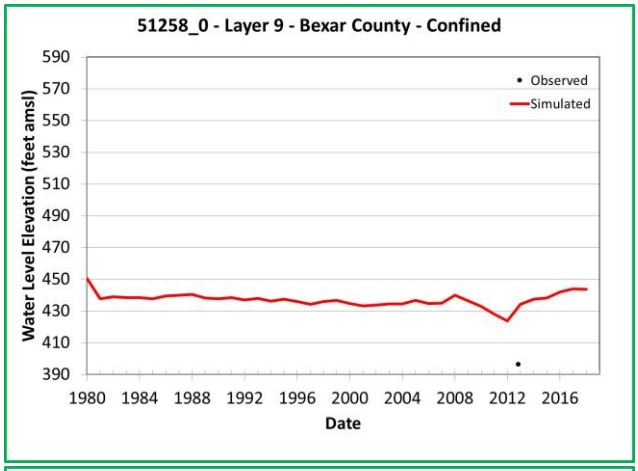
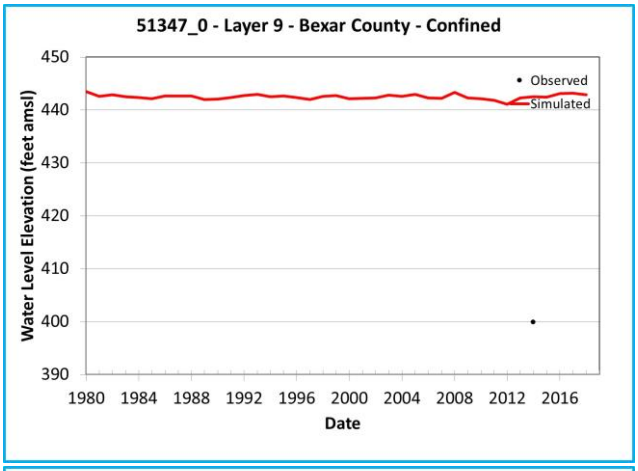
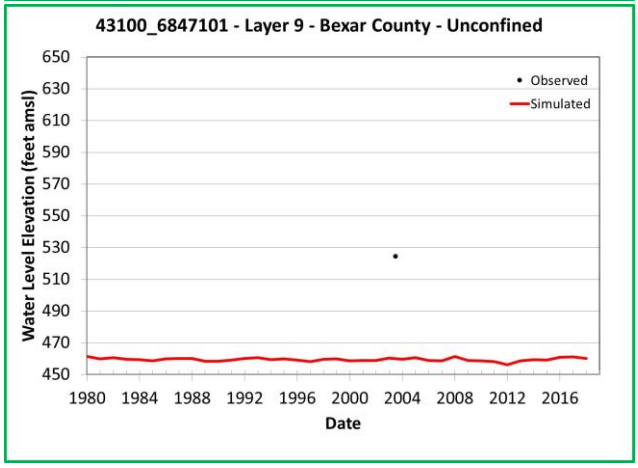
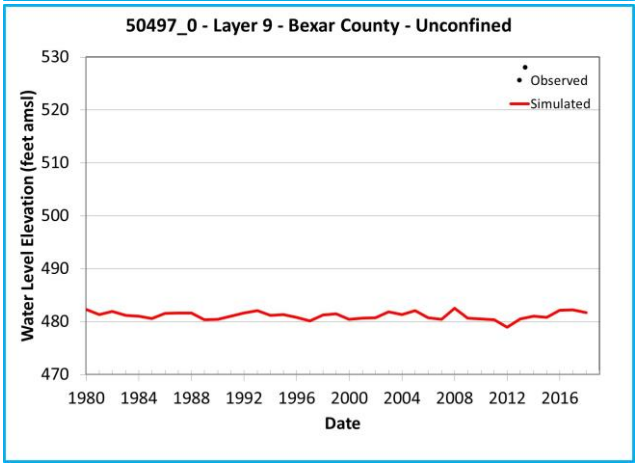
FIGURE I-3.3d

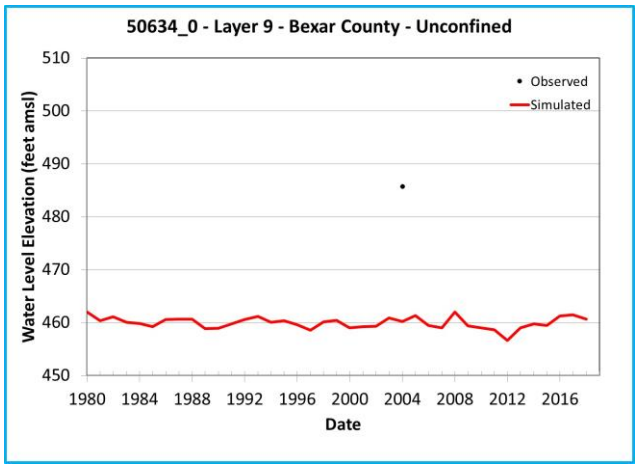
GSI ENVIRONMENTAL

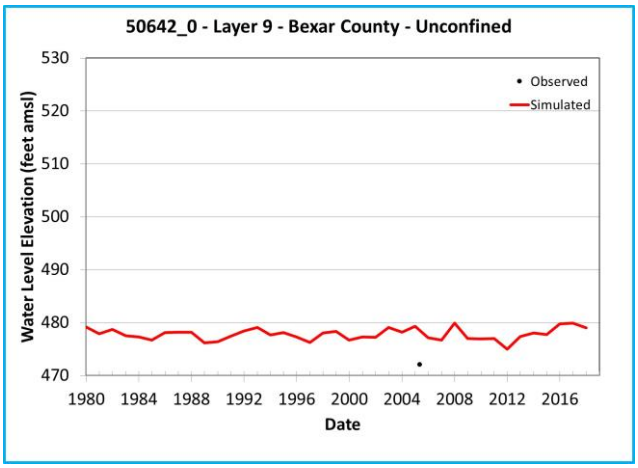












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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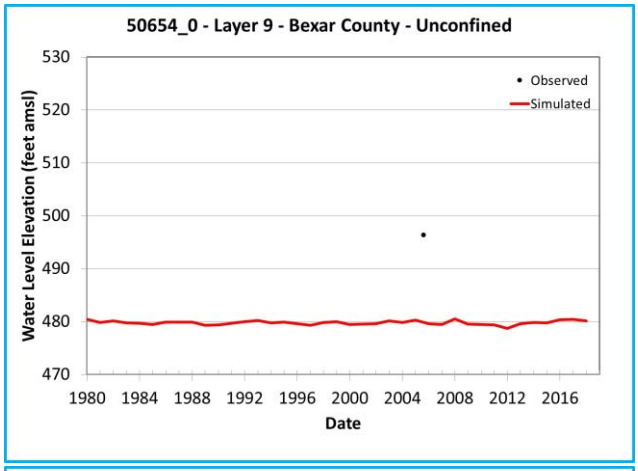
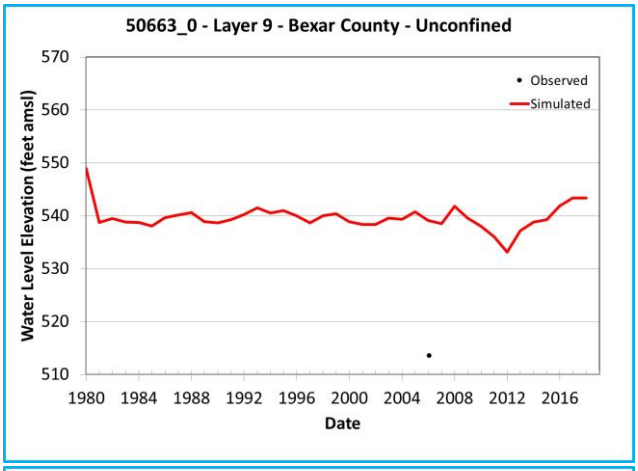
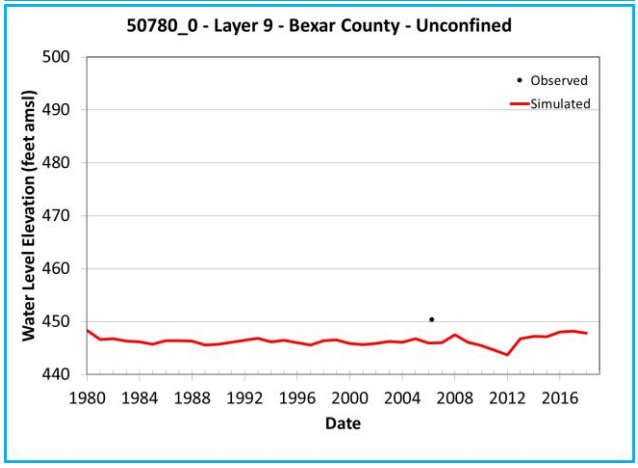
Revised		Aprv'd by	SP

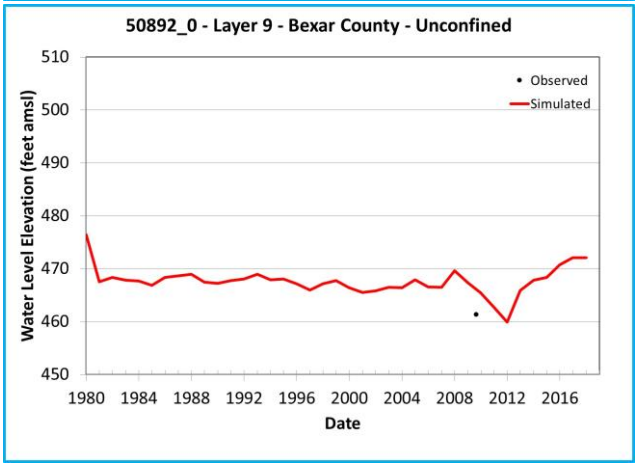
FIGURE I-3.3e

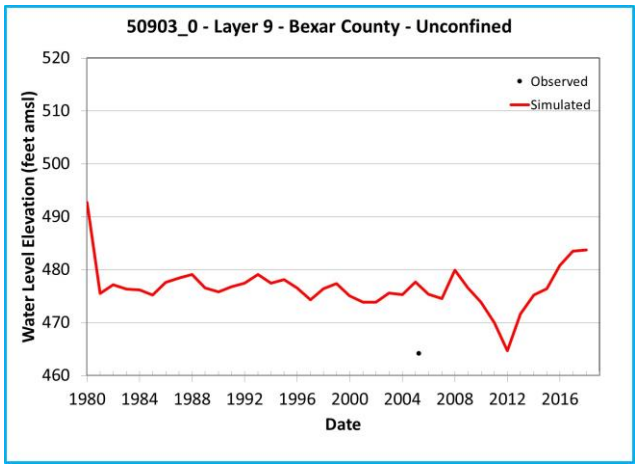
GSI ENVIRONMENTAL

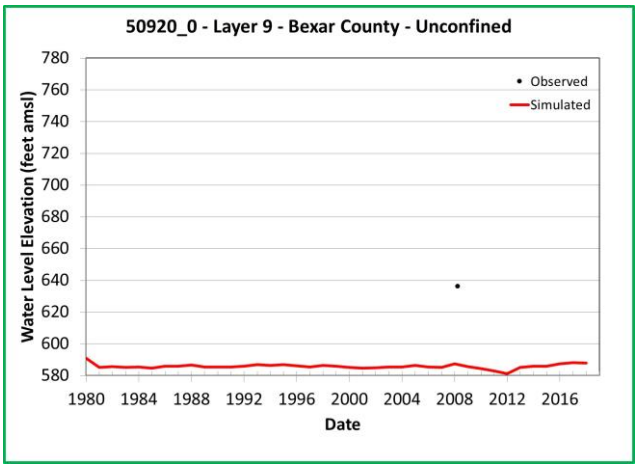












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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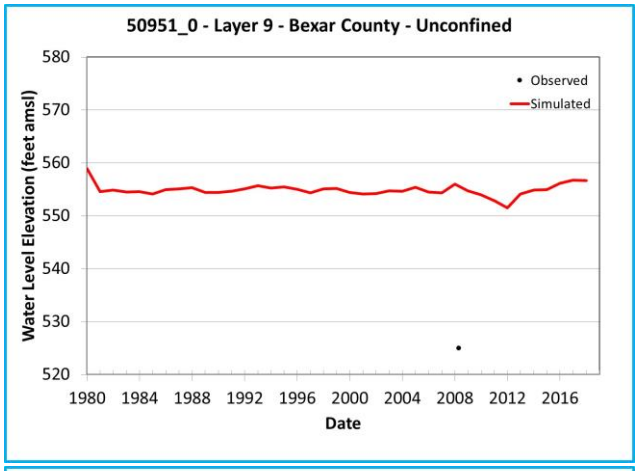
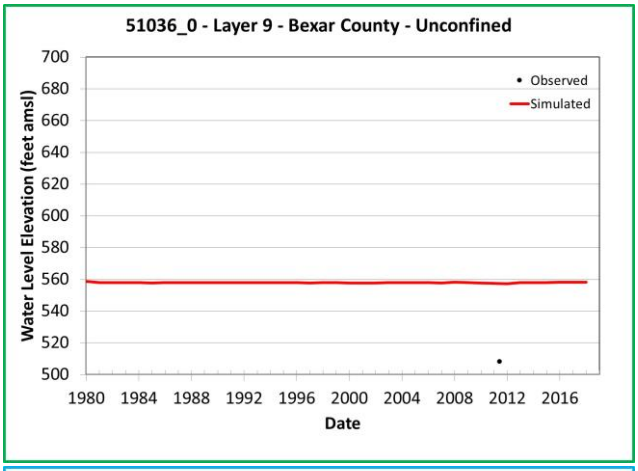
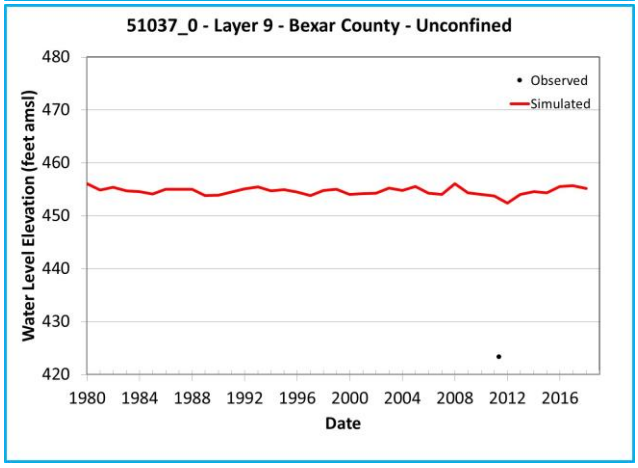
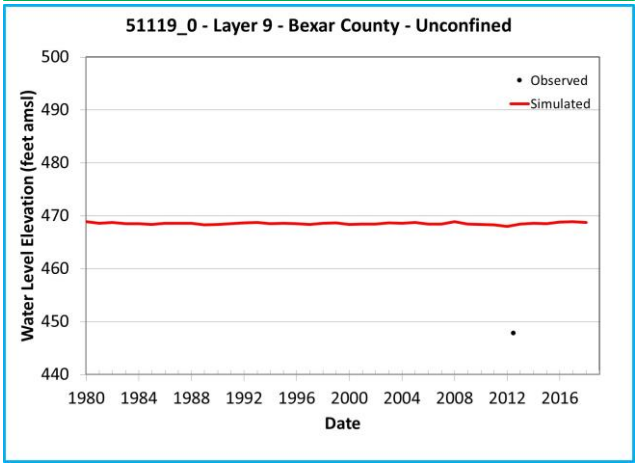
FIGURE I-3.3f

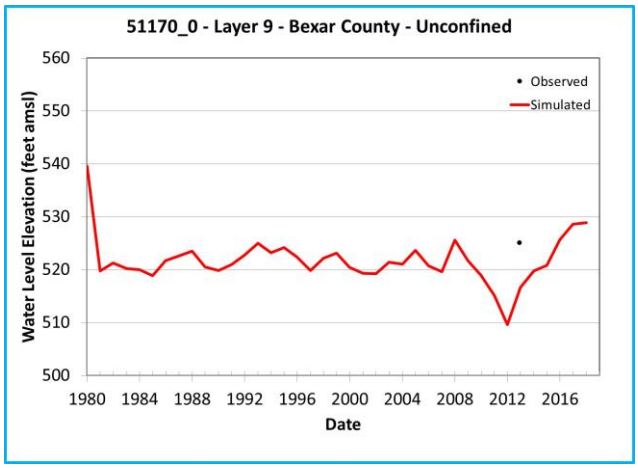
GSI ENVIRONMENTAL

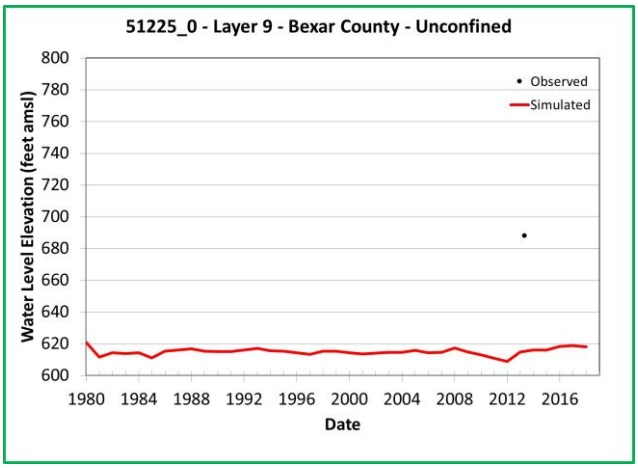












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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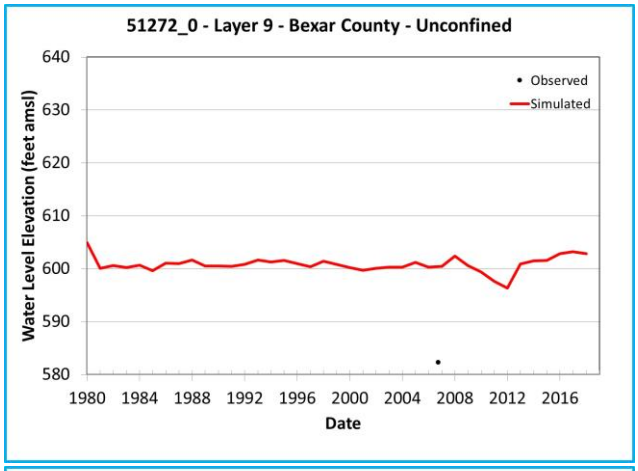
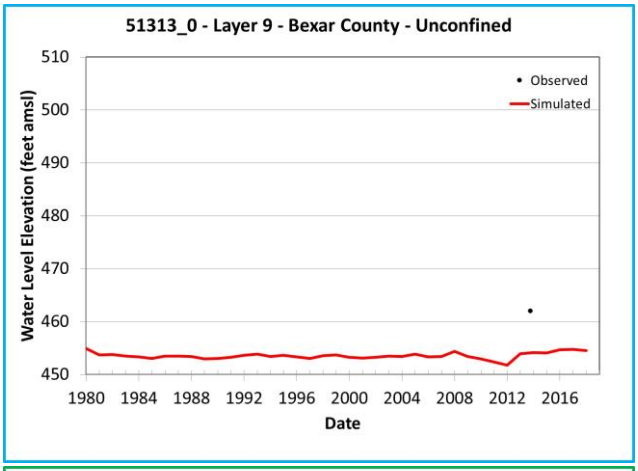
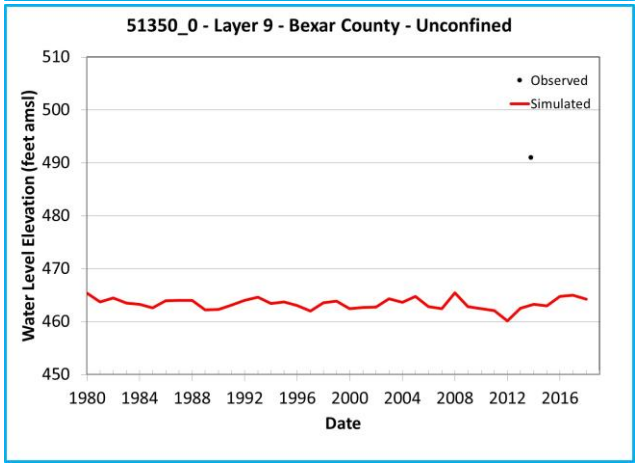
Revised		Aprv'd by	SP

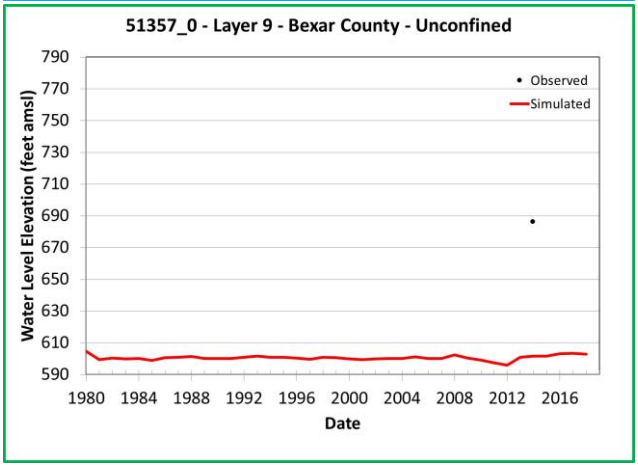
FIGURE I-3.3g

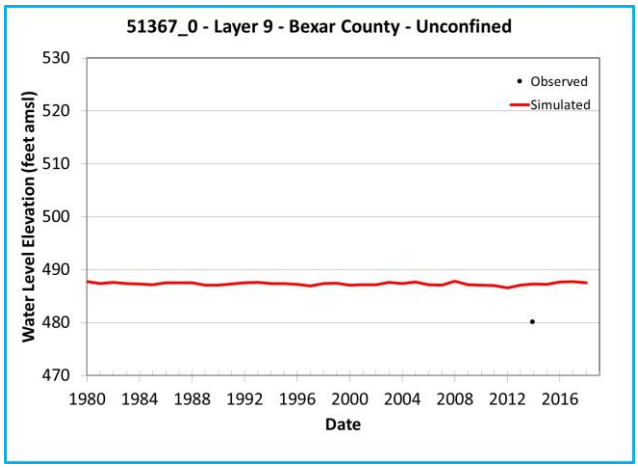
GSI ENVIRONMENTAL

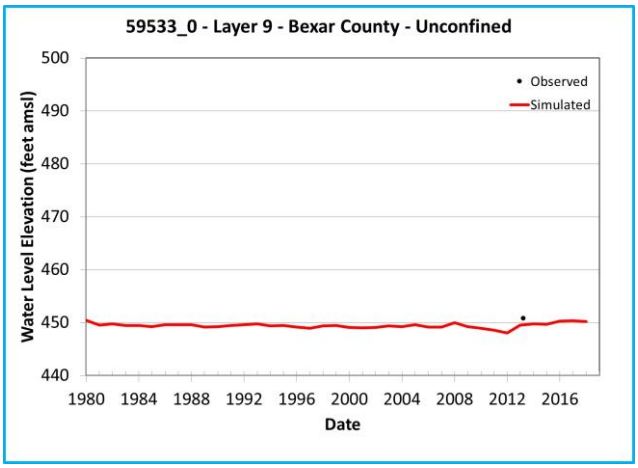












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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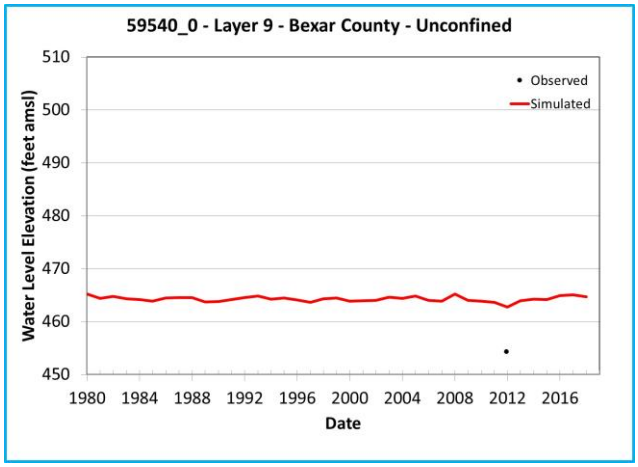
FIGURE I-3.3h

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Bexar County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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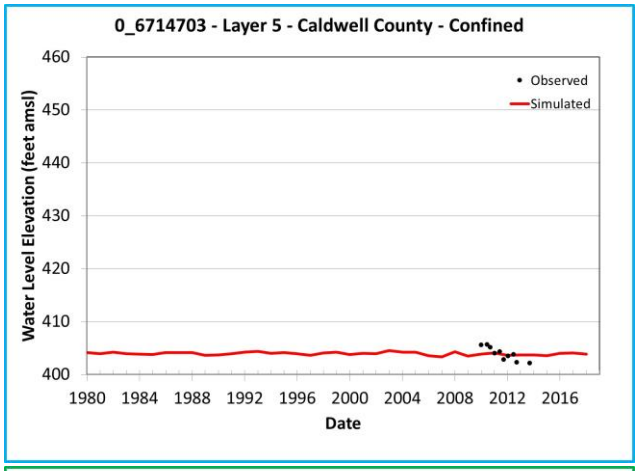
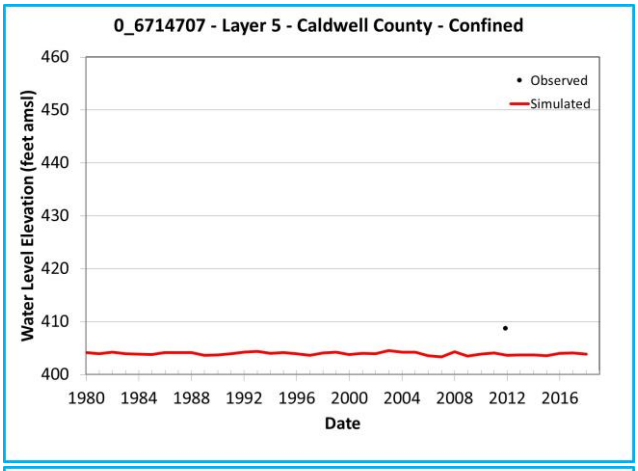
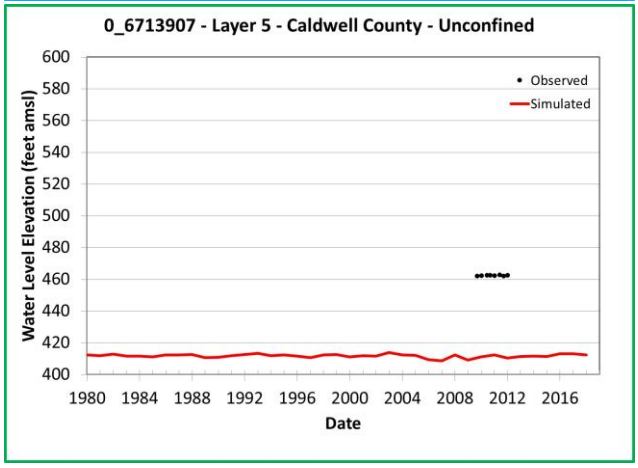
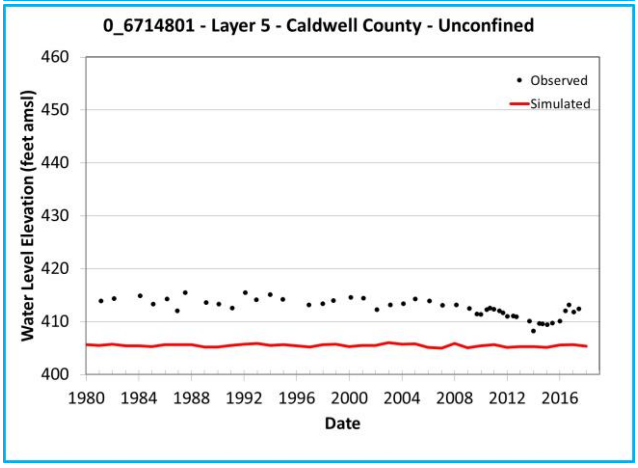
FIGURE I-3.3i

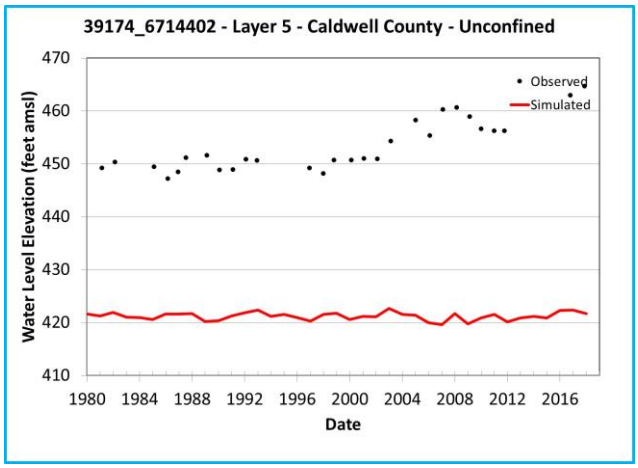
GSI ENVIRONMENTAL

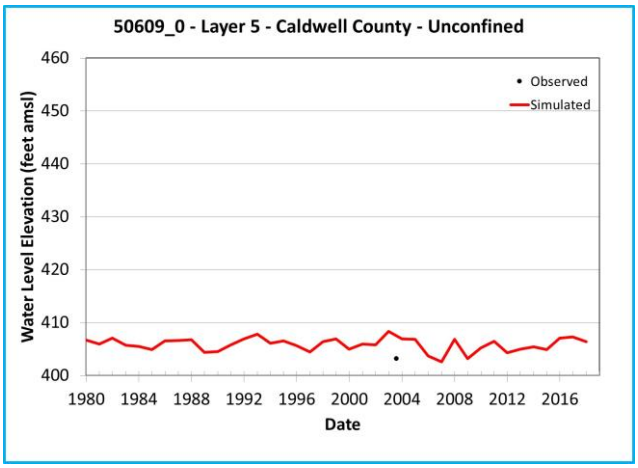












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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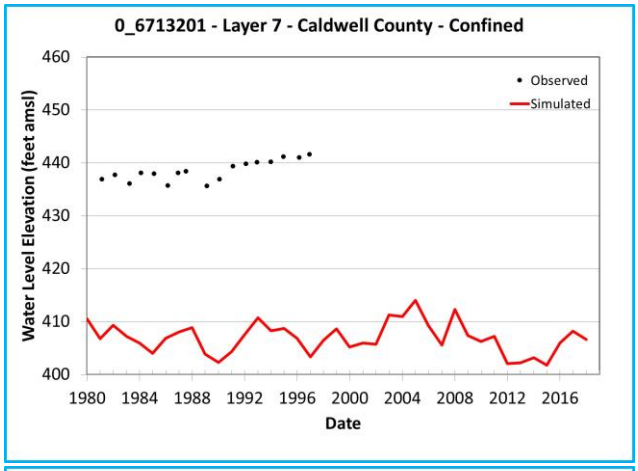
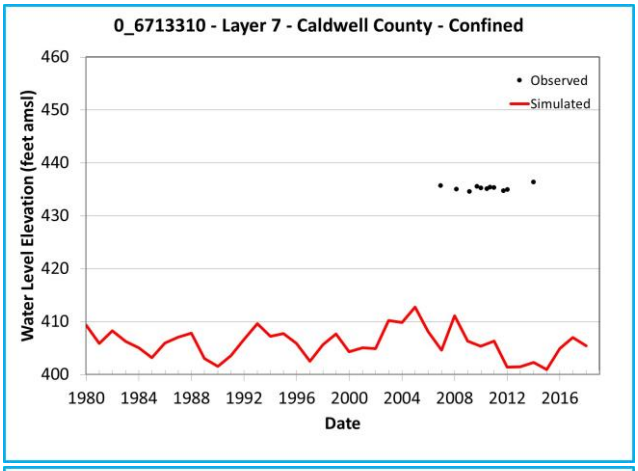
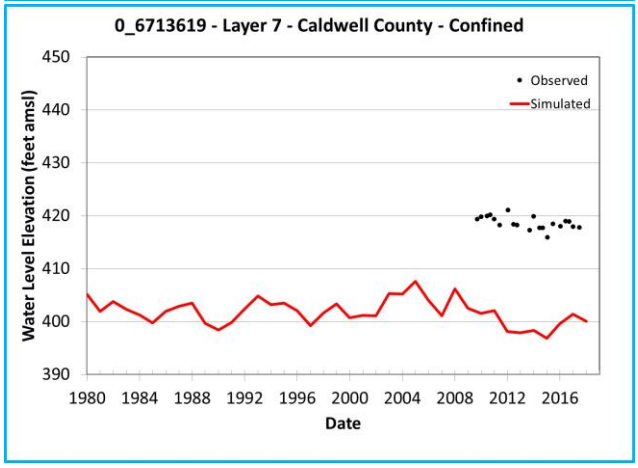
Revised		Aprv'd by	SP

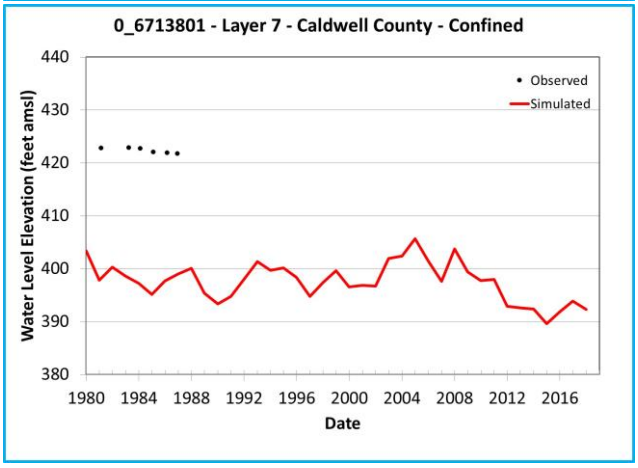
FIGURE I-4.1a

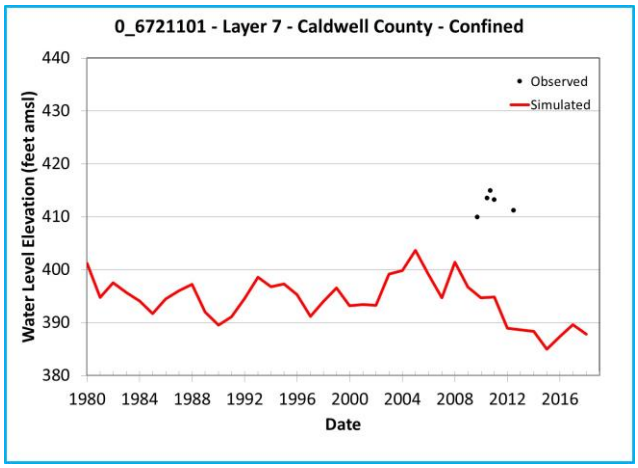
GSI ENVIRONMENTAL

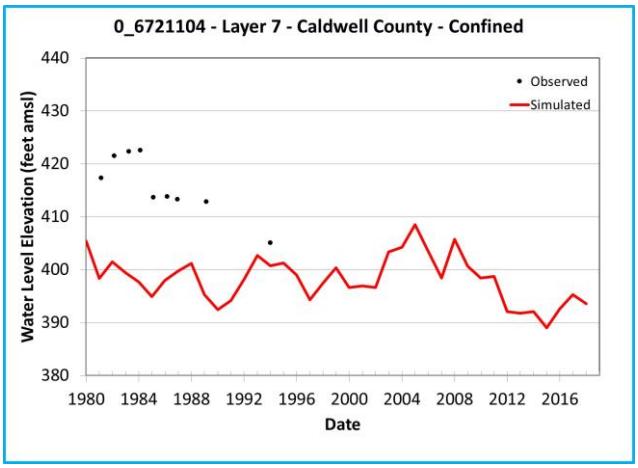












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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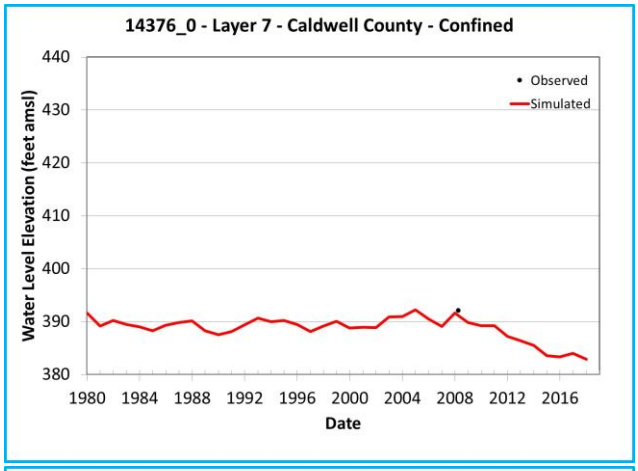
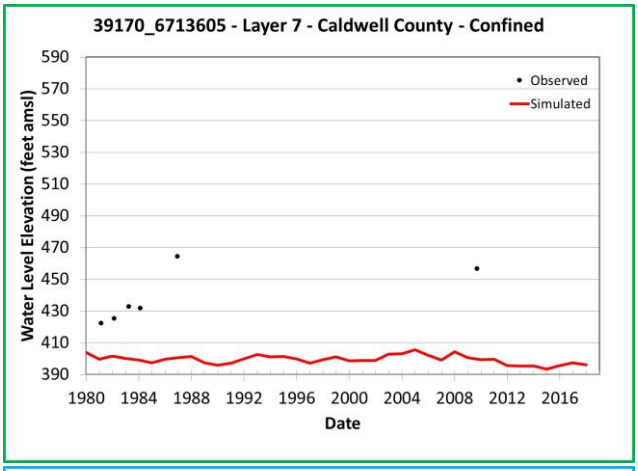
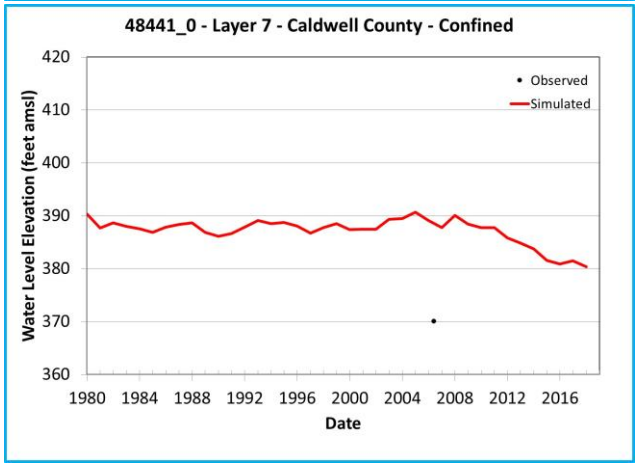
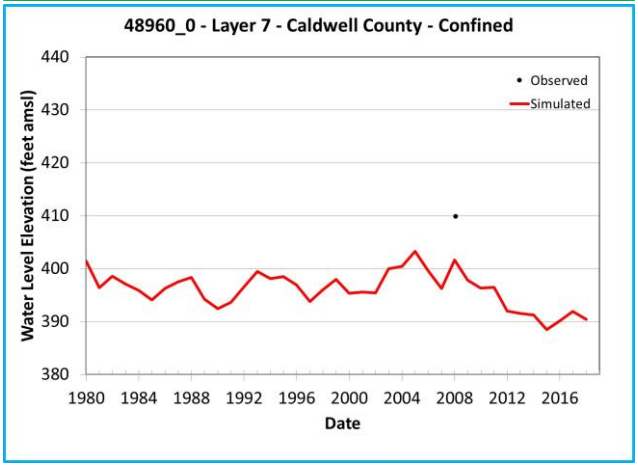
FIGURE I-4.2a

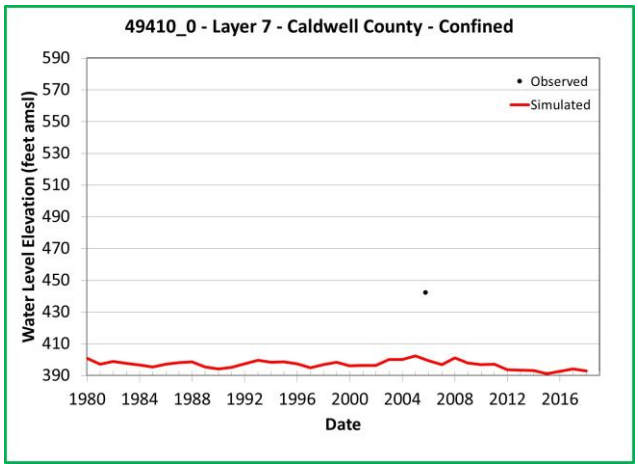
GSI ENVIRONMENTAL

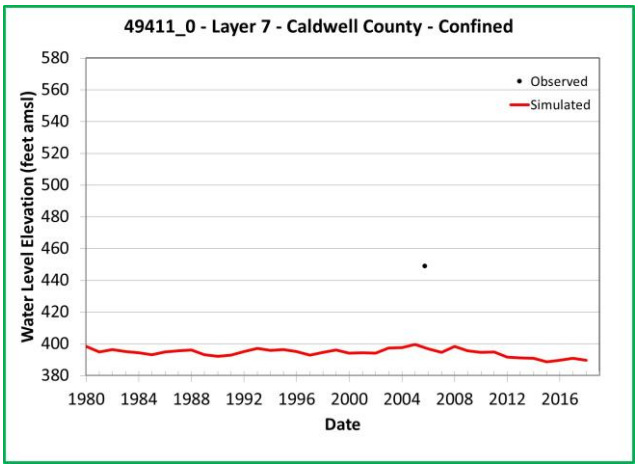












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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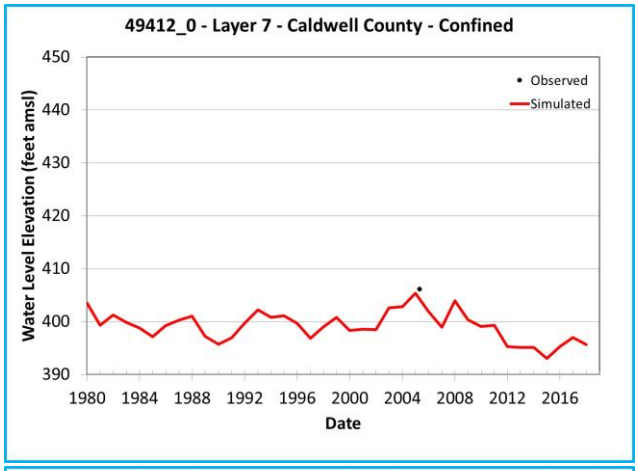
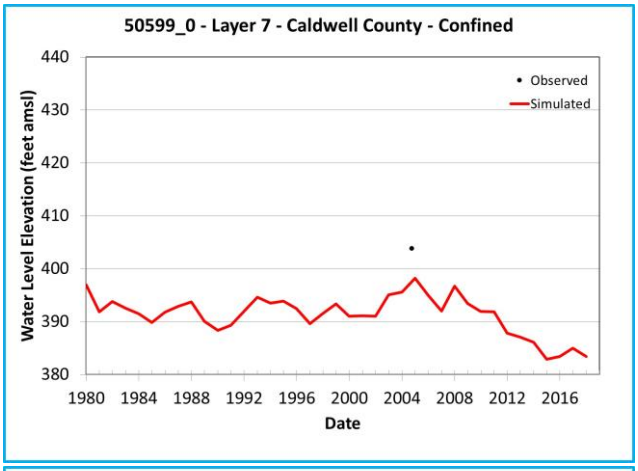
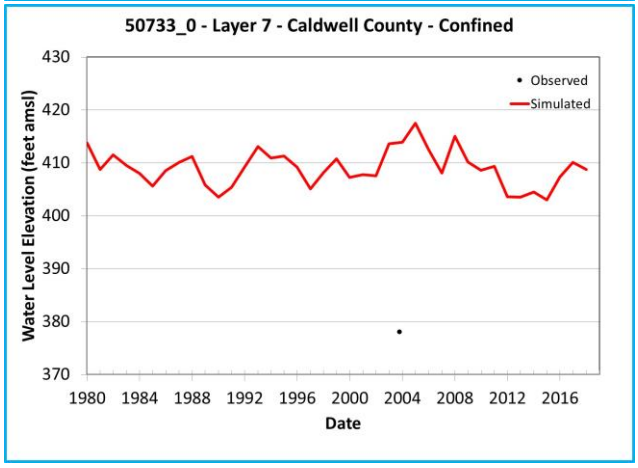
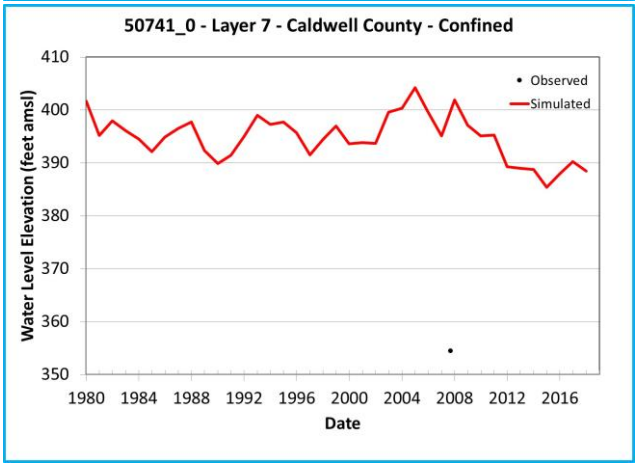
FIGURE I-4.2b

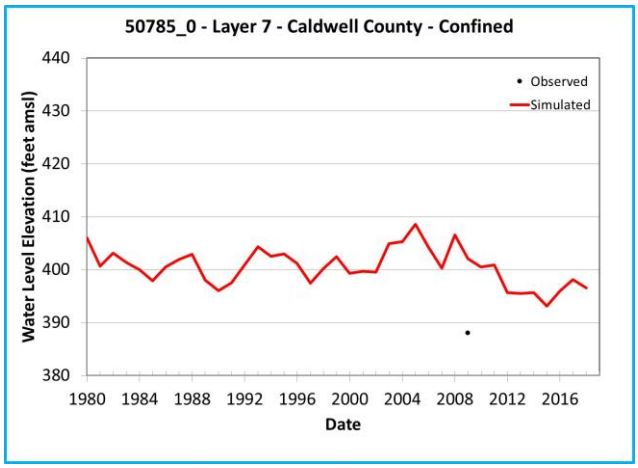
GSI ENVIRONMENTAL

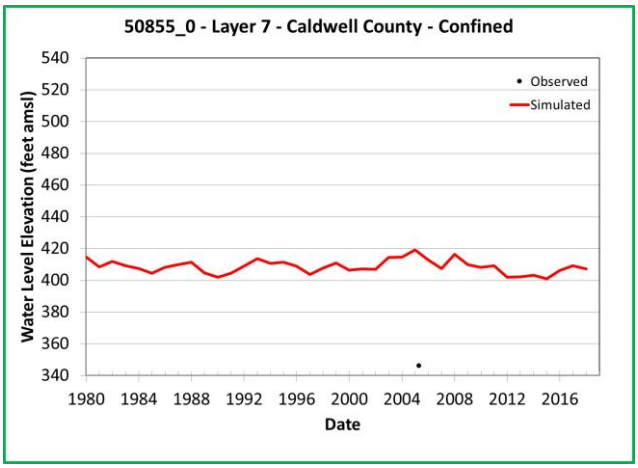












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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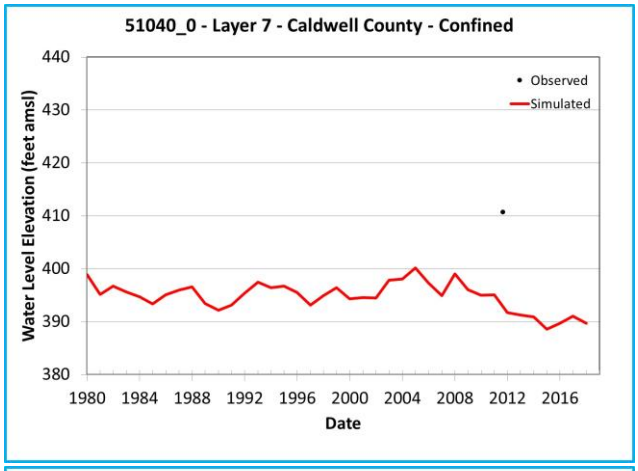
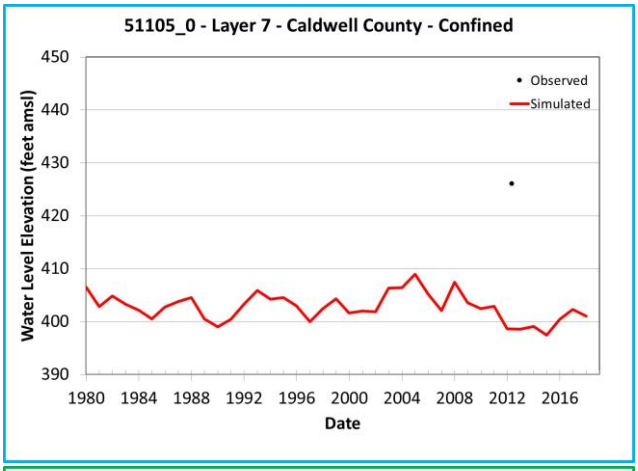
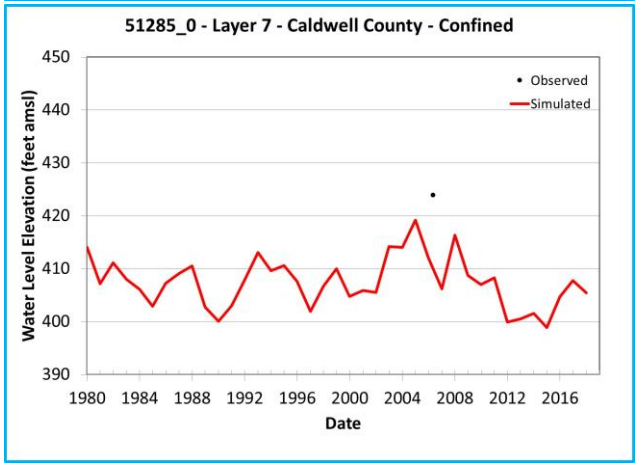
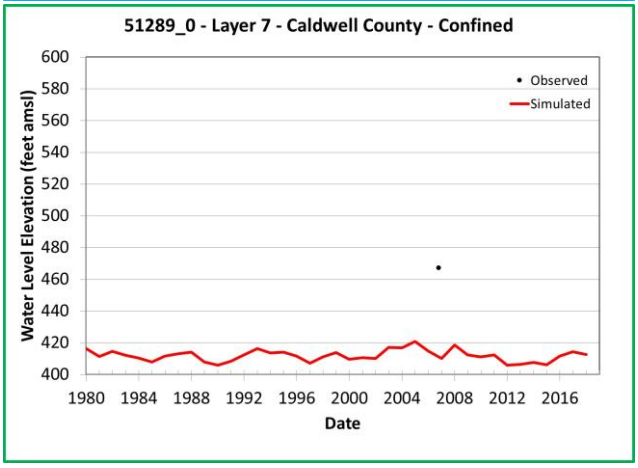
FIGURE I-4.2c

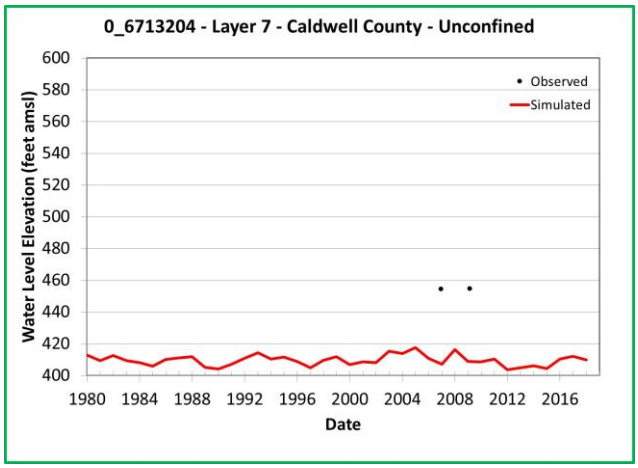
GSI ENVIRONMENTAL

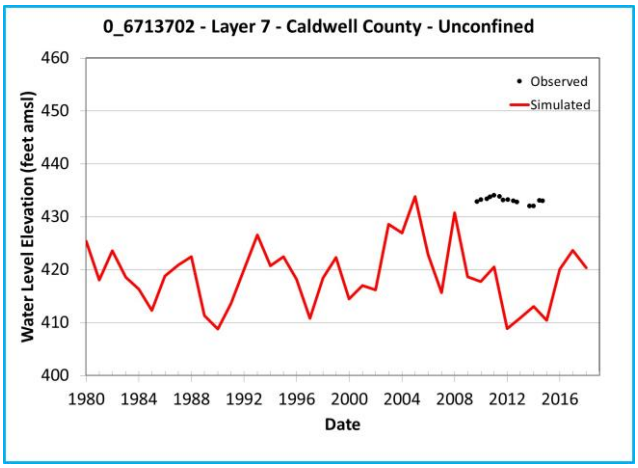












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

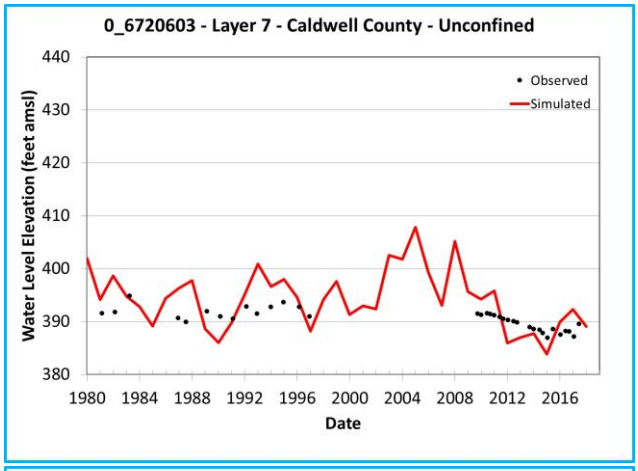
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 7

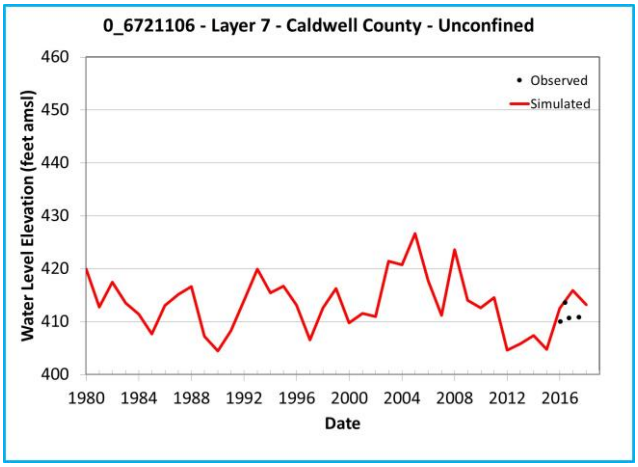
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

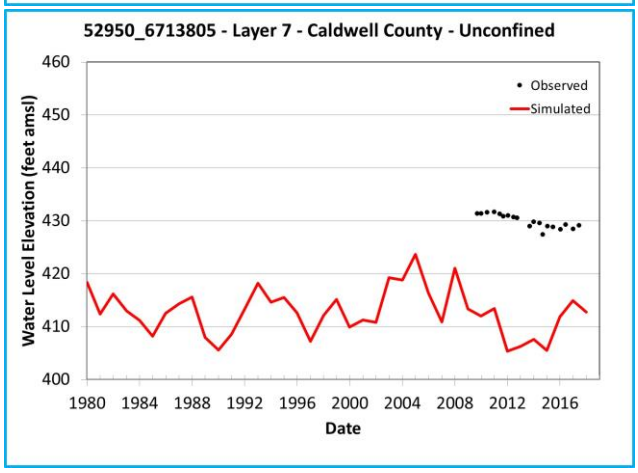
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-4.2d

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

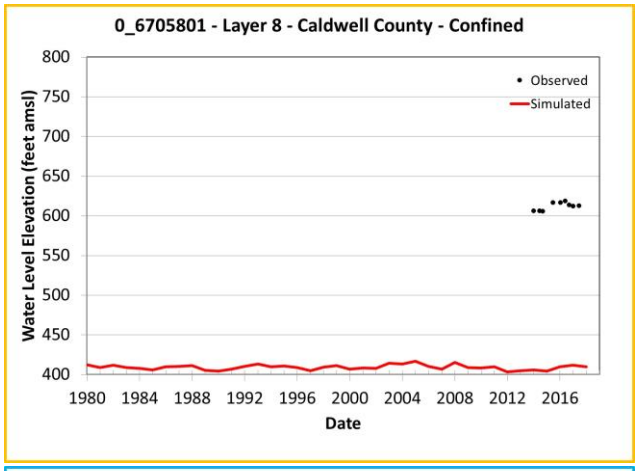
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 7

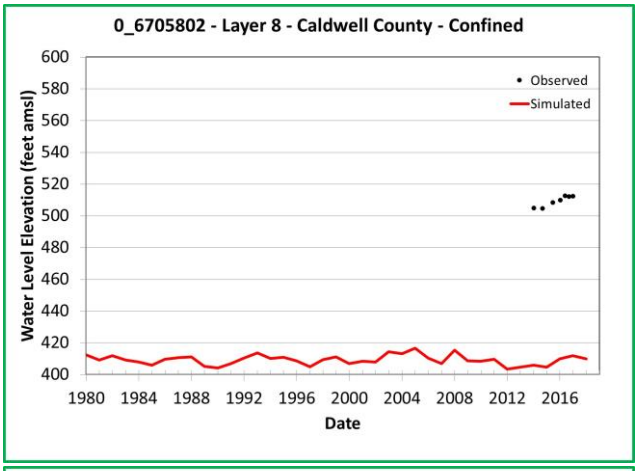
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

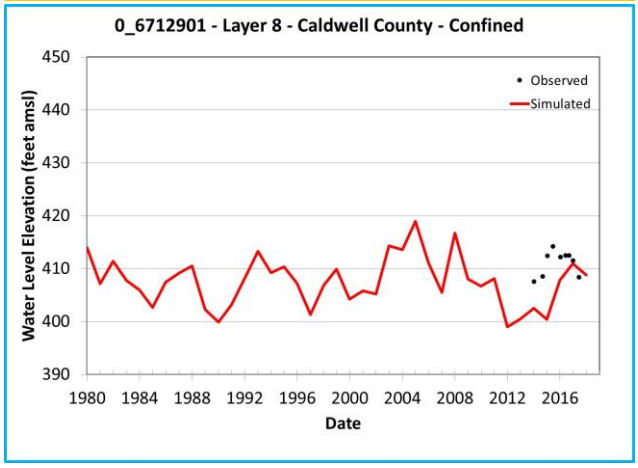
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

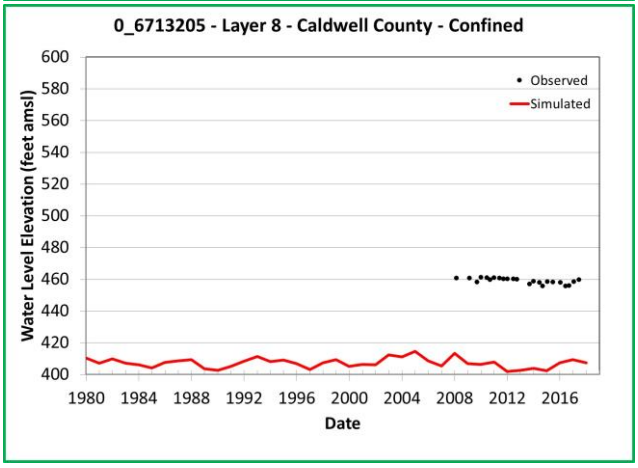
FIGURE I-4.2e

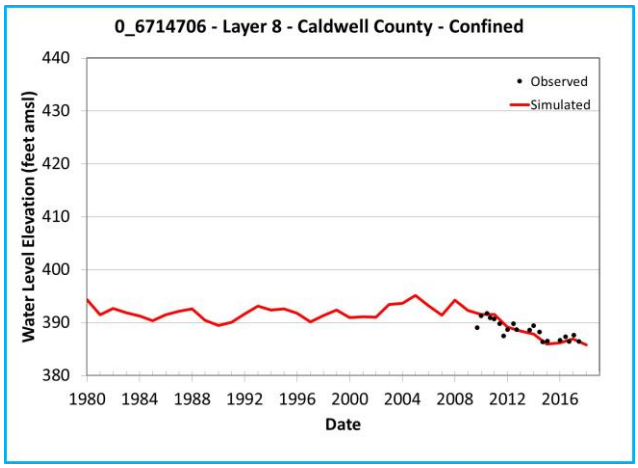
GSI ENVIRONMENTAL

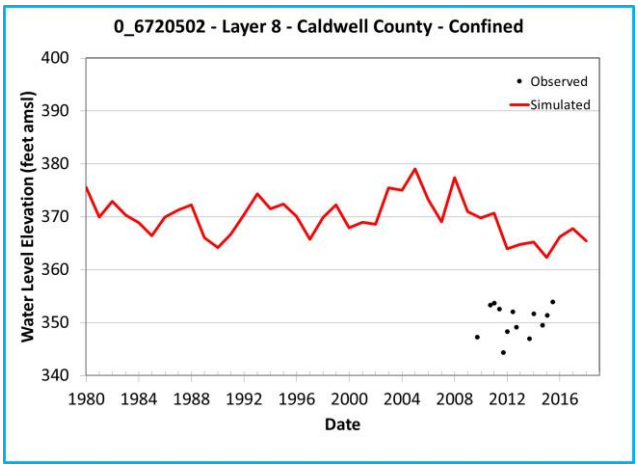












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

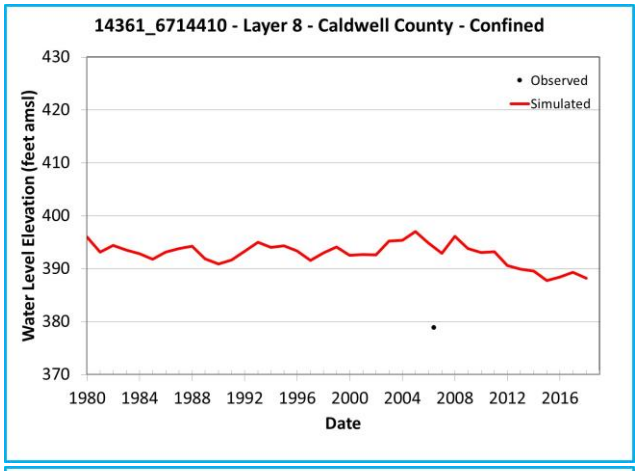
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 8

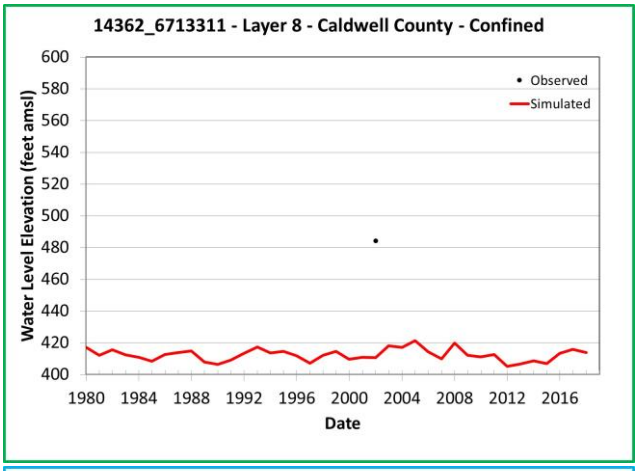
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

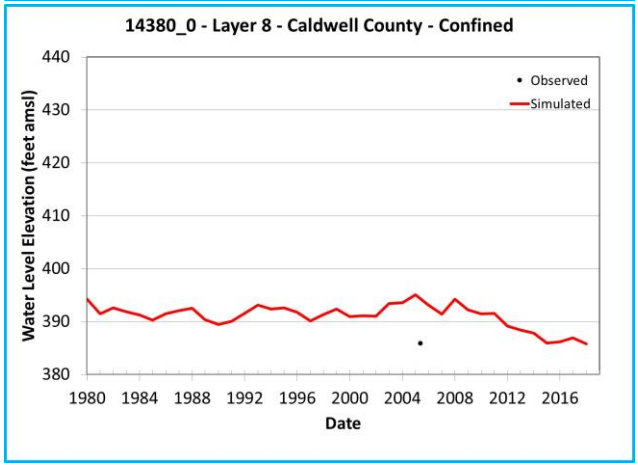
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

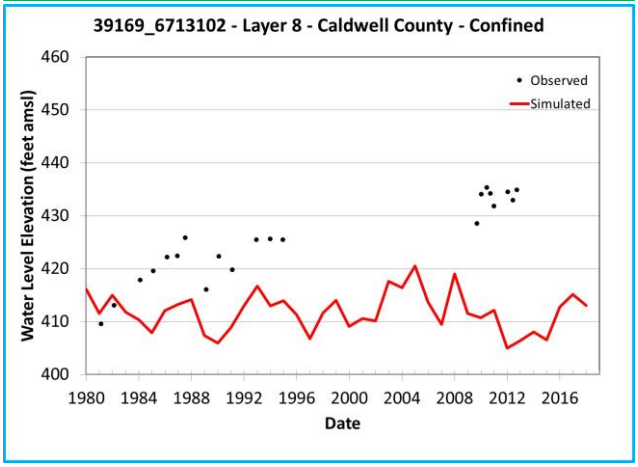
FIGURE I-4.3a

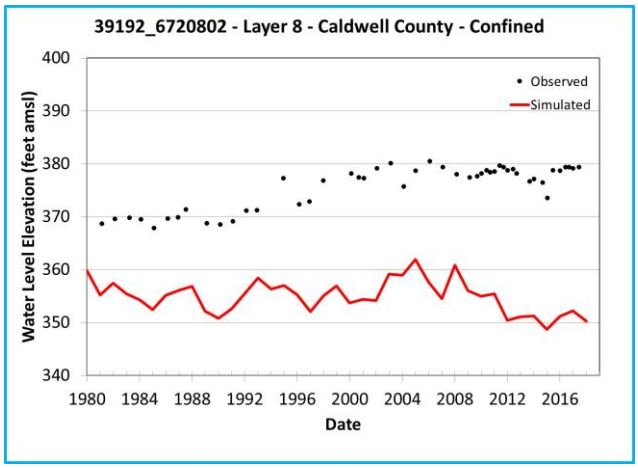
GSI ENVIRONMENTAL

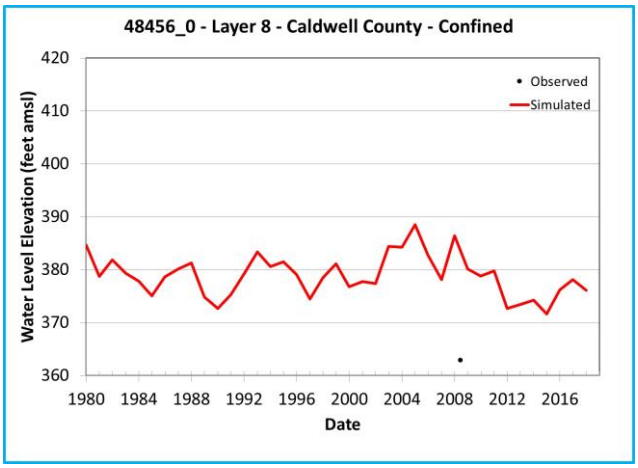












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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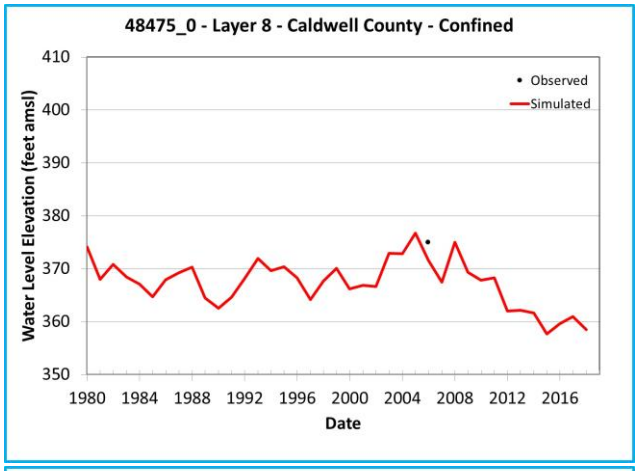
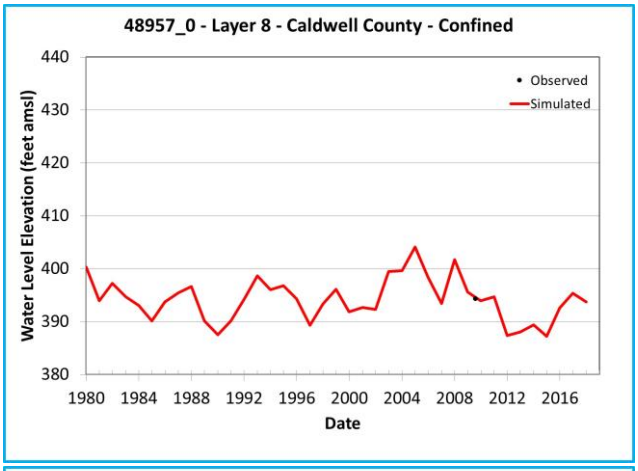
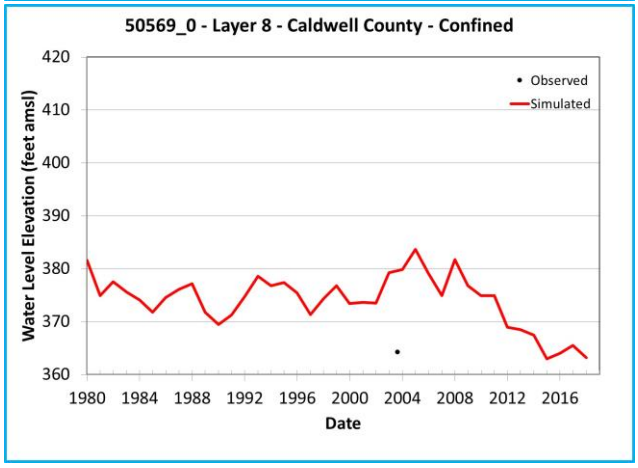
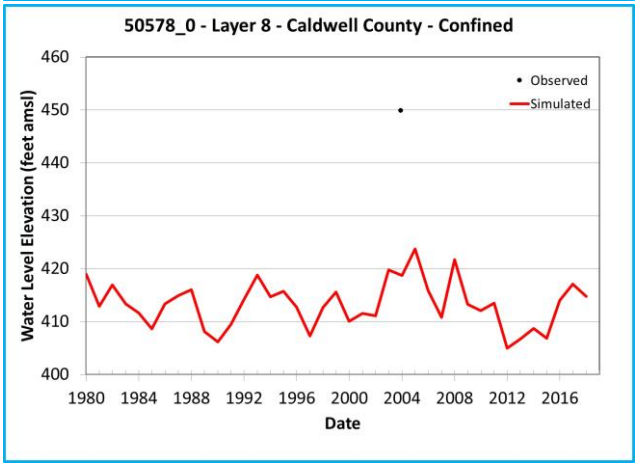
FIGURE I-4.3b

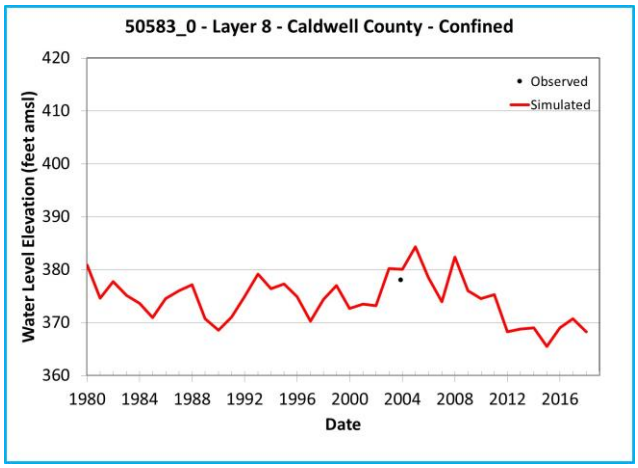
GSI ENVIRONMENTAL

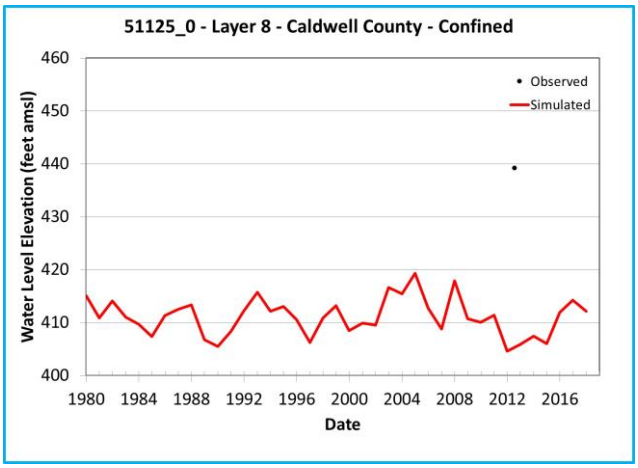












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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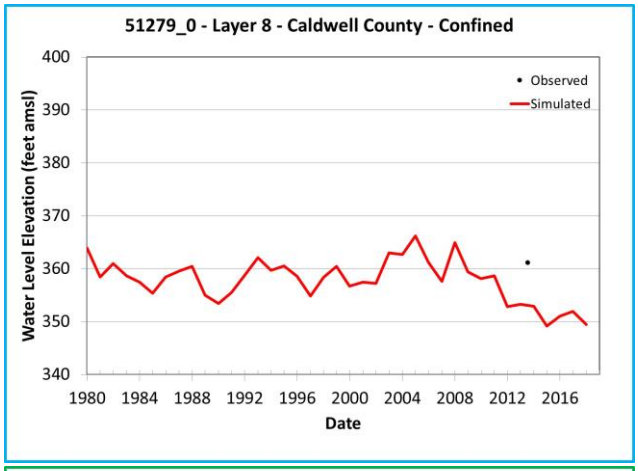
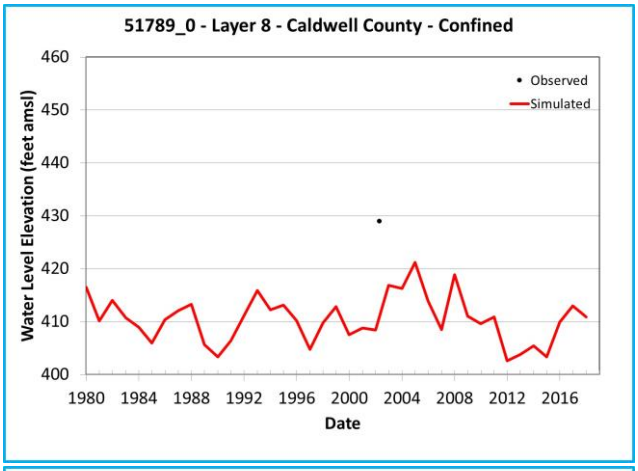
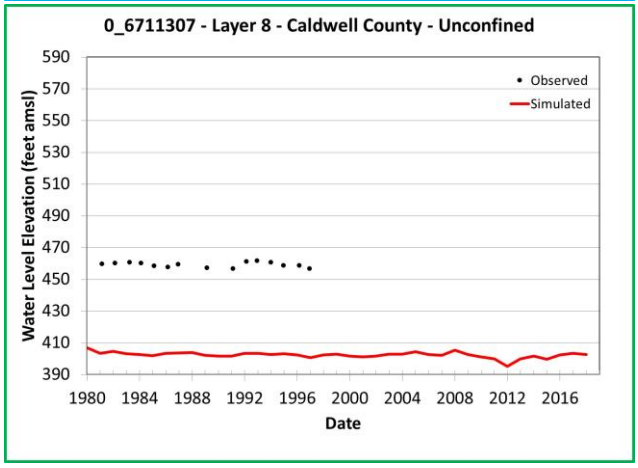
Revised		Aprv'd by	SP

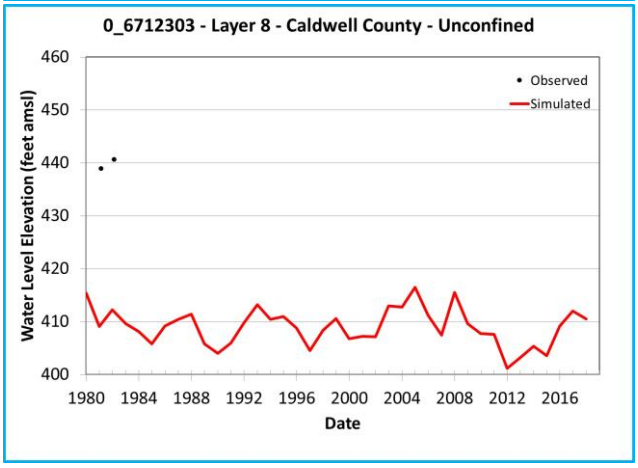
FIGURE I-4.3c

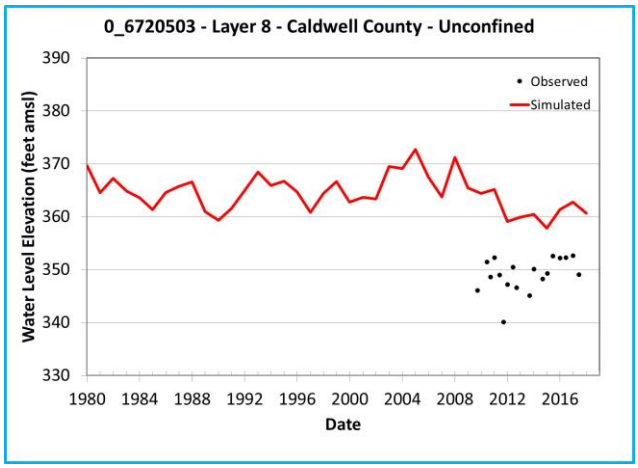
GSI ENVIRONMENTAL

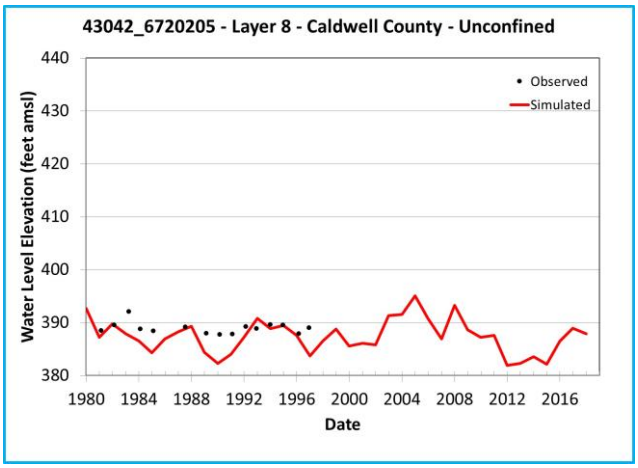












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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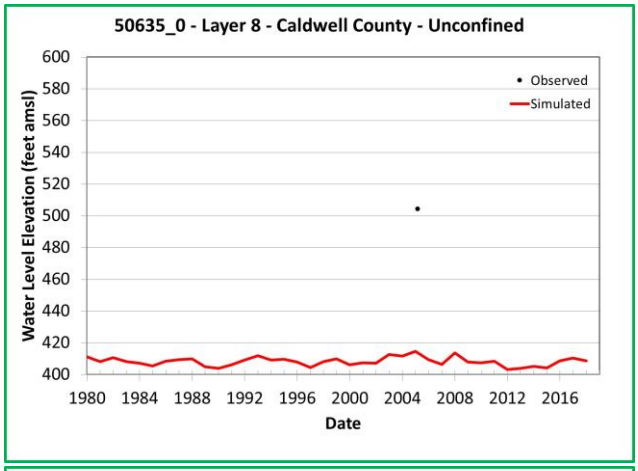
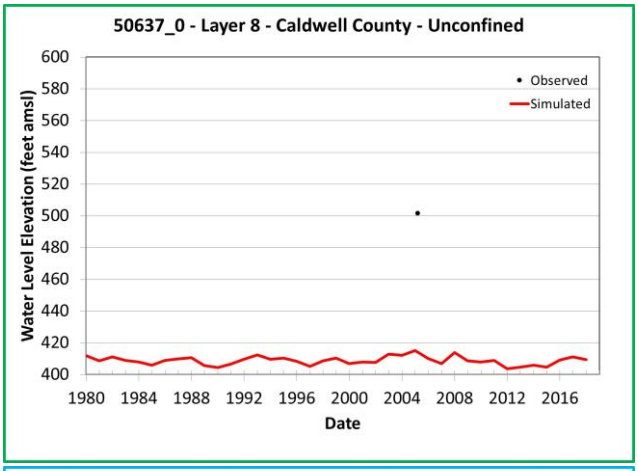
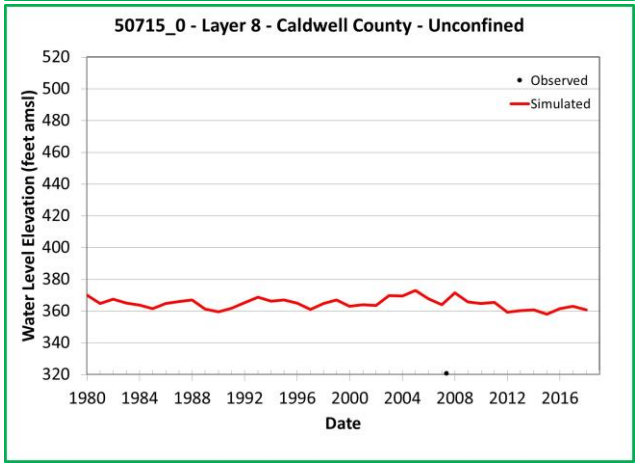
Revised		Aprv'd by	SP

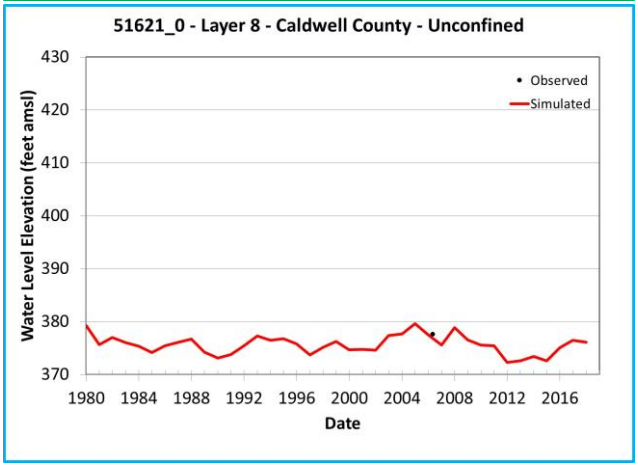
FIGURE I-4.3d

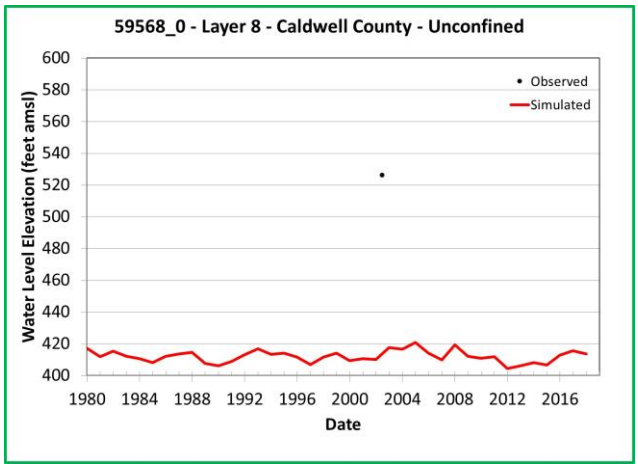
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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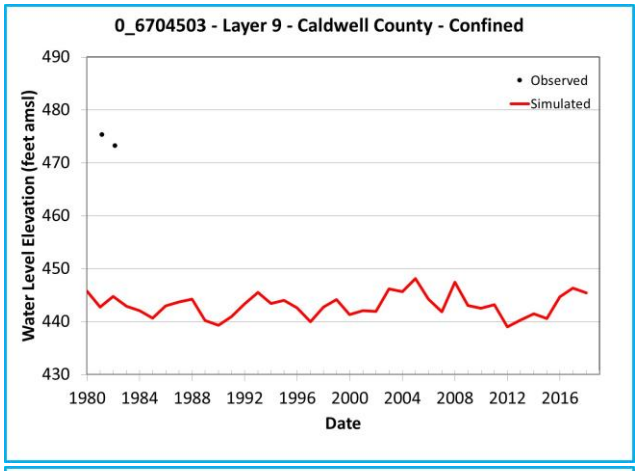
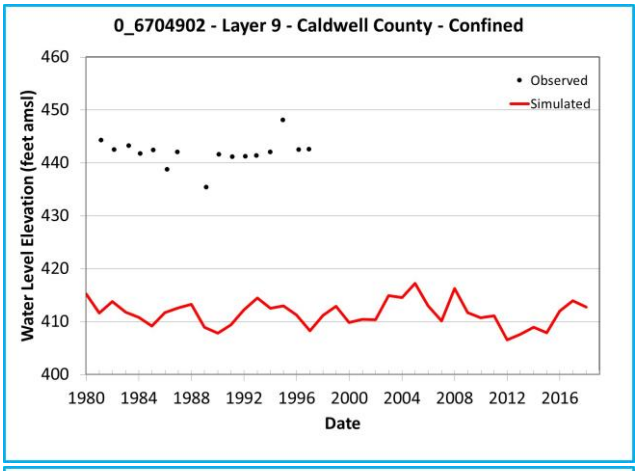
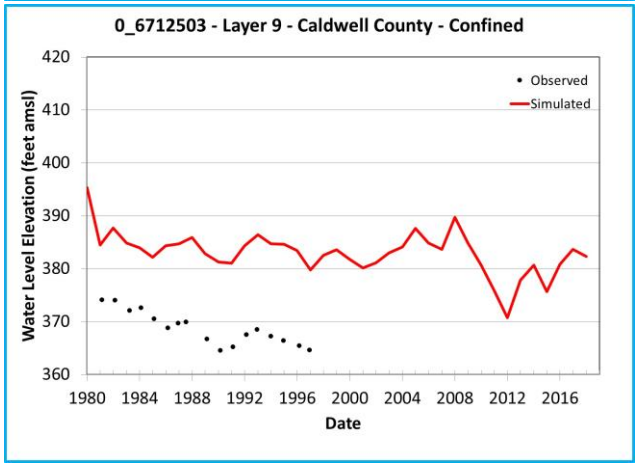
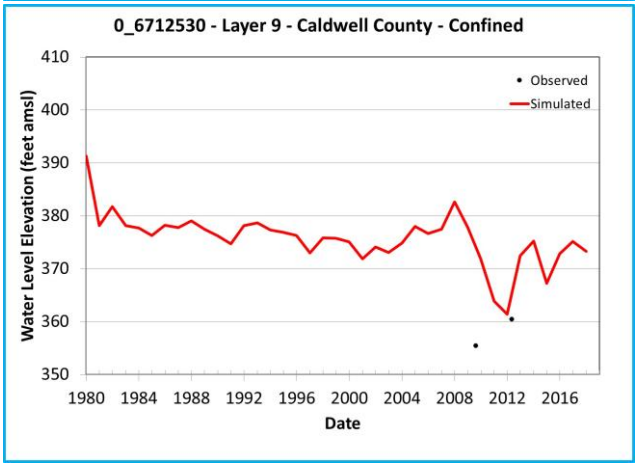
FIGURE I-4.3e

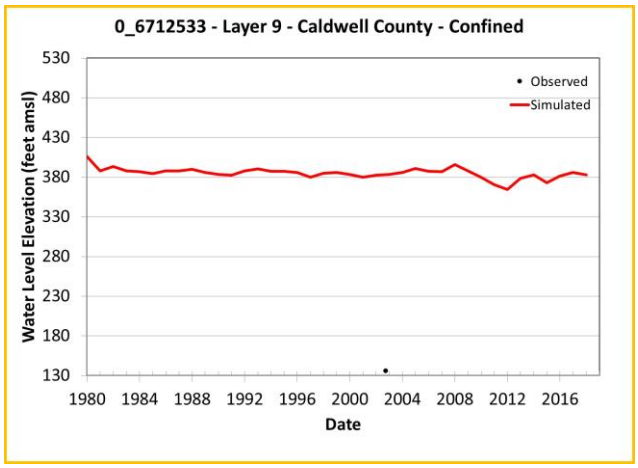
GSI ENVIRONMENTAL

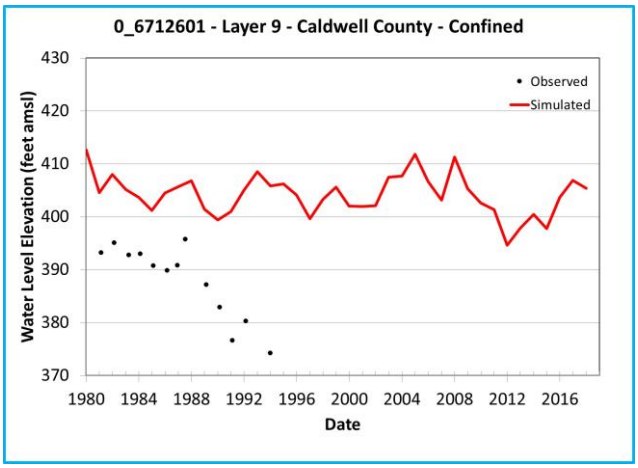












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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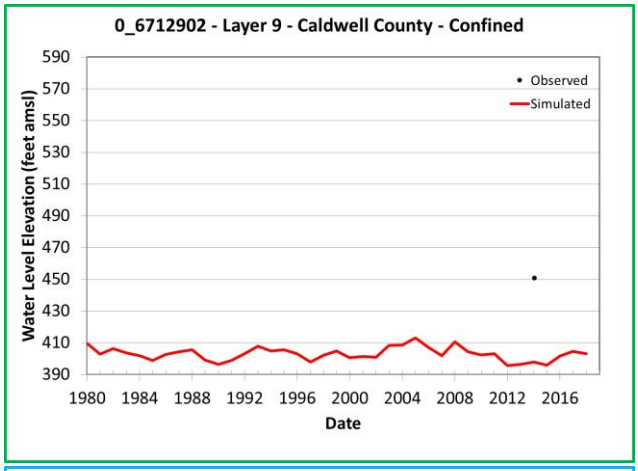
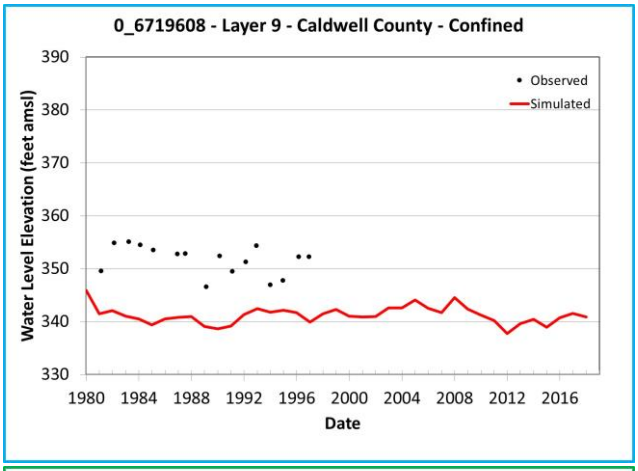
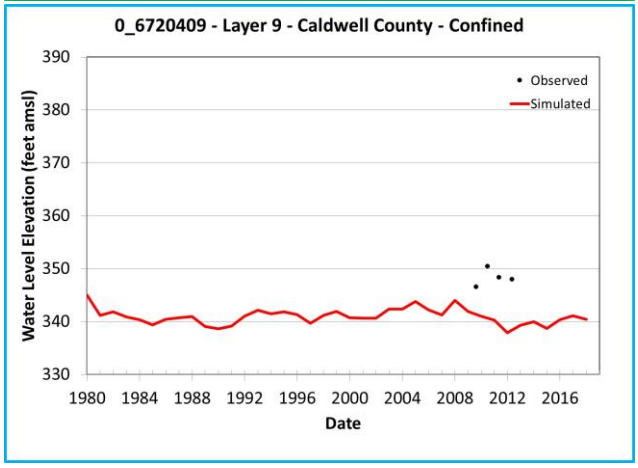
Revised		Aprv'd by	SP

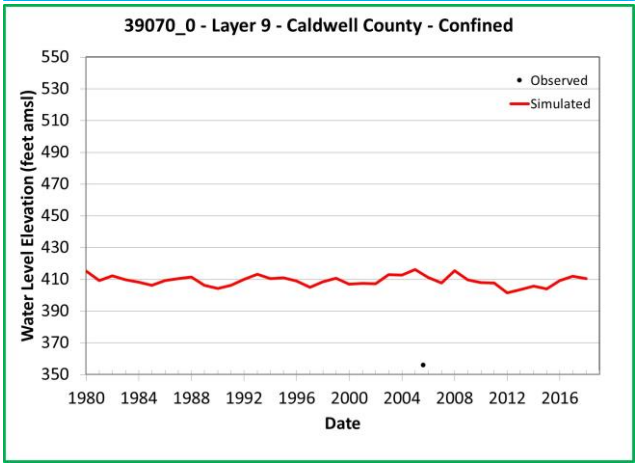
FIGURE I-4.4a

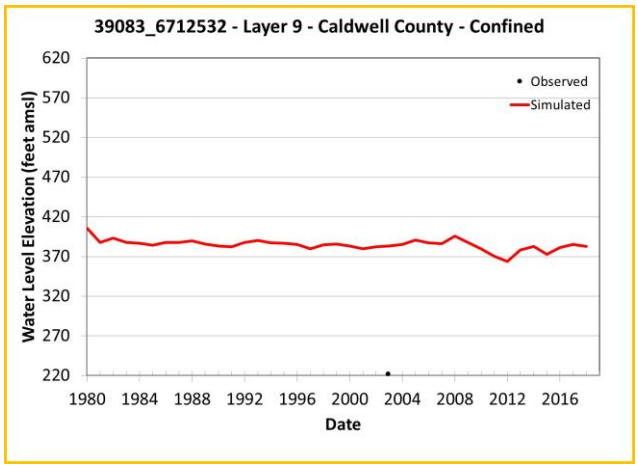
GSI ENVIRONMENTAL

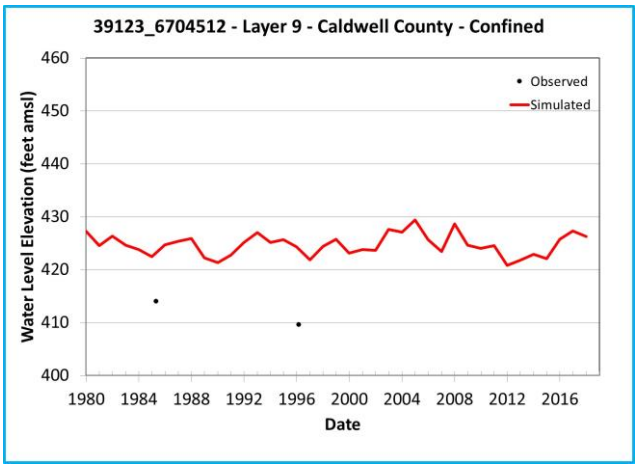












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

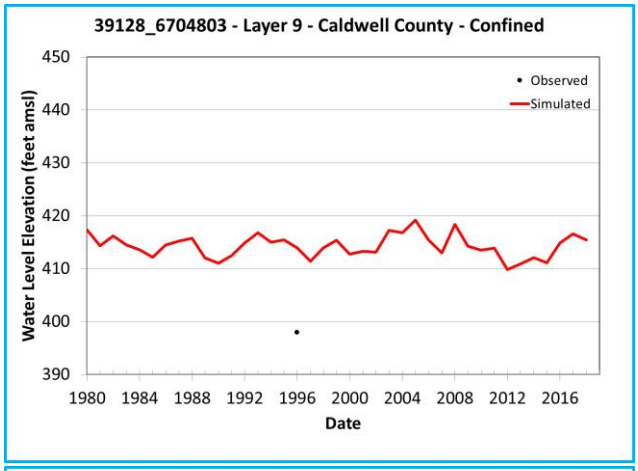
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

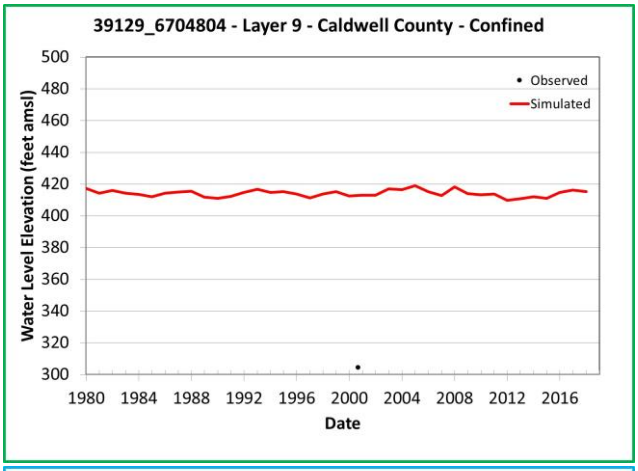
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

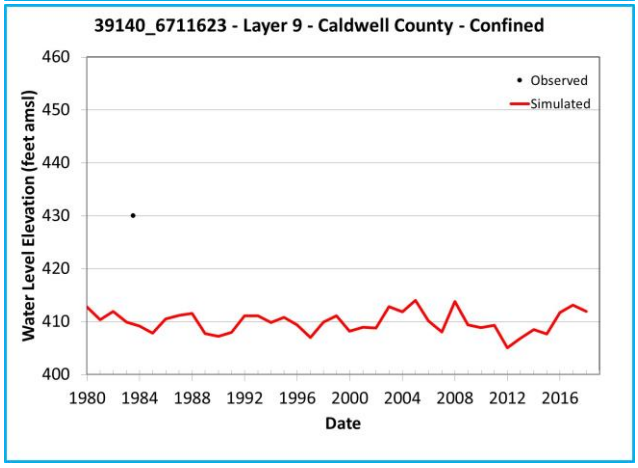
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

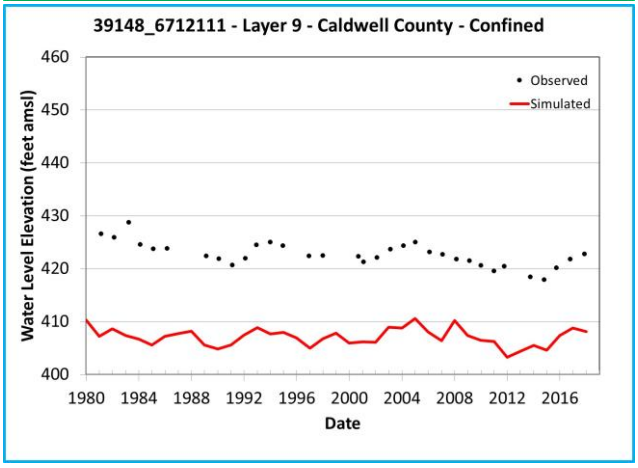
FIGURE I-4.4b

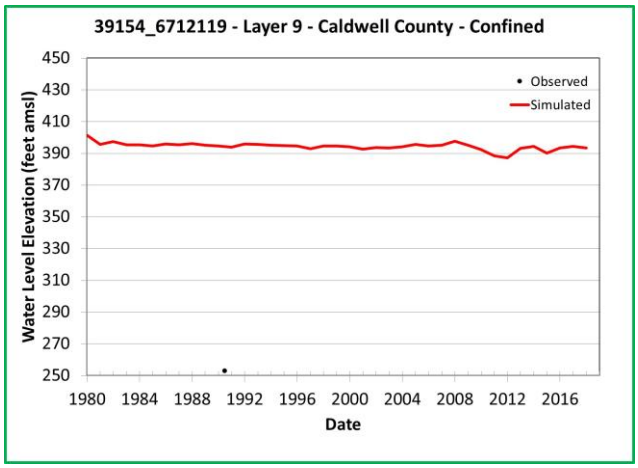
GSI ENVIRONMENTAL

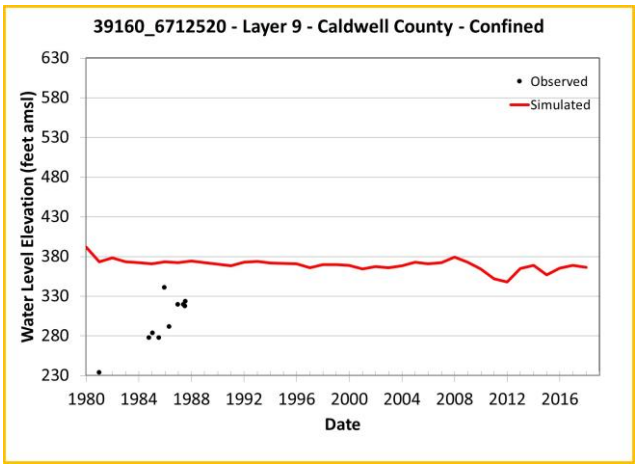












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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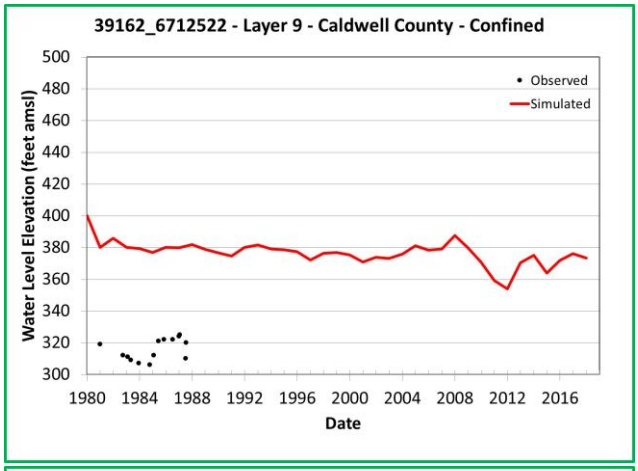
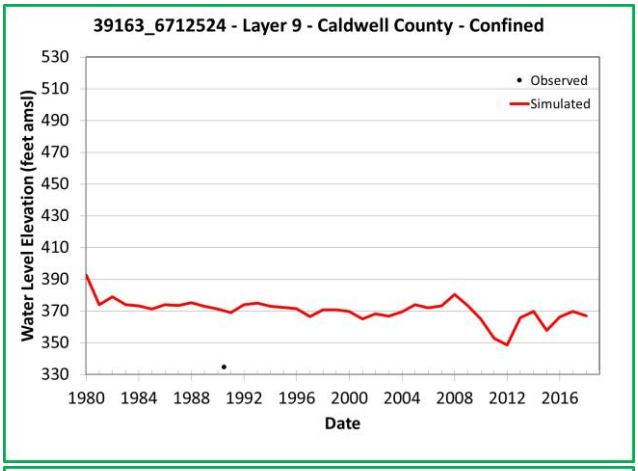
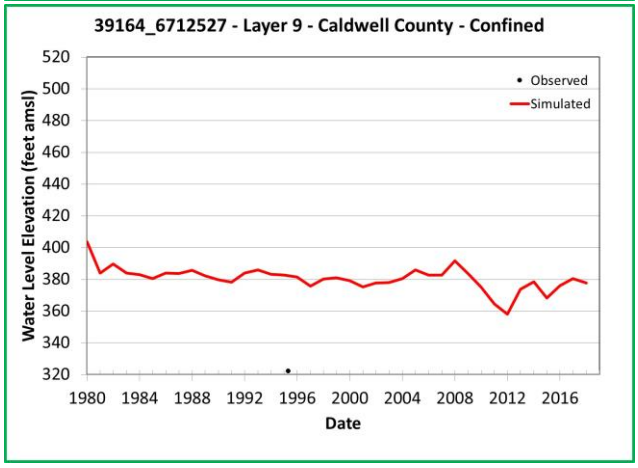
Revised		Aprv'd by	SP

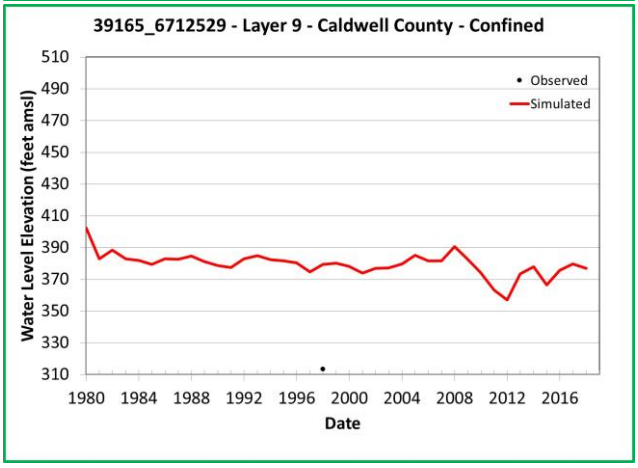
FIGURE I-4.4c

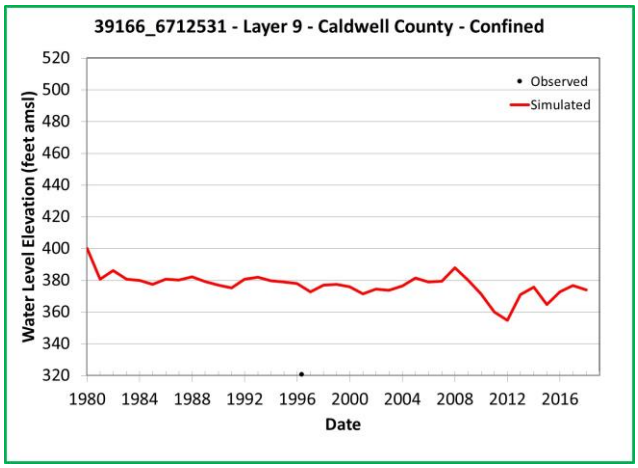
GSI ENVIRONMENTAL

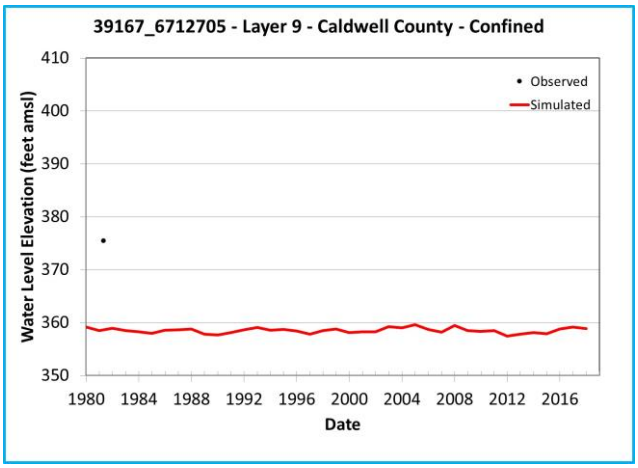












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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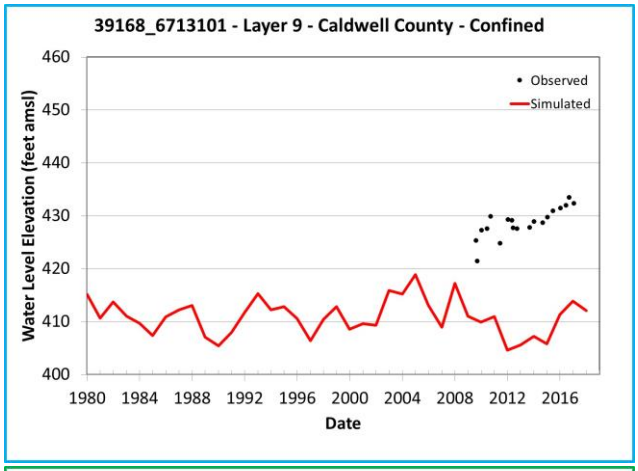
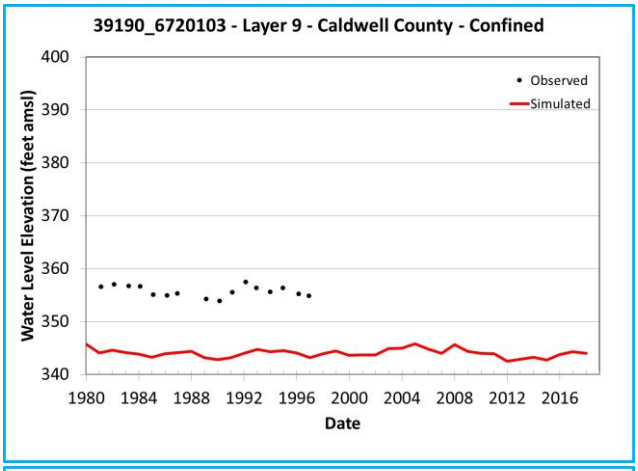
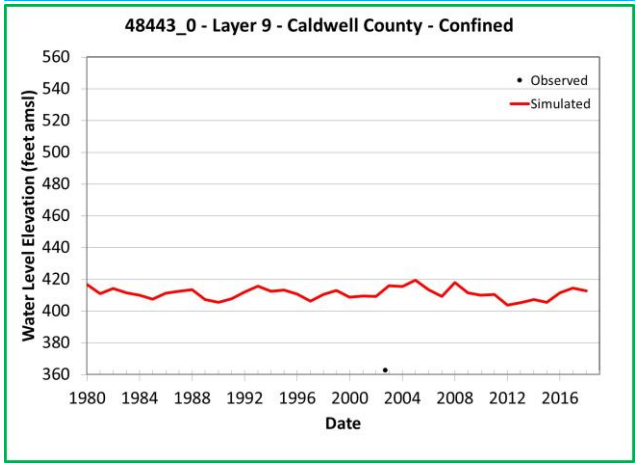
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

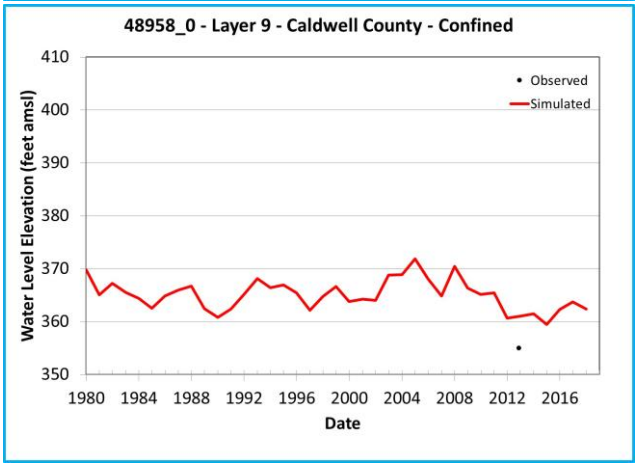
FIGURE I-4.4d

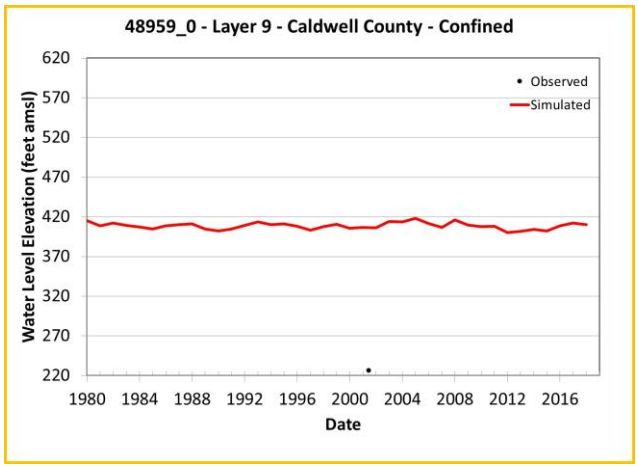
GSI ENVIRONMENTAL

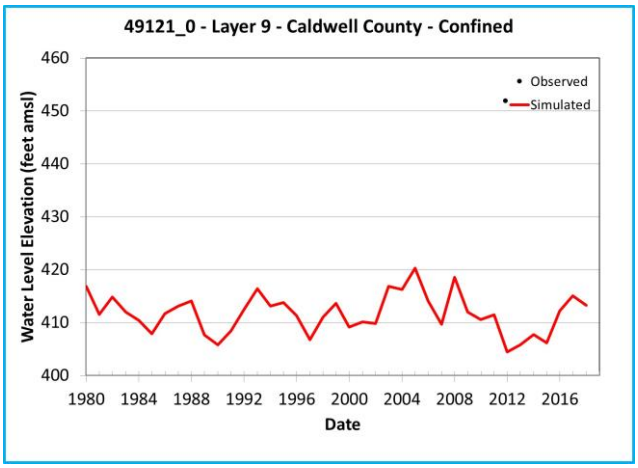












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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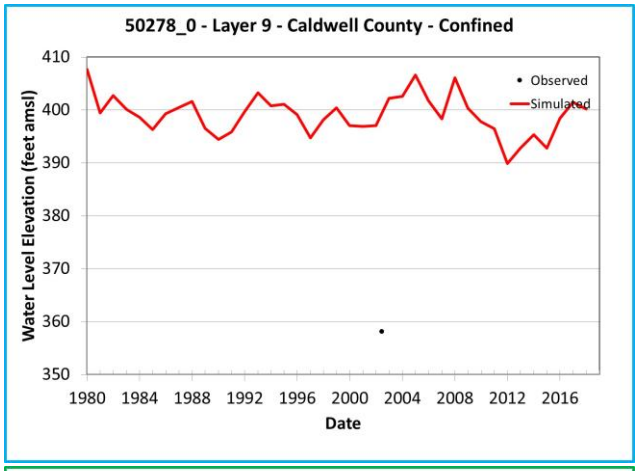
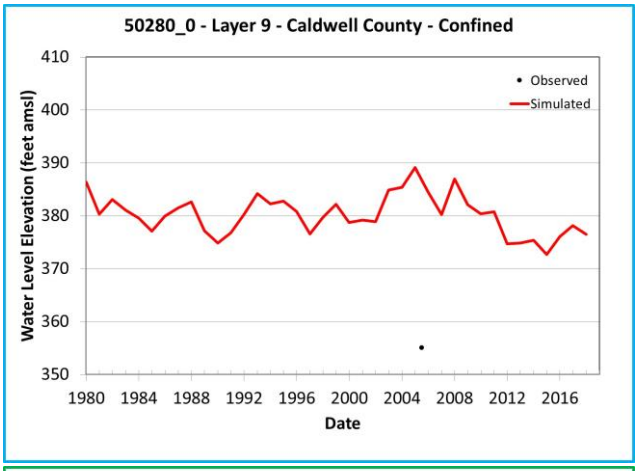
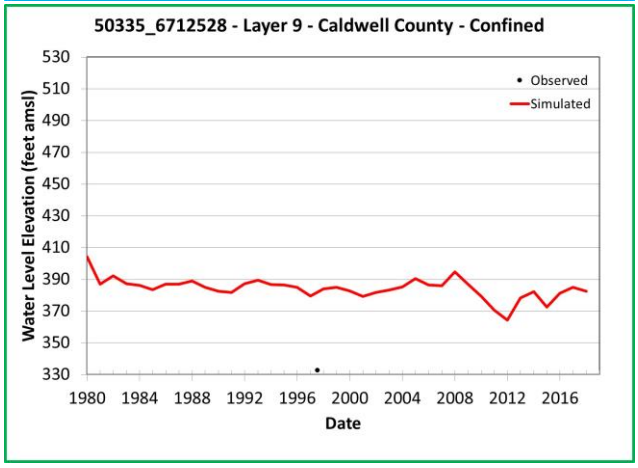
Revised		Aprv'd by	SP

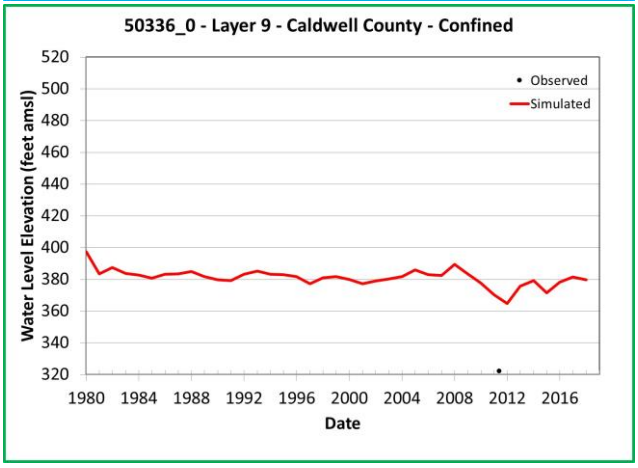
FIGURE I-4.4e

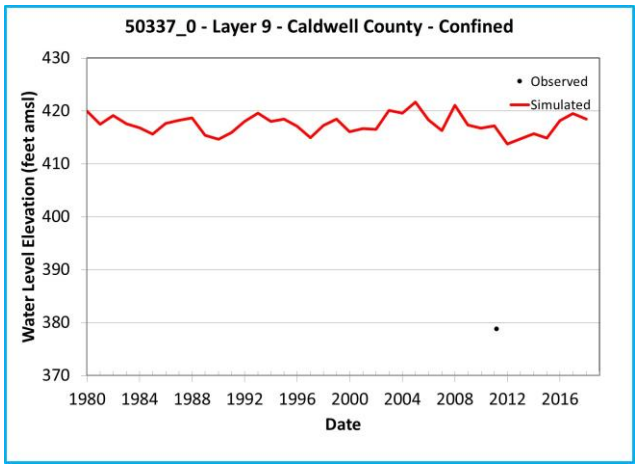
GSI ENVIRONMENTAL

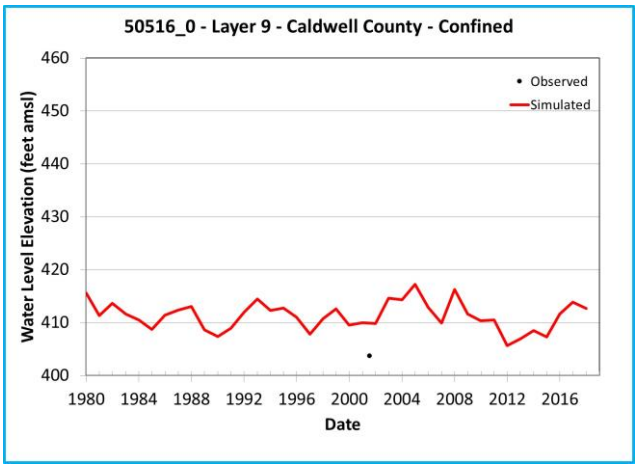












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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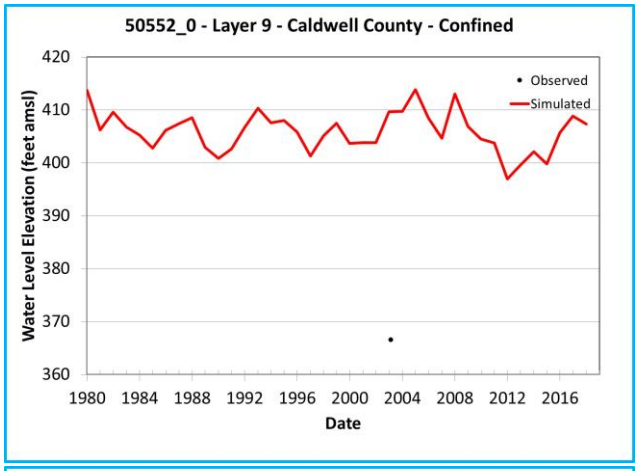
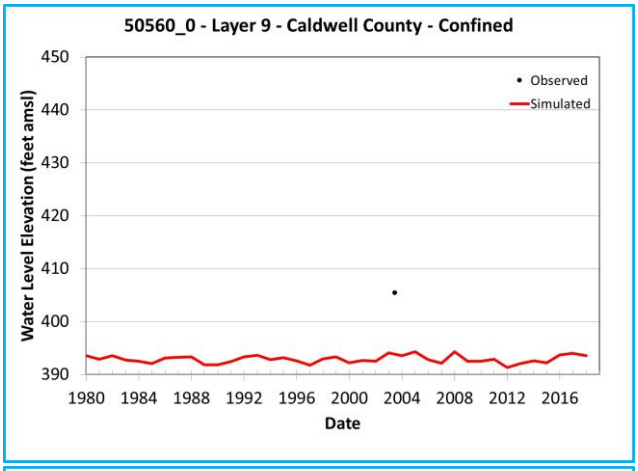
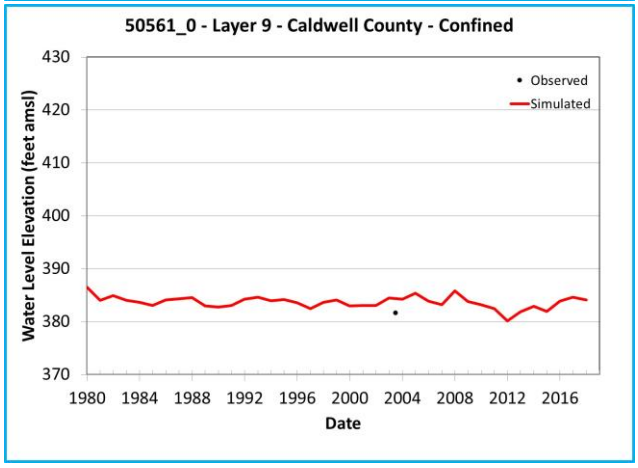
Revised		Aprv'd by	SP

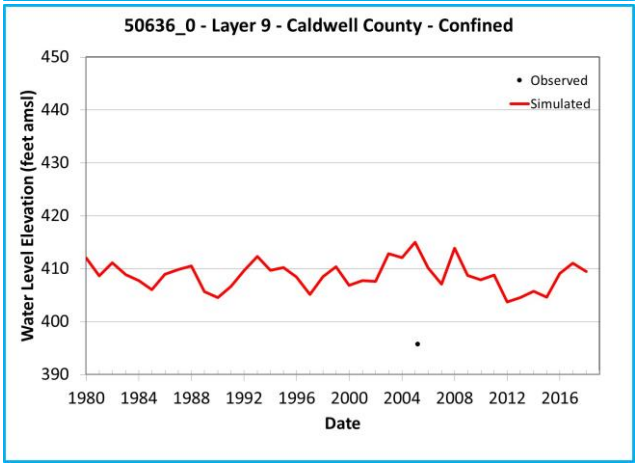
FIGURE I-4.4f

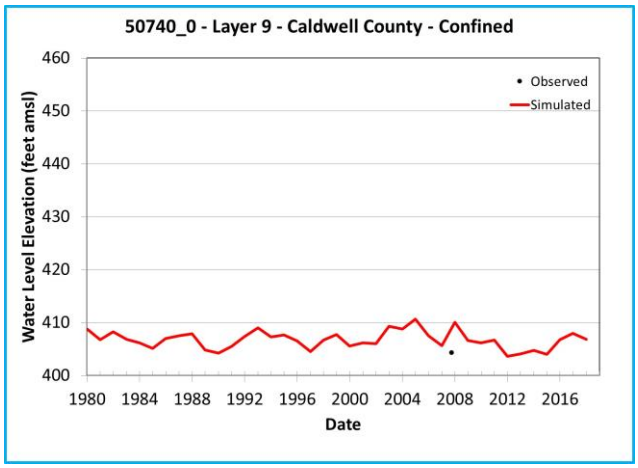
GSI ENVIRONMENTAL

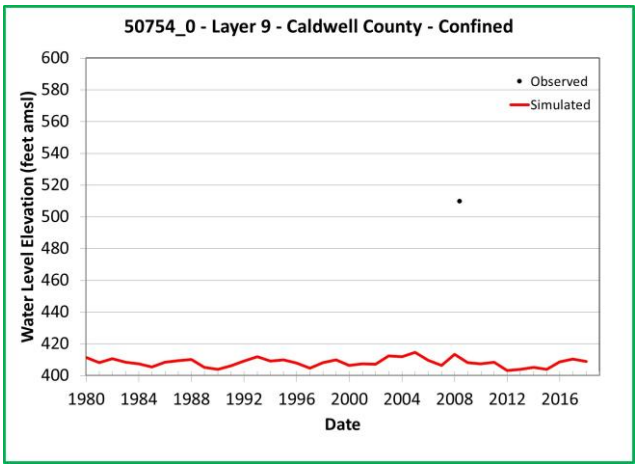












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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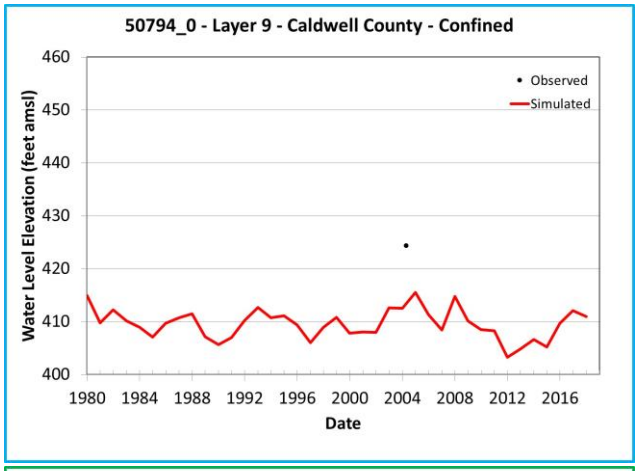
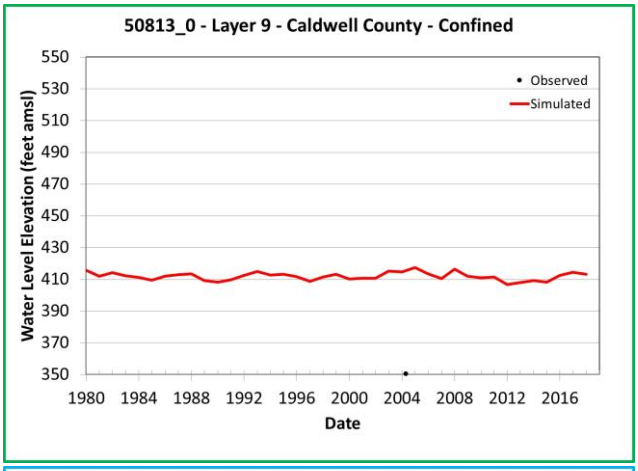
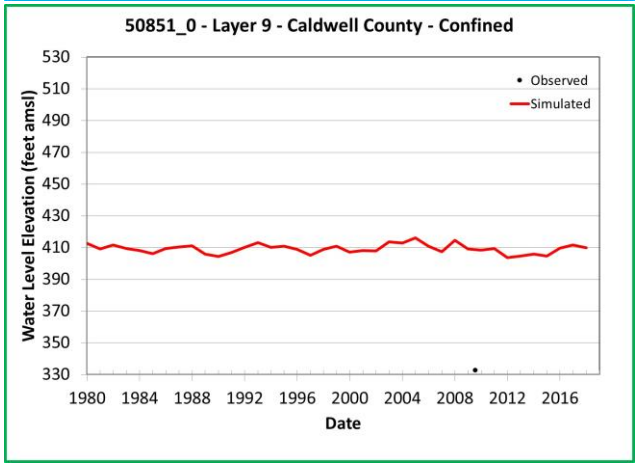
Revised		Aprv'd by	SP

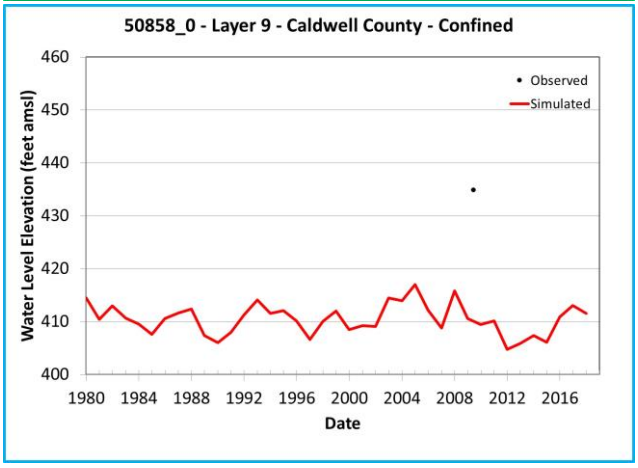
FIGURE I-4.4g

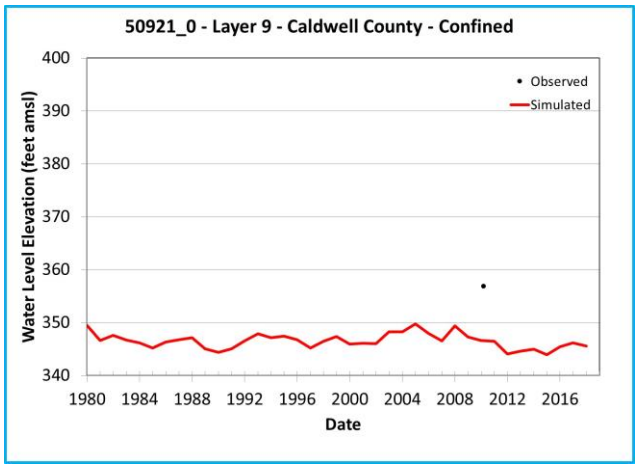
GSI ENVIRONMENTAL

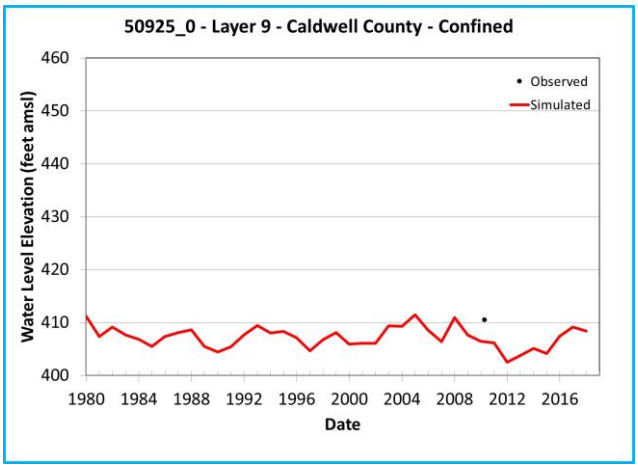












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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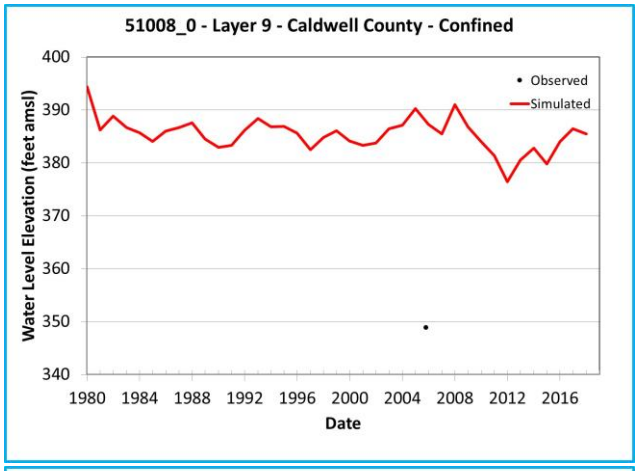
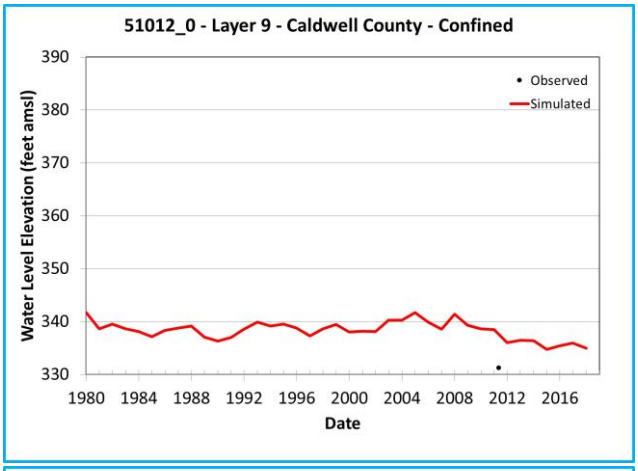
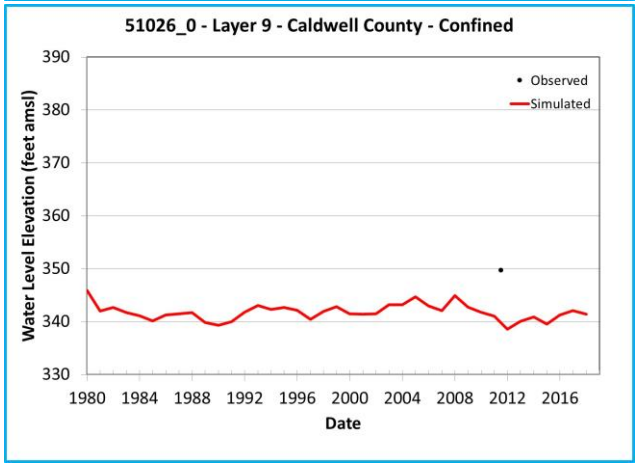
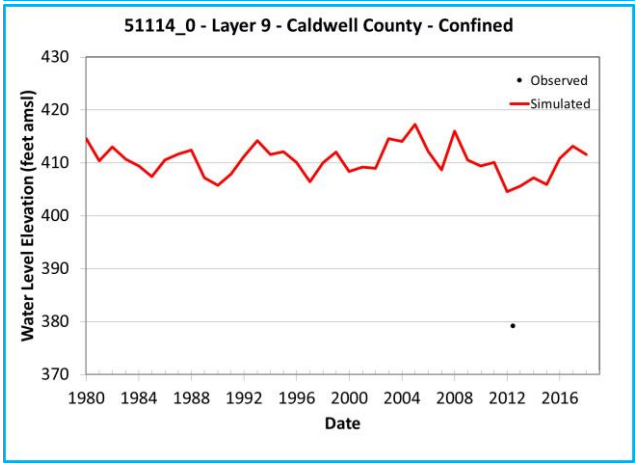
FIGURE I-4.4h

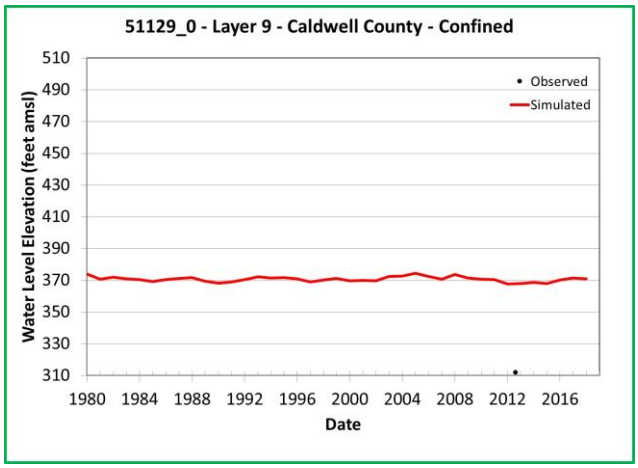
GSI ENVIRONMENTAL

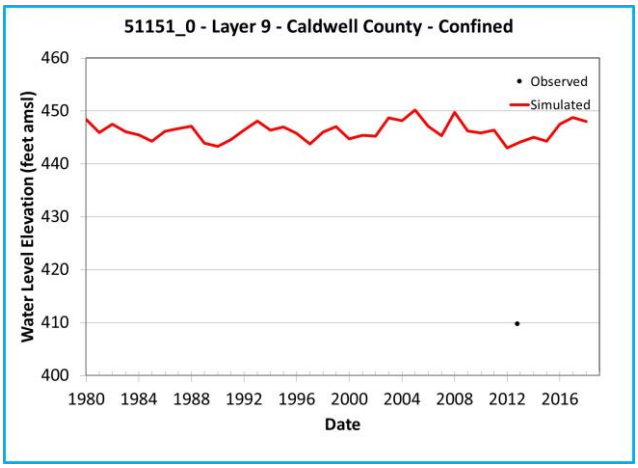












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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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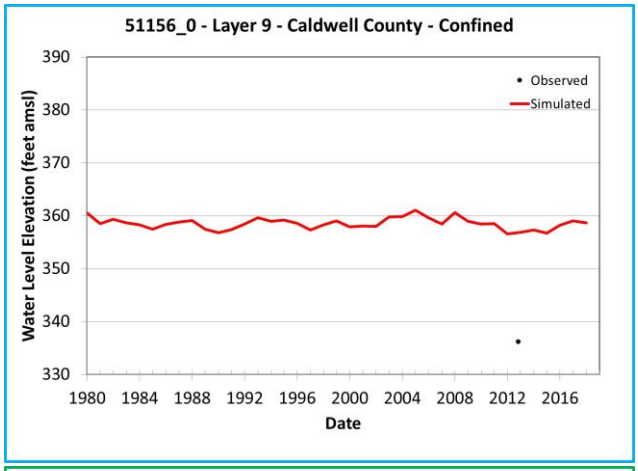
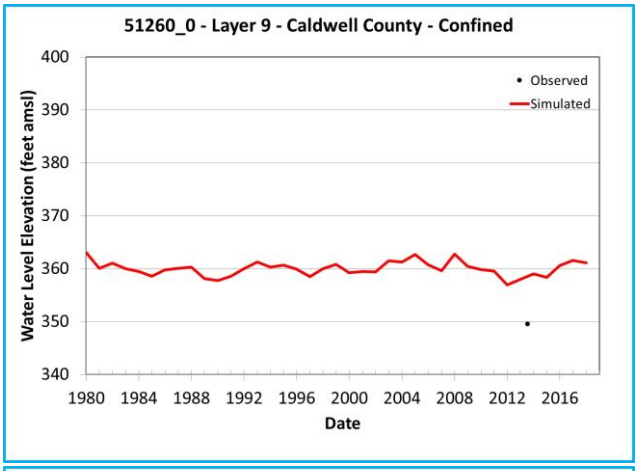
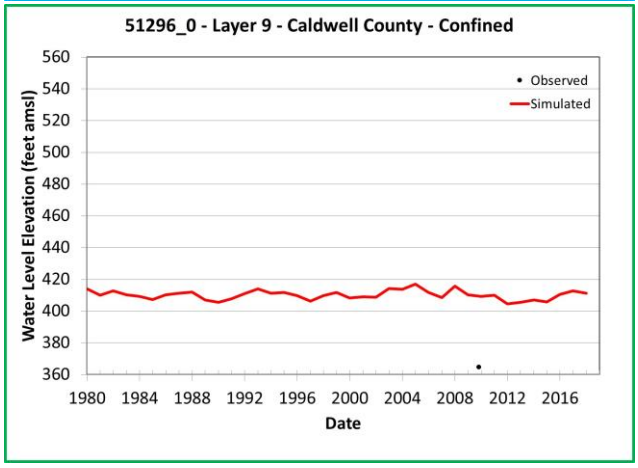
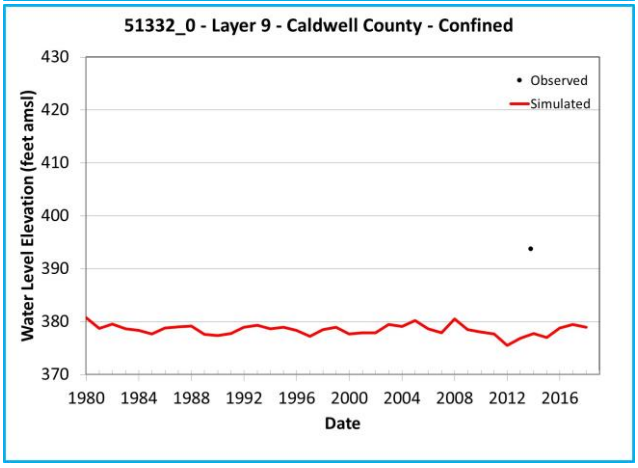
FIGURE I-4.4i

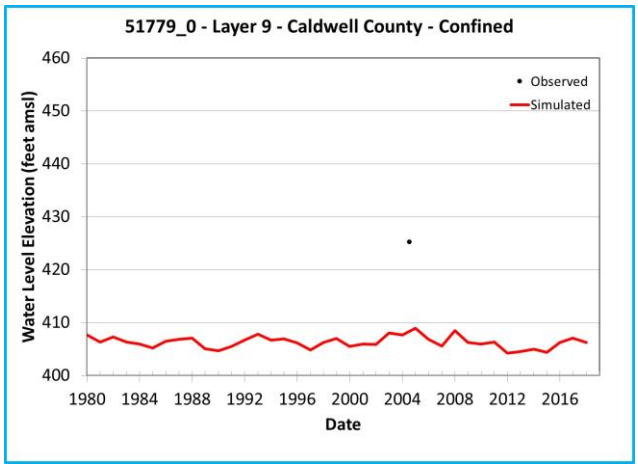
GSI ENVIRONMENTAL

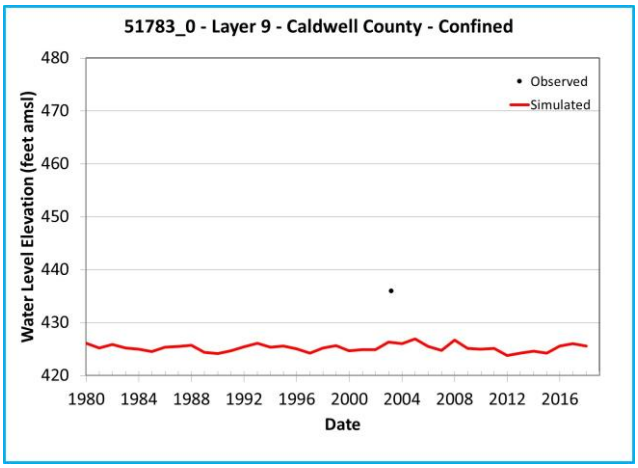












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Blue = 60 feet

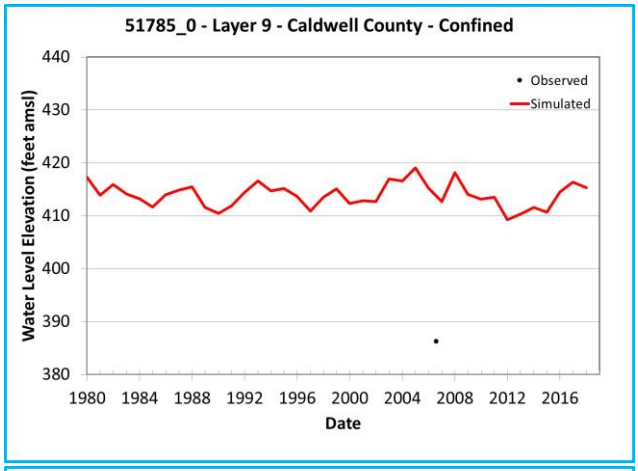
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

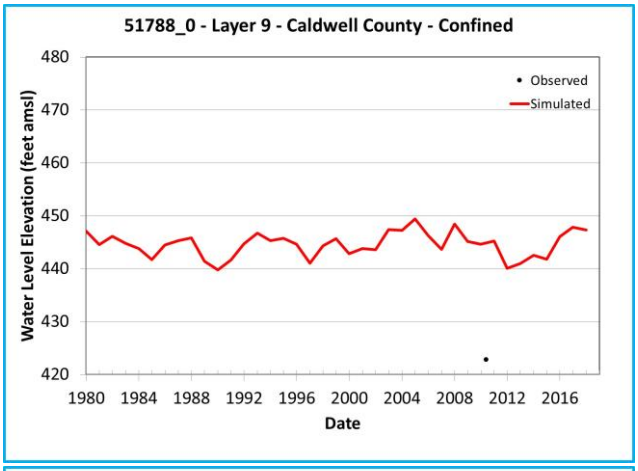
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

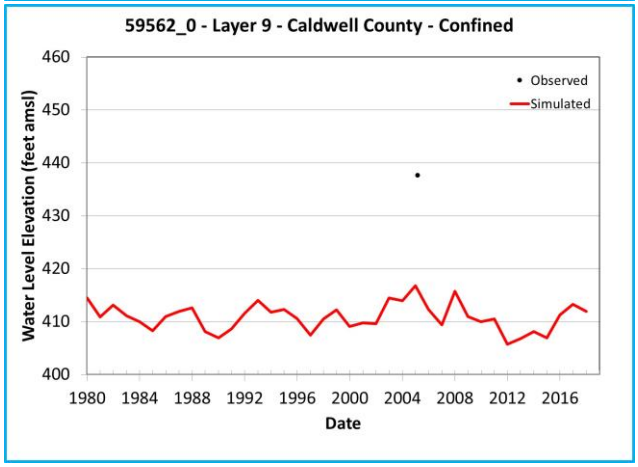
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

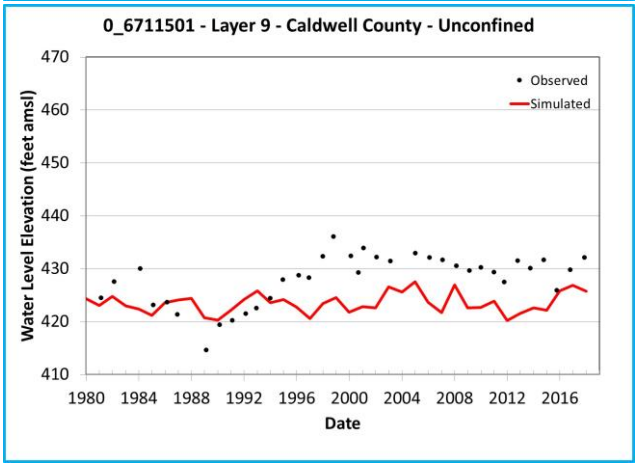
FIGURE I-4.4j

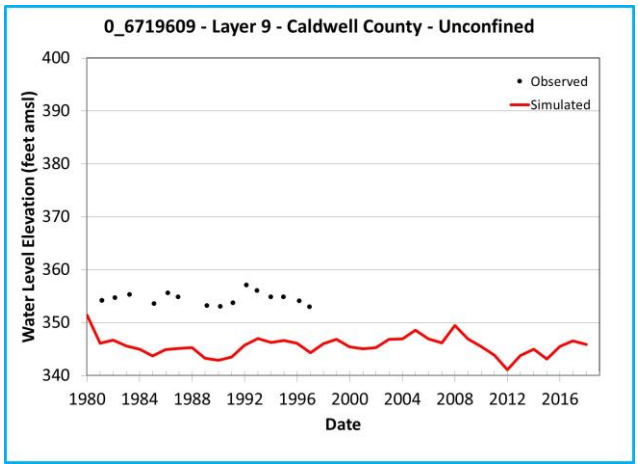
GSI ENVIRONMENTAL

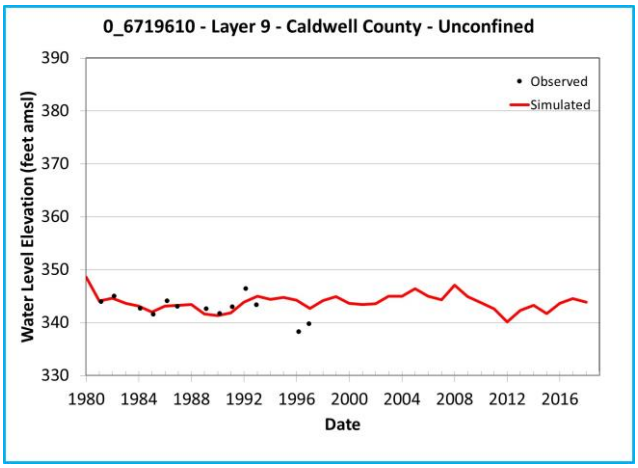












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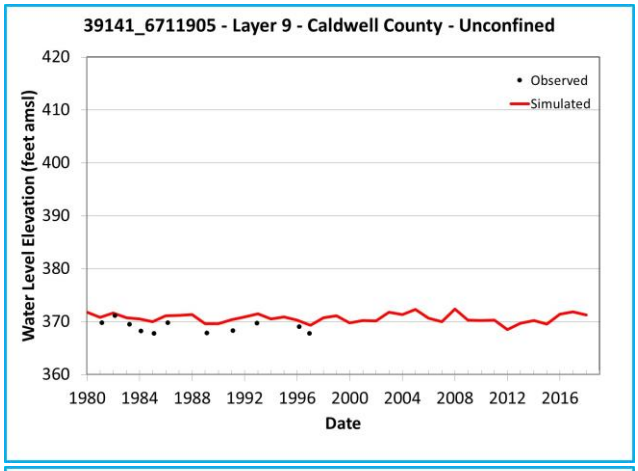
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

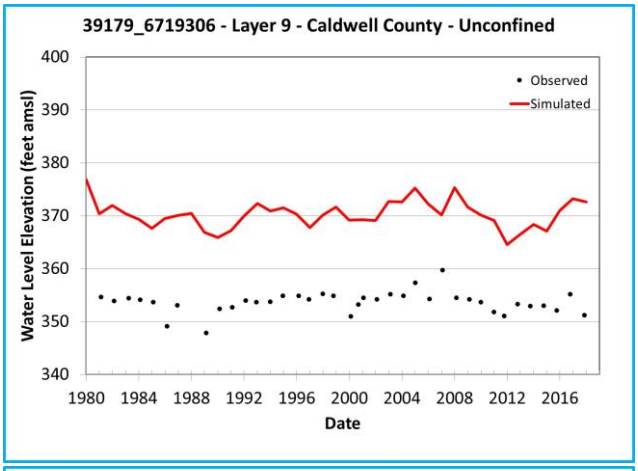
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

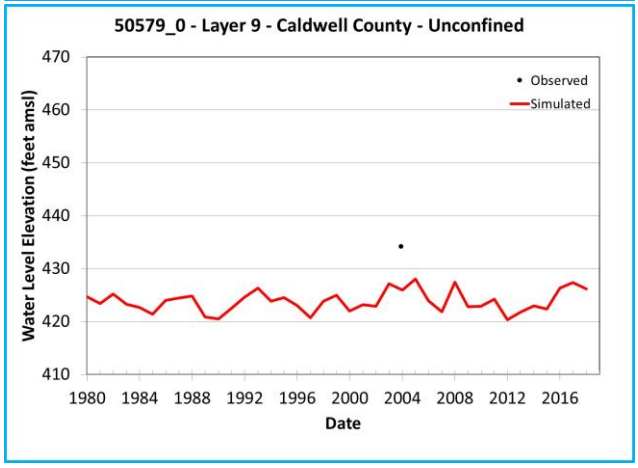
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

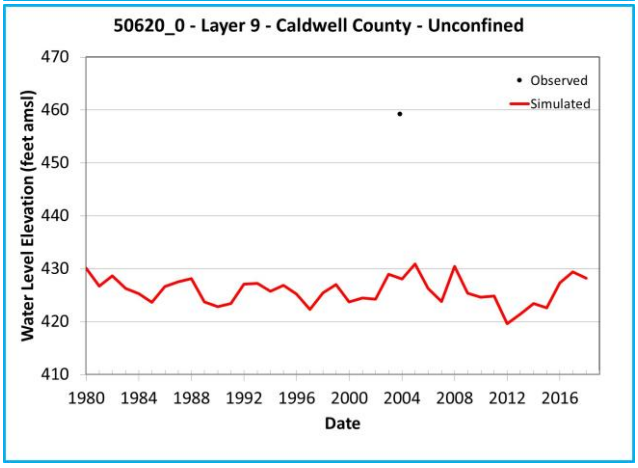
FIGURE I-4.4k

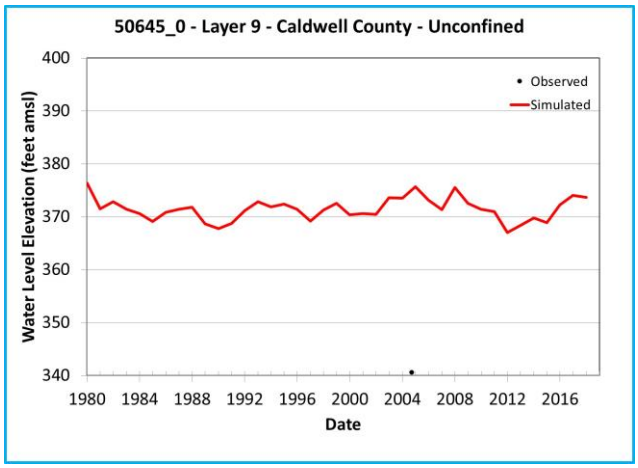
GSI ENVIRONMENTAL

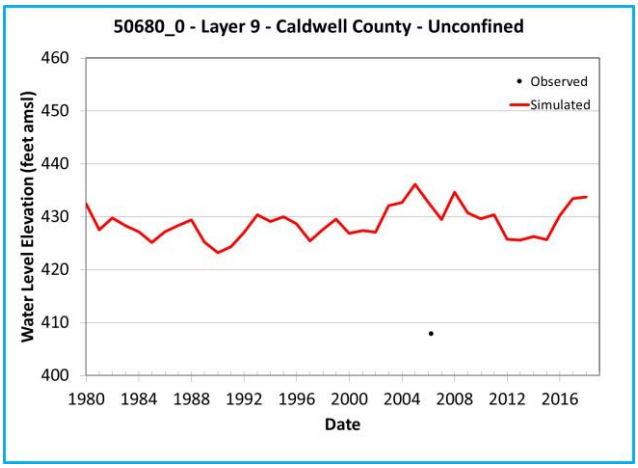












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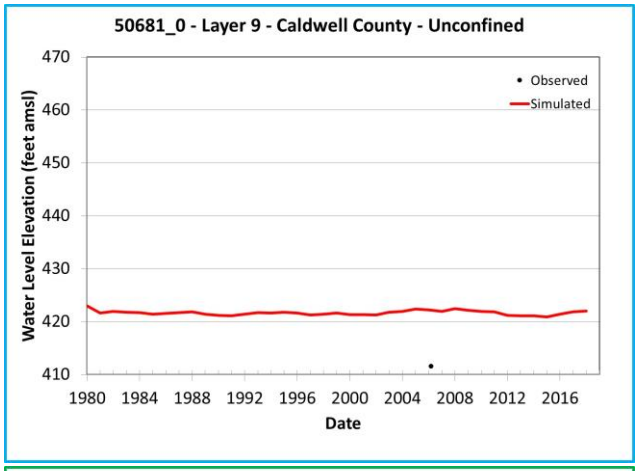
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

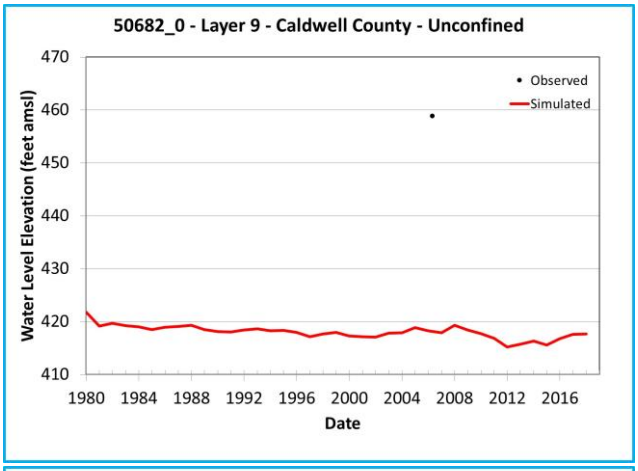
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

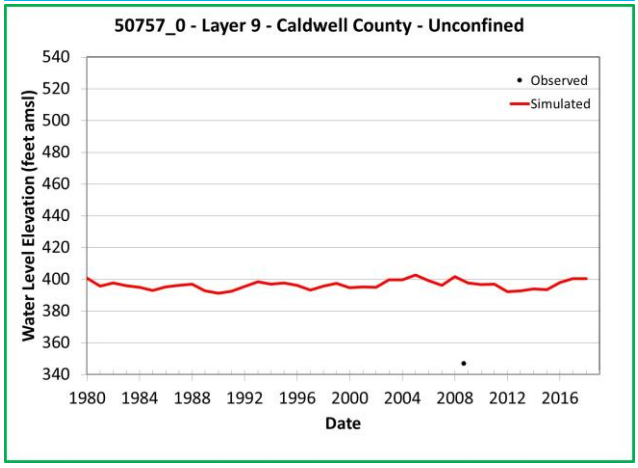
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

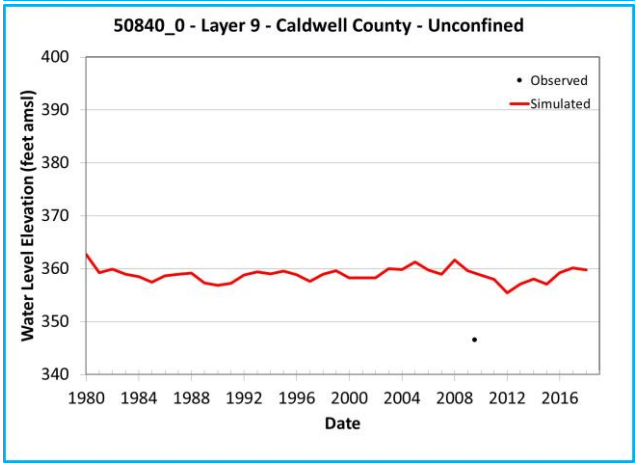
FIGURE I-4.4l

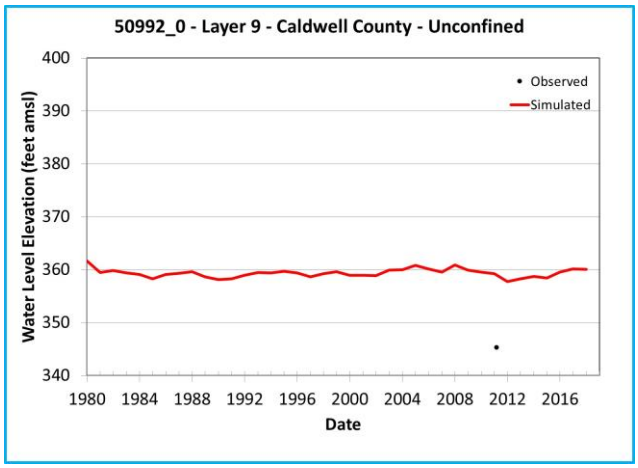
GSI ENVIRONMENTAL

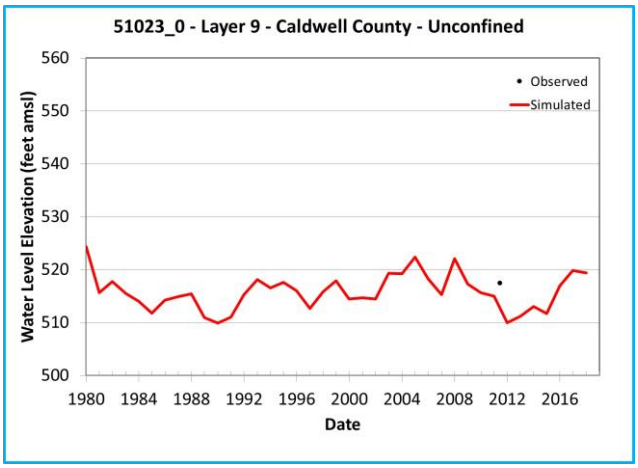












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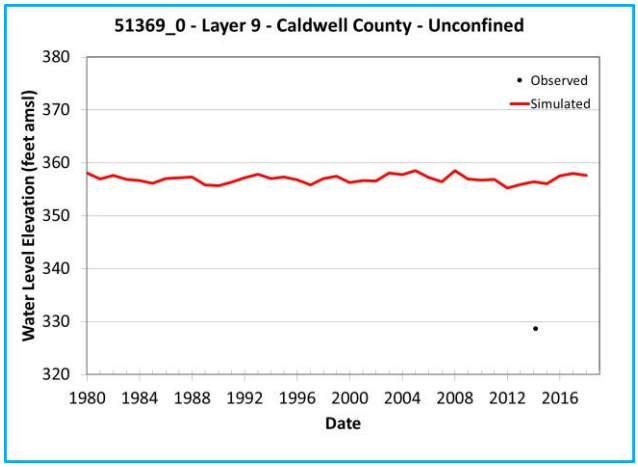
Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

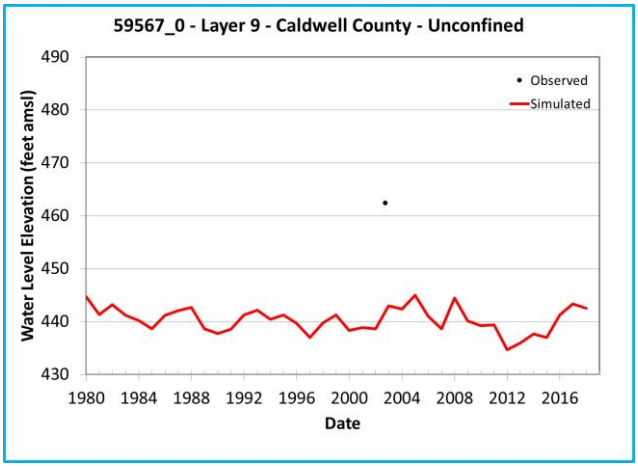
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-4.4m

GSI ENVIRONMENTAL





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Simulated and Observed Water Level Elevation Hydrographs, Caldwell County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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Issued	January 2023	Chk'd by	GM
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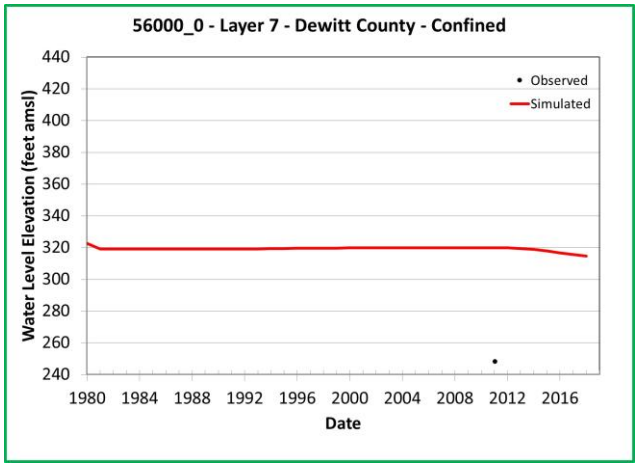
FIGURE I-4.4n

GSI ENVIRONMENTAL



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Simulated and Observed Water Level Elevation Hydrographs, Dewitt County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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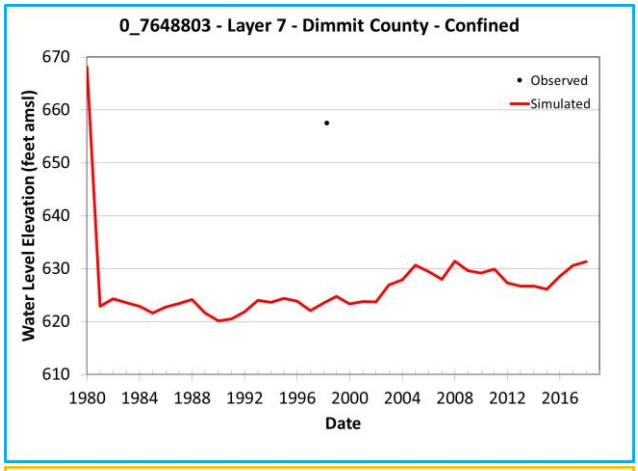
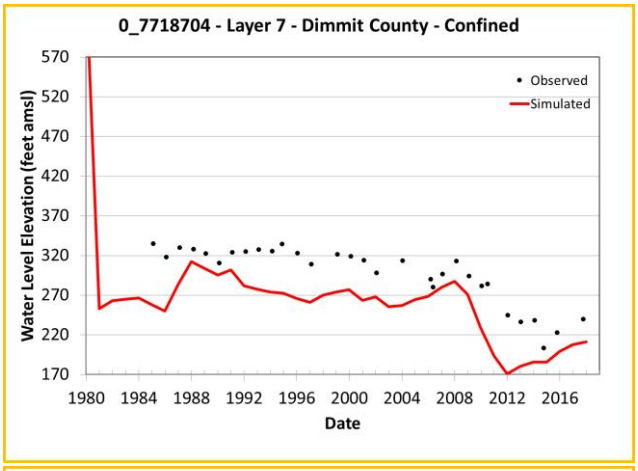
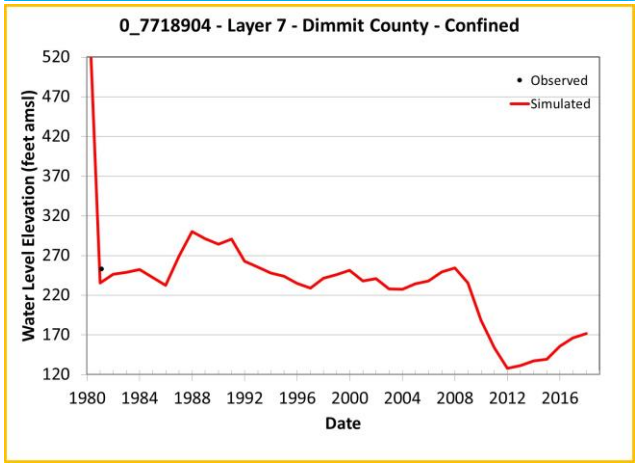
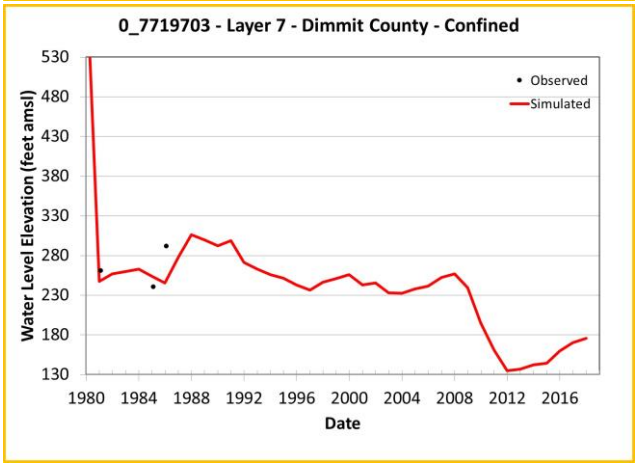
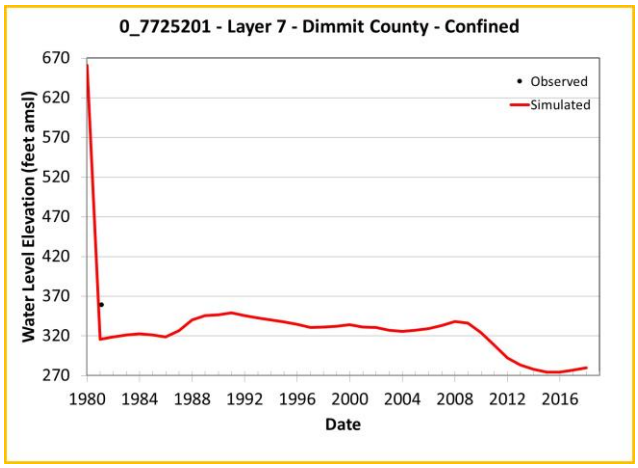
FIGURE I-5.1a

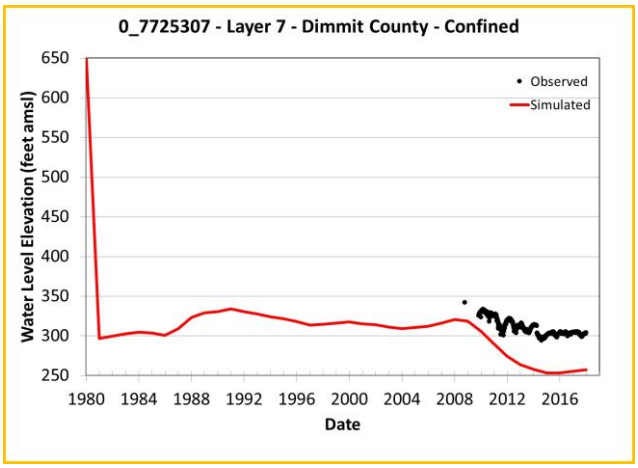












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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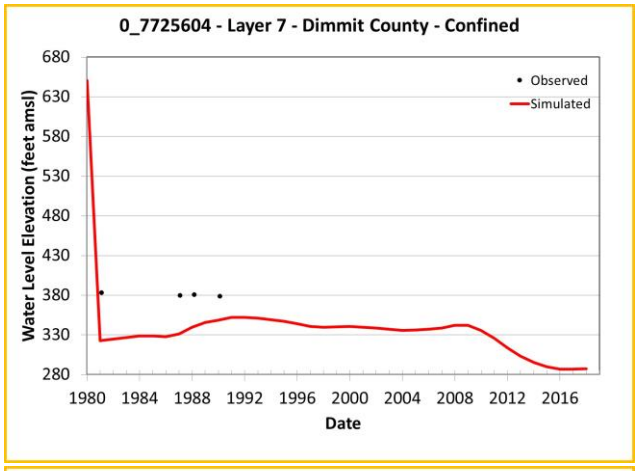
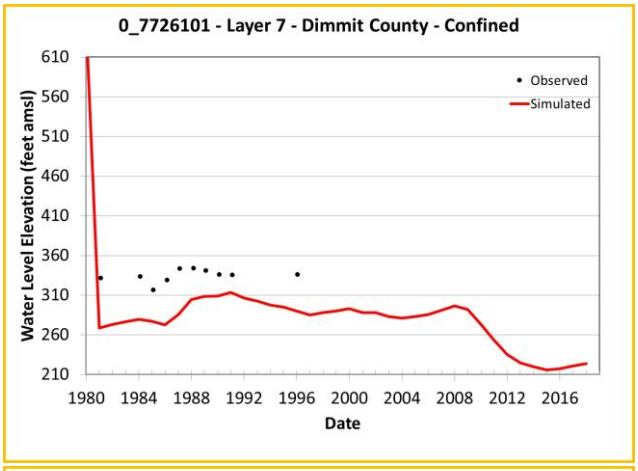
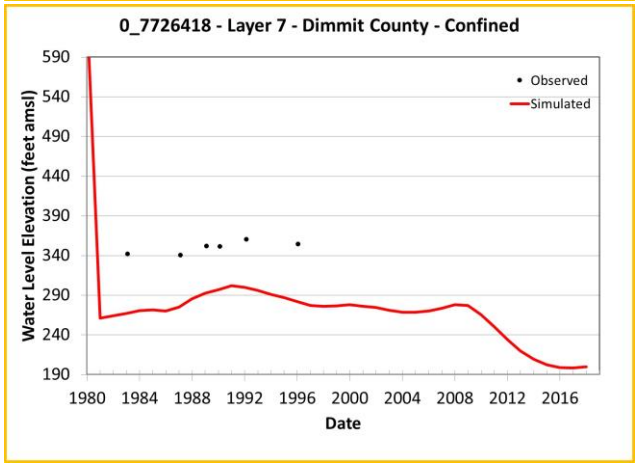
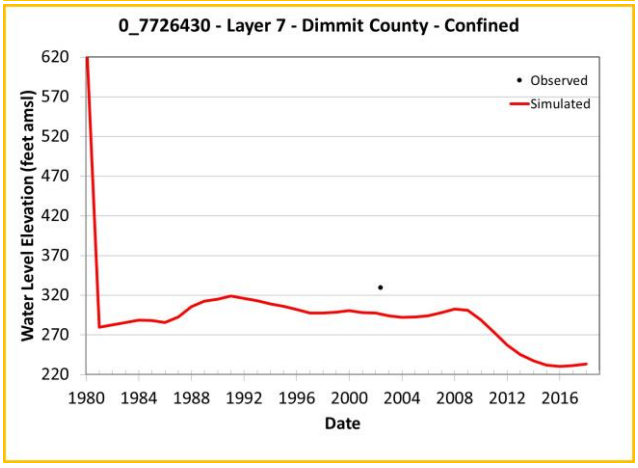
FIGURE I-6.1b

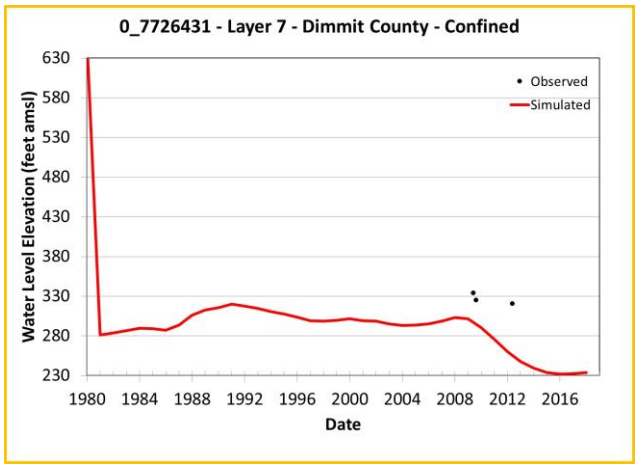
GSI ENVIRONMENTAL

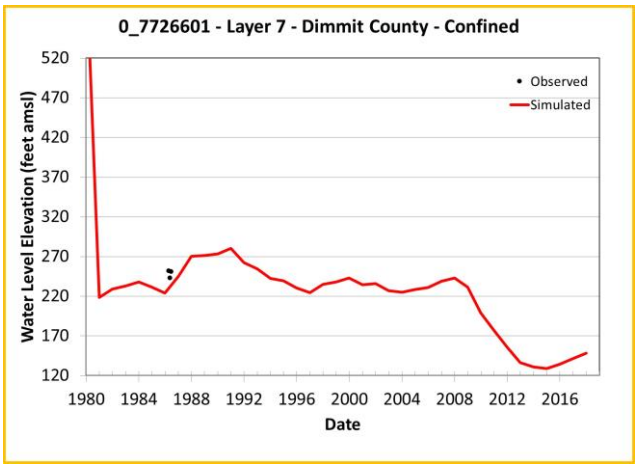












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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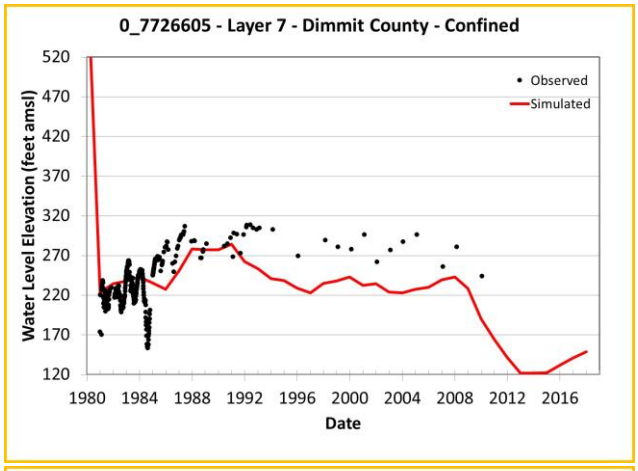
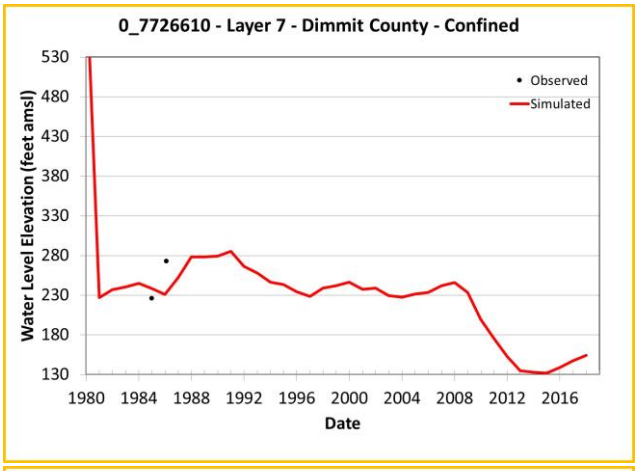
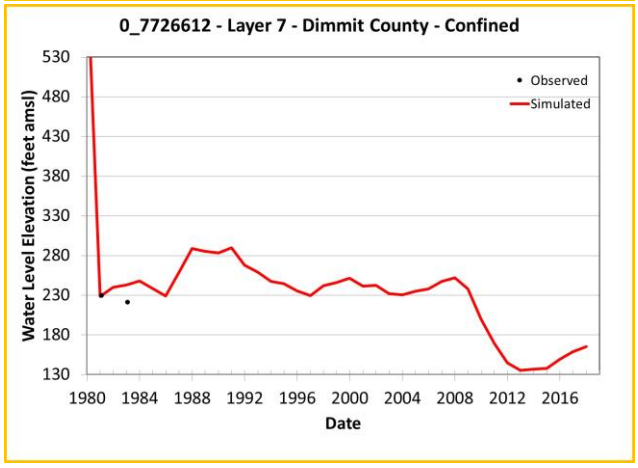
Revised		Aprv'd by	SP

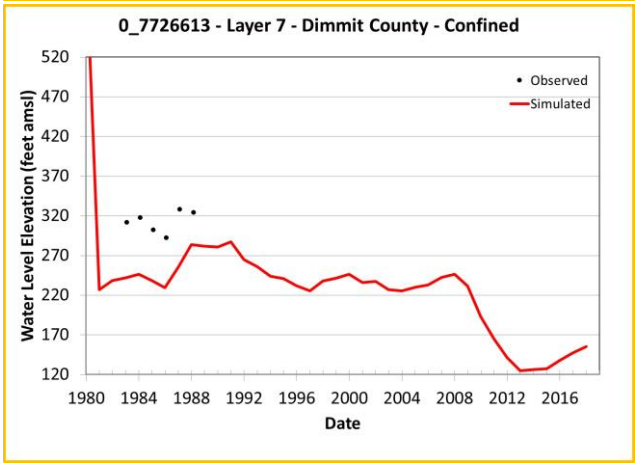
FIGURE I-6.1c

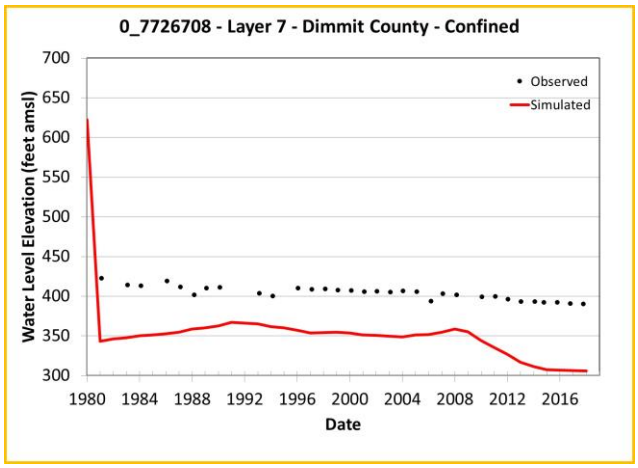
GSI ENVIRONMENTAL

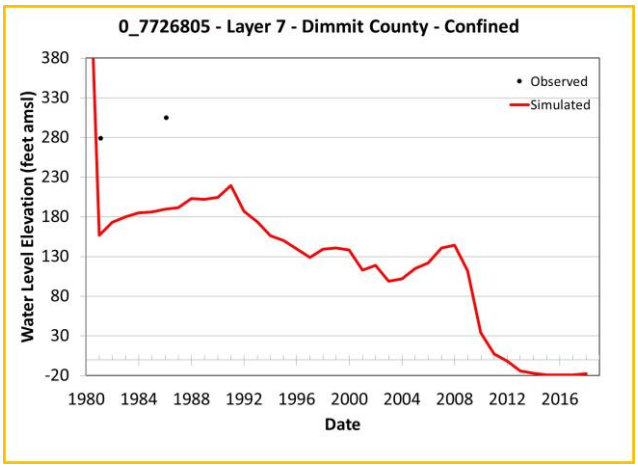












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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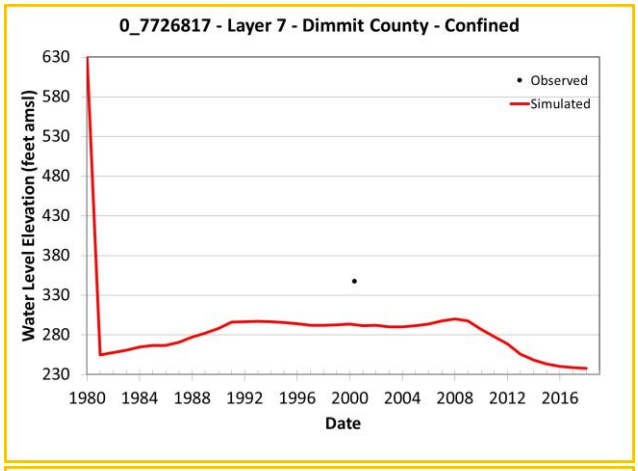
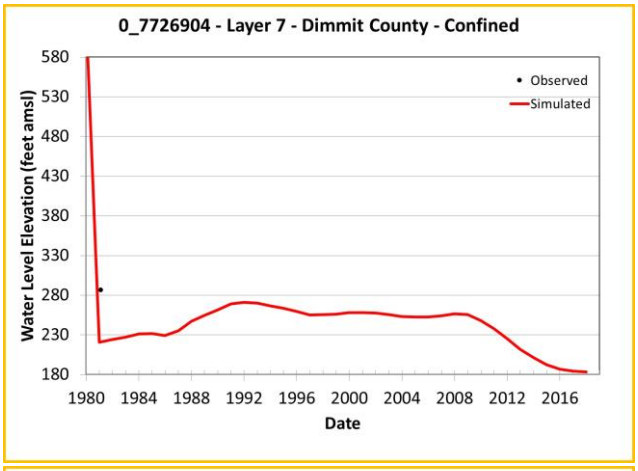
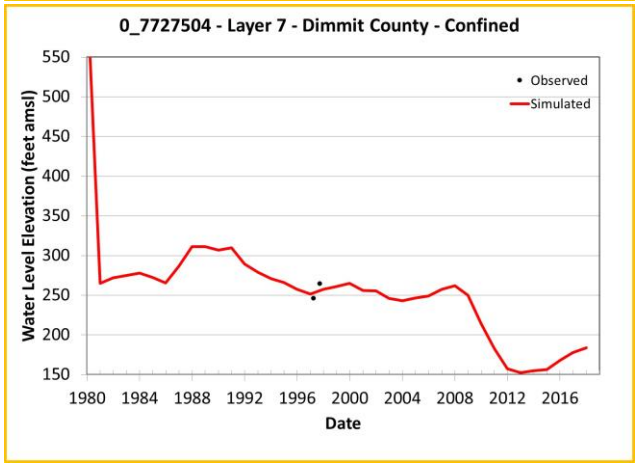
Revised		Aprv'd by	SP

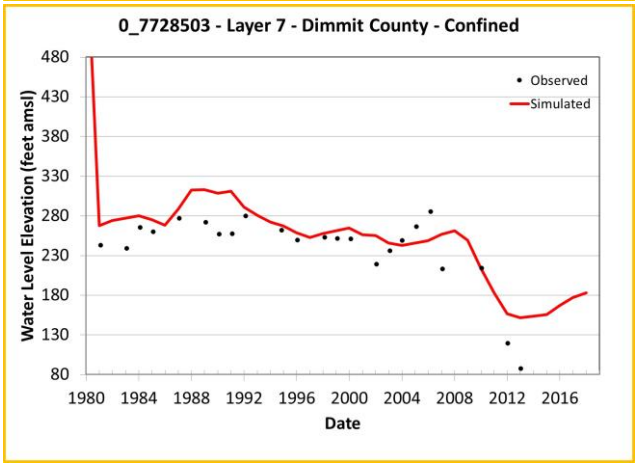
FIGURE I-6.1d

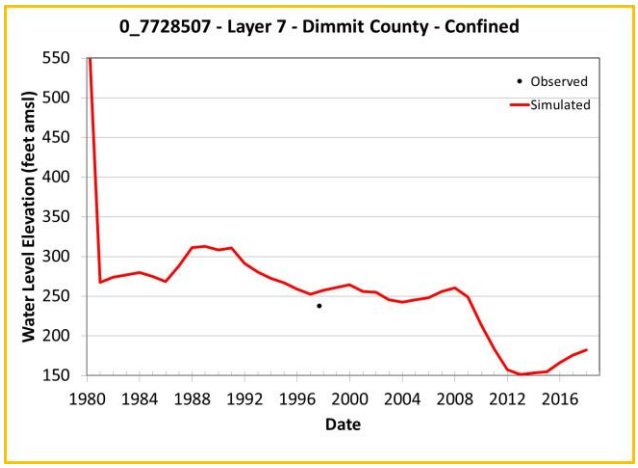
GSI ENVIRONMENTAL

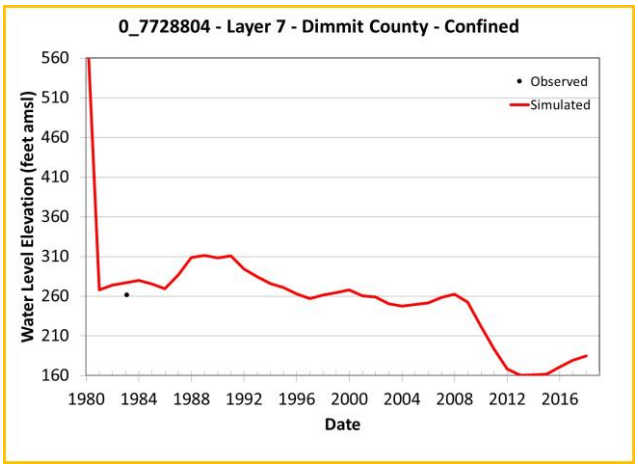












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

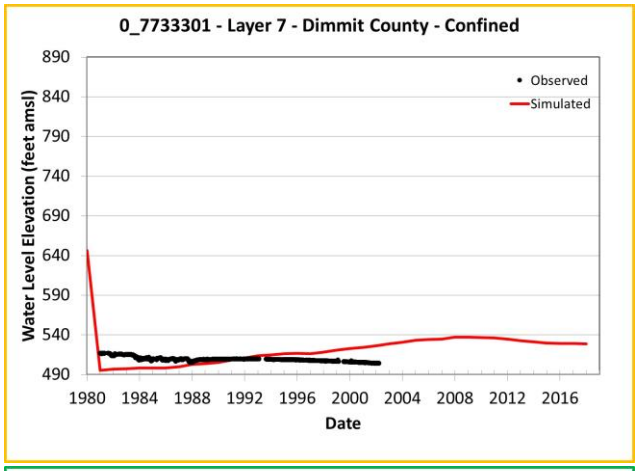
Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

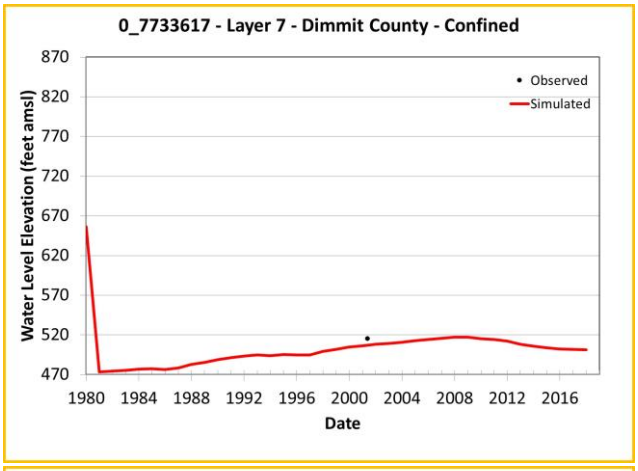
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

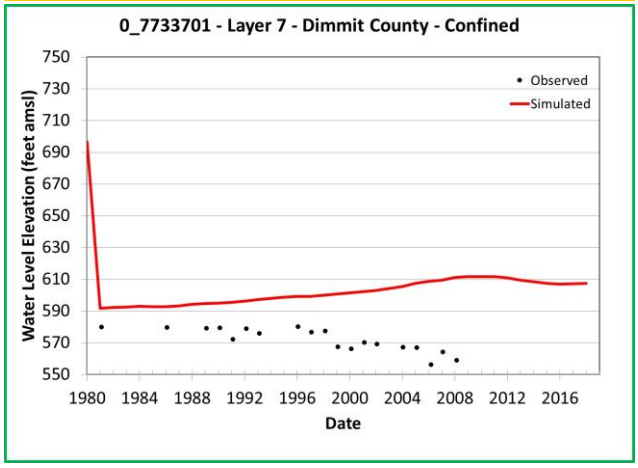
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

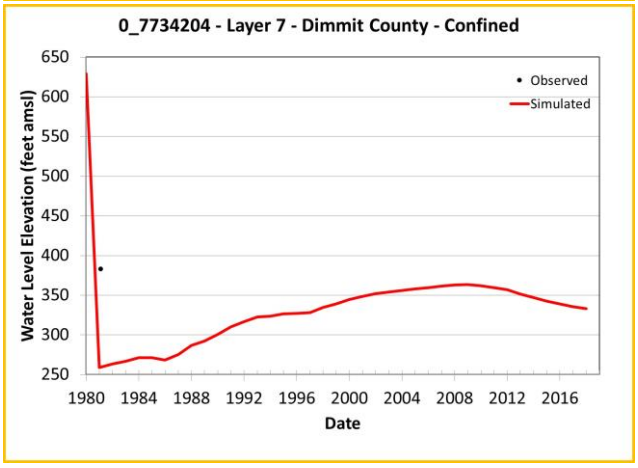
FIGURE I-6.1e

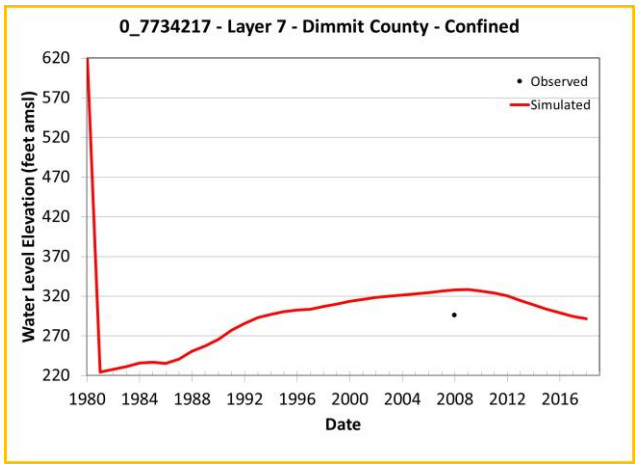
GSI ENVIRONMENTAL

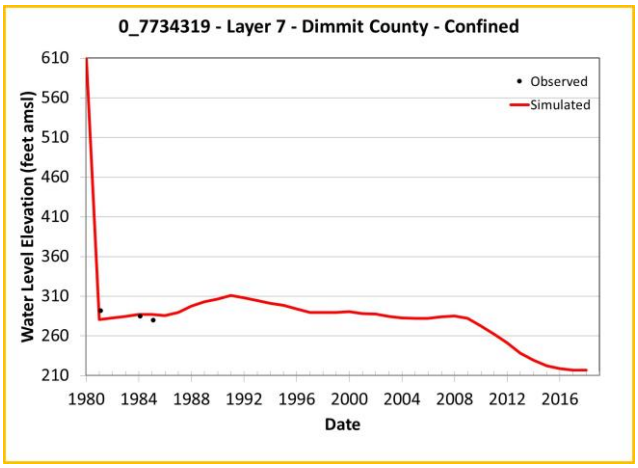












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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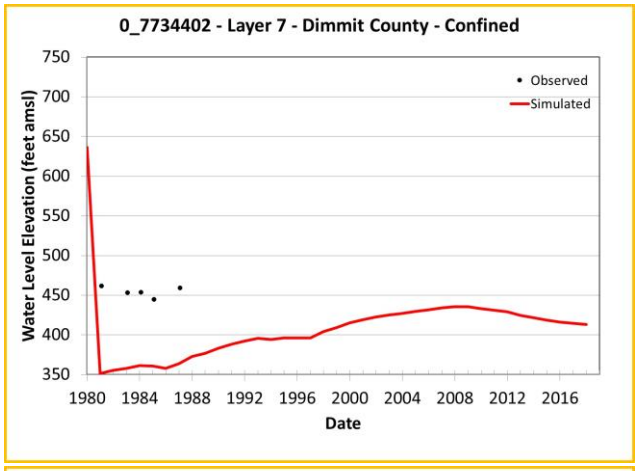
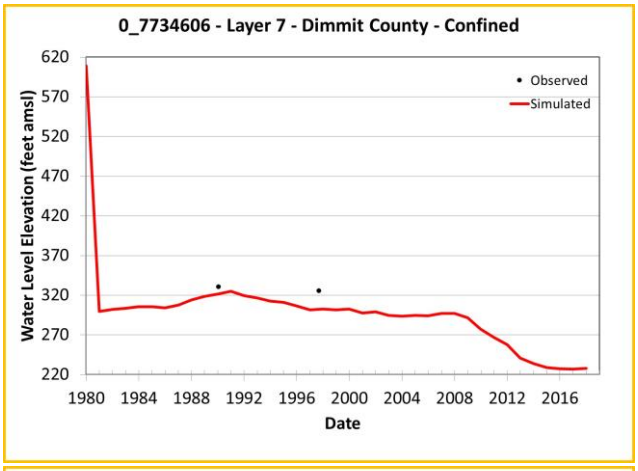
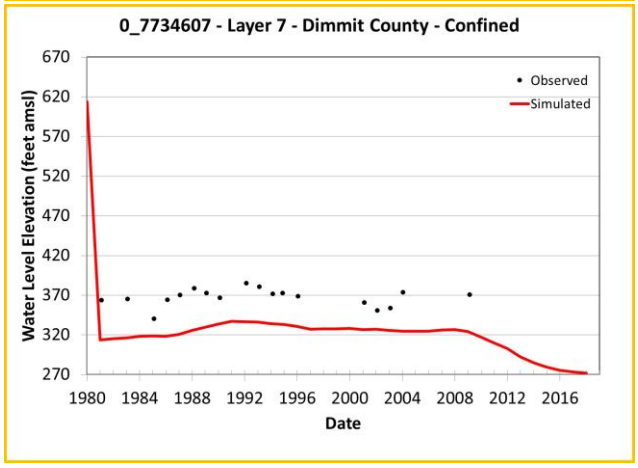
Revised		Aprv'd by	SP

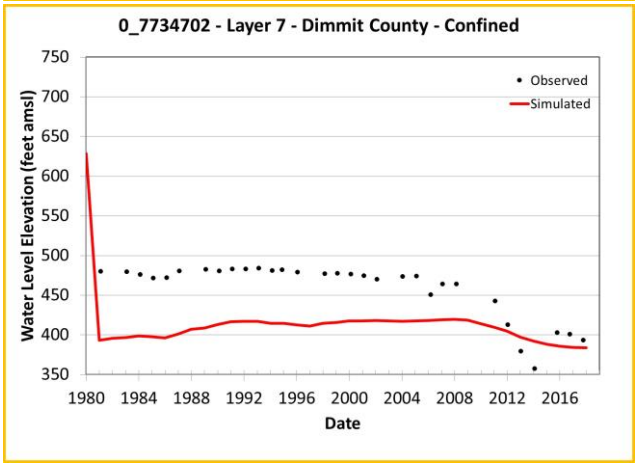
FIGURE I-6.1f

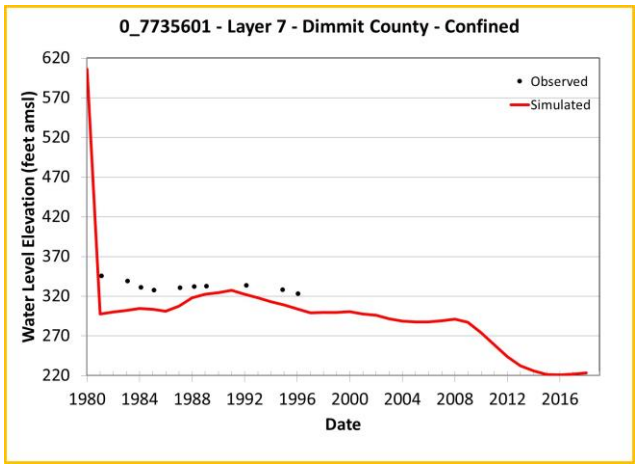
GSI ENVIRONMENTAL

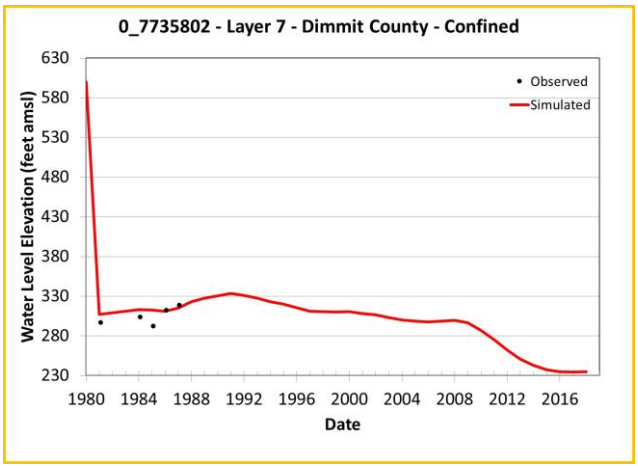












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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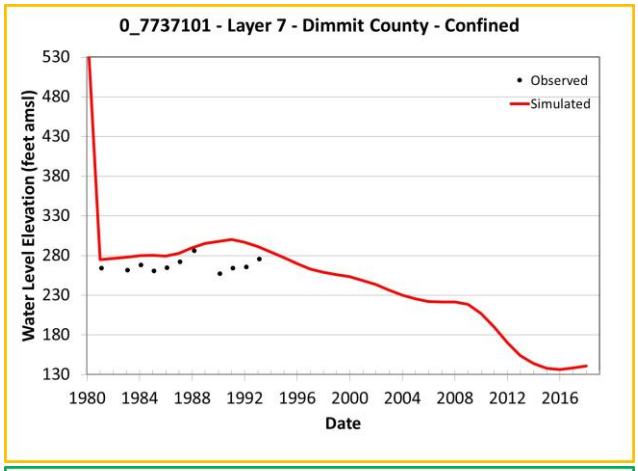
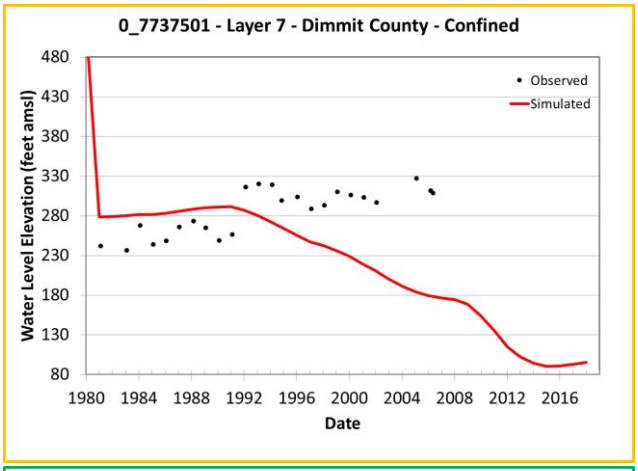
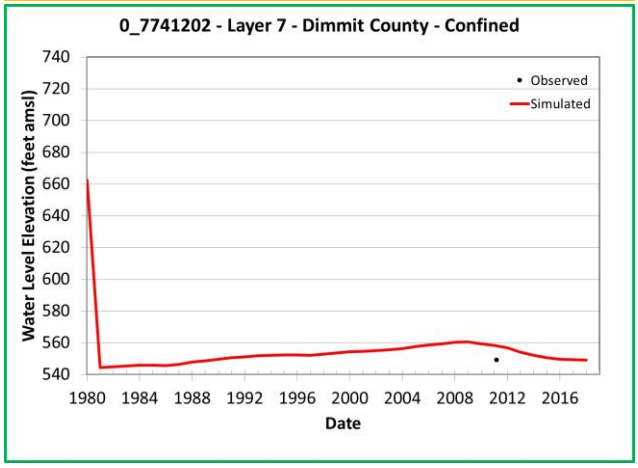
Revised		Aprv'd by	SP

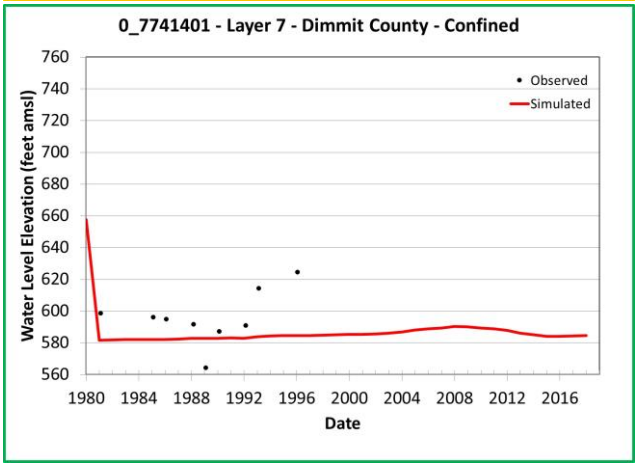
FIGURE I-6.1g

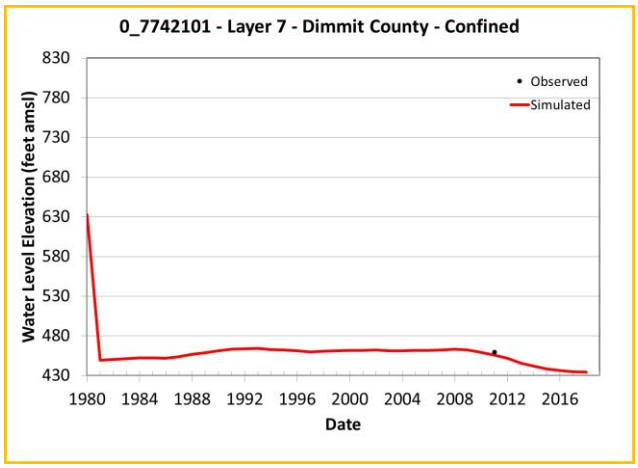
GSI ENVIRONMENTAL

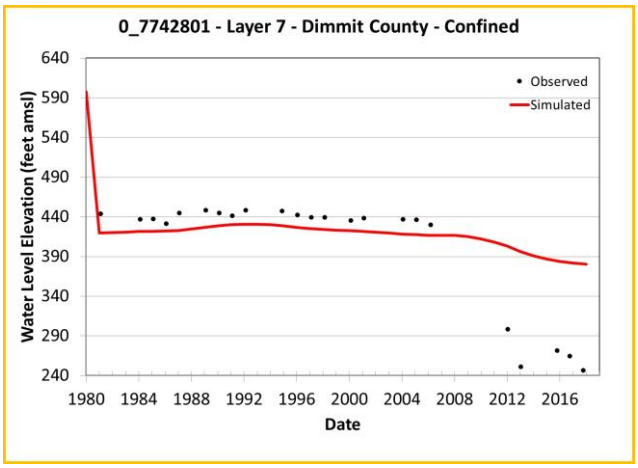












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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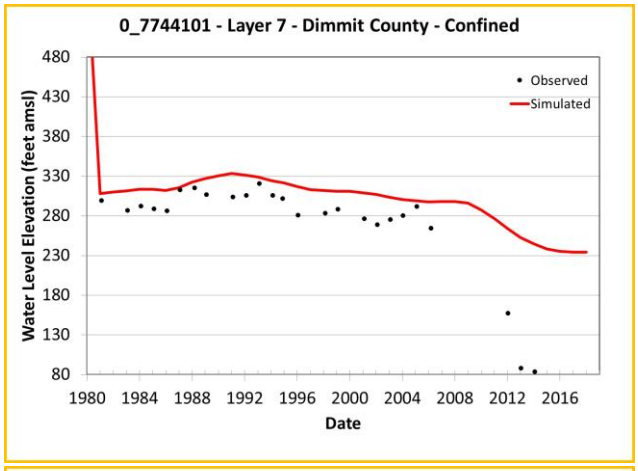
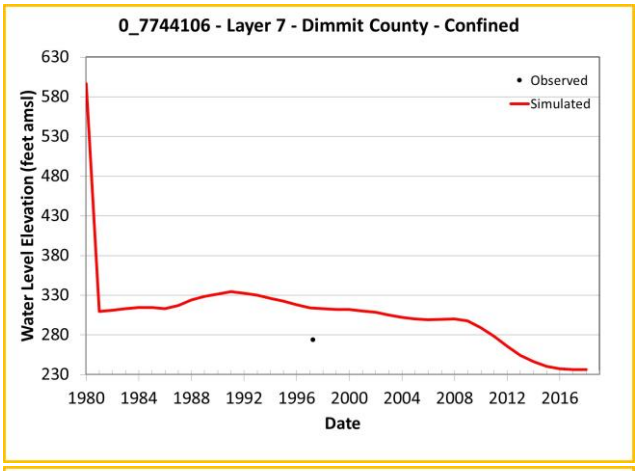
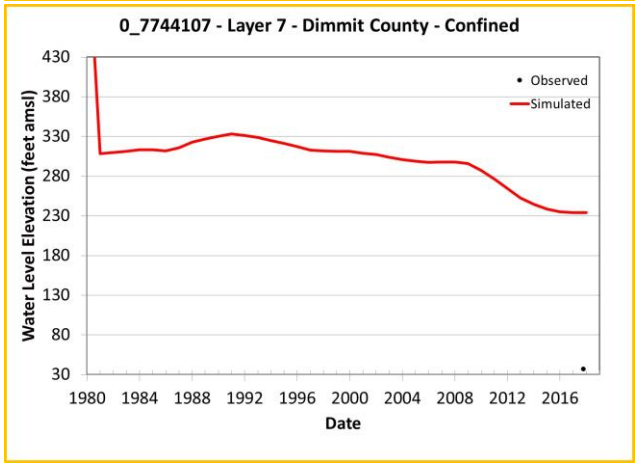
Revised		Aprv'd by	SP

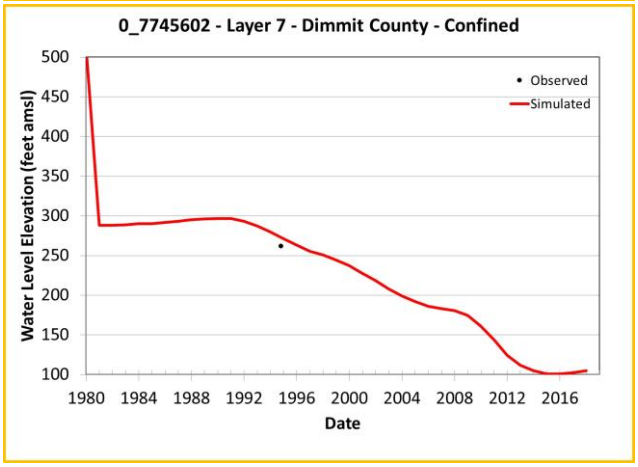
FIGURE I-6.1h

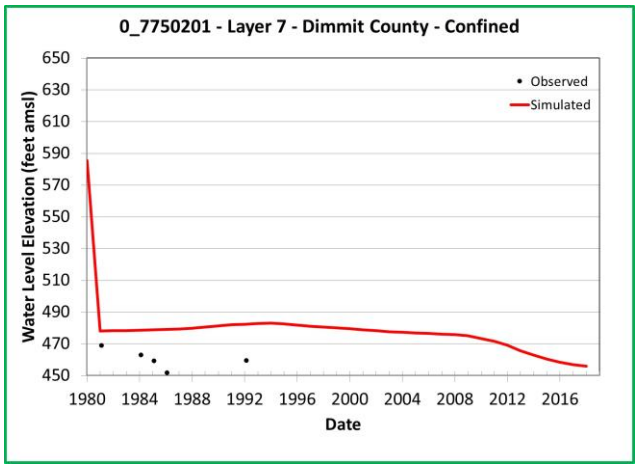
GSI ENVIRONMENTAL

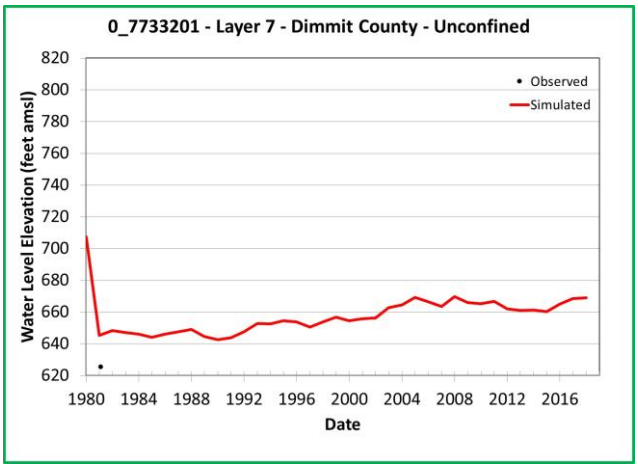












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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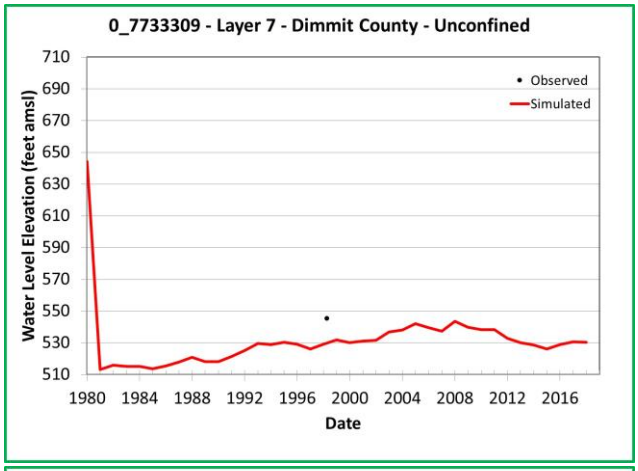
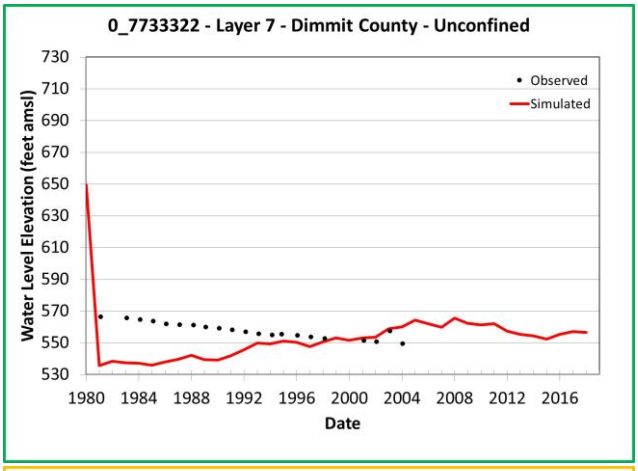
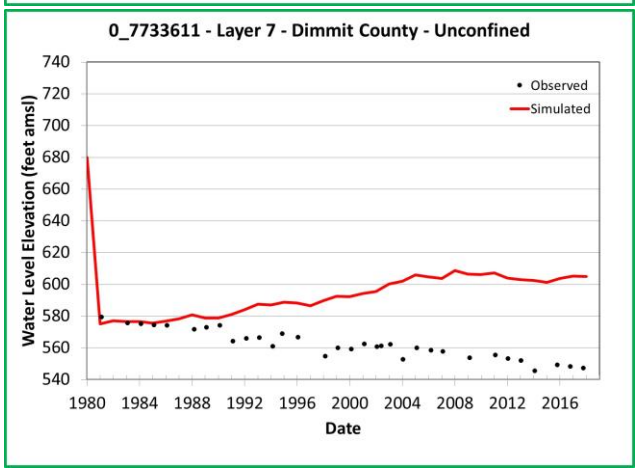
Revised		Aprv'd by	SP

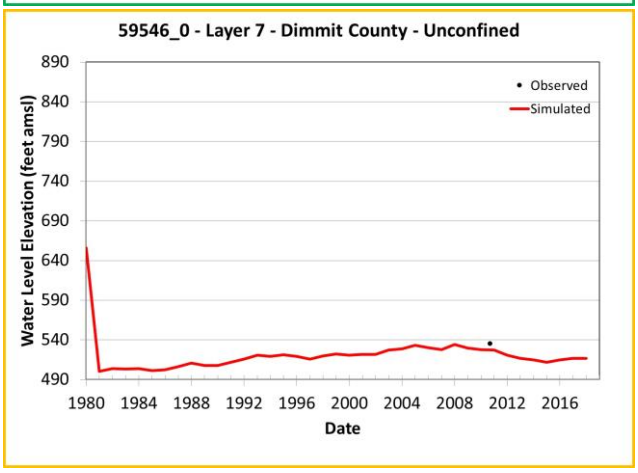
FIGURE I-6.1i

GSI ENVIRONMENTAL









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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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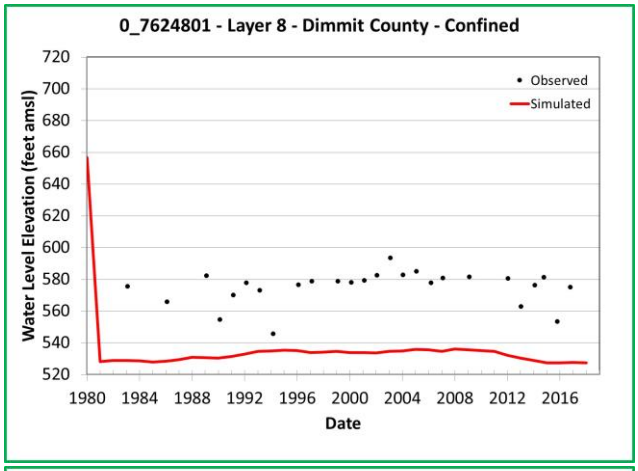
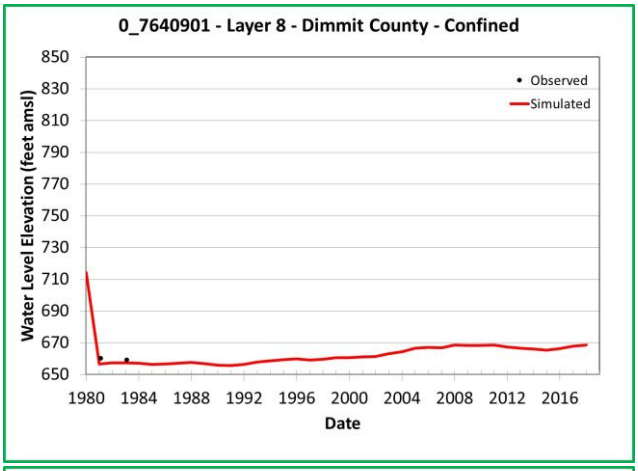
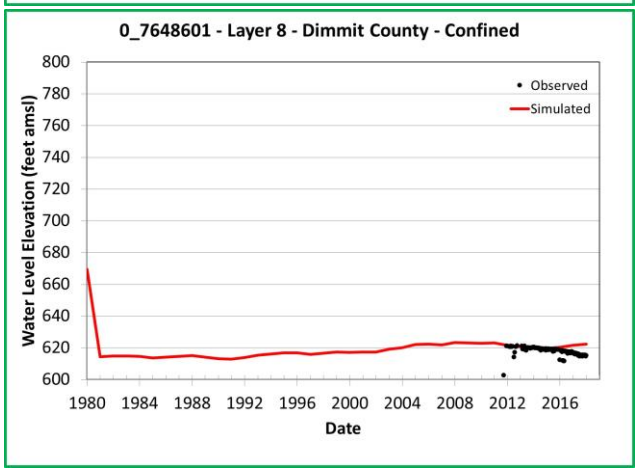
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

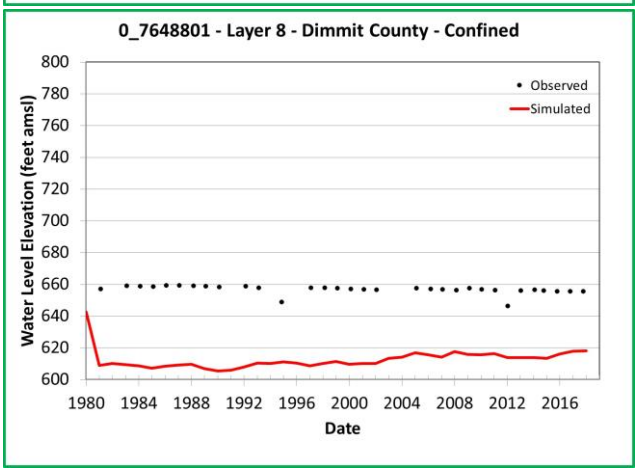
FIGURE I-6.1j

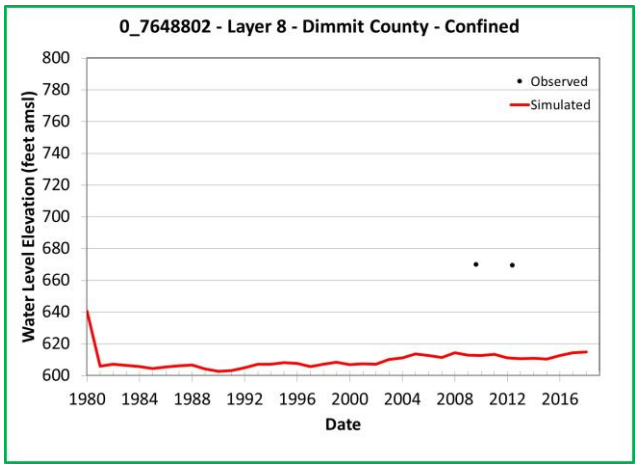
GSI ENVIRONMENTAL

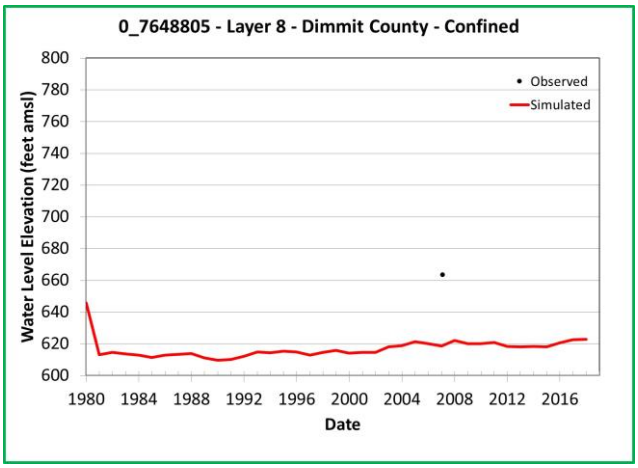












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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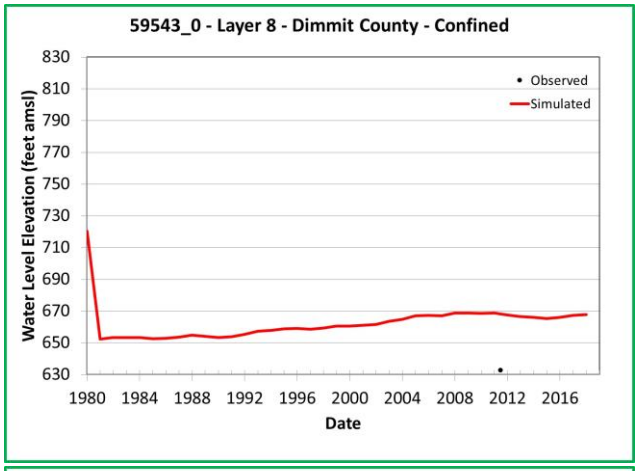
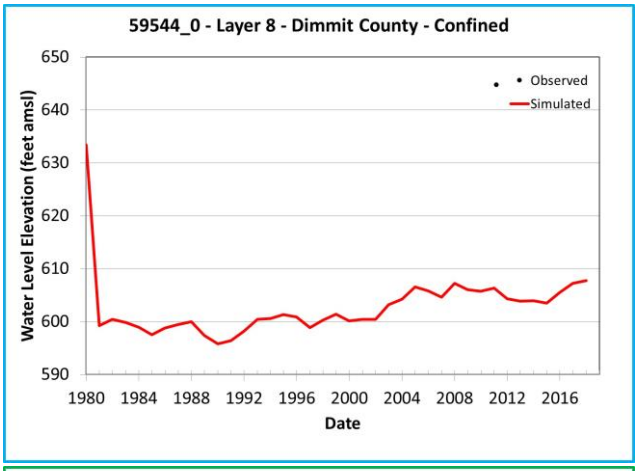
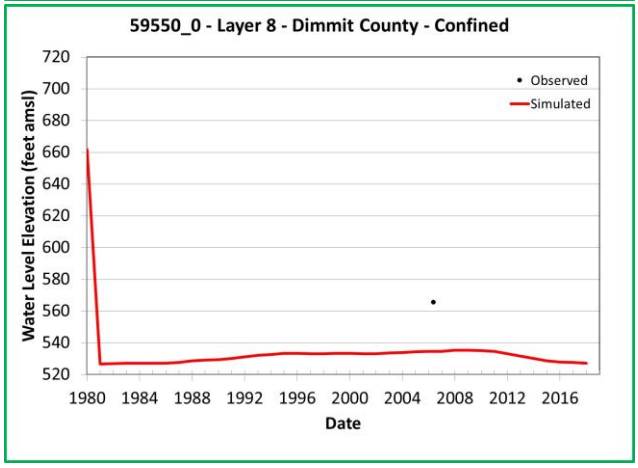
Revised		Aprv'd by	SP

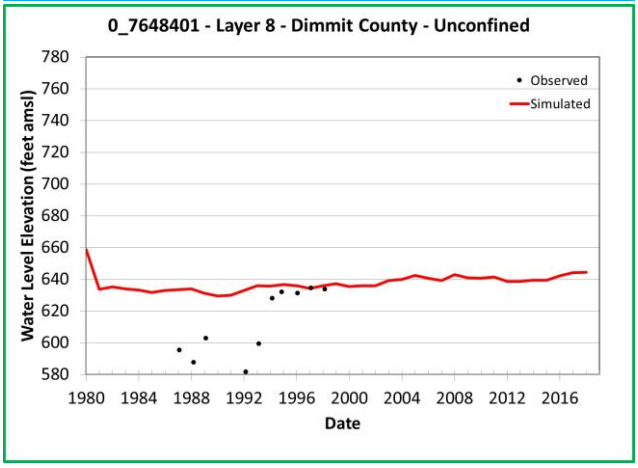
FIGURE I-6.2a

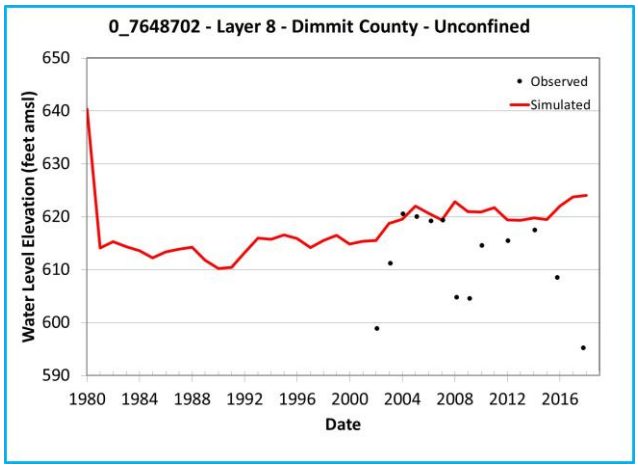
GSI ENVIRONMENTAL

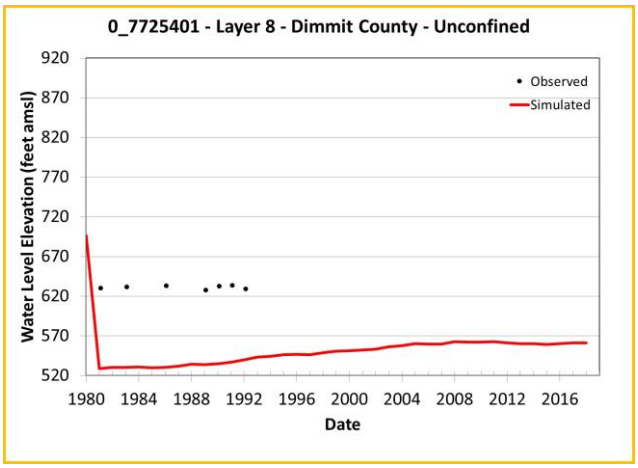












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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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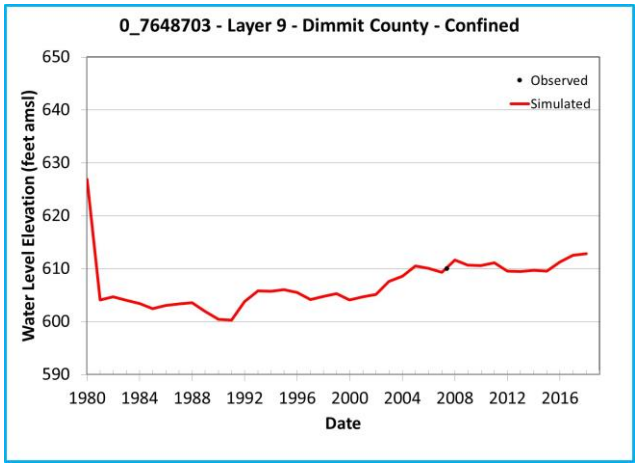
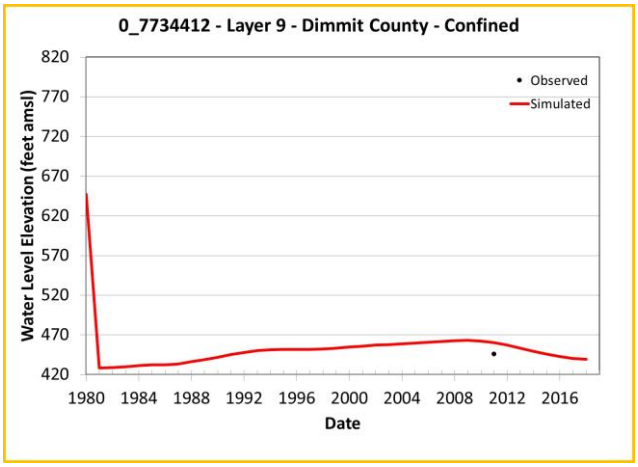
Revised		Aprv'd by	SP

FIGURE I-6.2b

GSI ENVIRONMENTAL





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Simulated and Observed Water Level Elevation Hydrographs, Dimmit County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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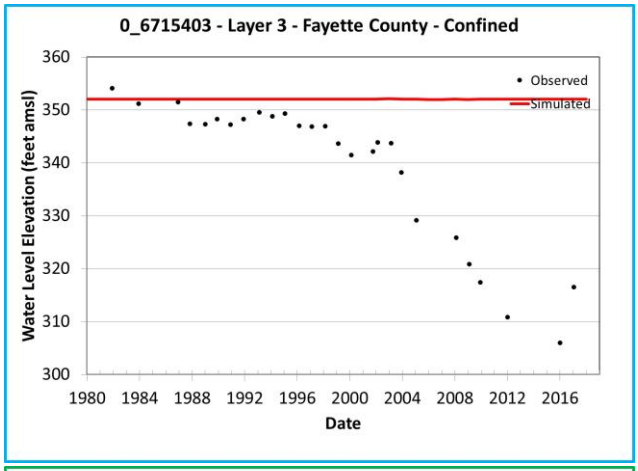
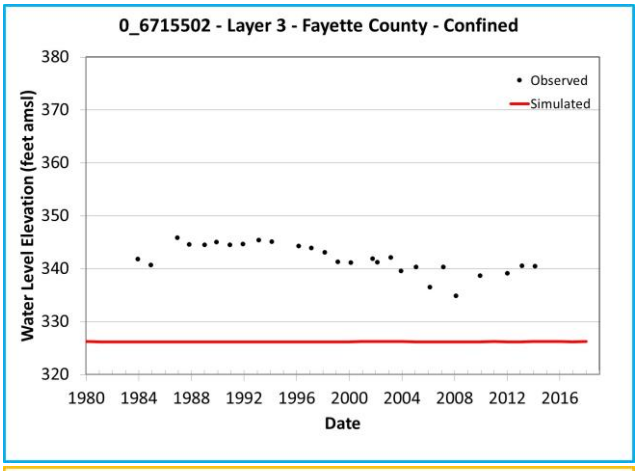
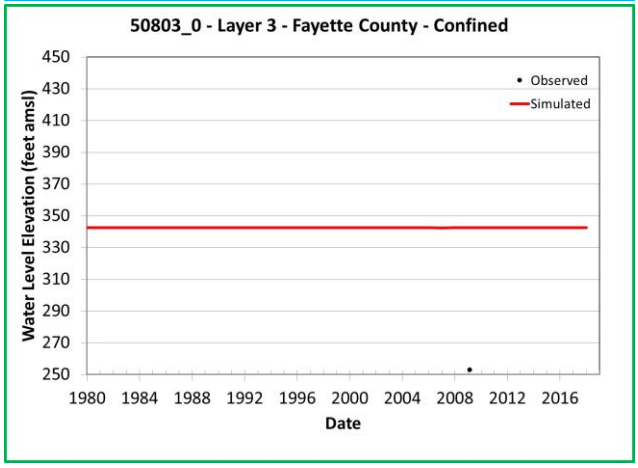
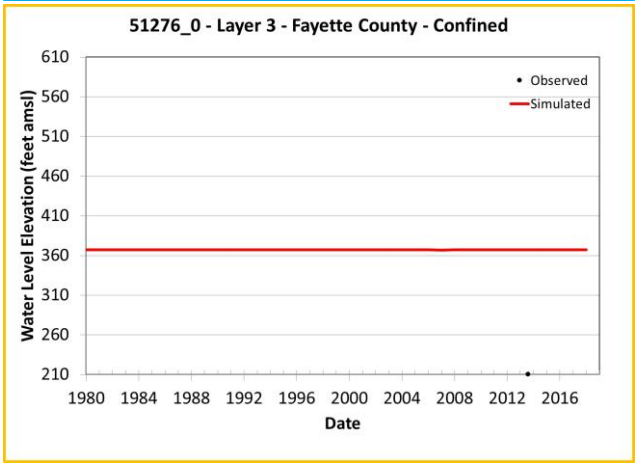
FIGURE I-6.3a

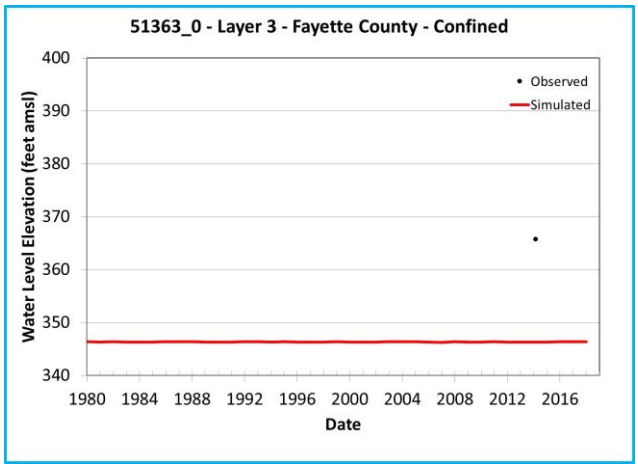
GSI ENVIRONMENTAL

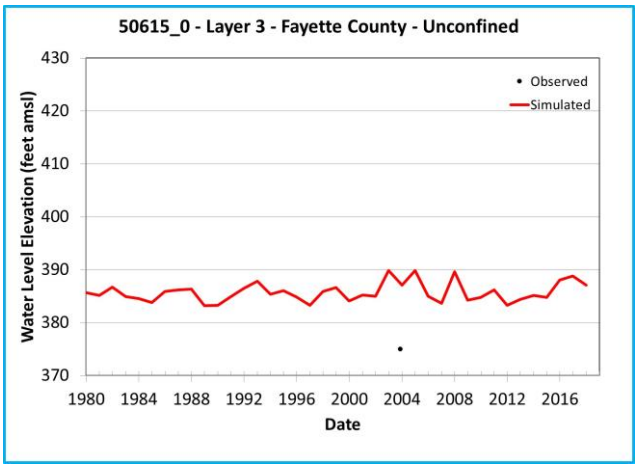












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

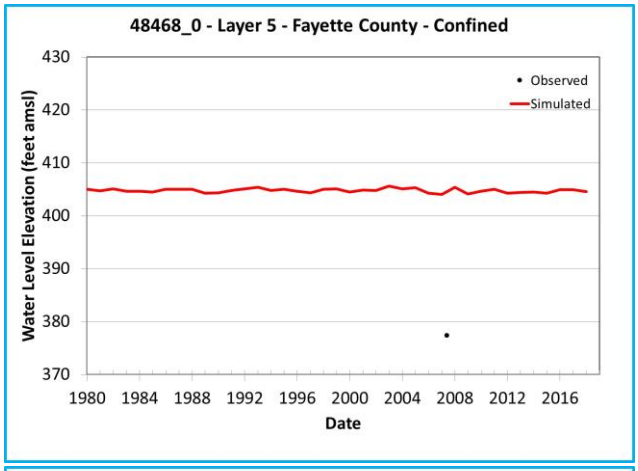
Simulated and Observed Water Level Elevation Hydrographs, Fayette County, Layer 3

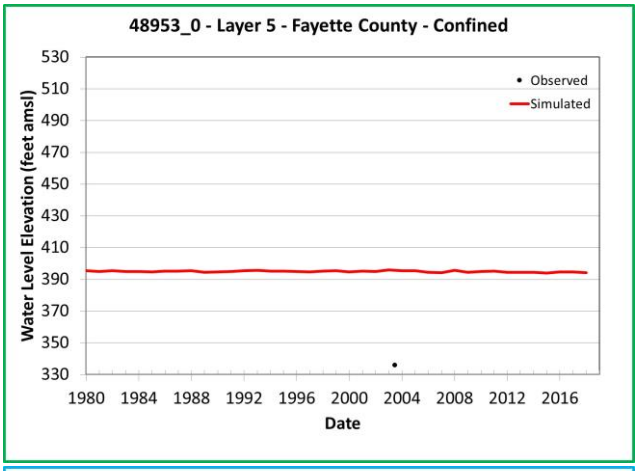
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

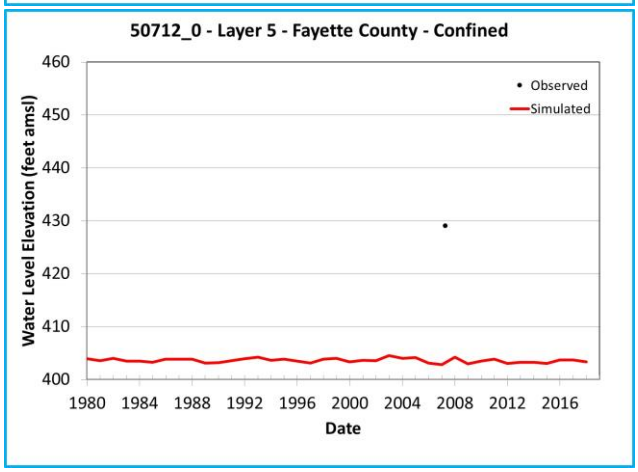
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

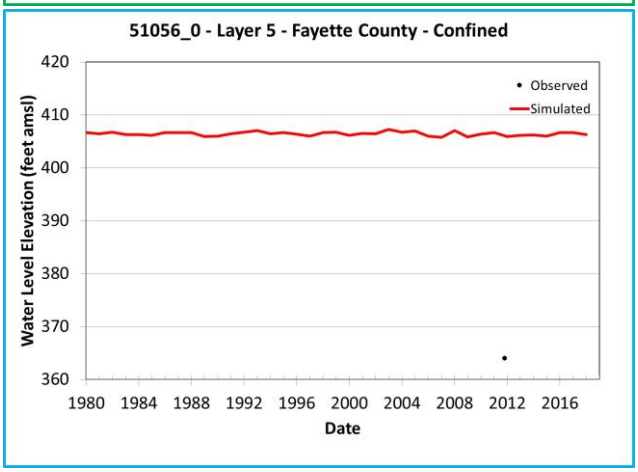
FIGURE I-7.1a

GSI ENVIRONMENTAL









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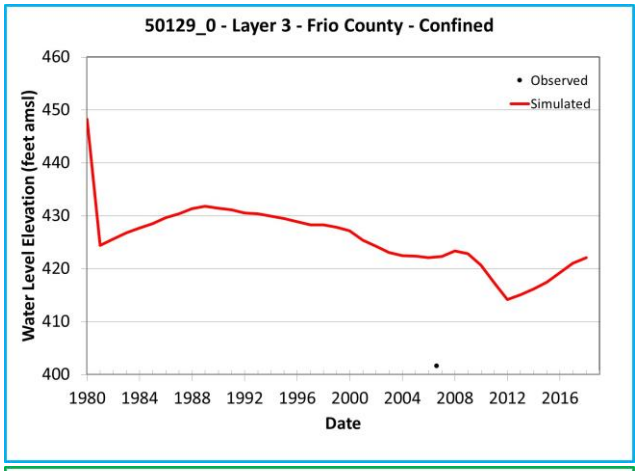
Simulated and Observed Water Level Elevation Hydrographs, Fayette County, Layer 5

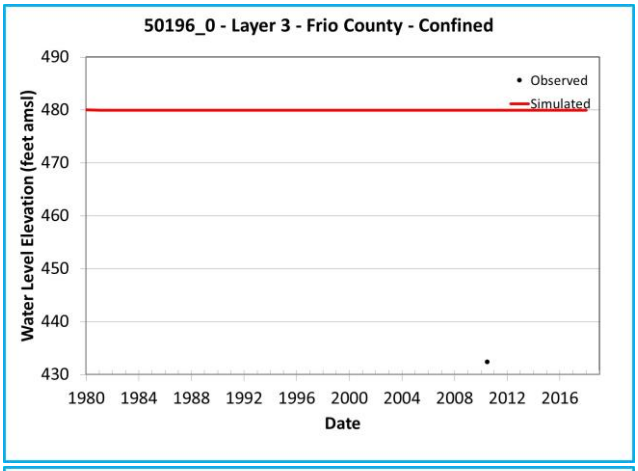
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

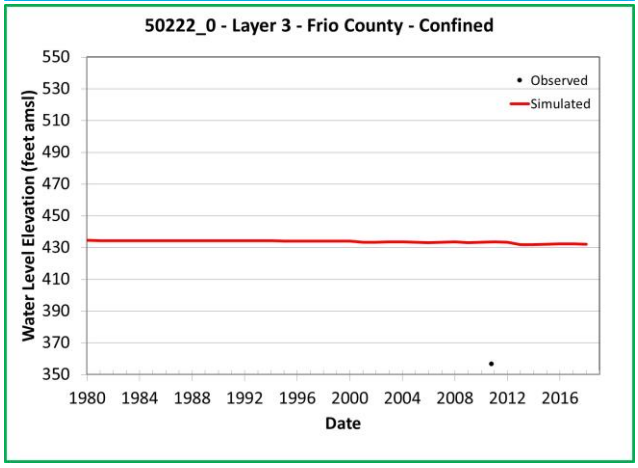
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

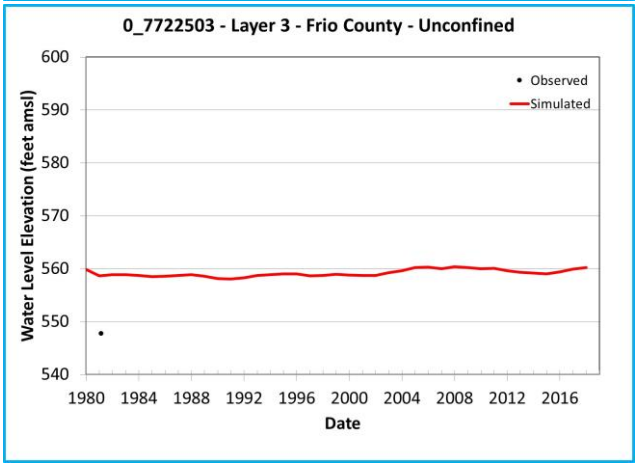
FIGURE I-7.2a

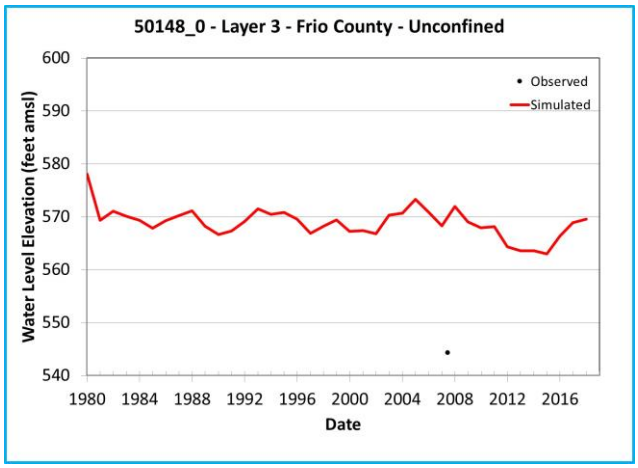
GSI ENVIRONMENTAL

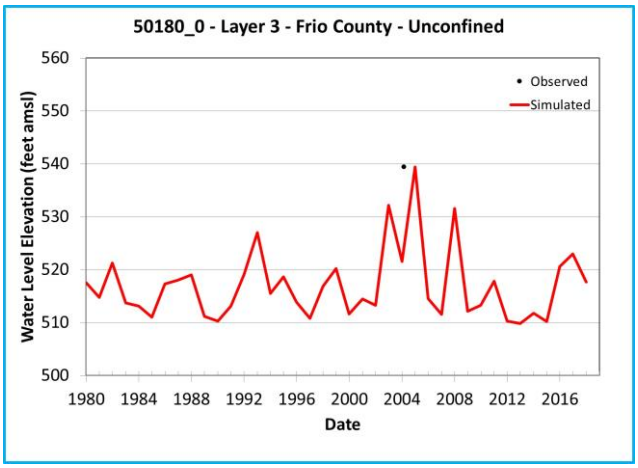












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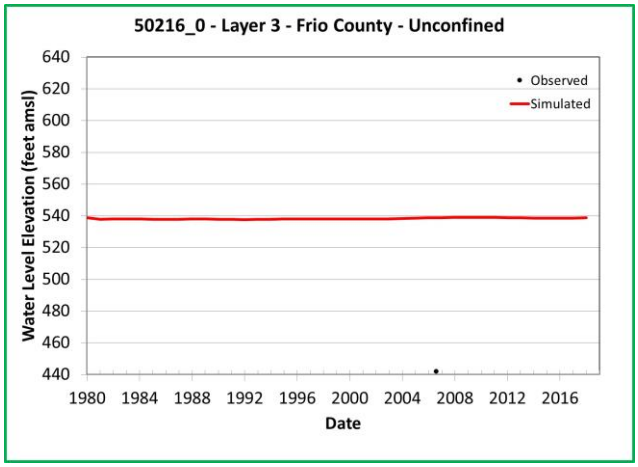
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-8.1a

GSI ENVIRONMENTAL



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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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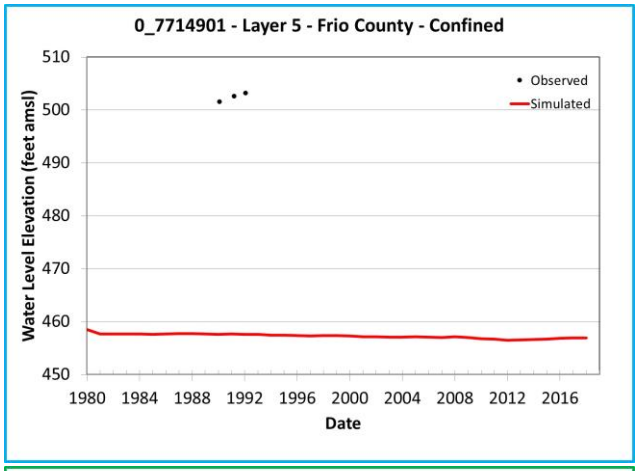
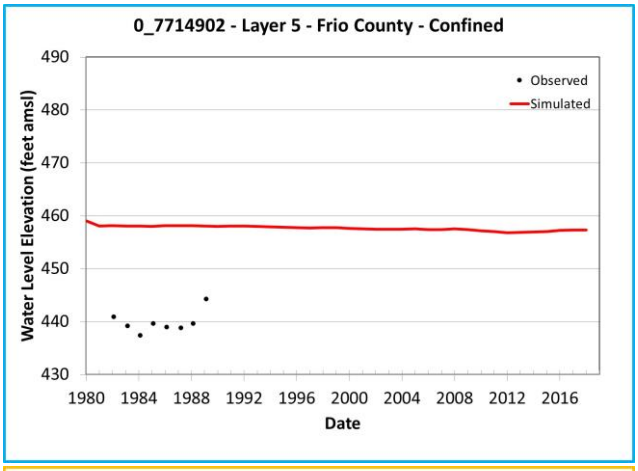
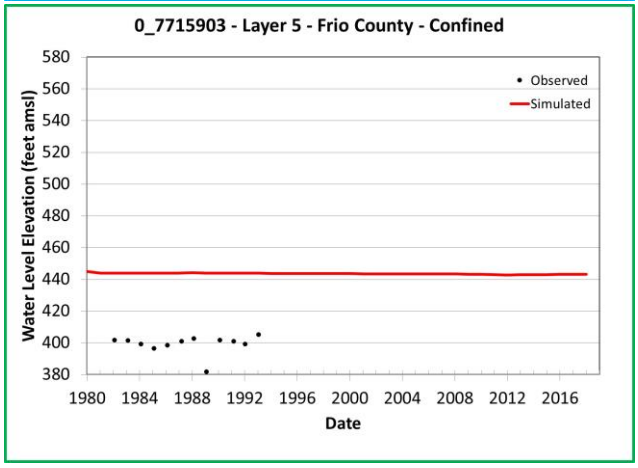
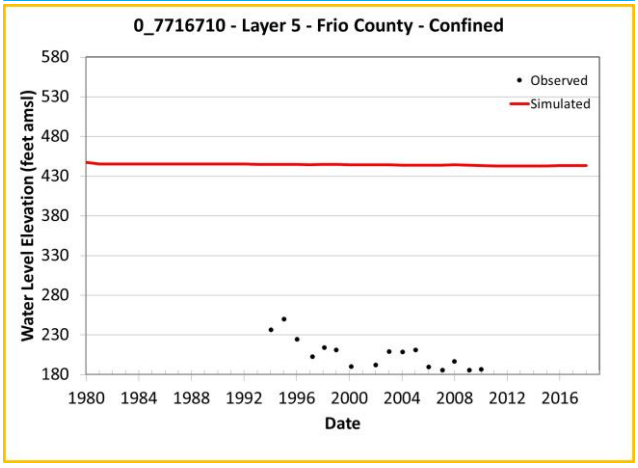
FIGURE I-8.1b

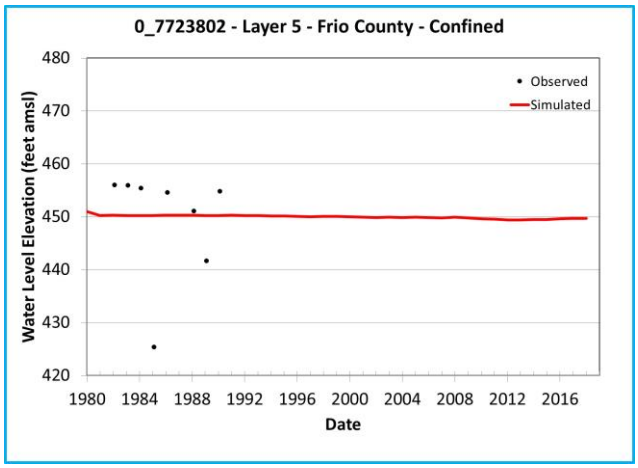
GSI ENVIRONMENTAL

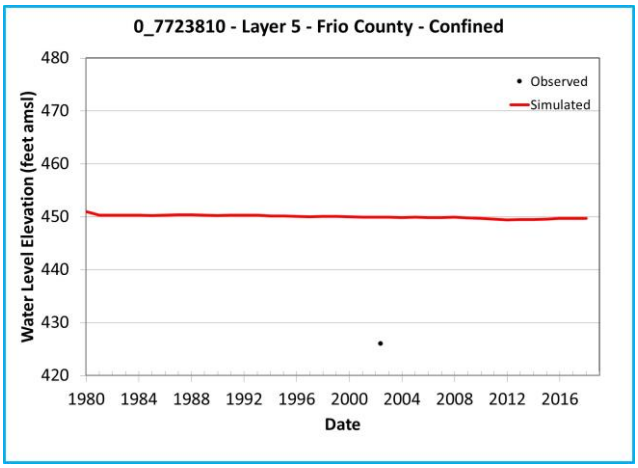












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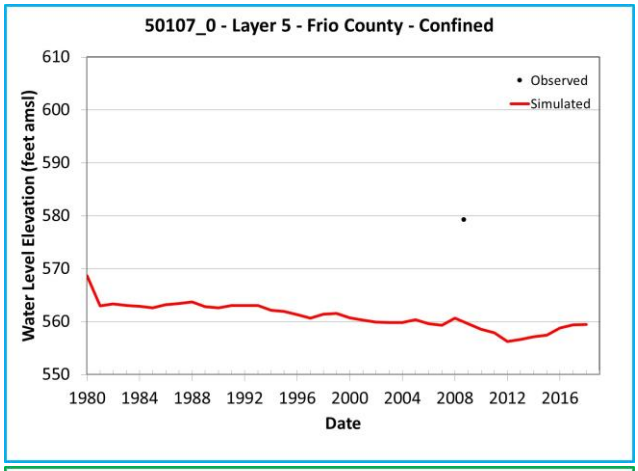
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

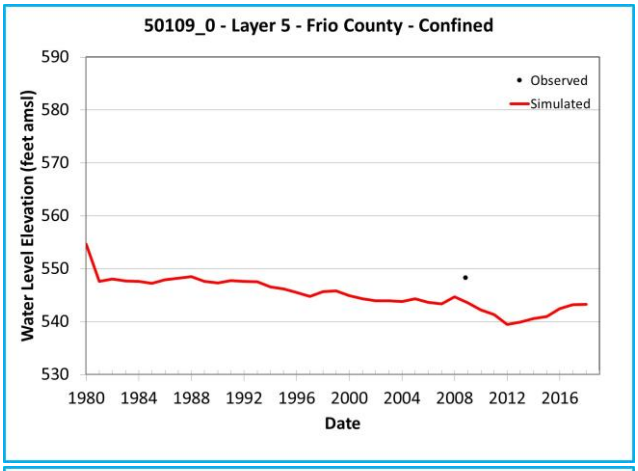
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

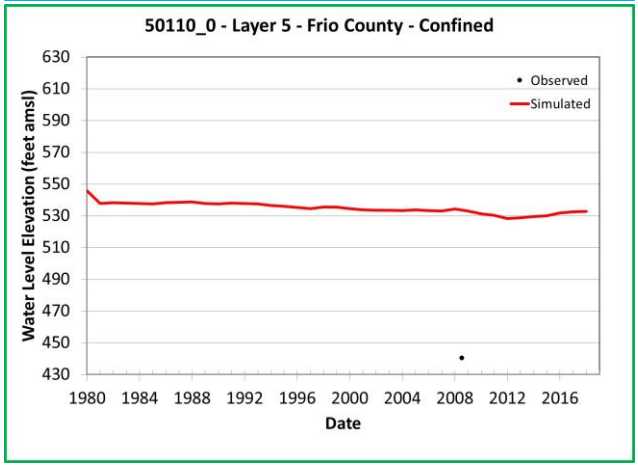
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

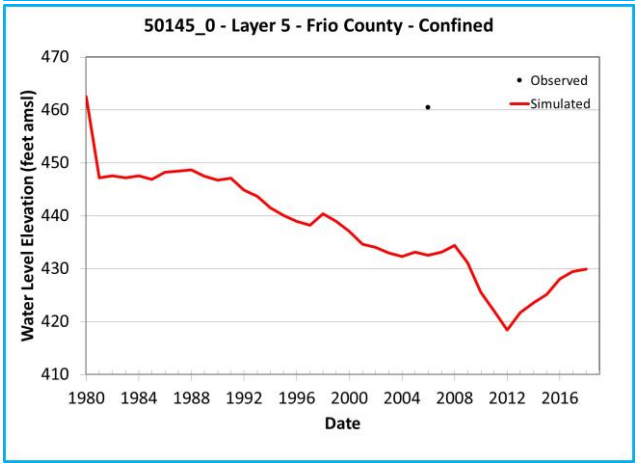
FIGURE I-8.2a

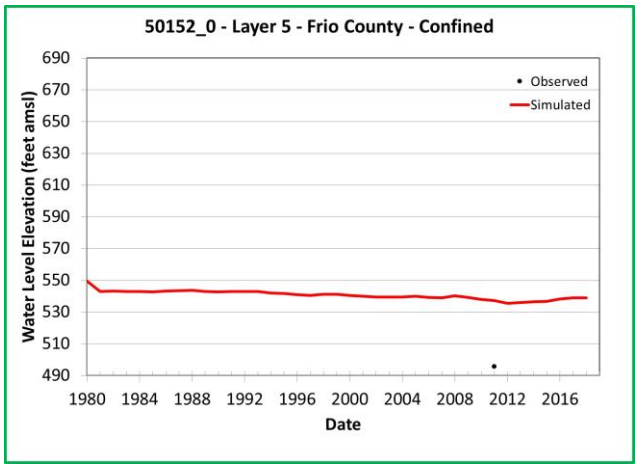
GSI ENVIRONMENTAL

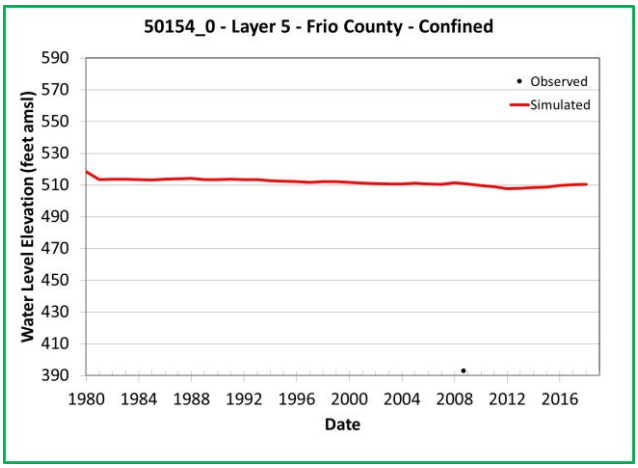












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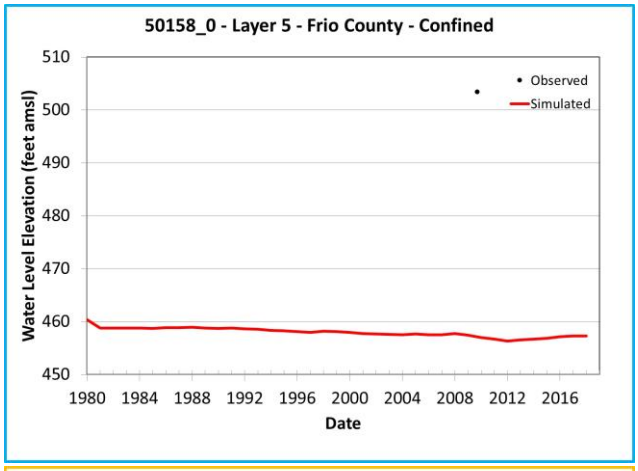
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

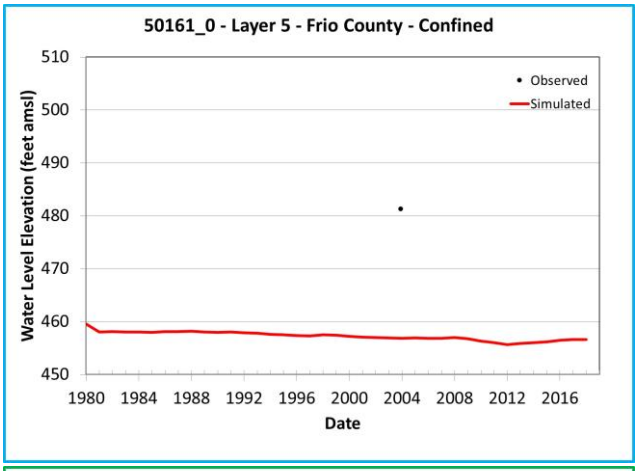
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

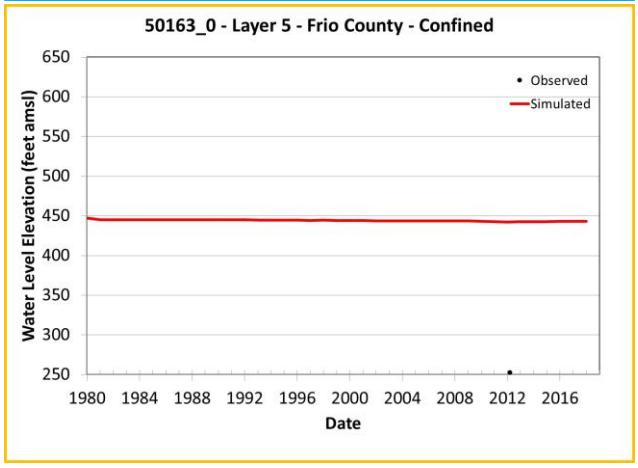
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

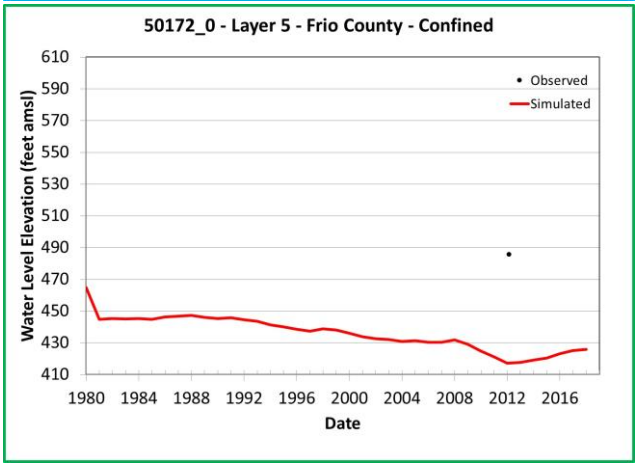
FIGURE I-8.2b

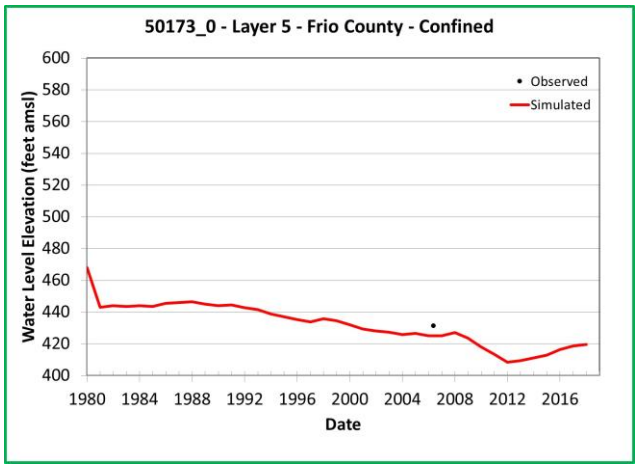
GSI ENVIRONMENTAL

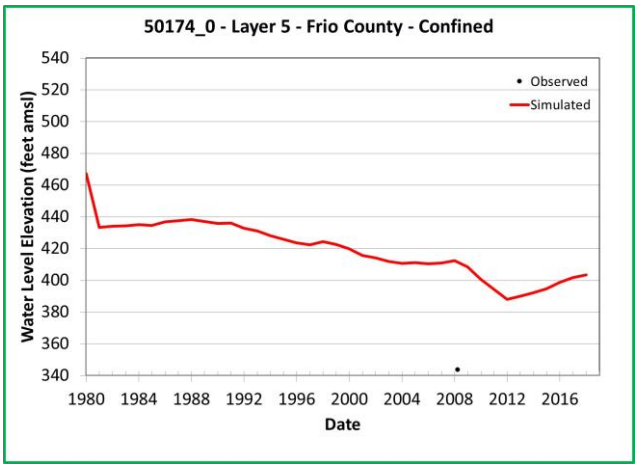












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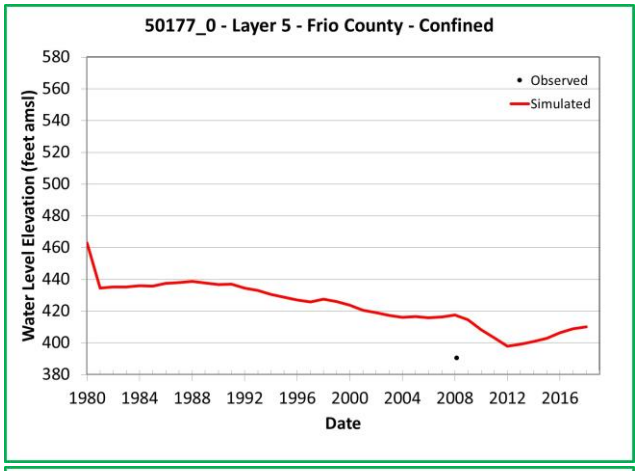
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

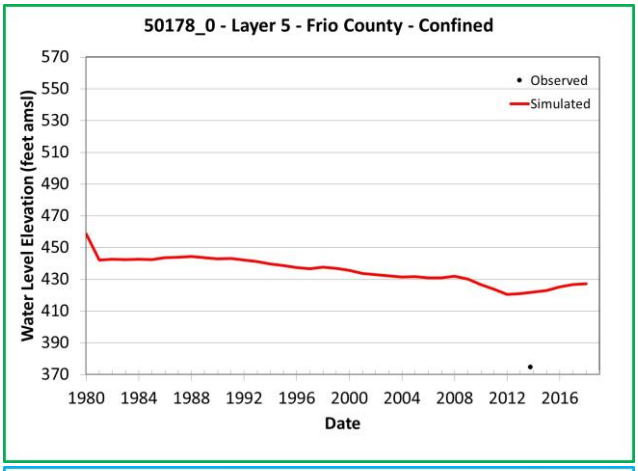
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

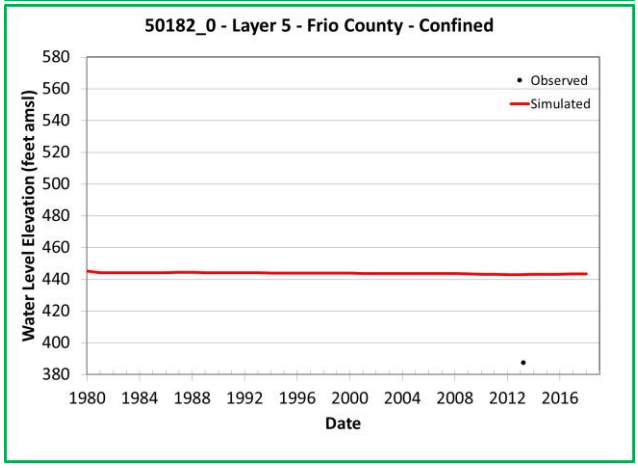
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

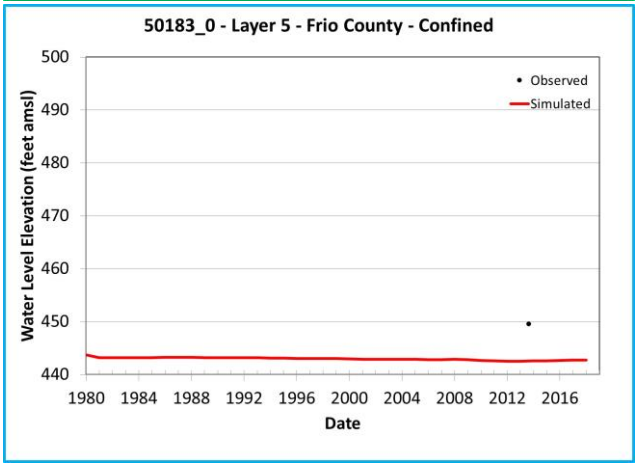
FIGURE I-8.2c

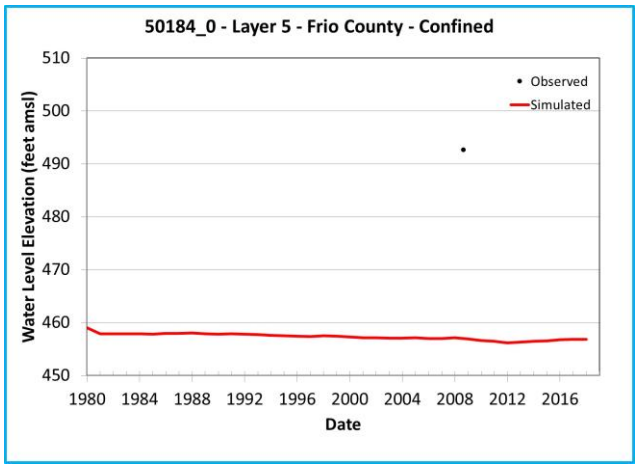
GSI ENVIRONMENTAL

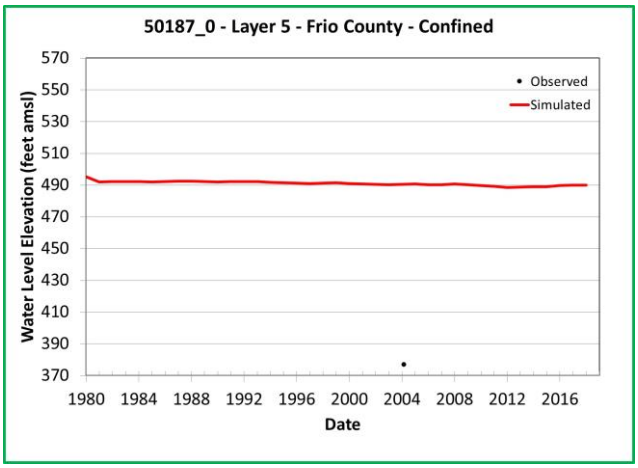












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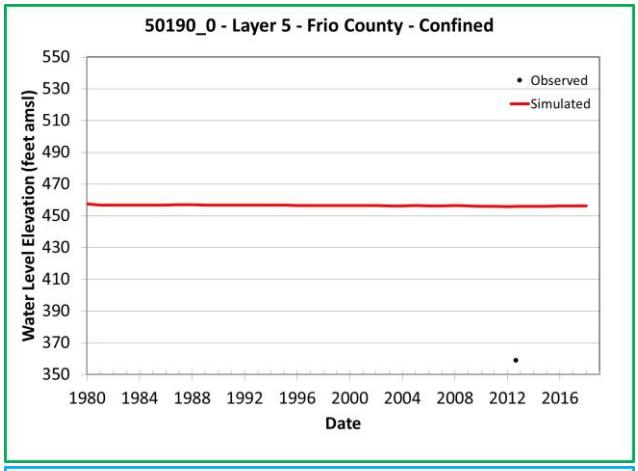
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

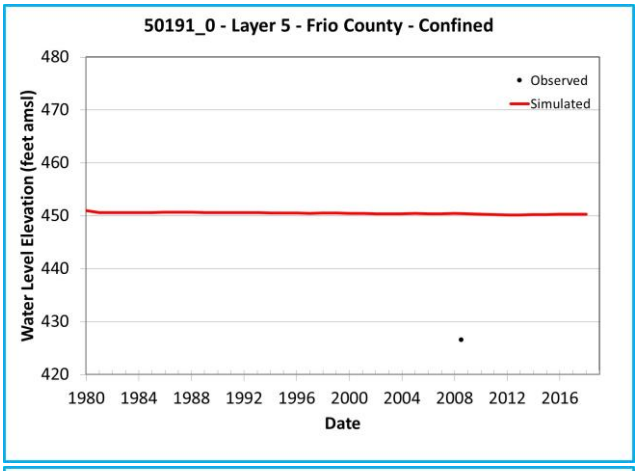
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

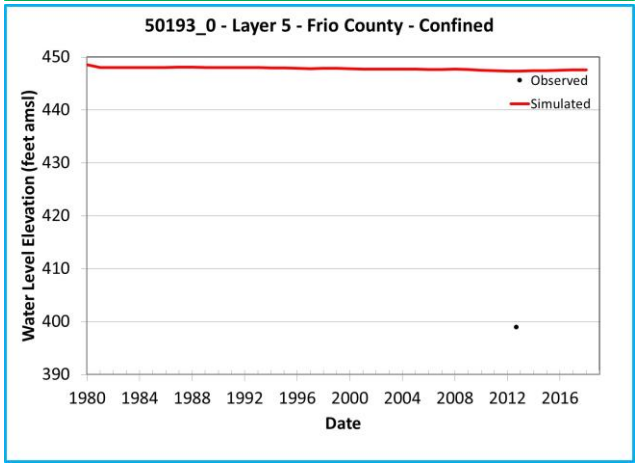
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

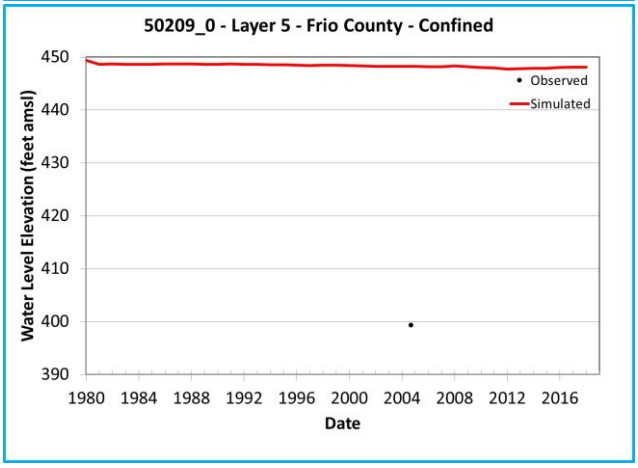
FIGURE I-8.2d

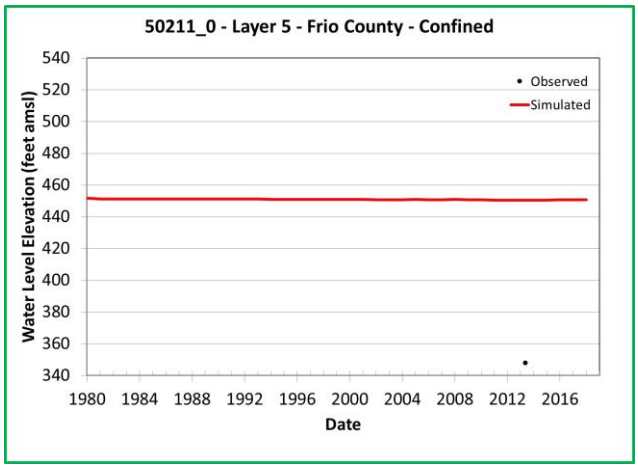
GSI ENVIRONMENTAL

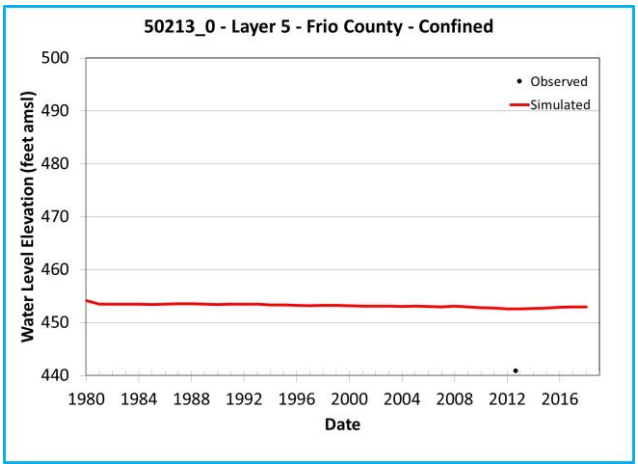












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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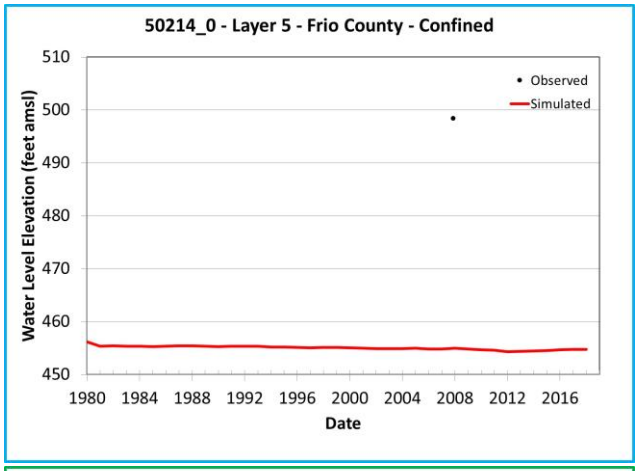
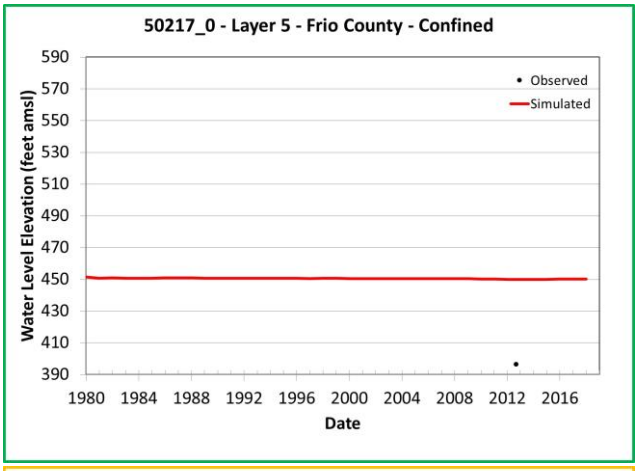
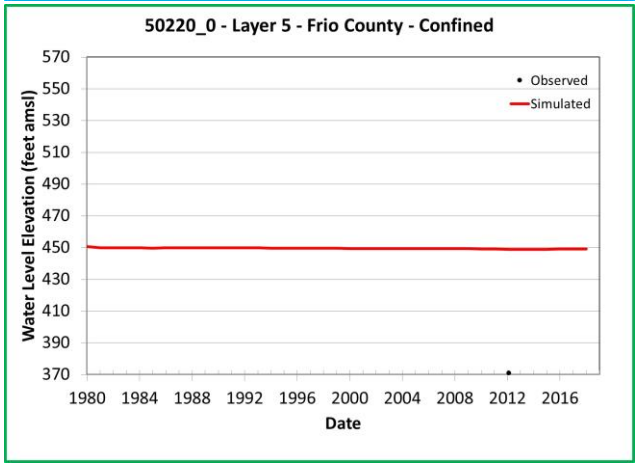
Revised		Aprv'd by	SP

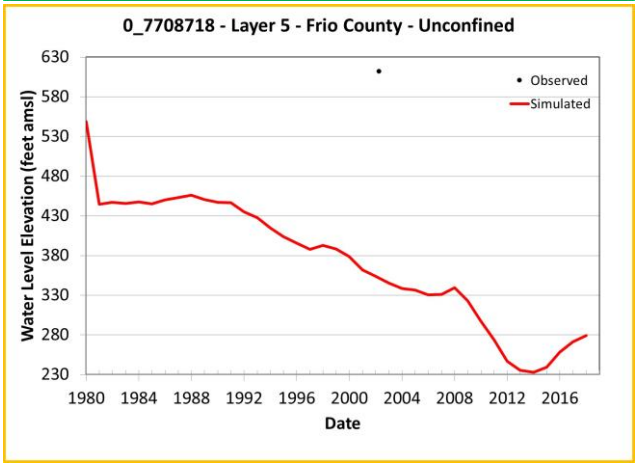
FIGURE I-8.2e

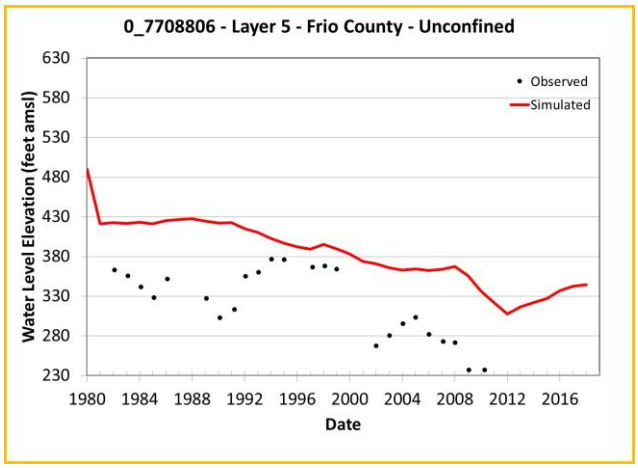
GSI ENVIRONMENTAL

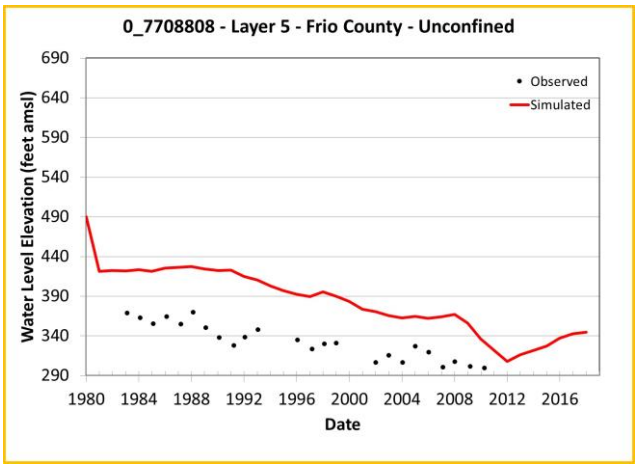












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

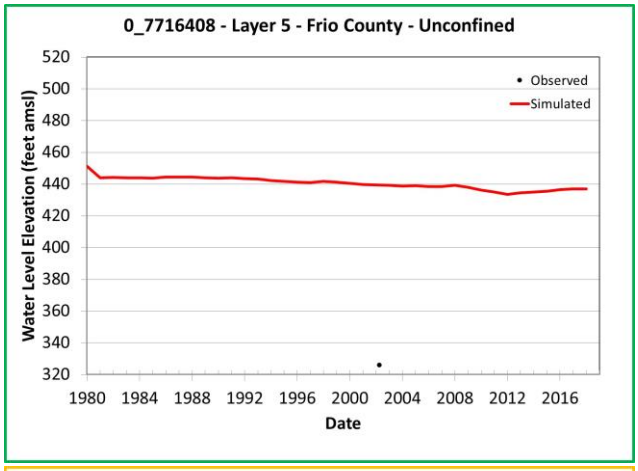
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

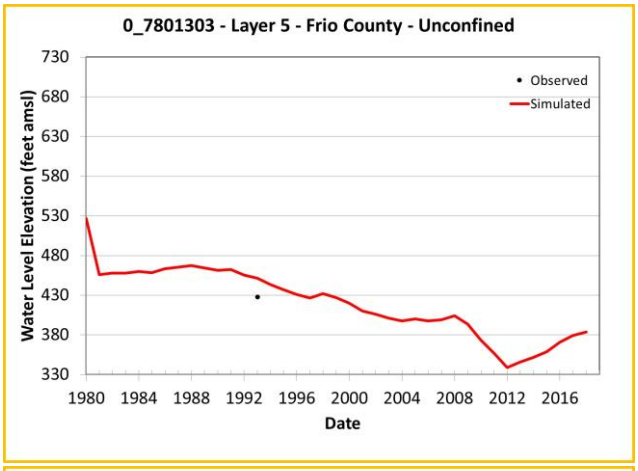
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

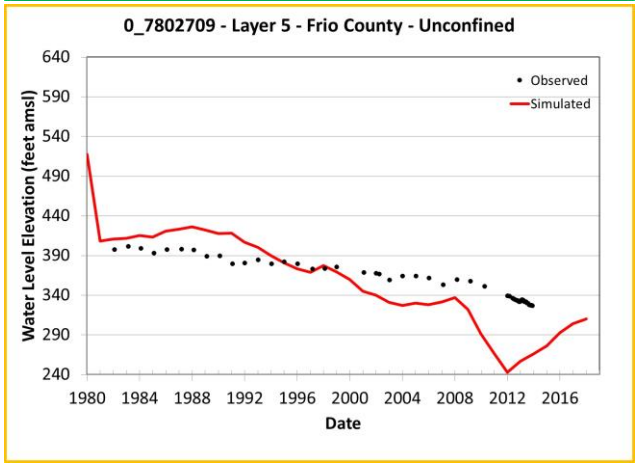
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

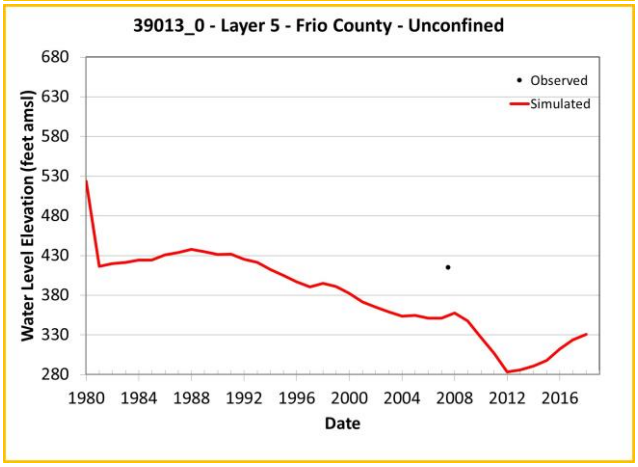
FIGURE I-8.2f

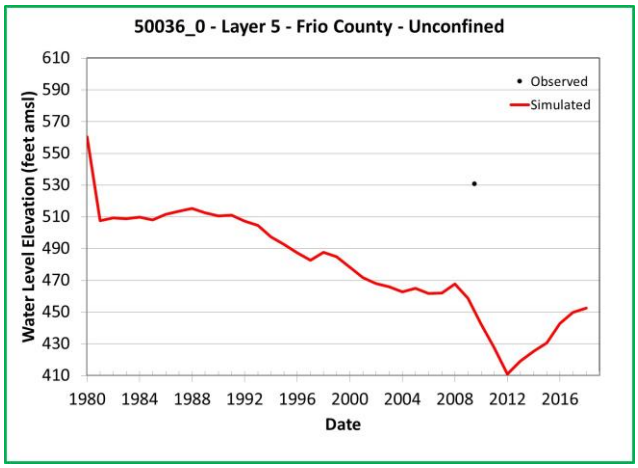
GSI ENVIRONMENTAL

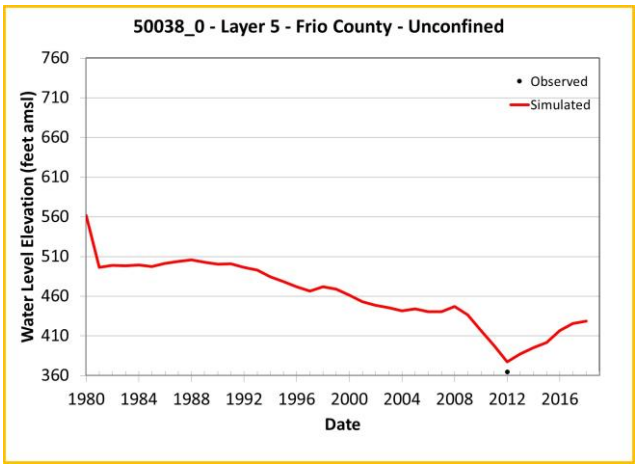












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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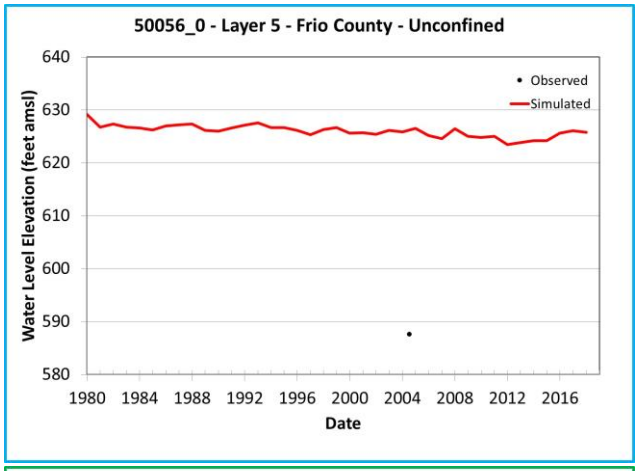
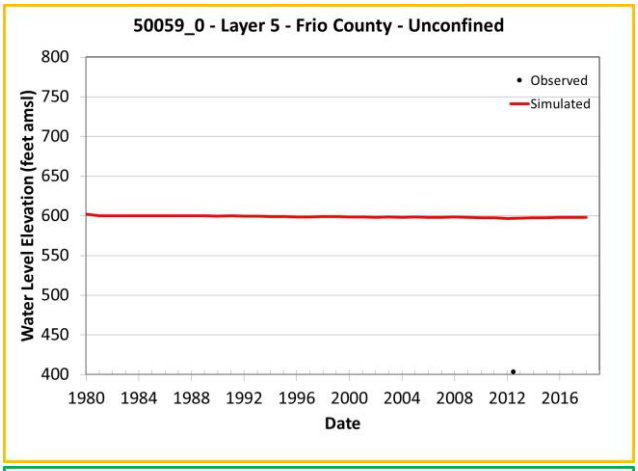
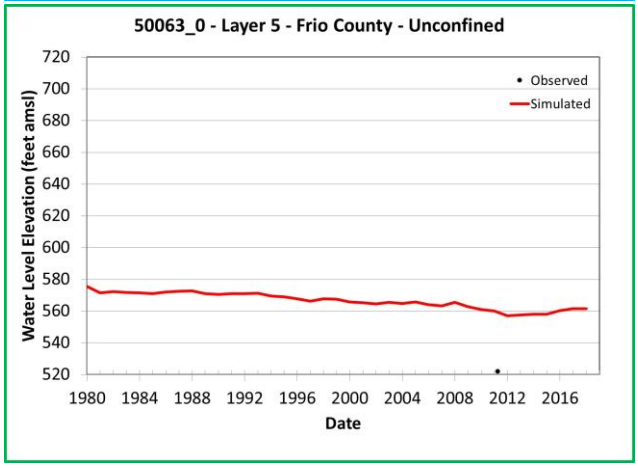
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

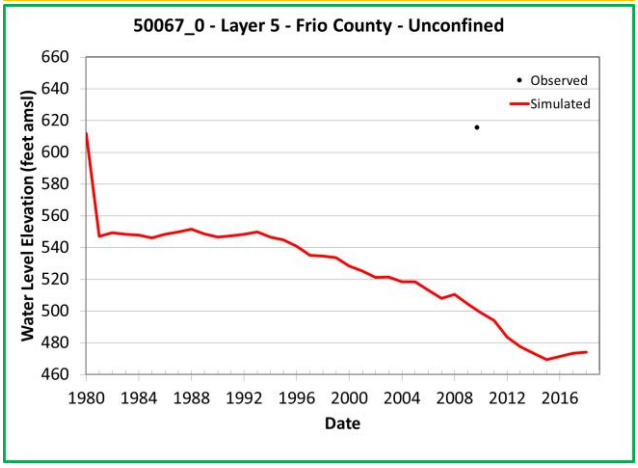
FIGURE I-8.2g

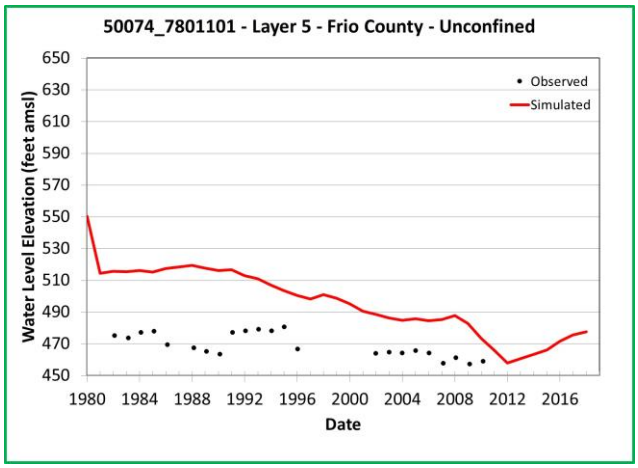
GSI ENVIRONMENTAL

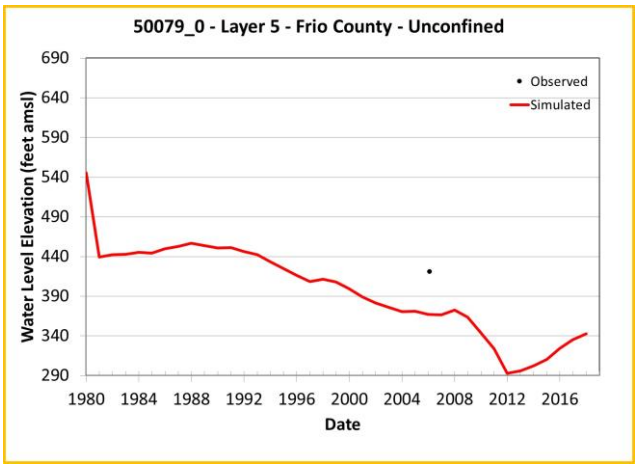












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

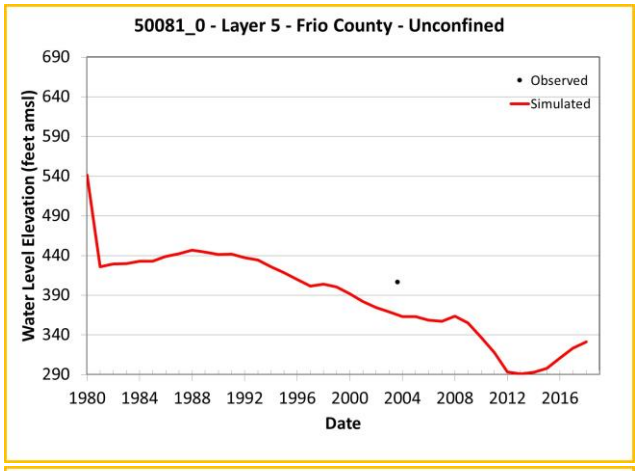
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

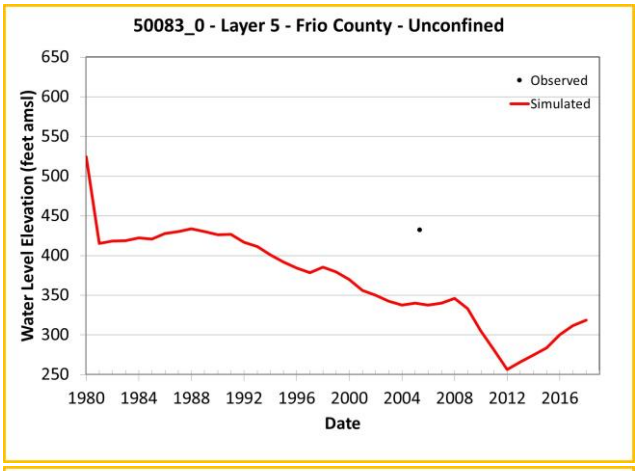
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

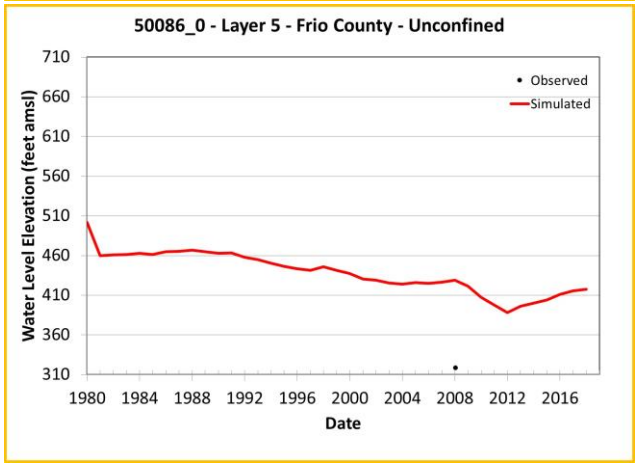
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

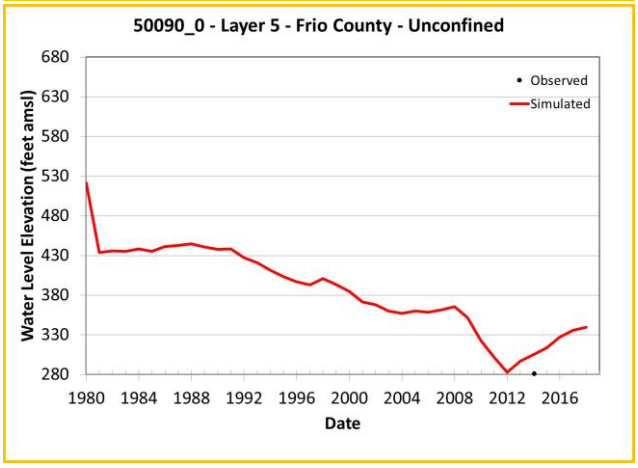
FIGURE I-8.2h

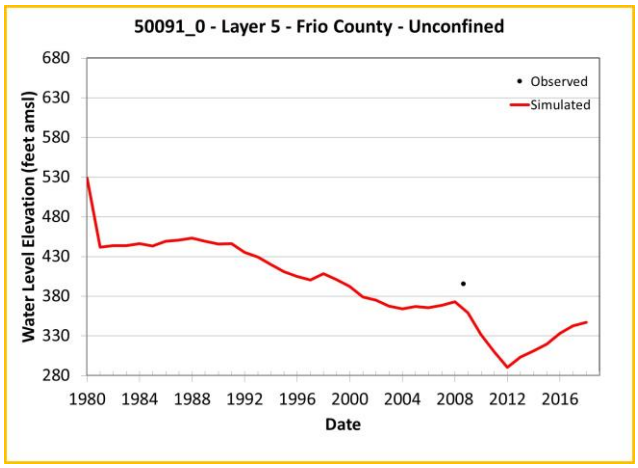
GSI ENVIRONMENTAL

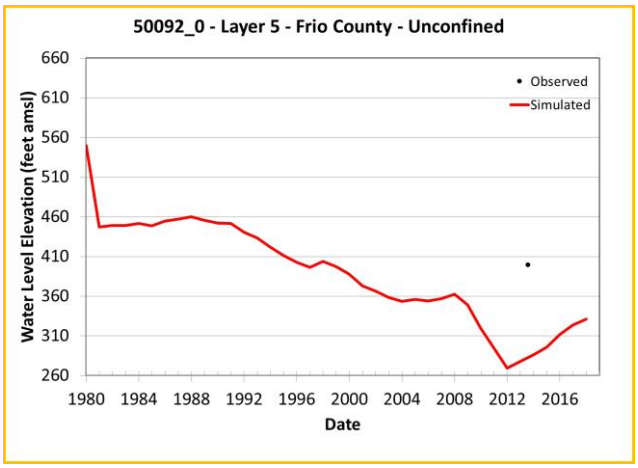












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

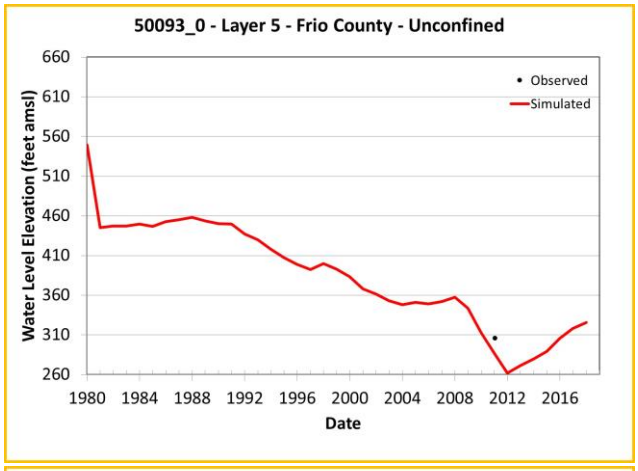
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

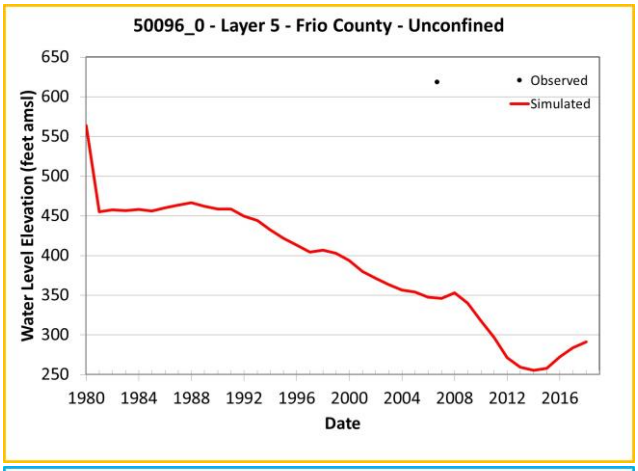
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

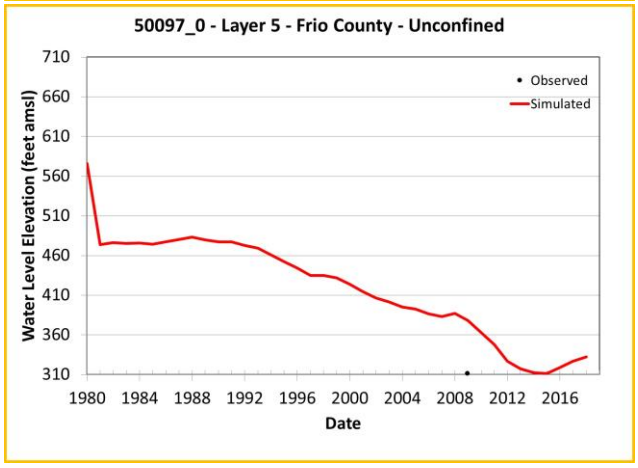
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

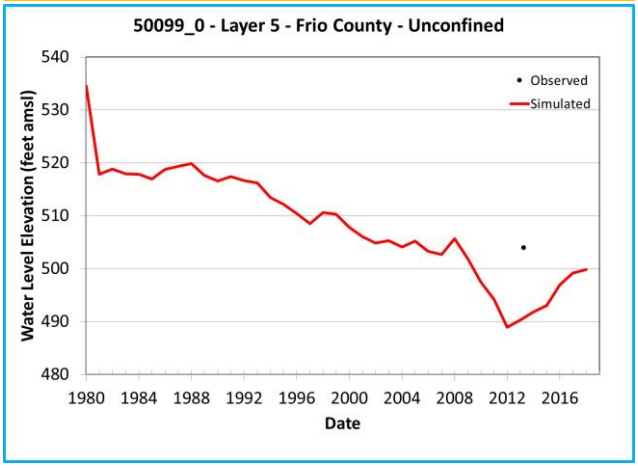
FIGURE I-8.2i

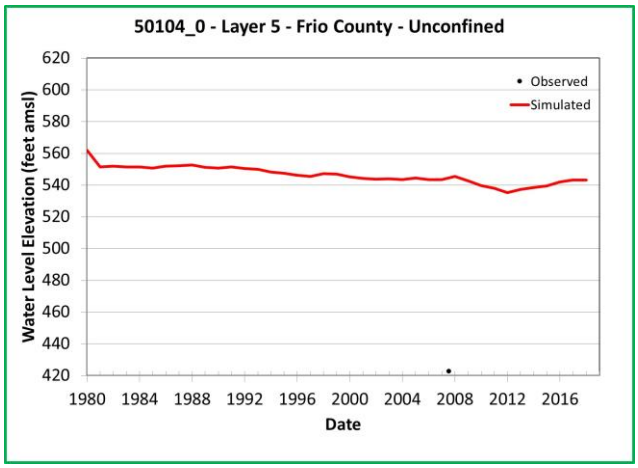
GSI ENVIRONMENTAL

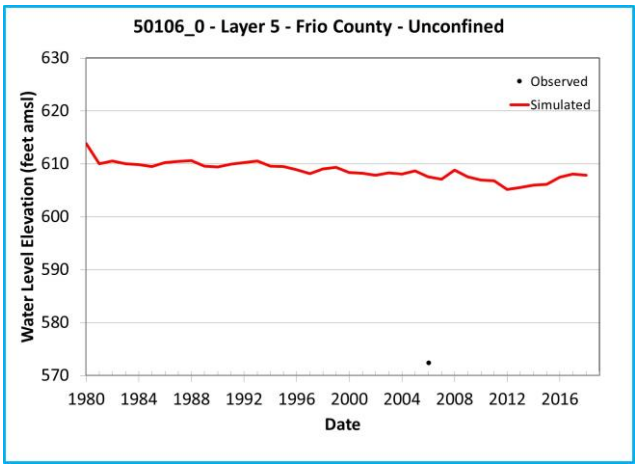












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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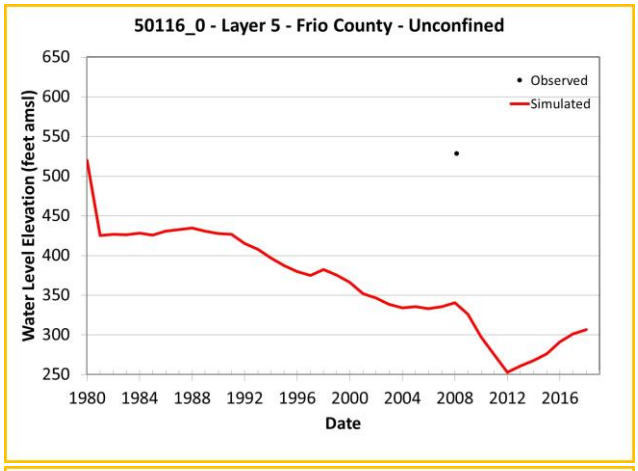
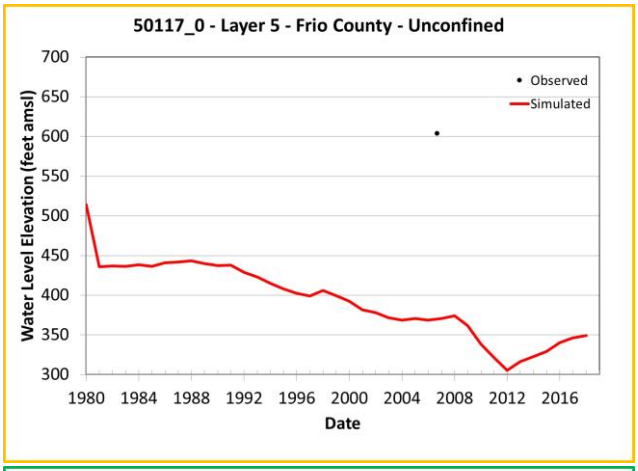
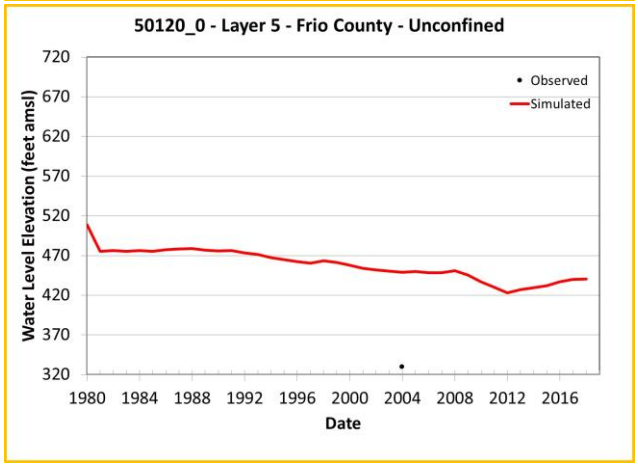
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

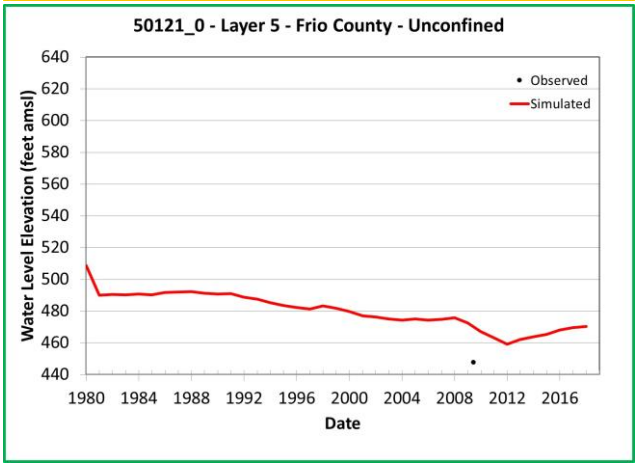
FIGURE I-8.2j

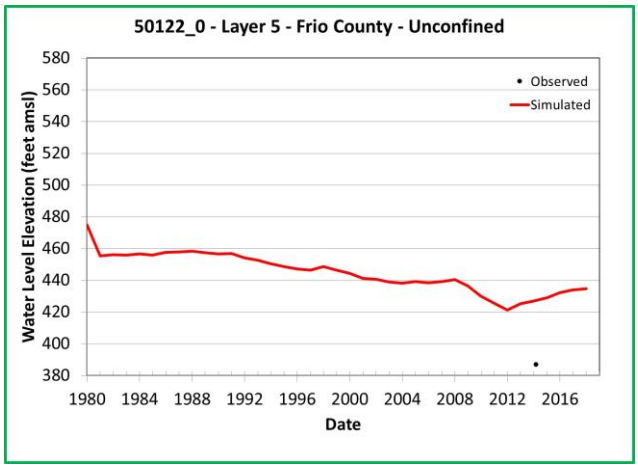
GSI ENVIRONMENTAL

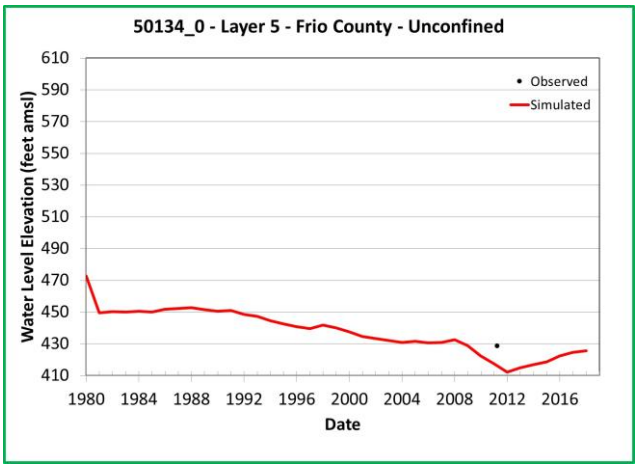












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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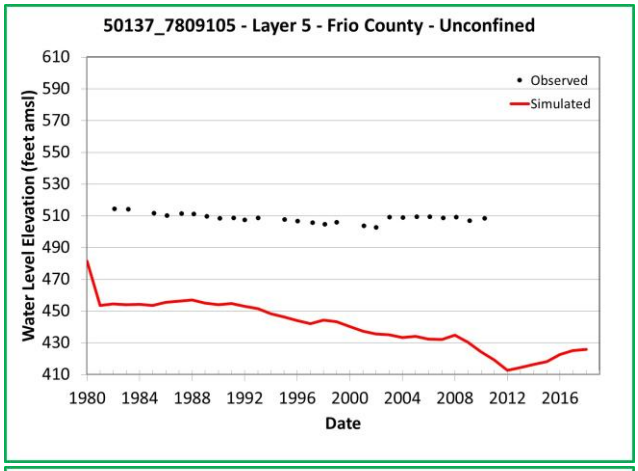
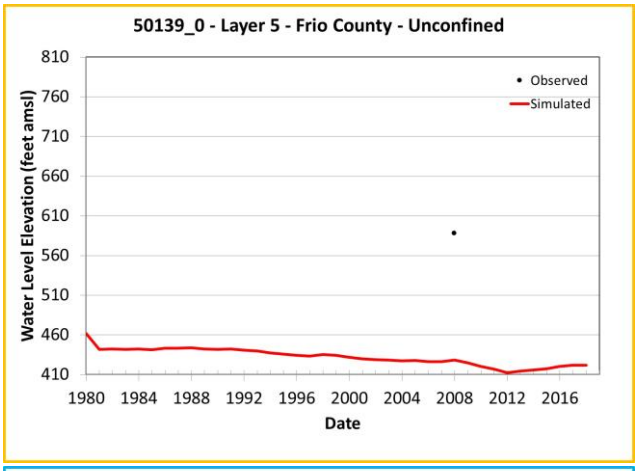
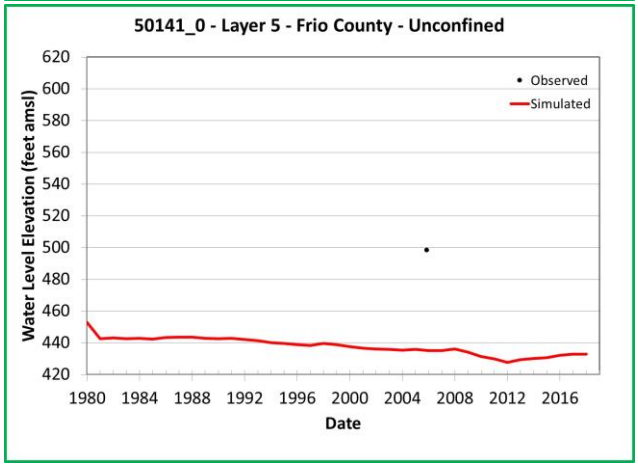
Revised		Aprv'd by	SP

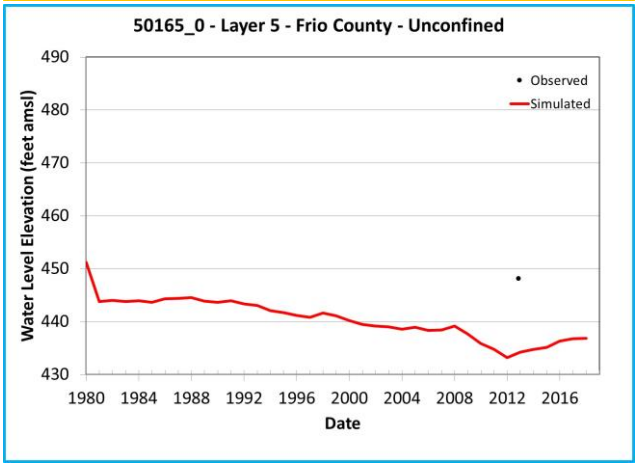
FIGURE I-8.2k

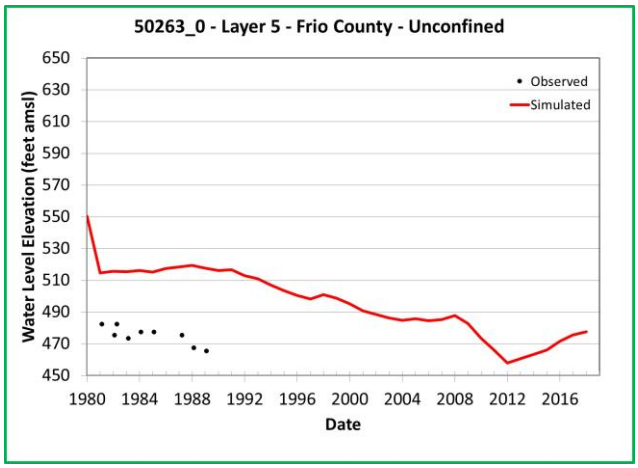
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

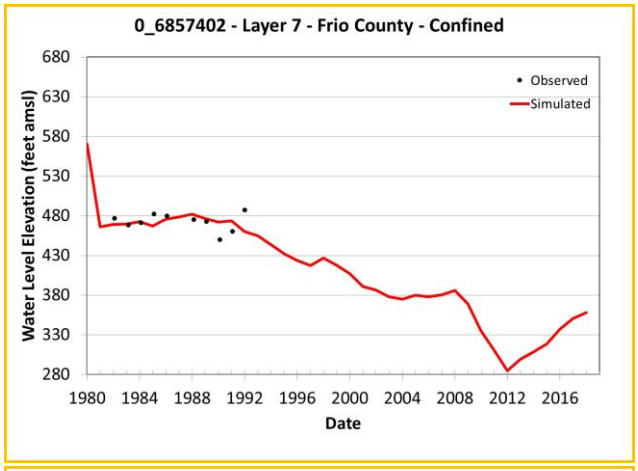
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 5

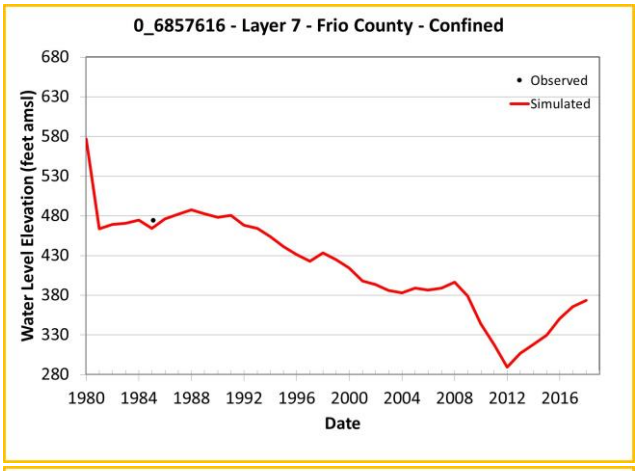
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

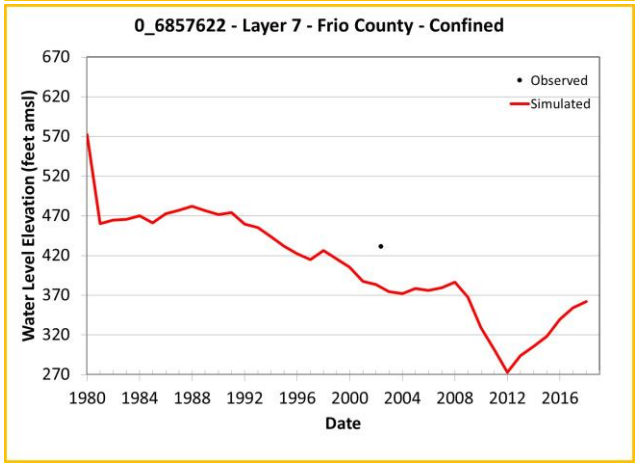
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

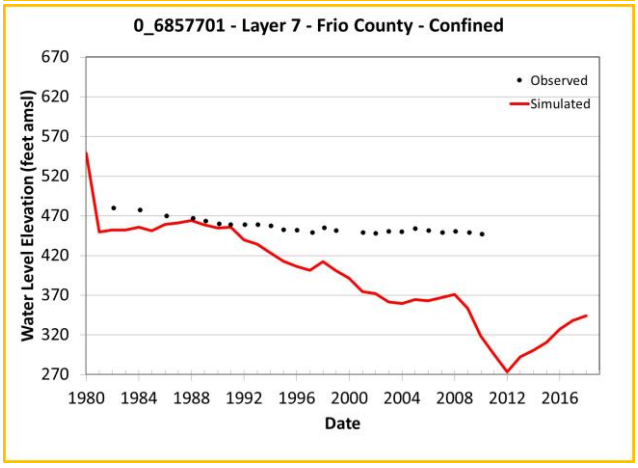
FIGURE I-8.2l

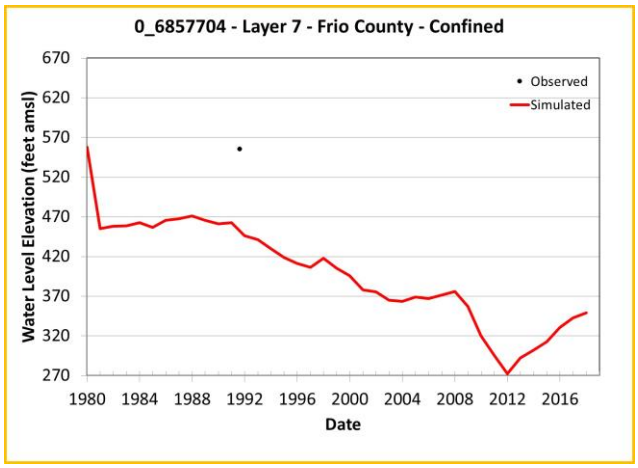
GSI ENVIRONMENTAL

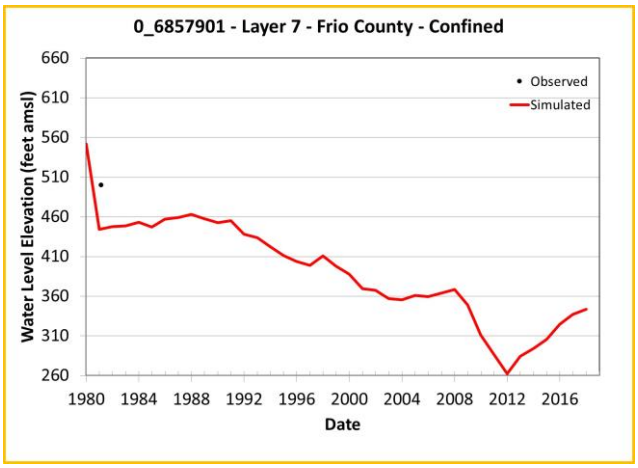












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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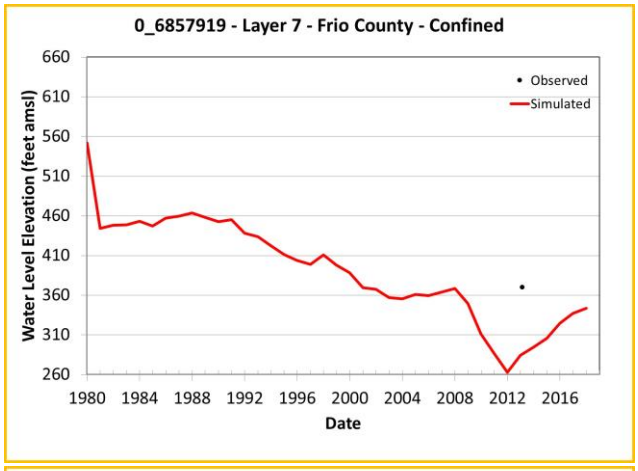
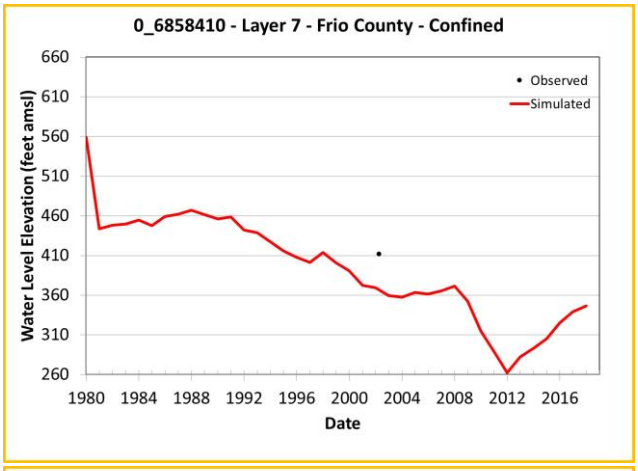
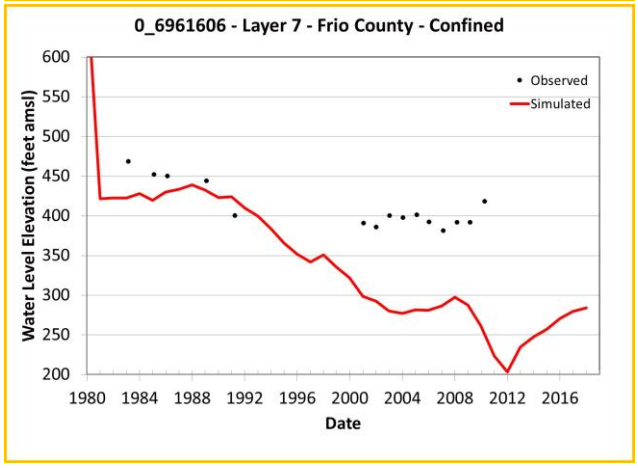
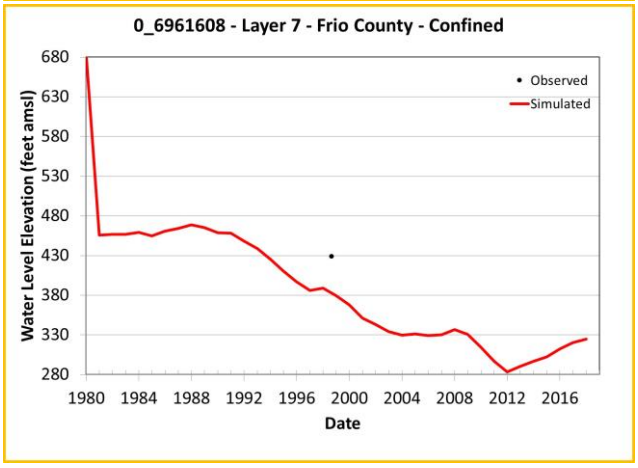
FIGURE I-8.3a

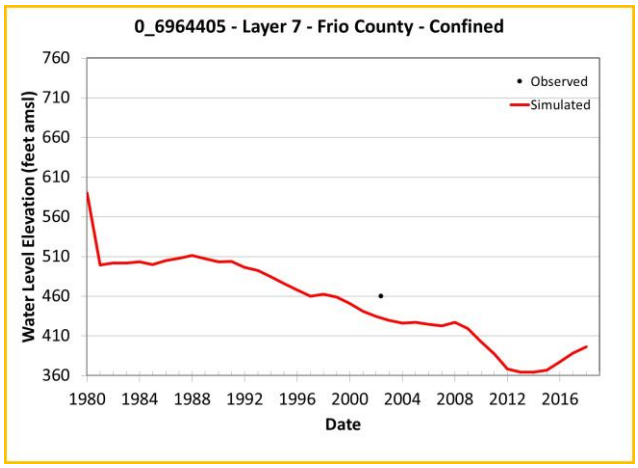
GSI ENVIRONMENTAL

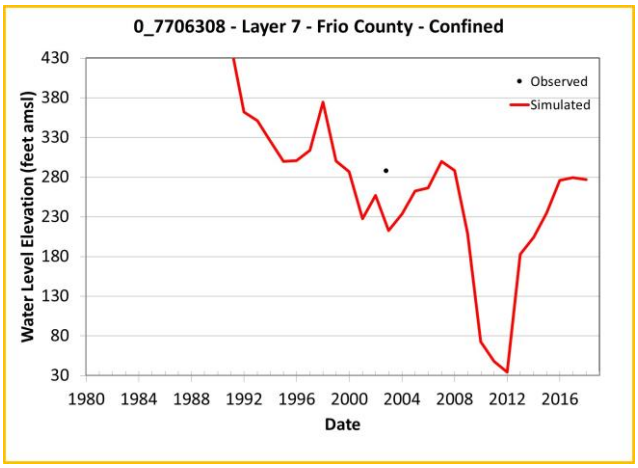












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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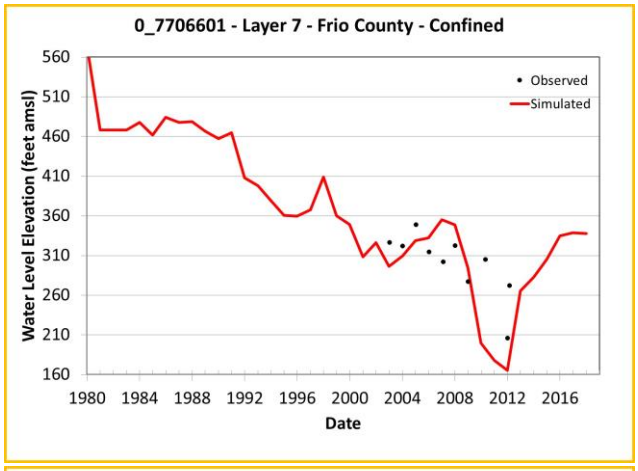
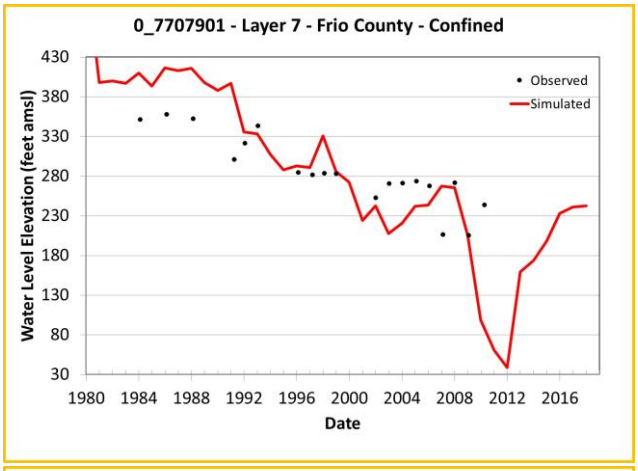
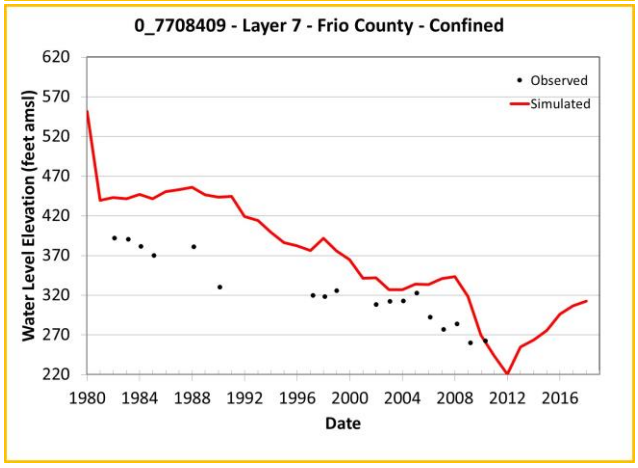
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

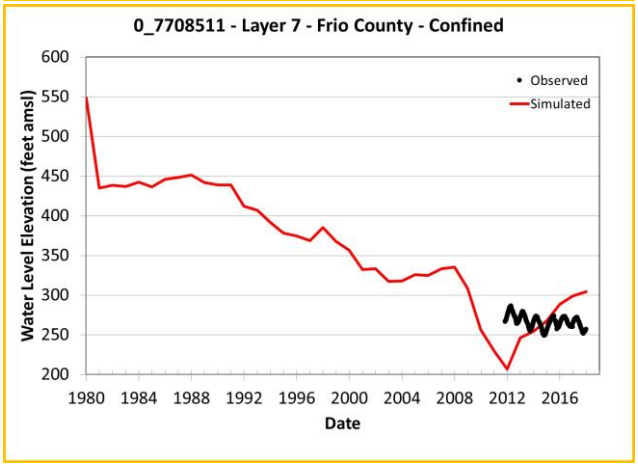
FIGURE I-8.3b

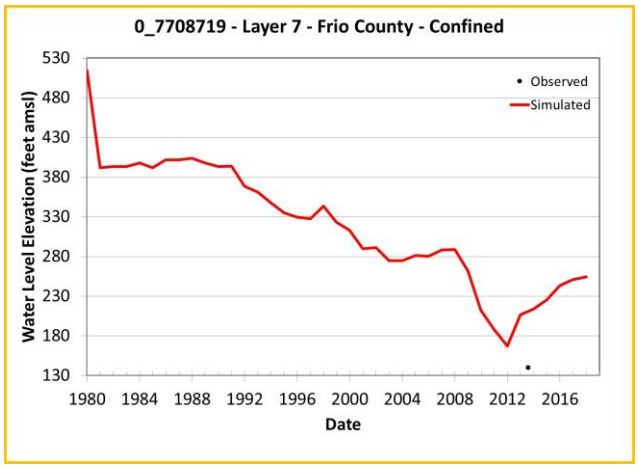
GSI ENVIRONMENTAL

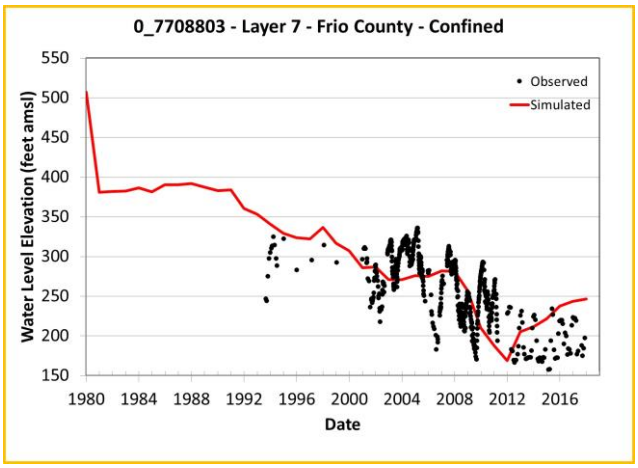












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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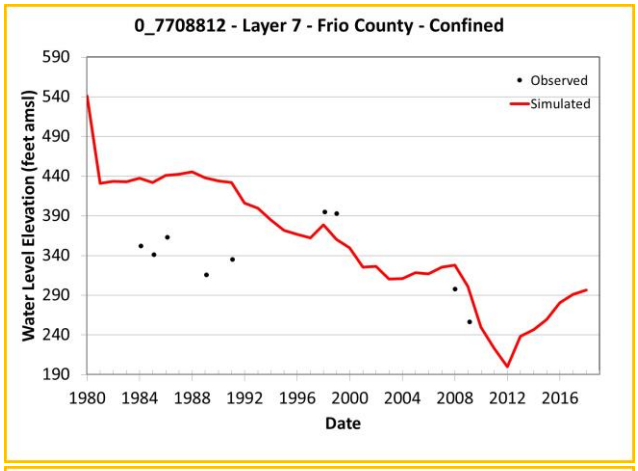
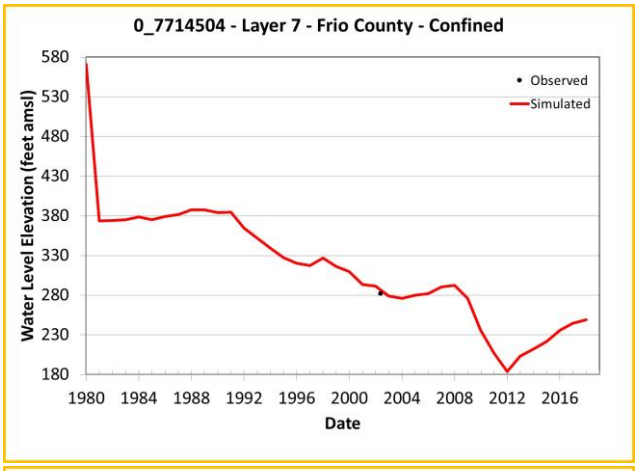
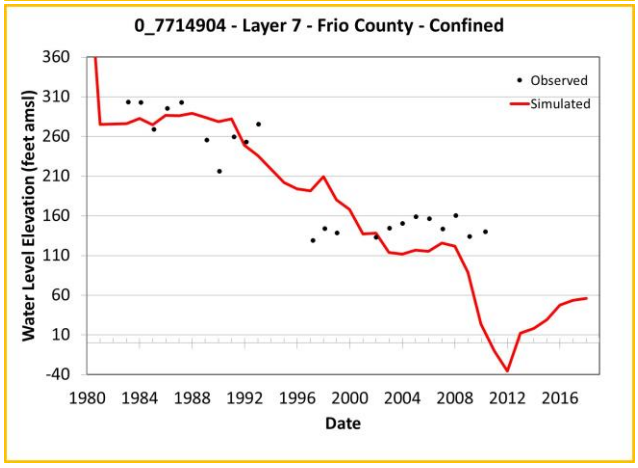
Revised		Aprv'd by	SP

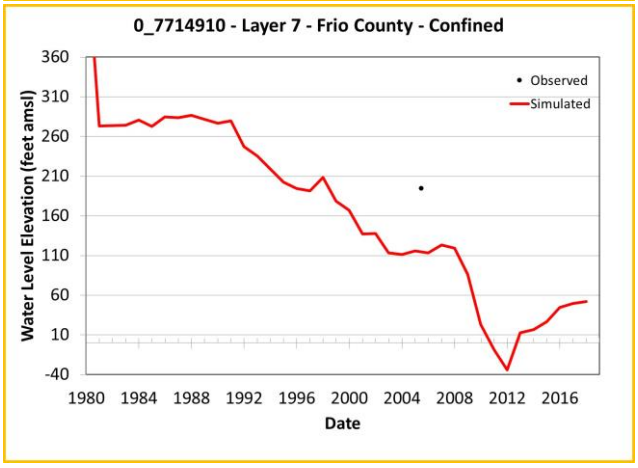
FIGURE I-8.3c

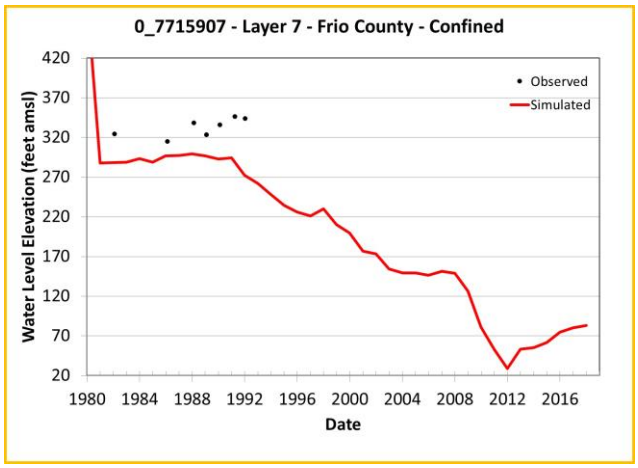
GSI ENVIRONMENTAL

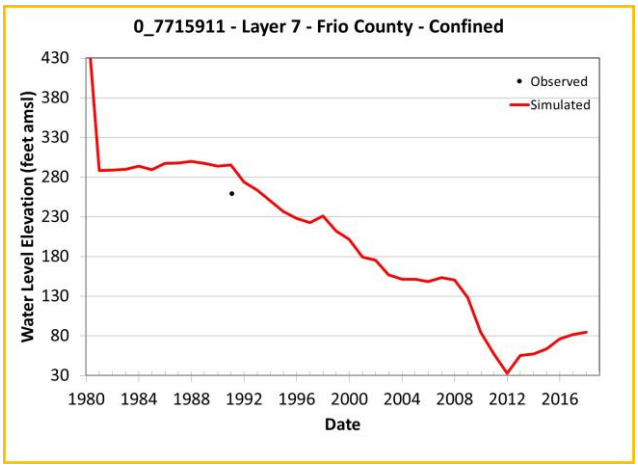












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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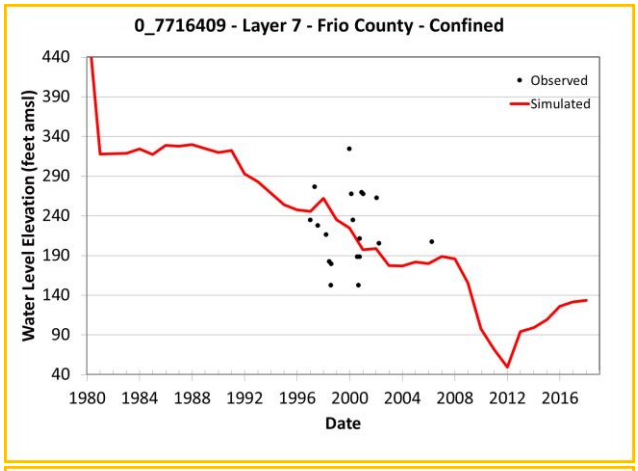
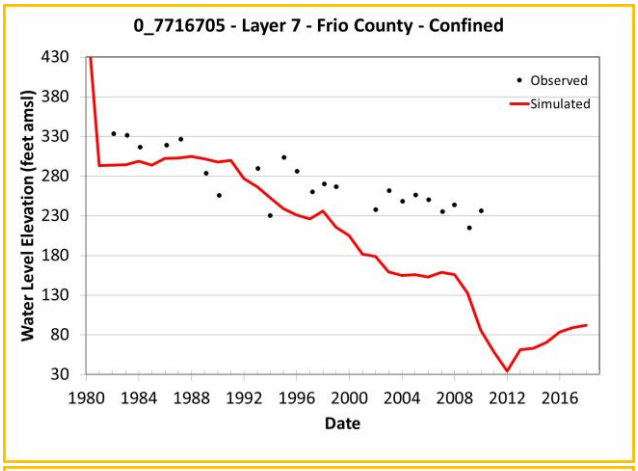
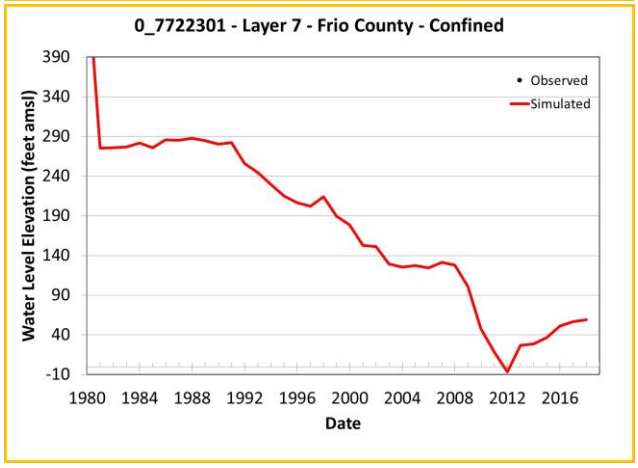
Revised		Aprv'd by	SP

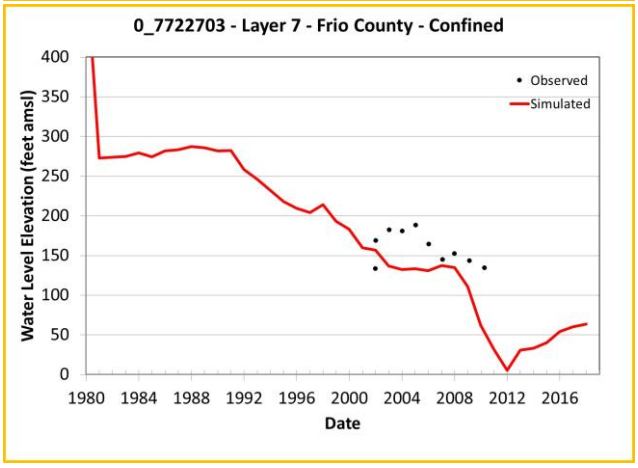
FIGURE I-8.3d

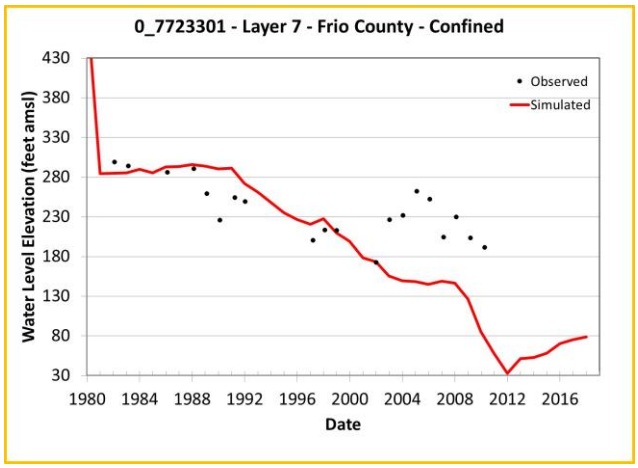
GSI ENVIRONMENTAL

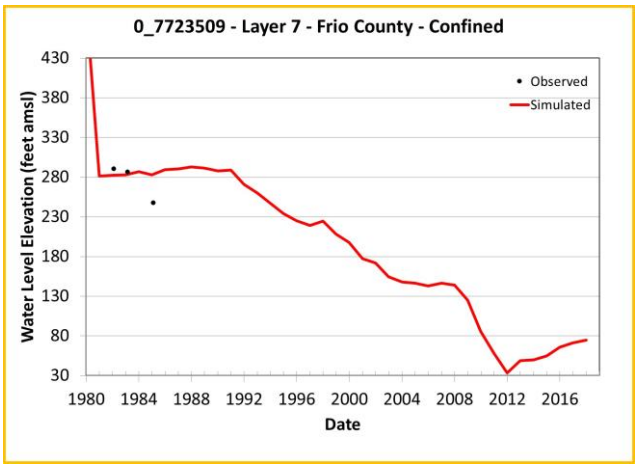












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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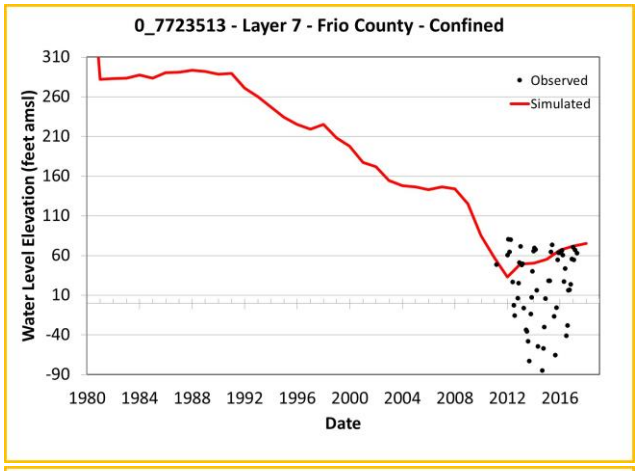
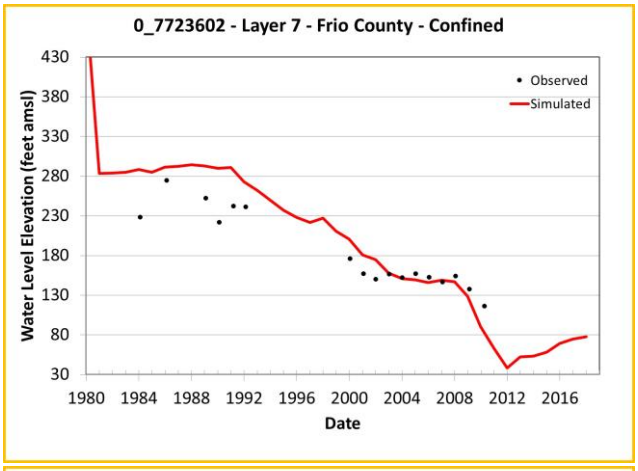
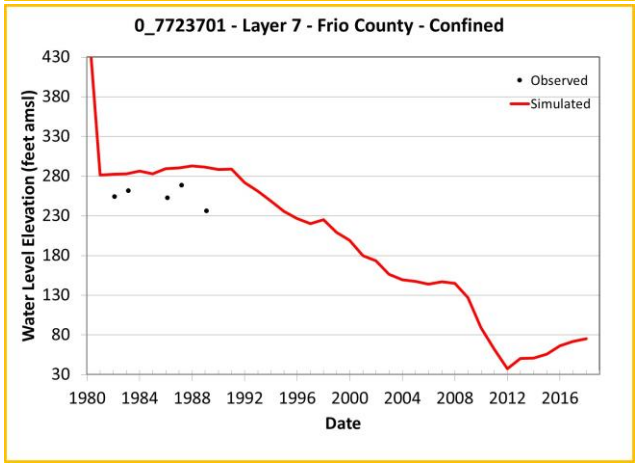
Revised		Aprv'd by	SP

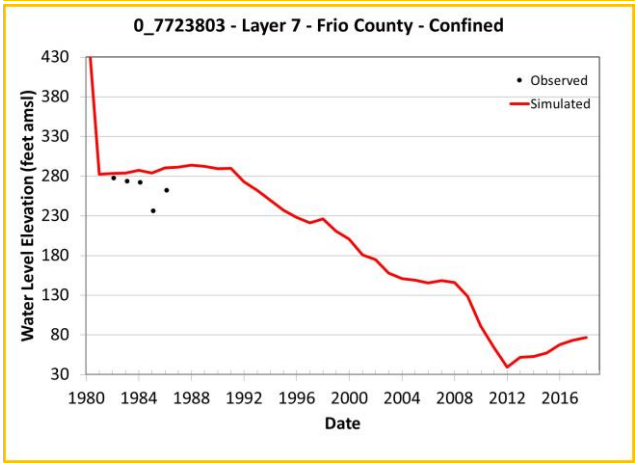
FIGURE I-8.3e

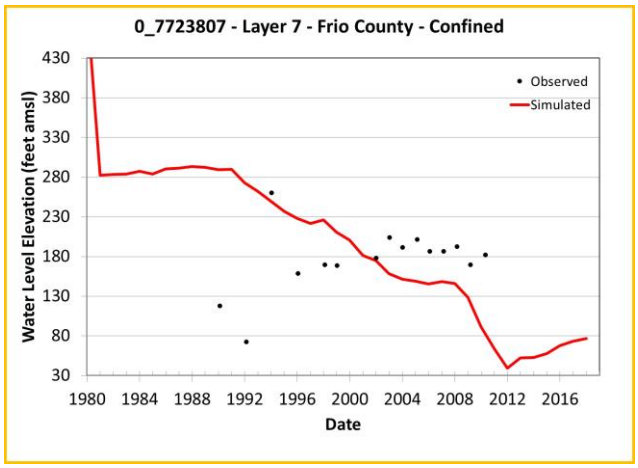
GSI ENVIRONMENTAL

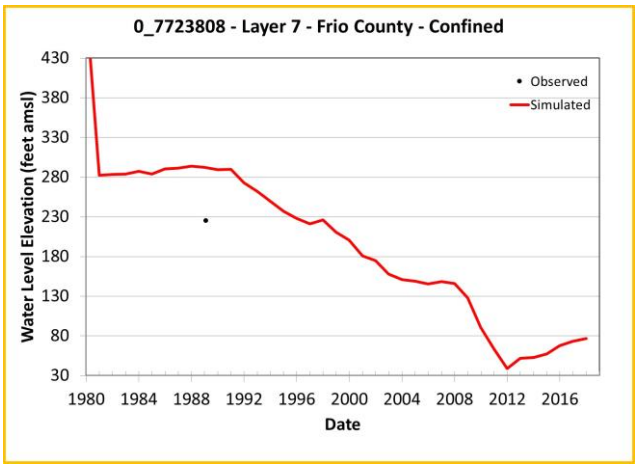












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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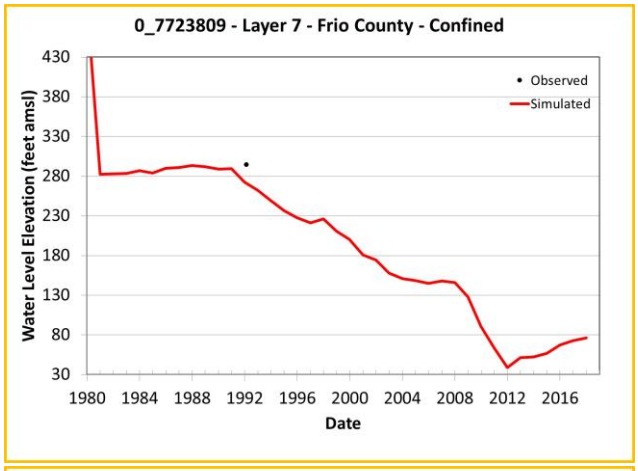
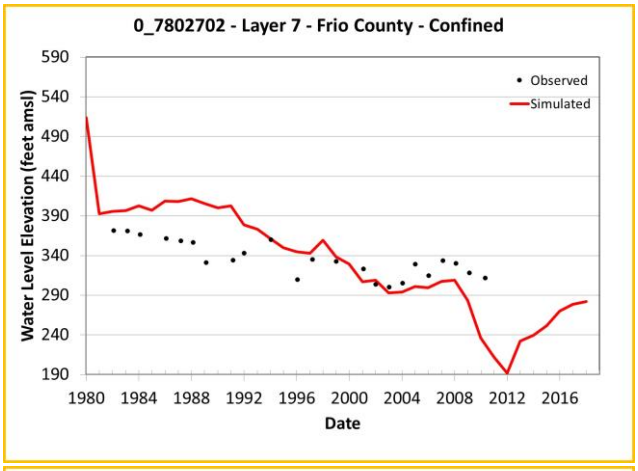
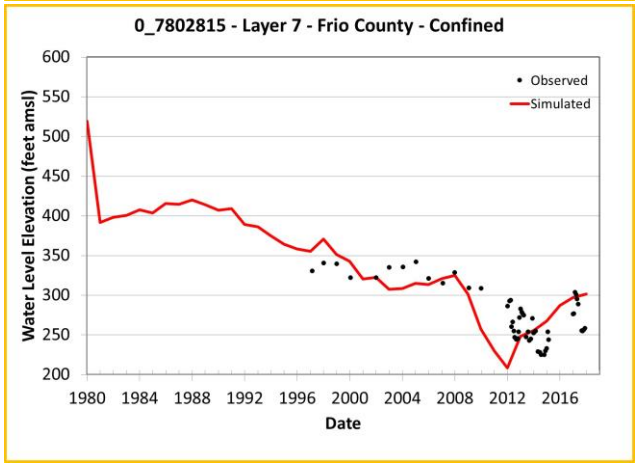
Revised		Aprv'd by	SP

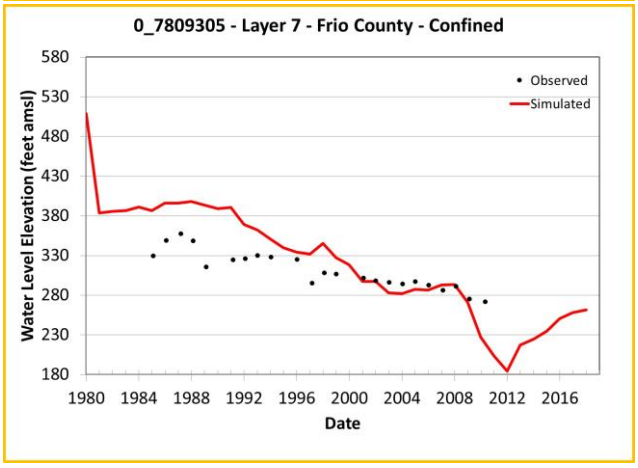
FIGURE I-8.3f

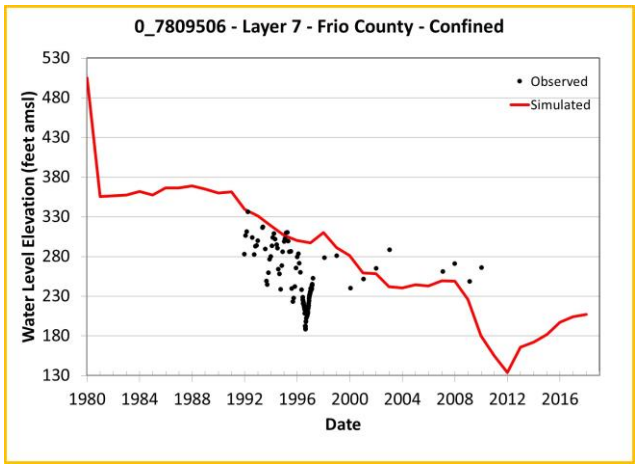
GSI ENVIRONMENTAL

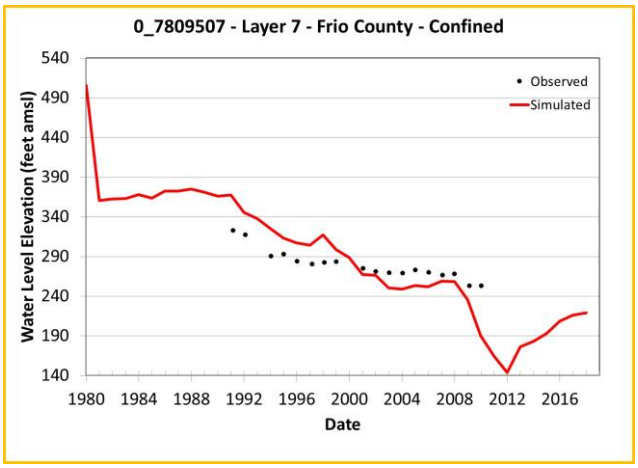












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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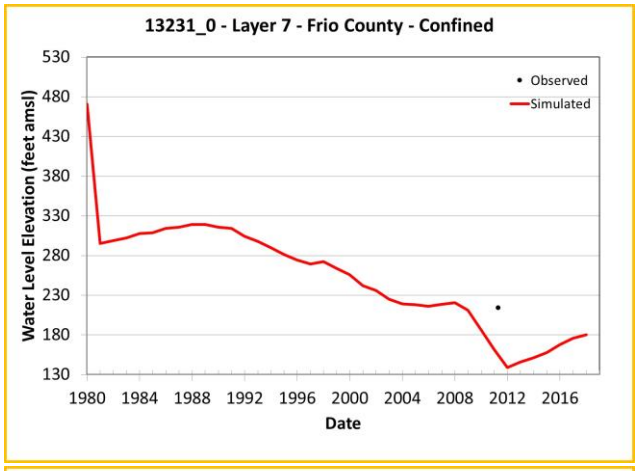
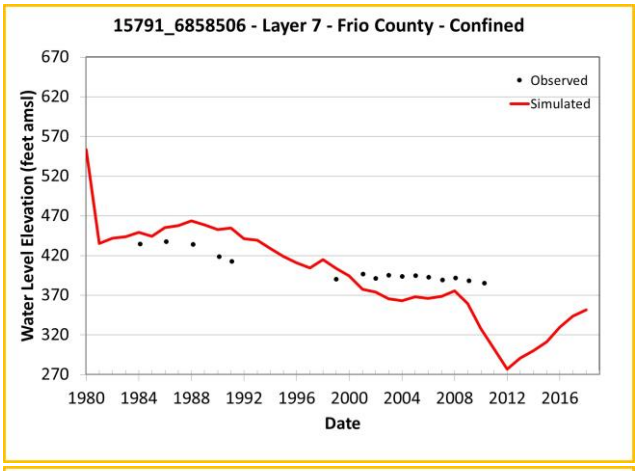
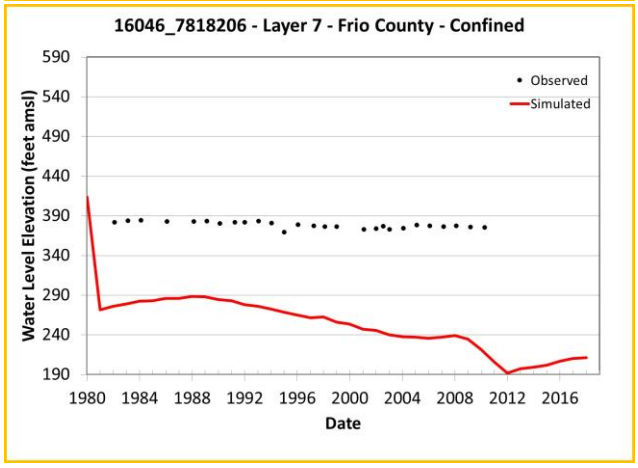
Revised		Aprv'd by	SP

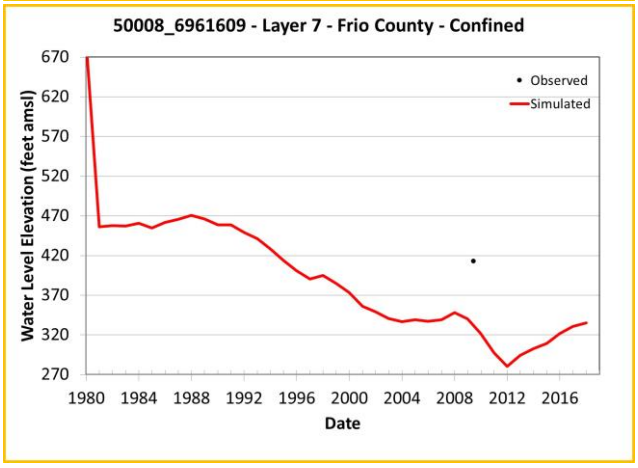
FIGURE I-8.3g

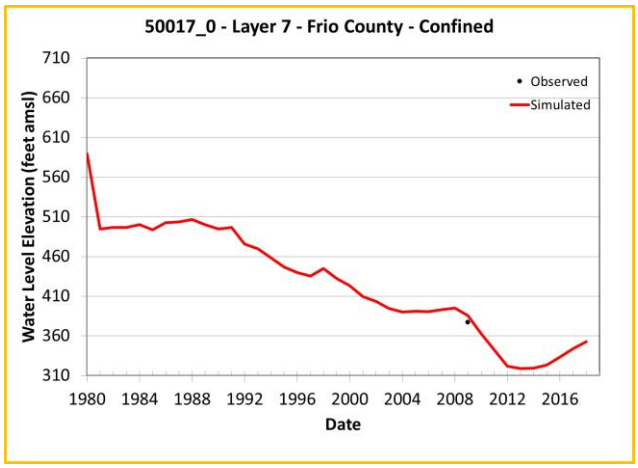
GSI ENVIRONMENTAL

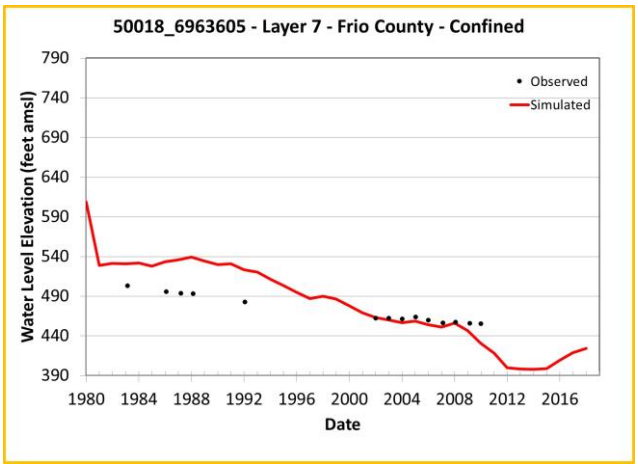












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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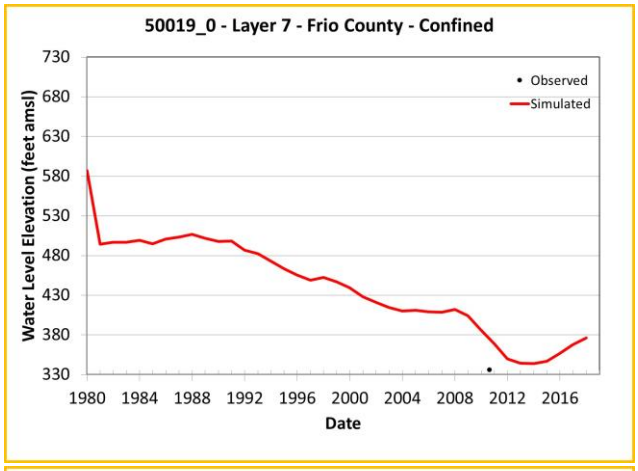
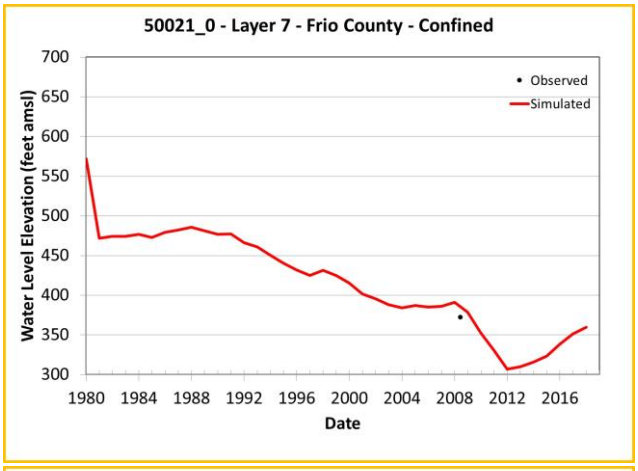
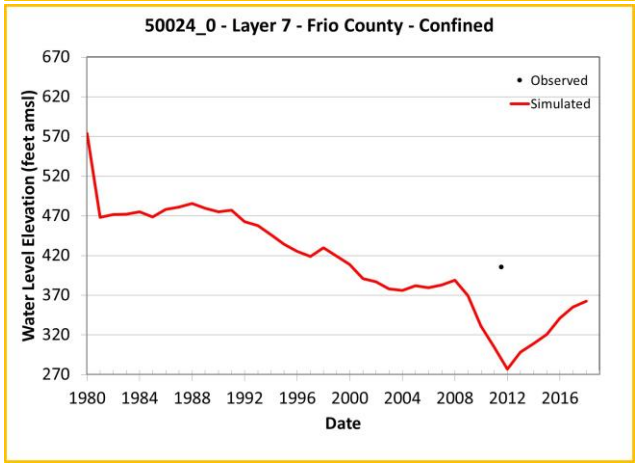
Revised		Aprv'd by	SP

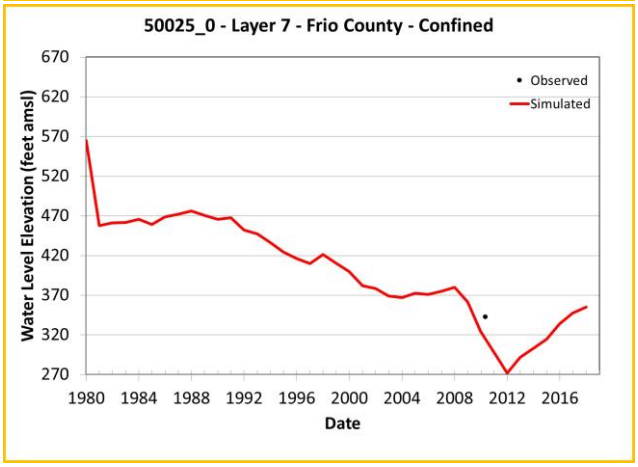
FIGURE I-8.3h

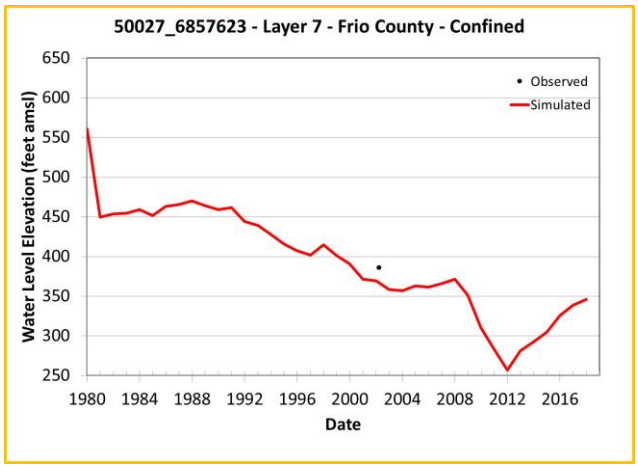
GSI ENVIRONMENTAL

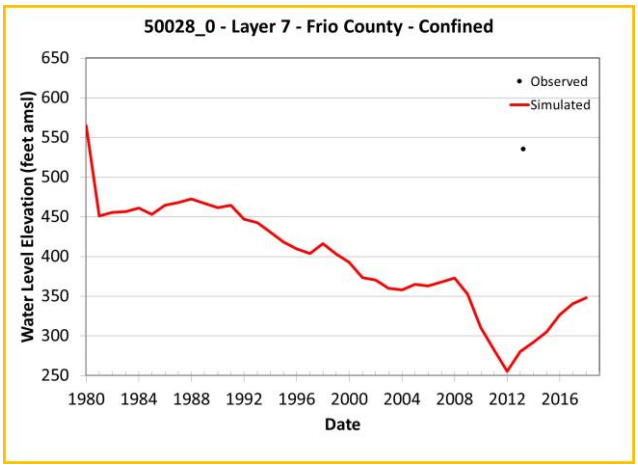












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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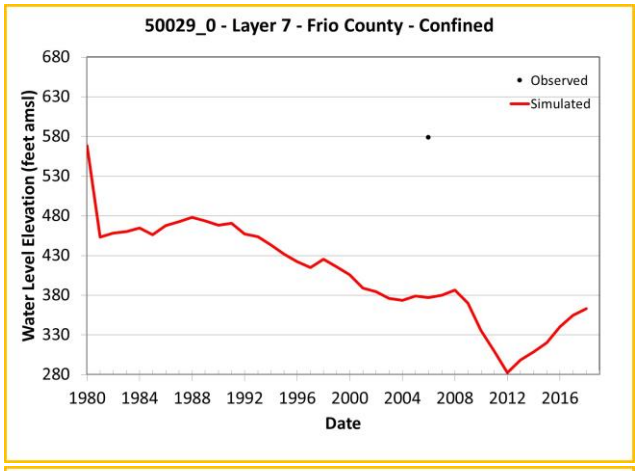
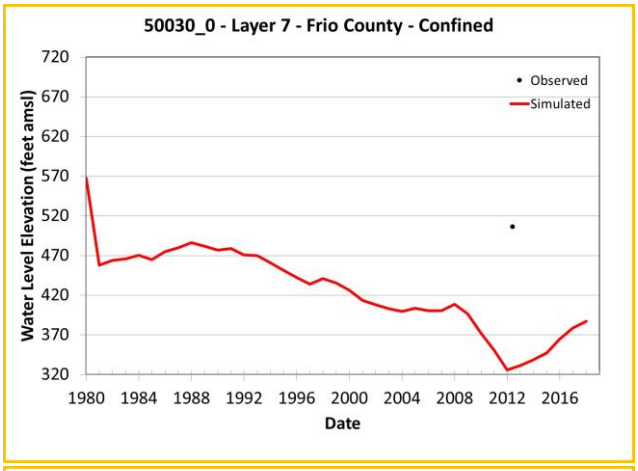
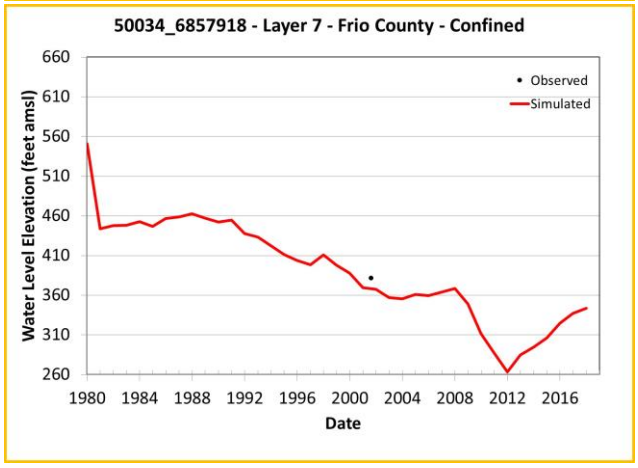
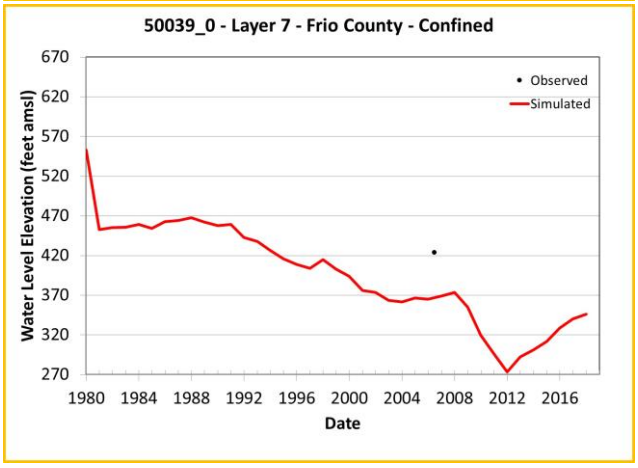
FIGURE I-8.3i

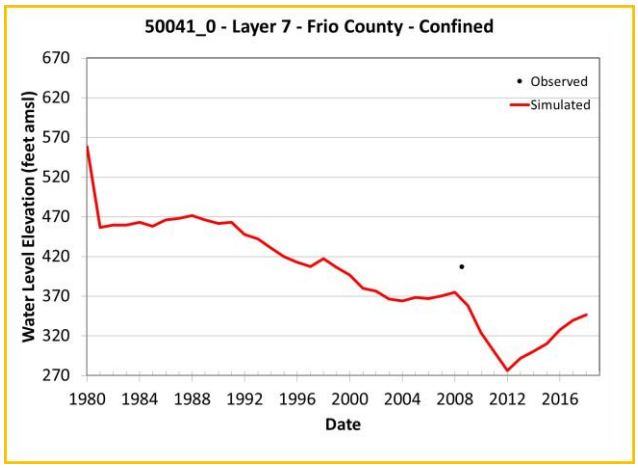
GSI ENVIRONMENTAL

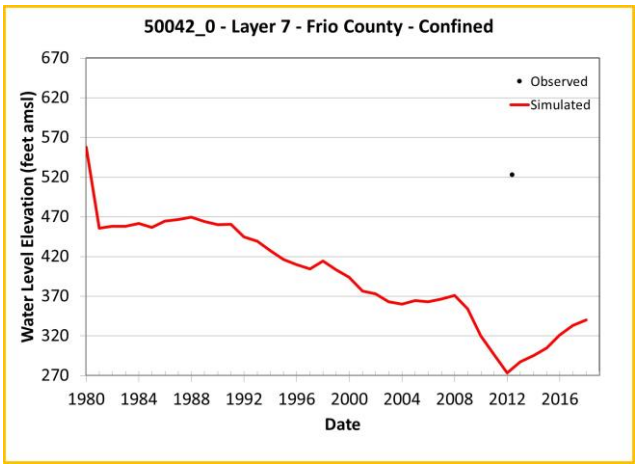












Note: Chart outline color indicates Y-axis range.
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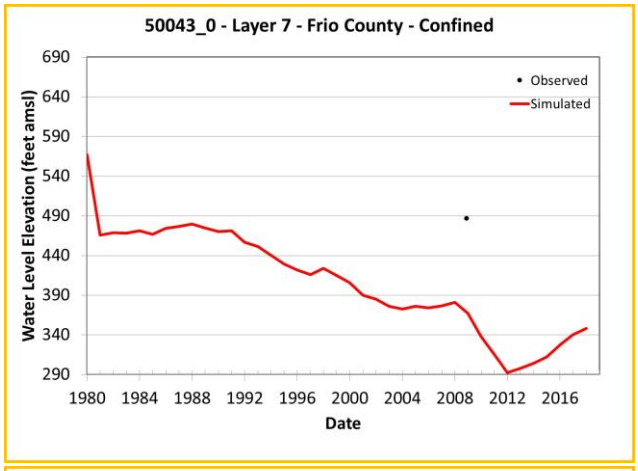
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

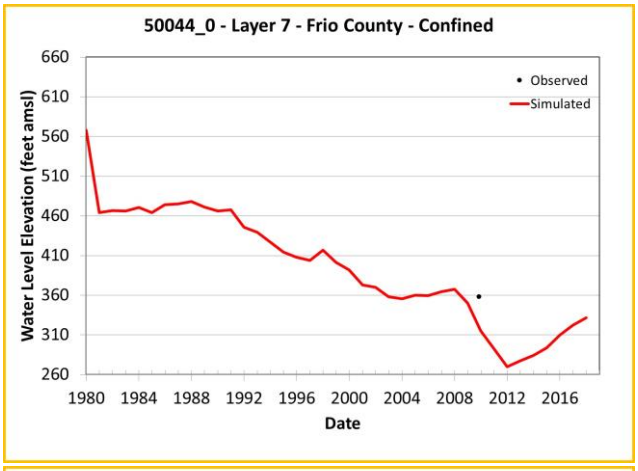
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

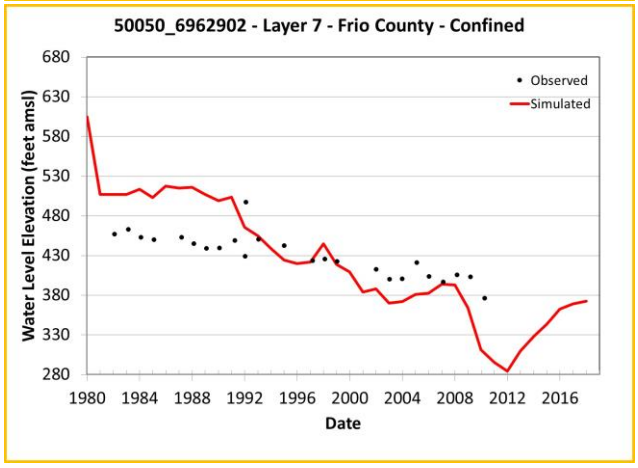
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

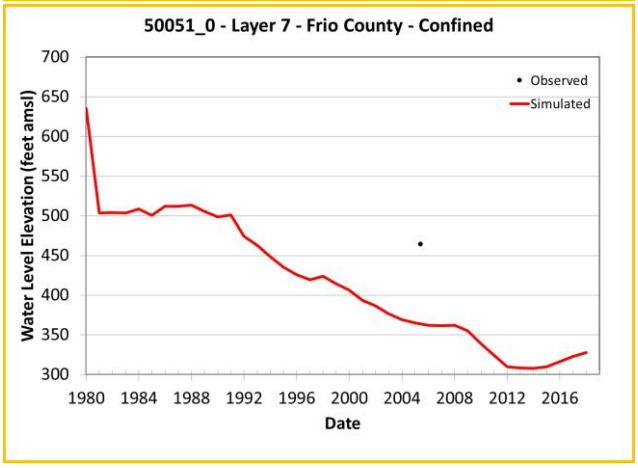
FIGURE I-8.3j

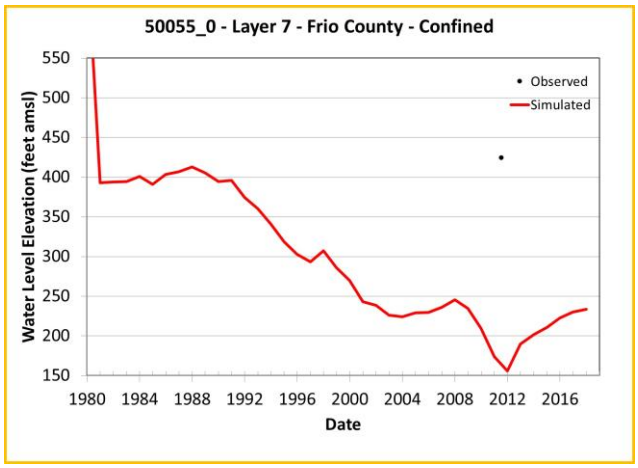
GSI ENVIRONMENTAL

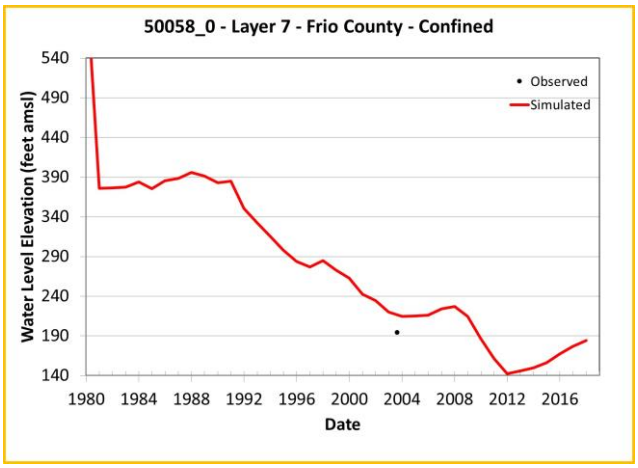












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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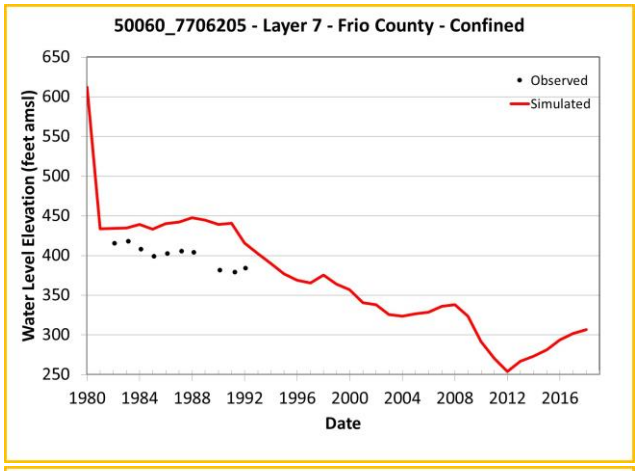
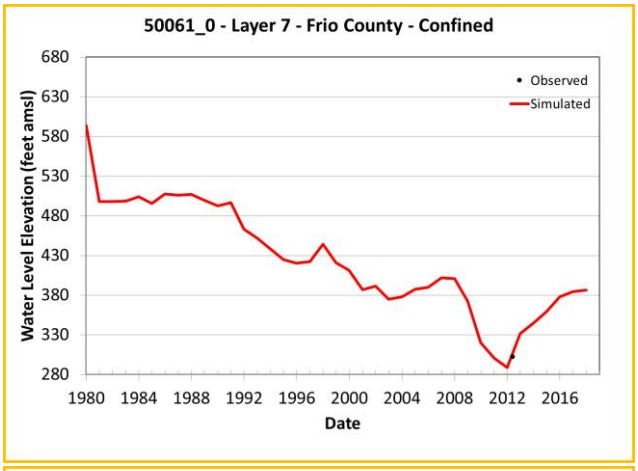
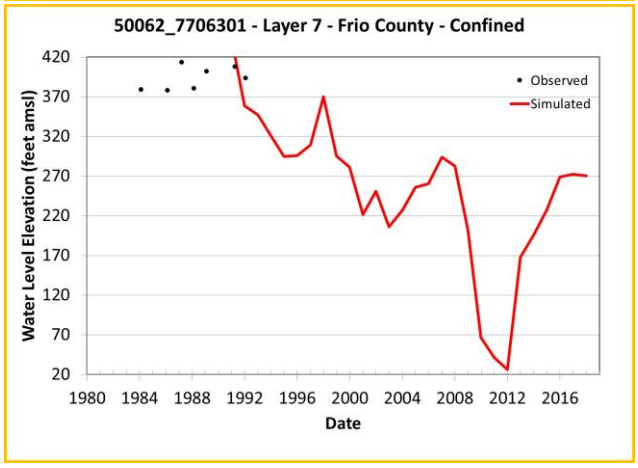
Revised		Aprv'd by	SP

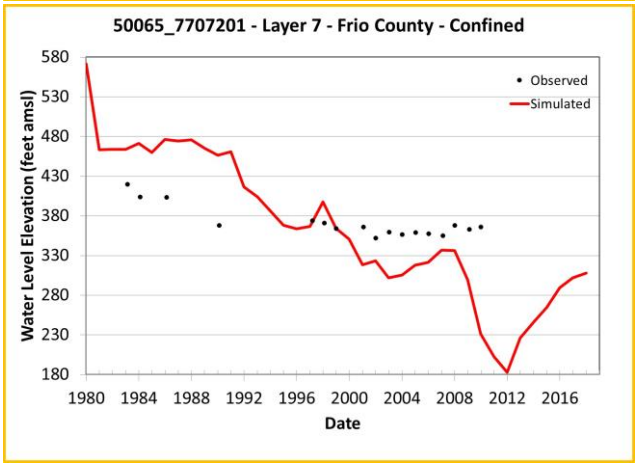
FIGURE I-8.3k

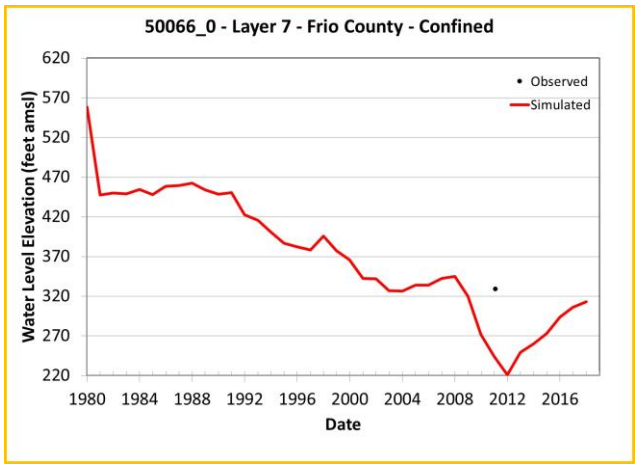
GSI ENVIRONMENTAL

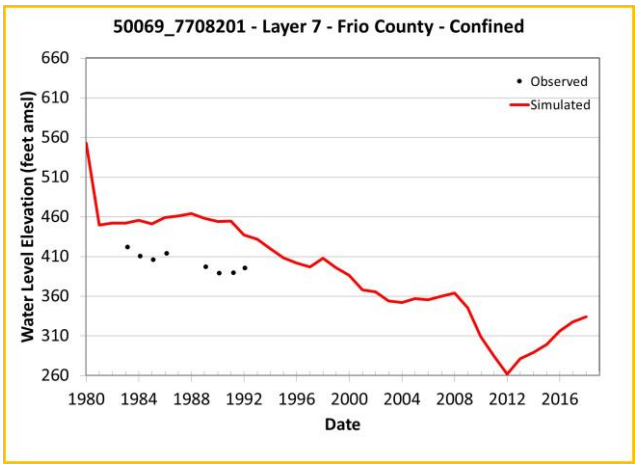












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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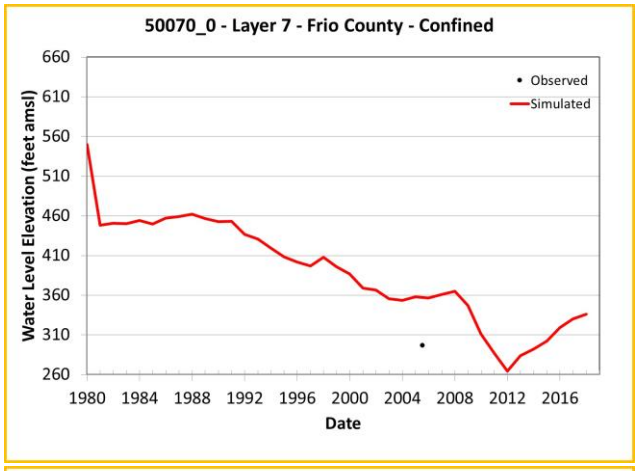
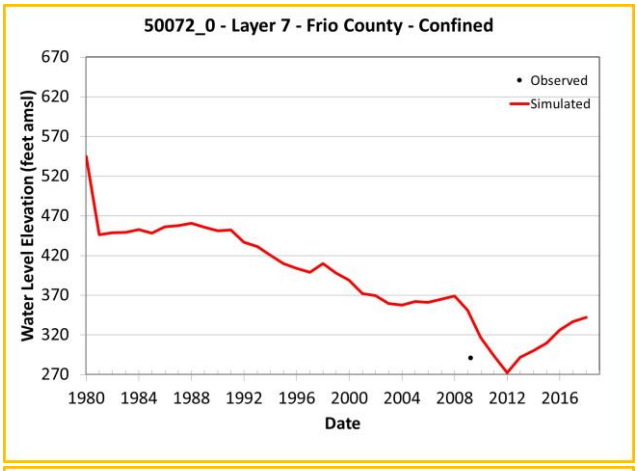
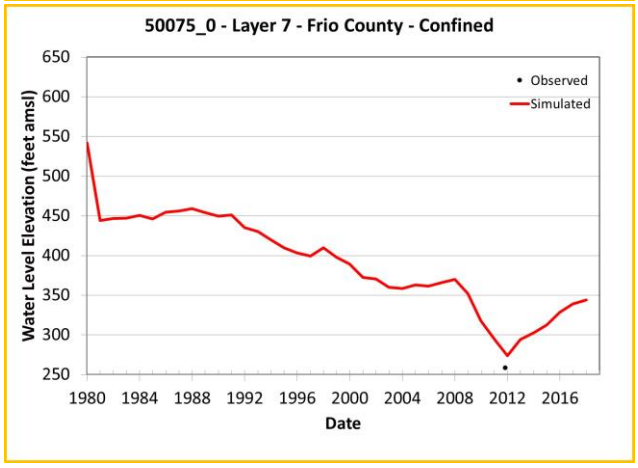
Revised		Aprv'd by	SP

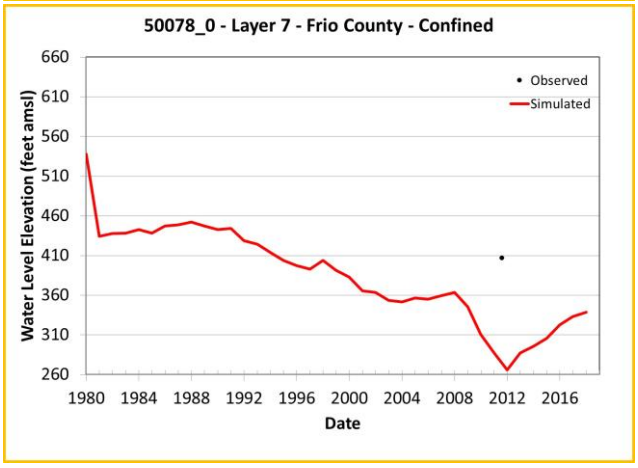
FIGURE I-8.3l

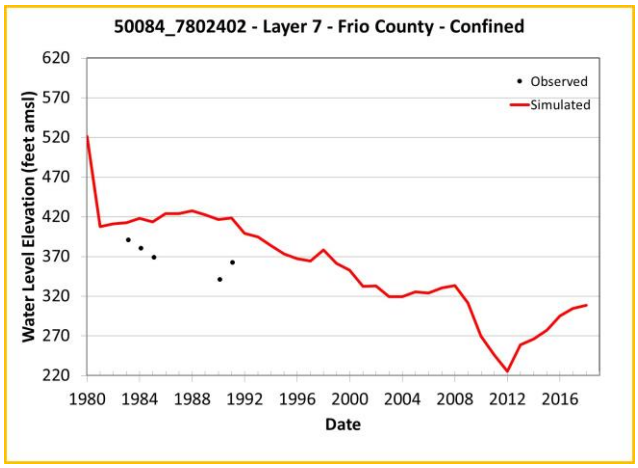
GSI ENVIRONMENTAL

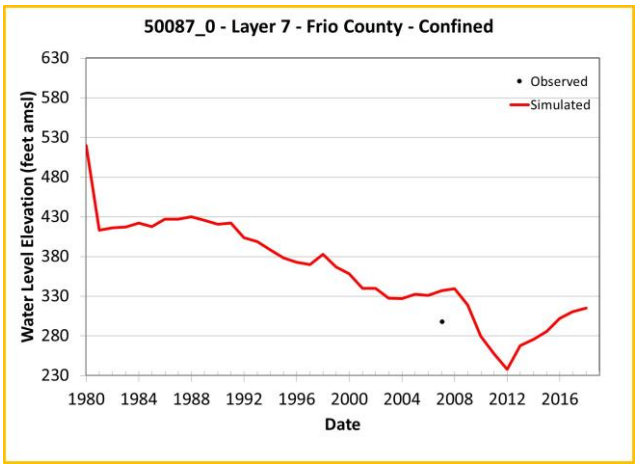












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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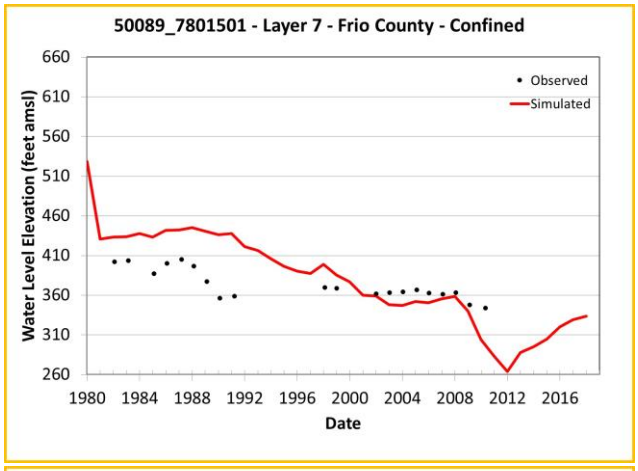
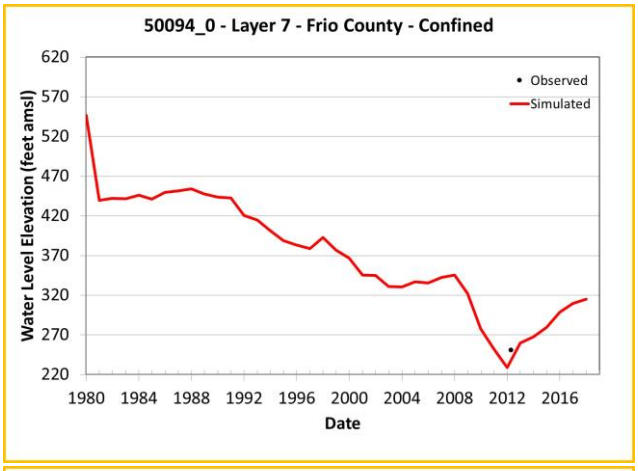
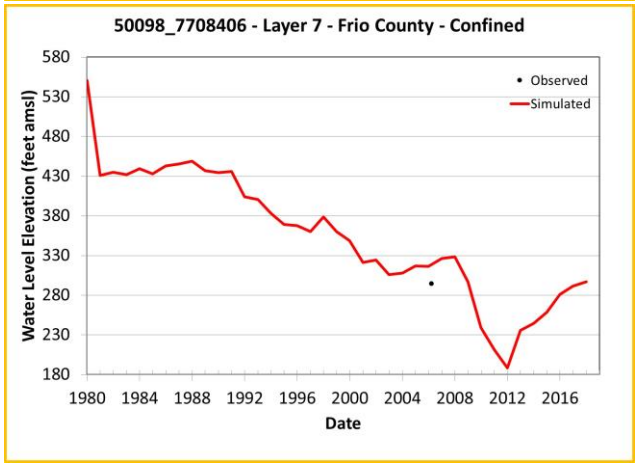
Revised		Aprv'd by	SP

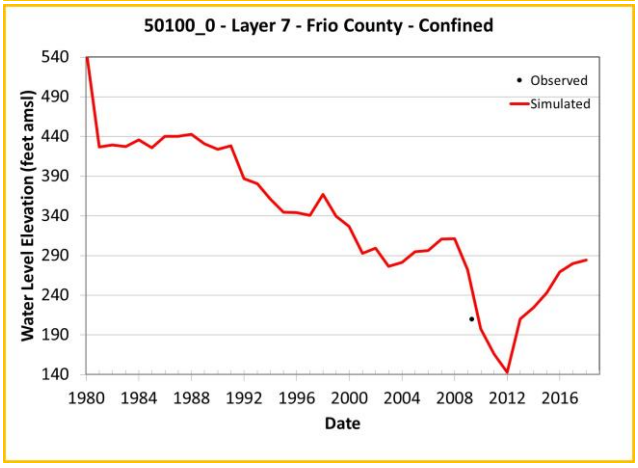
FIGURE I-8.3m

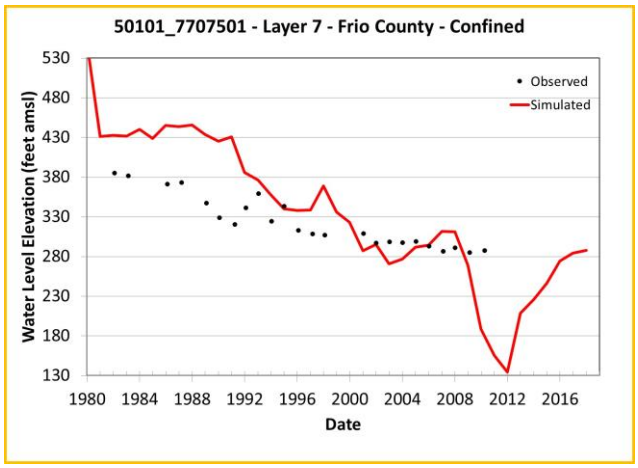
GSI ENVIRONMENTAL

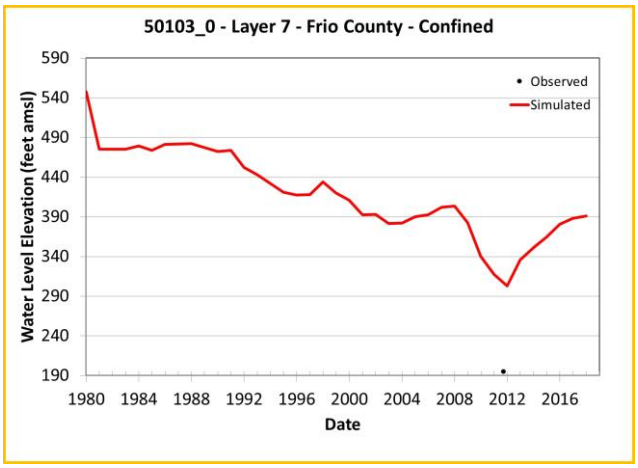












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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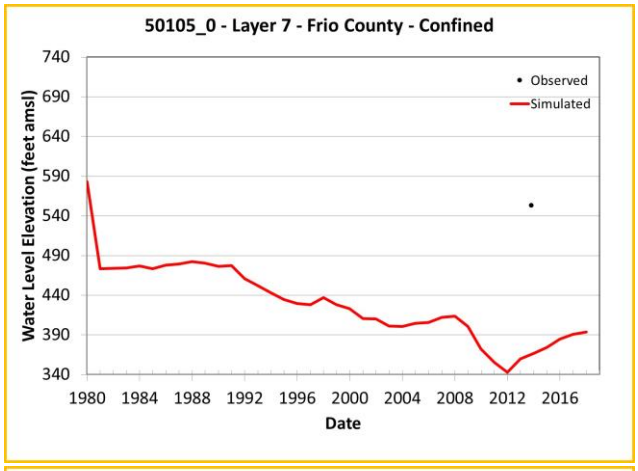
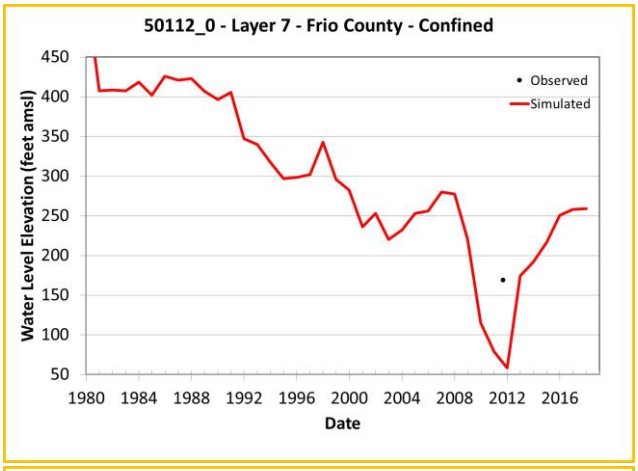
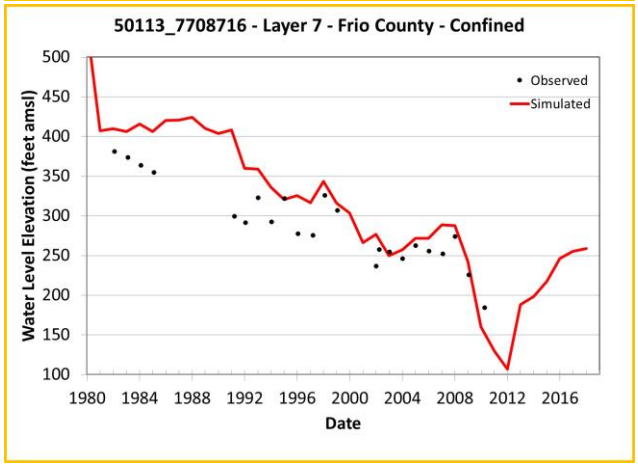
Revised		Aprv'd by	SP

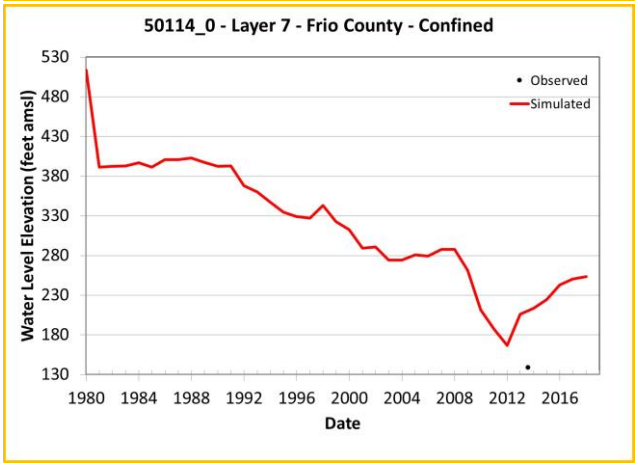
FIGURE I-8.3n

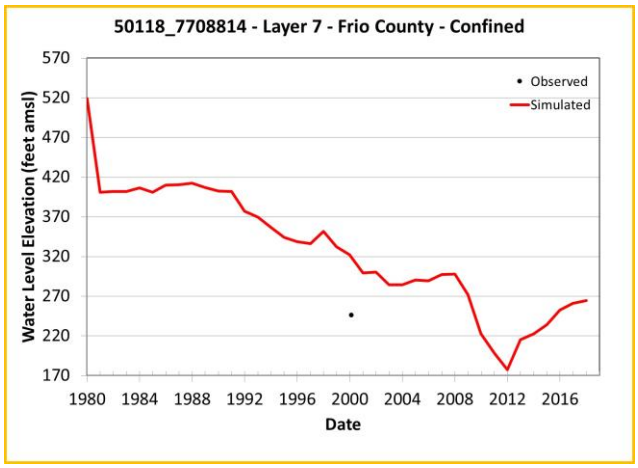
GSI ENVIRONMENTAL

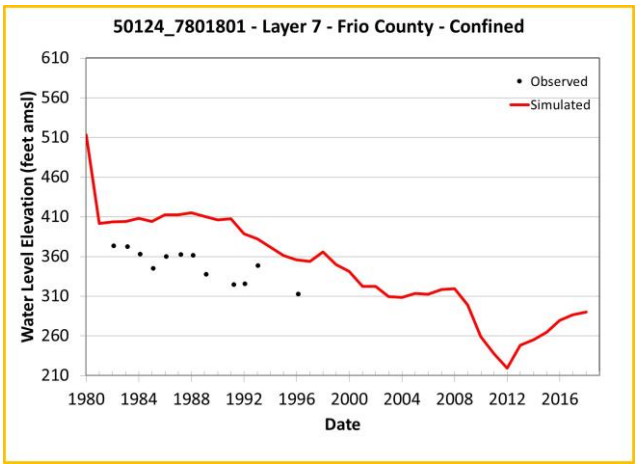












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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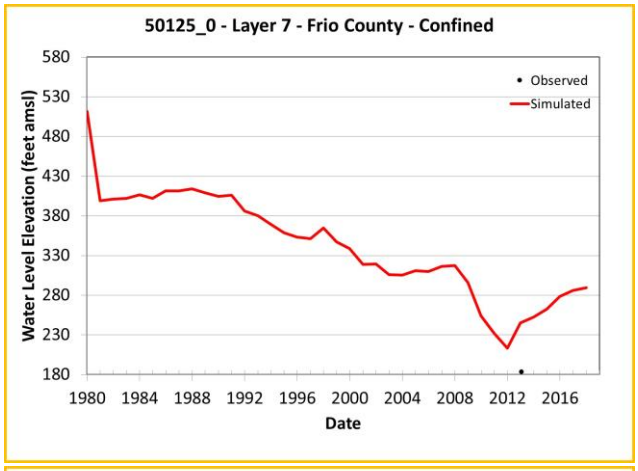
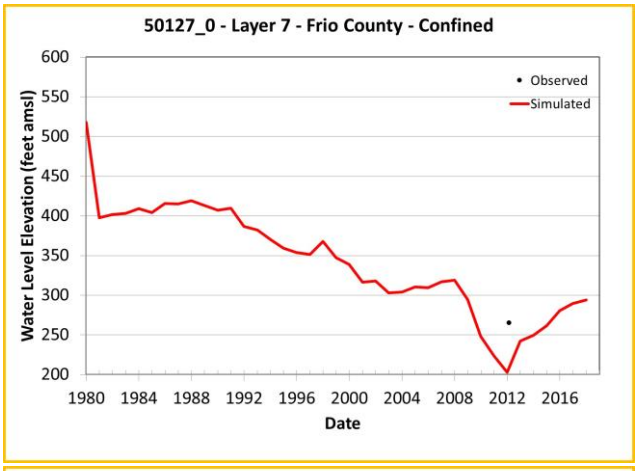
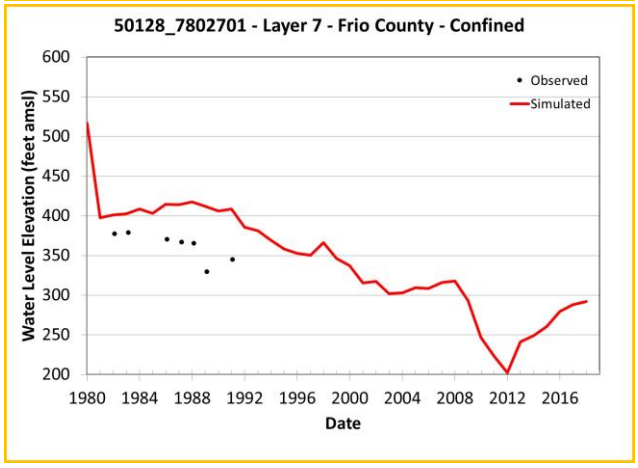
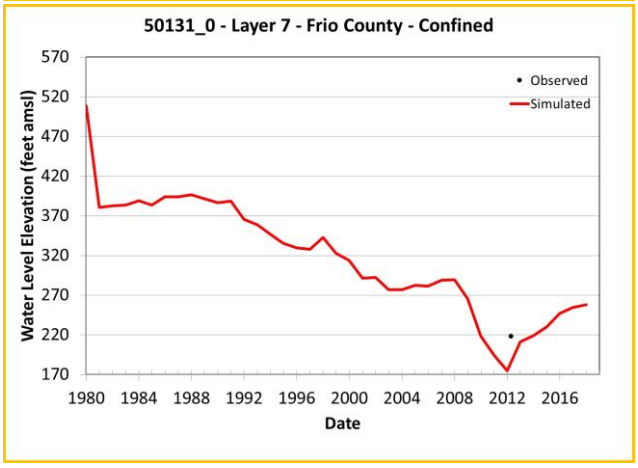
FIGURE I-8.3o

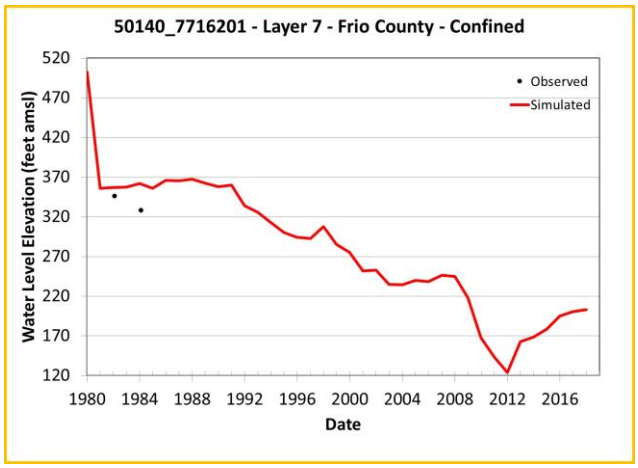
GSI ENVIRONMENTAL

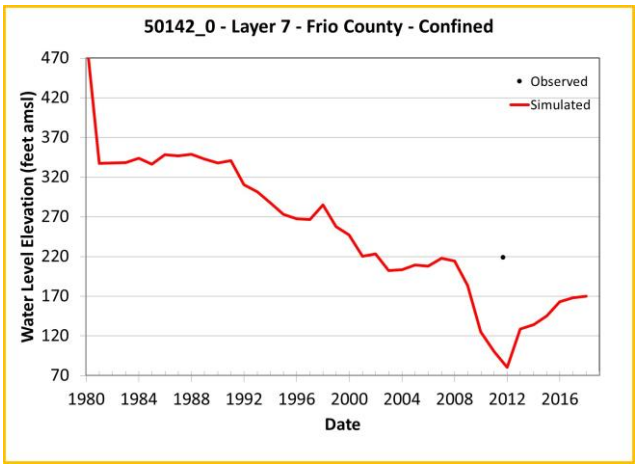












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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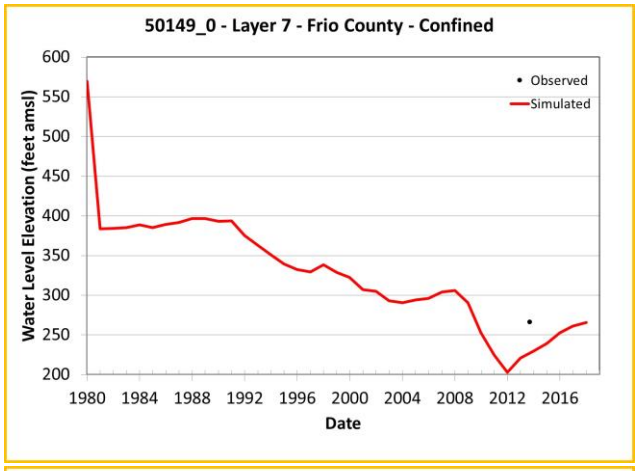
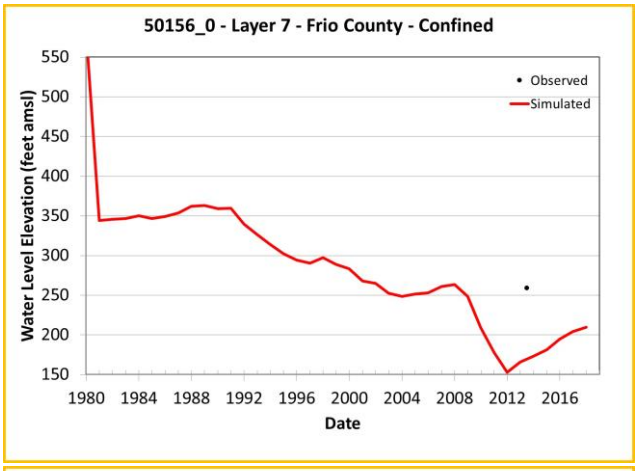
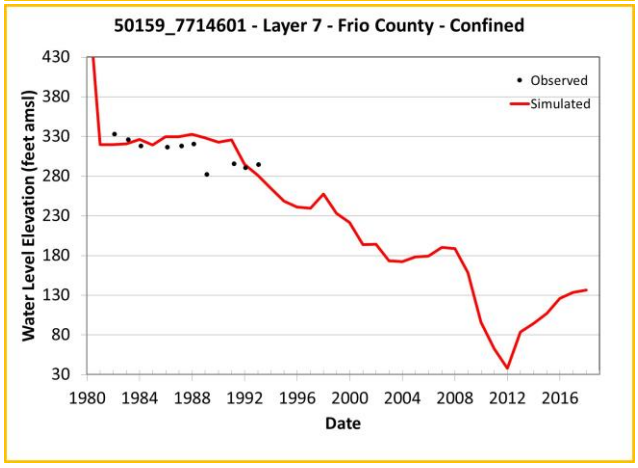
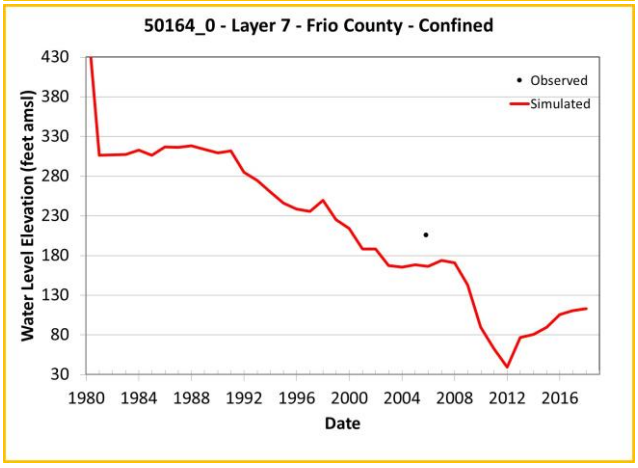
FIGURE I-8.3p

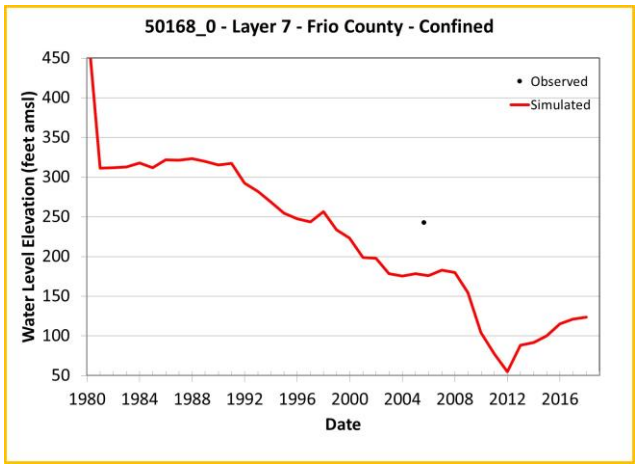
GSI ENVIRONMENTAL

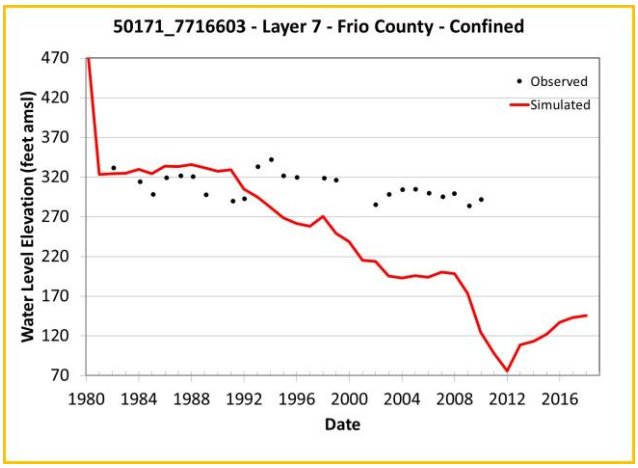












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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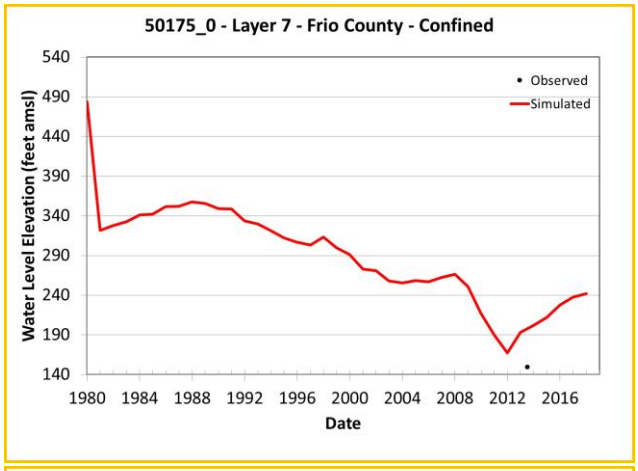
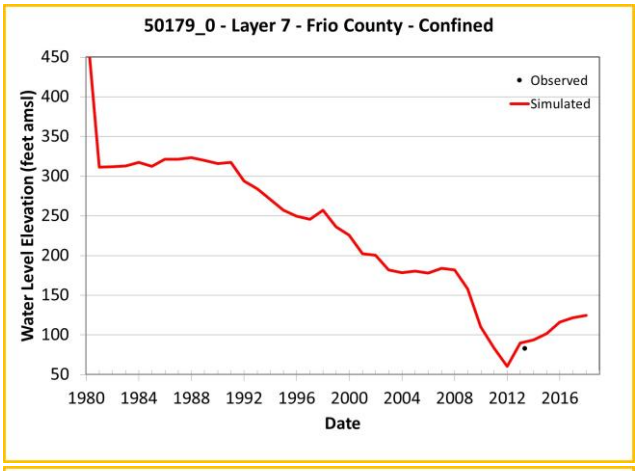
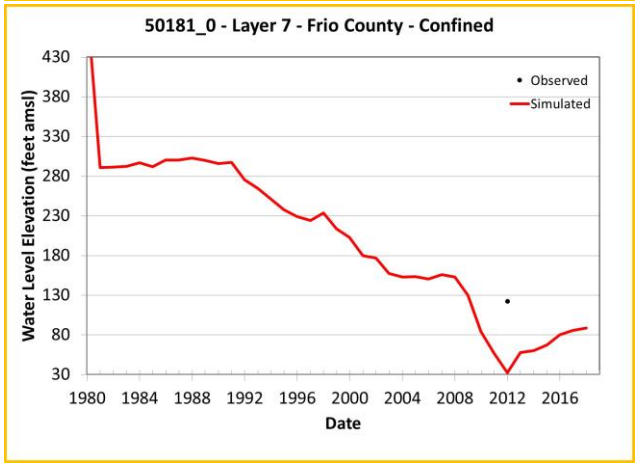
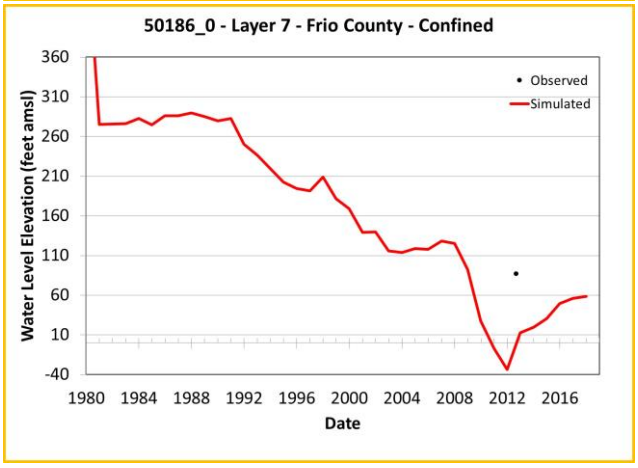
FIGURE I-8.3q

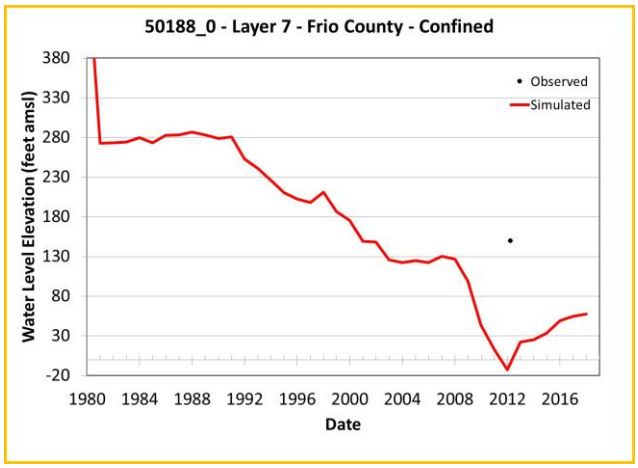
GSI ENVIRONMENTAL

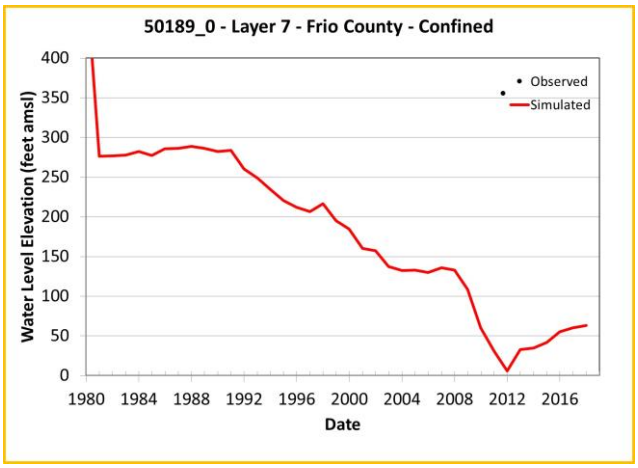












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

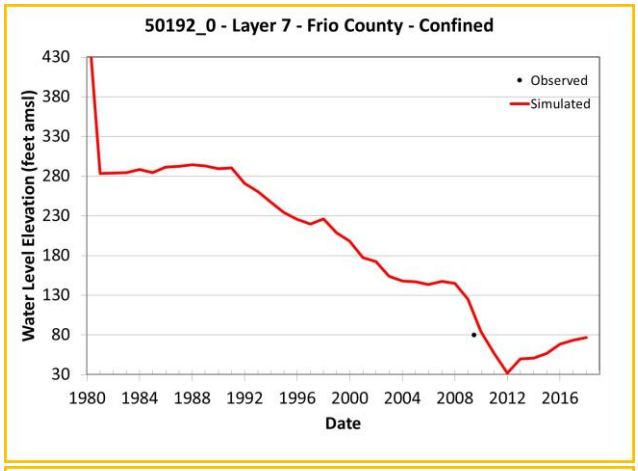
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

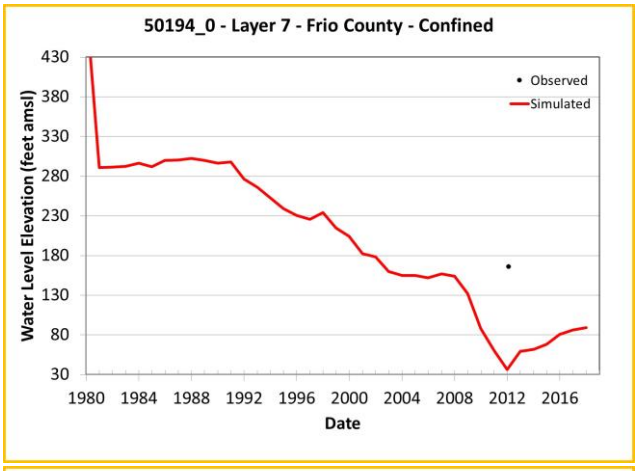
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

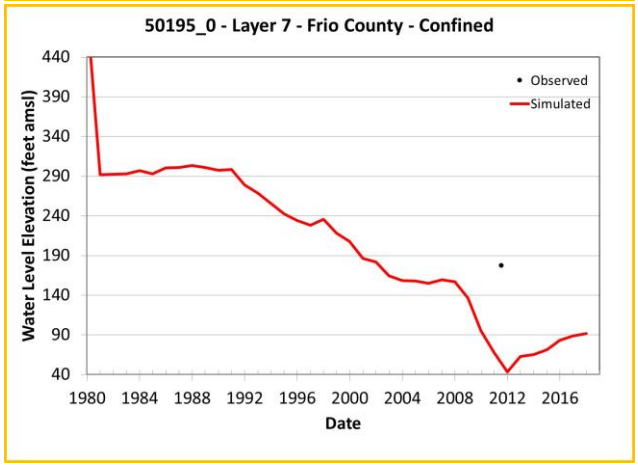
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

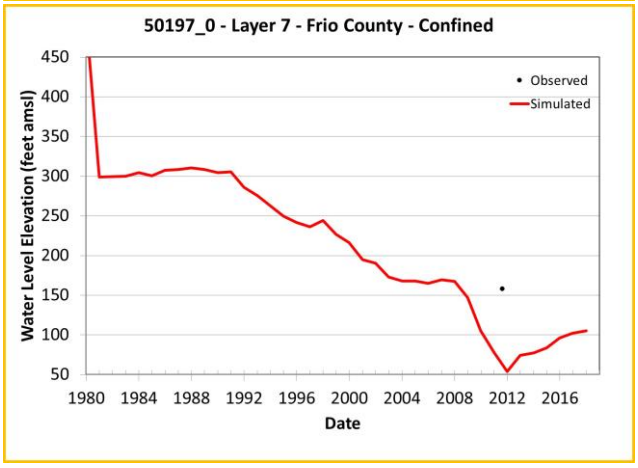
FIGURE I-8.3r

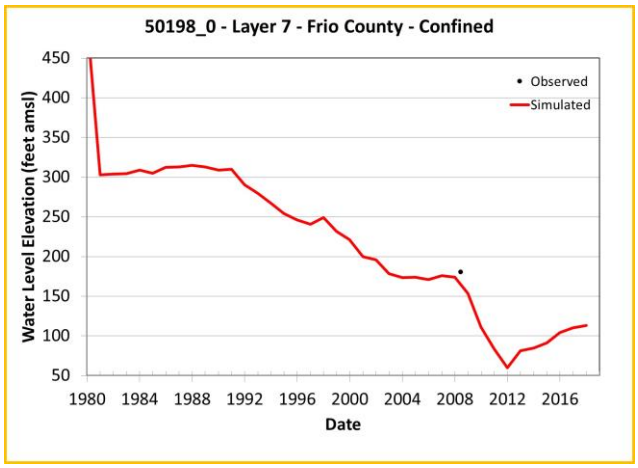
GSI ENVIRONMENTAL

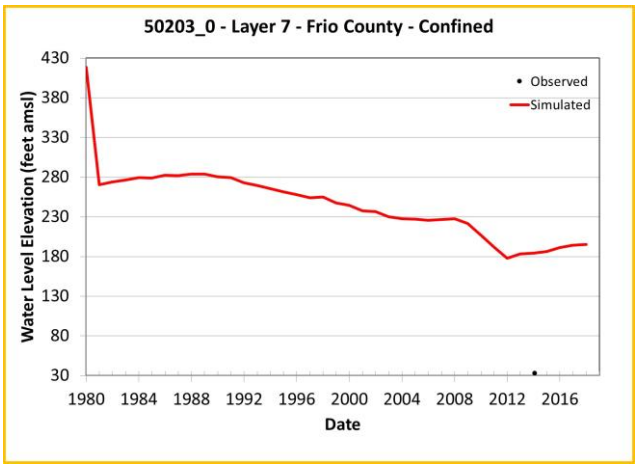












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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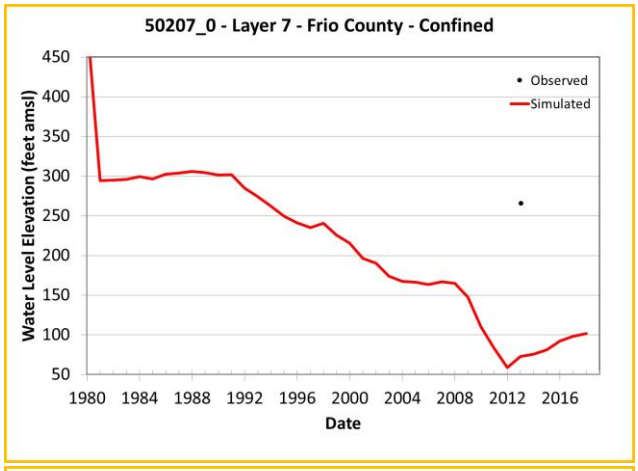
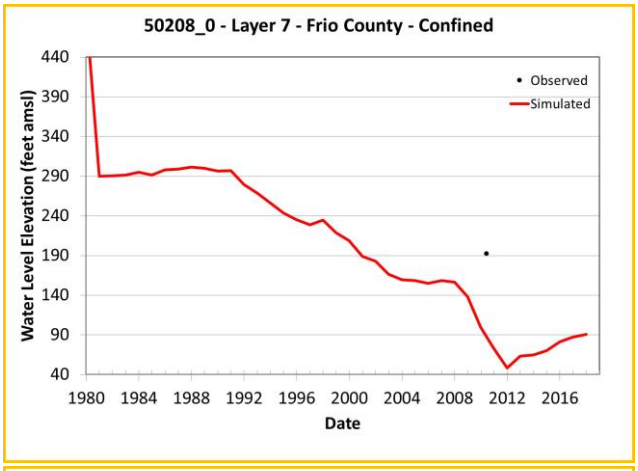
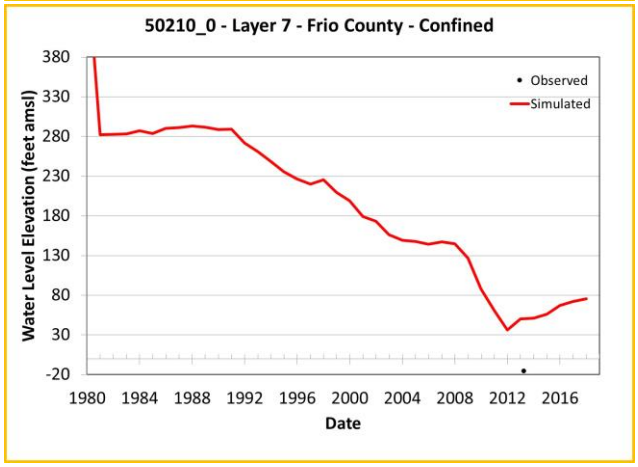
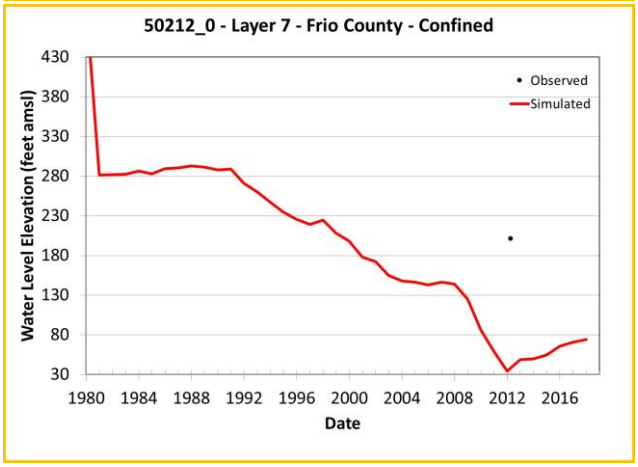
FIGURE I-8.3s

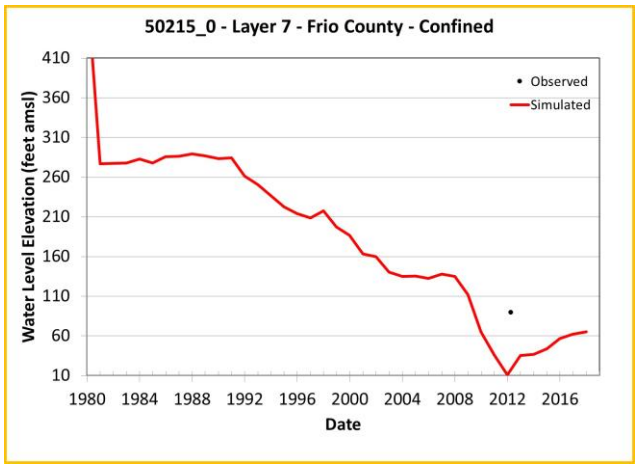
GSI ENVIRONMENTAL

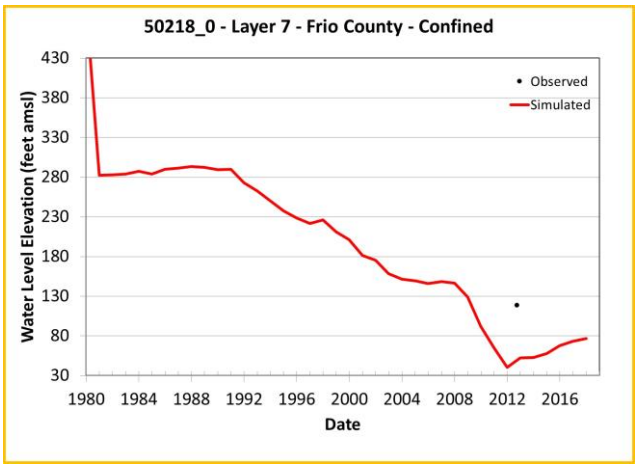












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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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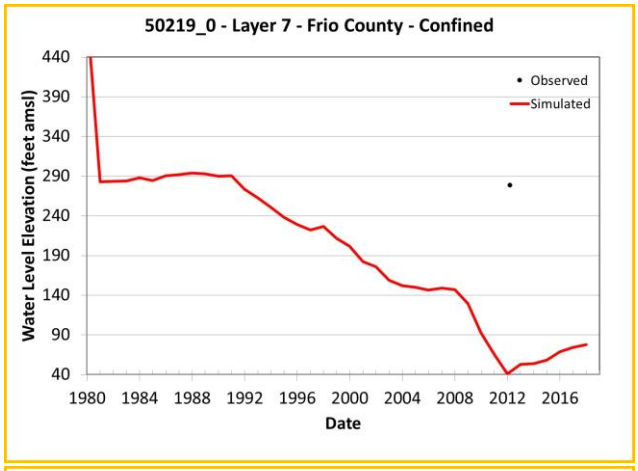
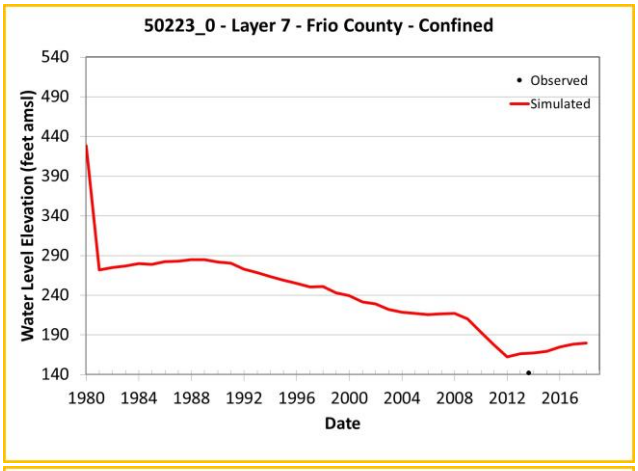
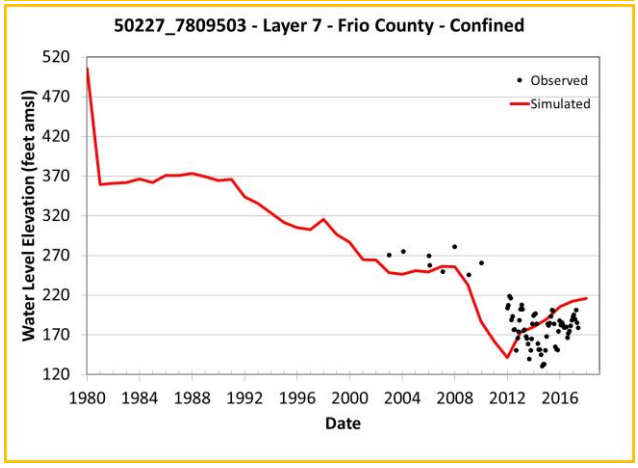
Revised		Aprv'd by	SP

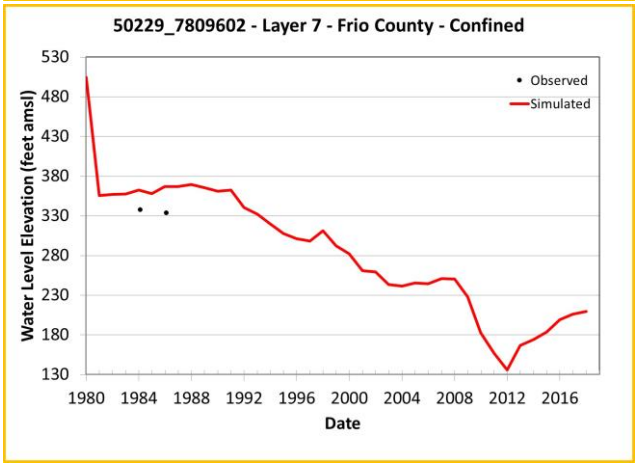
FIGURE I-8.3t

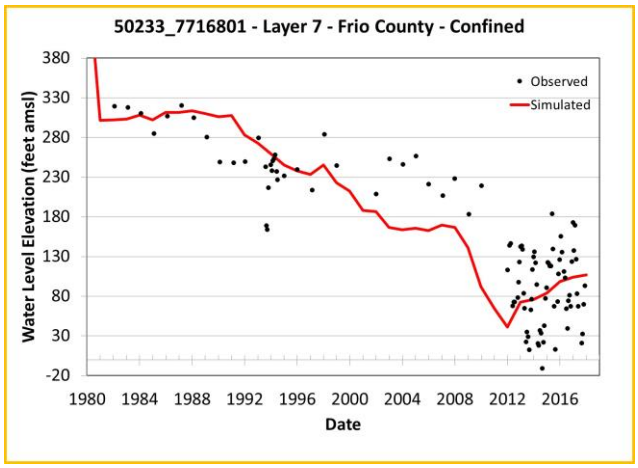
GSI ENVIRONMENTAL

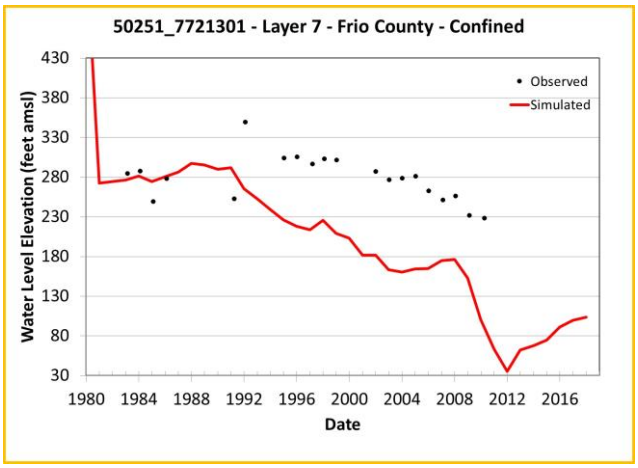












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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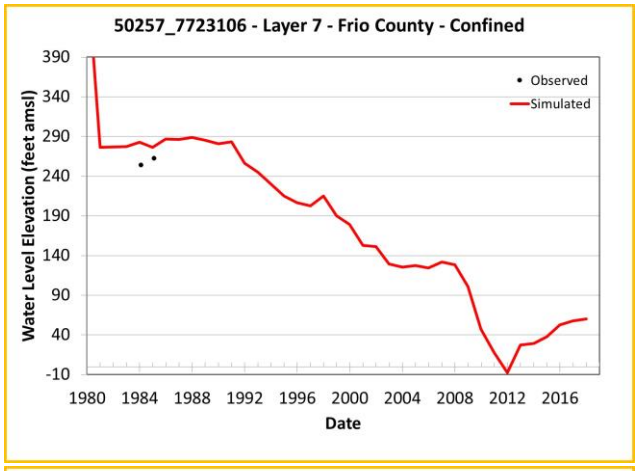
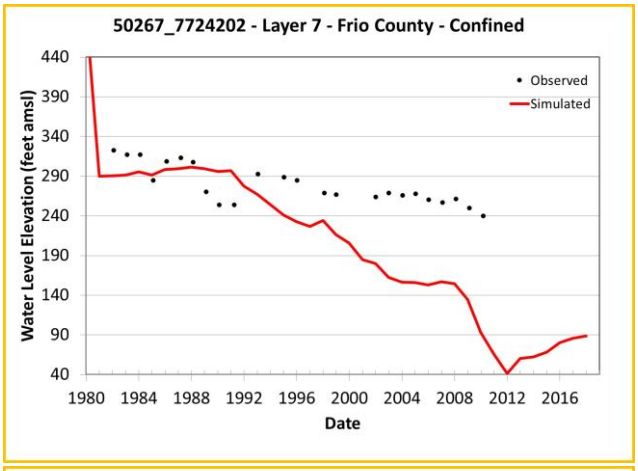
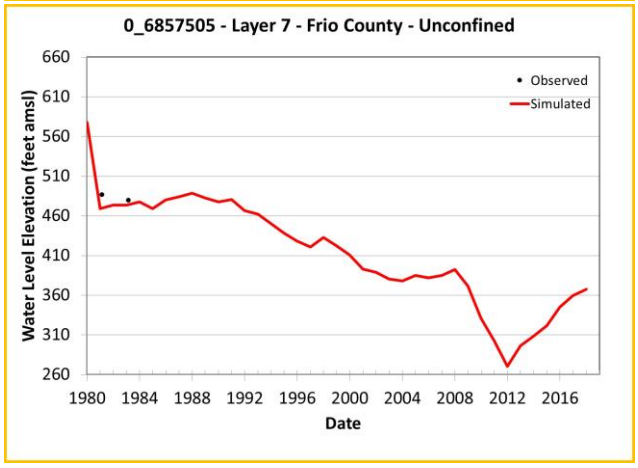
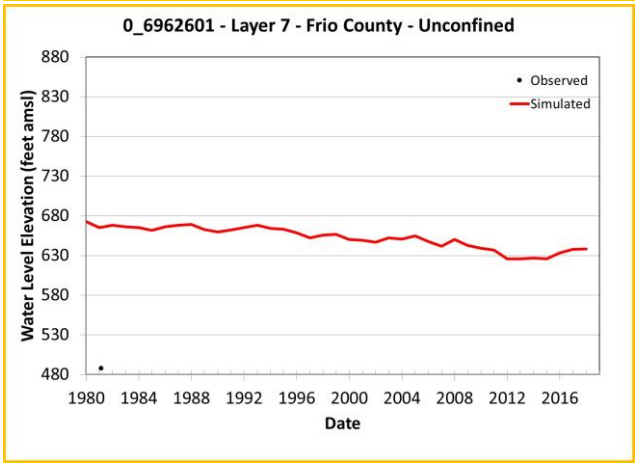
FIGURE I-8.3u

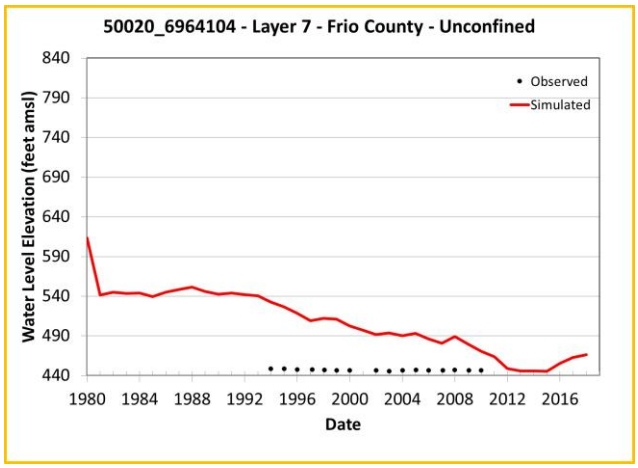
GSI ENVIRONMENTAL











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Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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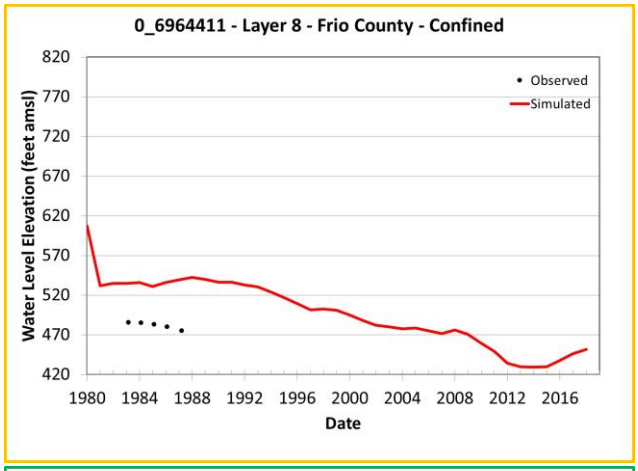
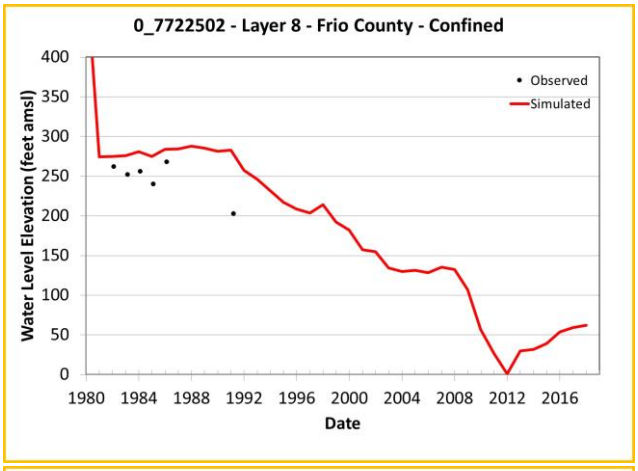
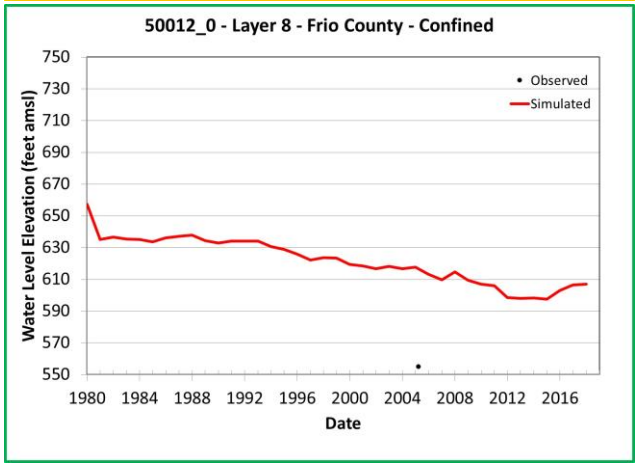
Revised		Aprv'd by	SP

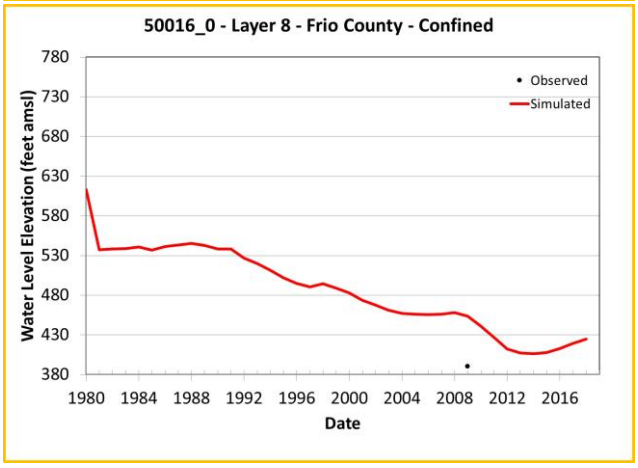
FIGURE I-8.3v

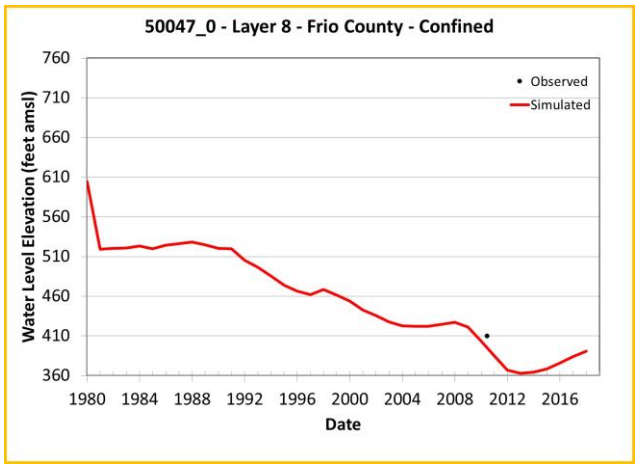
GSI ENVIRONMENTAL

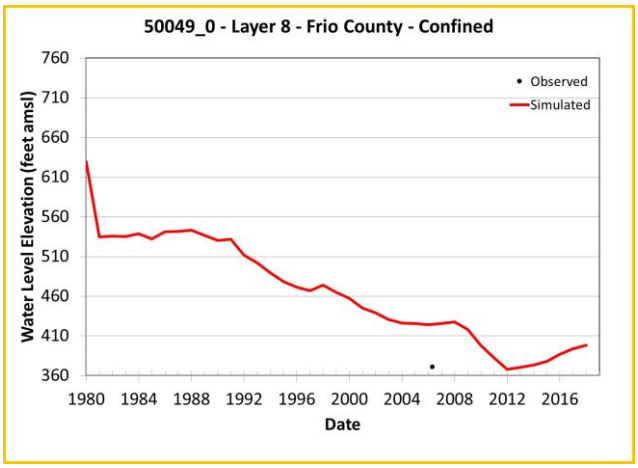












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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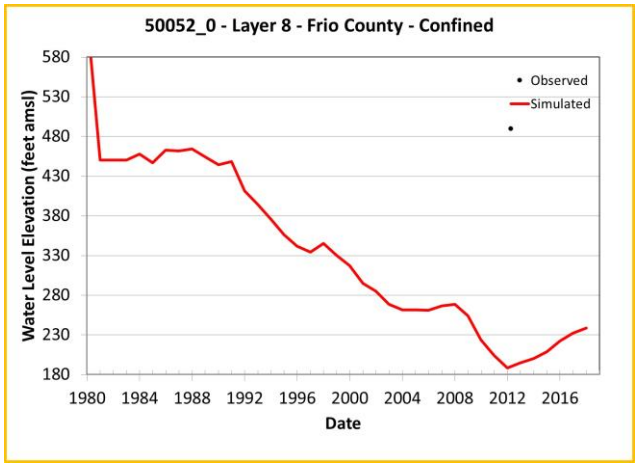
Revised		Aprv'd by	SP

FIGURE I-8.4a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

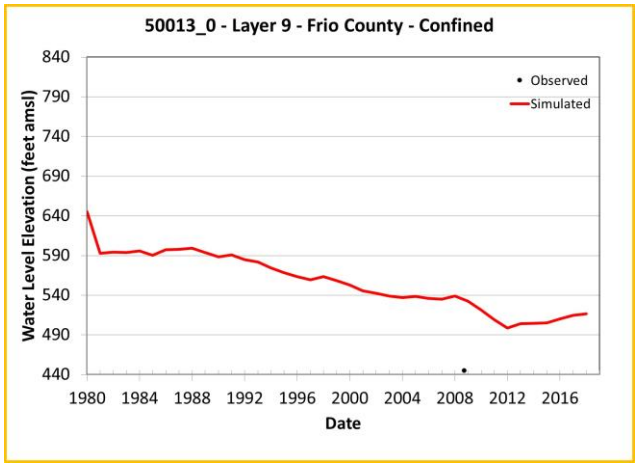
Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-8.4b

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Frio County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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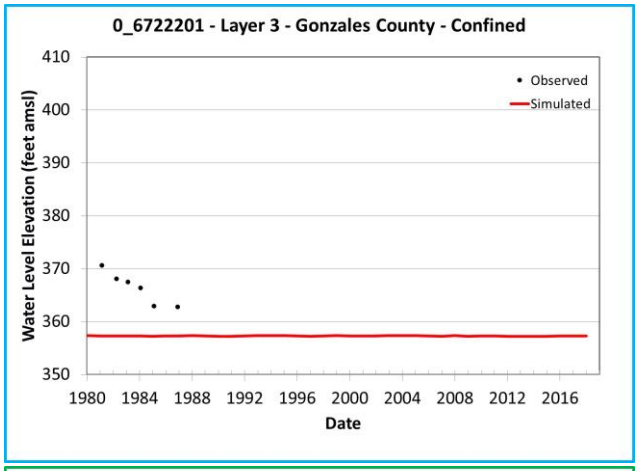
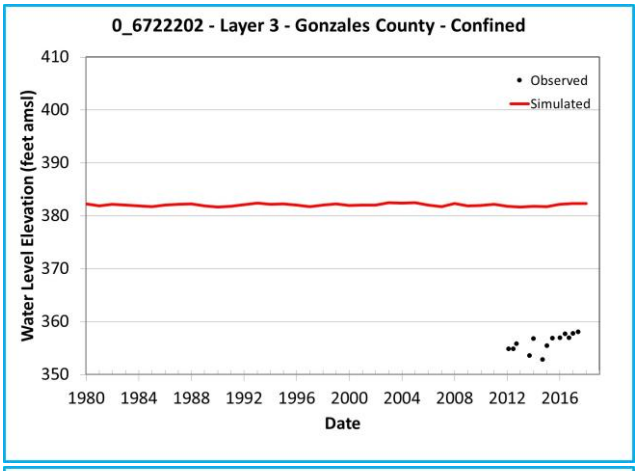
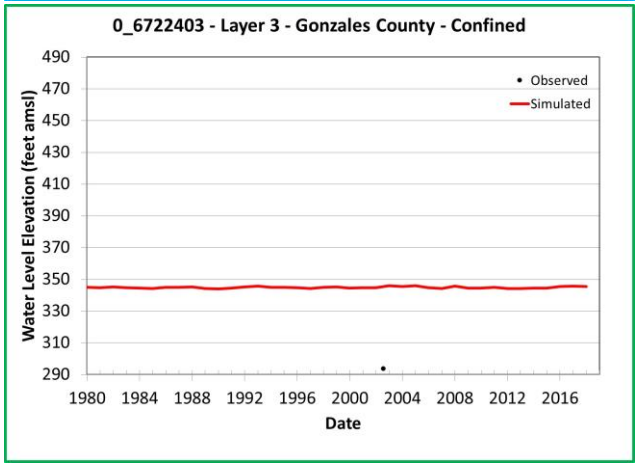
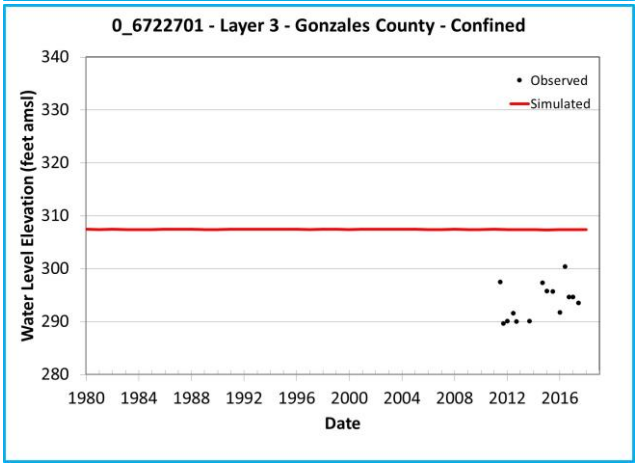
FIGURE I-8.5a

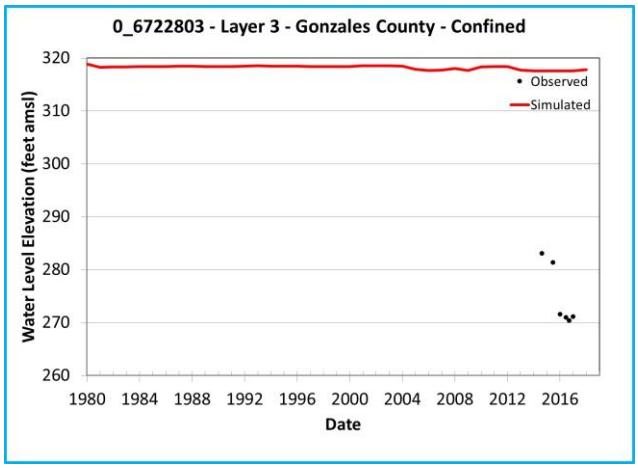
GSI ENVIRONMENTAL

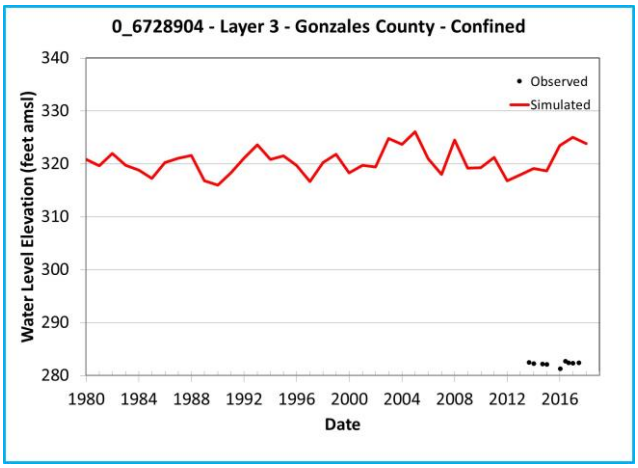












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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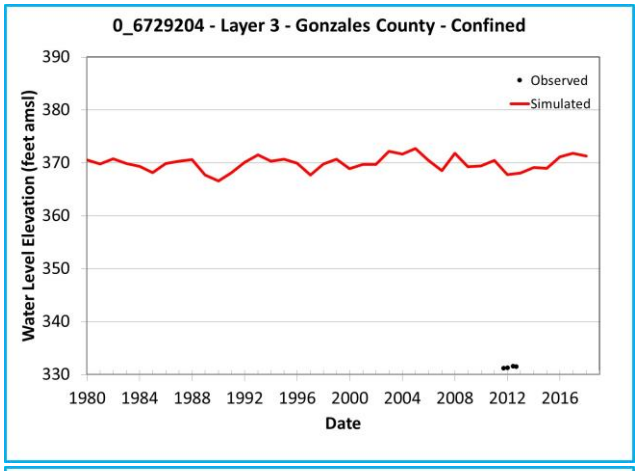
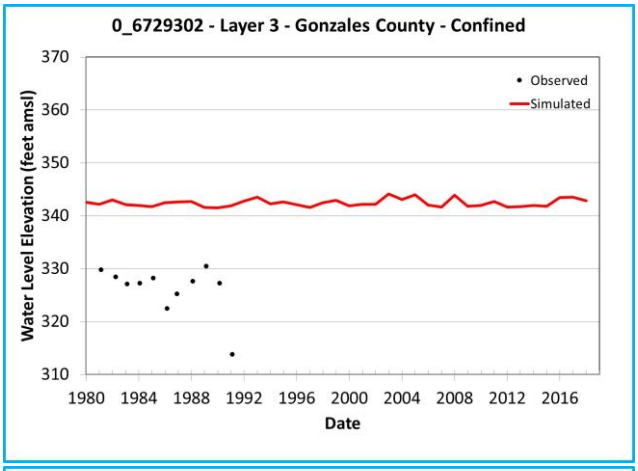
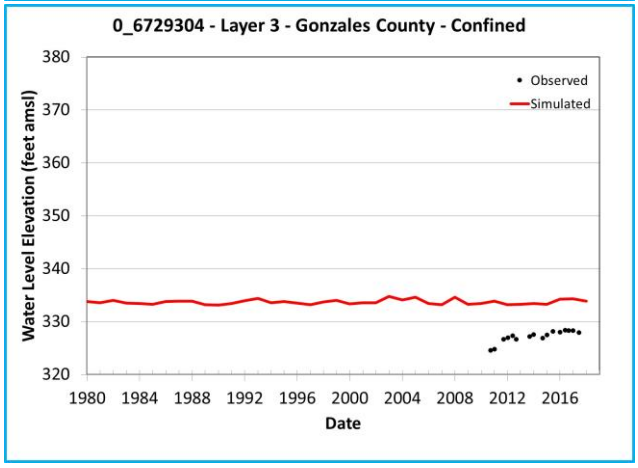
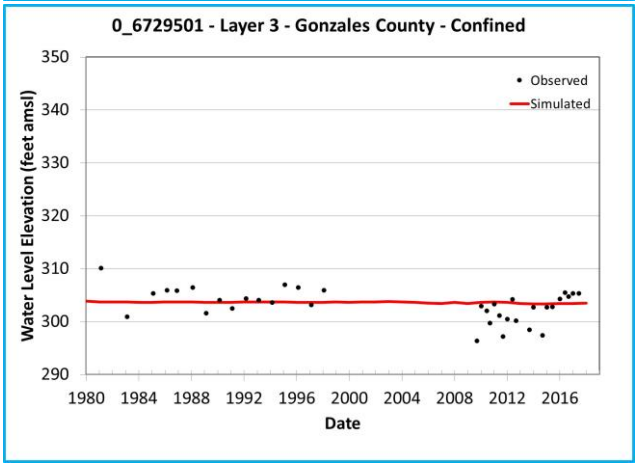
FIGURE I-9.1a

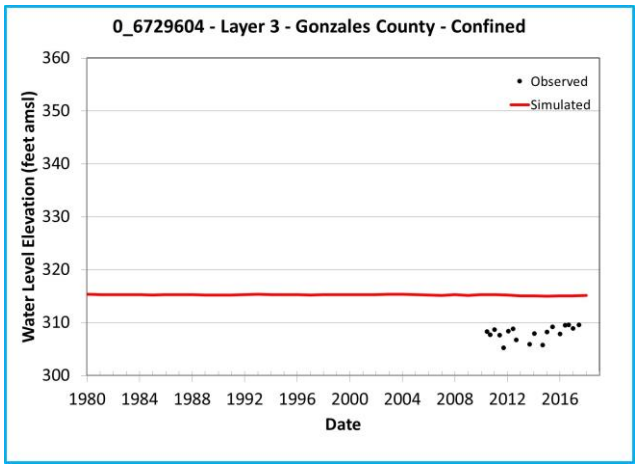
GSI ENVIRONMENTAL

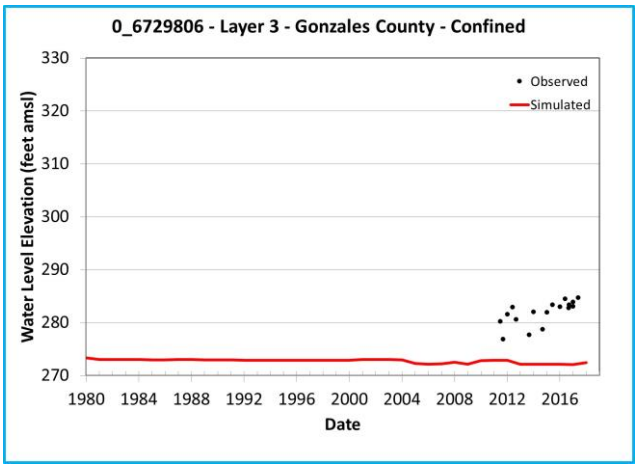












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

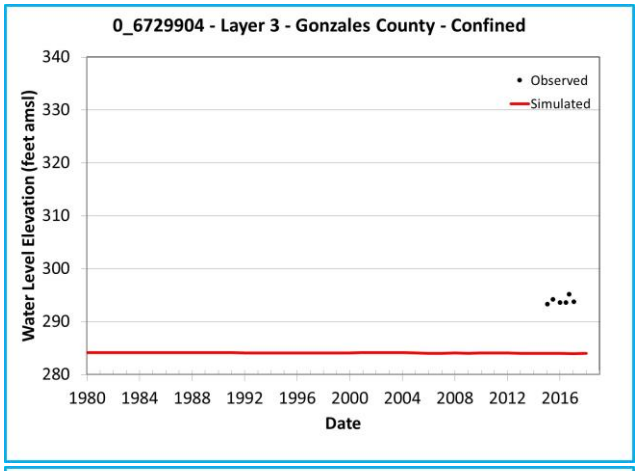
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

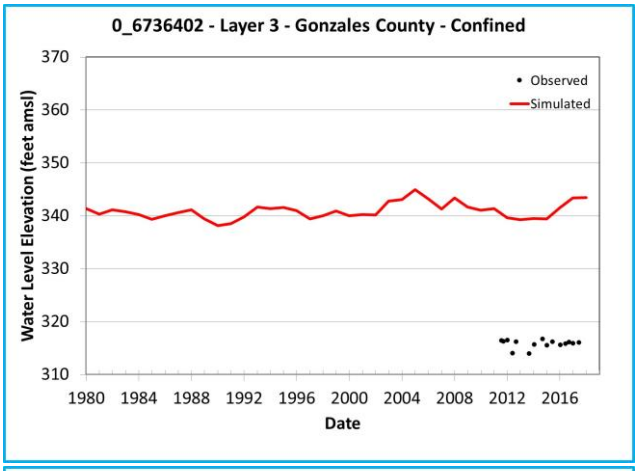
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

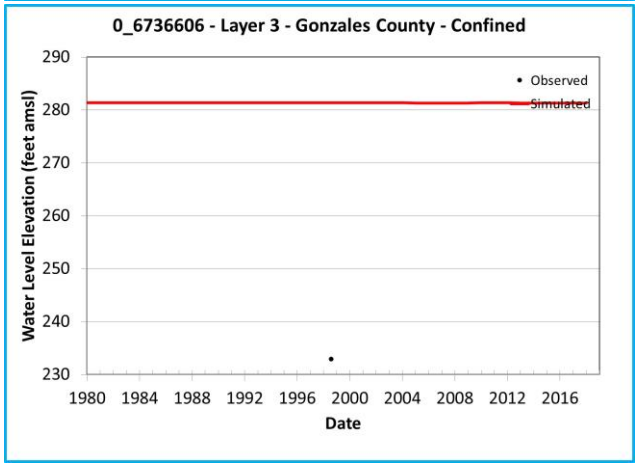
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

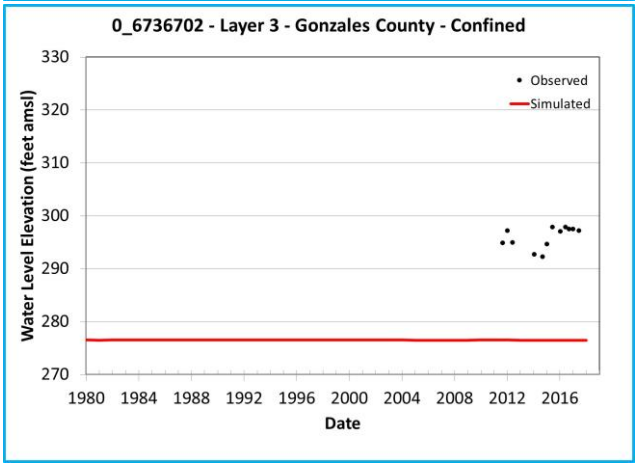
FIGURE I-9.1b

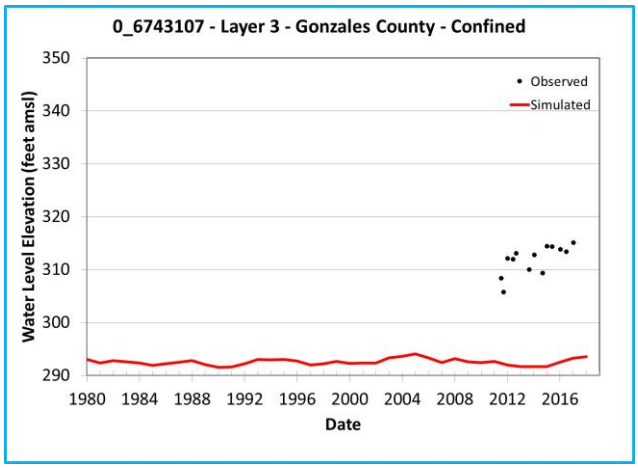
GSI ENVIRONMENTAL

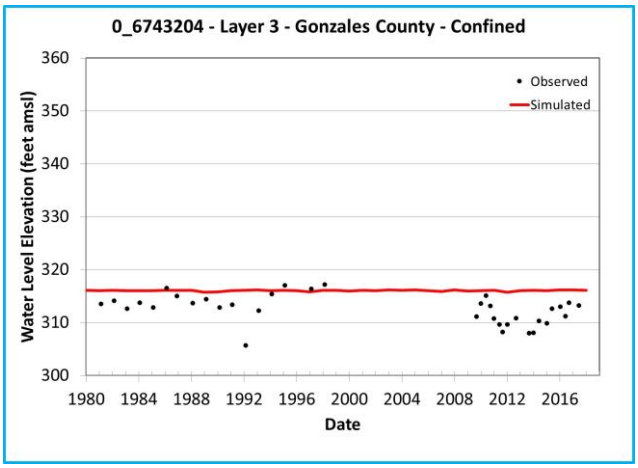












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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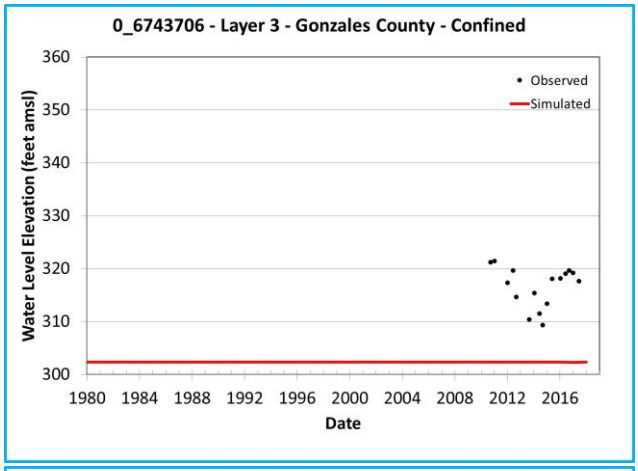
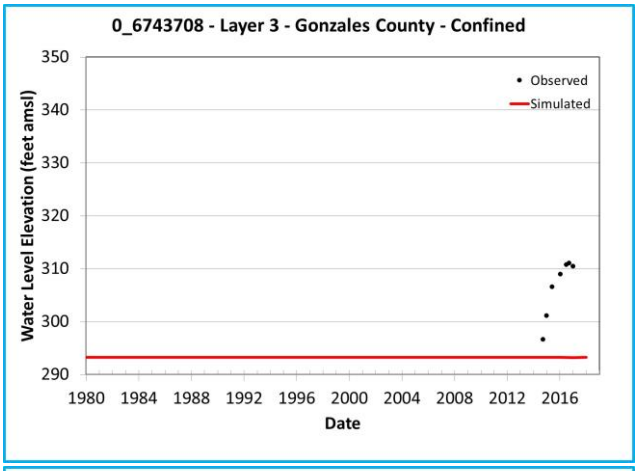
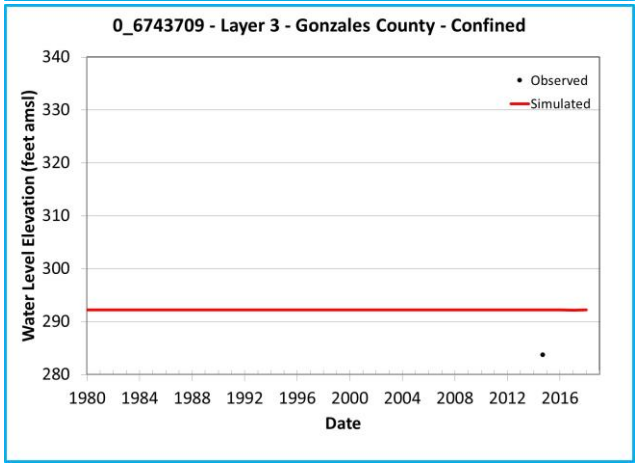
Revised		Aprv'd by	SP

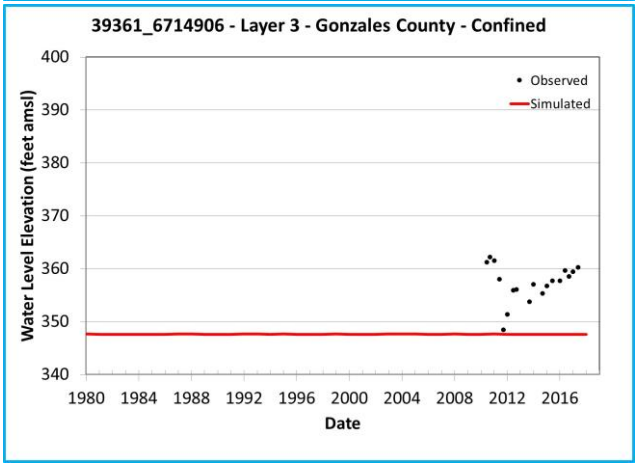
FIGURE I-9.1c

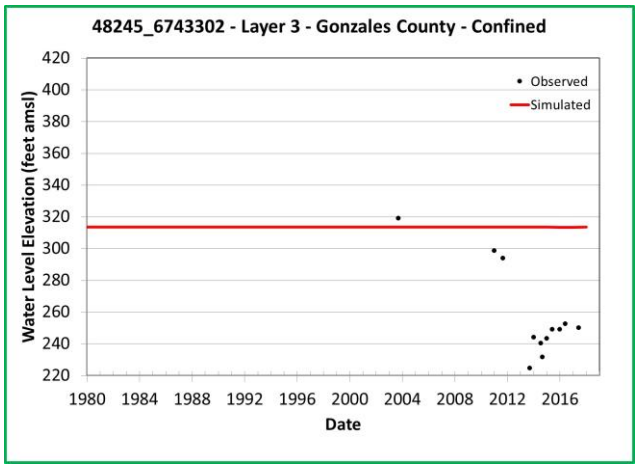
GSI ENVIRONMENTAL

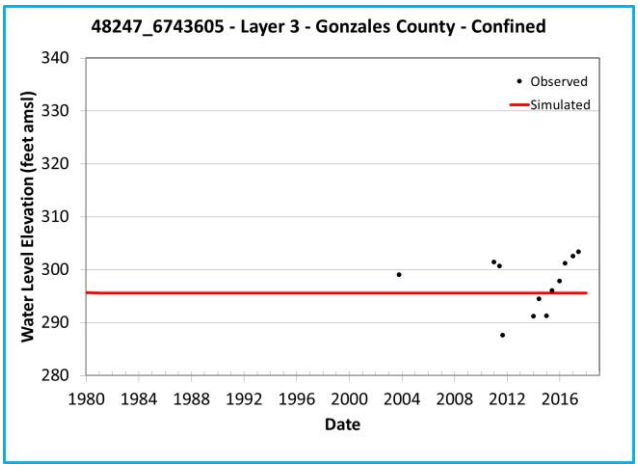












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

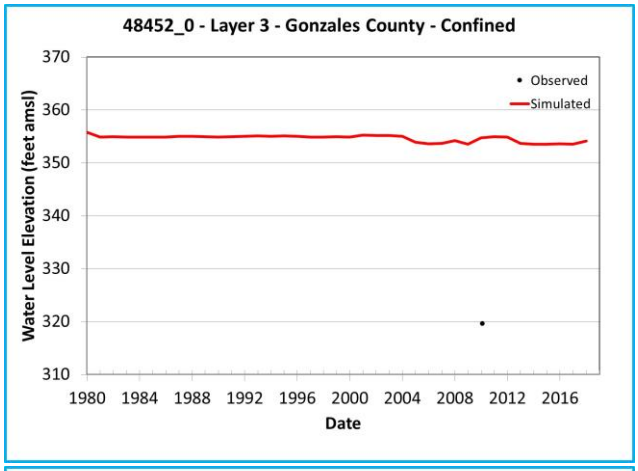
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

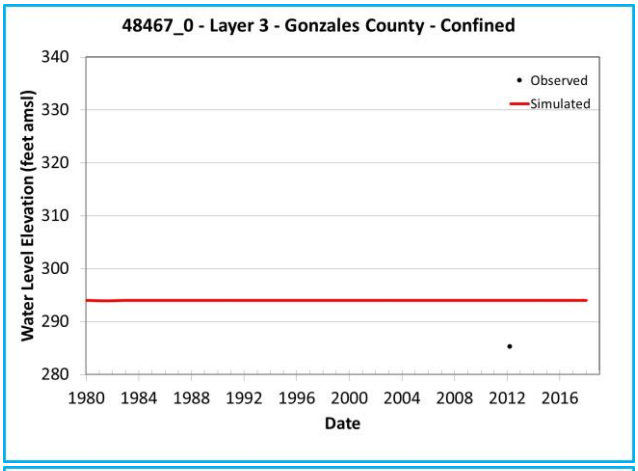
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

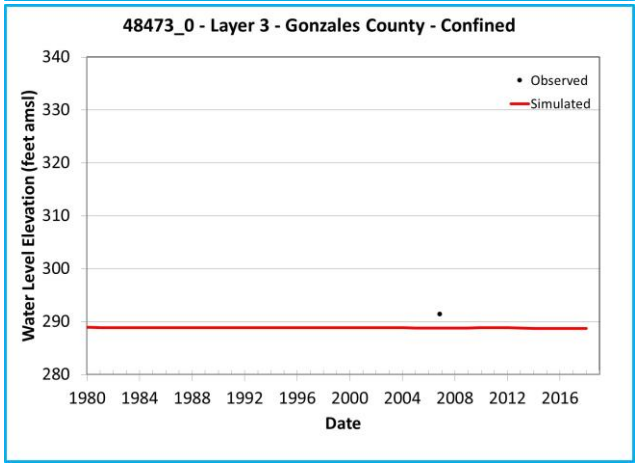
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

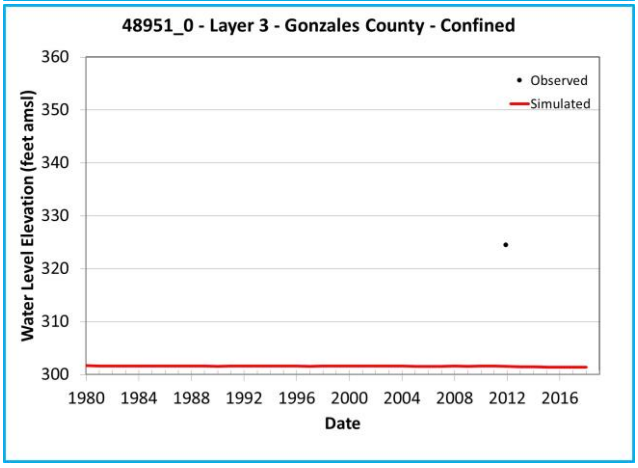
FIGURE I-9.1d

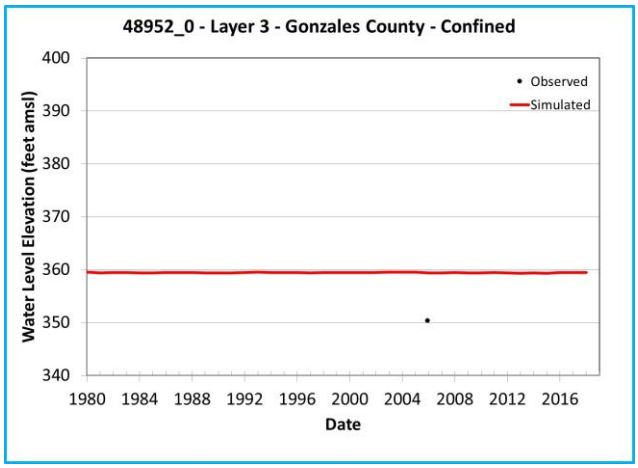
GSI ENVIRONMENTAL

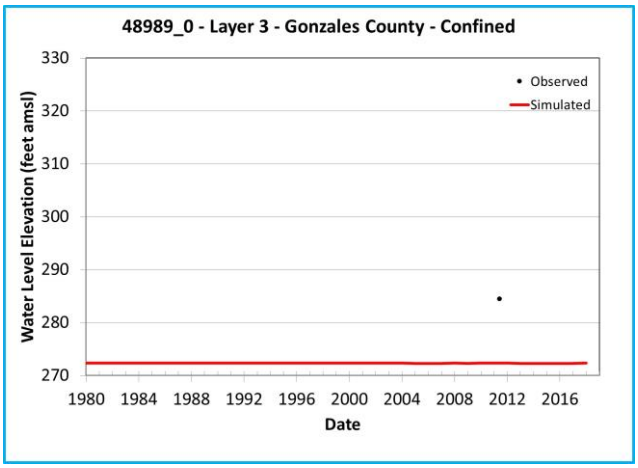












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

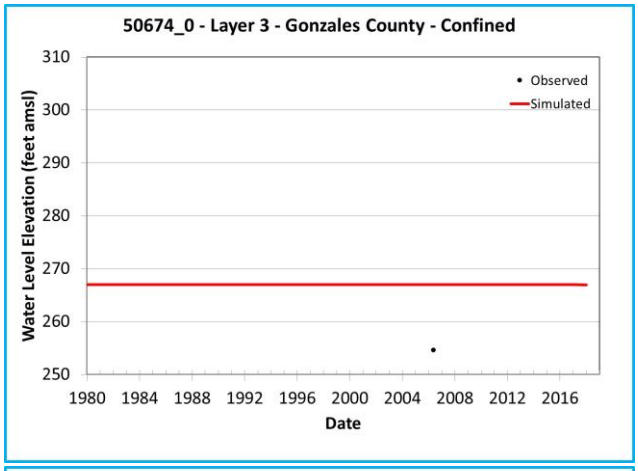
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

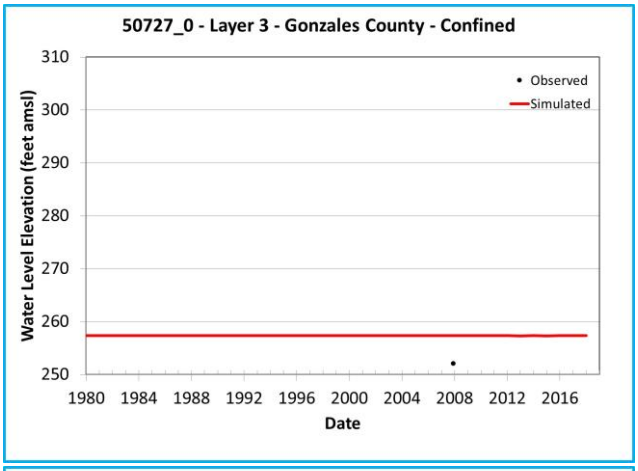
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

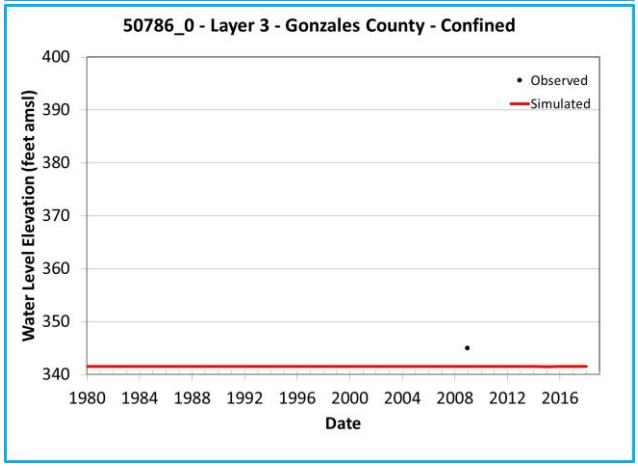
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

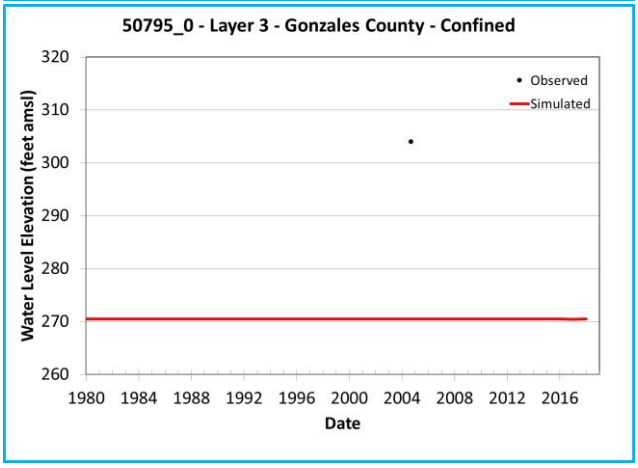
FIGURE I-9.1e

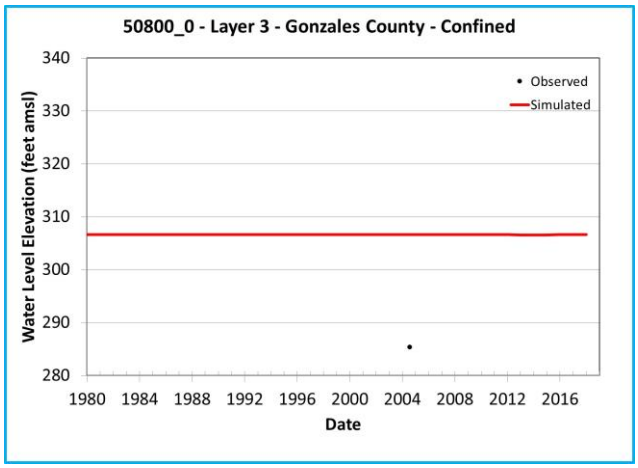
GSI ENVIRONMENTAL

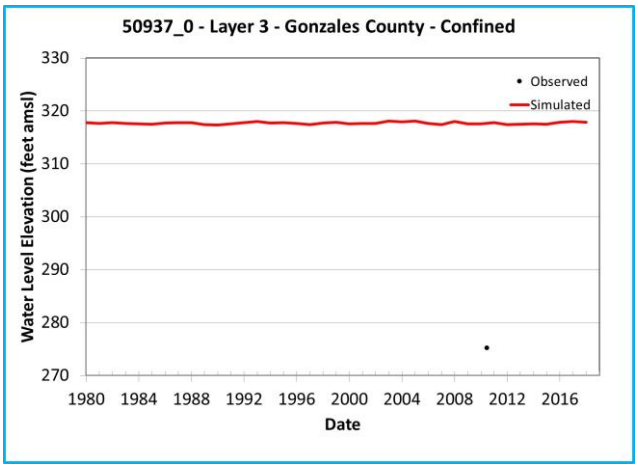












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

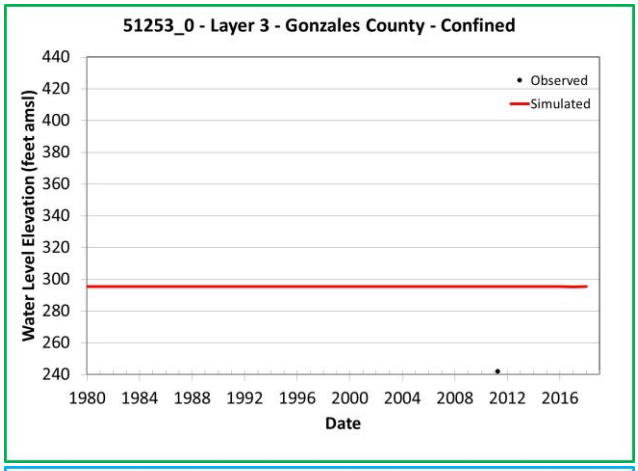
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

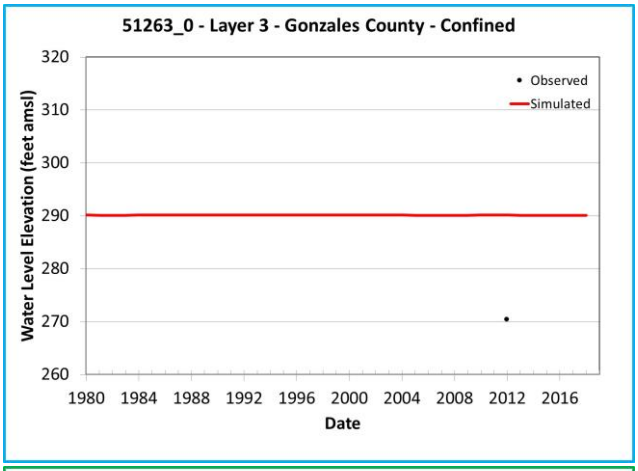
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

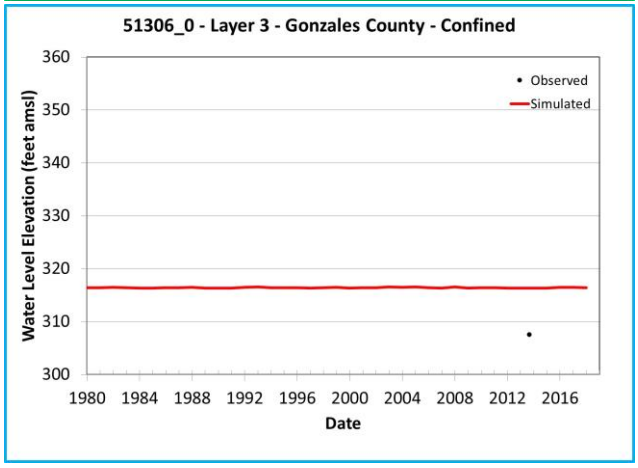
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

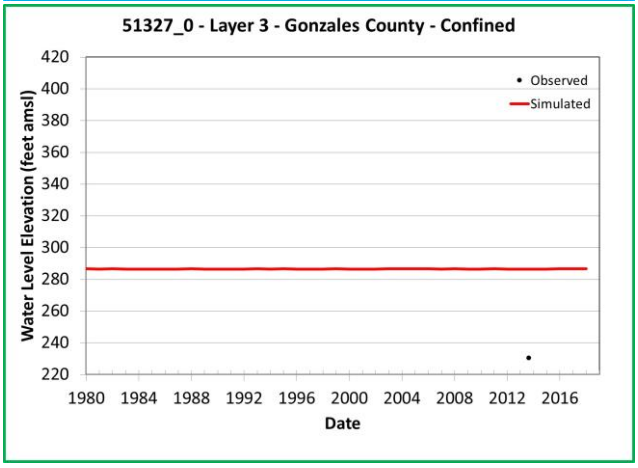
FIGURE I-9.1f

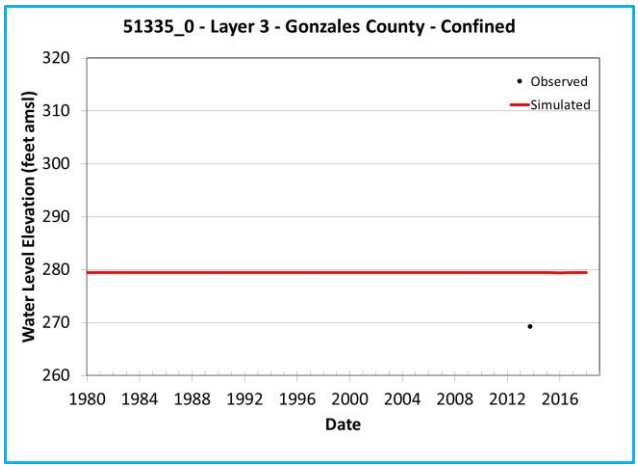
GSI ENVIRONMENTAL

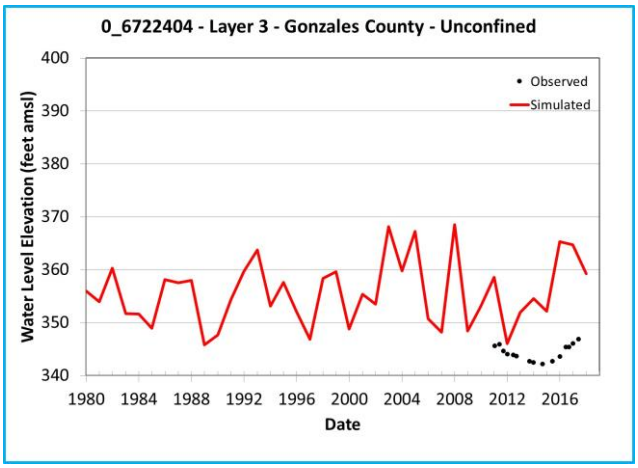












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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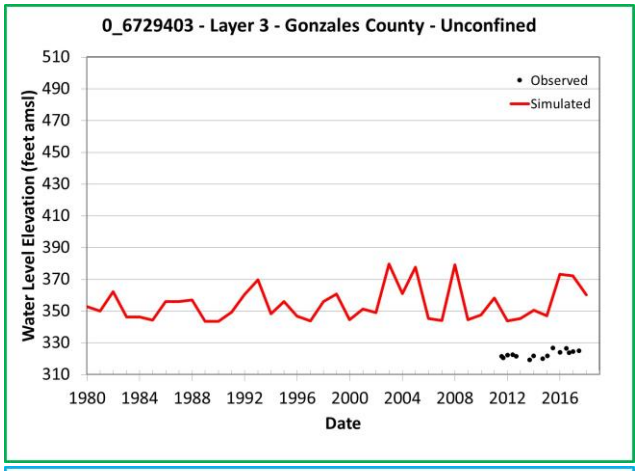
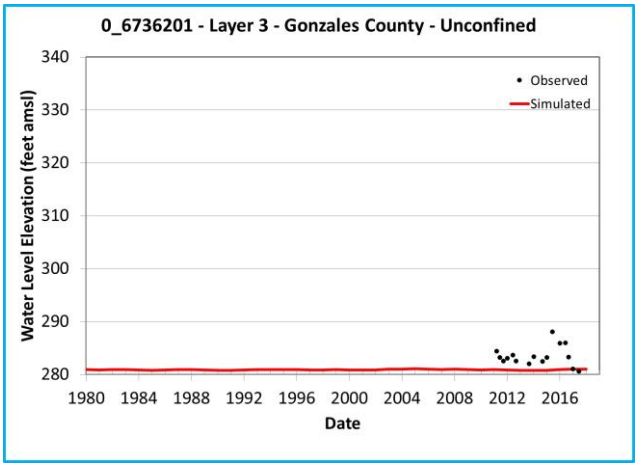
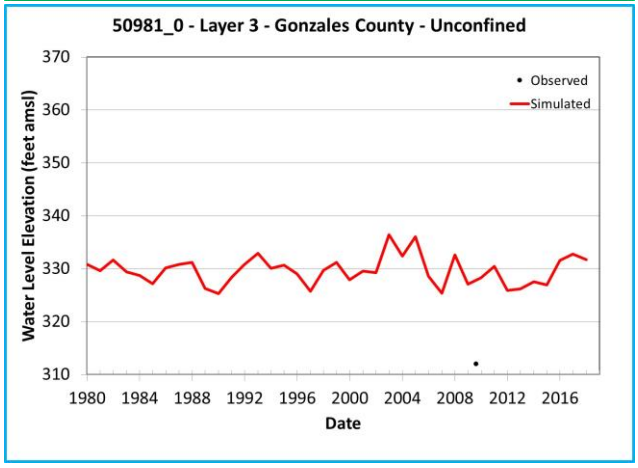
Revised		Aprv'd by	SP

FIGURE I-9.1g

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.

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Blue = 60 feet

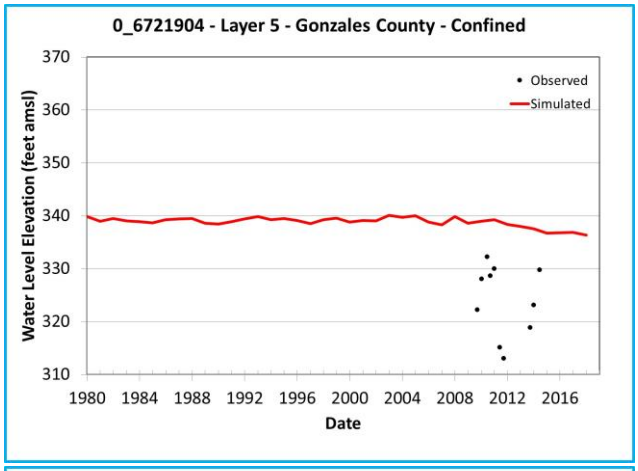
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 3

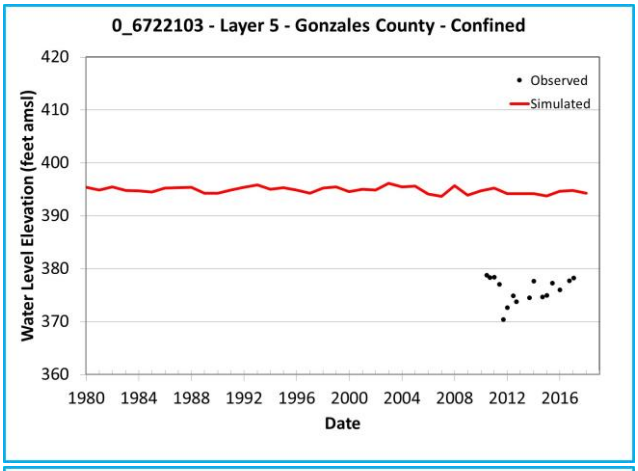
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

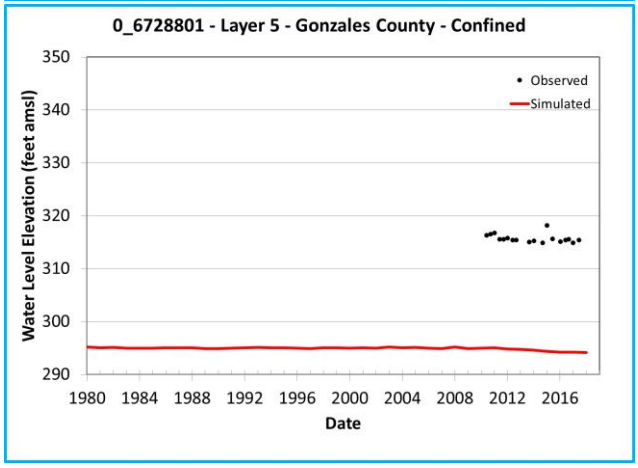
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

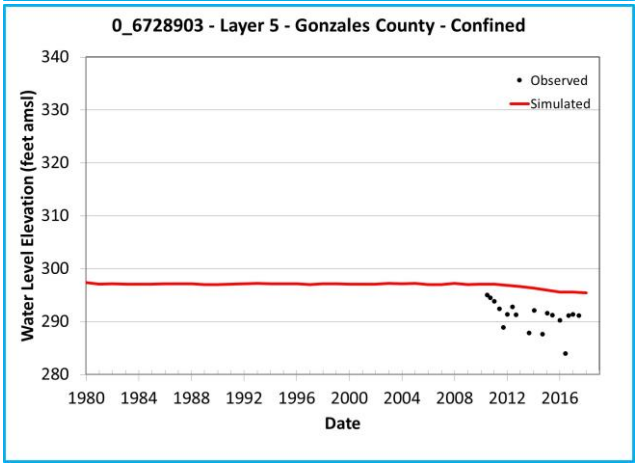
FIGURE I-9.1h

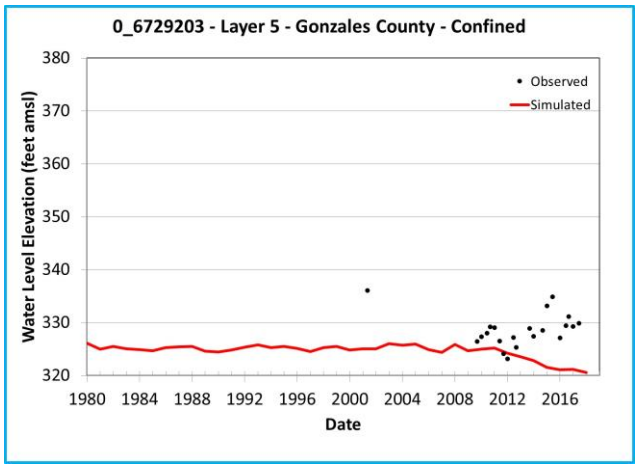
GSI ENVIRONMENTAL

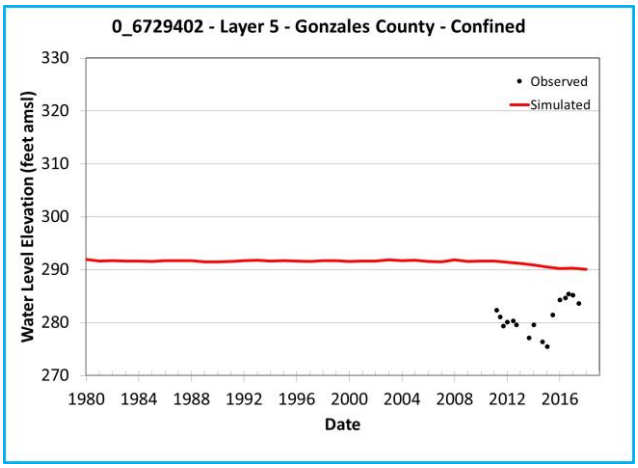












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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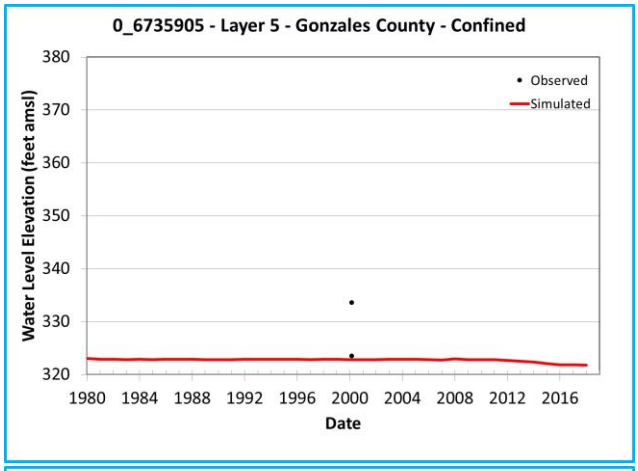
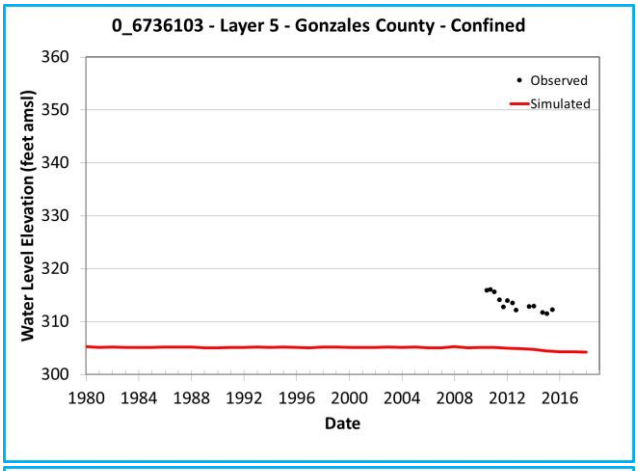
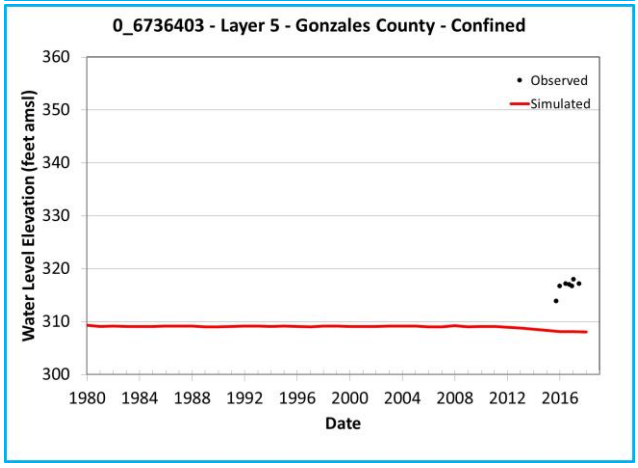
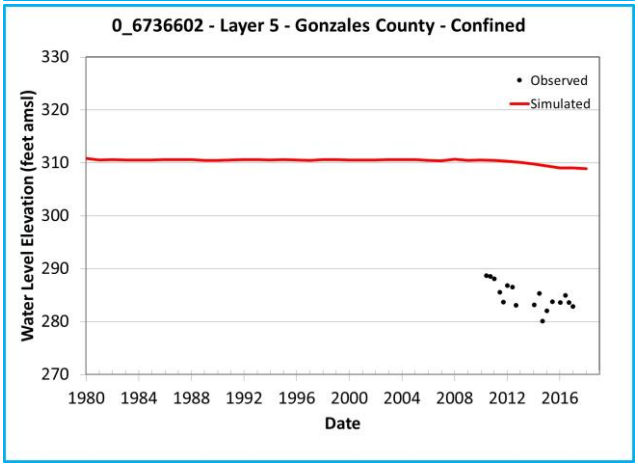
FIGURE I-9.2a

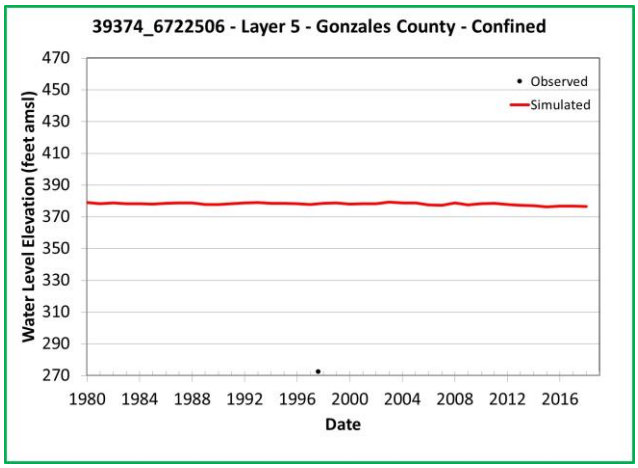
GSI ENVIRONMENTAL

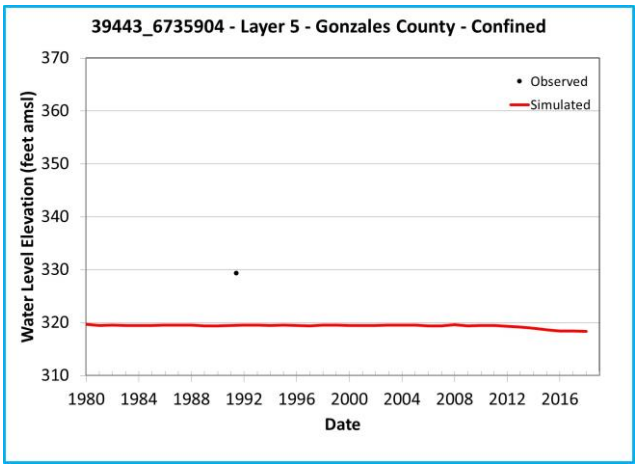












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

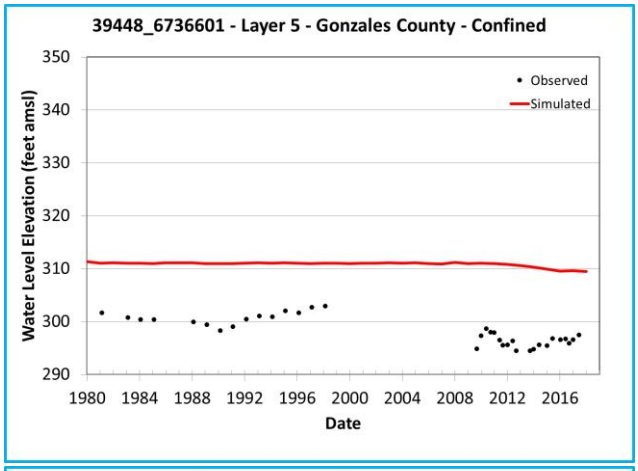
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

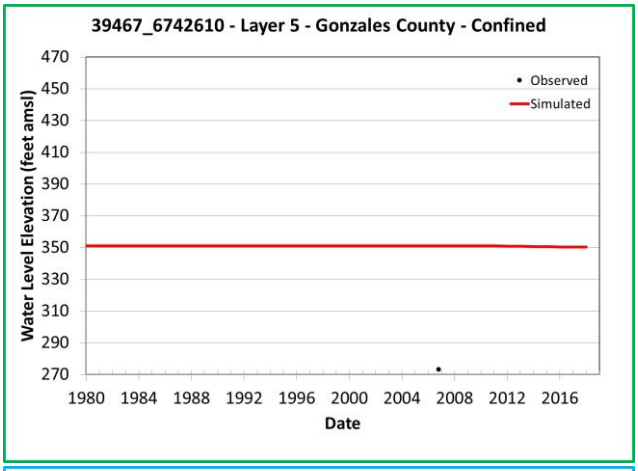
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

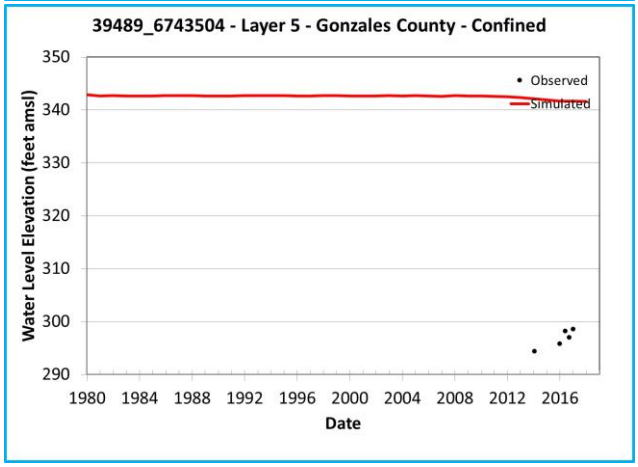
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

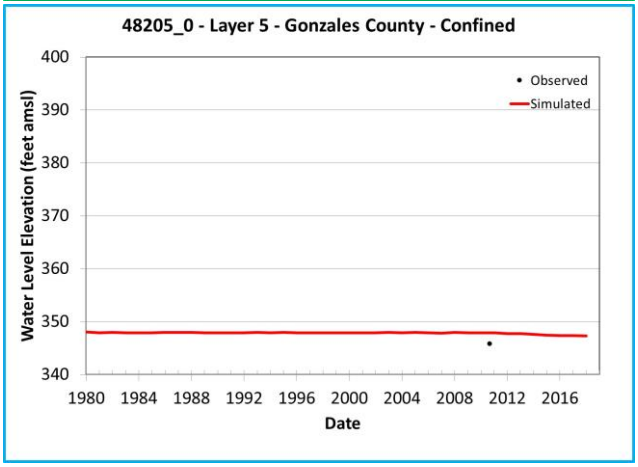
FIGURE I-9.2b

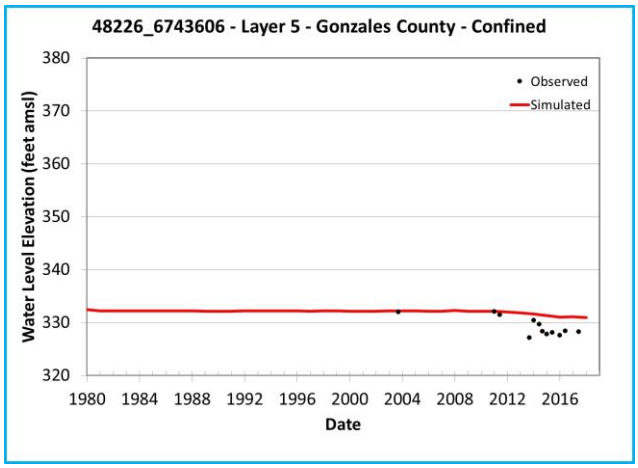
GSI ENVIRONMENTAL

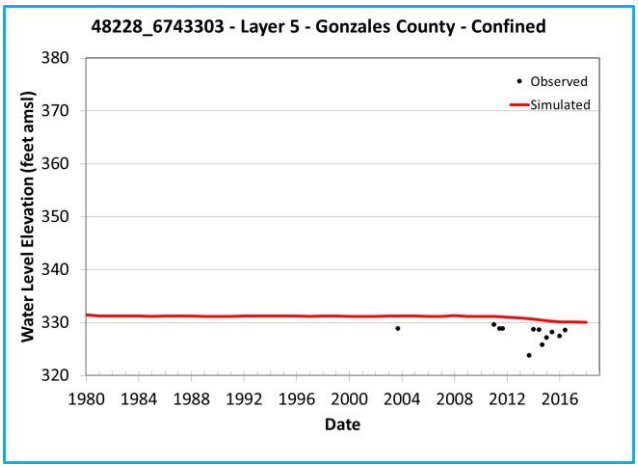












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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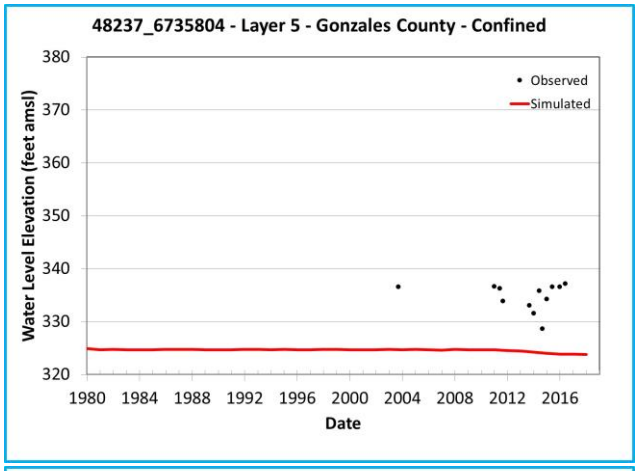
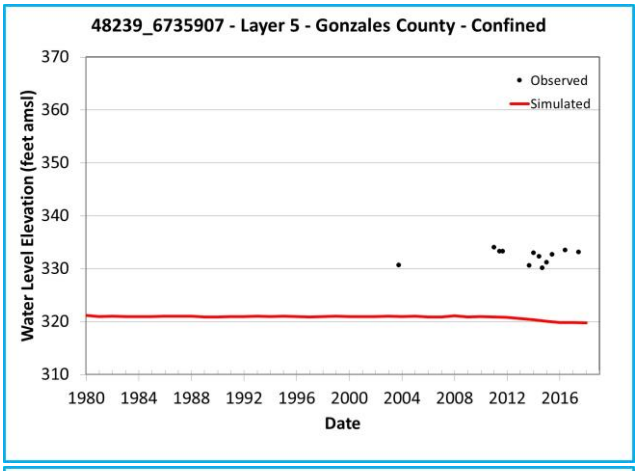
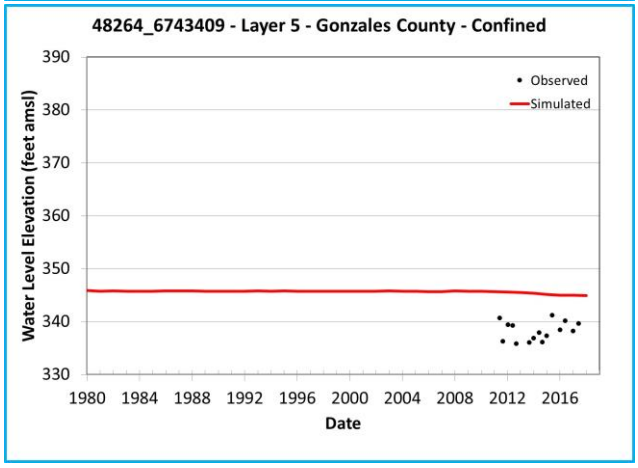
Revised		Aprv'd by	SP

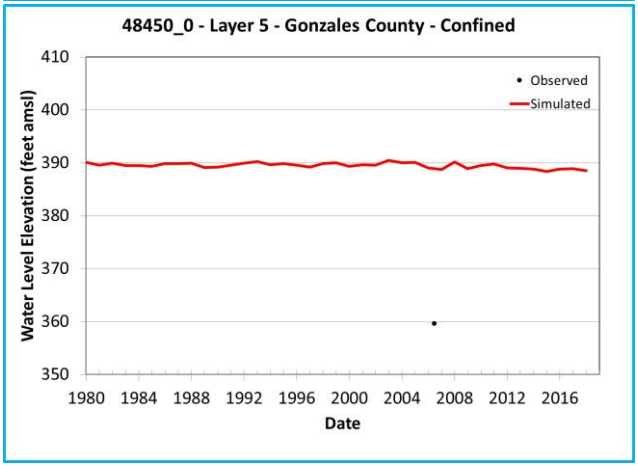
FIGURE I-9.2c

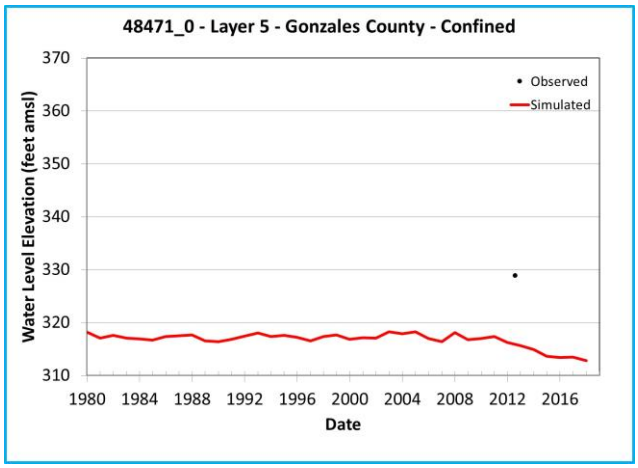
GSI ENVIRONMENTAL

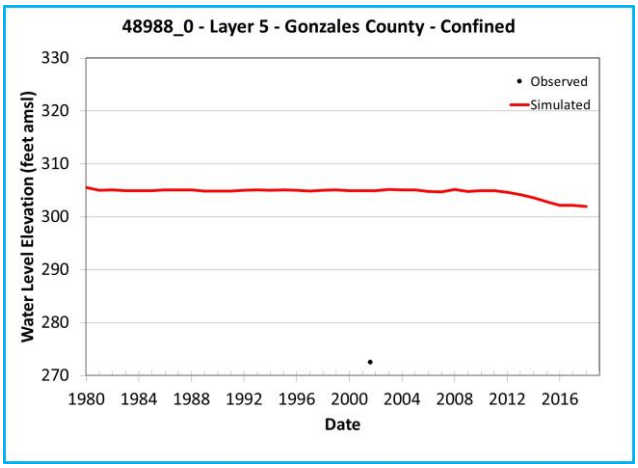












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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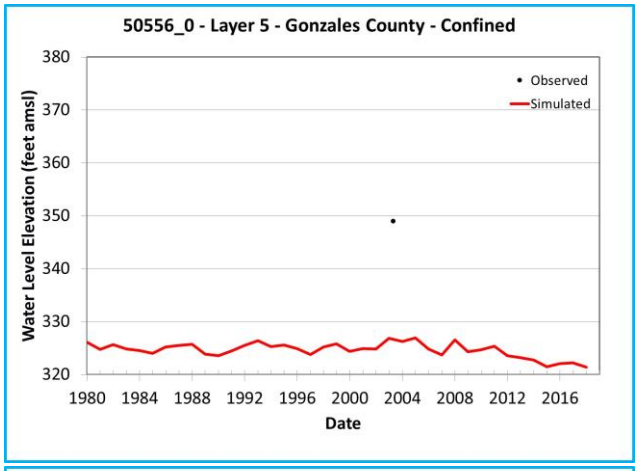
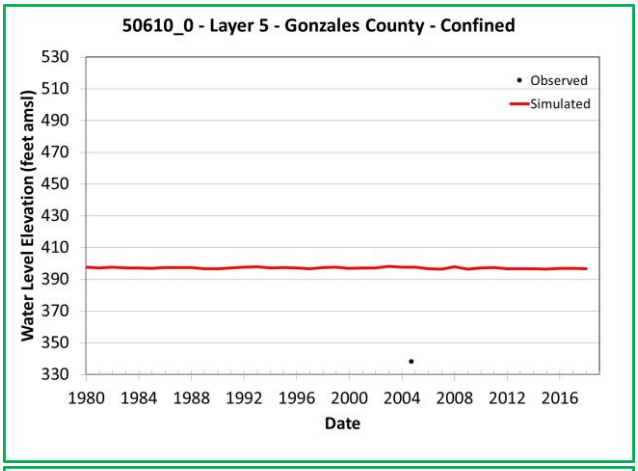
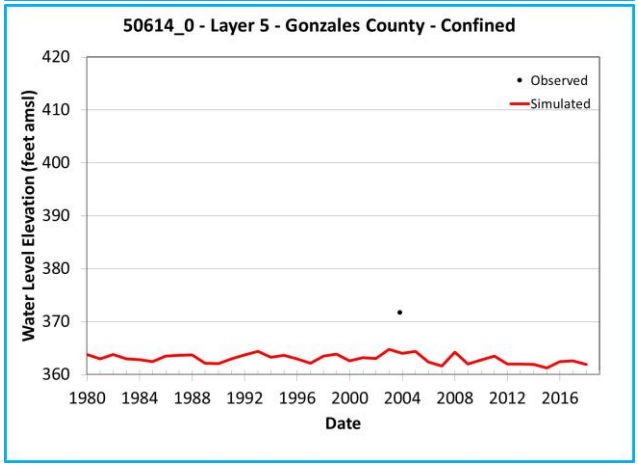
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

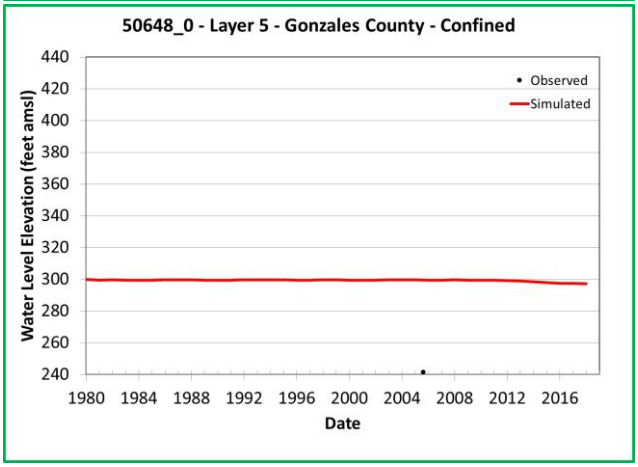
FIGURE I-9.2d

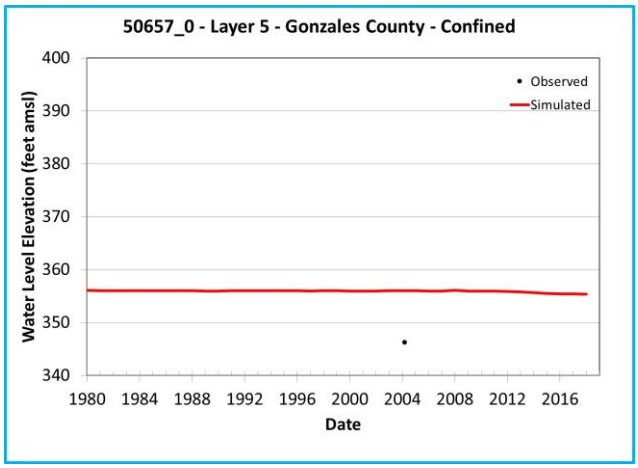
GSI ENVIRONMENTAL

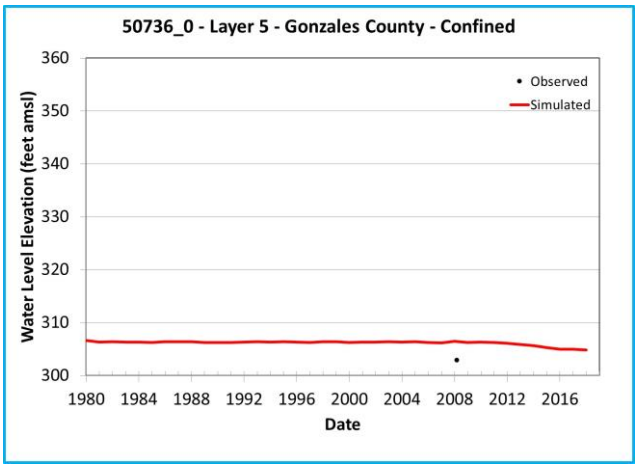












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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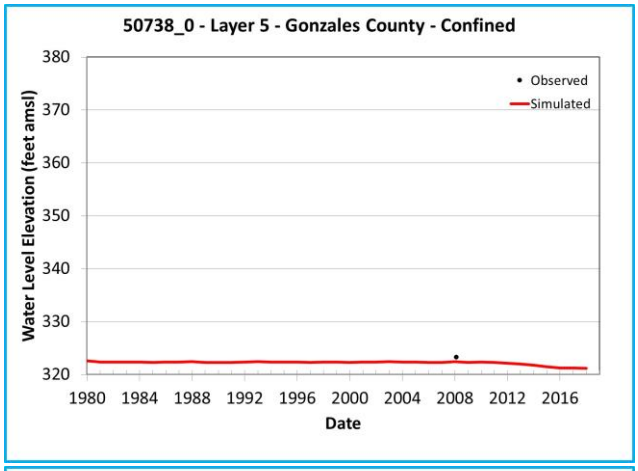
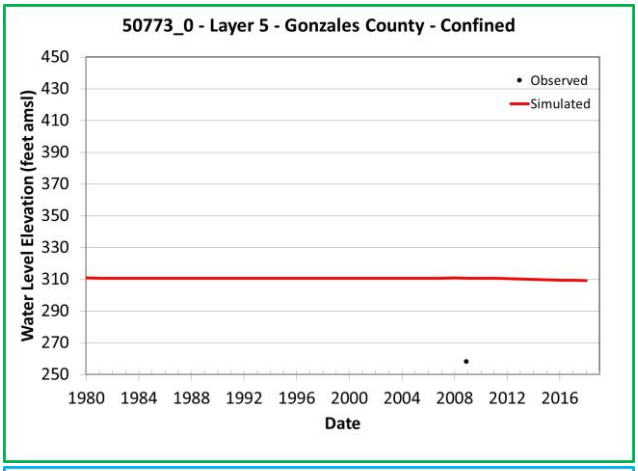
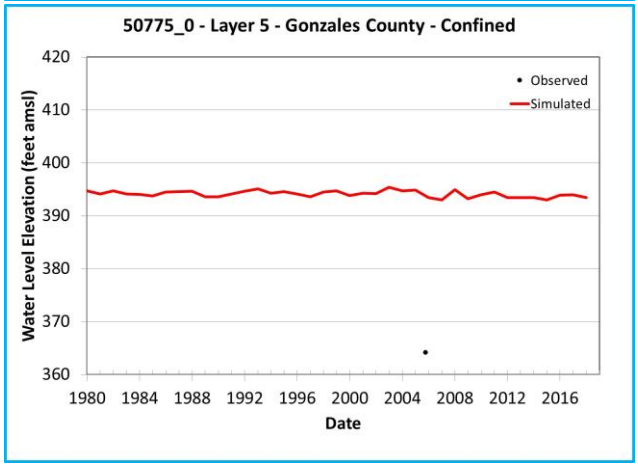
Revised		Aprv'd by	SP

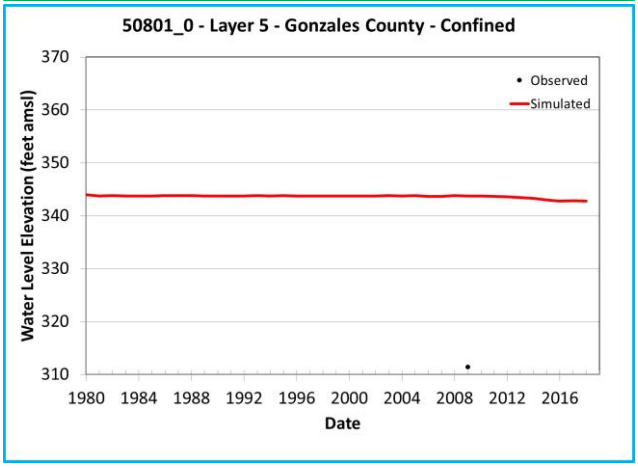
FIGURE I-9.2e

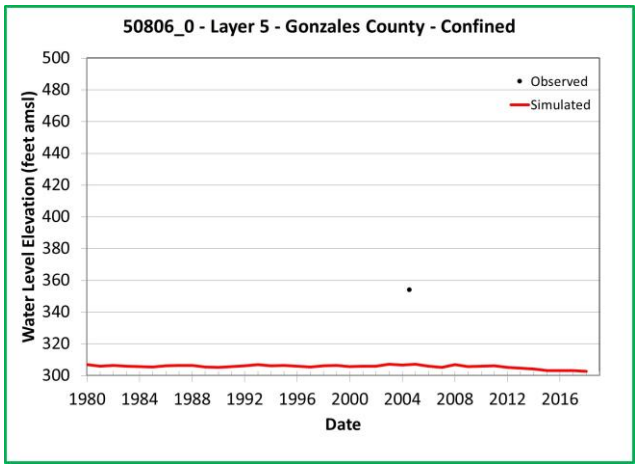
GSI ENVIRONMENTAL

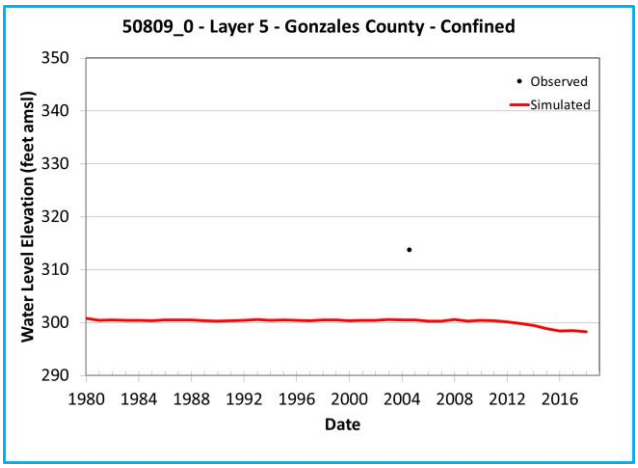












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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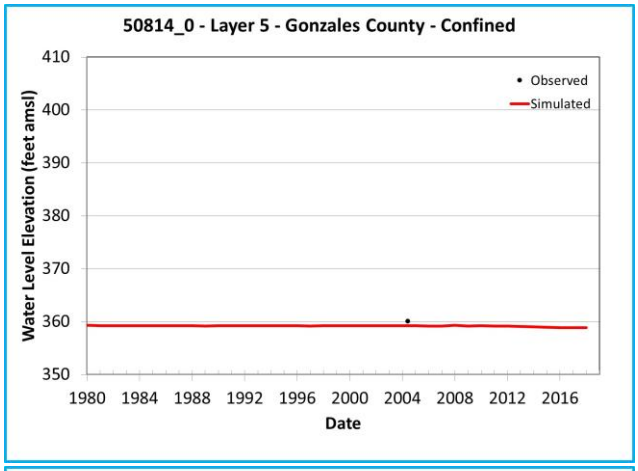
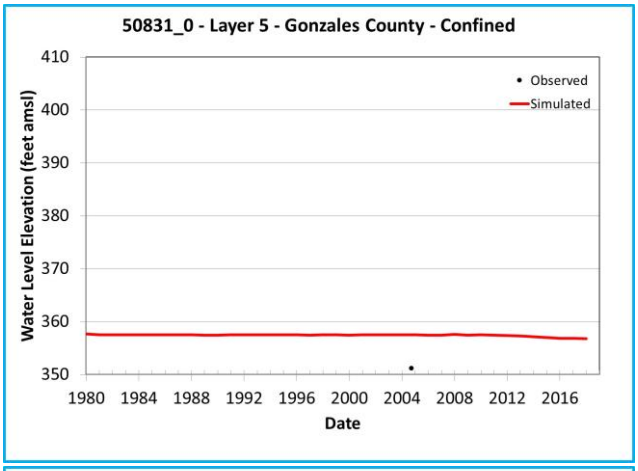
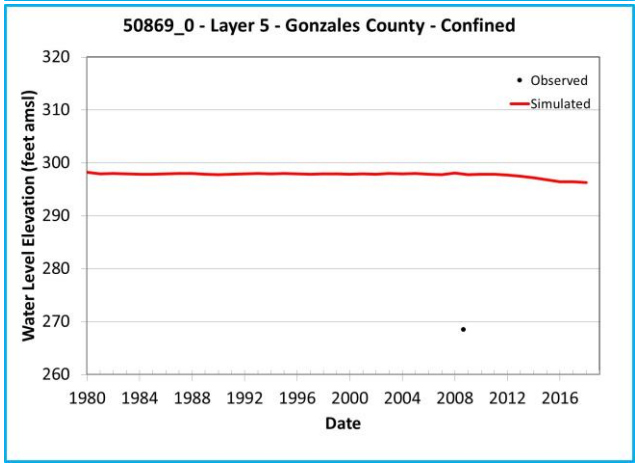
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

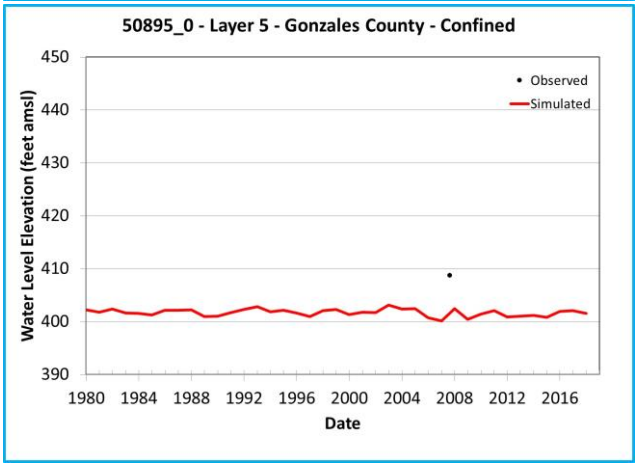
FIGURE I-9.2f

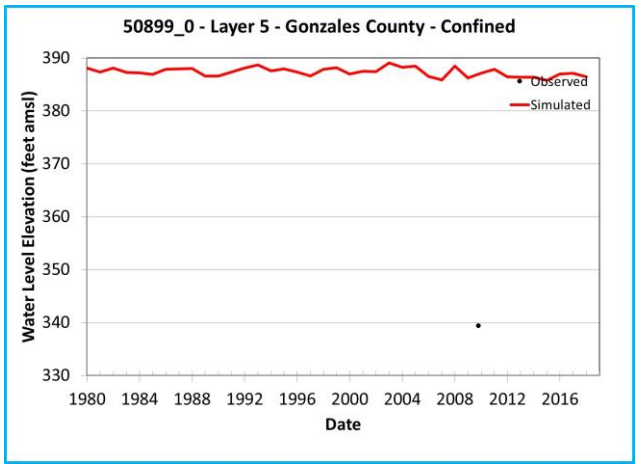
GSI ENVIRONMENTAL

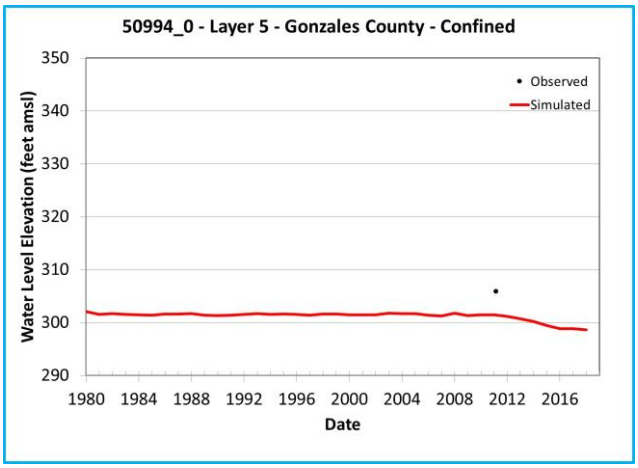












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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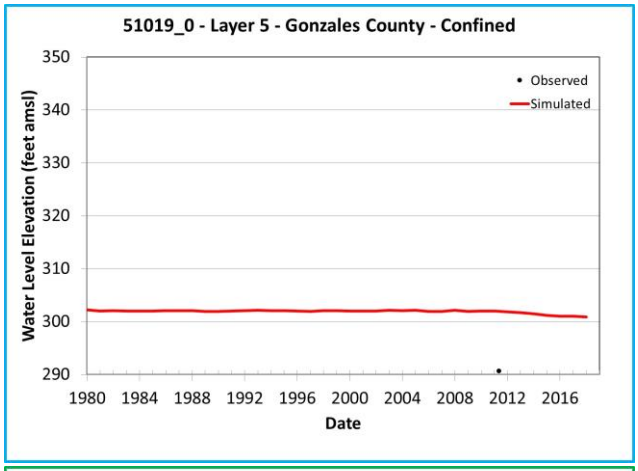
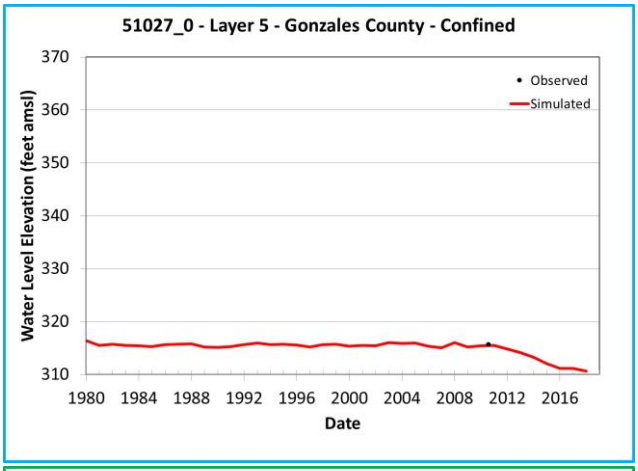
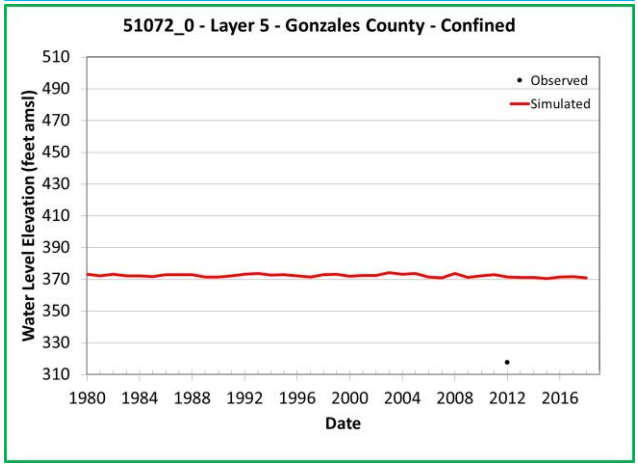
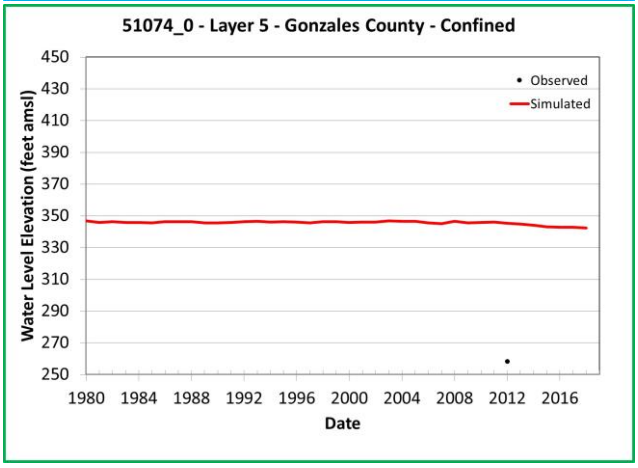
FIGURE I-9.2g

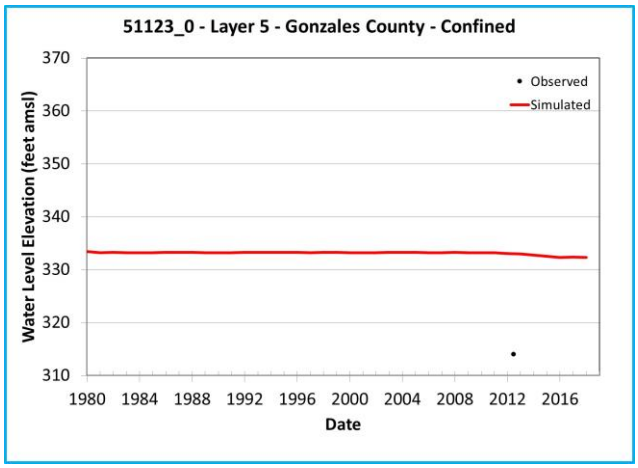
GSI ENVIRONMENTAL

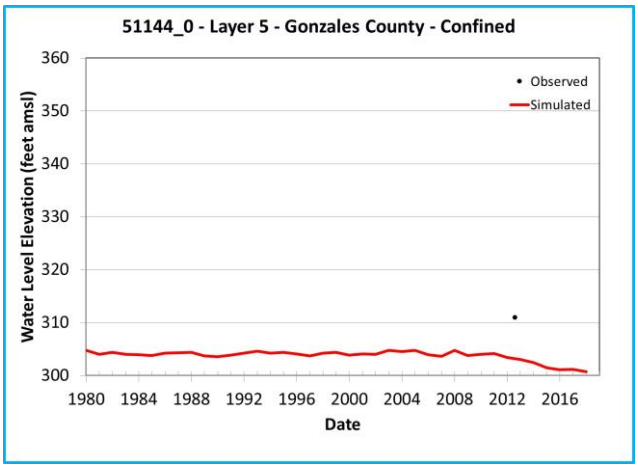












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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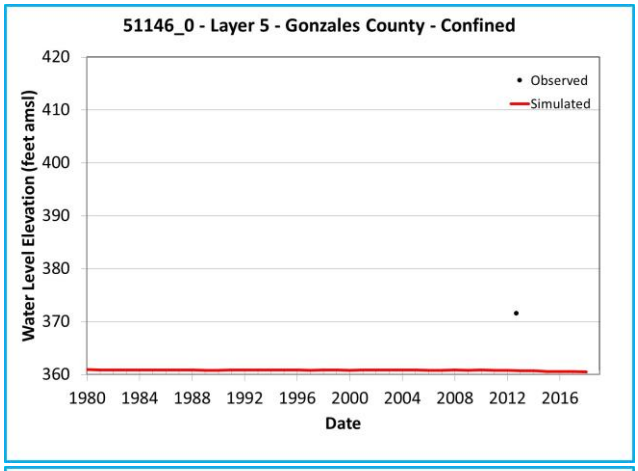
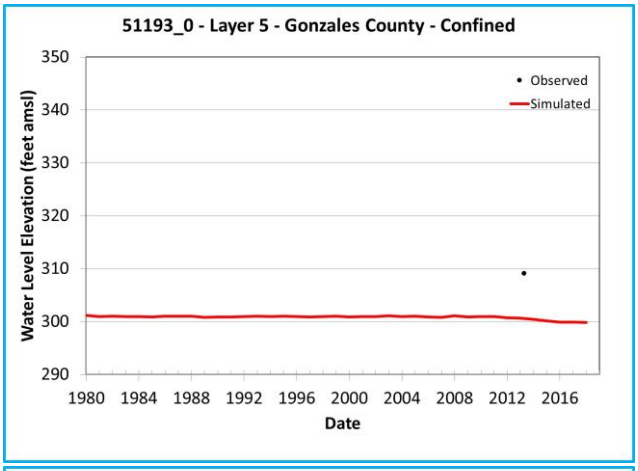
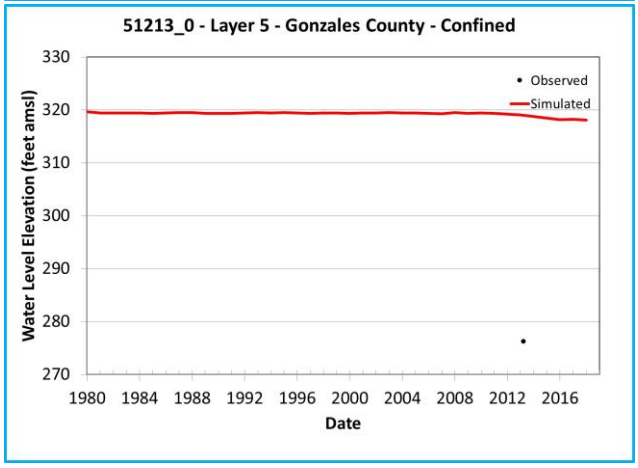
Revised		Aprv'd by	SP

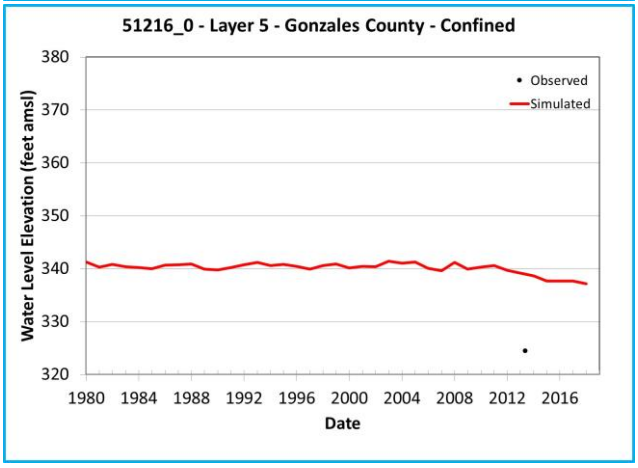
FIGURE I-9.2h

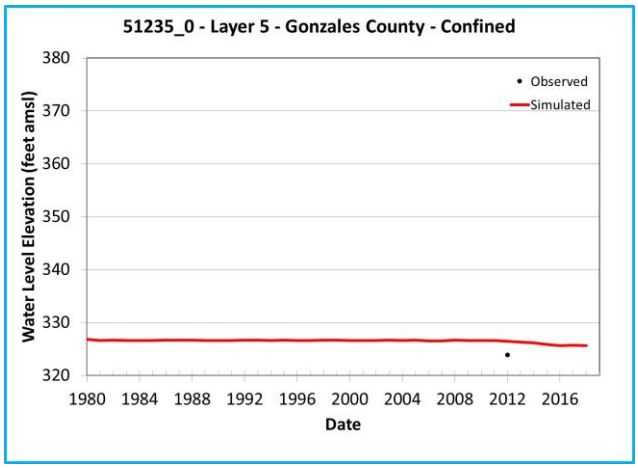
GSI ENVIRONMENTAL

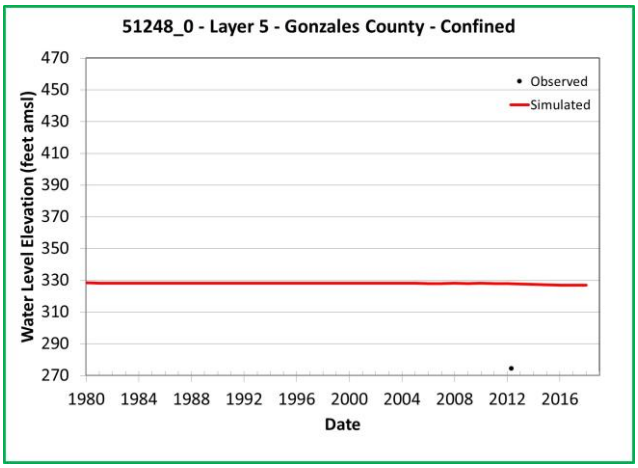












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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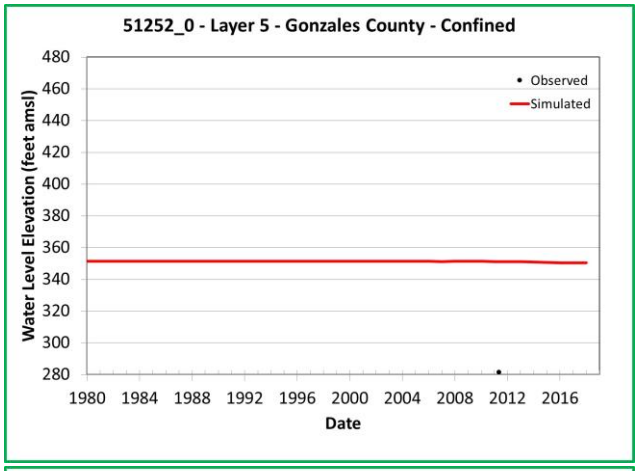
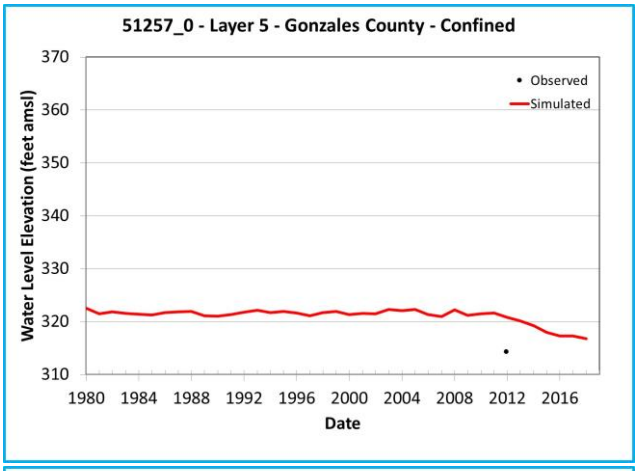
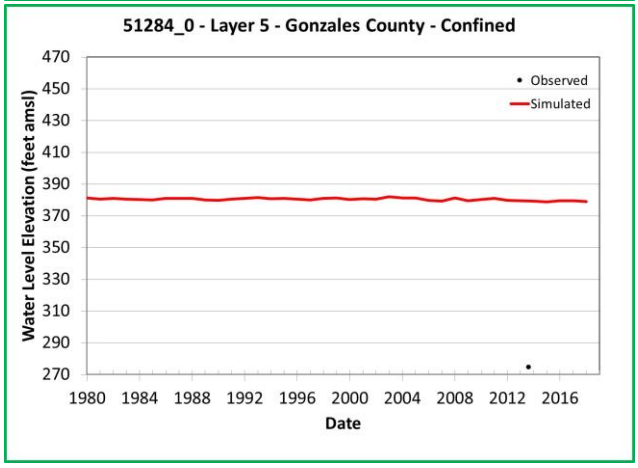
Revised		Aprv'd by	SP

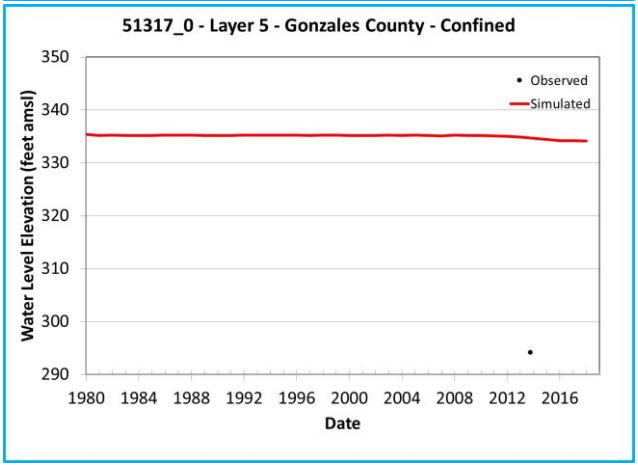
FIGURE I-9.2i

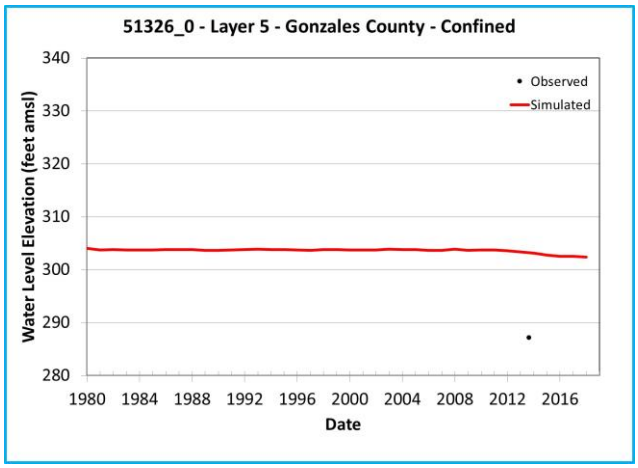
GSI ENVIRONMENTAL

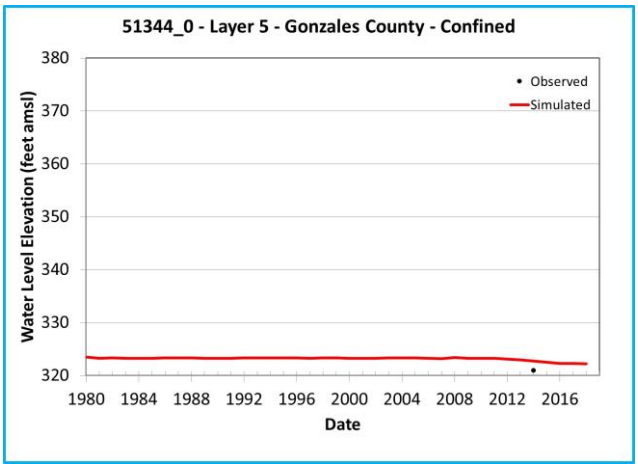












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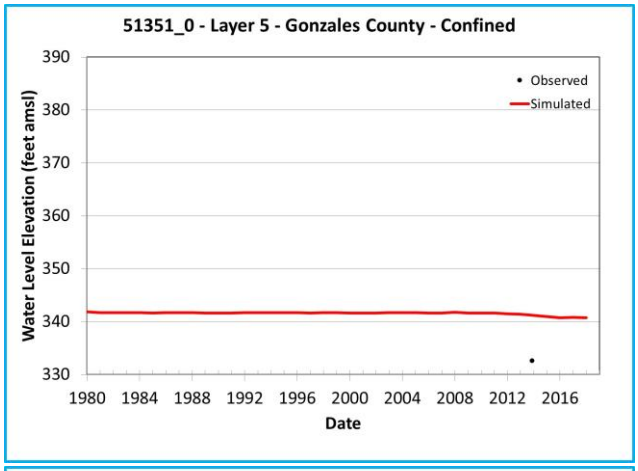
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

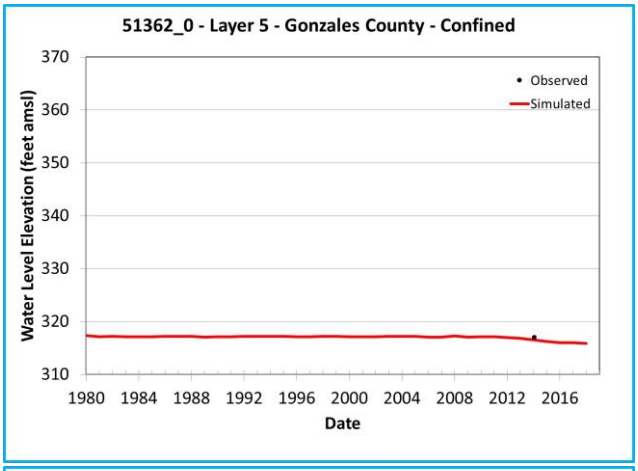
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

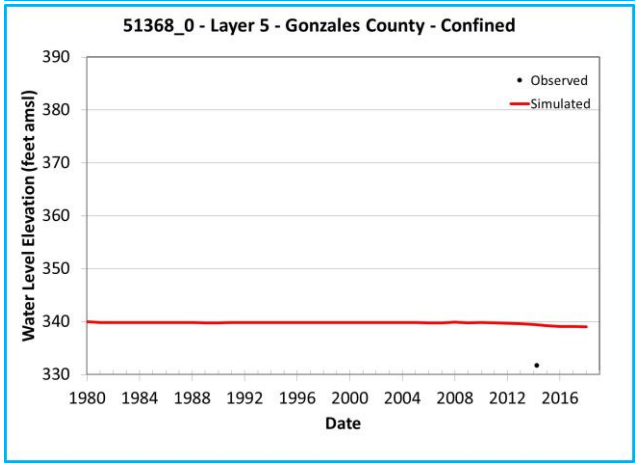
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

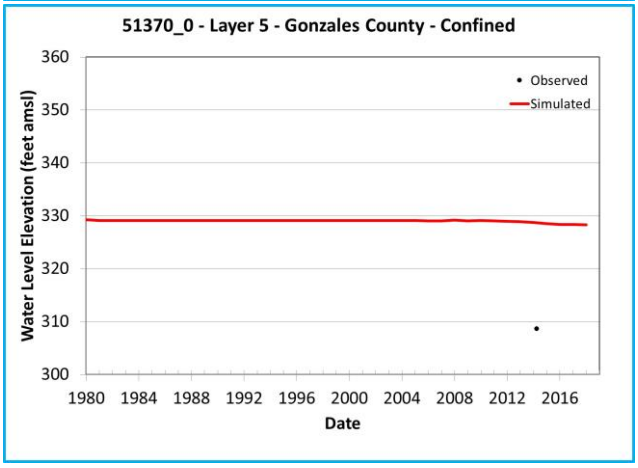
FIGURE I-9.2j

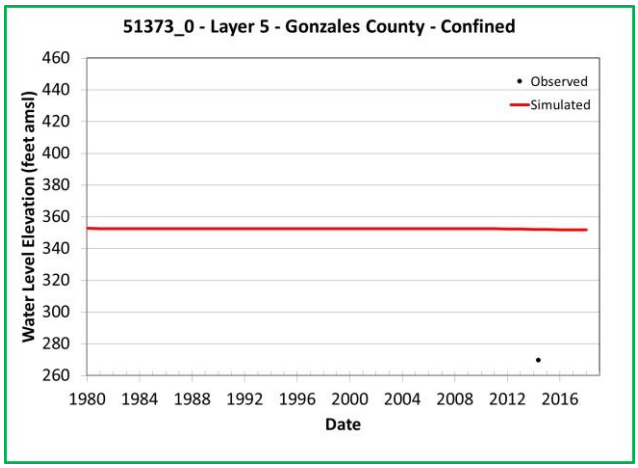
GSI ENVIRONMENTAL

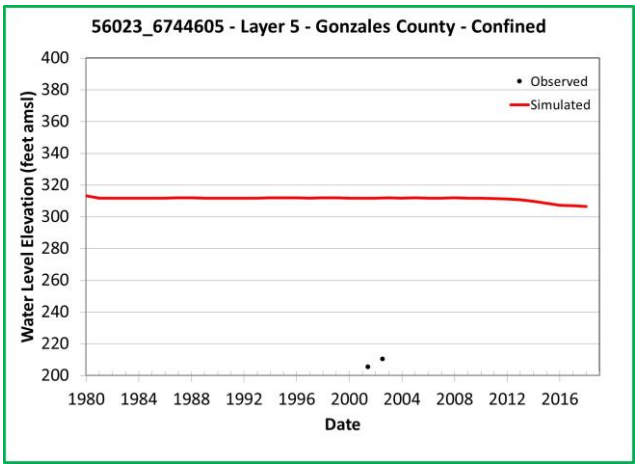












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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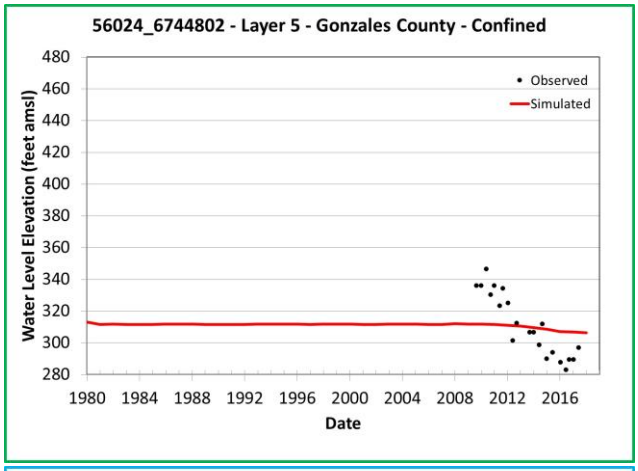
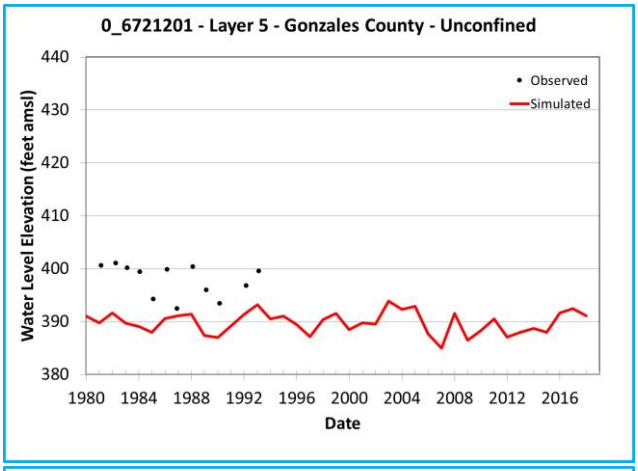
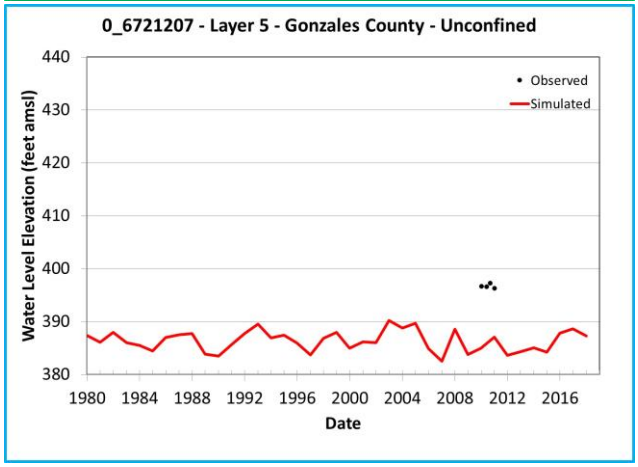
Revised		Aprv'd by	SP

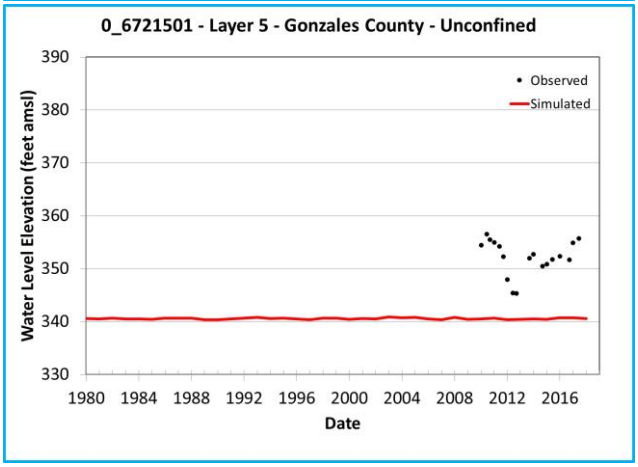
FIGURE I-9.2k

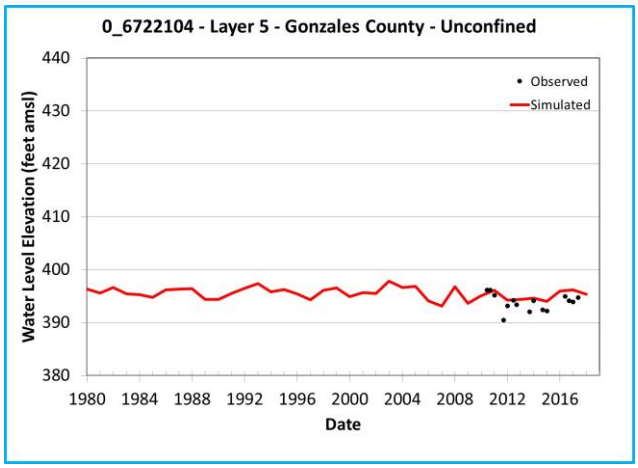
GSI ENVIRONMENTAL

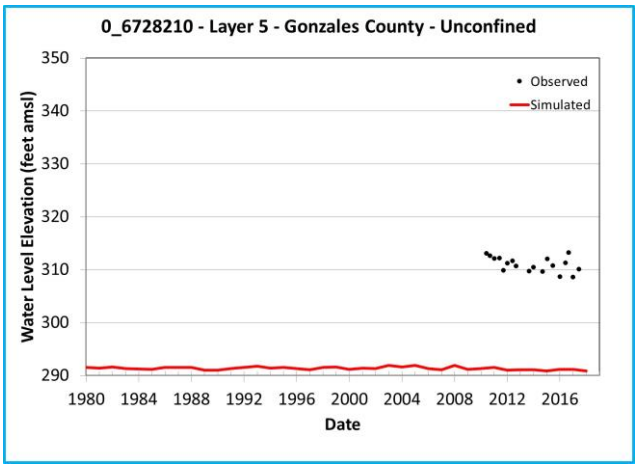












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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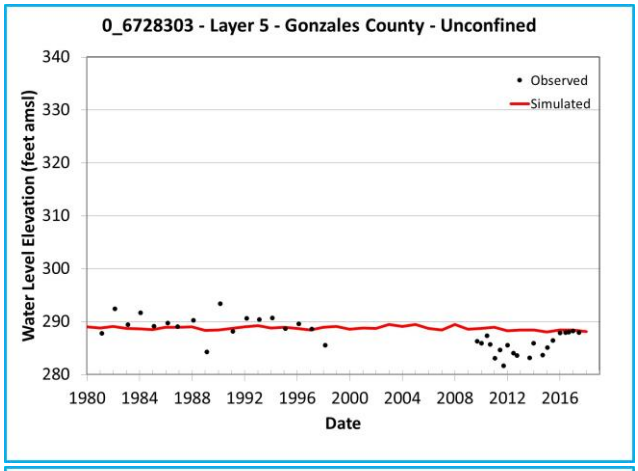
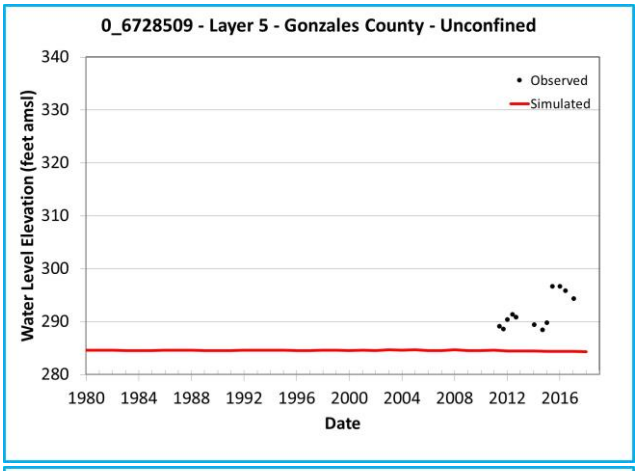
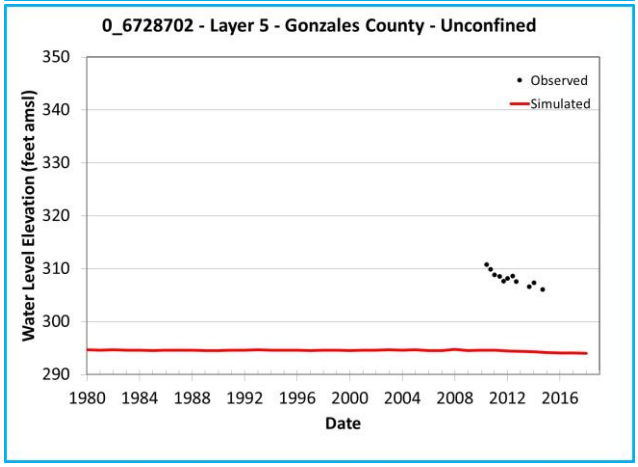
Revised		Aprv'd by	SP

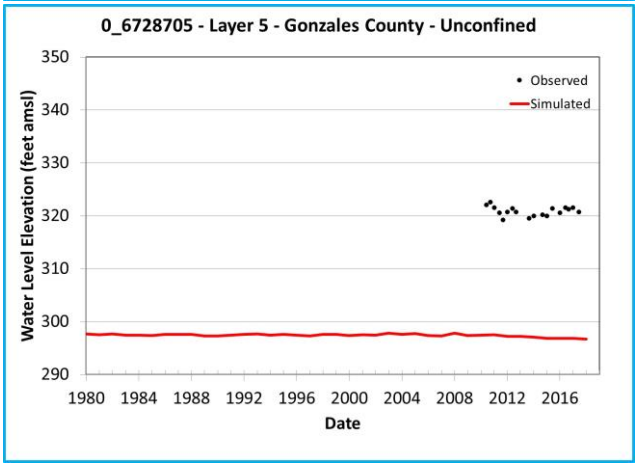
FIGURE I-9.2l

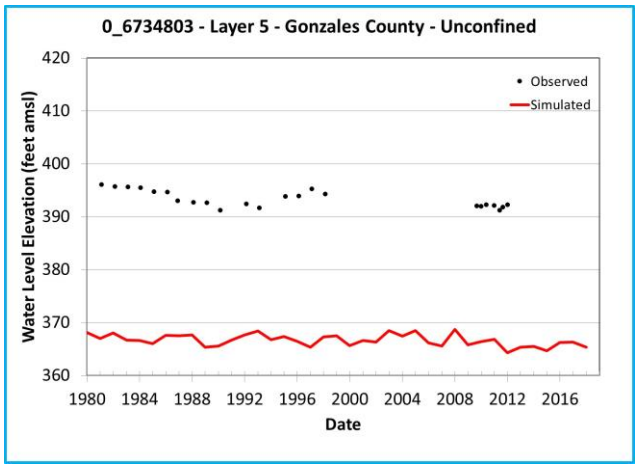
GSI ENVIRONMENTAL

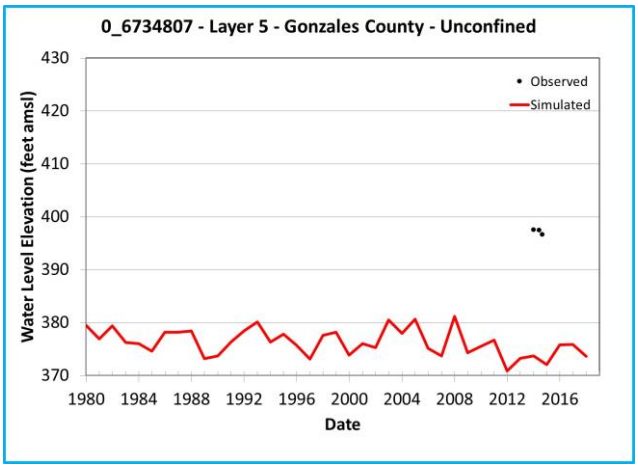












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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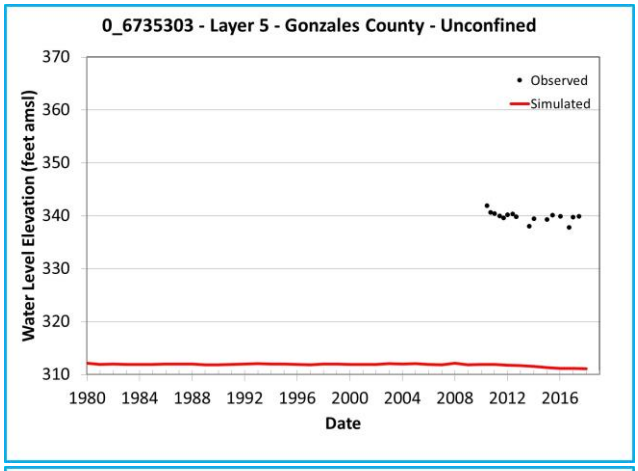
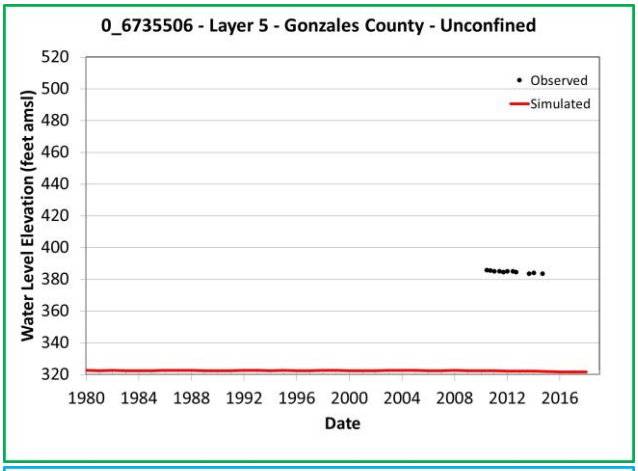
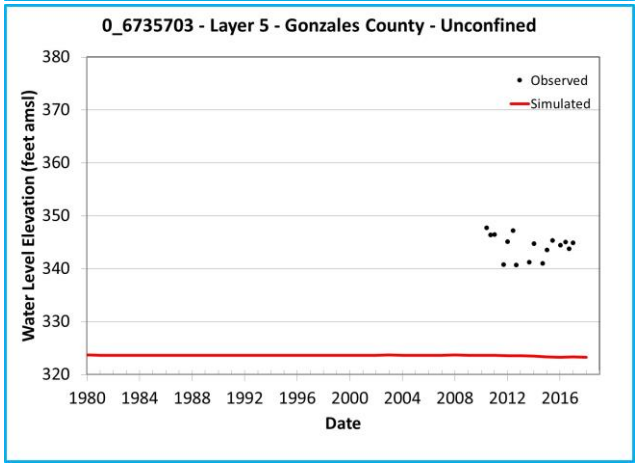
Revised		Aprv'd by	SP

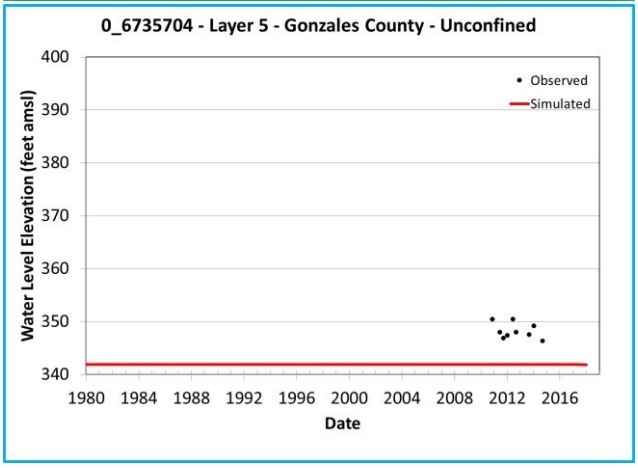
FIGURE I-9.2m

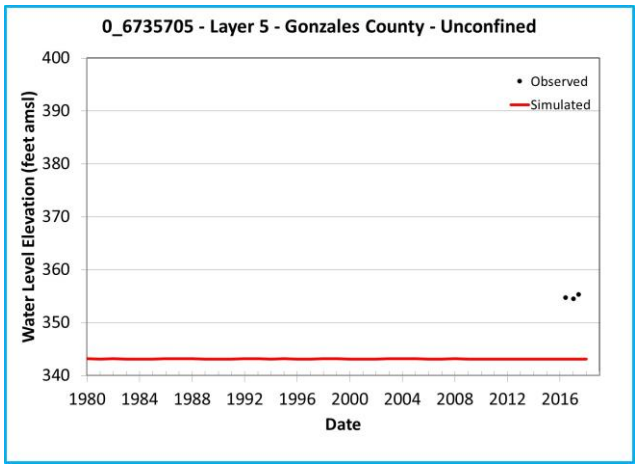
GSI ENVIRONMENTAL

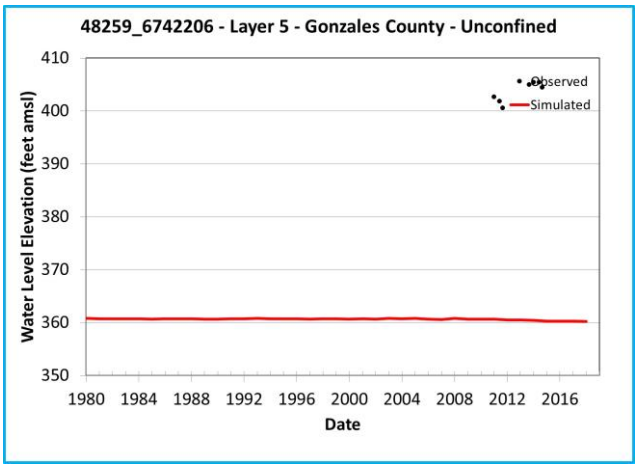












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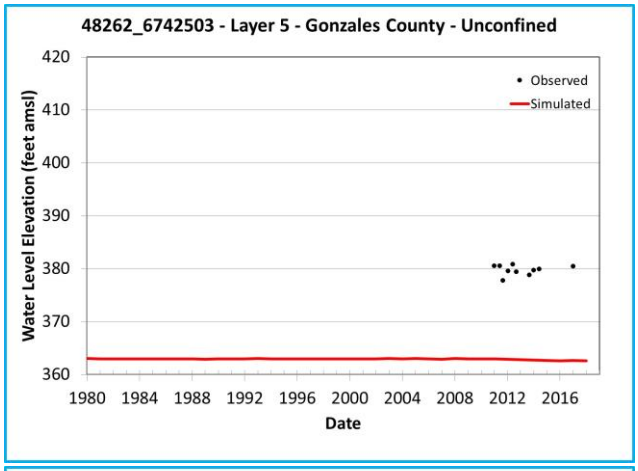
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

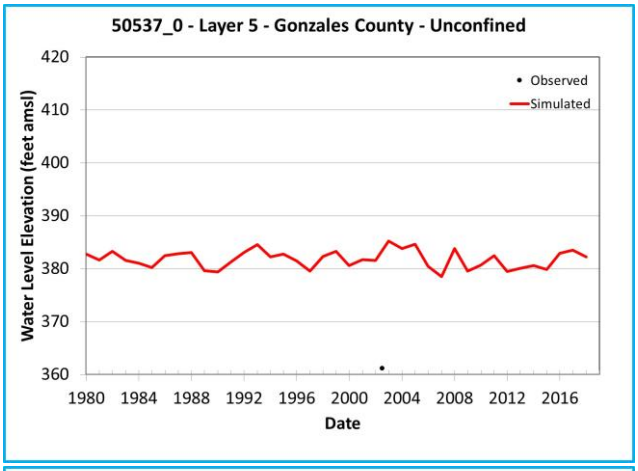
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

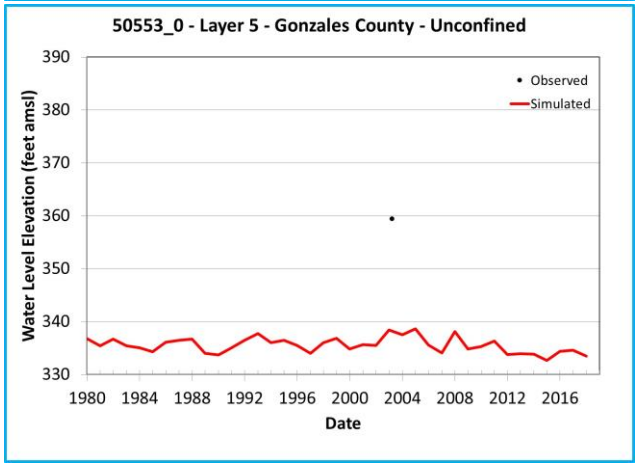
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

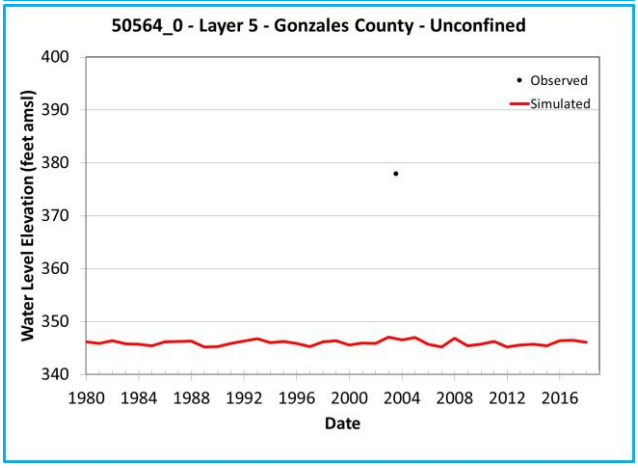
FIGURE I-9.2n

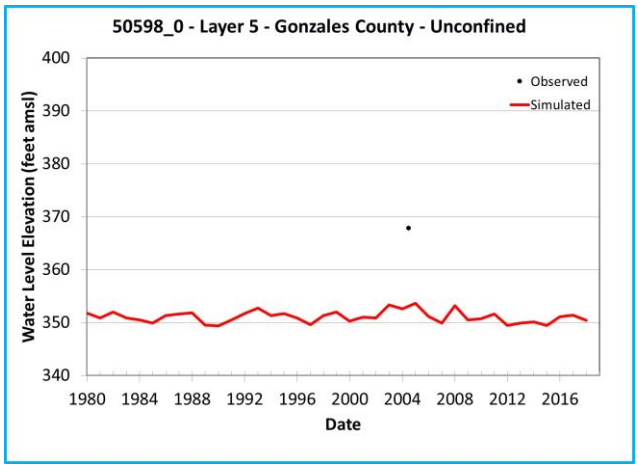
GSI ENVIRONMENTAL

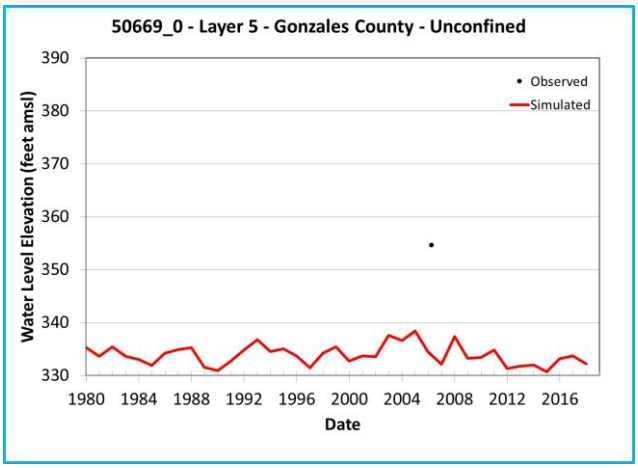












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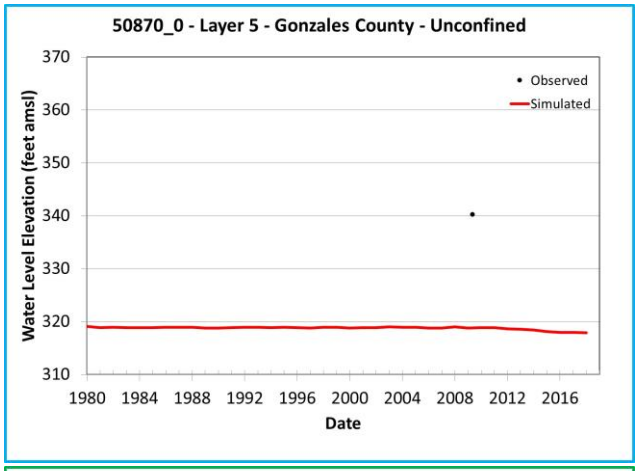
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

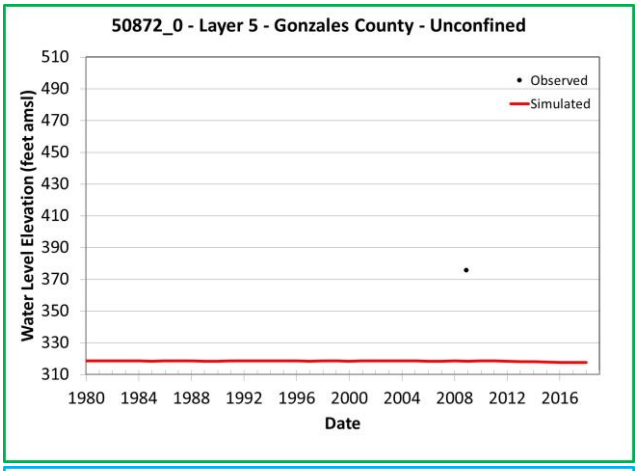
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

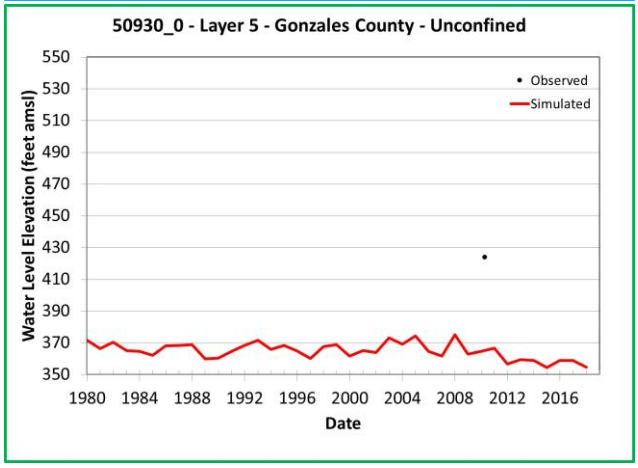
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

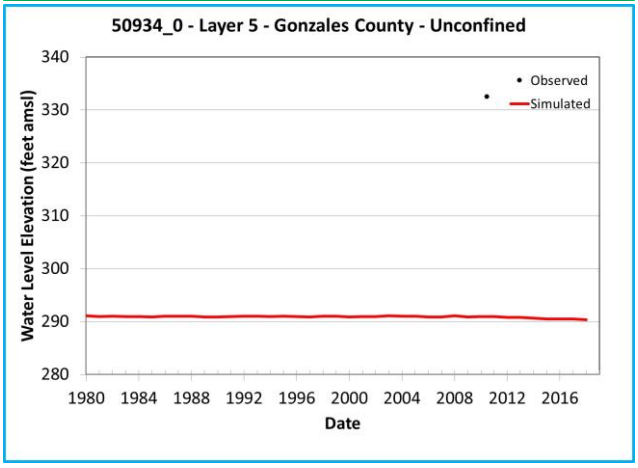
FIGURE I-9.2o

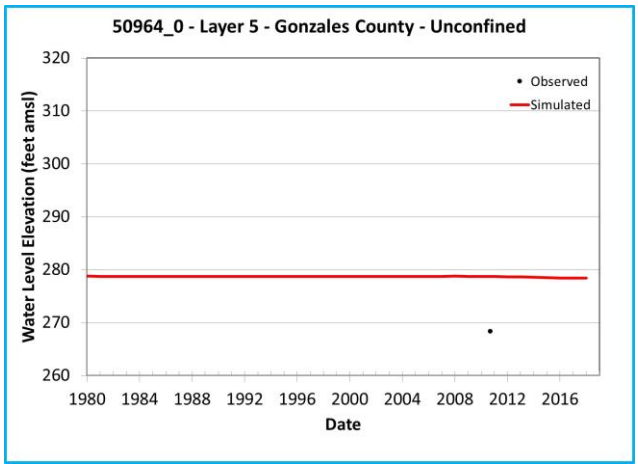
GSI ENVIRONMENTAL

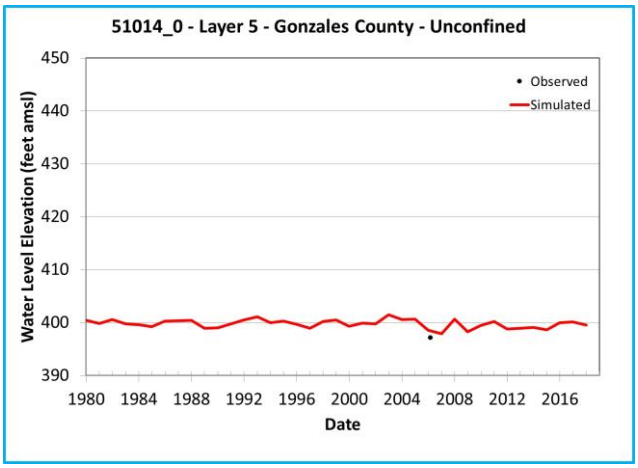












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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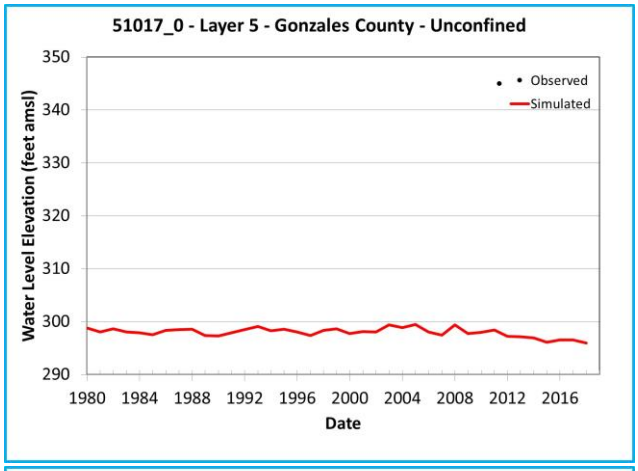
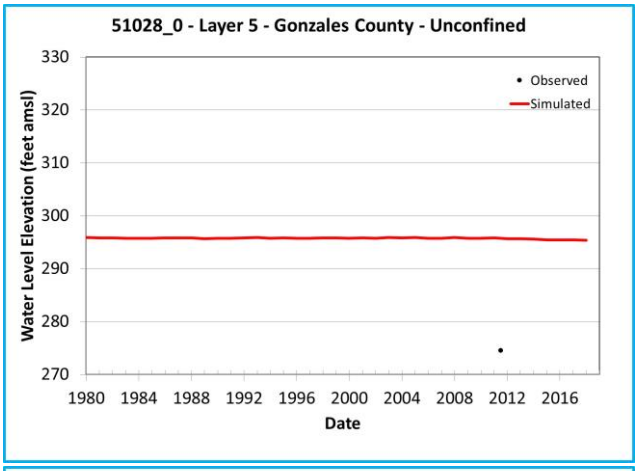
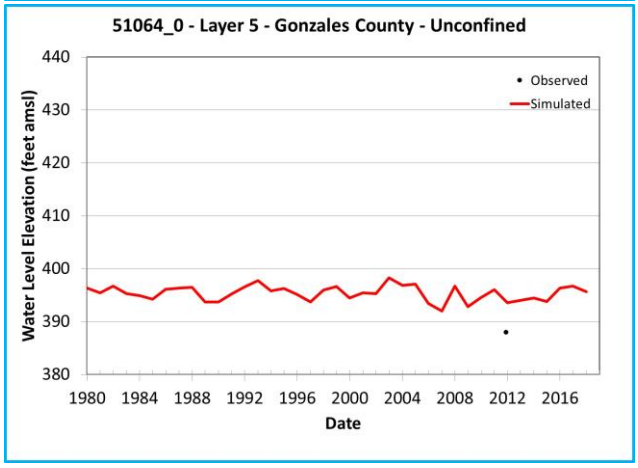
Revised		Aprv'd by	SP

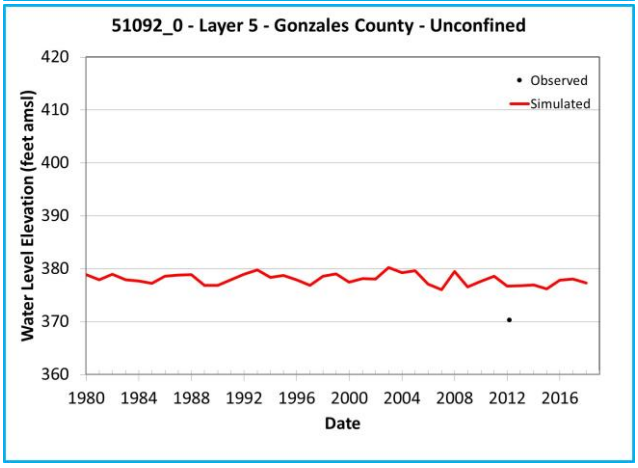
FIGURE I-9.2p

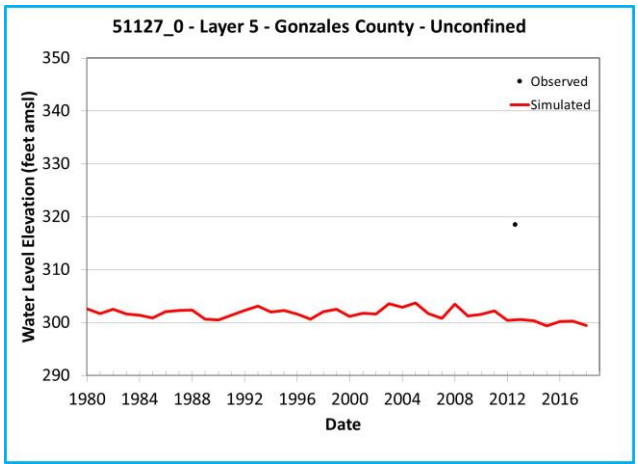
GSI ENVIRONMENTAL

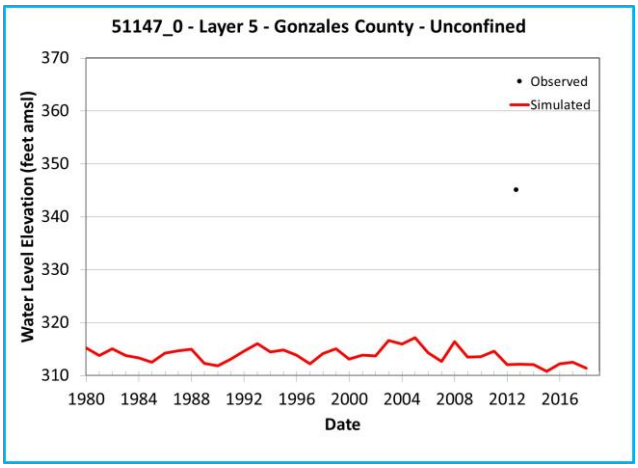












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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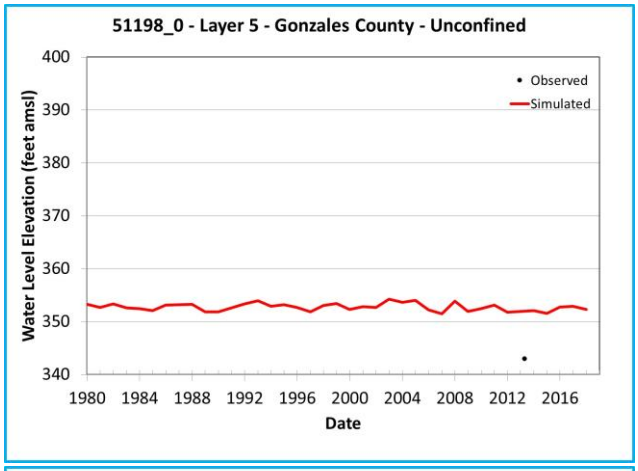
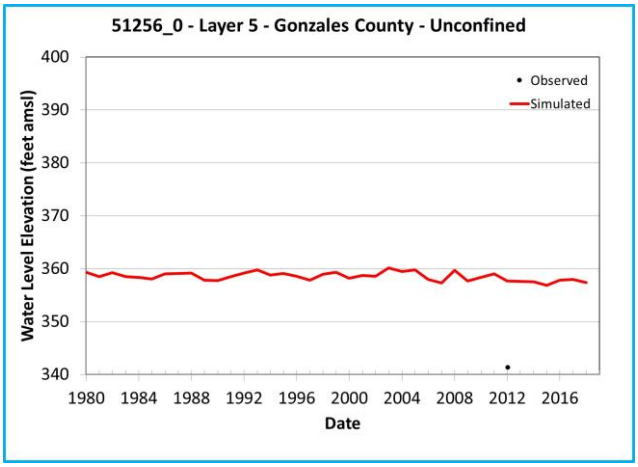
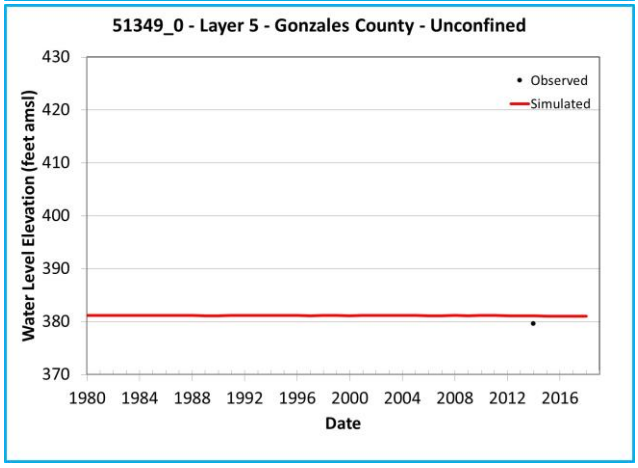
Revised		Aprv'd by	SP

FIGURE I-9.2q

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

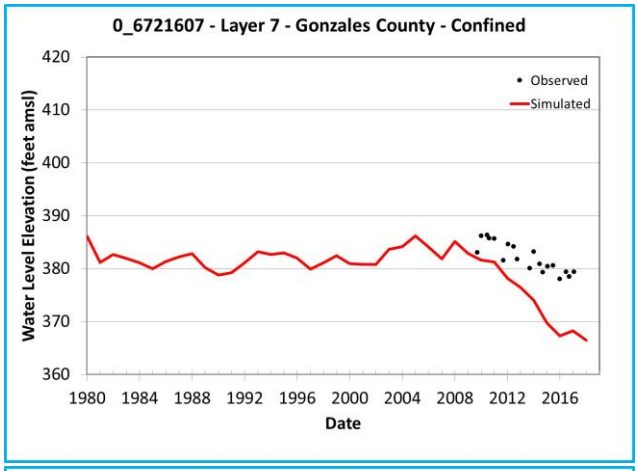
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 5

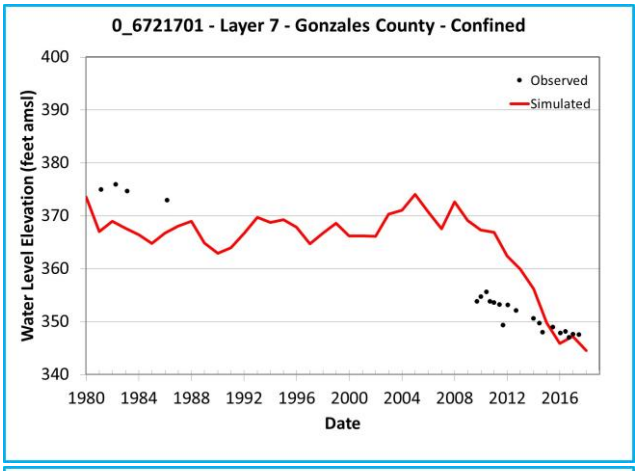
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

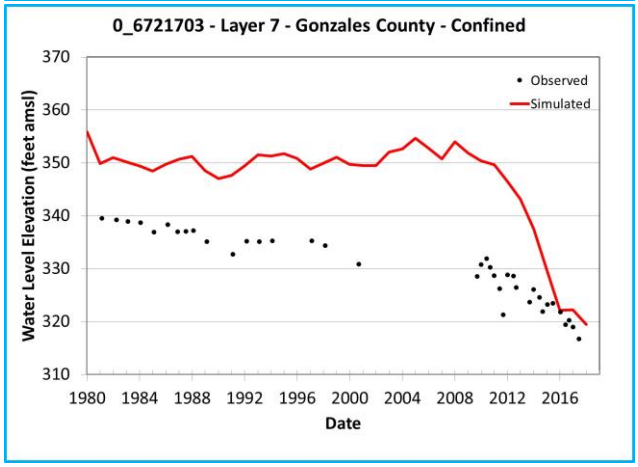
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

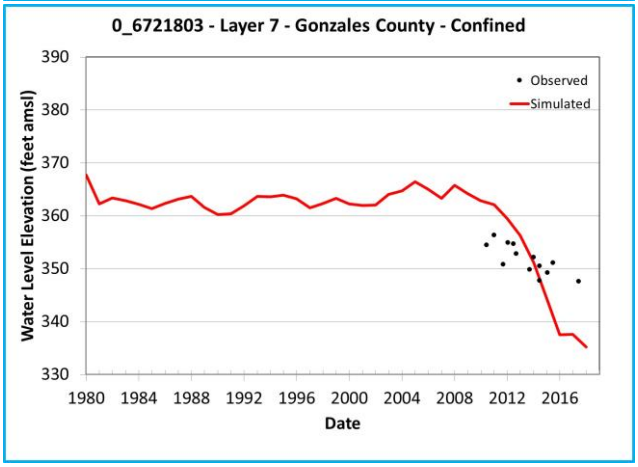
FIGURE I-9.2r

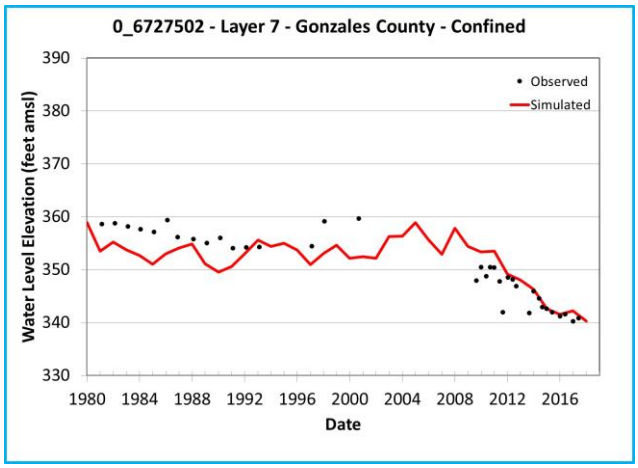
GSI ENVIRONMENTAL

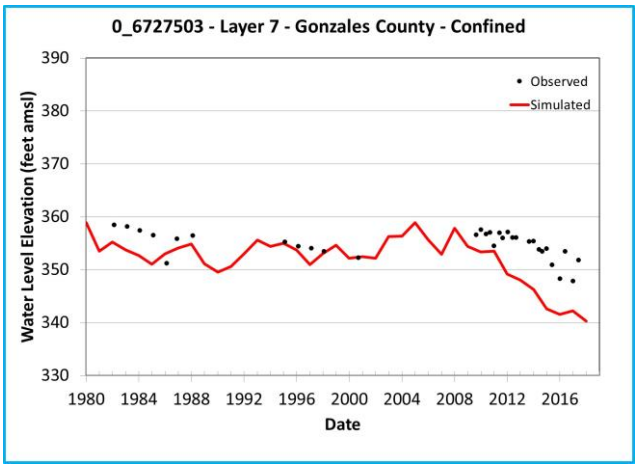












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

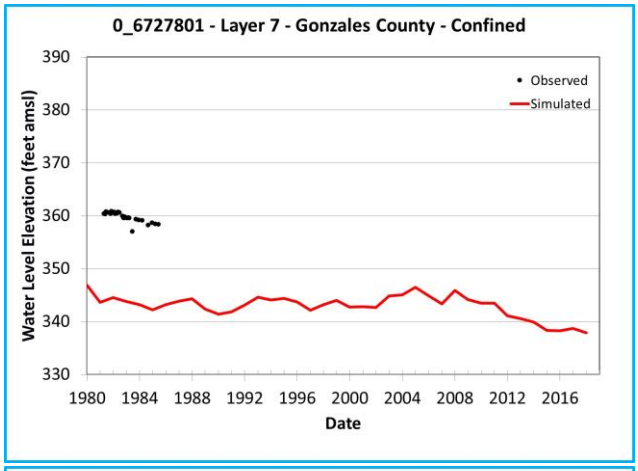
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

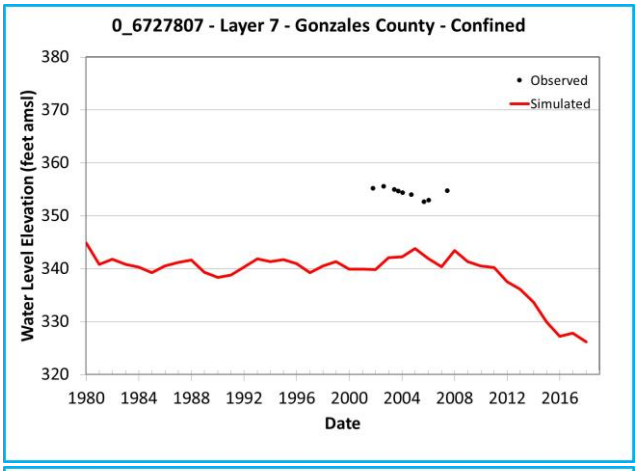
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

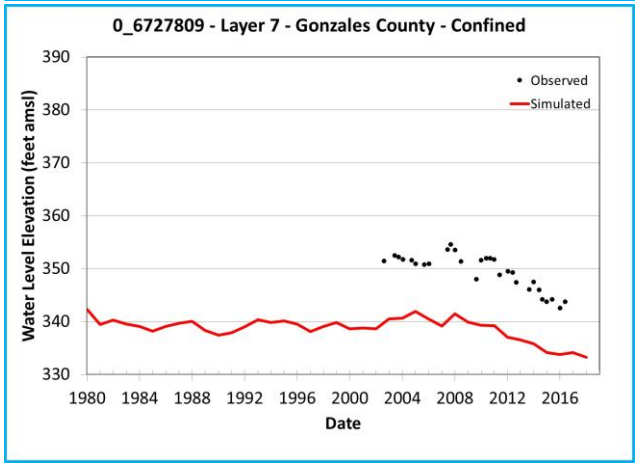
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

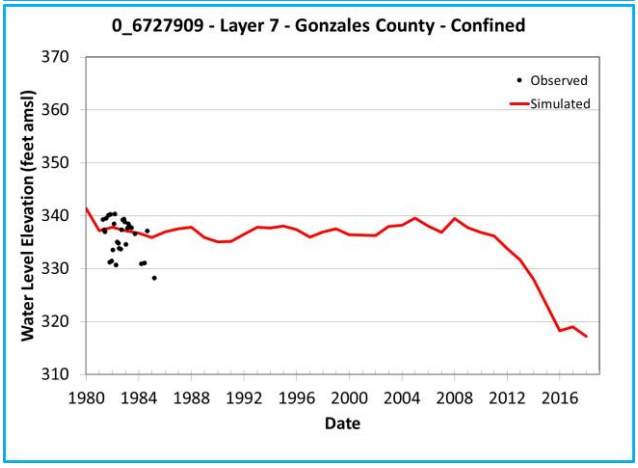
FIGURE I-9.3a

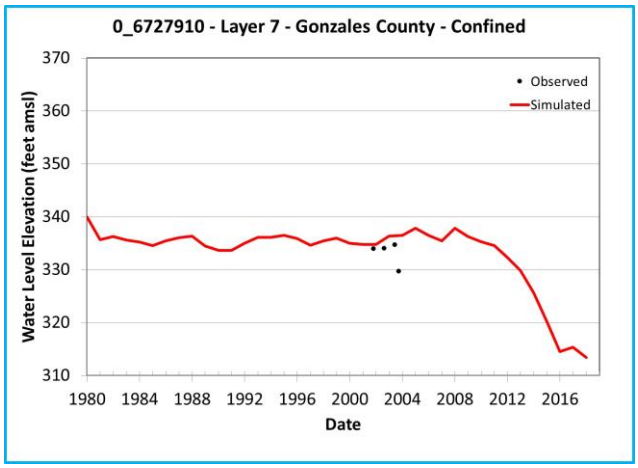
GSI ENVIRONMENTAL

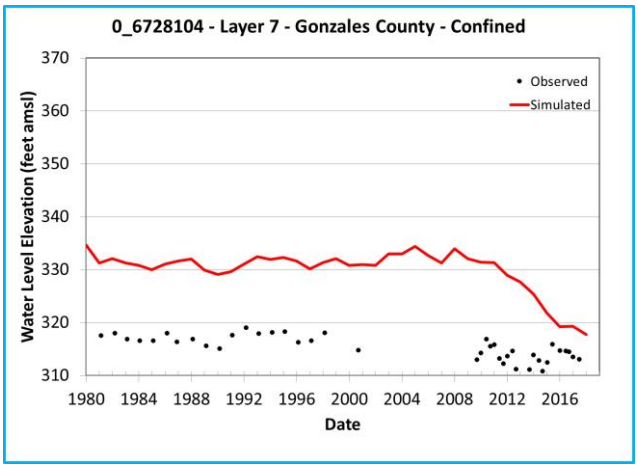












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

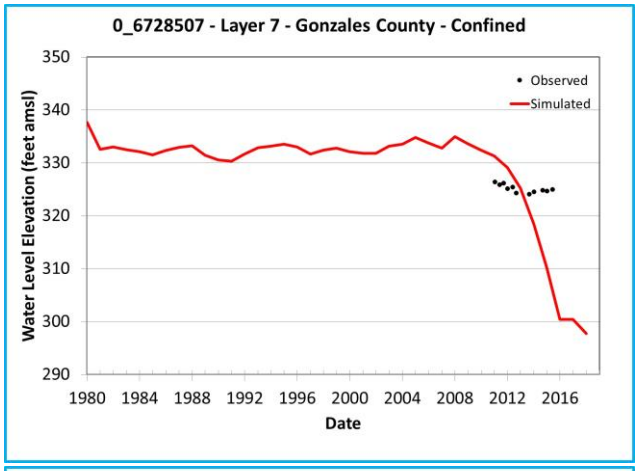
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

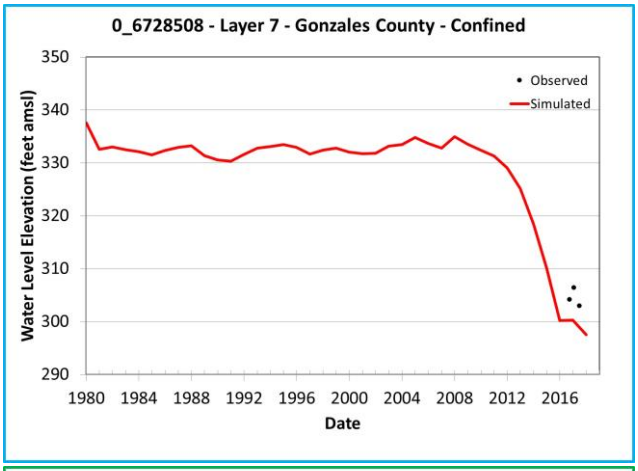
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

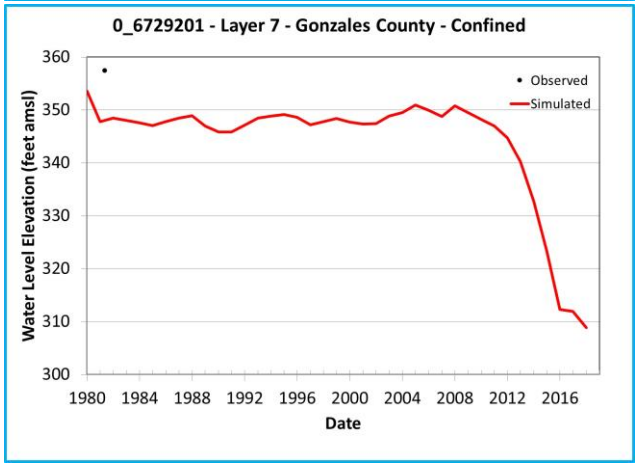
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

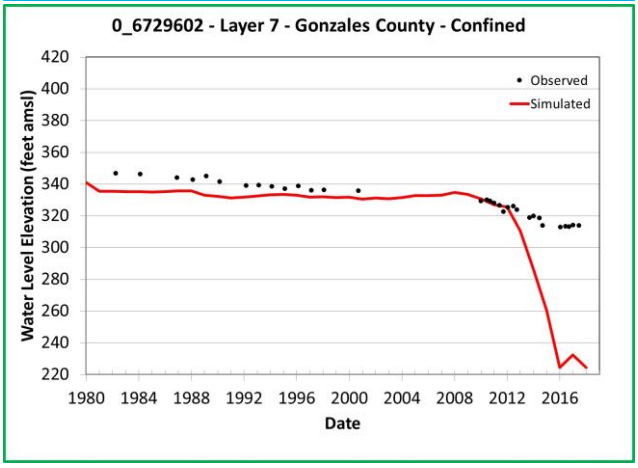
FIGURE I-9.3b

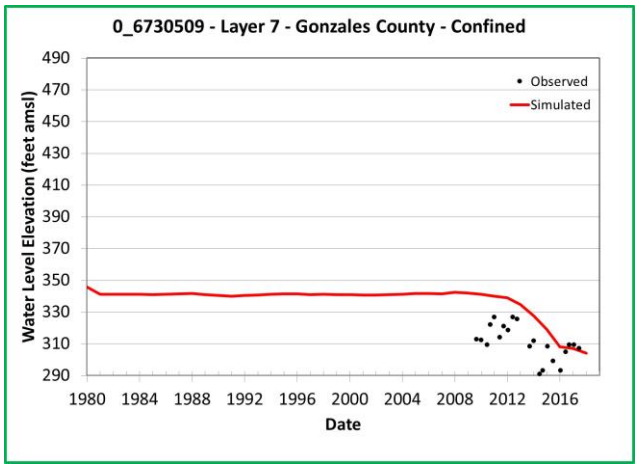
GSI ENVIRONMENTAL

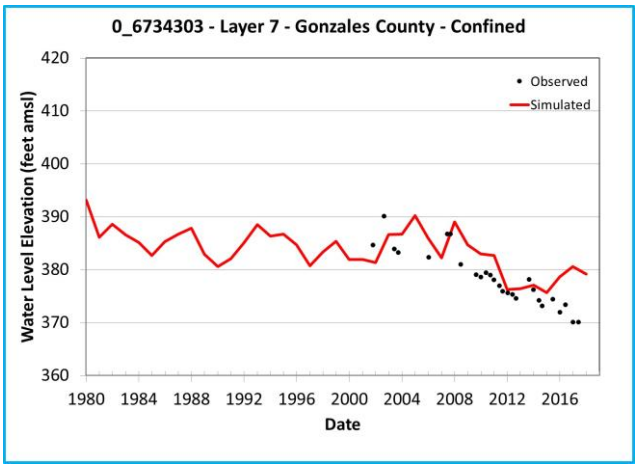












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Blue = 60 feet

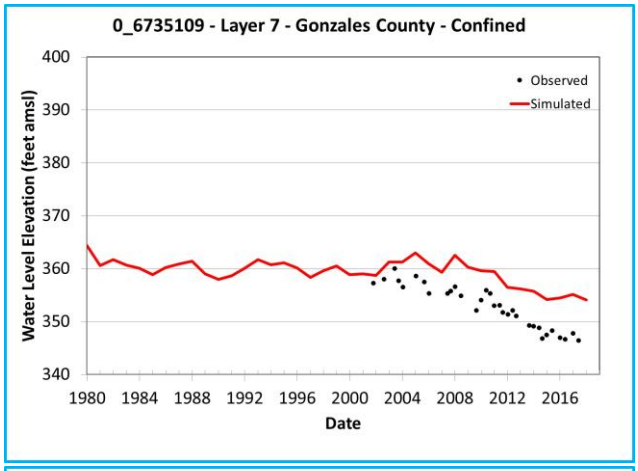
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

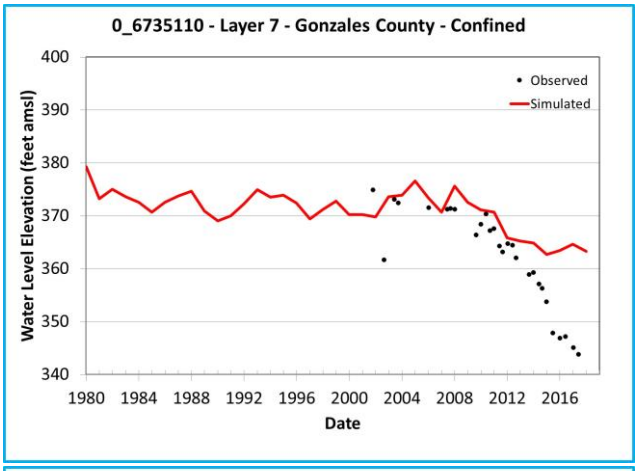
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

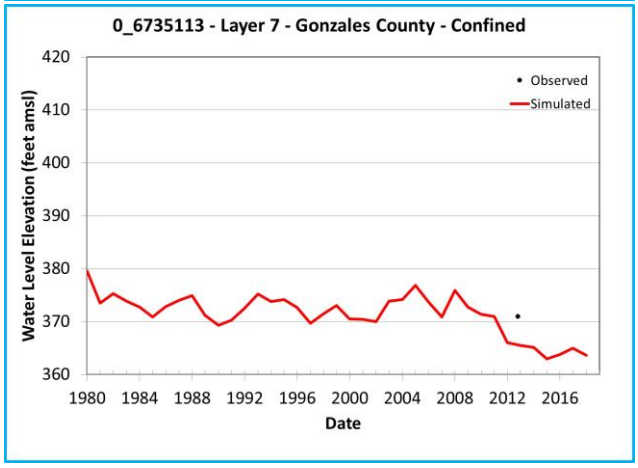
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

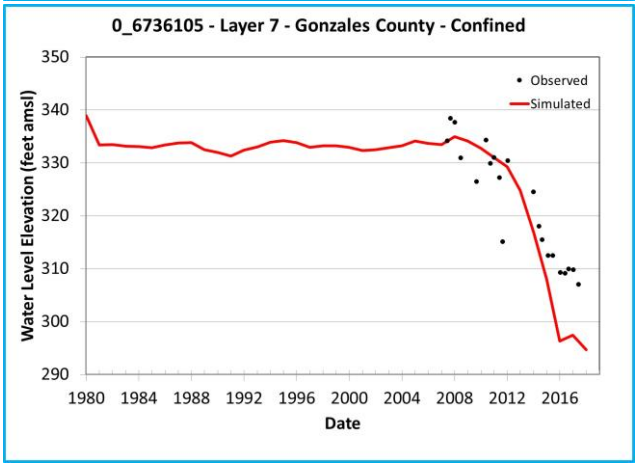
FIGURE I-9.3c

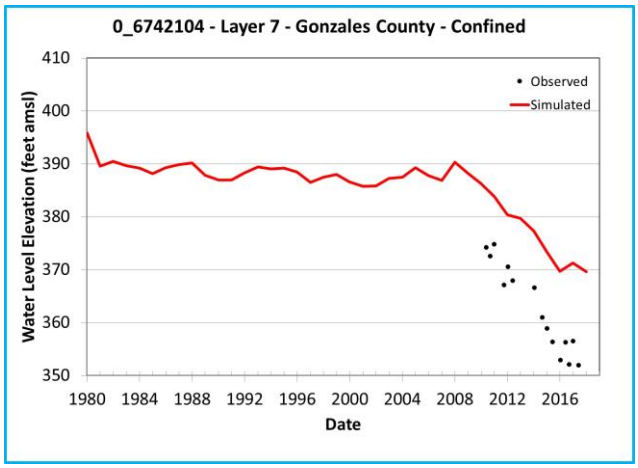
GSI ENVIRONMENTAL

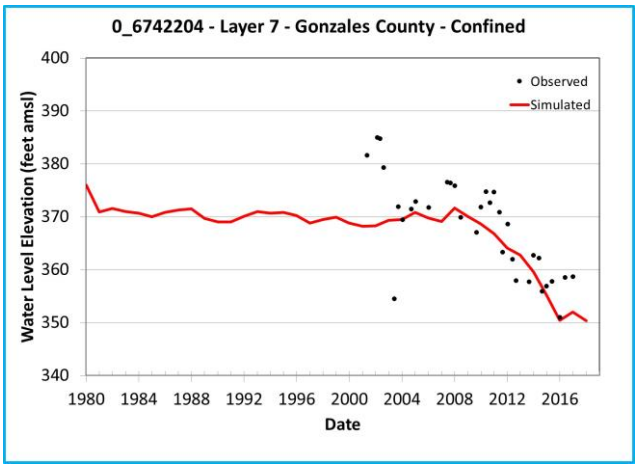












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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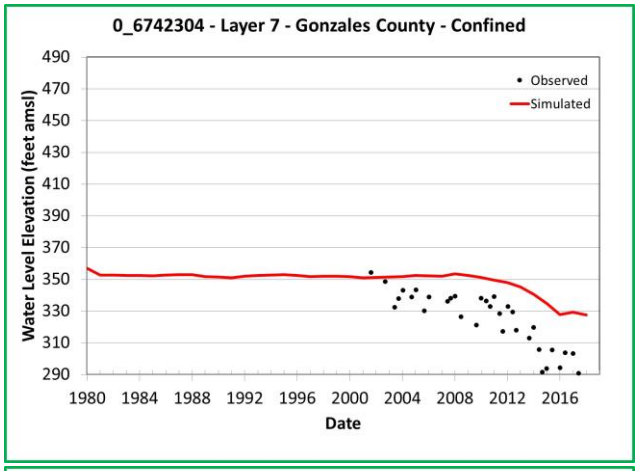
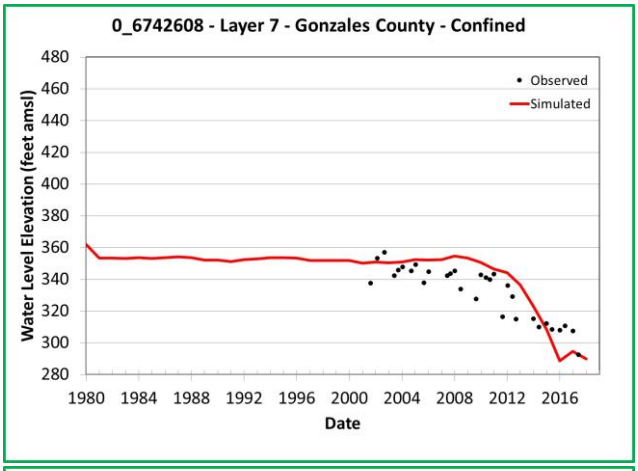
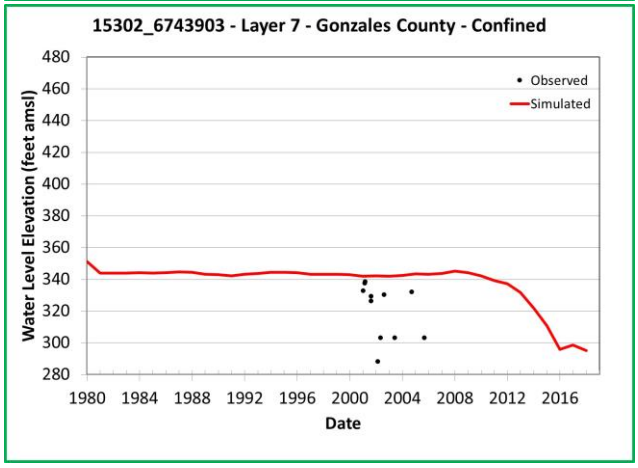
Revised		Aprv'd by	SP

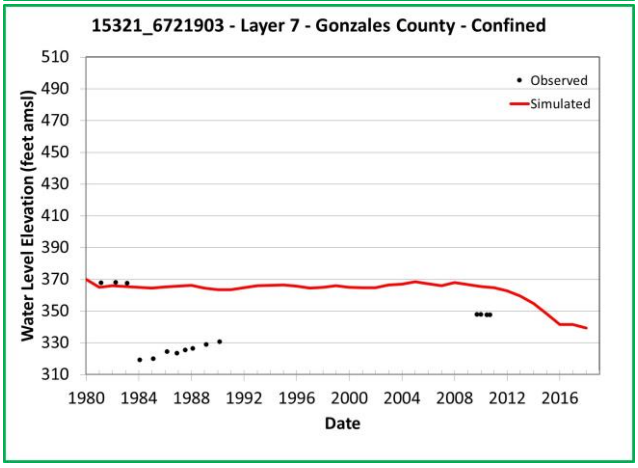
FIGURE I-9.3d

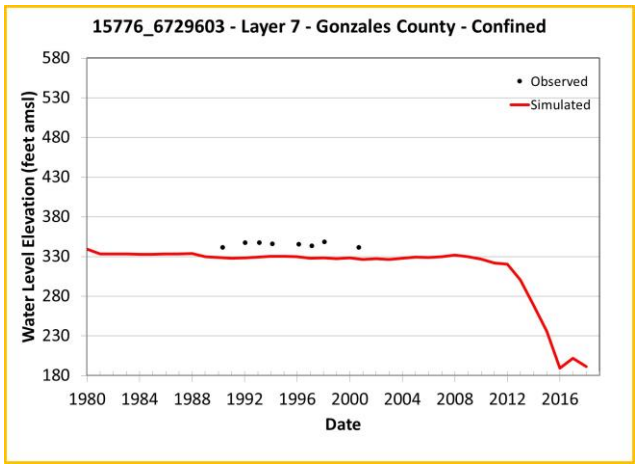
GSI ENVIRONMENTAL

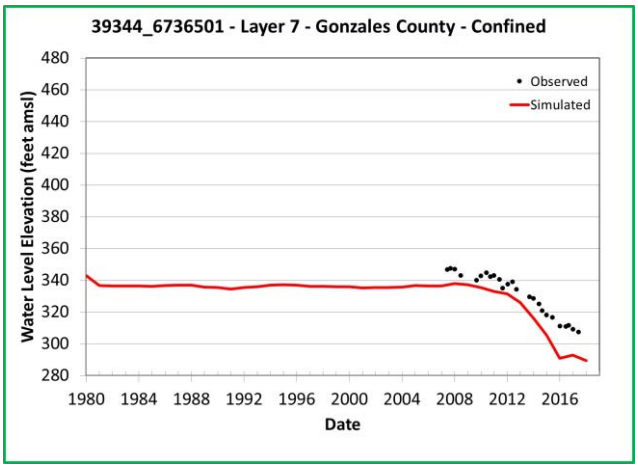












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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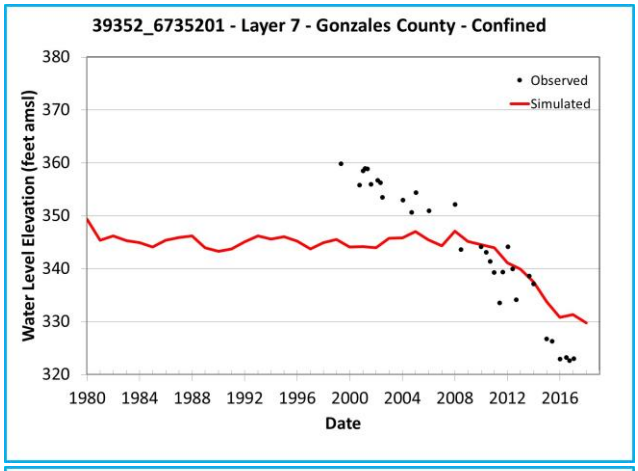
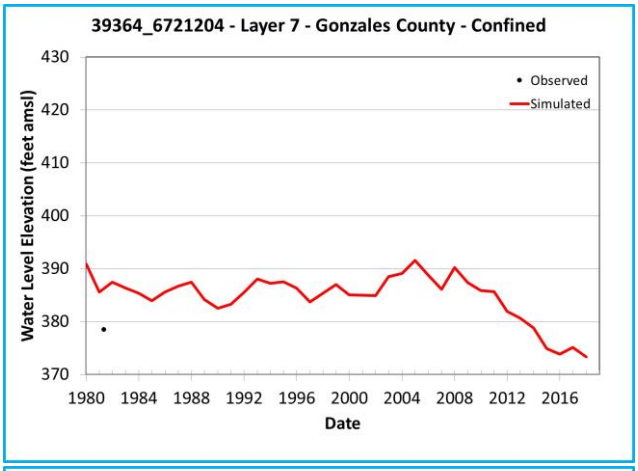
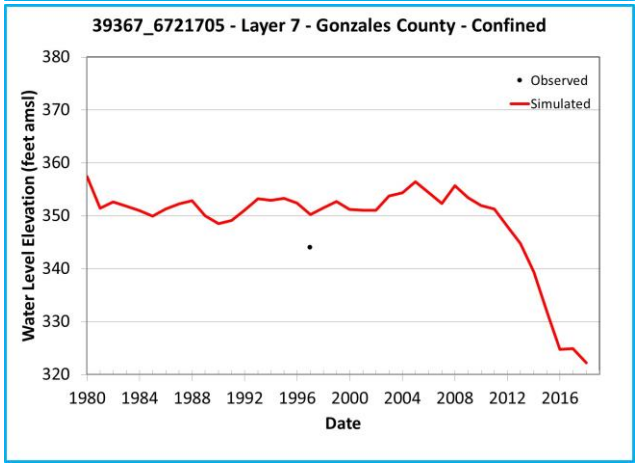
Revised		Aprv'd by	SP

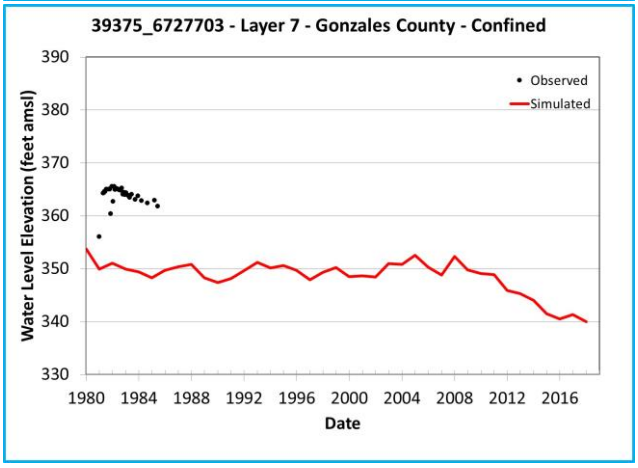
FIGURE I-9.3e

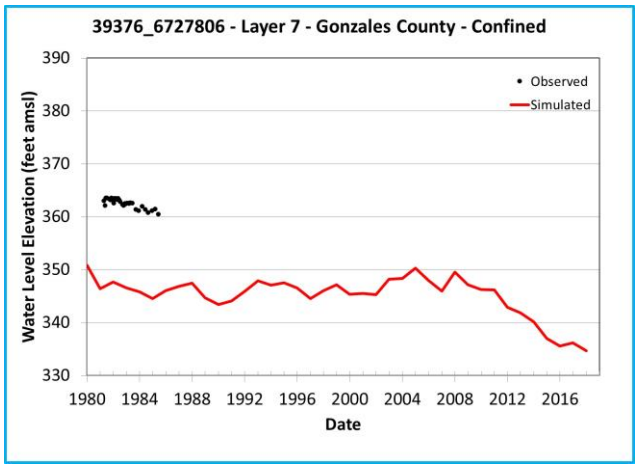
GSI ENVIRONMENTAL

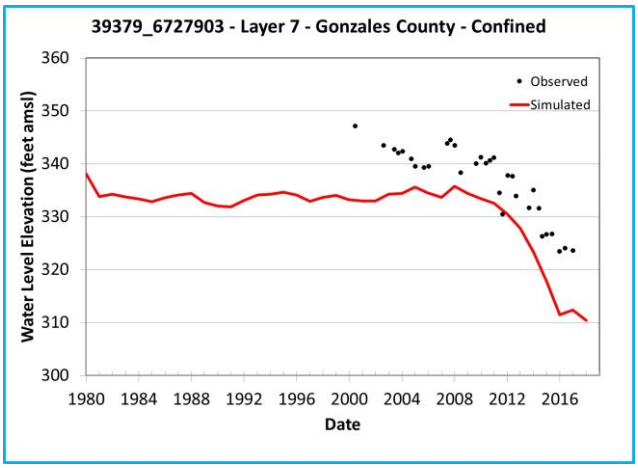












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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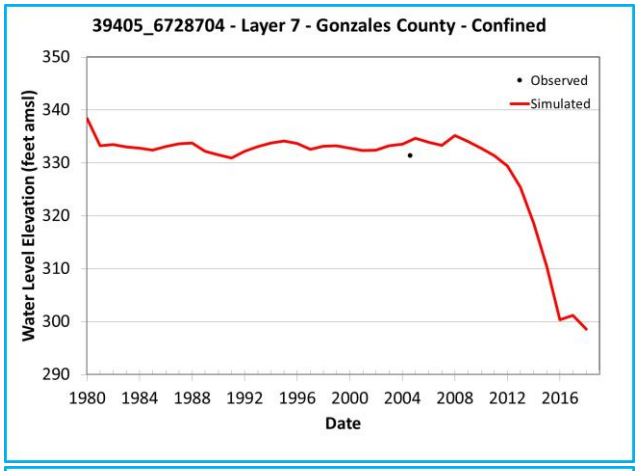
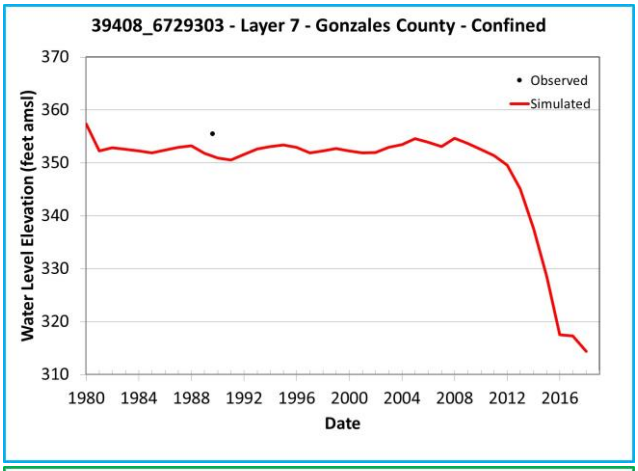
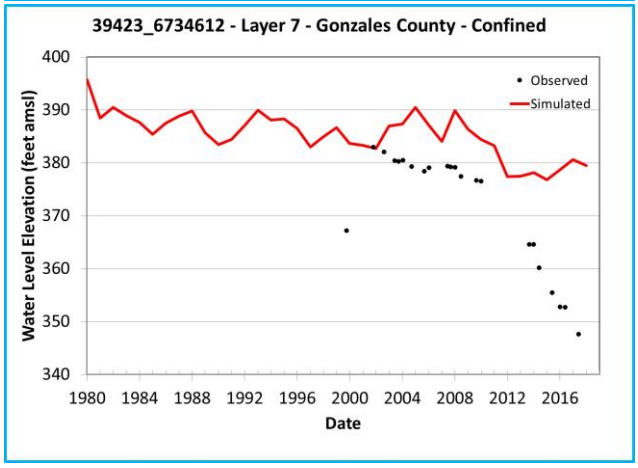
Revised		Aprv'd by	SP

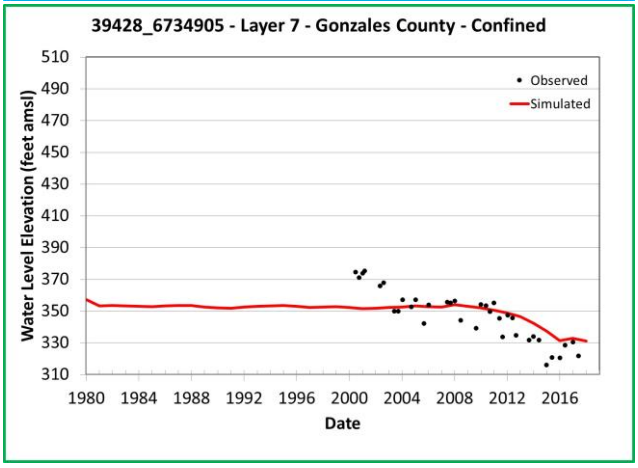
FIGURE I-9.3f

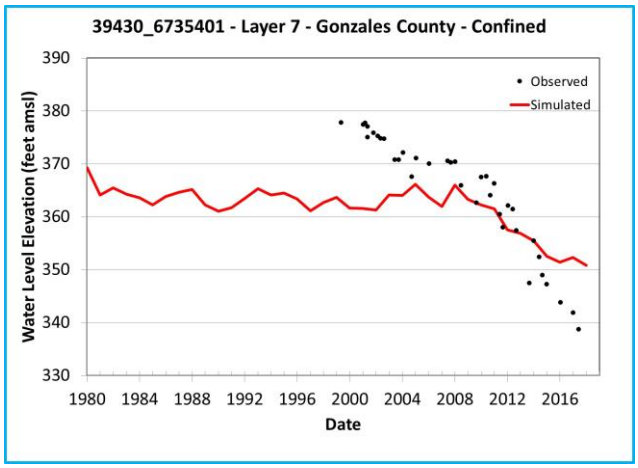
GSI ENVIRONMENTAL

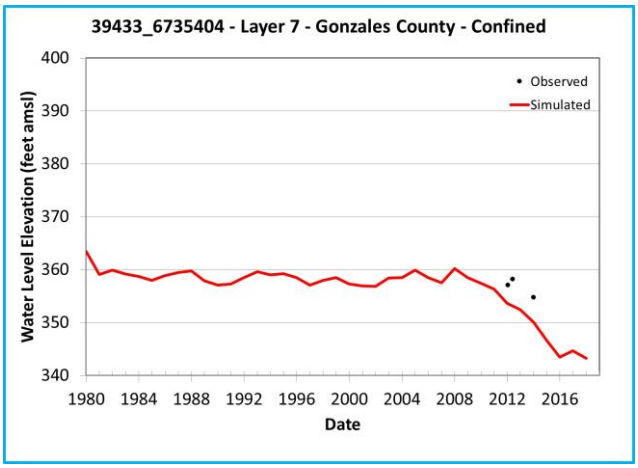












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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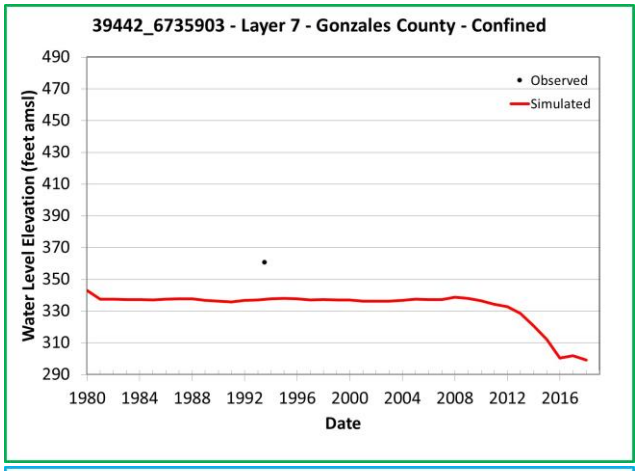
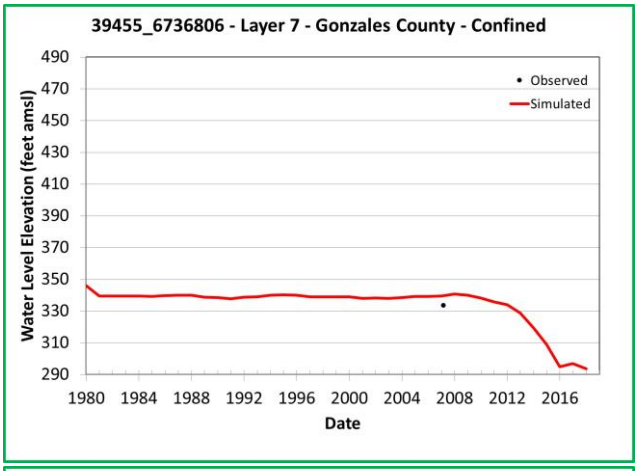
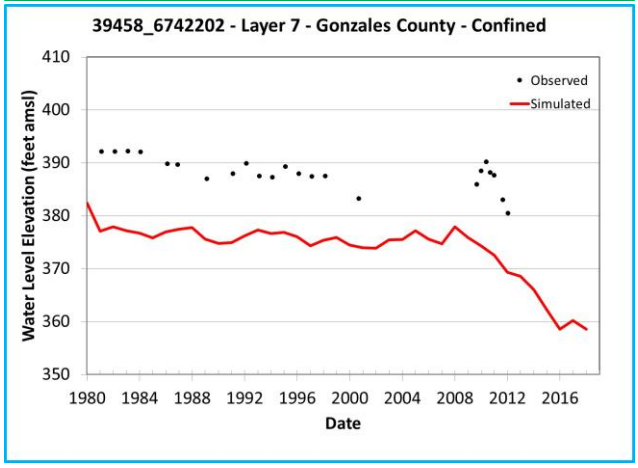
Revised		Aprv'd by	SP

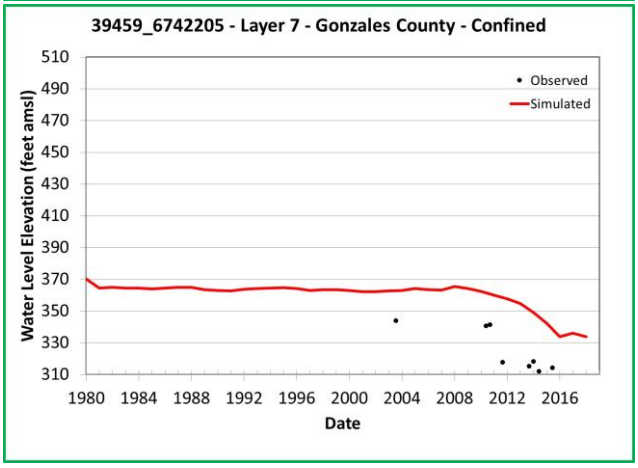
FIGURE I-9.3g

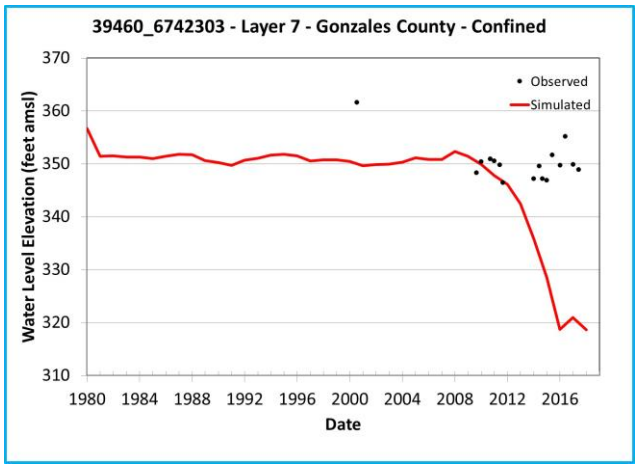
GSI ENVIRONMENTAL

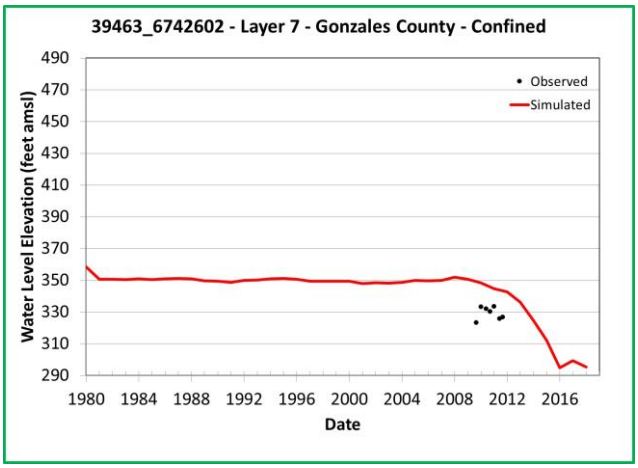












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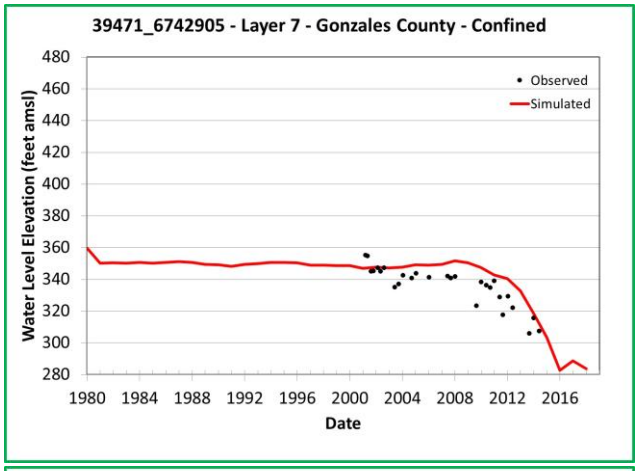
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

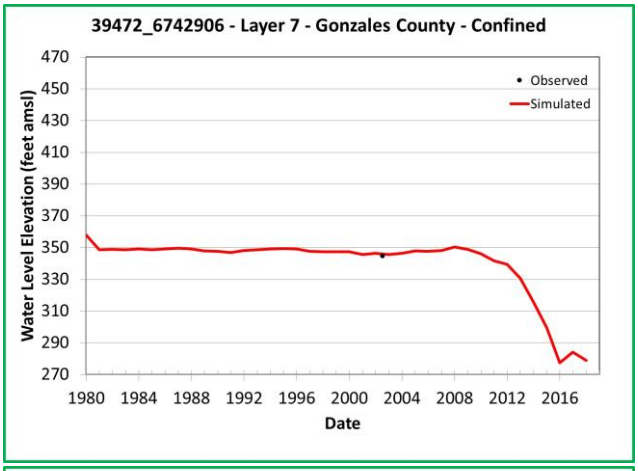
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

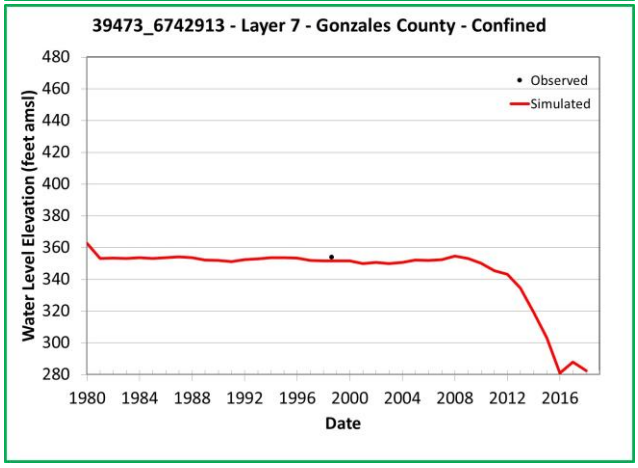
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

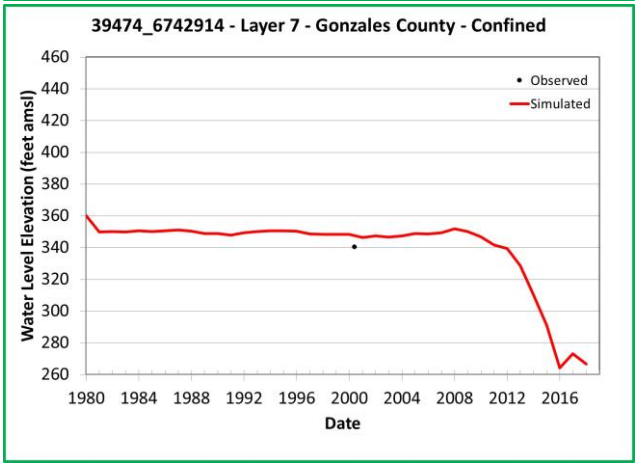
FIGURE I-9.3h

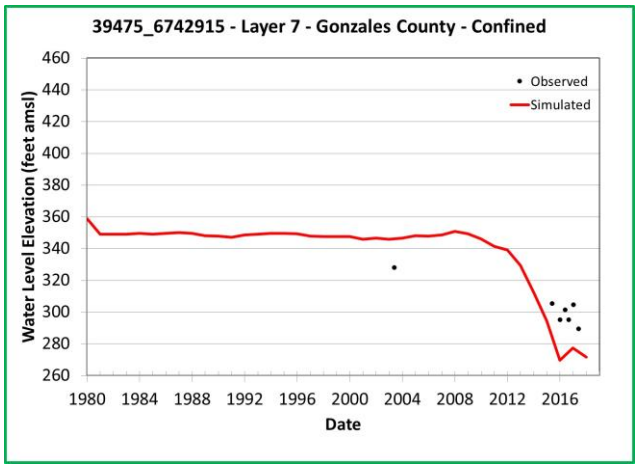
GSI ENVIRONMENTAL

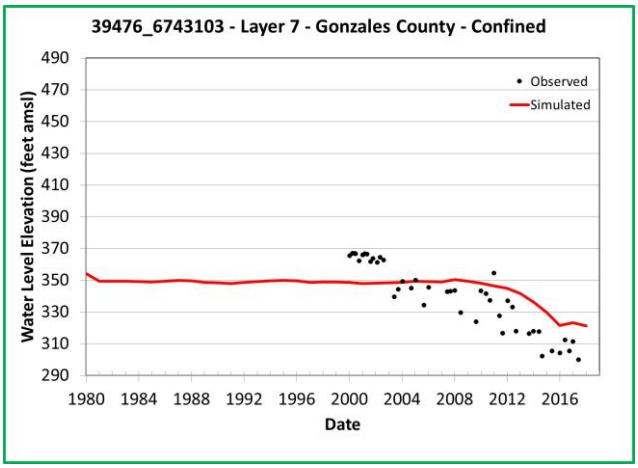












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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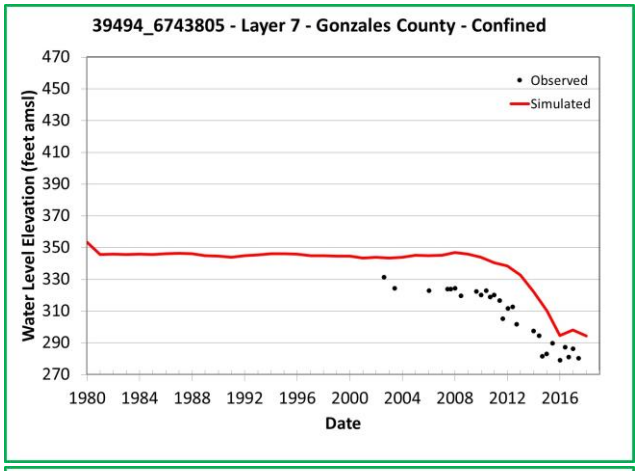
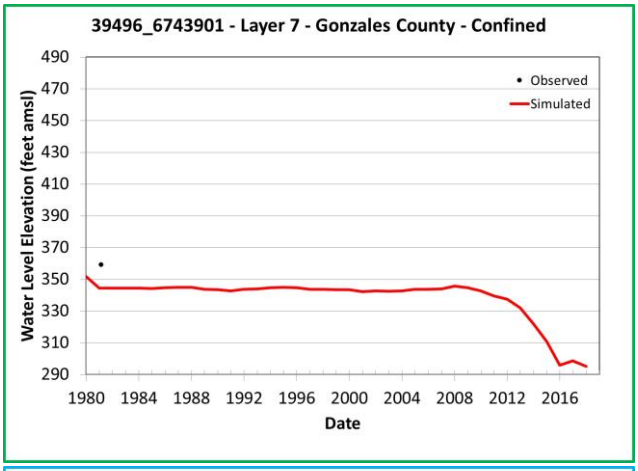
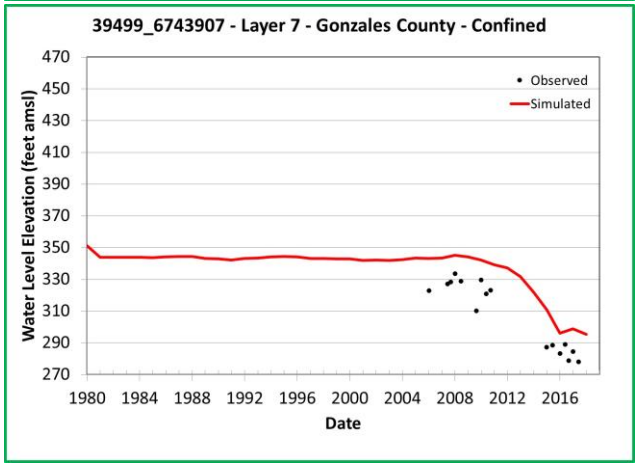
Revised		Aprv'd by	SP

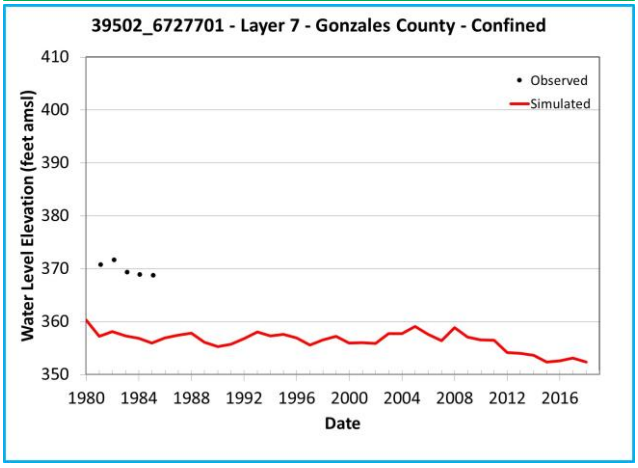
FIGURE I-9.3i

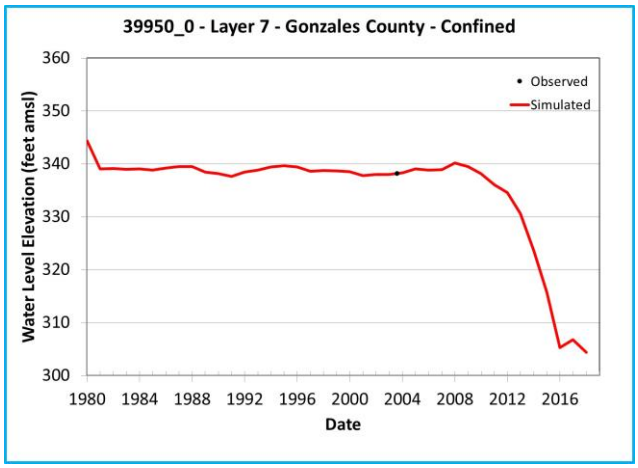
GSI ENVIRONMENTAL

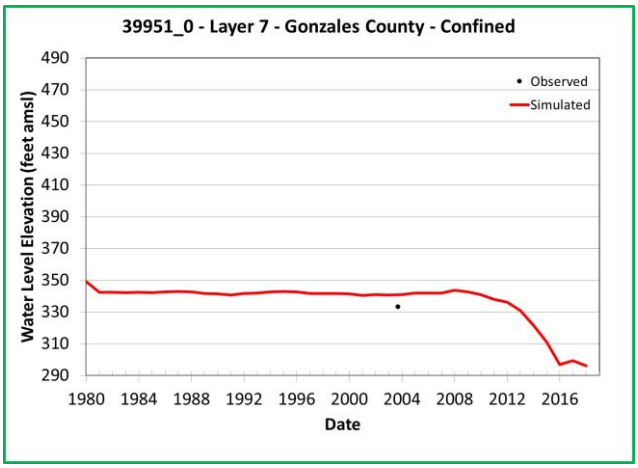












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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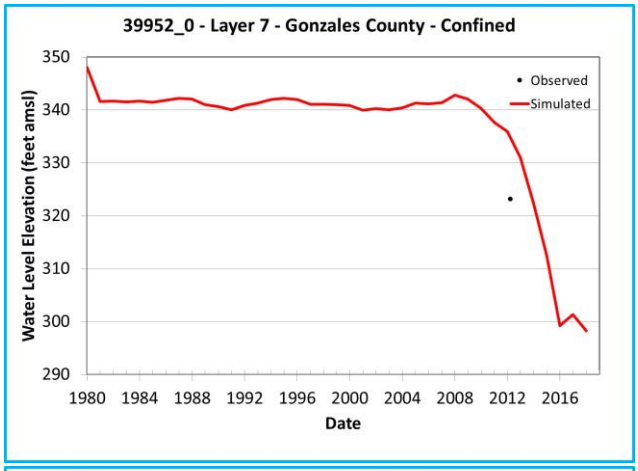
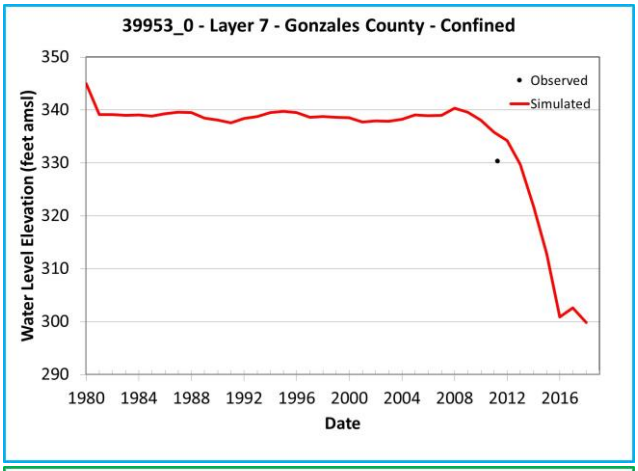
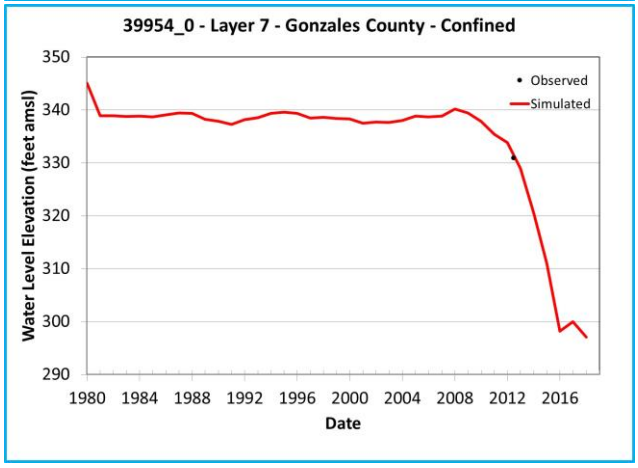
Revised		Aprv'd by	SP

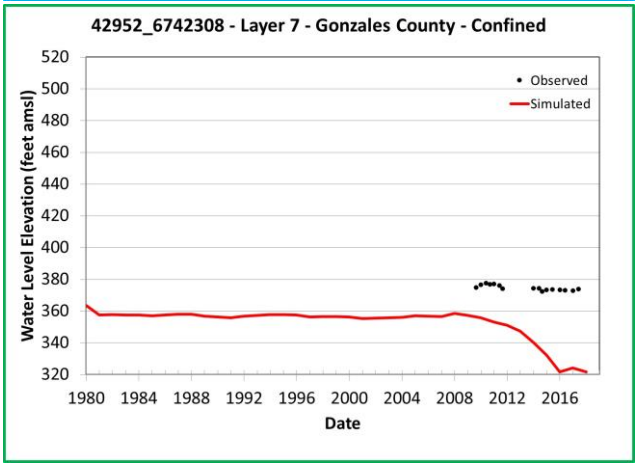
FIGURE I-9.3j

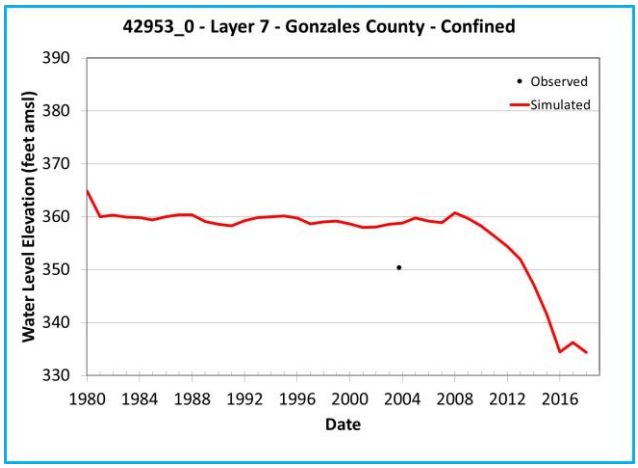
GSI ENVIRONMENTAL

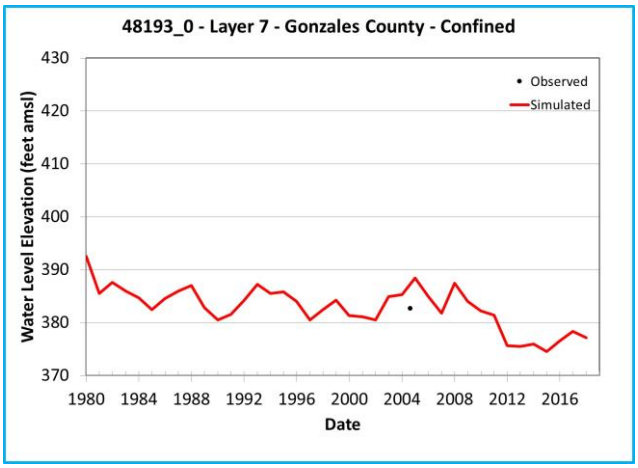












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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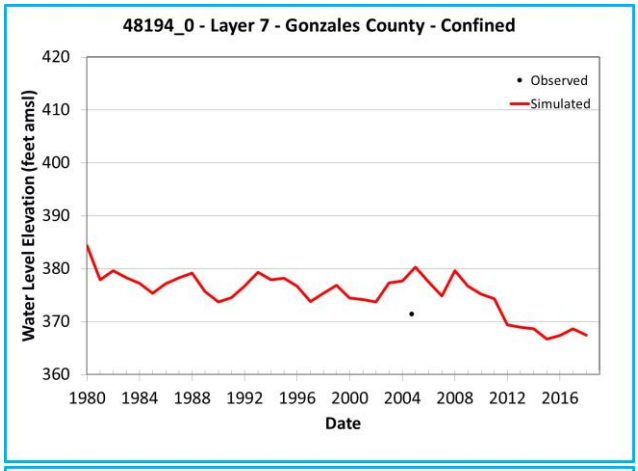
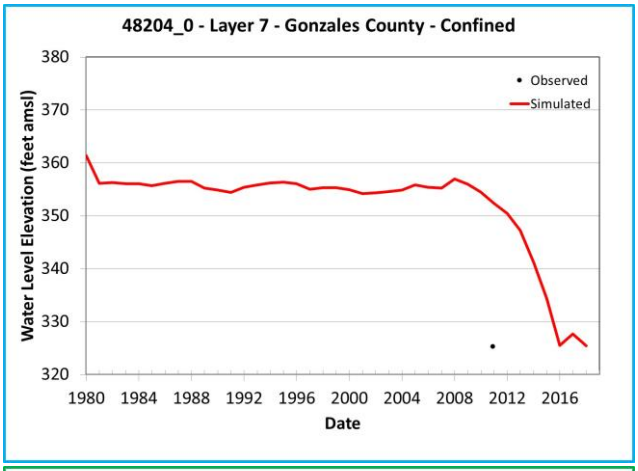
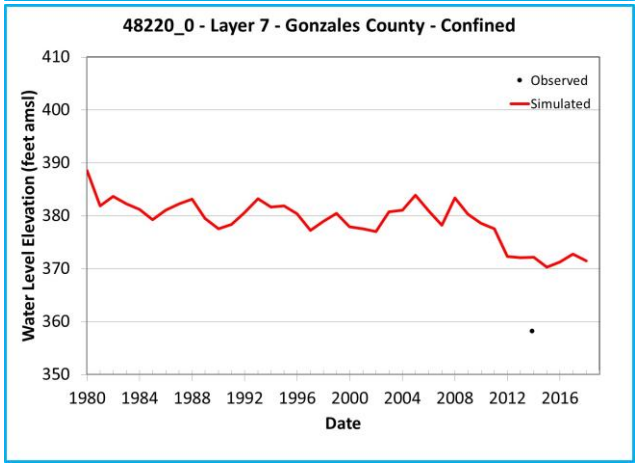
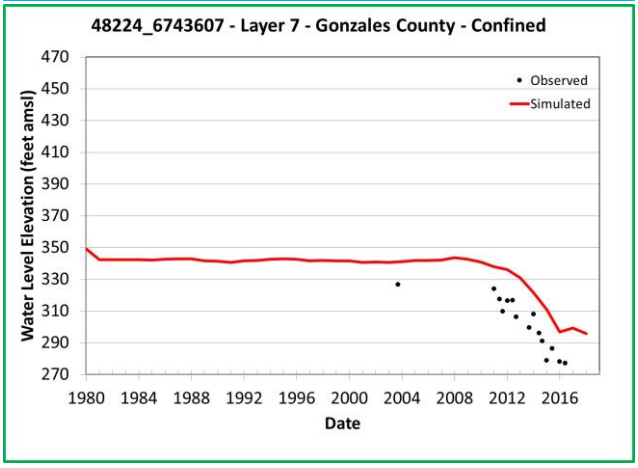
FIGURE I-9.3k

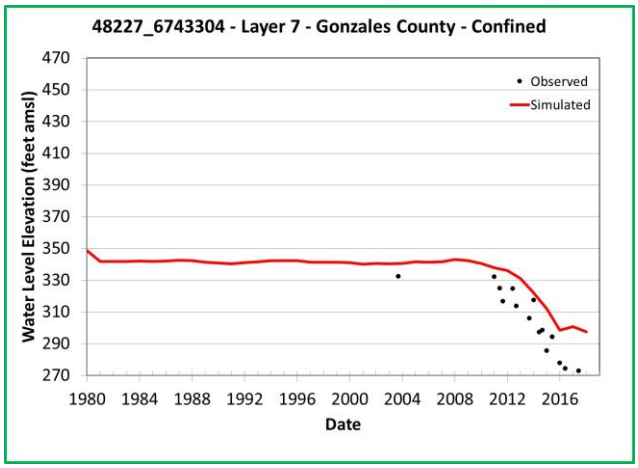
GSI ENVIRONMENTAL

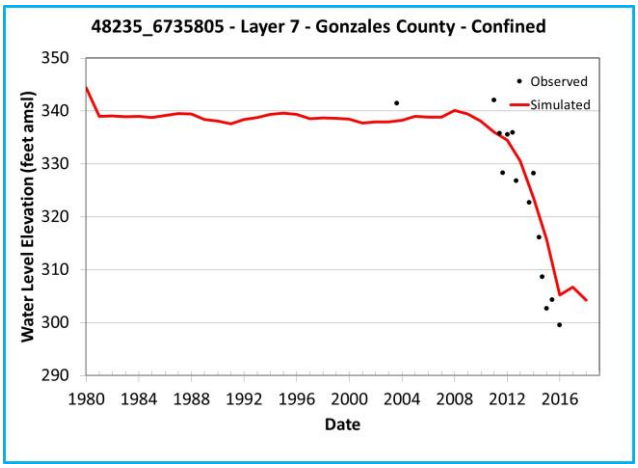












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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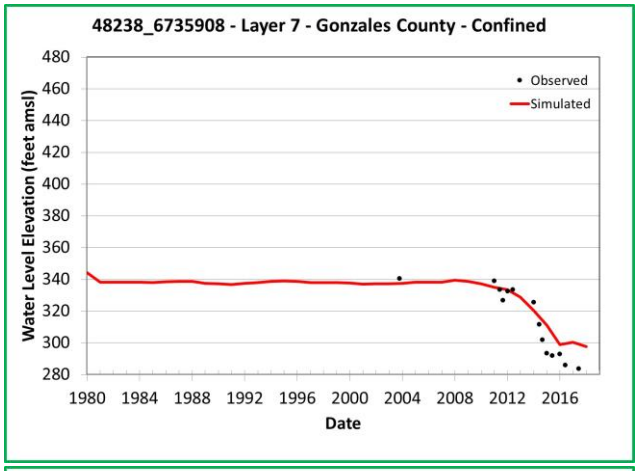
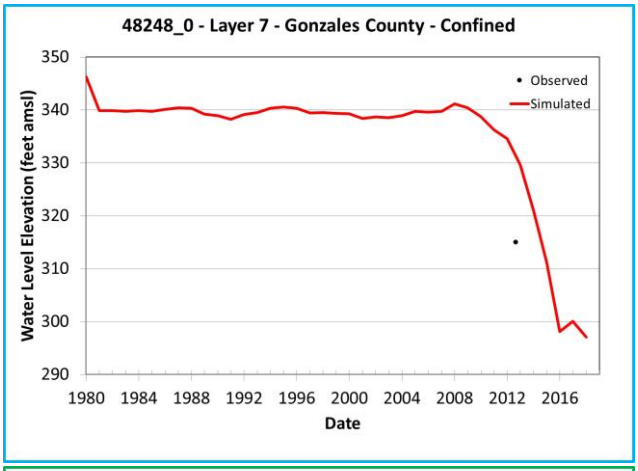
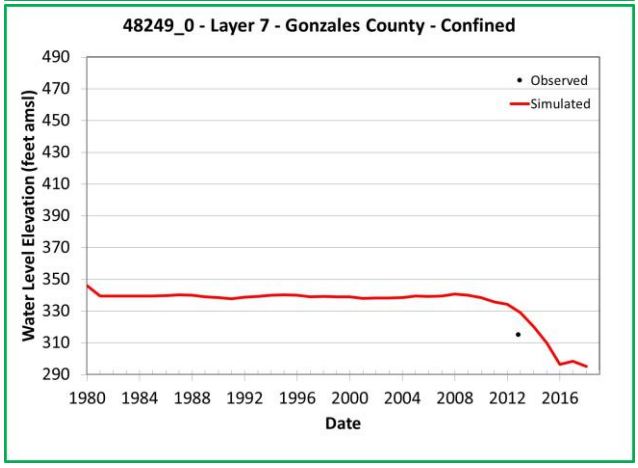
Revised		Aprv'd by	SP

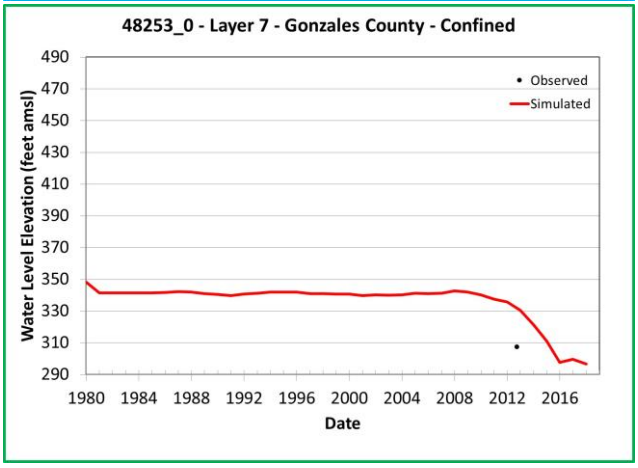
FIGURE I-9.3l

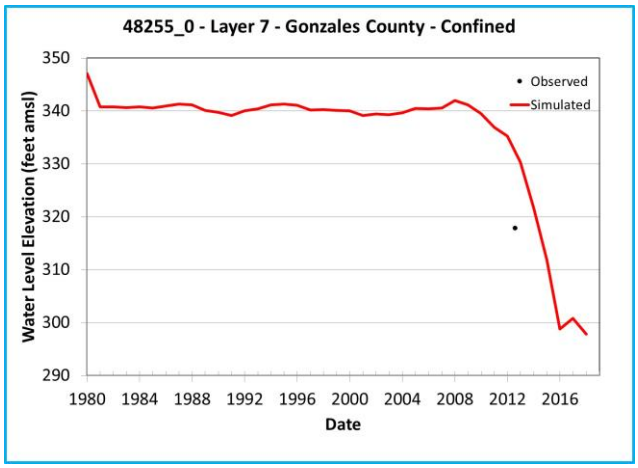
GSI ENVIRONMENTAL

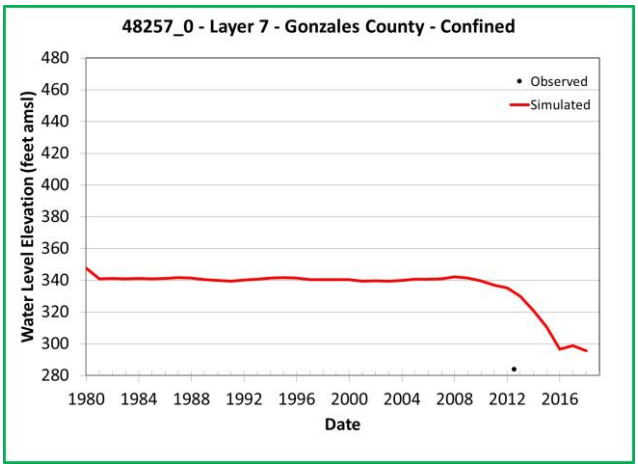












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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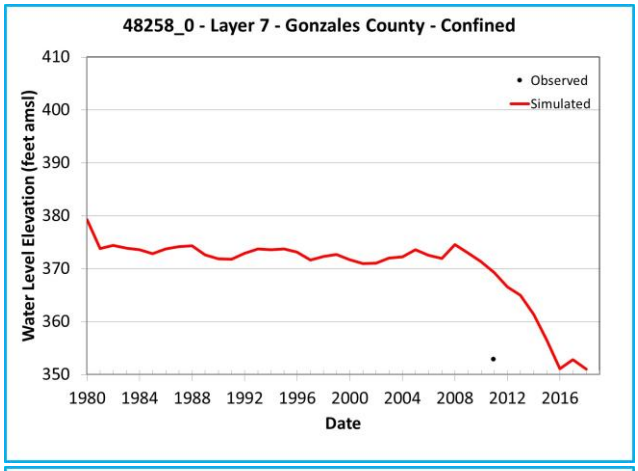
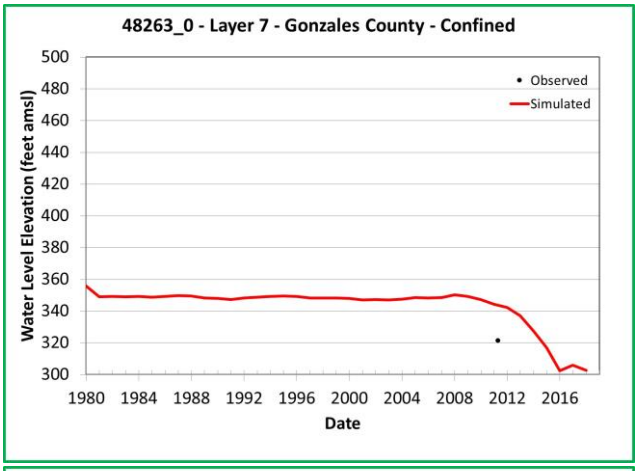
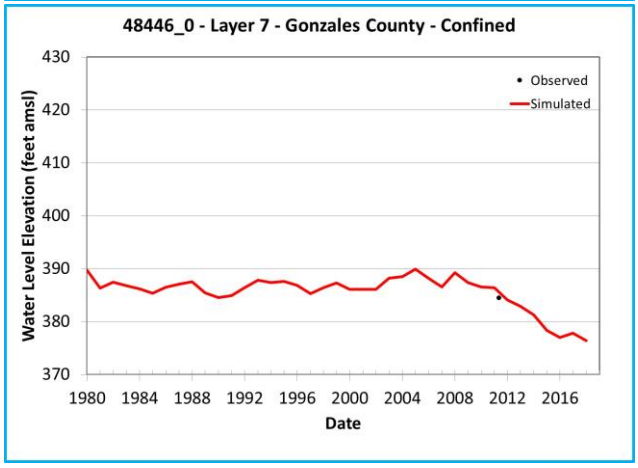
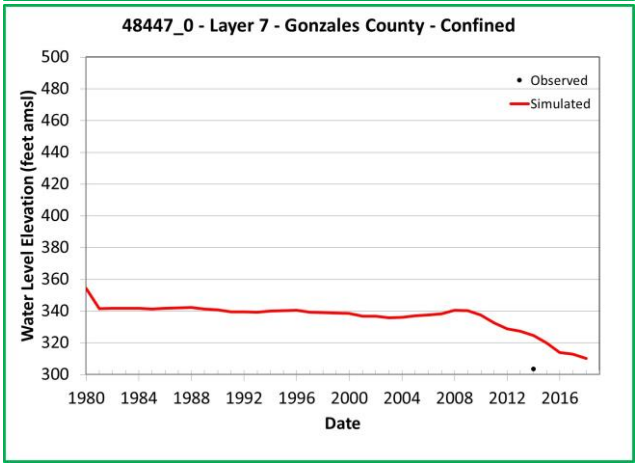
FIGURE I-9.3m

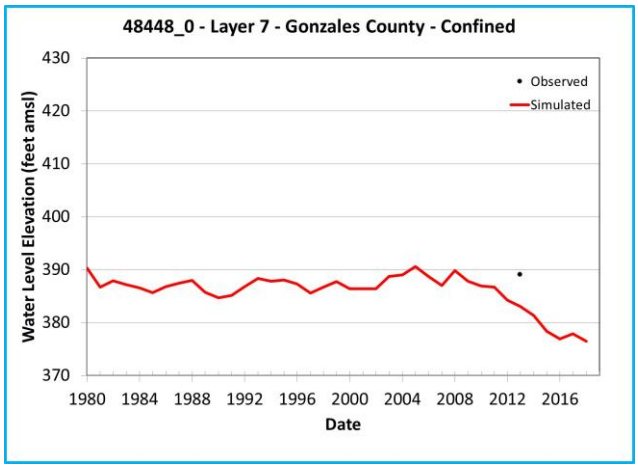
GSI ENVIRONMENTAL

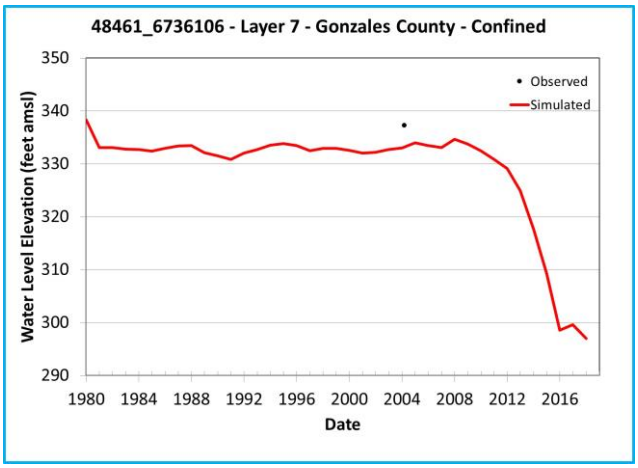












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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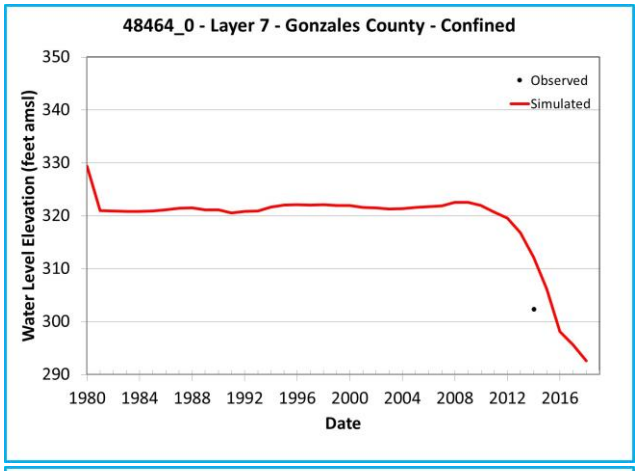
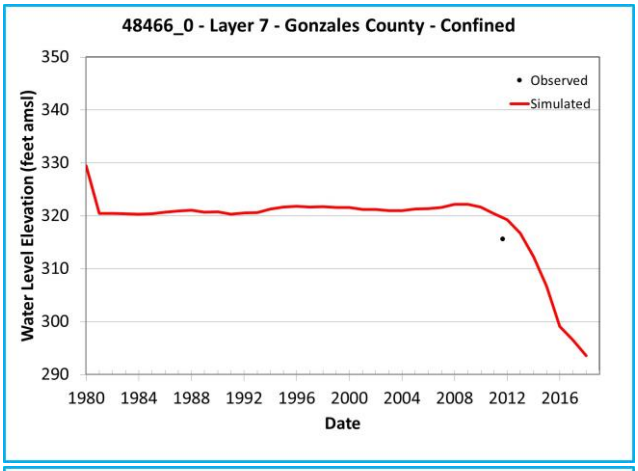
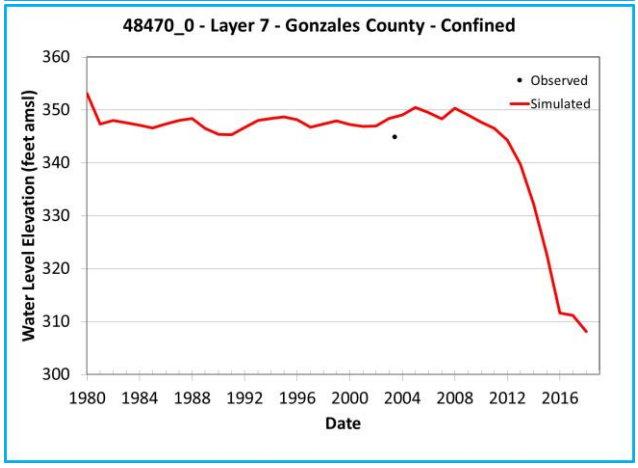
Revised		Aprv'd by	SP

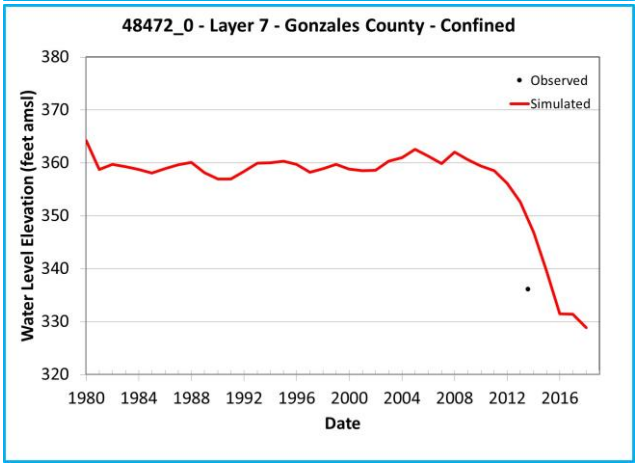
FIGURE I-9.3n

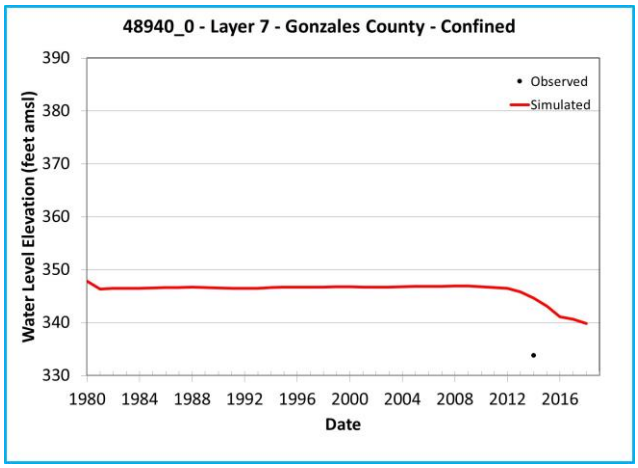
GSI ENVIRONMENTAL

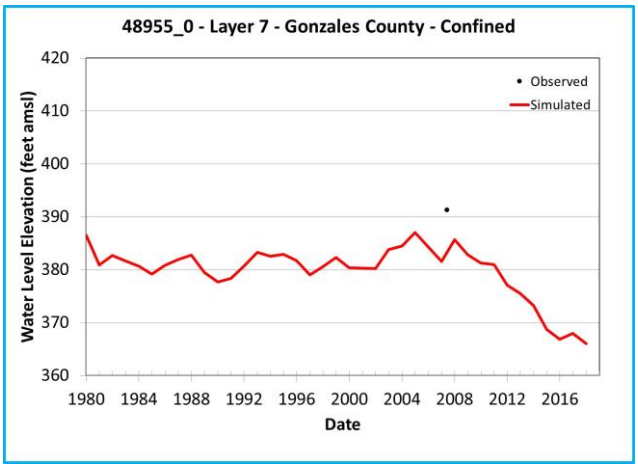












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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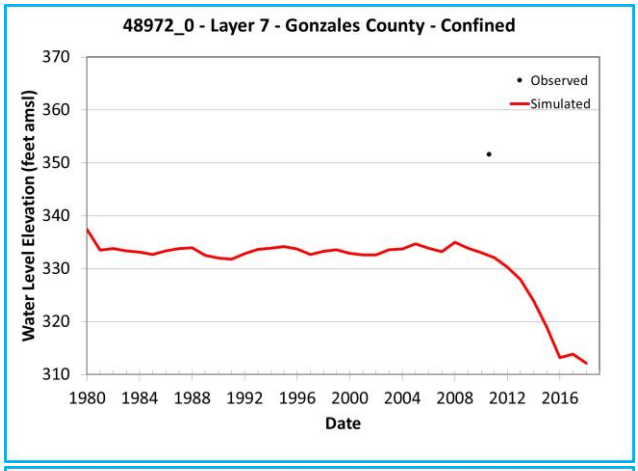
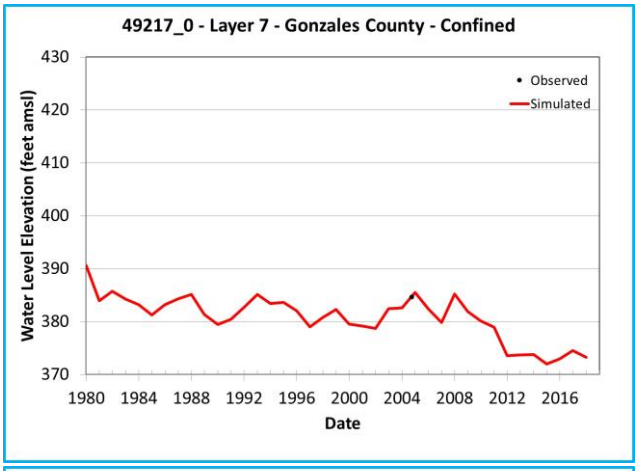
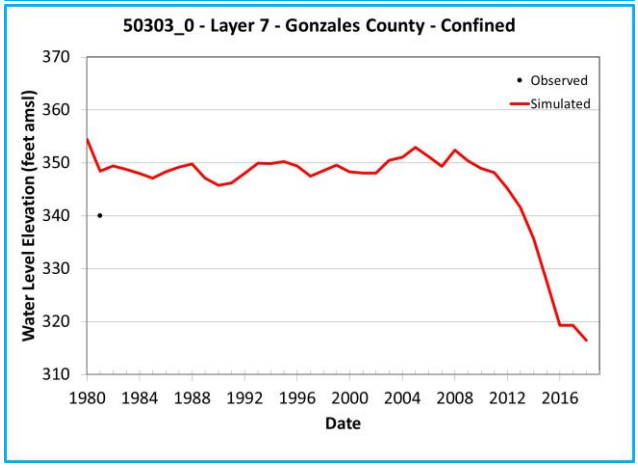
Revised		Aprv'd by	SP

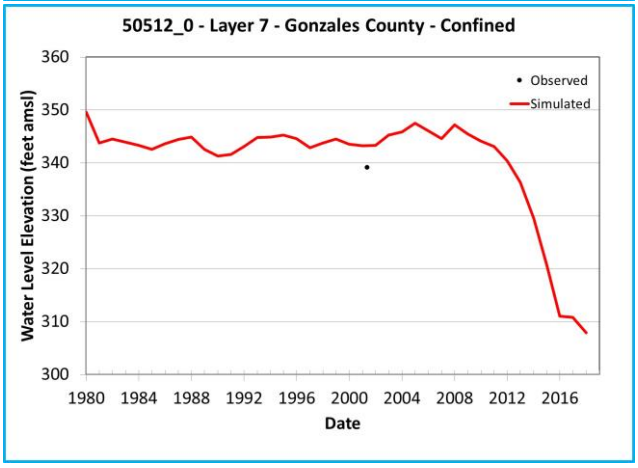
FIGURE I-9.3o

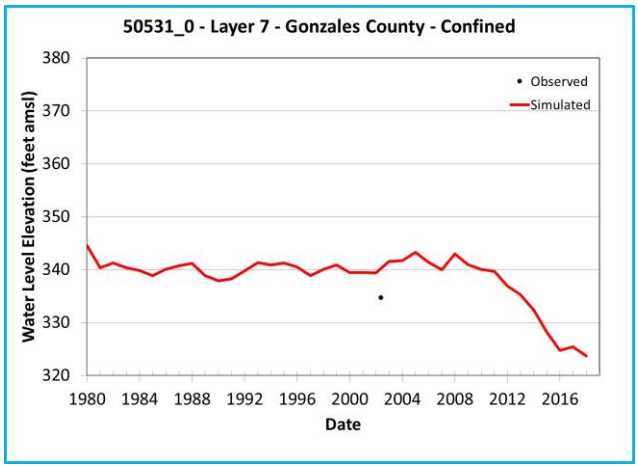
GSI ENVIRONMENTAL

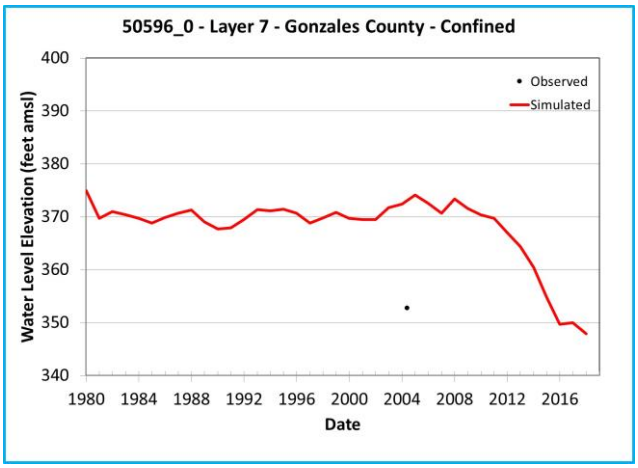












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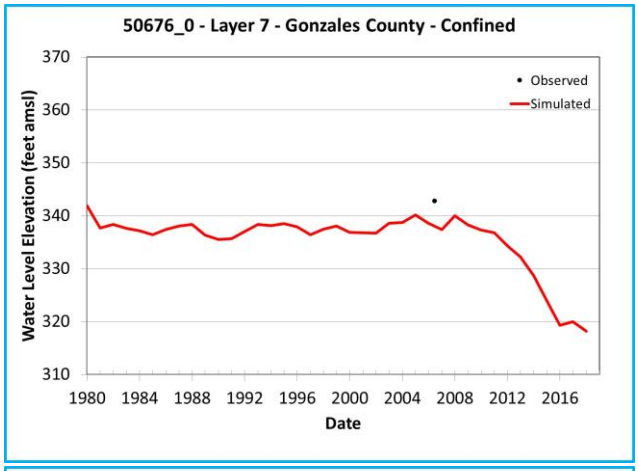
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

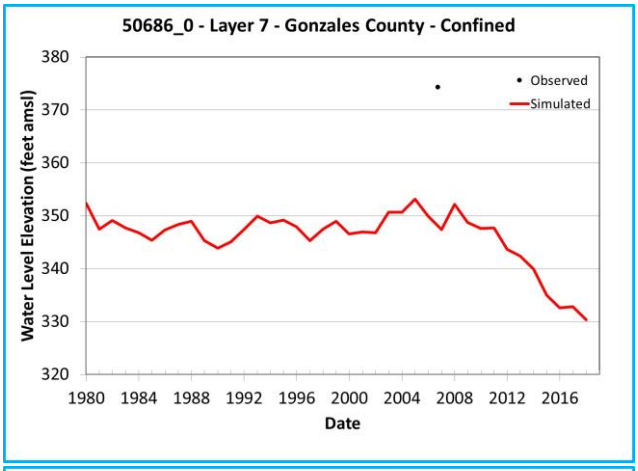
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

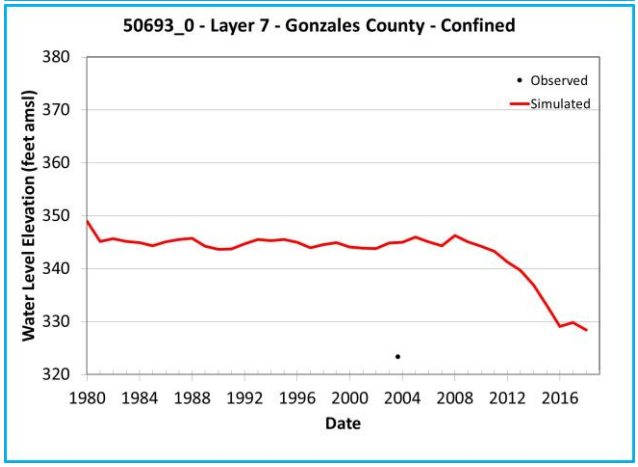
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

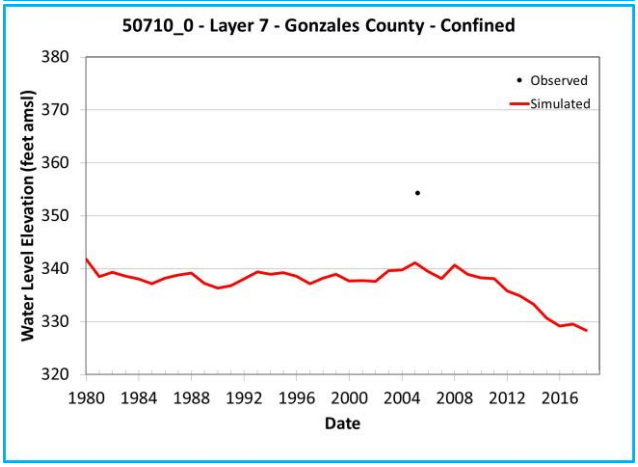
FIGURE I-9.3p

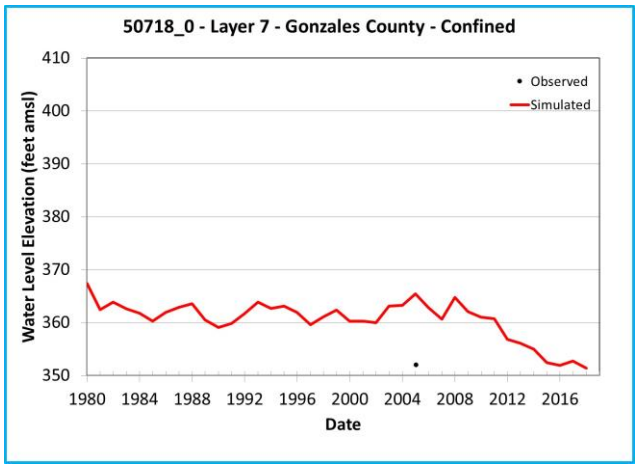
GSI ENVIRONMENTAL

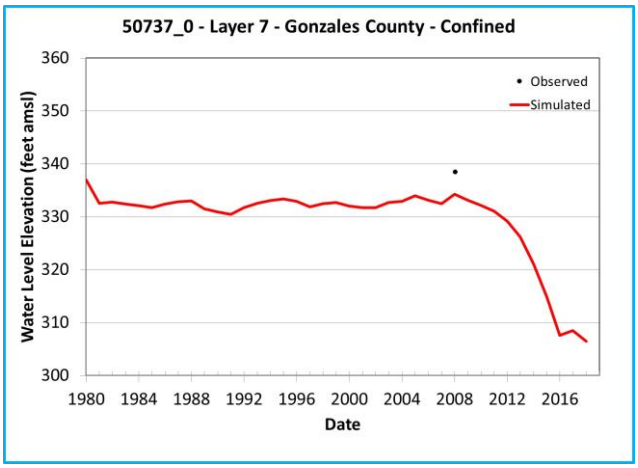












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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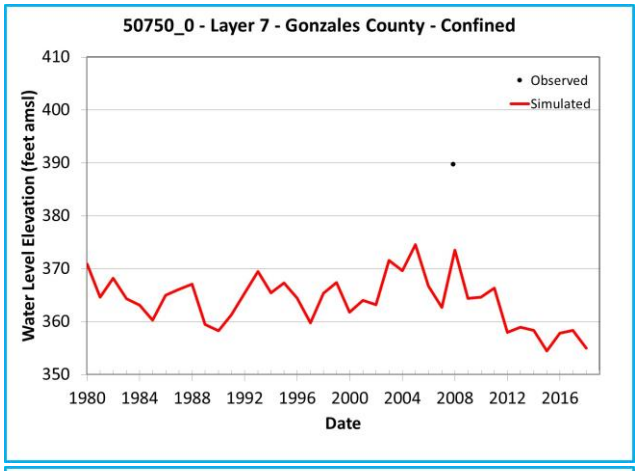
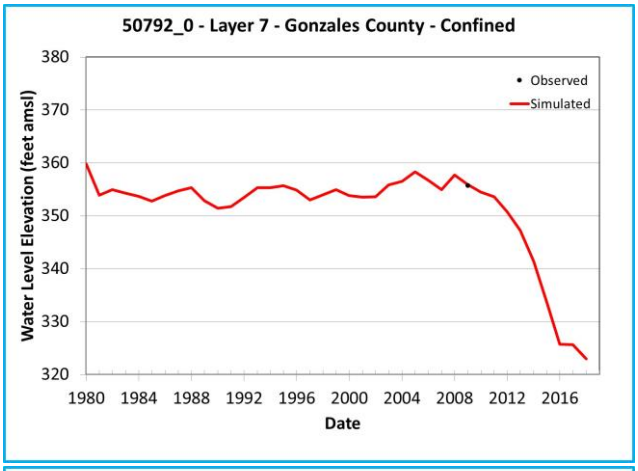
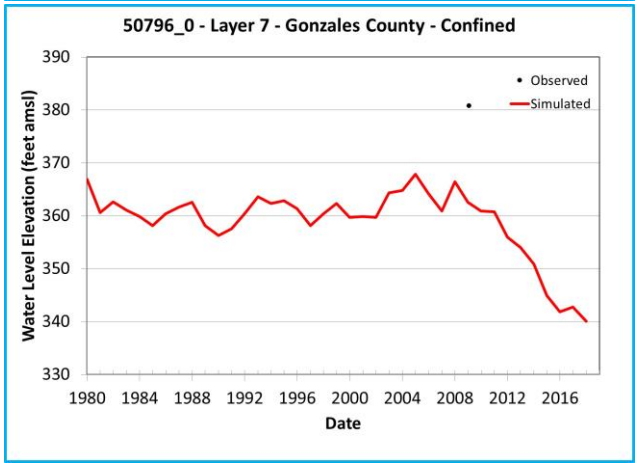
Revised		Aprv'd by	SP

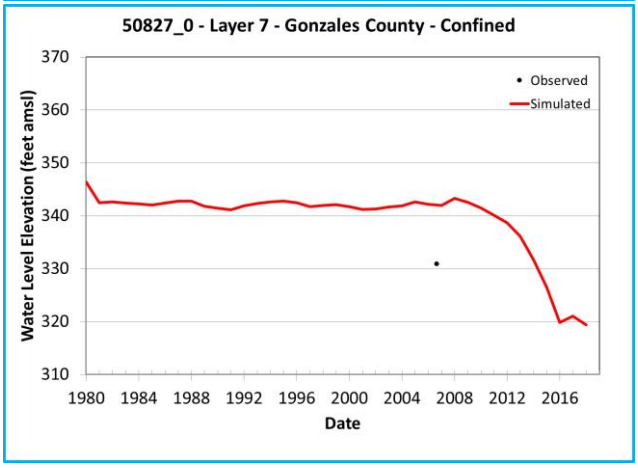
FIGURE I-9.3q

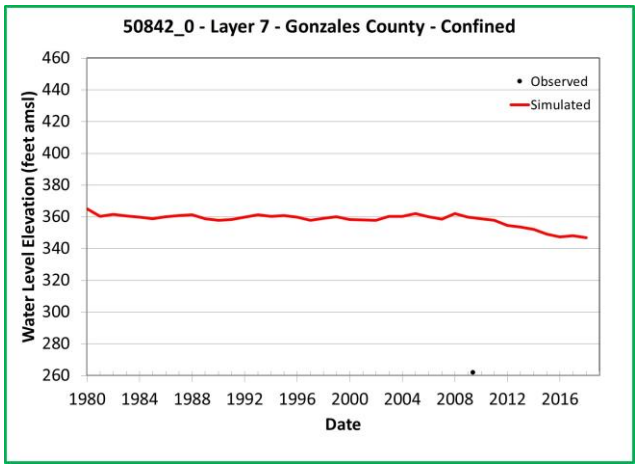
GSI ENVIRONMENTAL

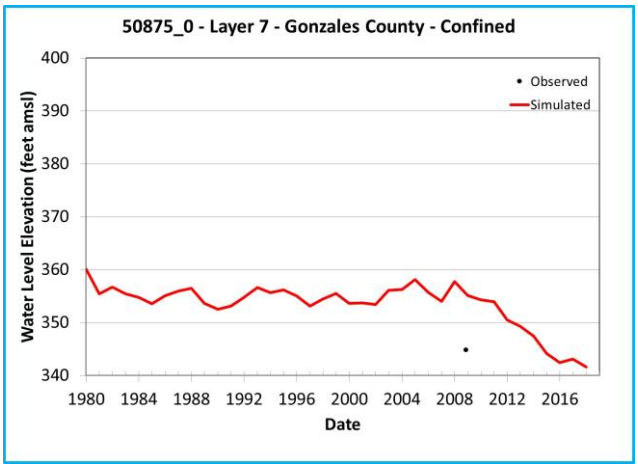












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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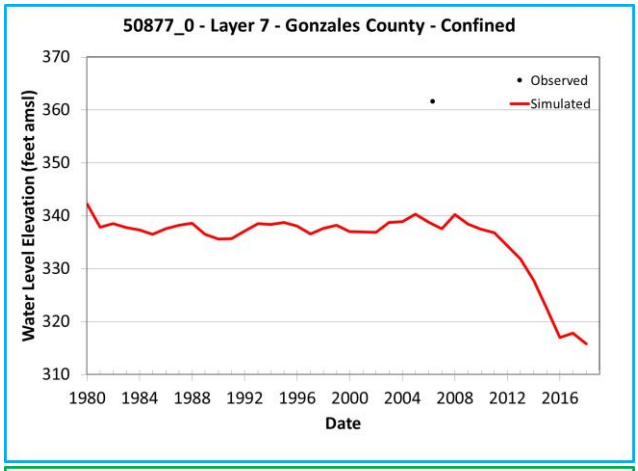
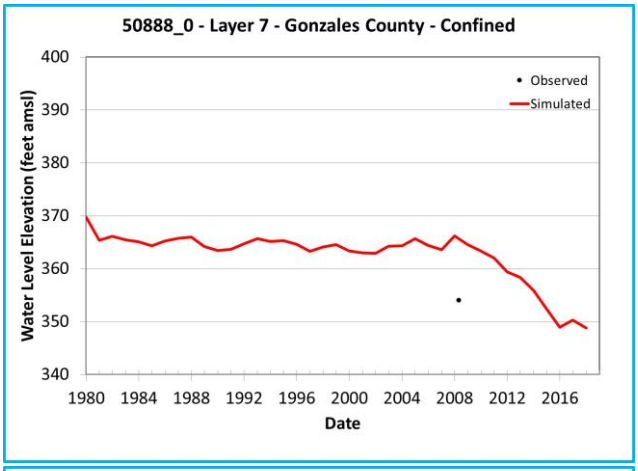
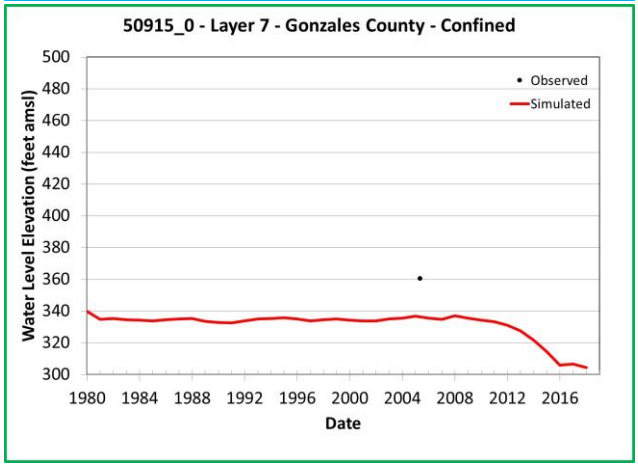
Revised		Aprv'd by	SP

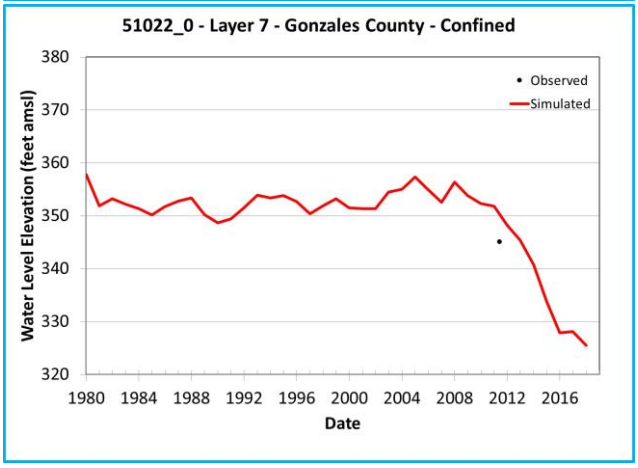
FIGURE I-9.3r

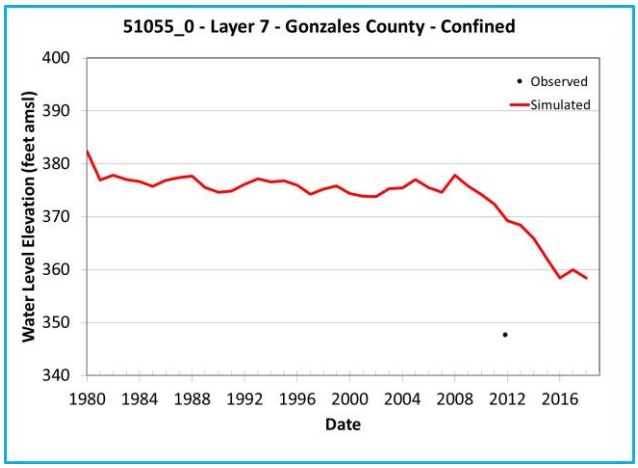
GSI ENVIRONMENTAL

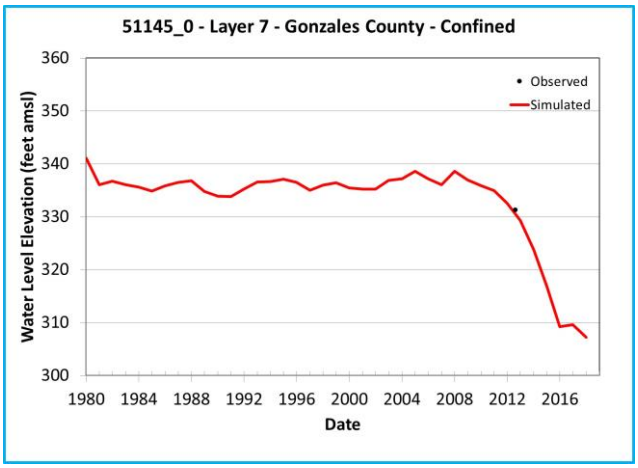












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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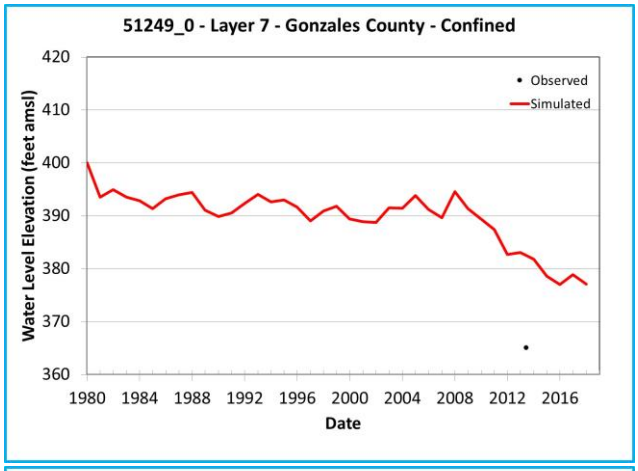
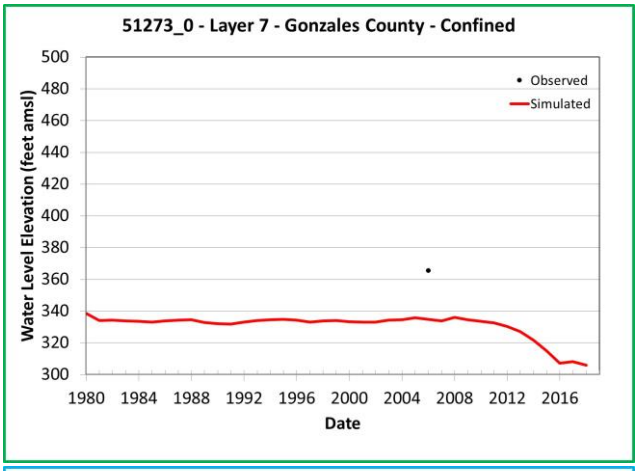
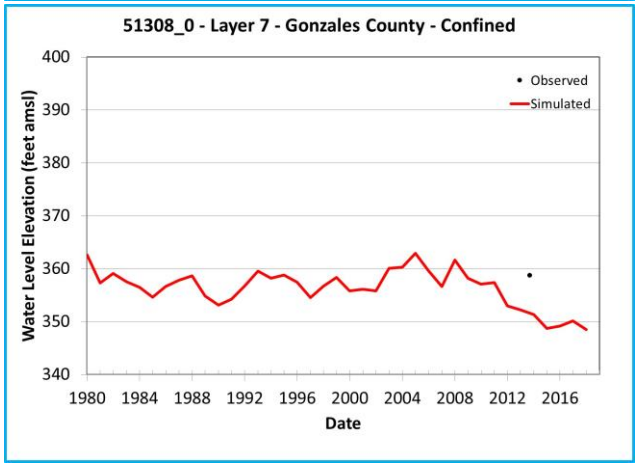
Revised		Aprv'd by	SP

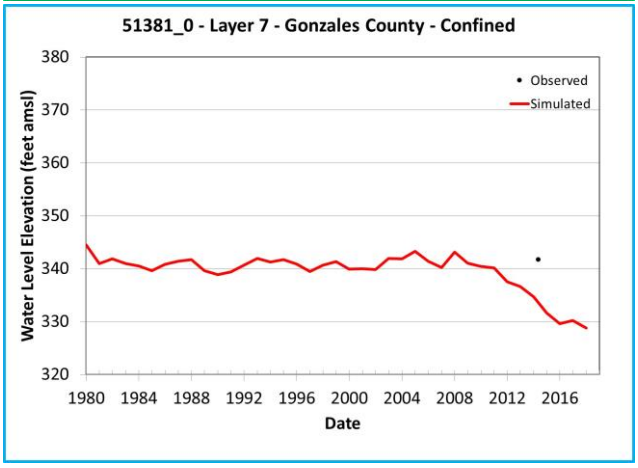
FIGURE I-9.3s

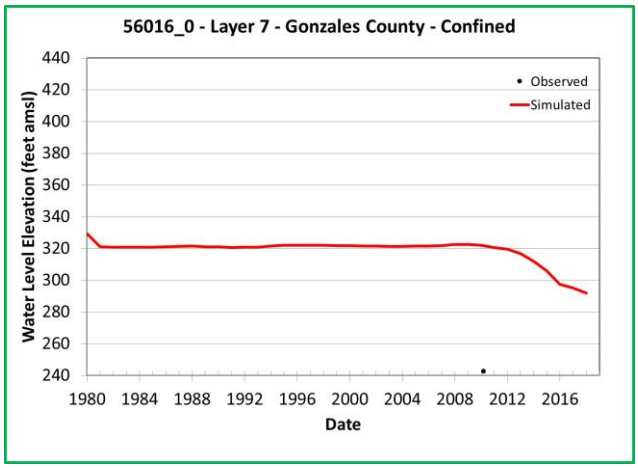
GSI ENVIRONMENTAL

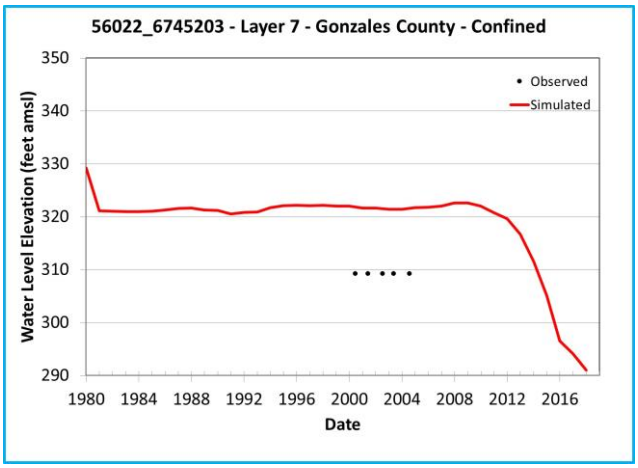












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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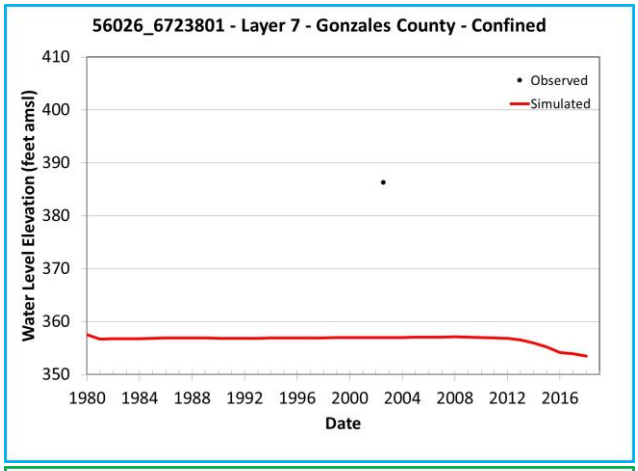
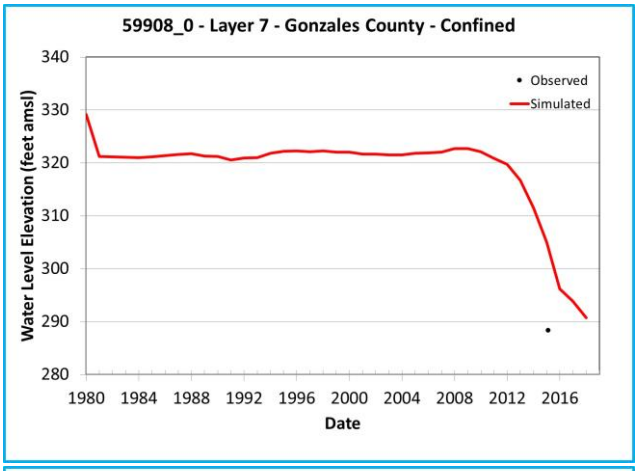
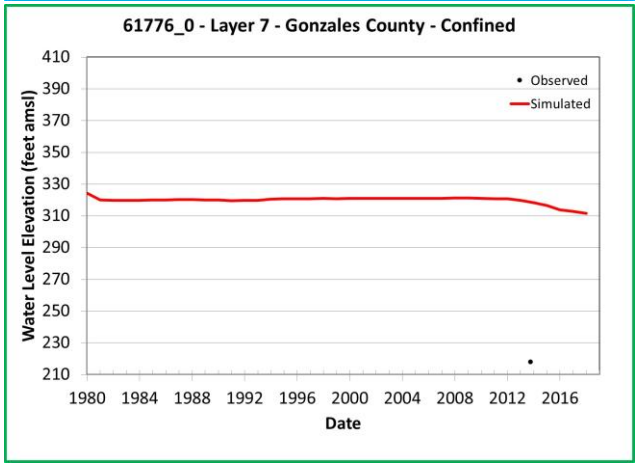
Revised		Aprv'd by	SP

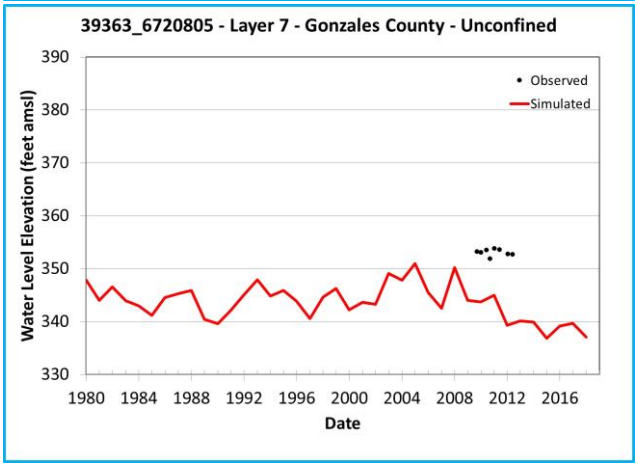
FIGURE I-9.3t

GSI ENVIRONMENTAL









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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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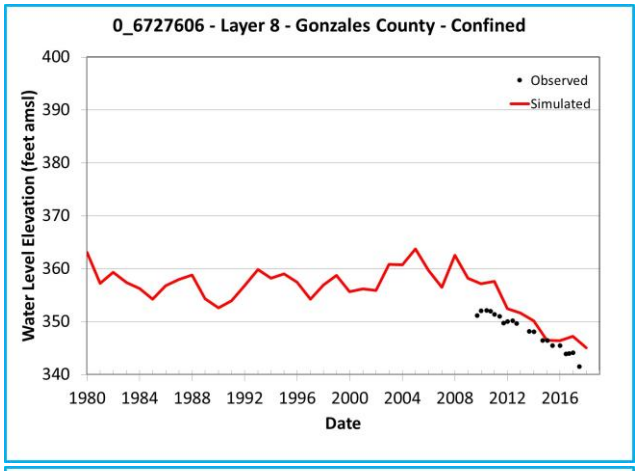
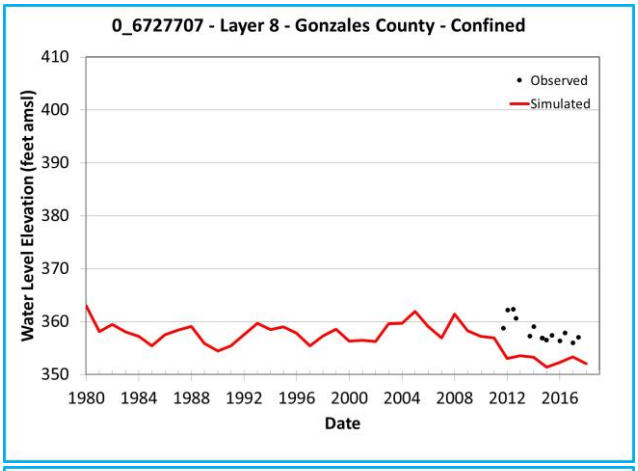
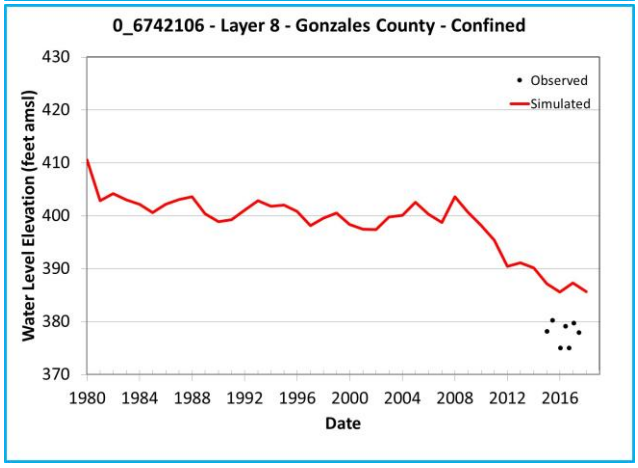
Revised		Aprv'd by	SP

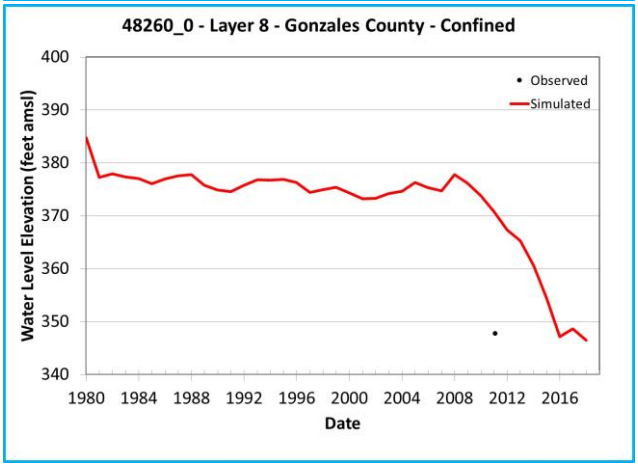
FIGURE I-9.3u

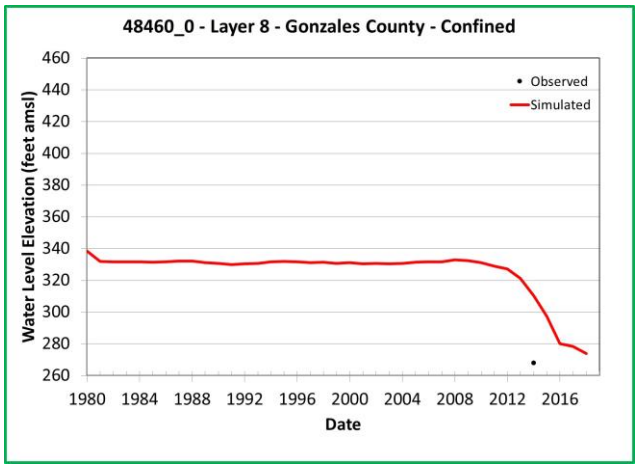
GSI ENVIRONMENTAL

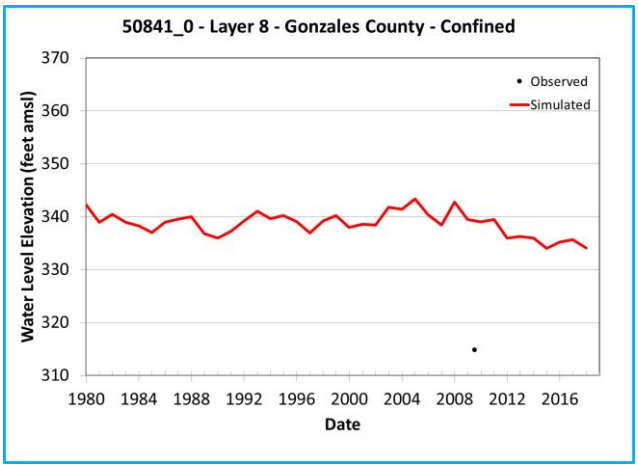












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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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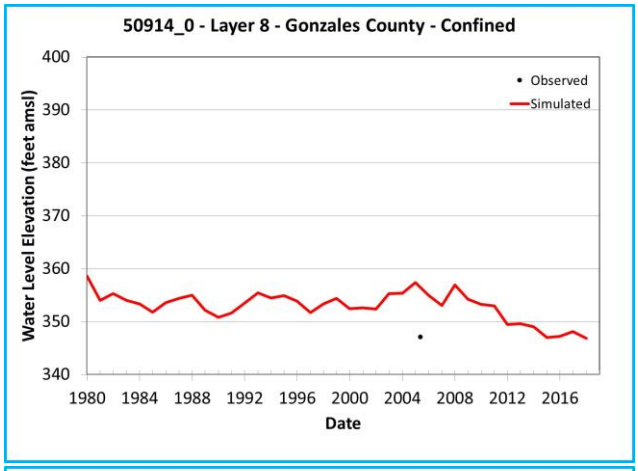
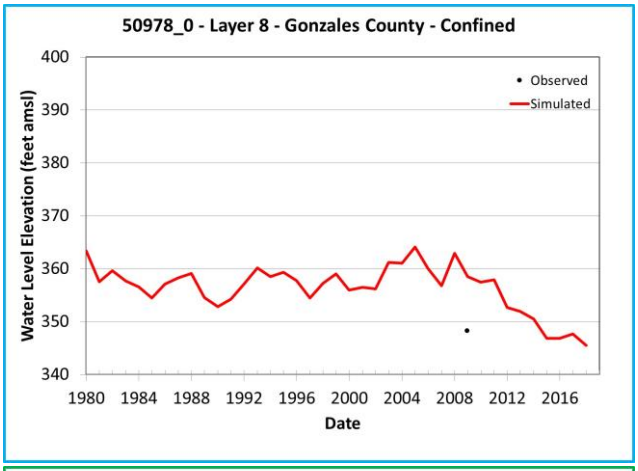
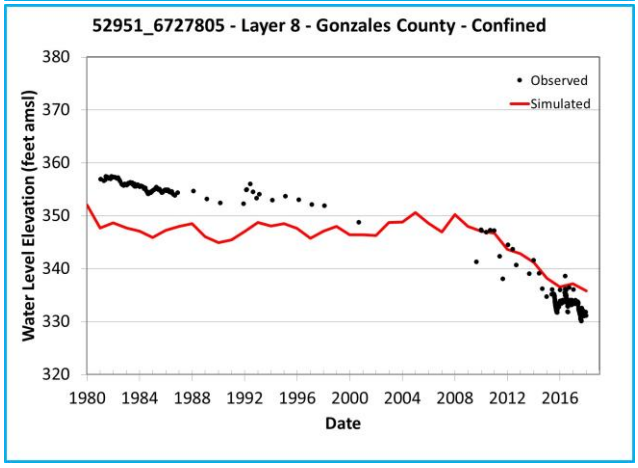
Revised		Aprv'd by	SP

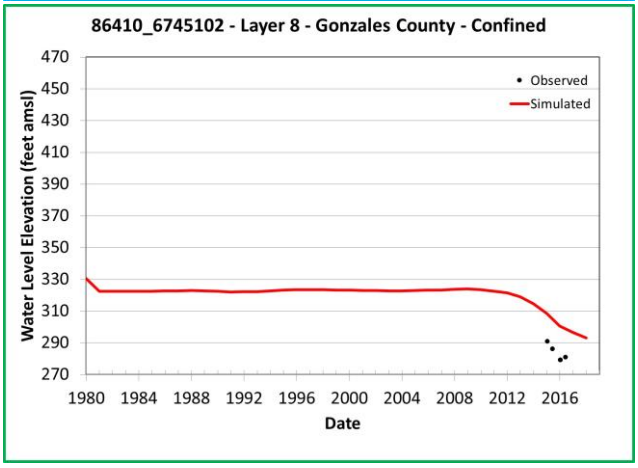
FIGURE I-9.4a

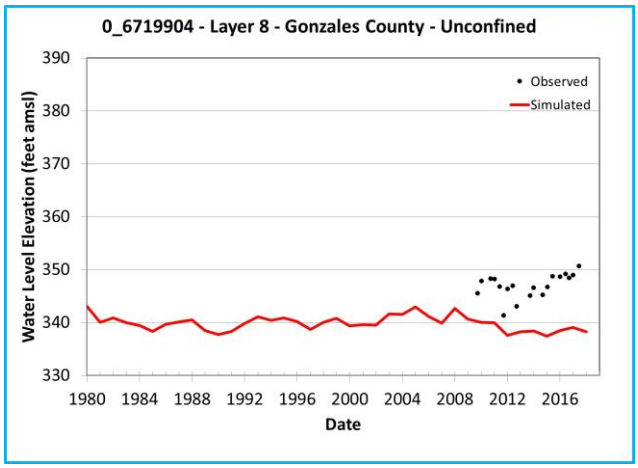
GSI ENVIRONMENTAL











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Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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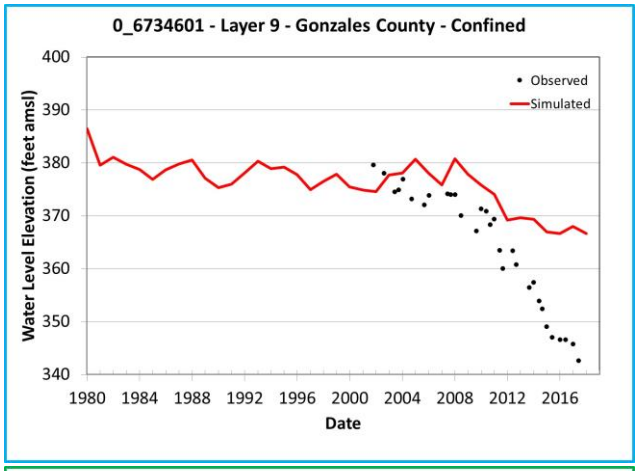
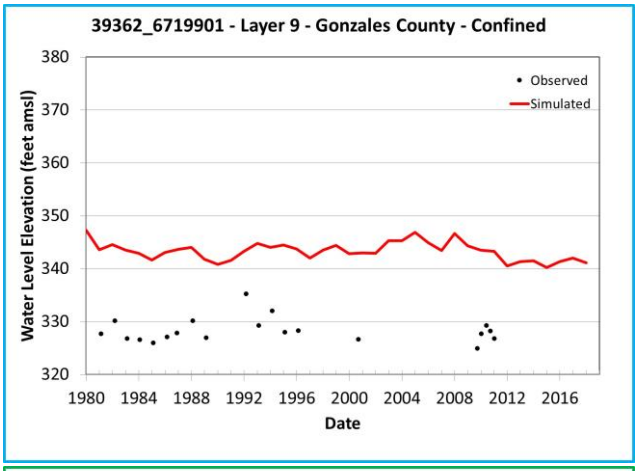
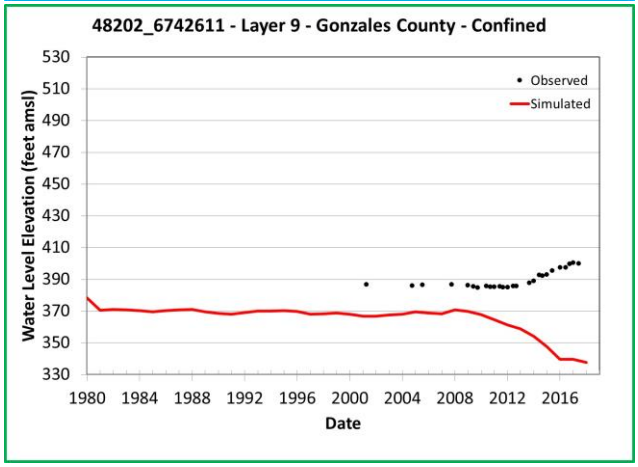
Revised		Aprv'd by	SP

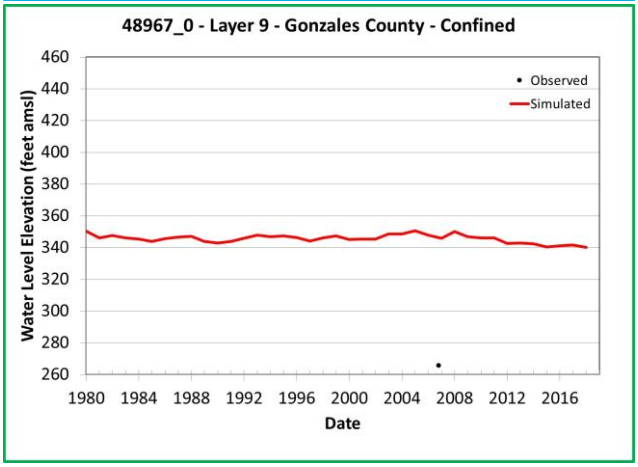
FIGURE I-9.4b

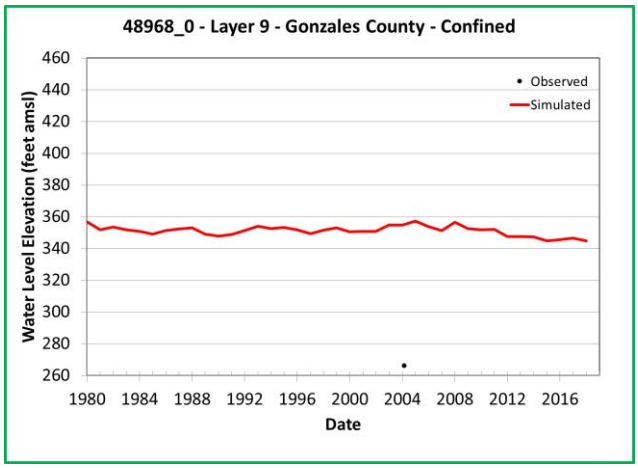
GSI ENVIRONMENTAL

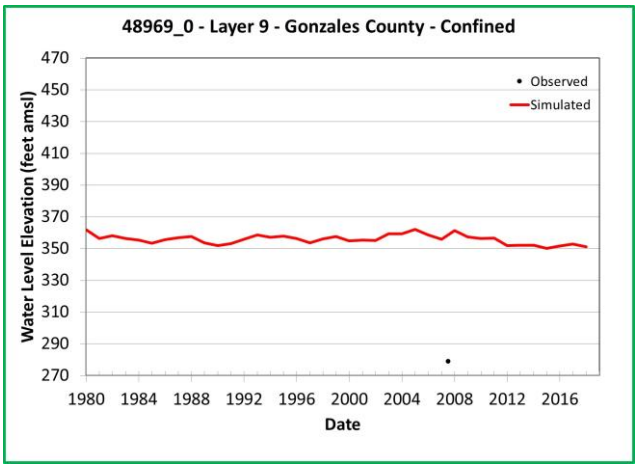












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

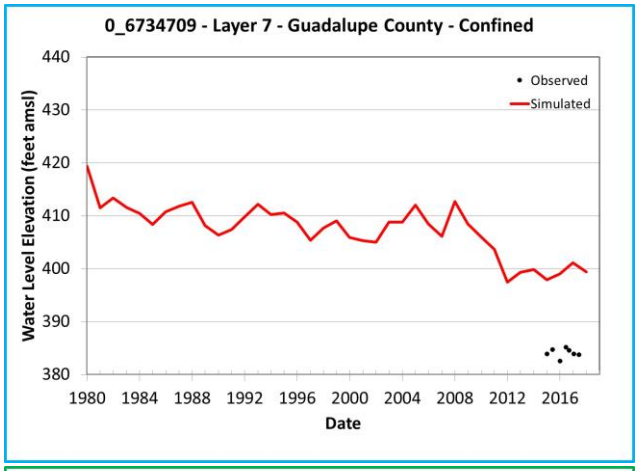
Simulated and Observed Water Level Elevation Hydrographs, Gonzales County, Layer 9

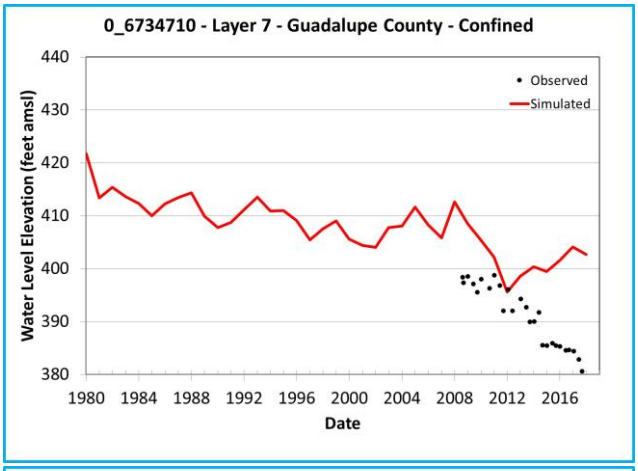
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

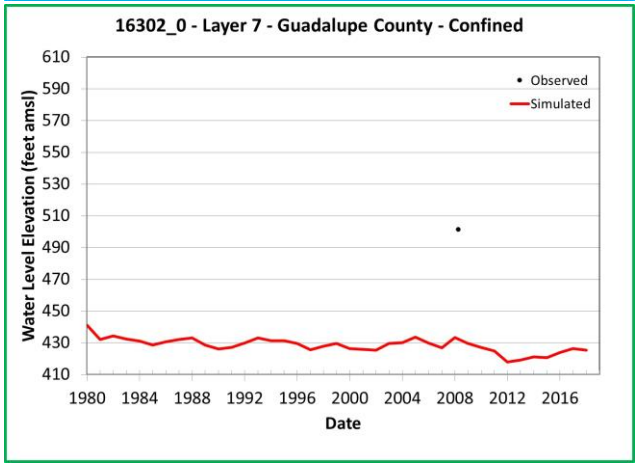
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

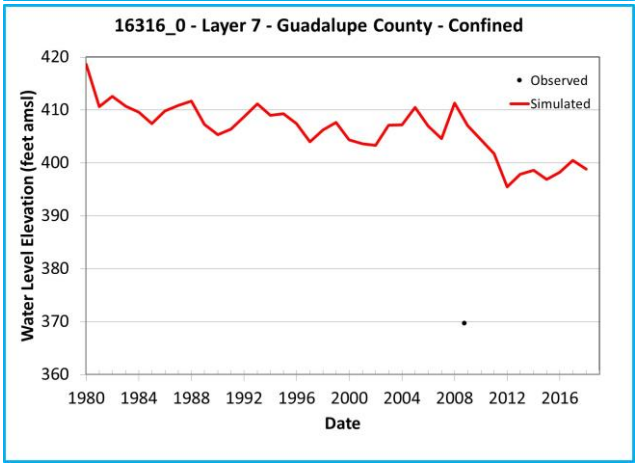
FIGURE I-9.5a

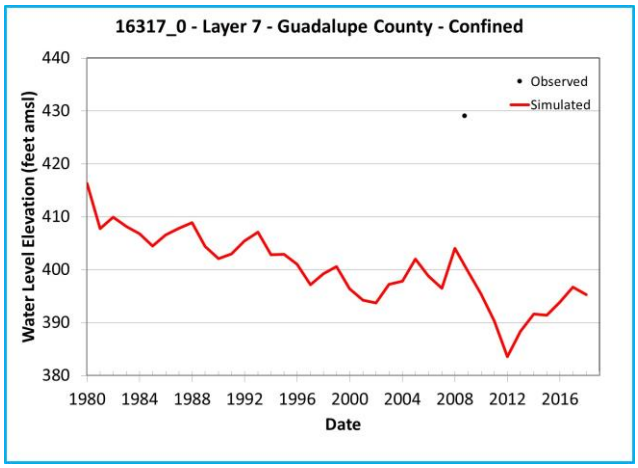
GSI ENVIRONMENTAL

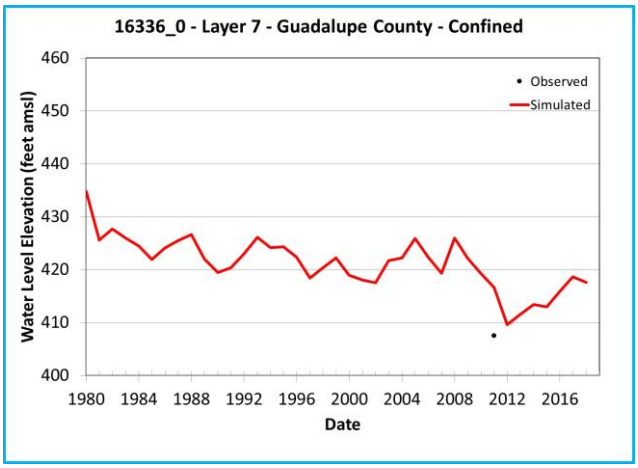












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

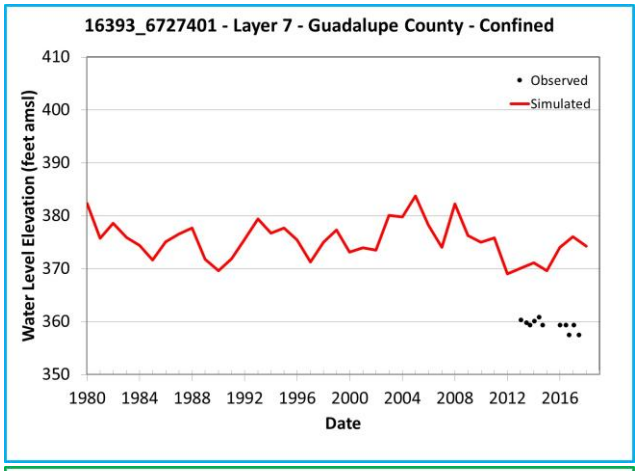
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 7

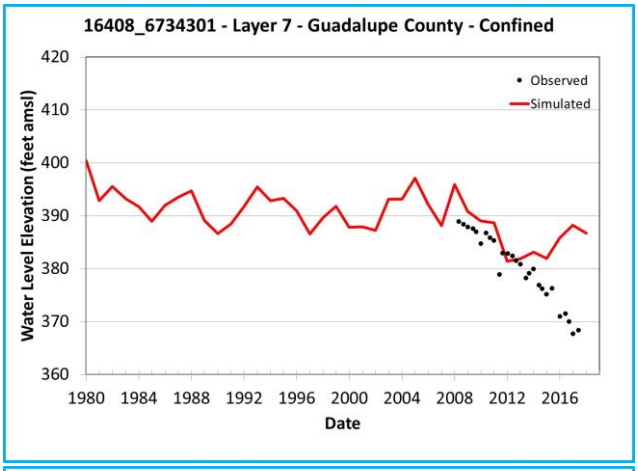
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

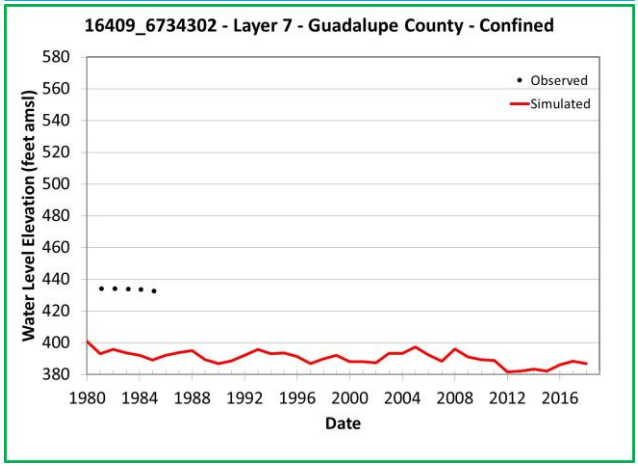
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

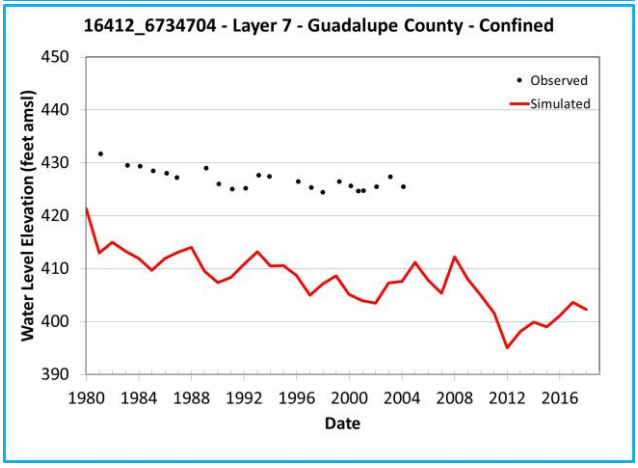
FIGURE I-10.1a

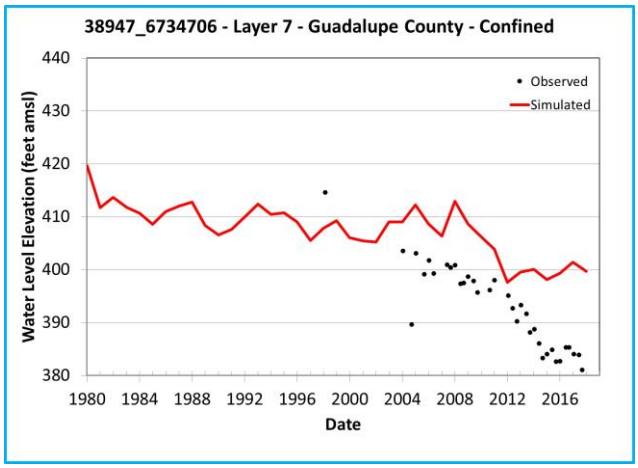
GSI ENVIRONMENTAL

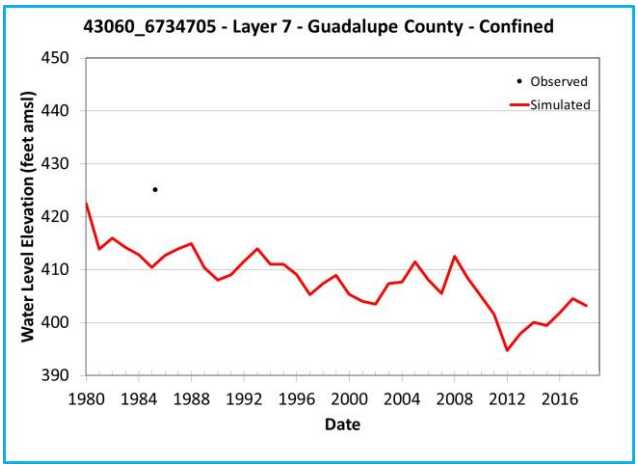












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

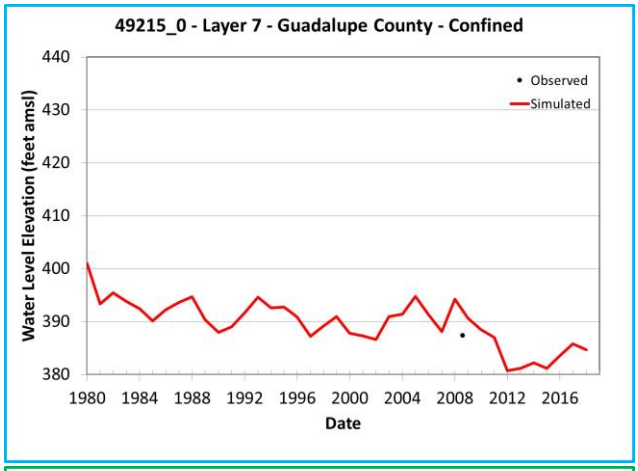
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 7

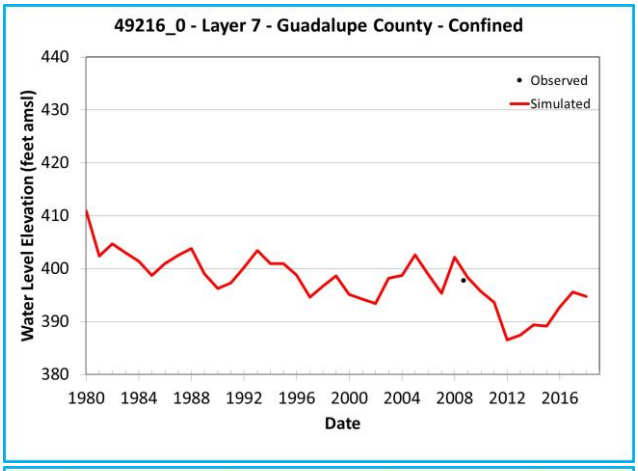
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

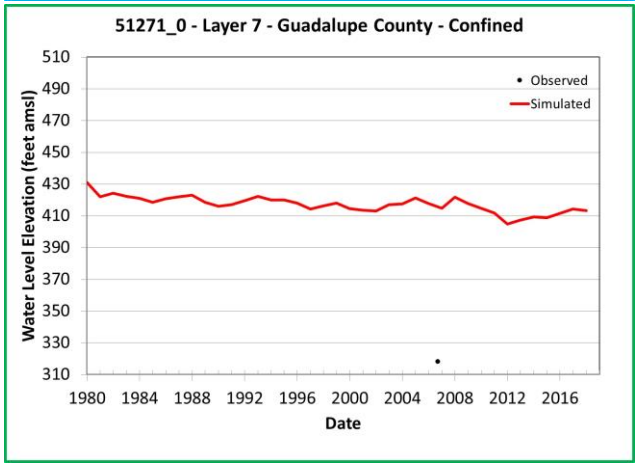
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

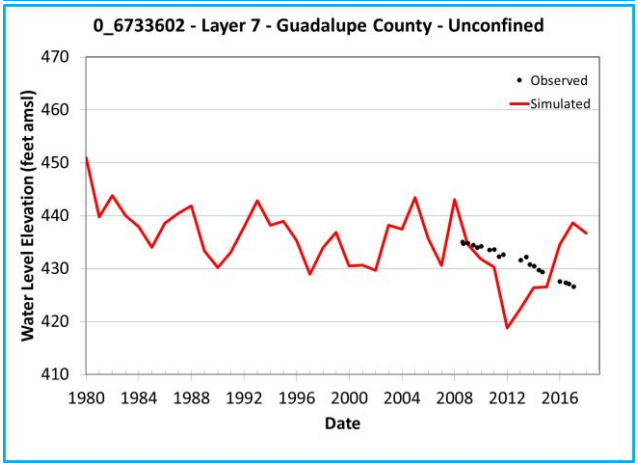
FIGURE I-10.1b

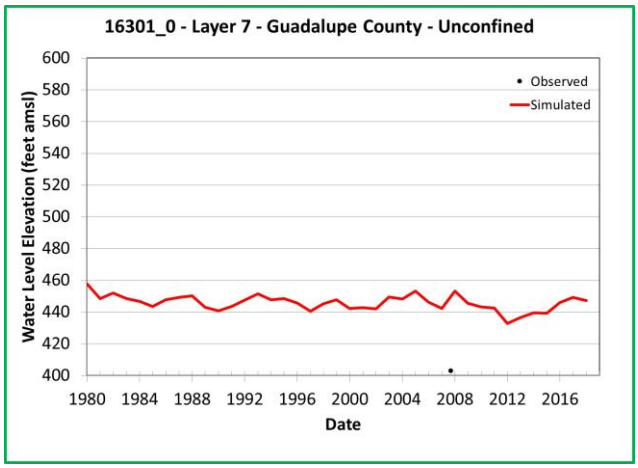
GSI ENVIRONMENTAL

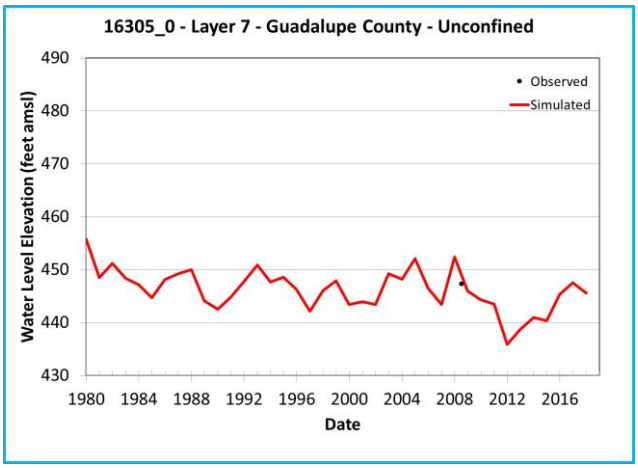












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

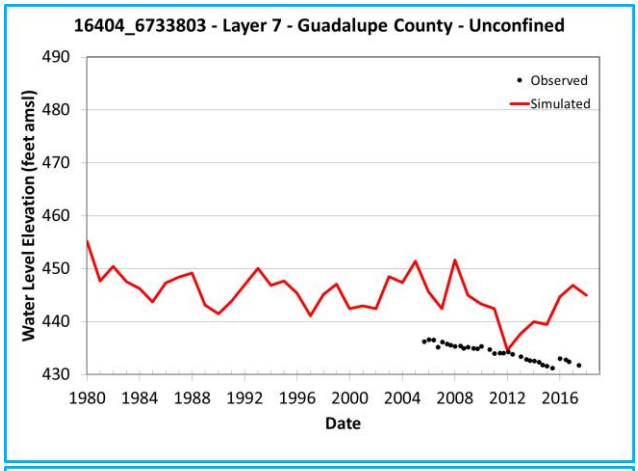
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 7

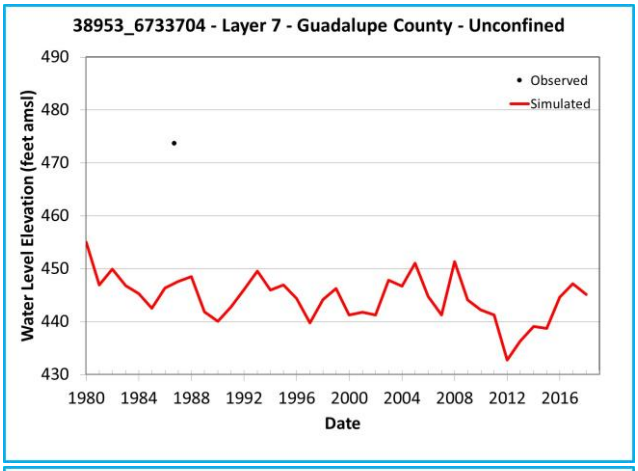
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

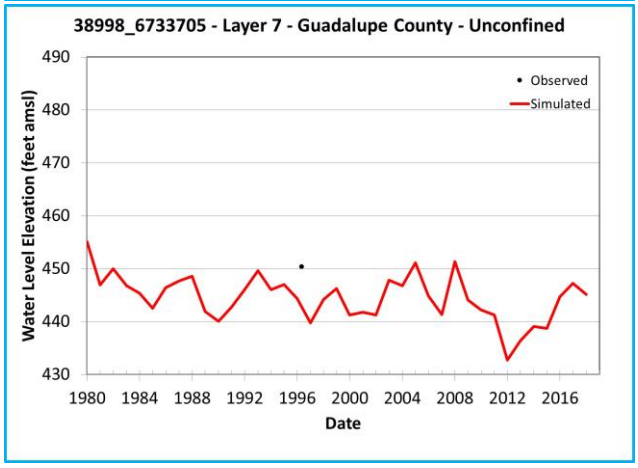
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

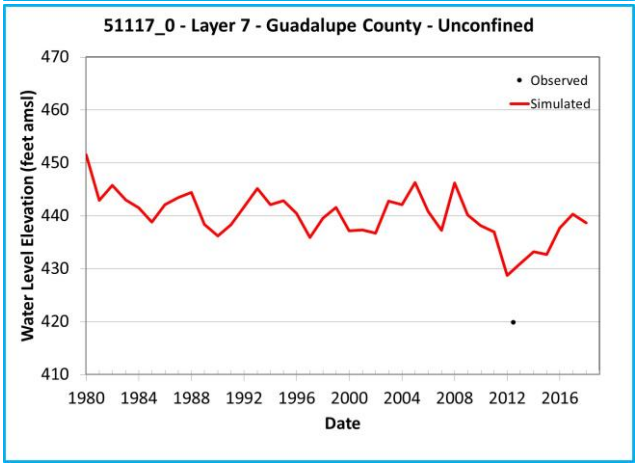
FIGURE I-10.1c

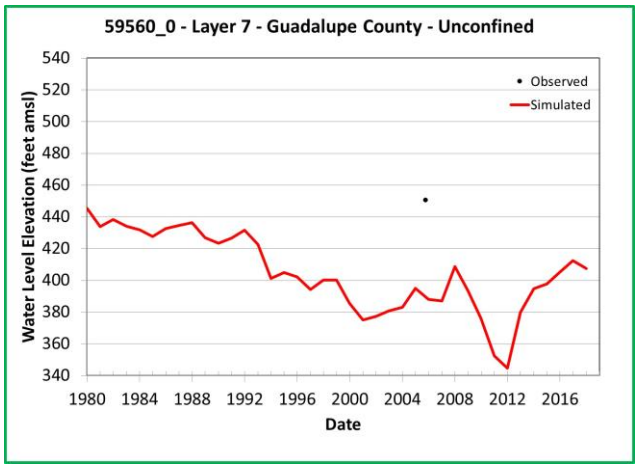
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

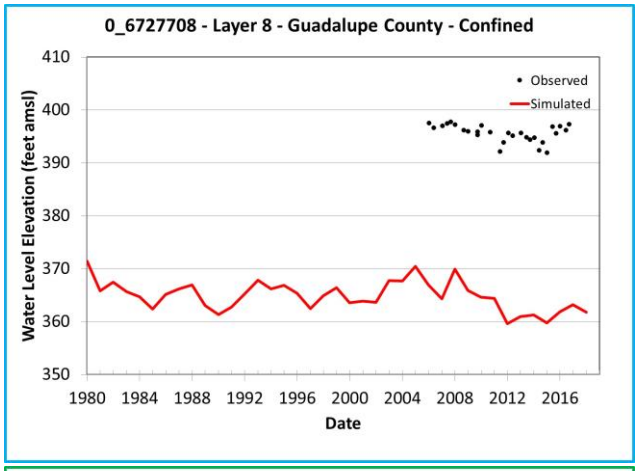
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 7

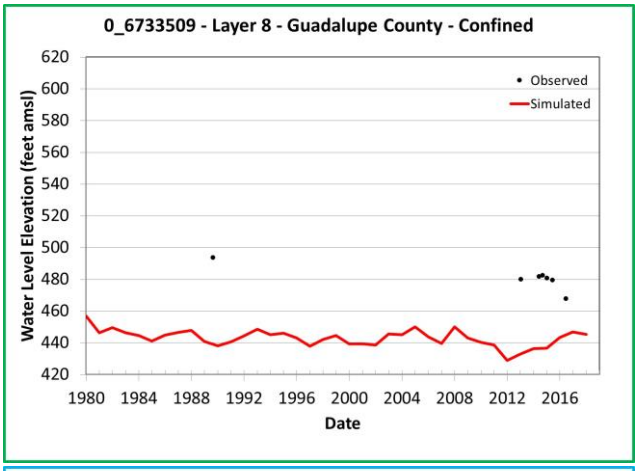
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

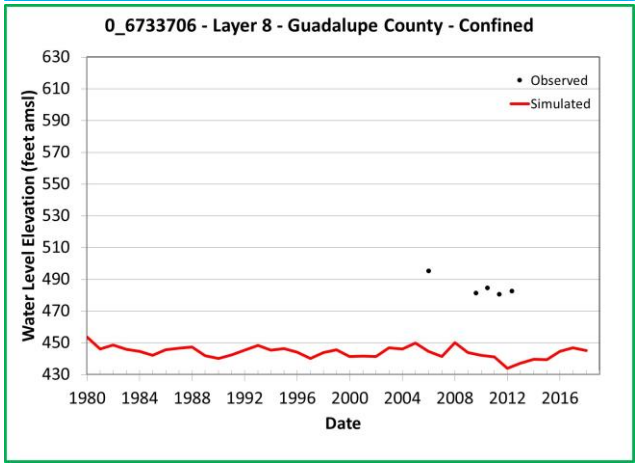
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

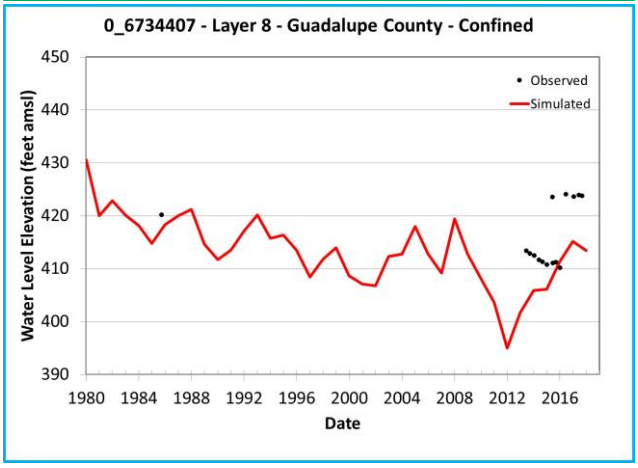
FIGURE I-10.1d

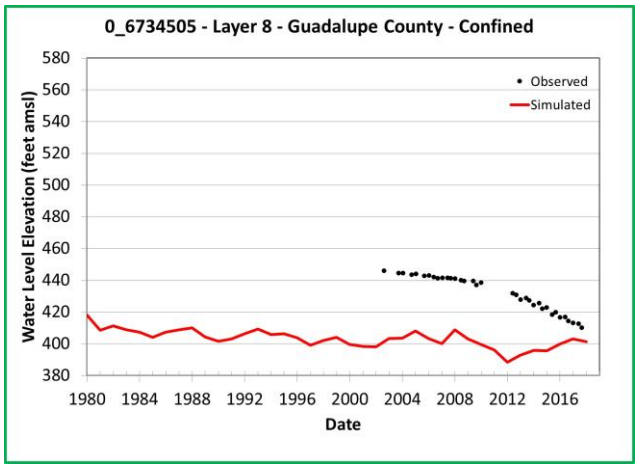
GSI ENVIRONMENTAL

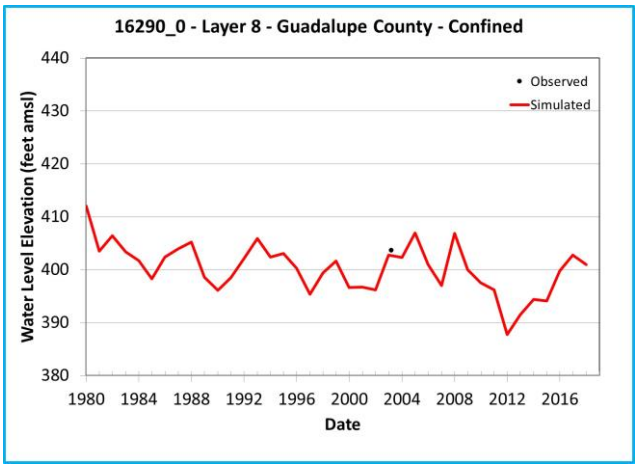












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

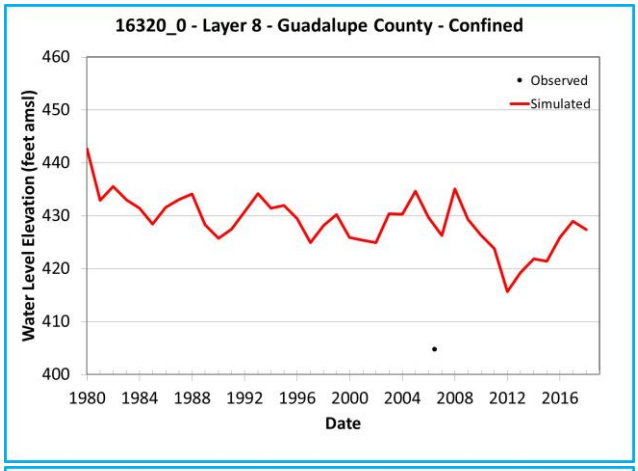
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 8

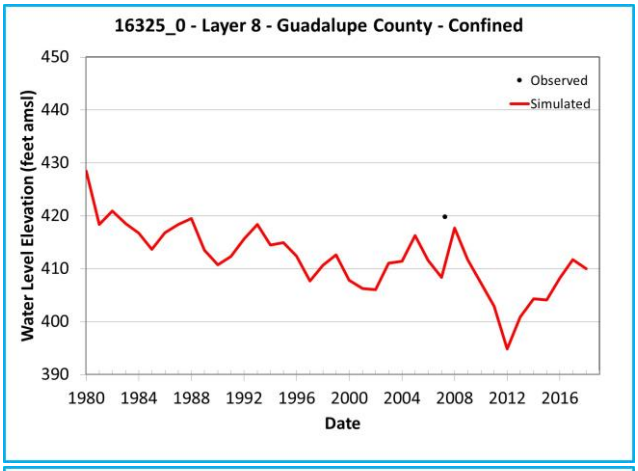
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

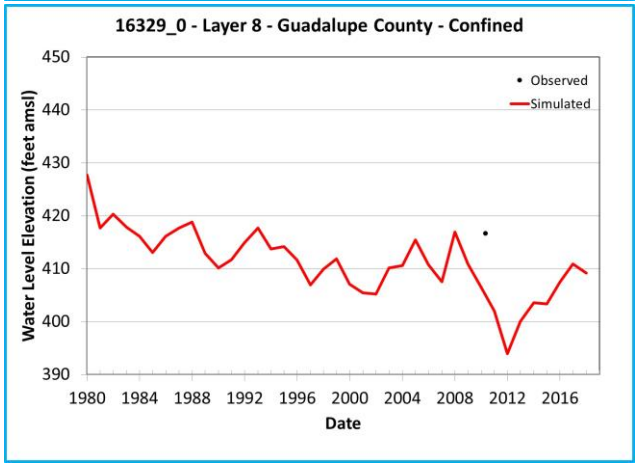
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

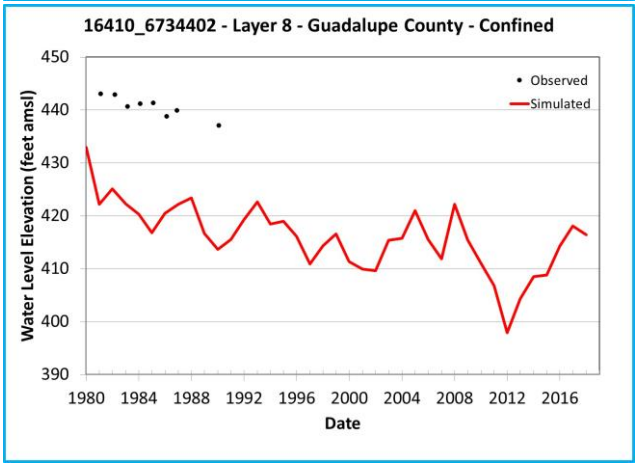
FIGURE I-10.2a

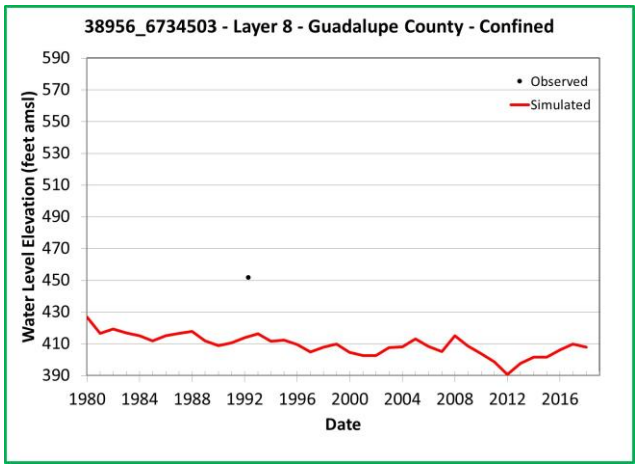
GSI ENVIRONMENTAL

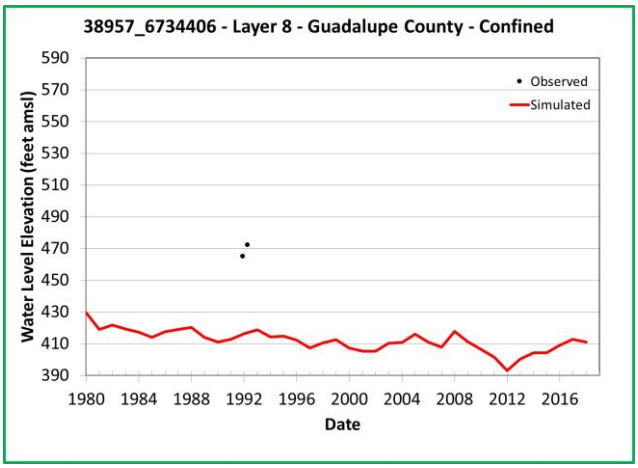












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

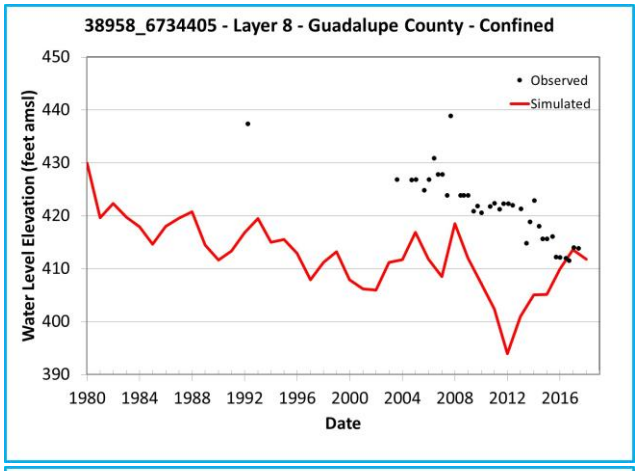
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 8

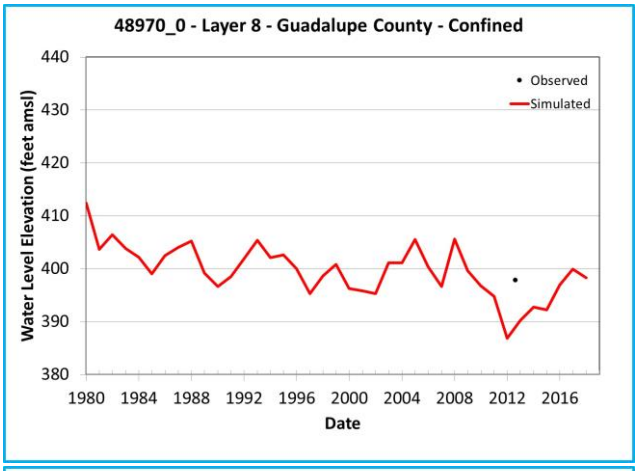
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

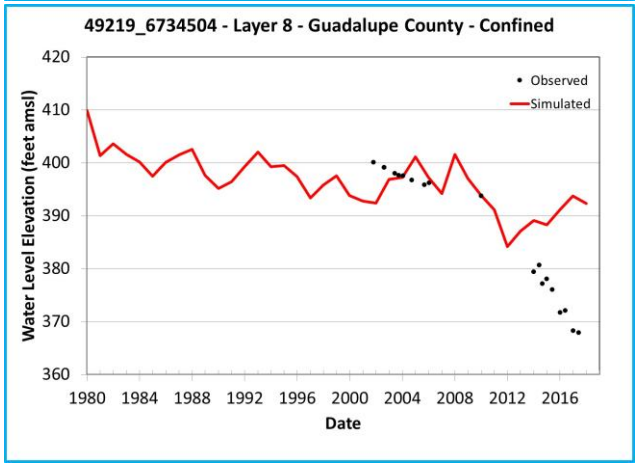
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

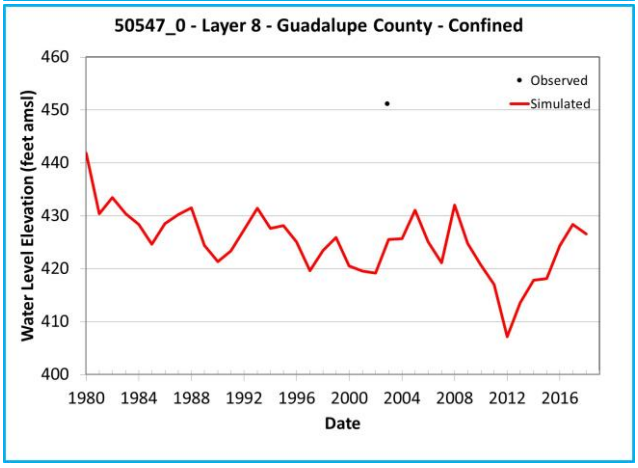
FIGURE I-10.2b

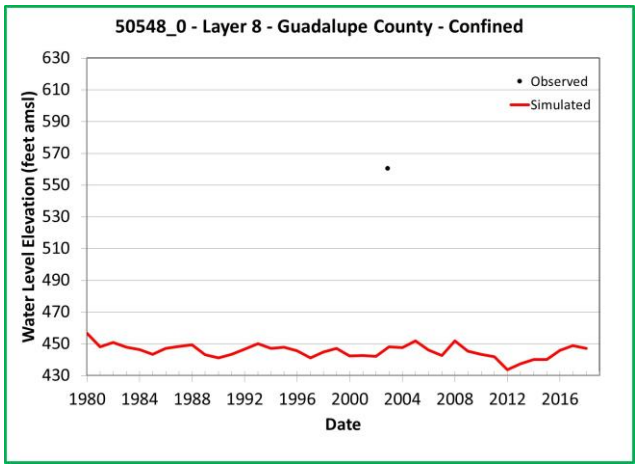
GSI ENVIRONMENTAL

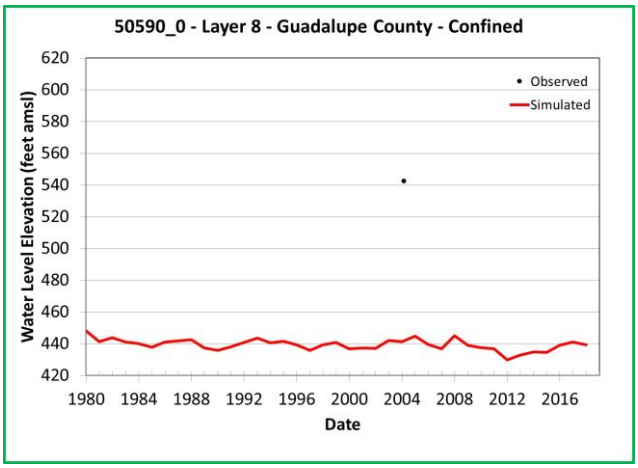












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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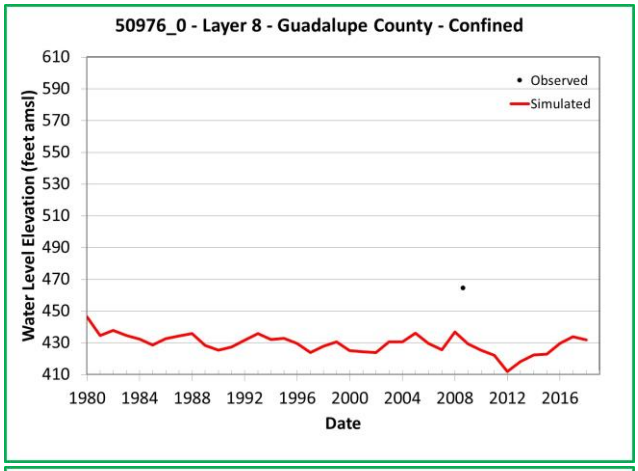
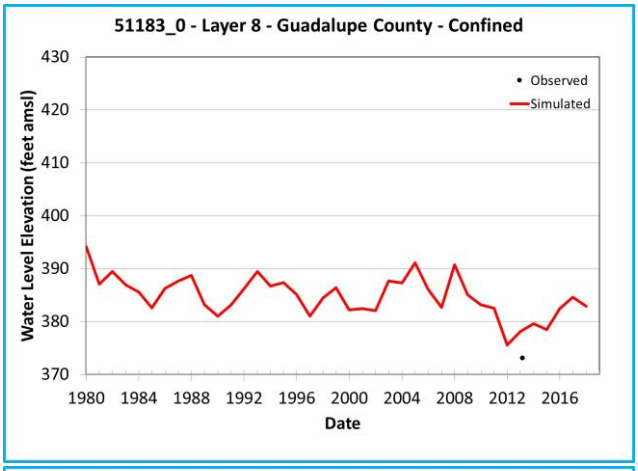
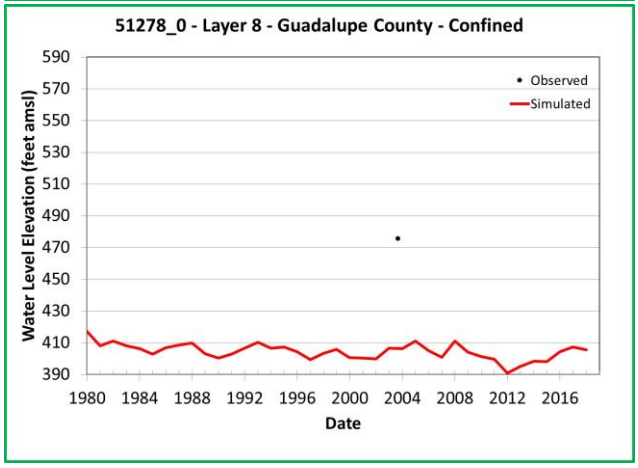
Revised		Aprv'd by	SP

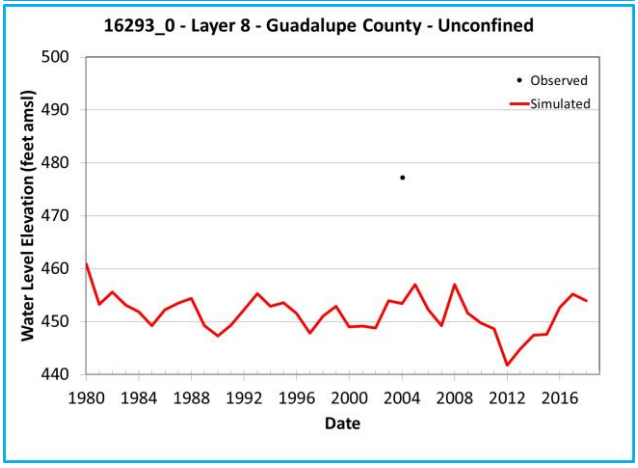
FIGURE I-10.2c

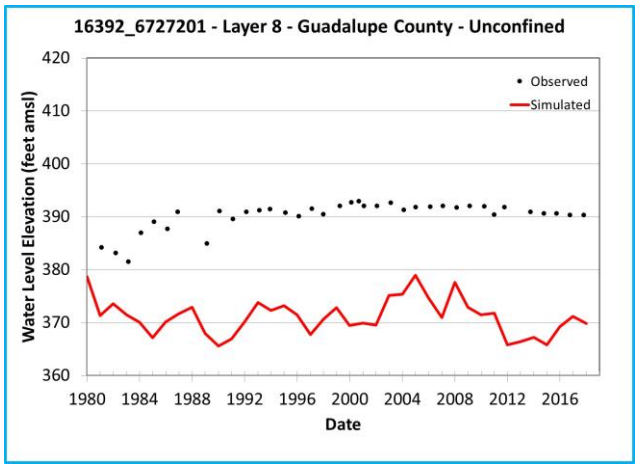
GSI ENVIRONMENTAL

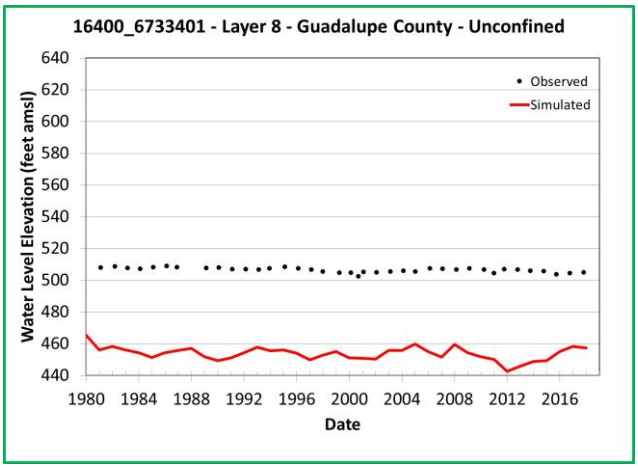












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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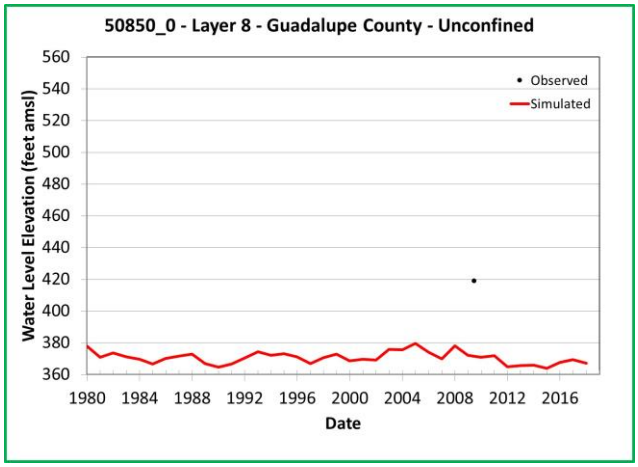
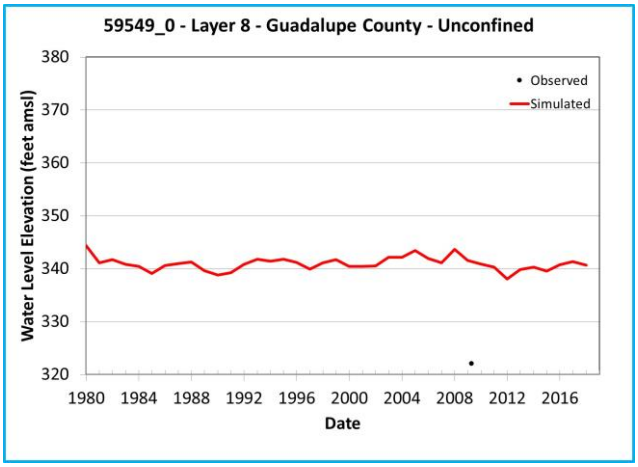
FIGURE I-10.2d

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

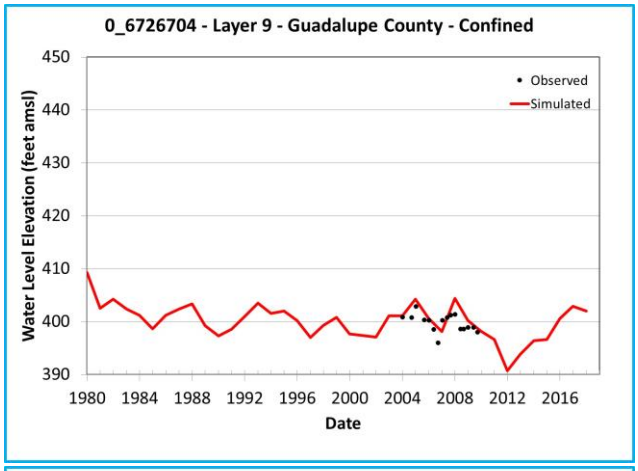
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 8

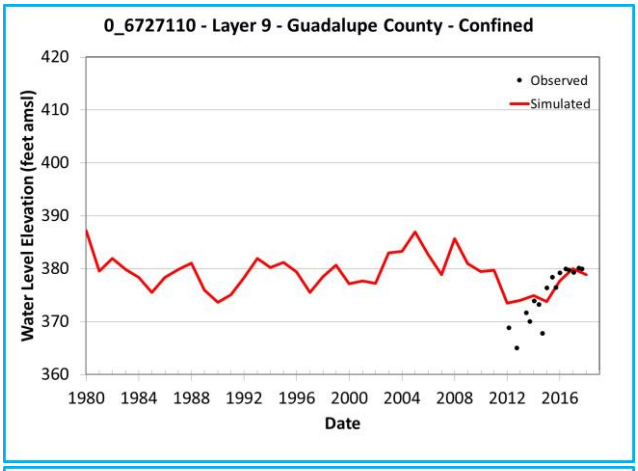
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

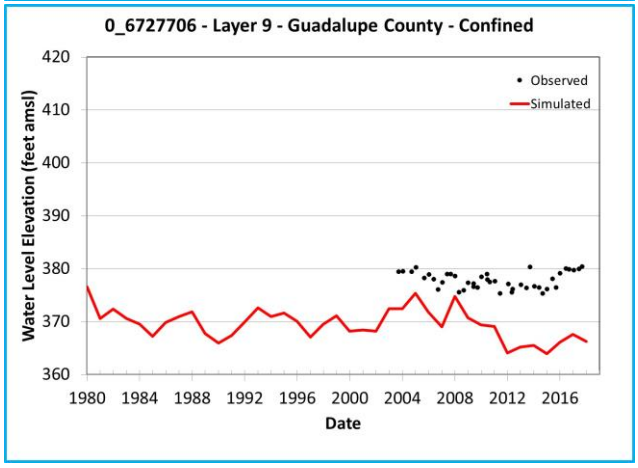
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

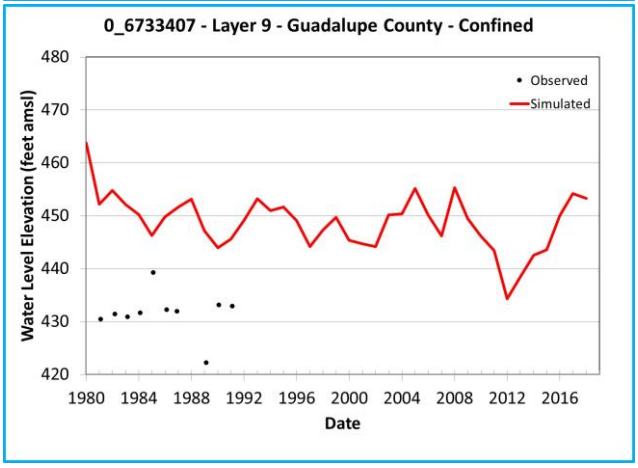
FIGURE I-10.2e

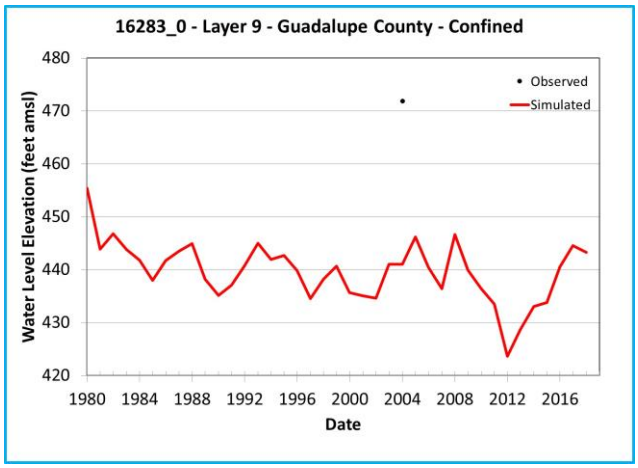
GSI ENVIRONMENTAL

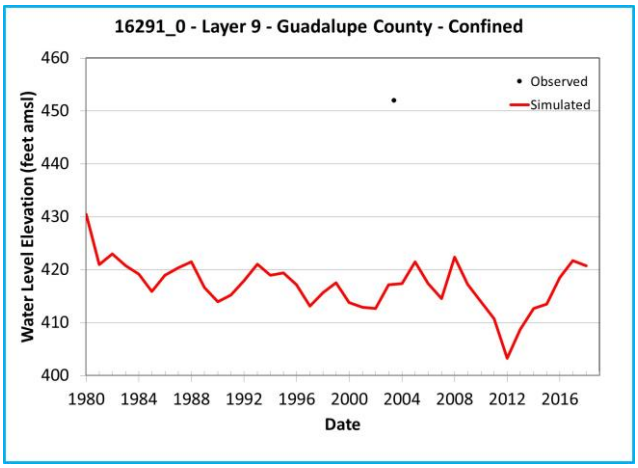












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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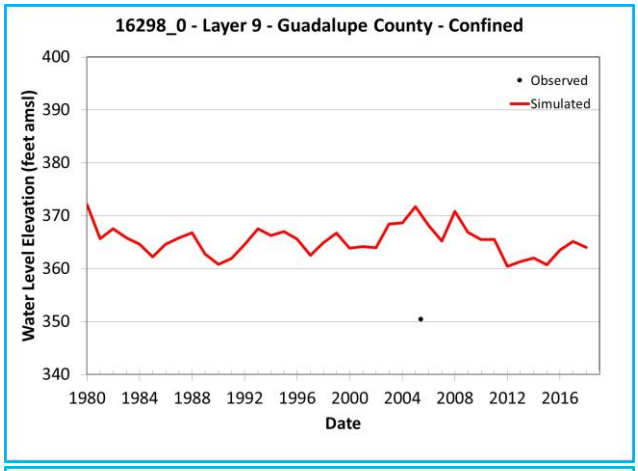
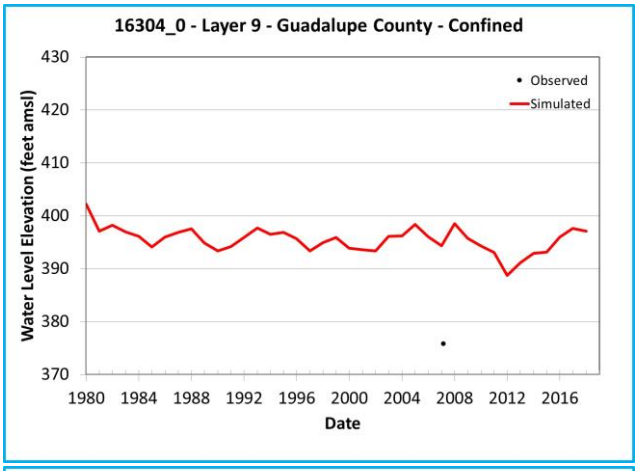
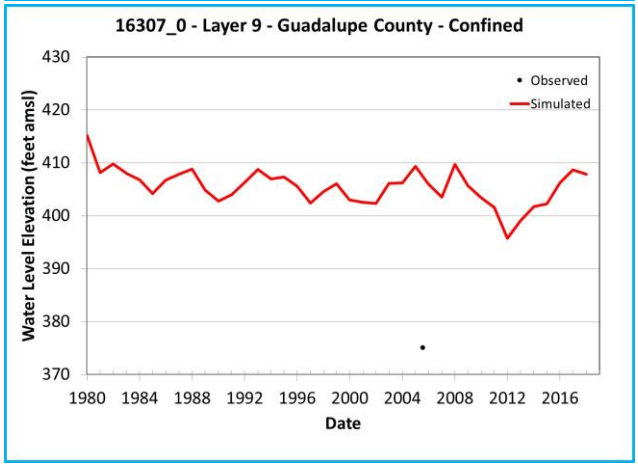
Revised		Aprv'd by	SP

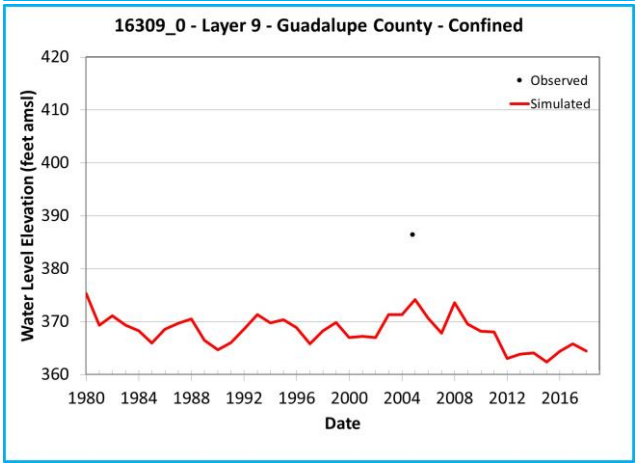
FIGURE I-10.3a

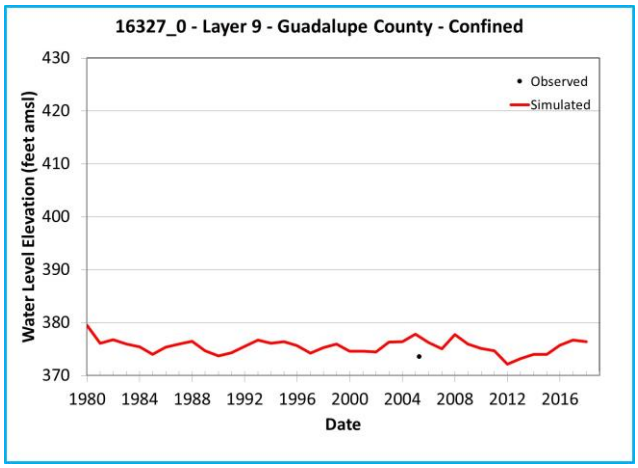
GSI ENVIRONMENTAL

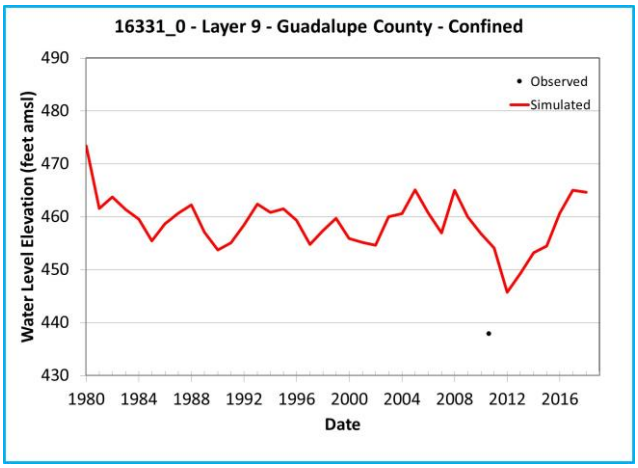












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

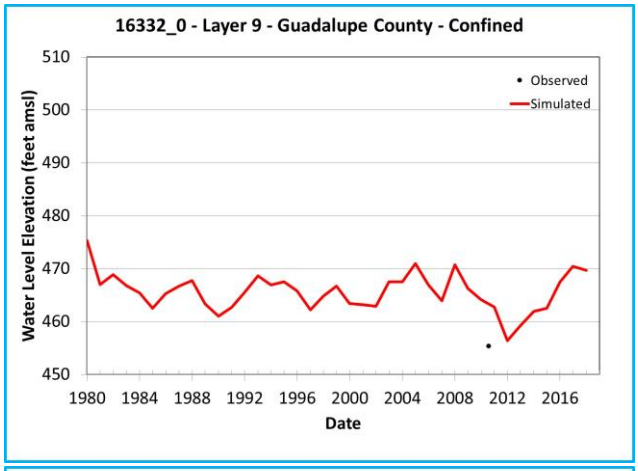
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

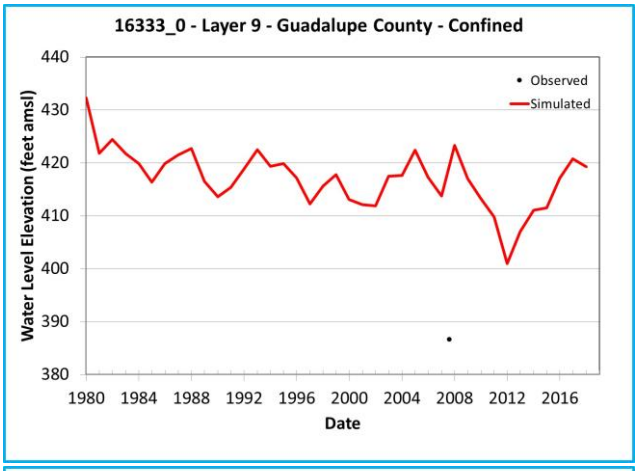
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

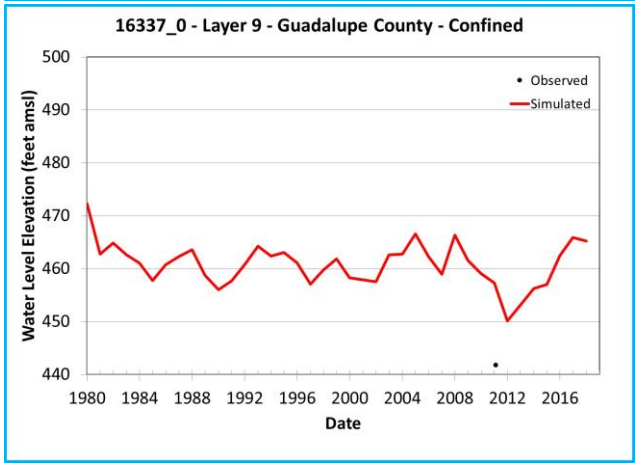
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

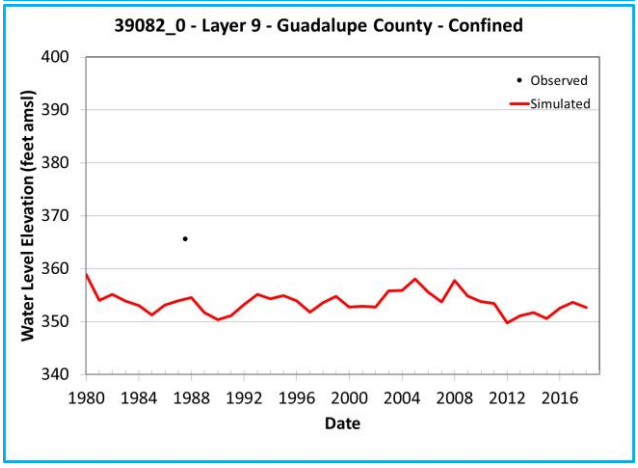
FIGURE I-10.3b

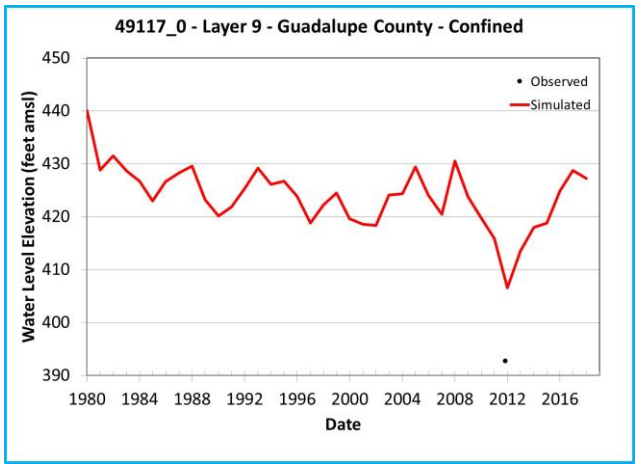
GSI ENVIRONMENTAL

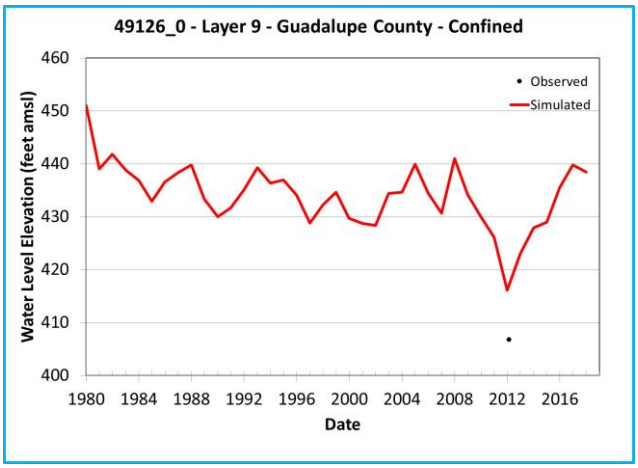












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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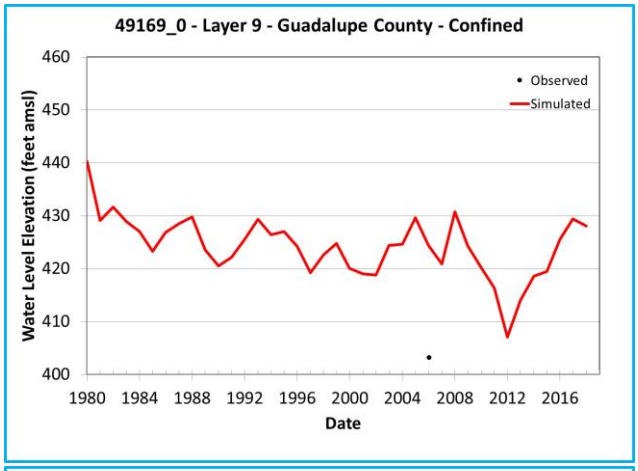
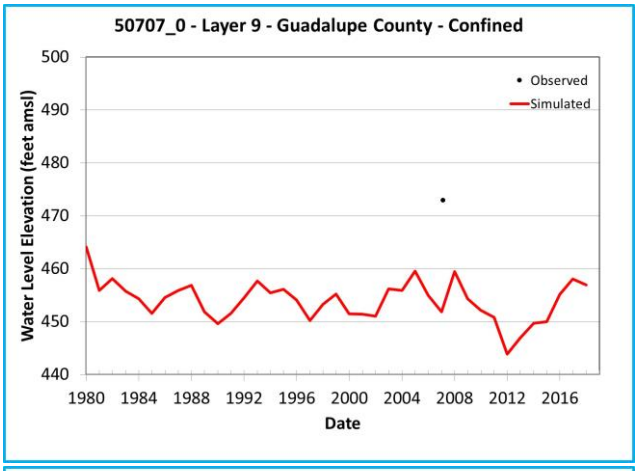
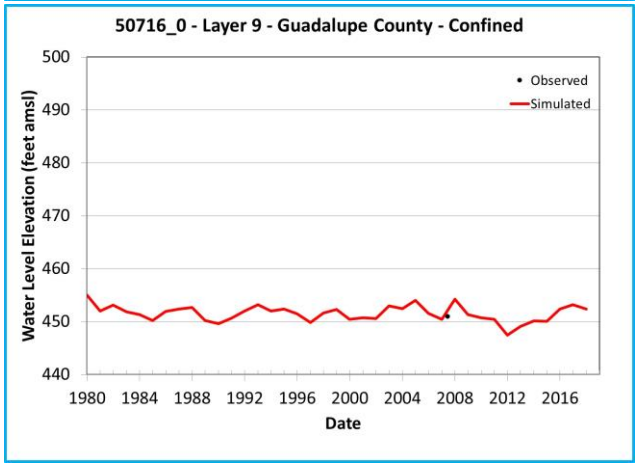
Revised		Aprv'd by	SP

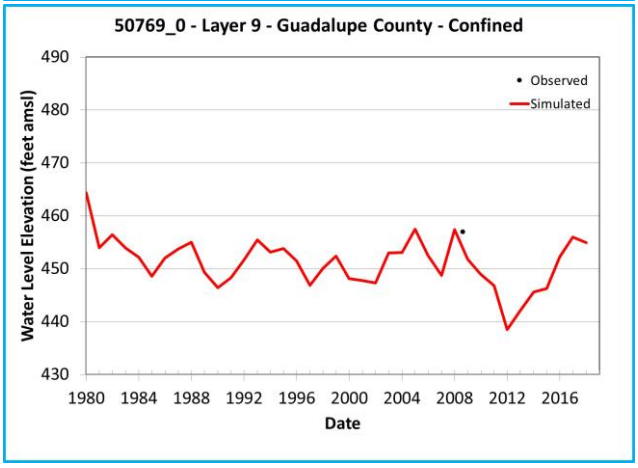
FIGURE I-10.3c

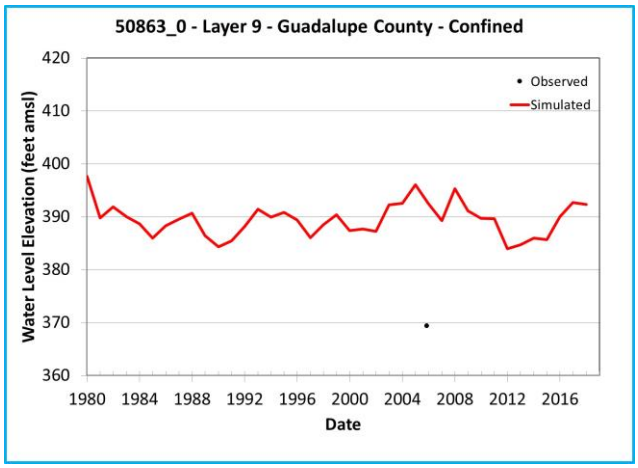
GSI ENVIRONMENTAL

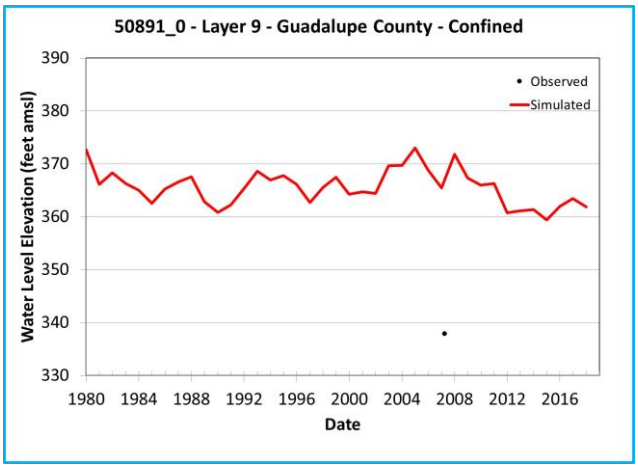












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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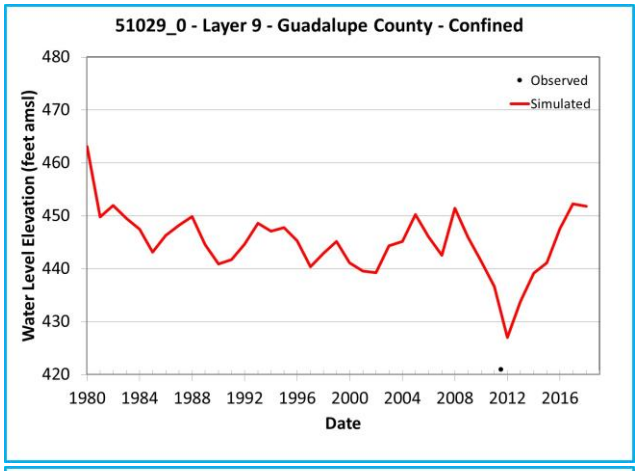
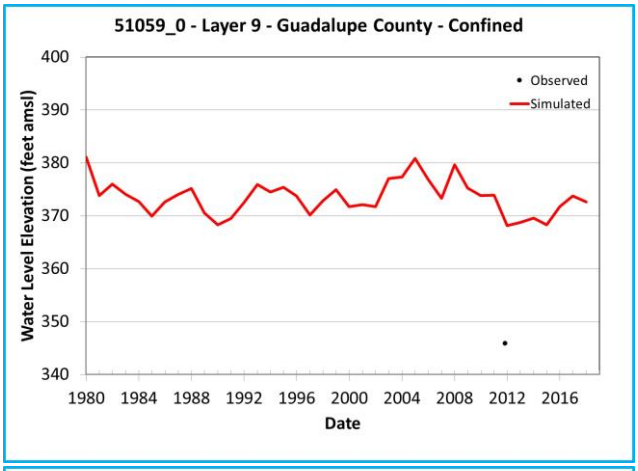
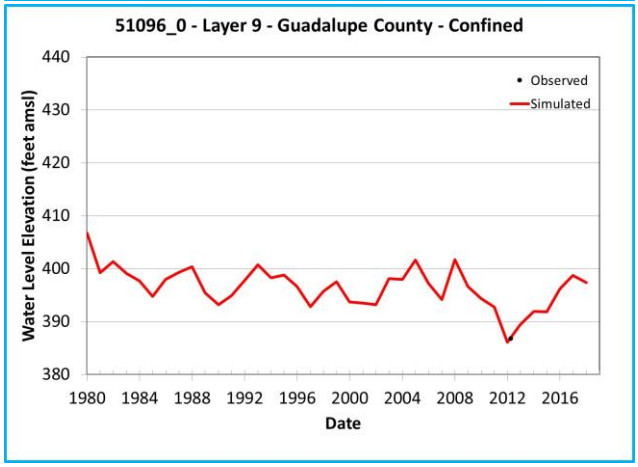
Revised		Aprv'd by	SP

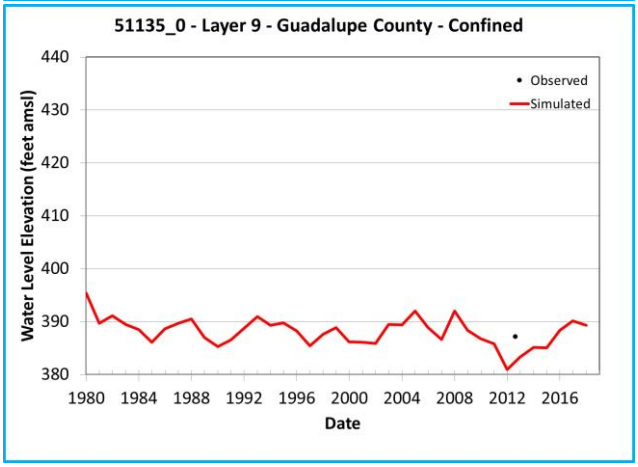
FIGURE I-10.3d

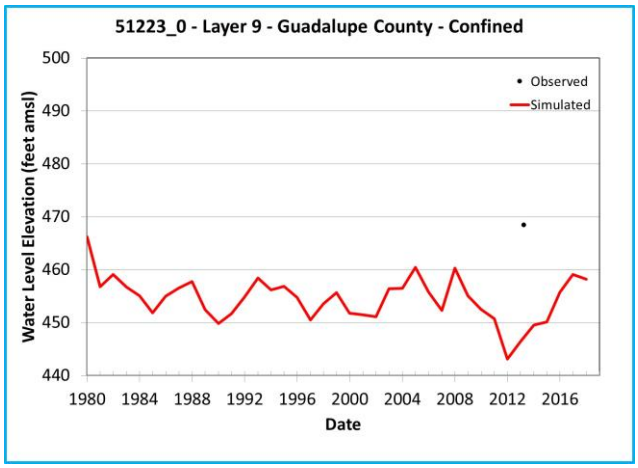
GSI ENVIRONMENTAL

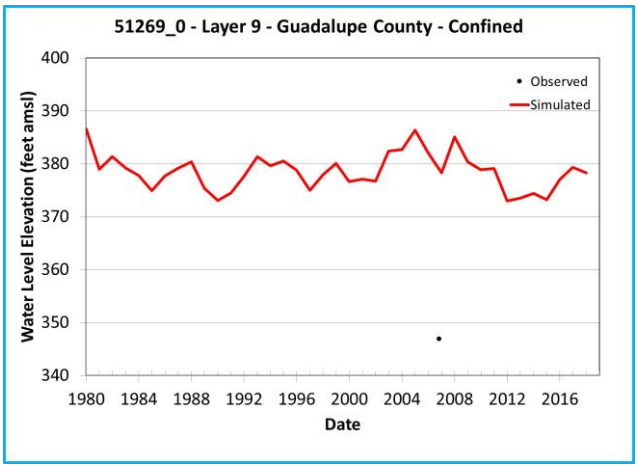












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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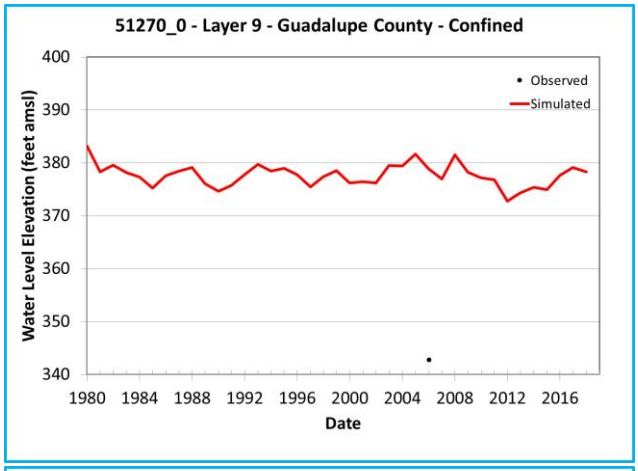
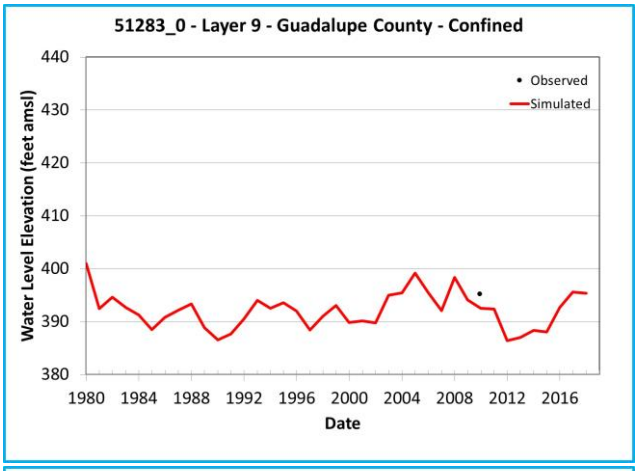
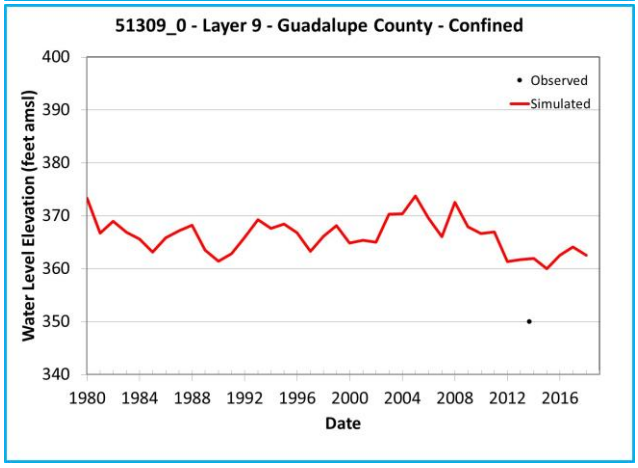
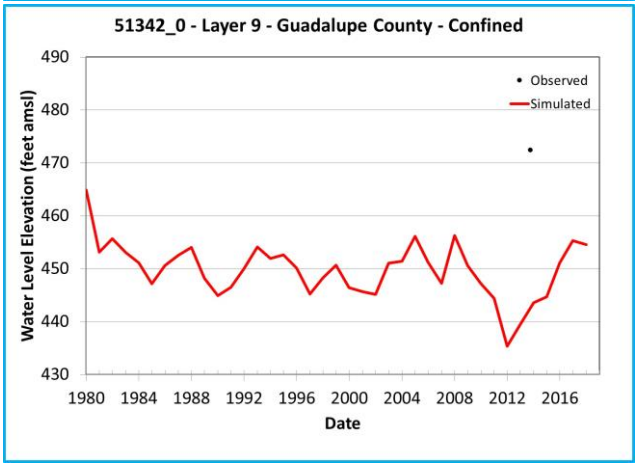
FIGURE I-10.3e

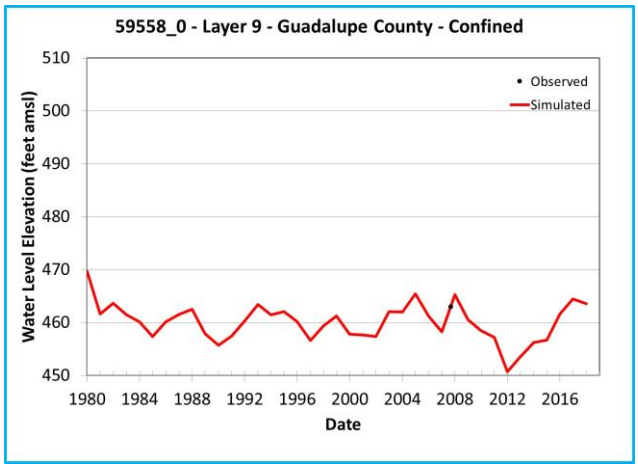
GSI ENVIRONMENTAL

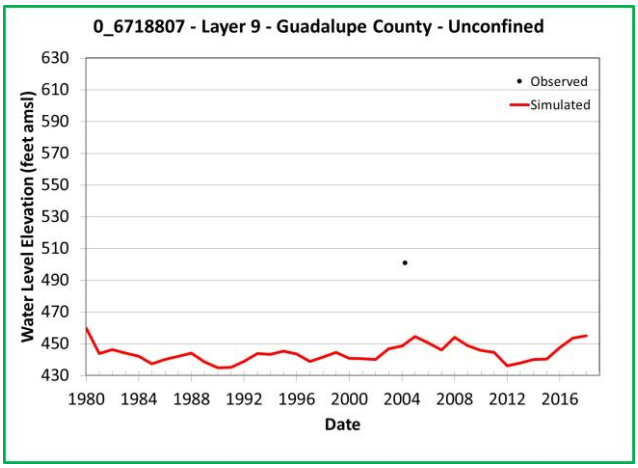












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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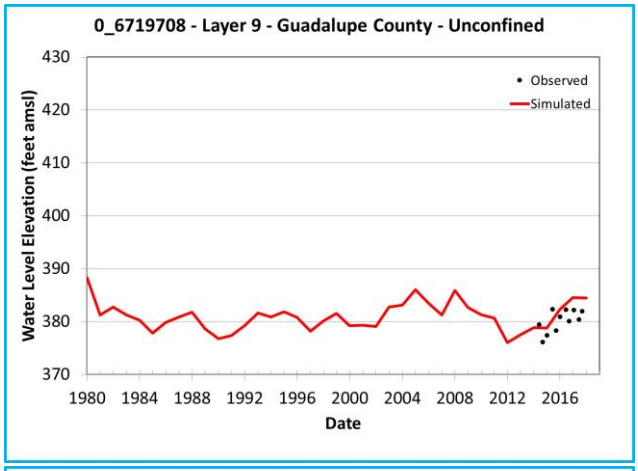
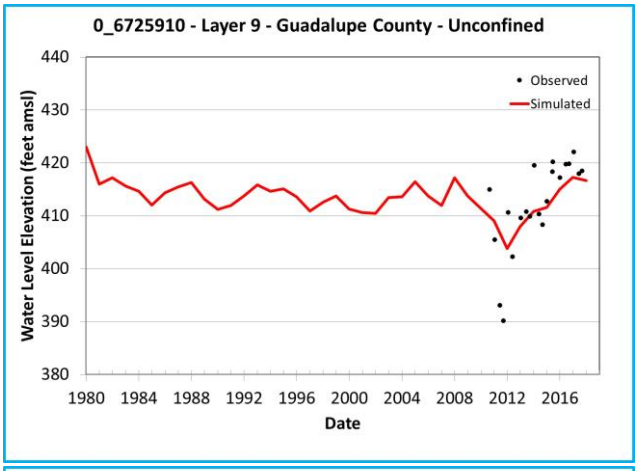
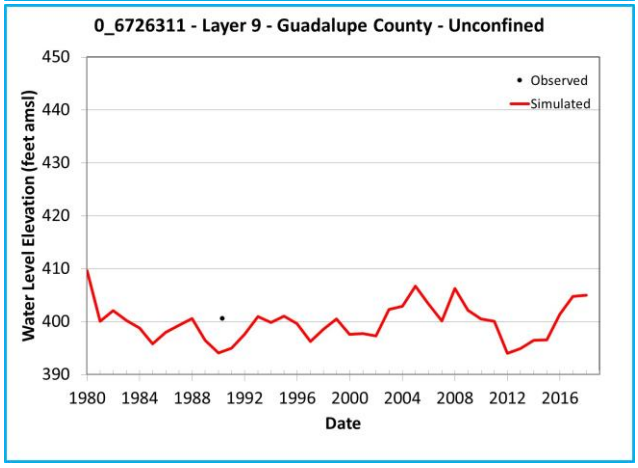
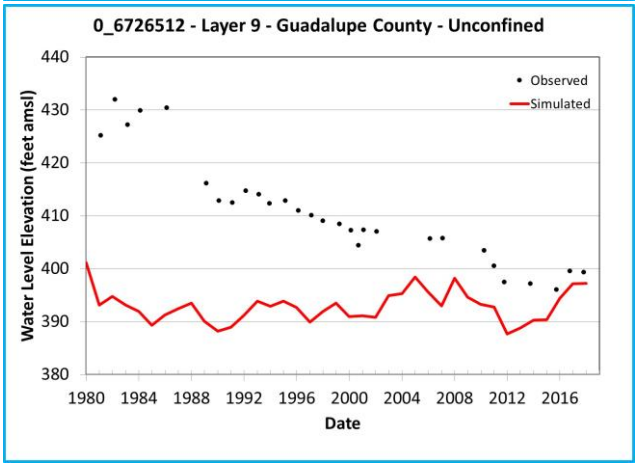
FIGURE I-10.3f

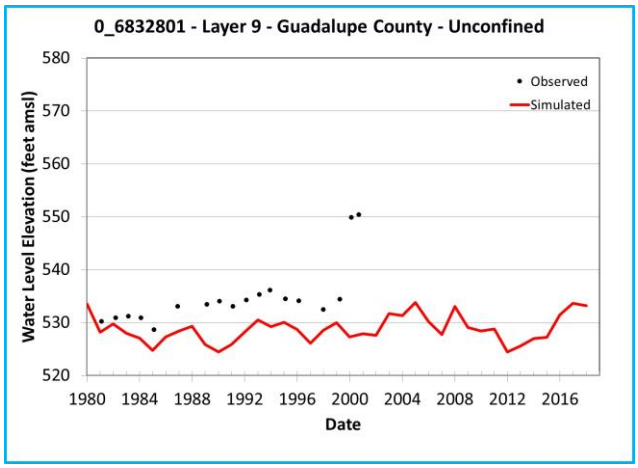
GSI ENVIRONMENTAL

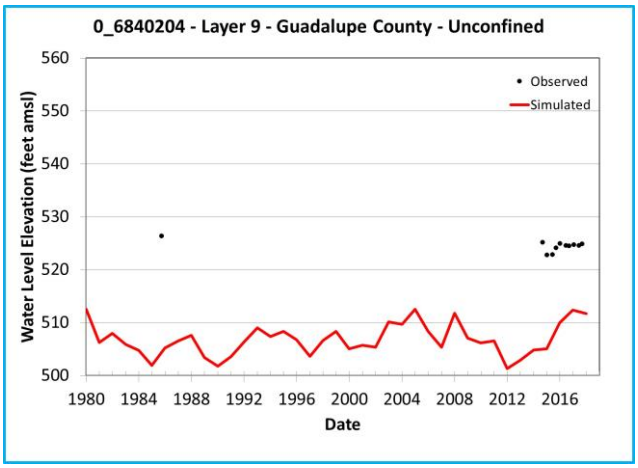












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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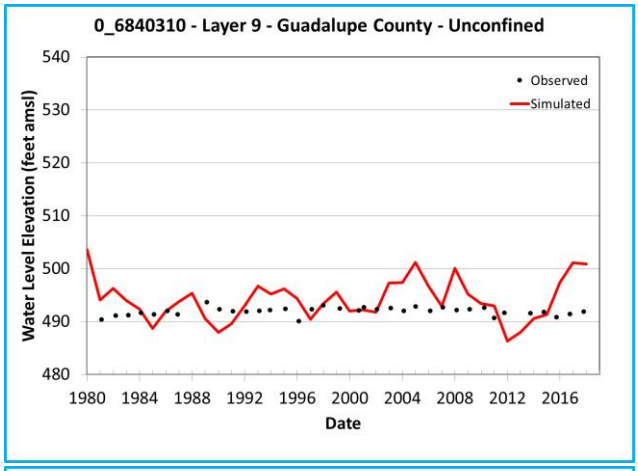
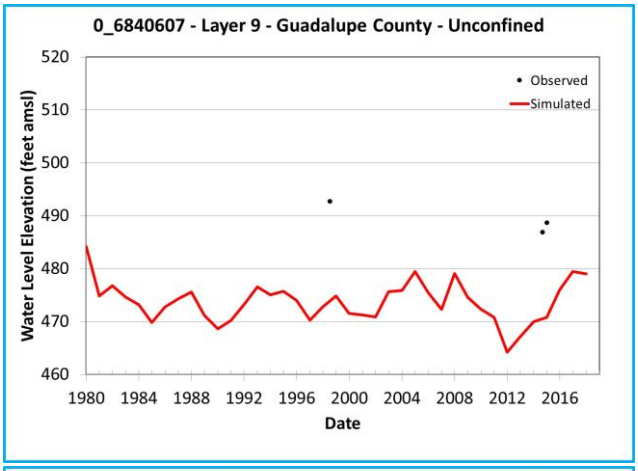
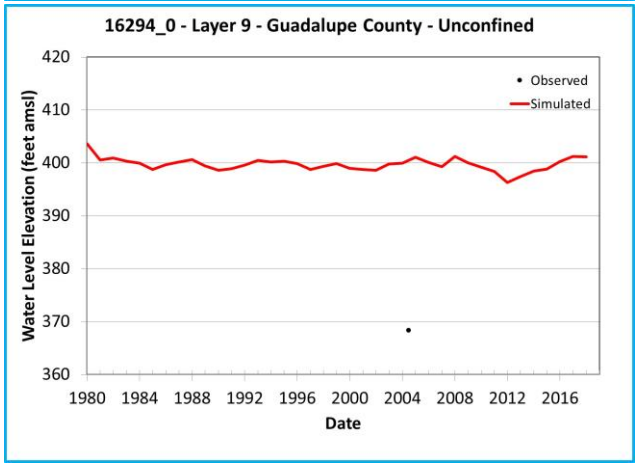
Revised		Aprv'd by	SP

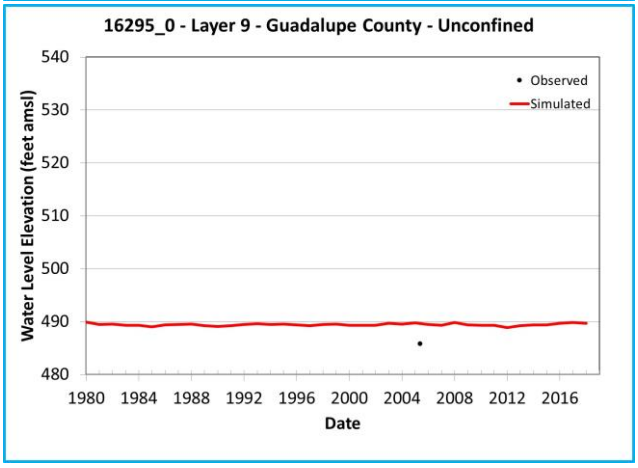
FIGURE I-10.3g

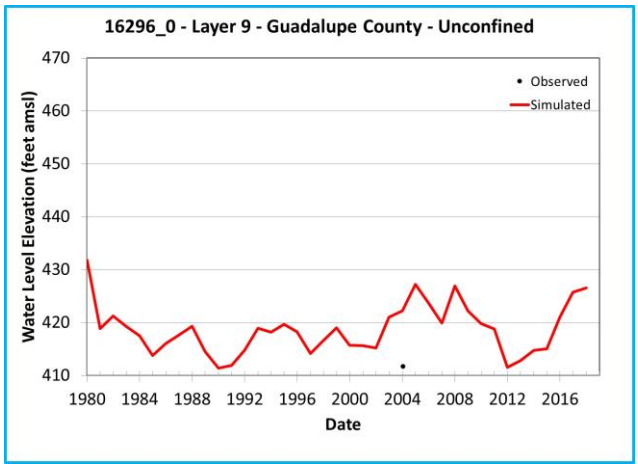
GSI ENVIRONMENTAL

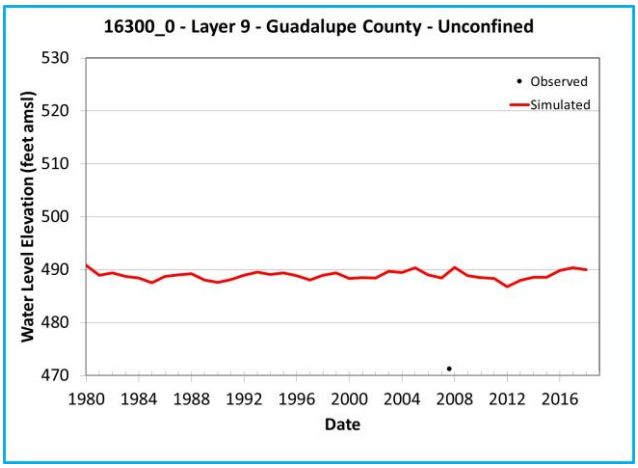












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

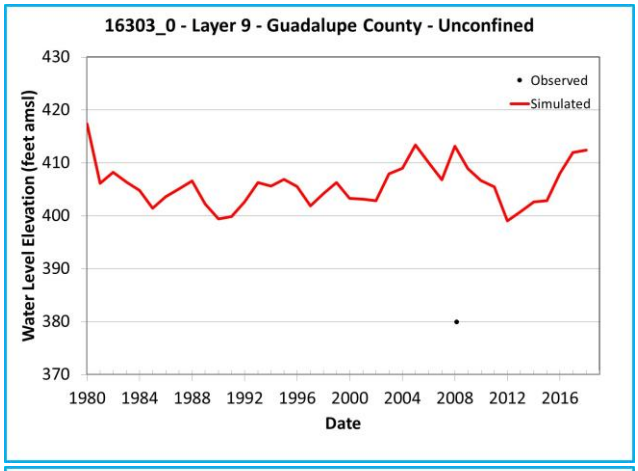
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

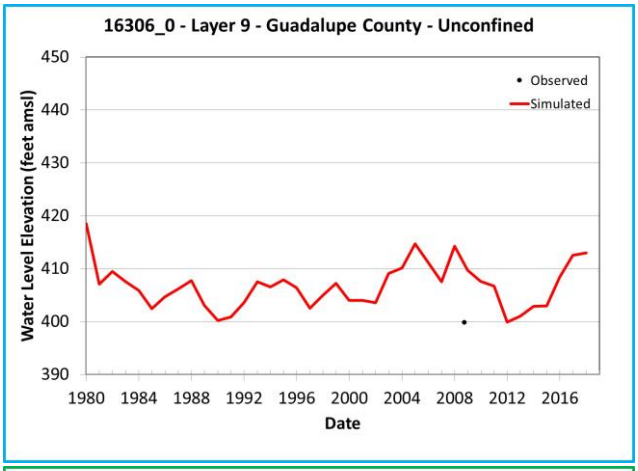
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

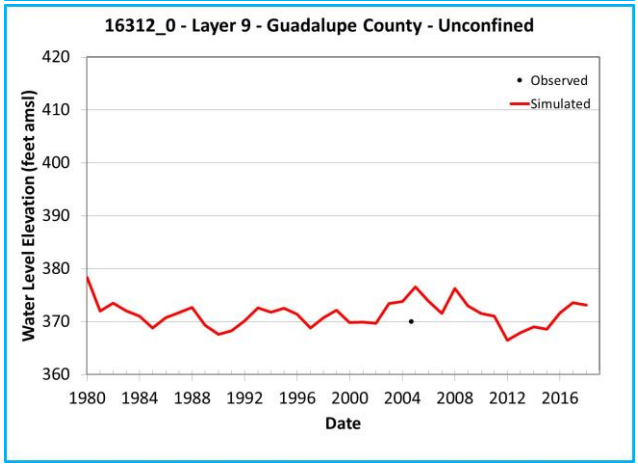
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

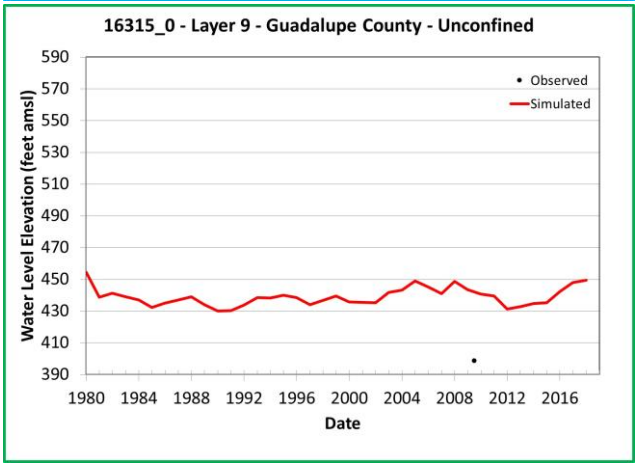
FIGURE I-10.3h

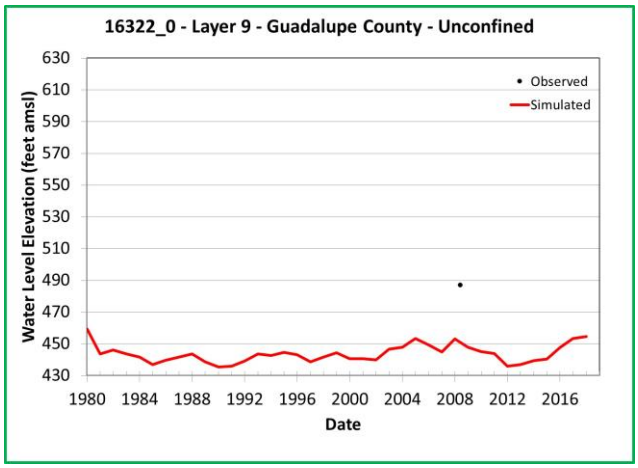
GSI ENVIRONMENTAL

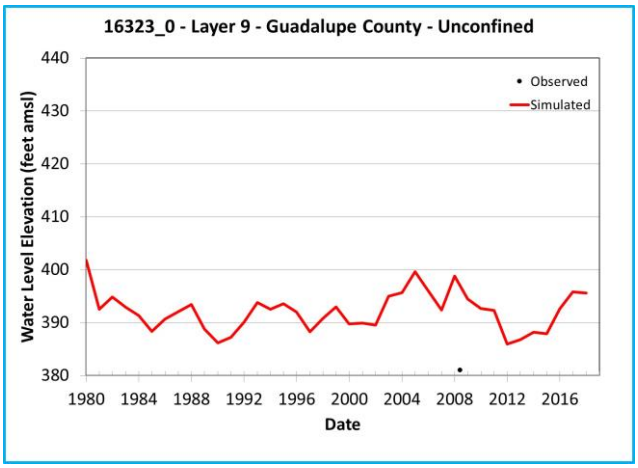












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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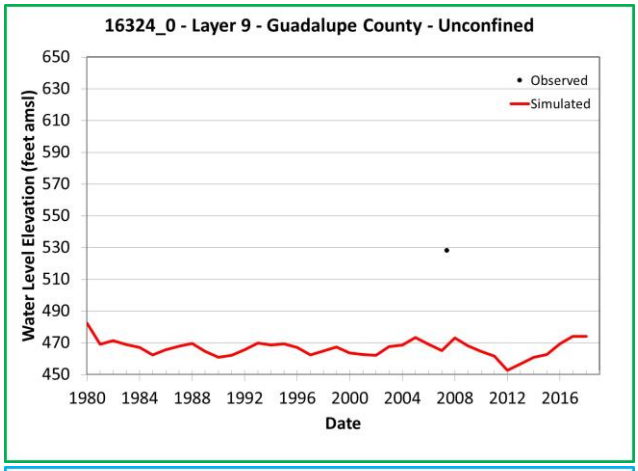
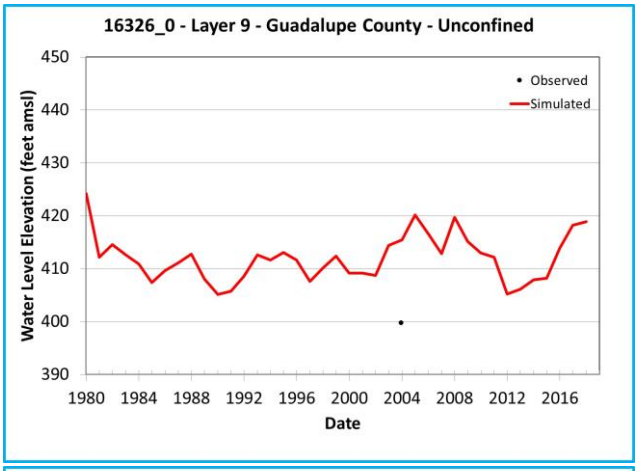
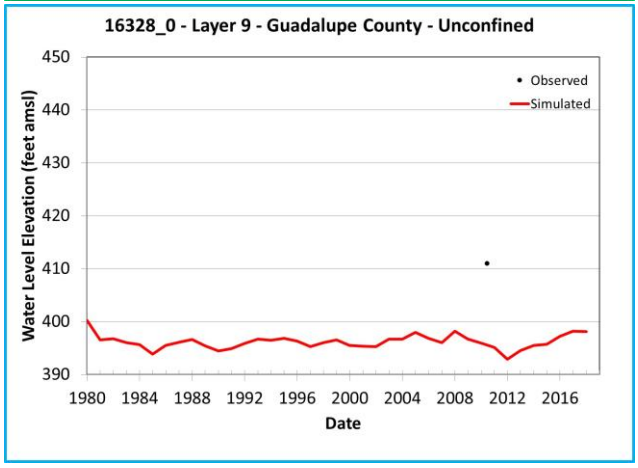
Revised		Aprv'd by	SP

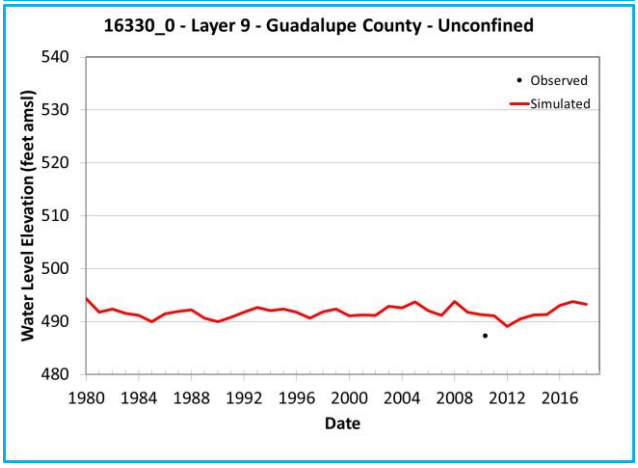
FIGURE I-10.3i

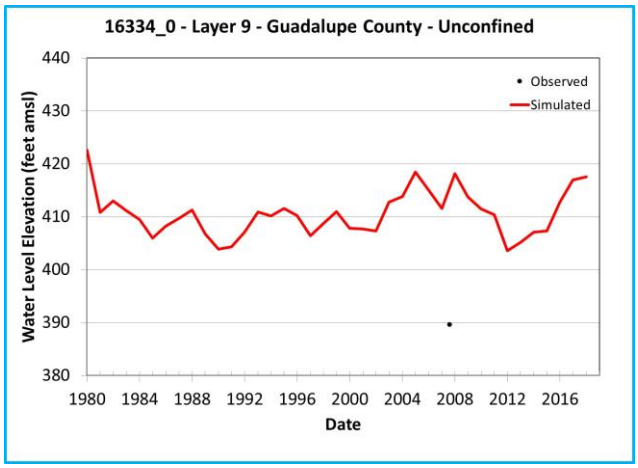
GSI ENVIRONMENTAL

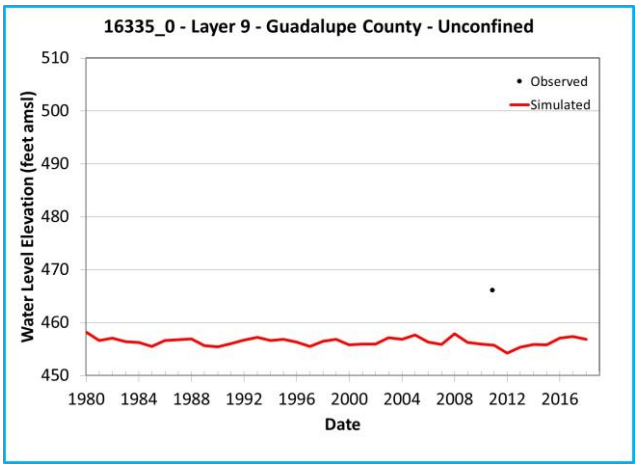












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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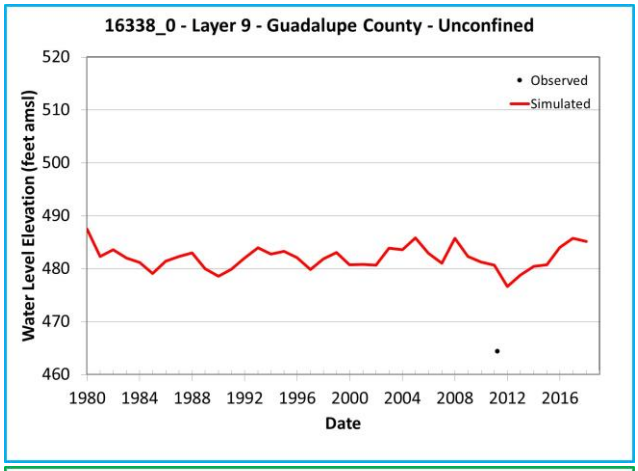
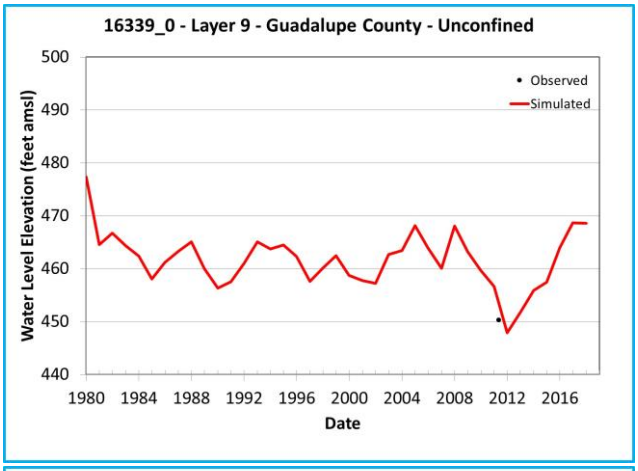
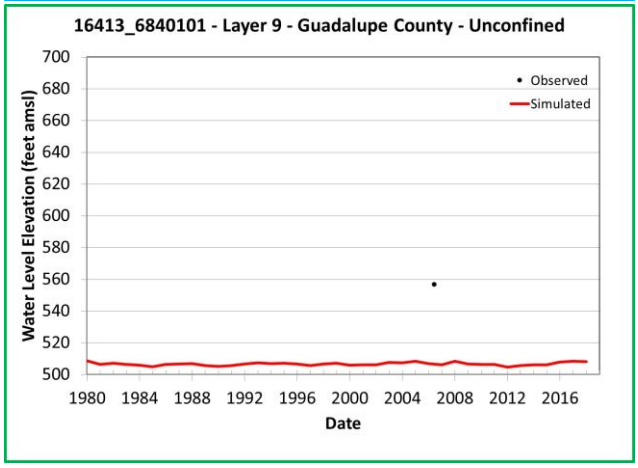
Revised		Aprv'd by	SP

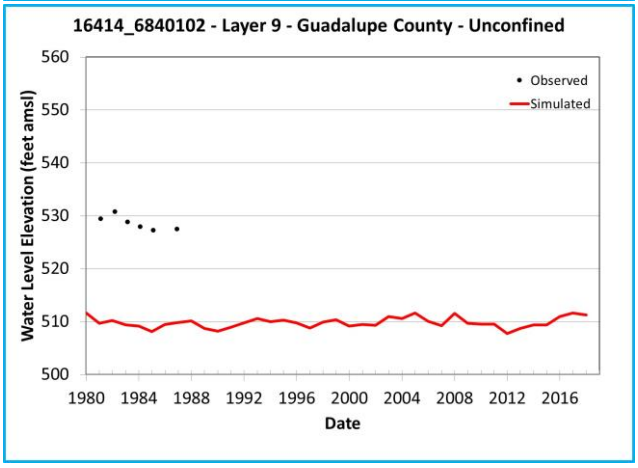
FIGURE I-10.3j

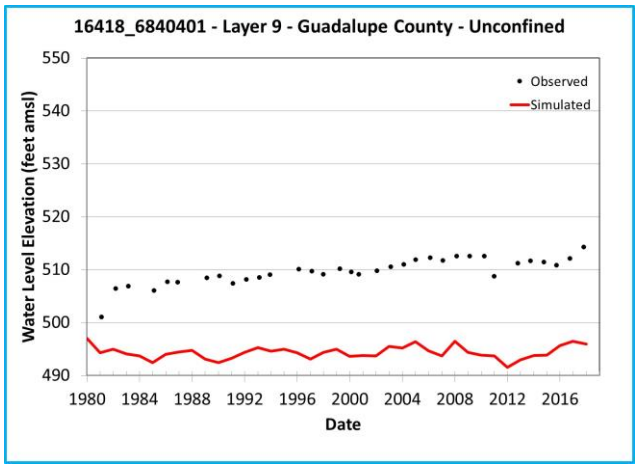
GSI ENVIRONMENTAL

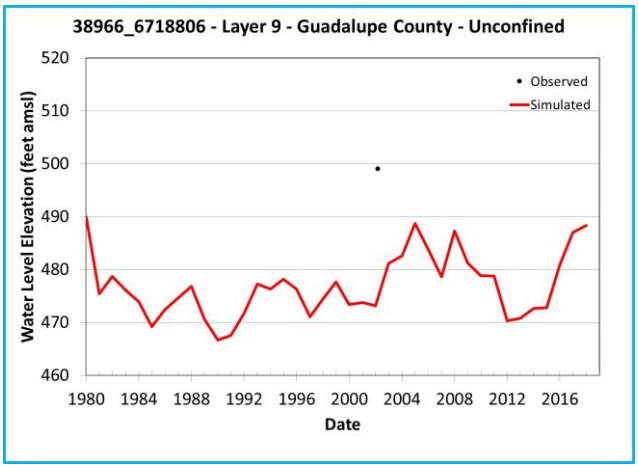












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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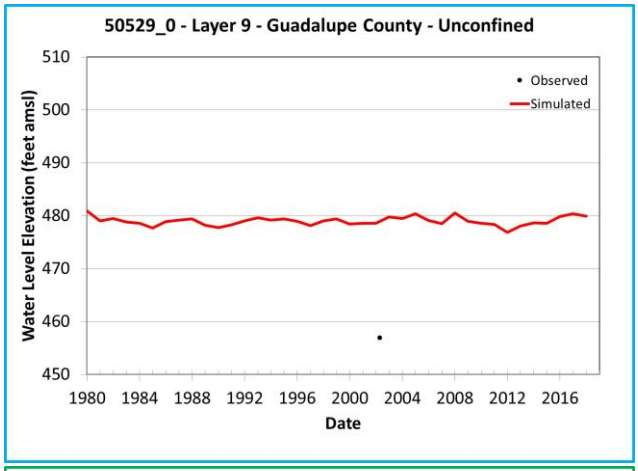
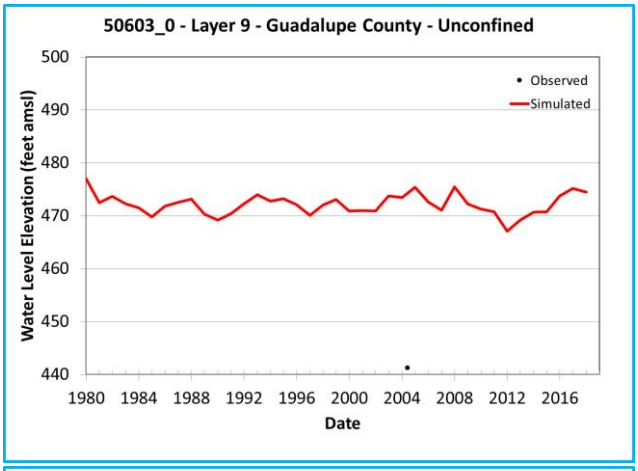
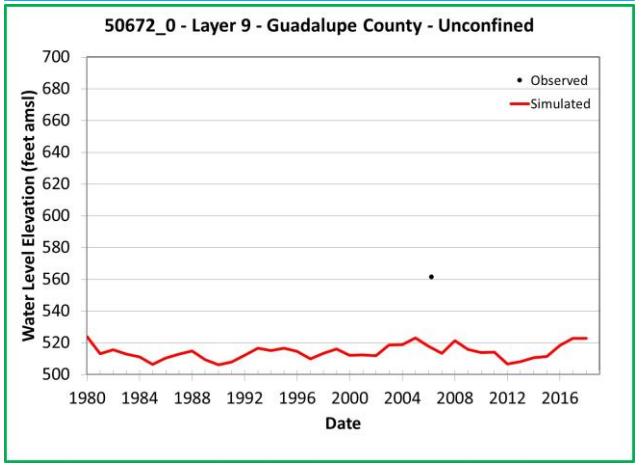
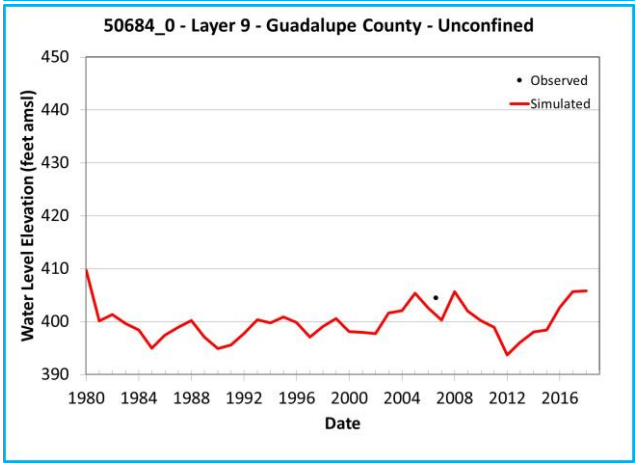
FIGURE I-10.3k

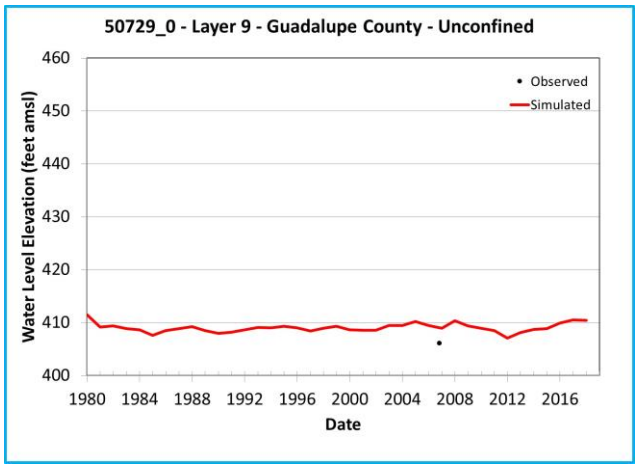
GSI ENVIRONMENTAL

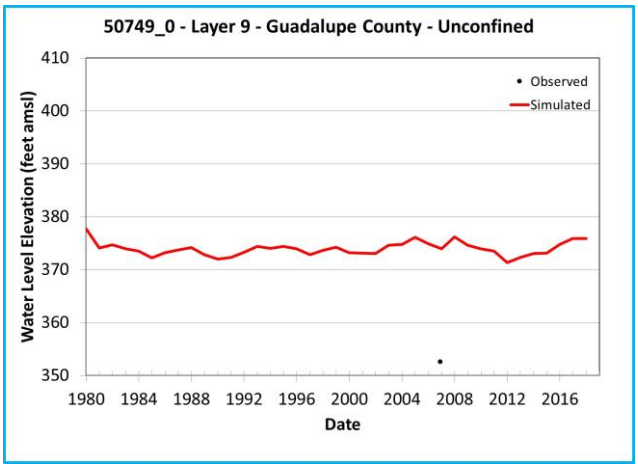












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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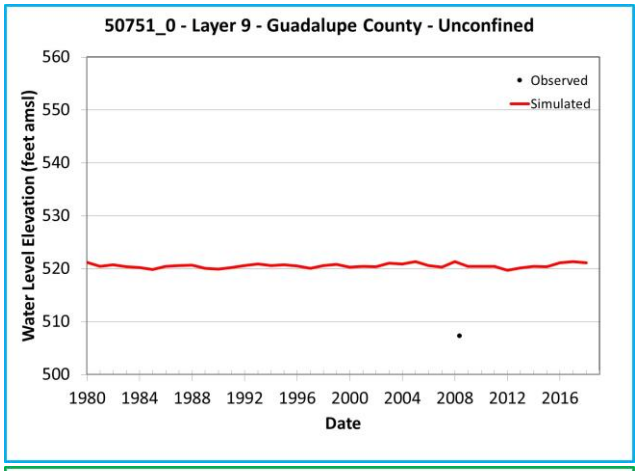
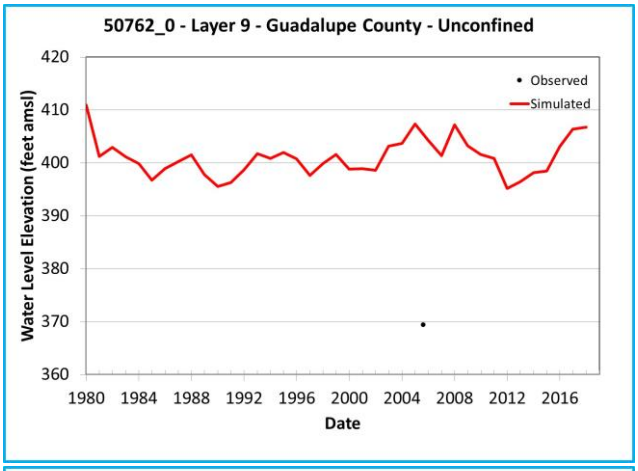
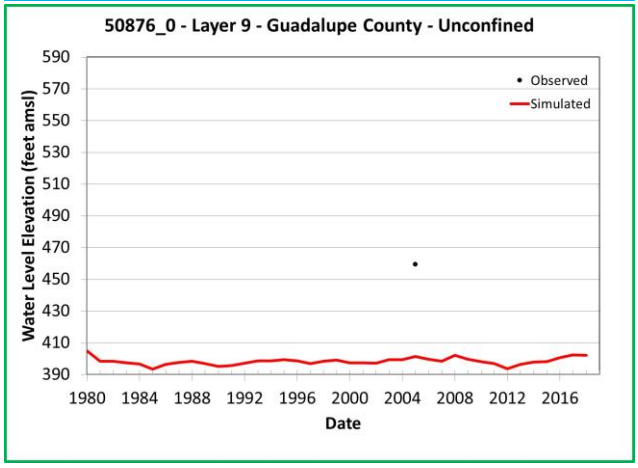
Revised		Aprv'd by	SP

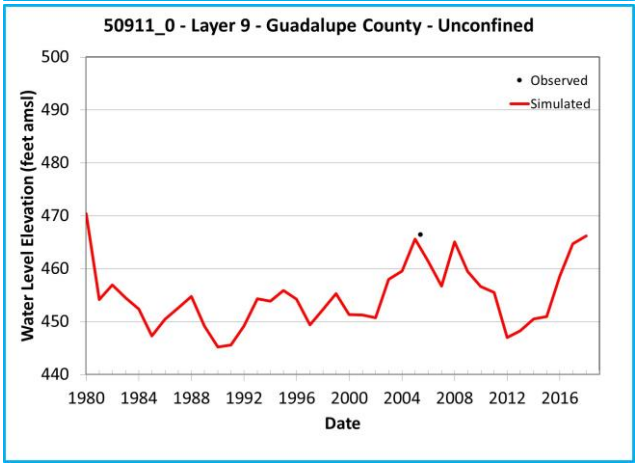
FIGURE I-10.3l

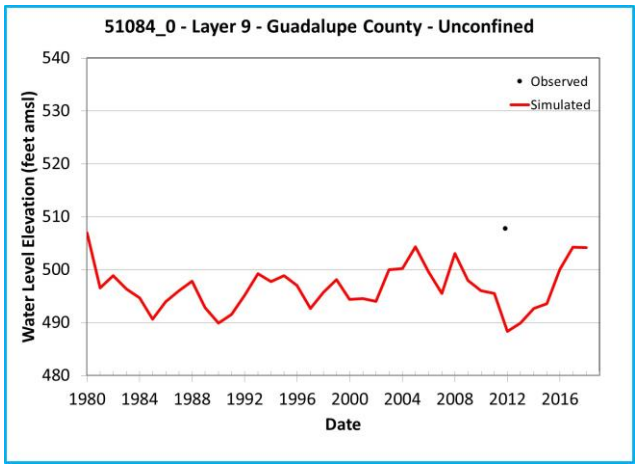
GSI ENVIRONMENTAL

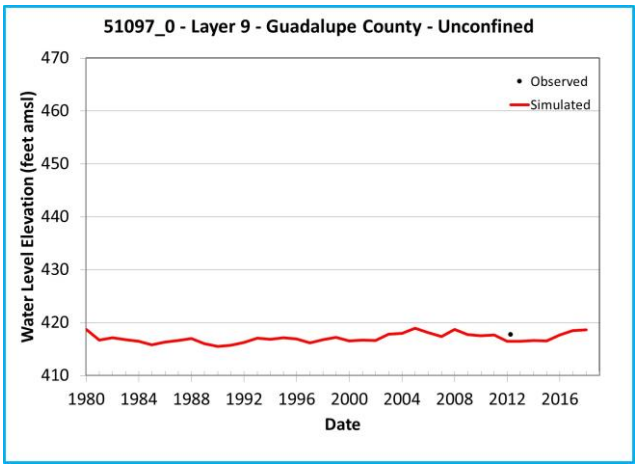












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Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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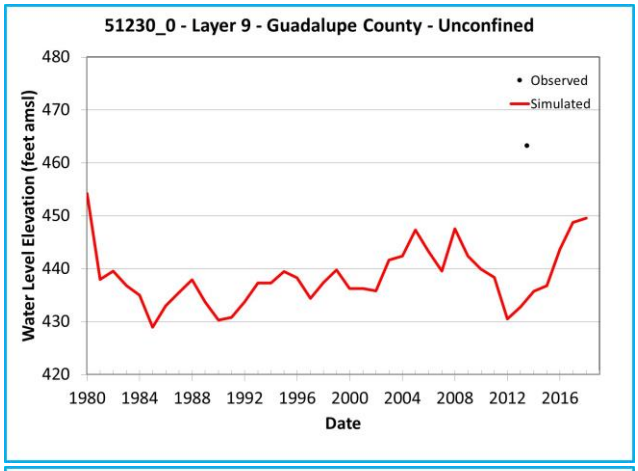
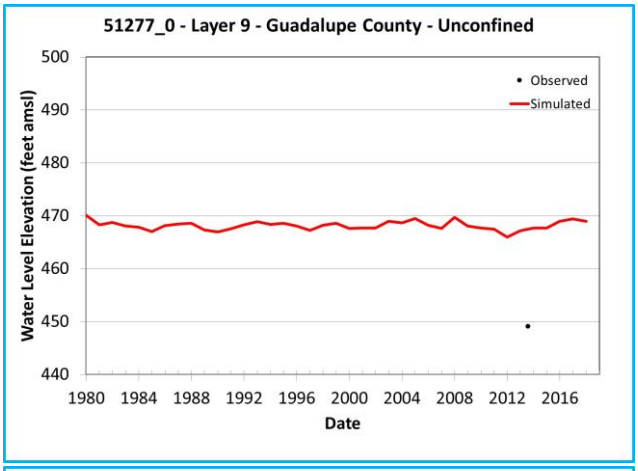
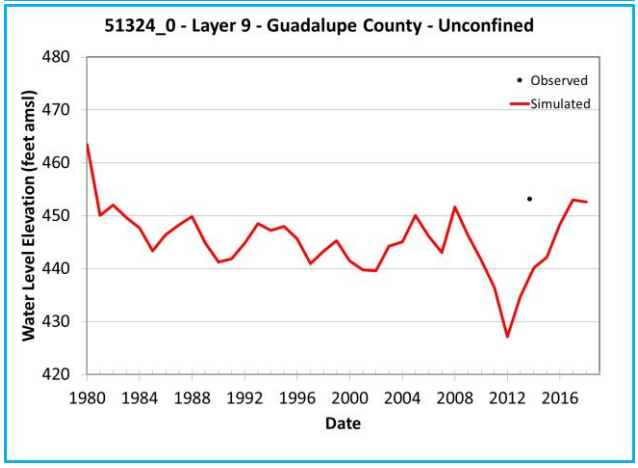
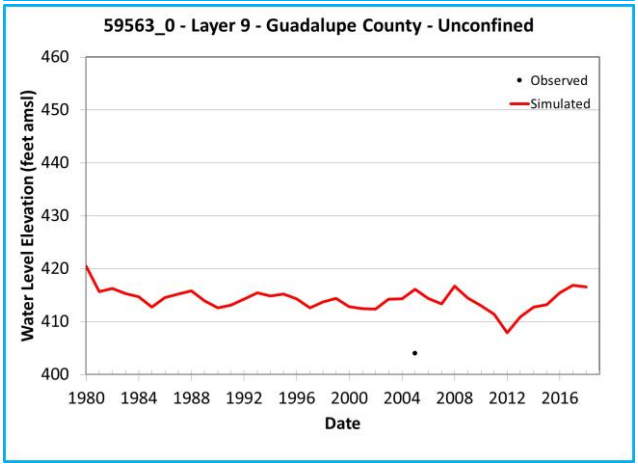
FIGURE I-10.3m

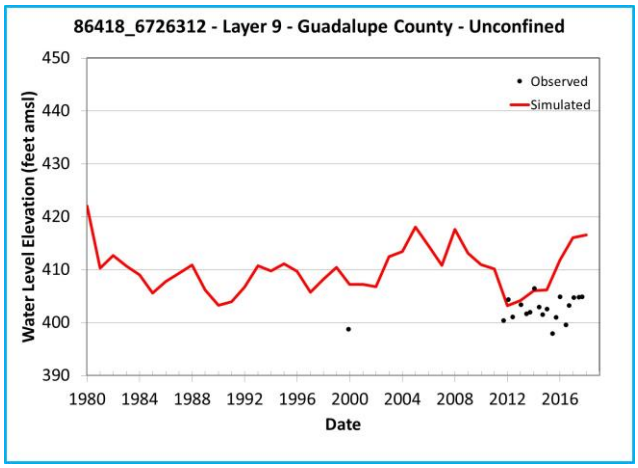
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

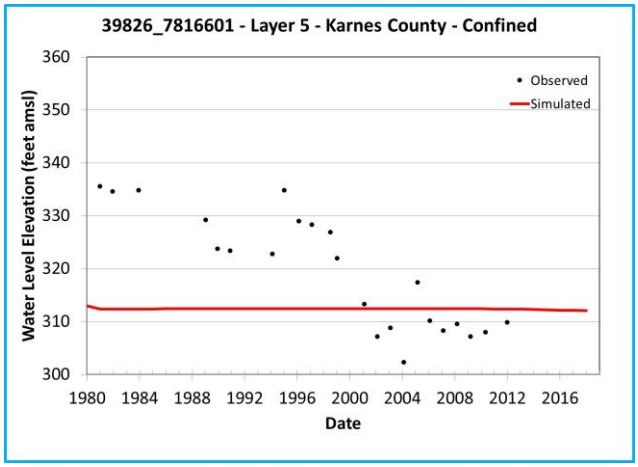
Simulated and Observed Water Level Elevation Hydrographs, Guadalupe County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-10.3n

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

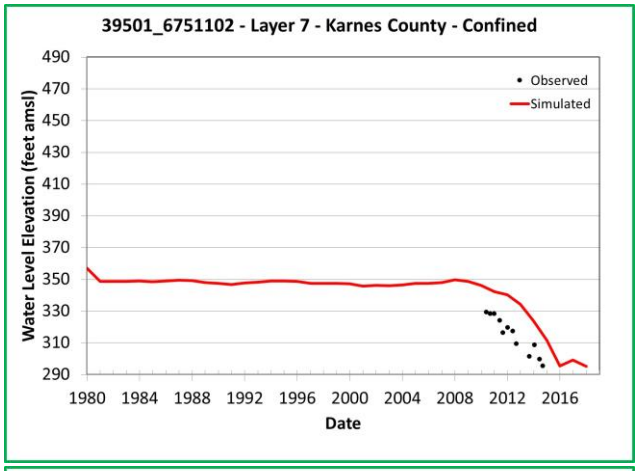
Simulated and Observed Water Level Elevation Hydrographs, Karnes County, Layer 5

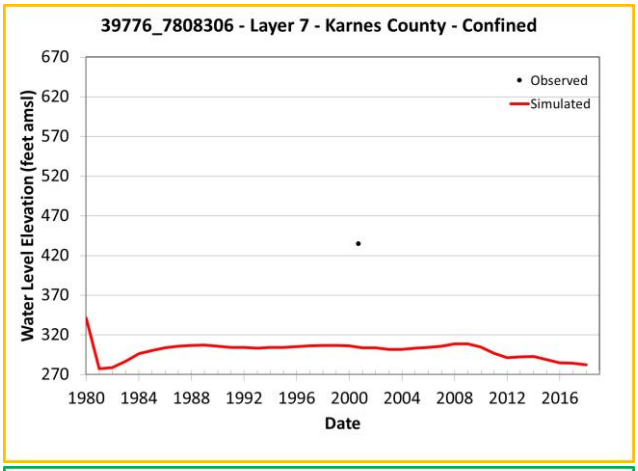
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

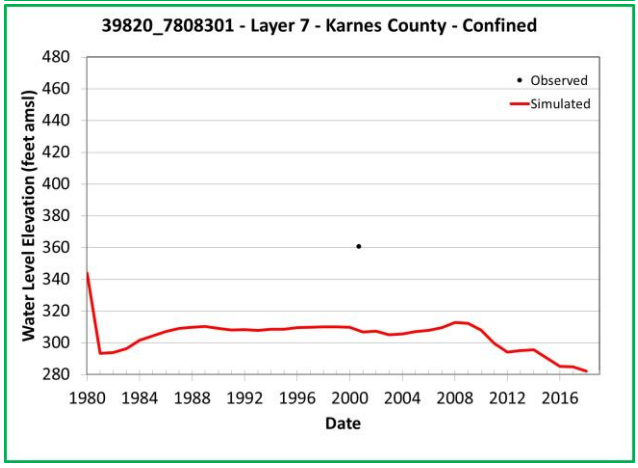
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

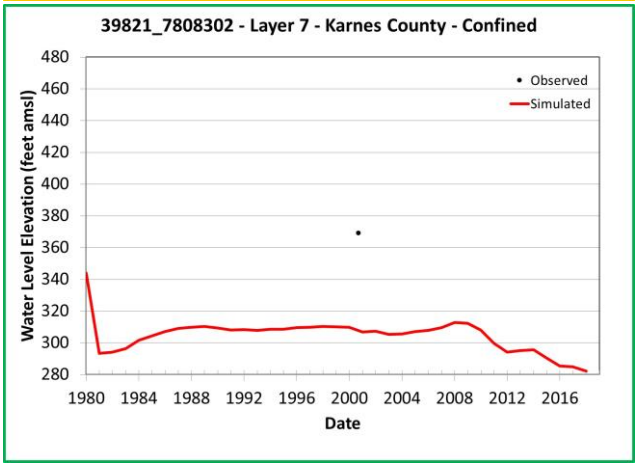
FIGURE I-11.1a

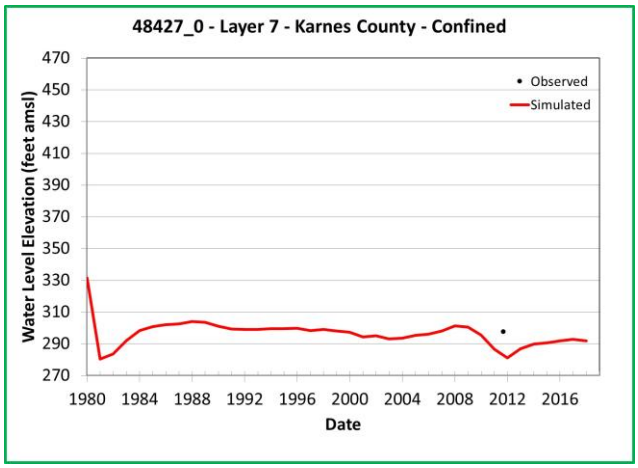
GSI ENVIRONMENTAL

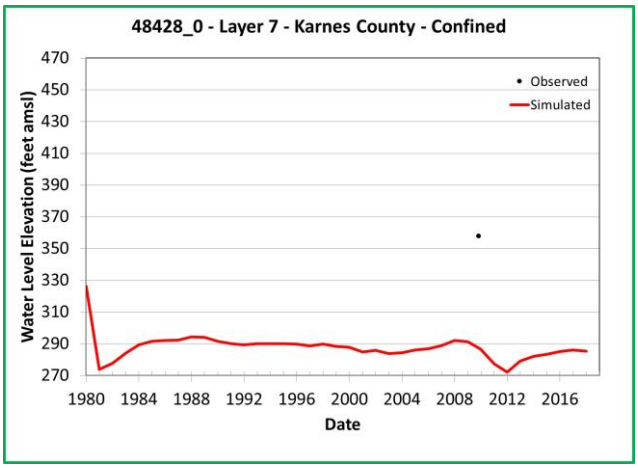












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

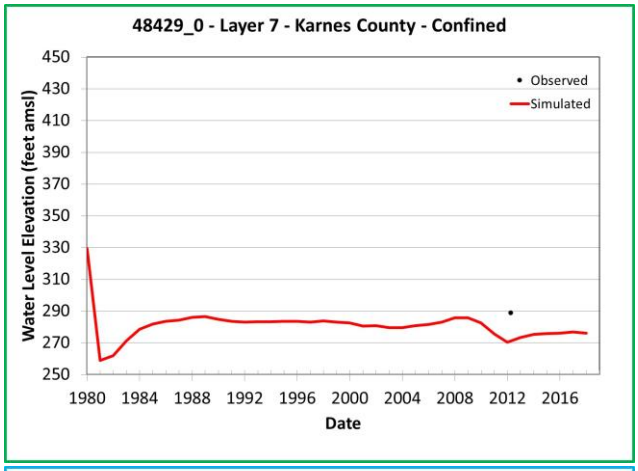
Simulated and Observed Water Level Elevation Hydrographs, Karnes County, Layer 7

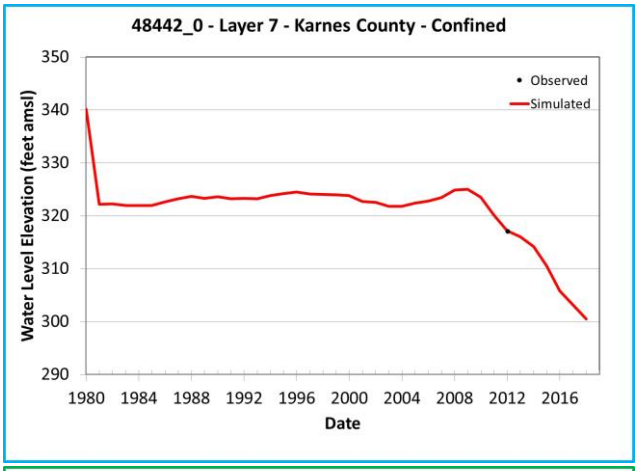
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

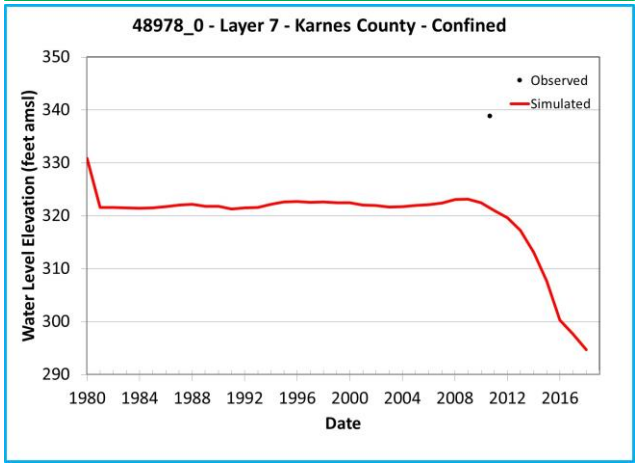
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

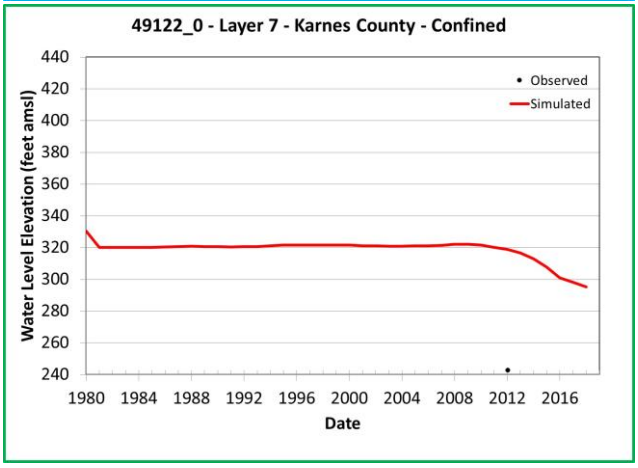
FIGURE I-11.2a

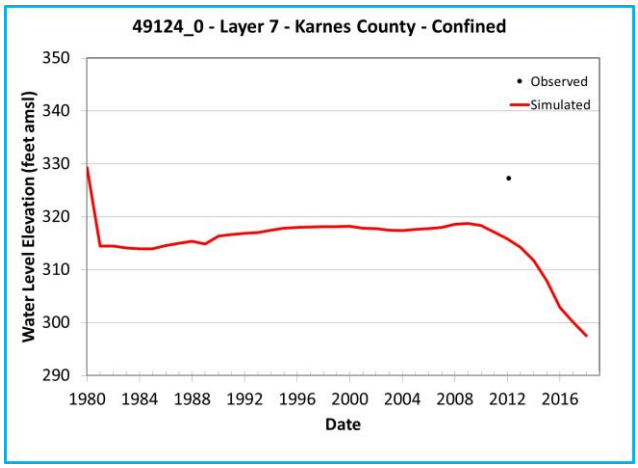
GSI ENVIRONMENTAL

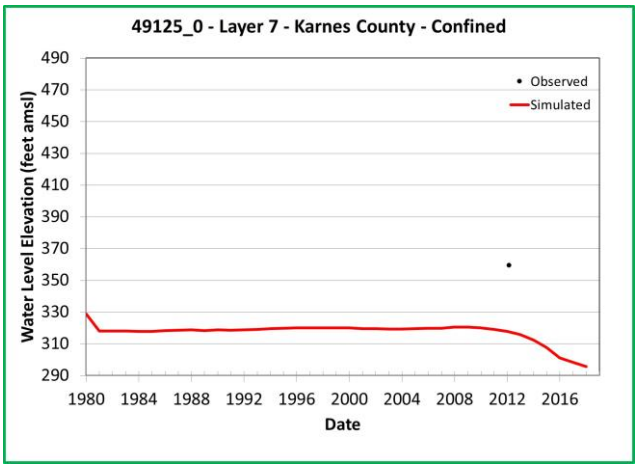












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

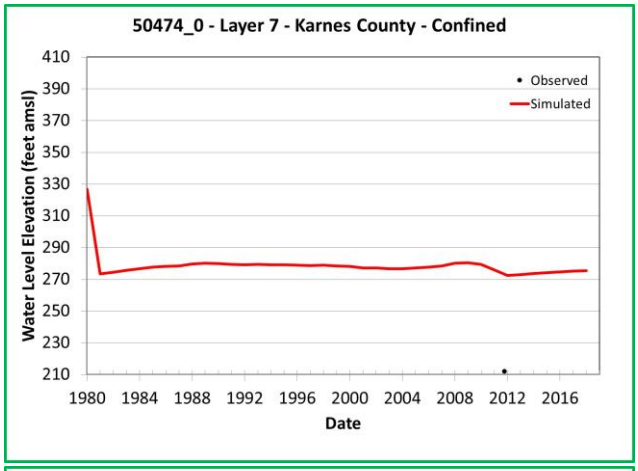
Simulated and Observed Water Level Elevation Hydrographs, Karnes County, Layer 7

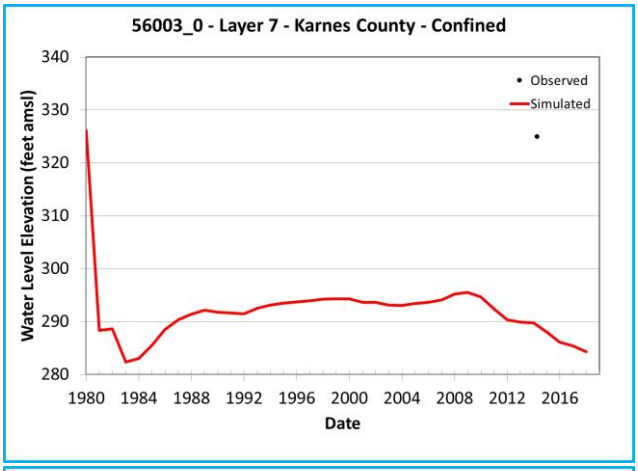
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

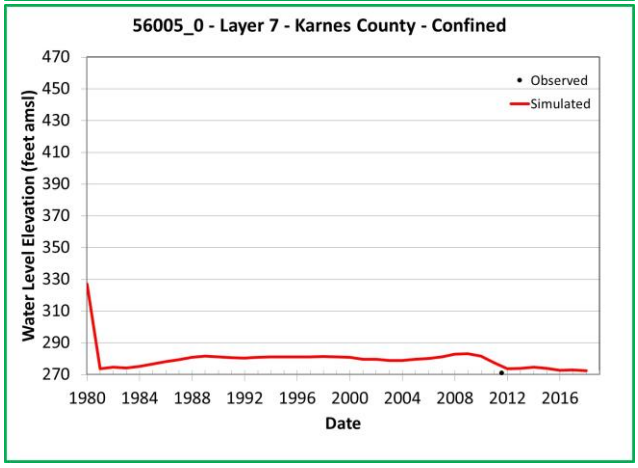
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

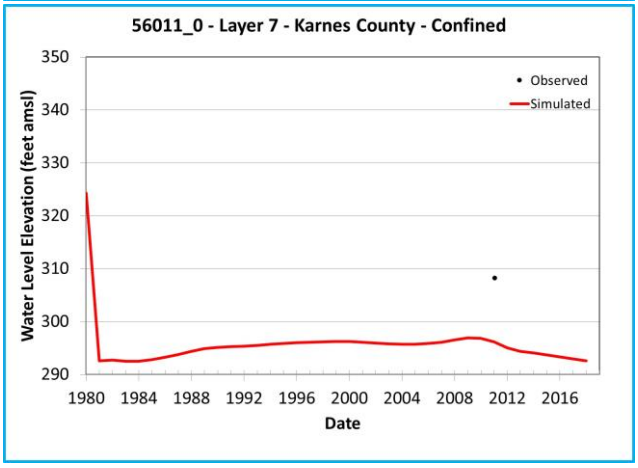
FIGURE I-11.2b

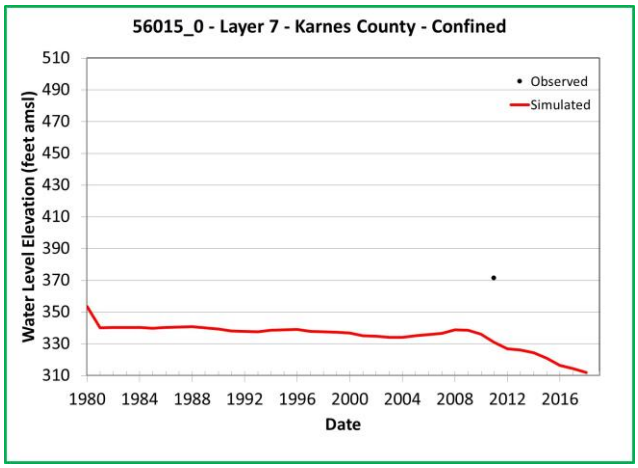
GSI ENVIRONMENTAL

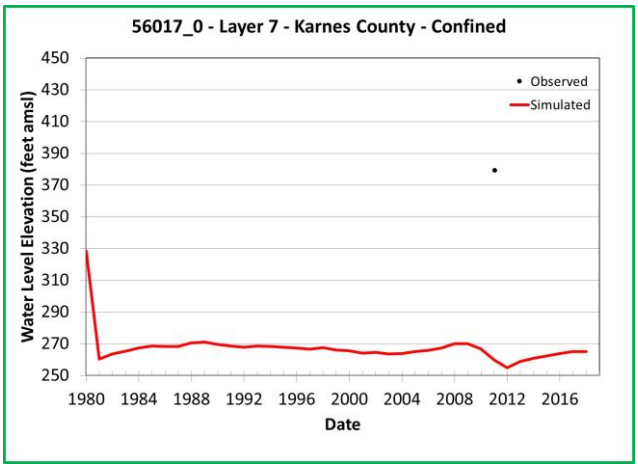












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

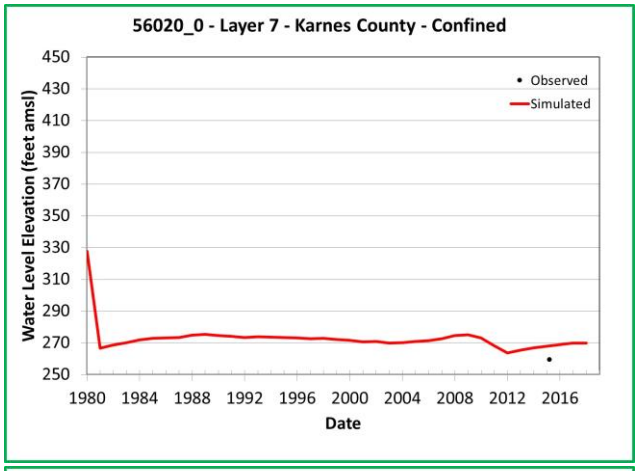
Simulated and Observed Water Level Elevation Hydrographs, Karnes County, Layer 7

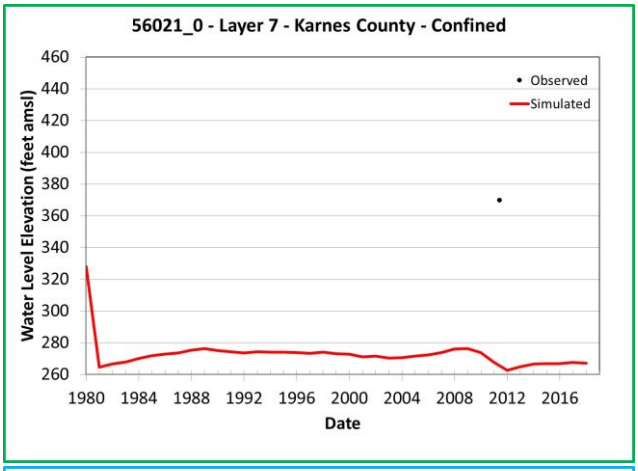
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

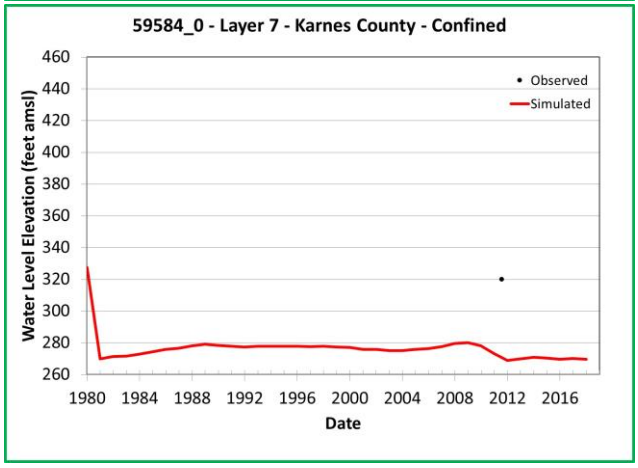
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

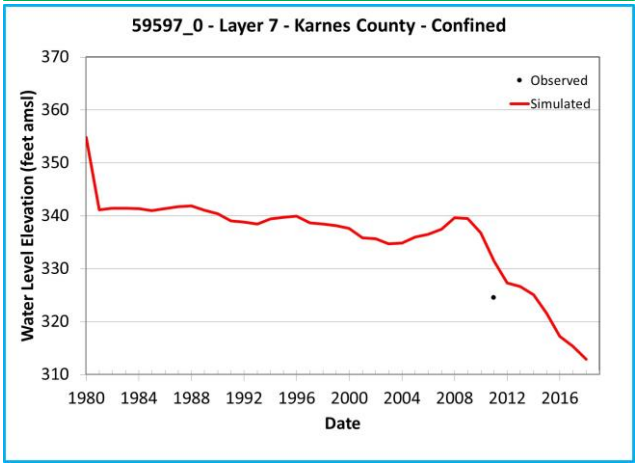
FIGURE I-11.2c

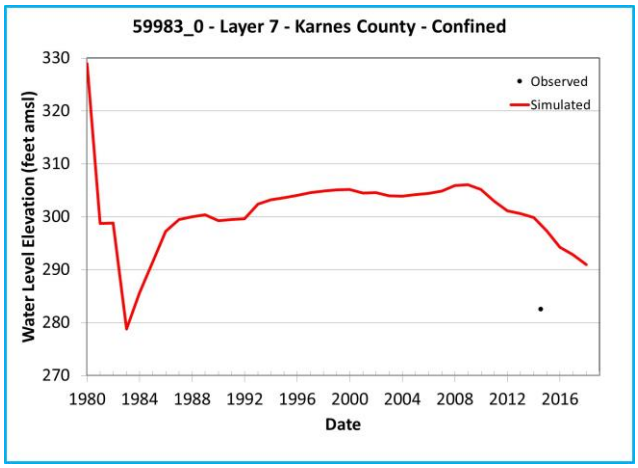
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

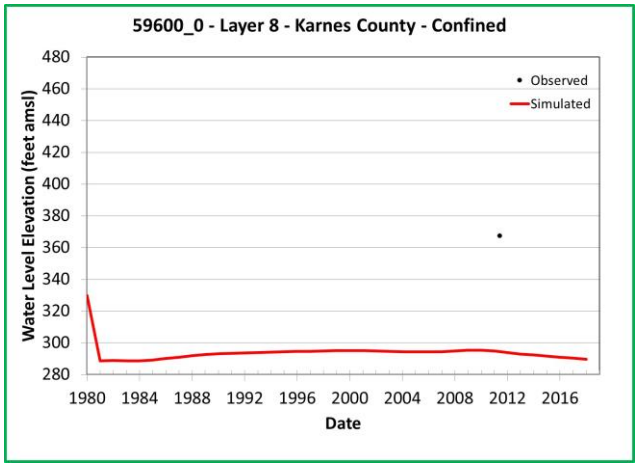
Simulated and Observed Water Level Elevation Hydrographs, Karnes County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-11.2d

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.

Yellow = 400 feet

Green = 200 feet

Blue = 60 feet

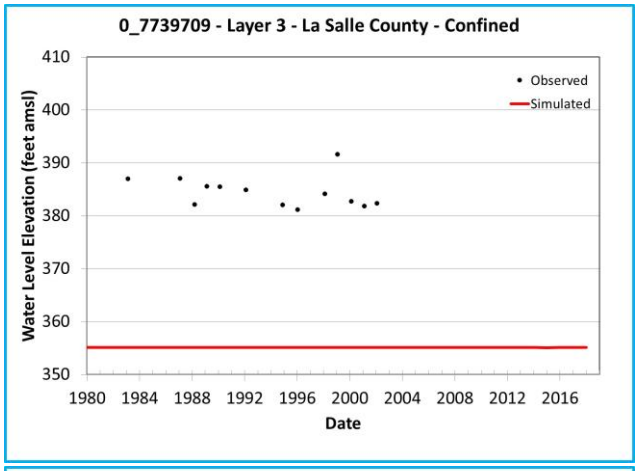
Simulated and Observed Water Level Elevation Hydrographs, Karnes County, Layer 8

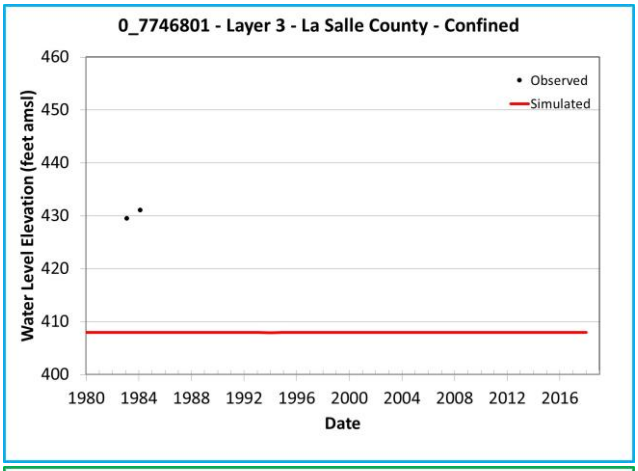
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

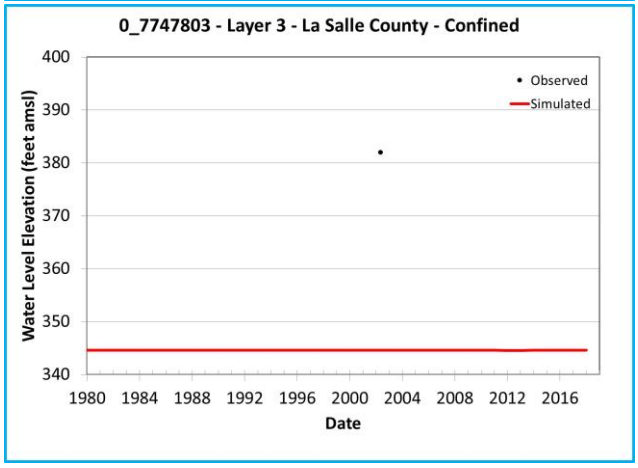
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

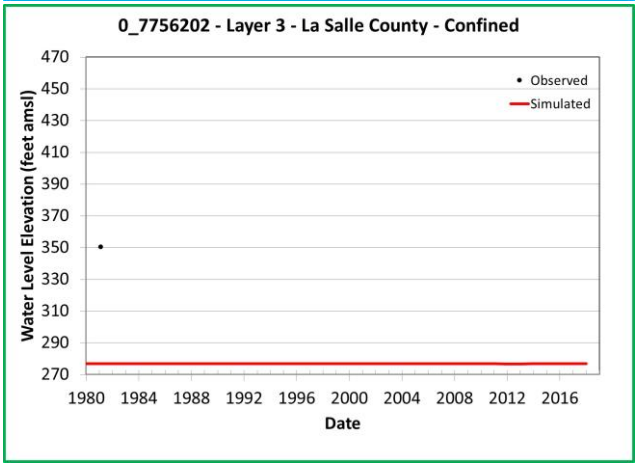
FIGURE I-11.3a

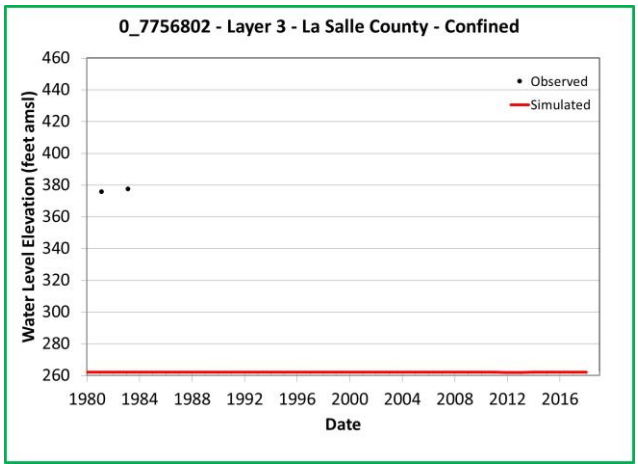
GSI ENVIRONMENTAL

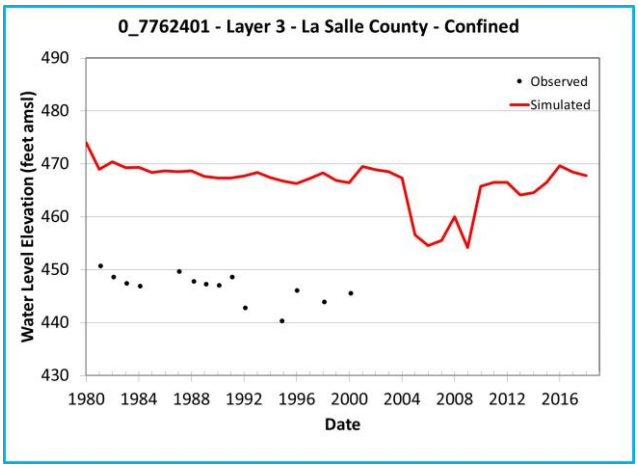












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

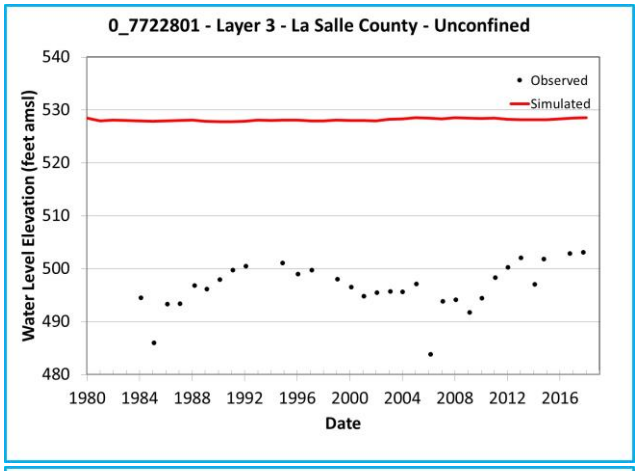
Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 3

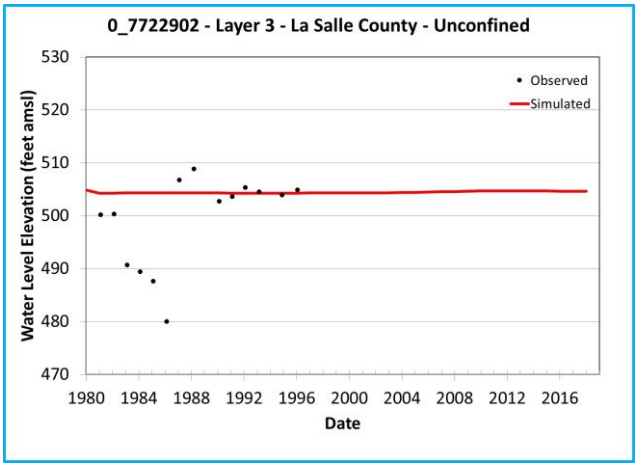
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

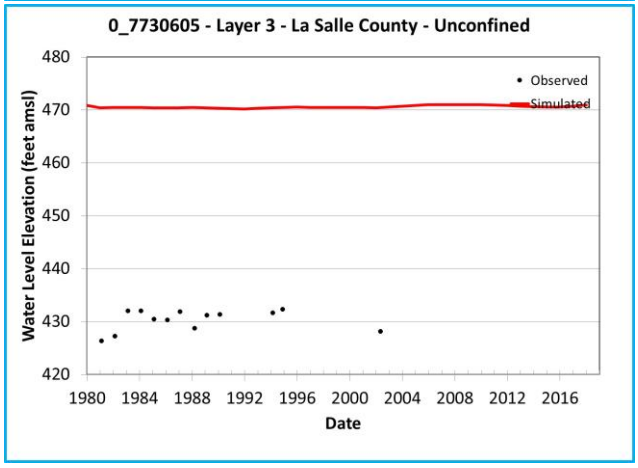
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-12.1a

GSI ENVIRONMENTAL







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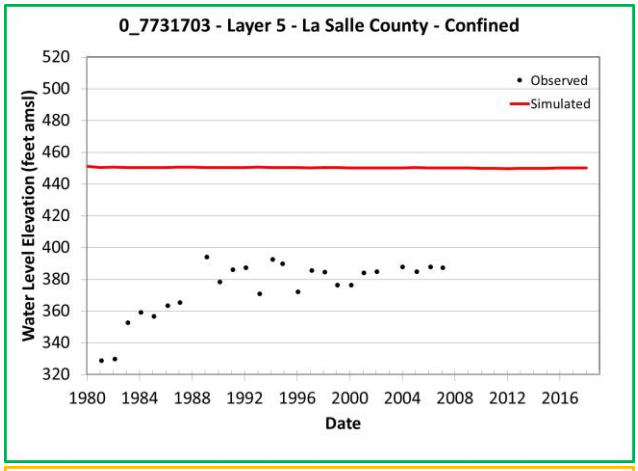
Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 3

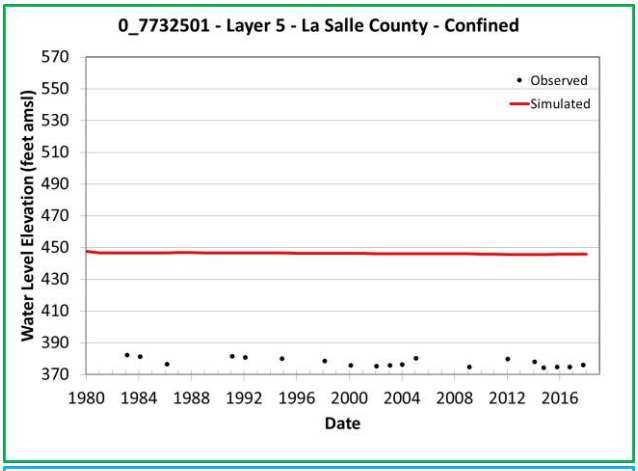
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

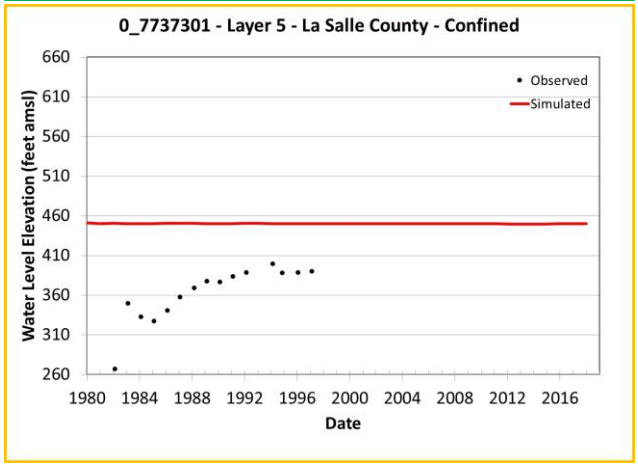
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

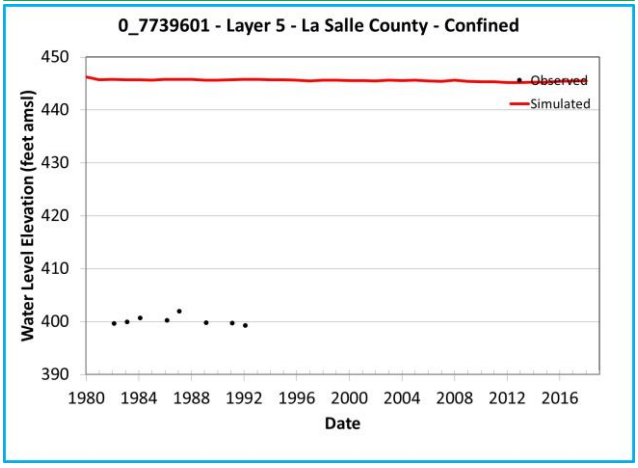
FIGURE I-12.1b

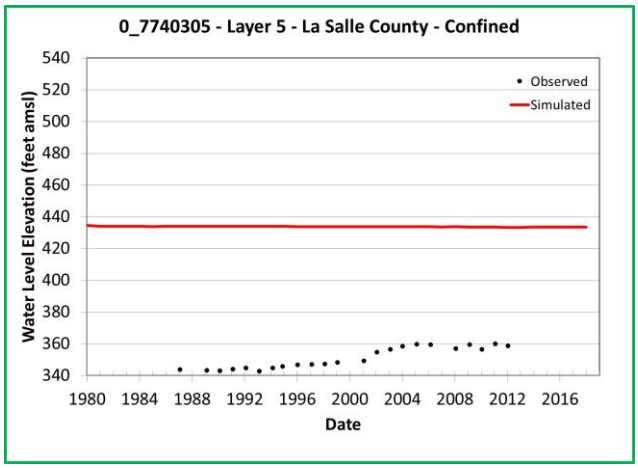
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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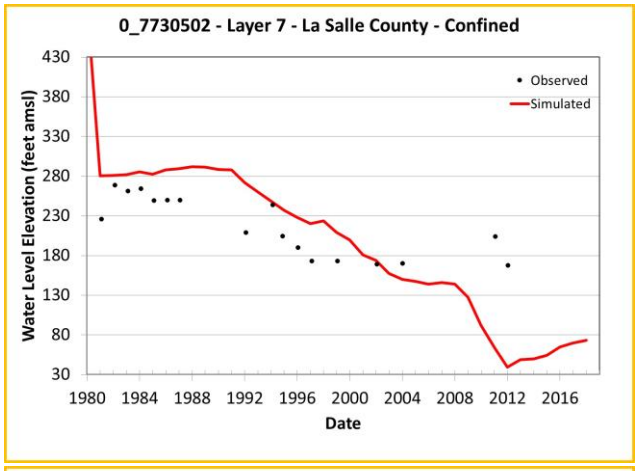
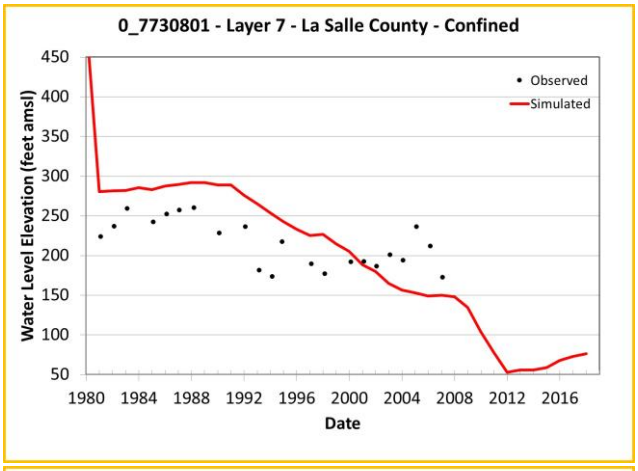
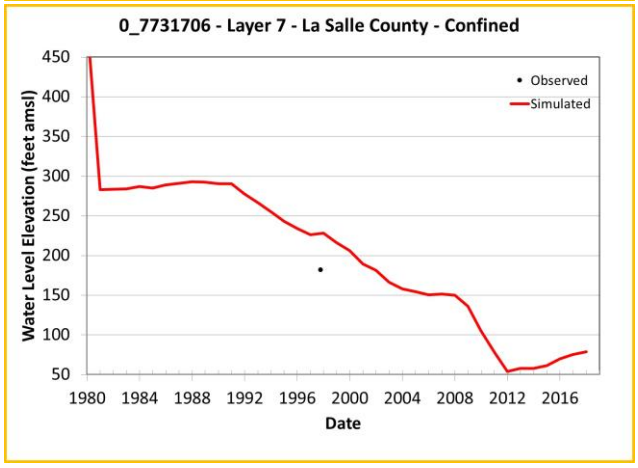
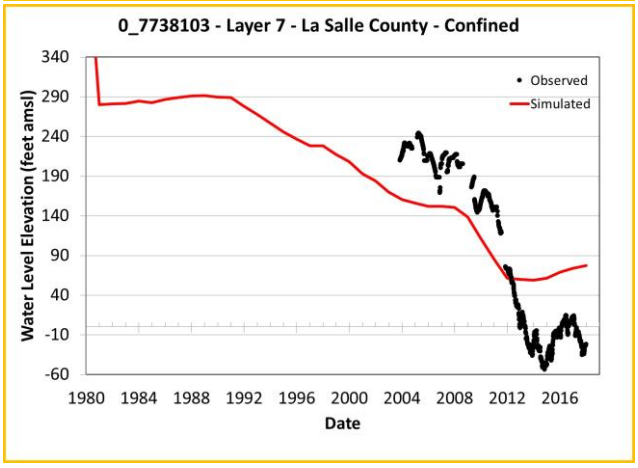
FIGURE I-12.2a

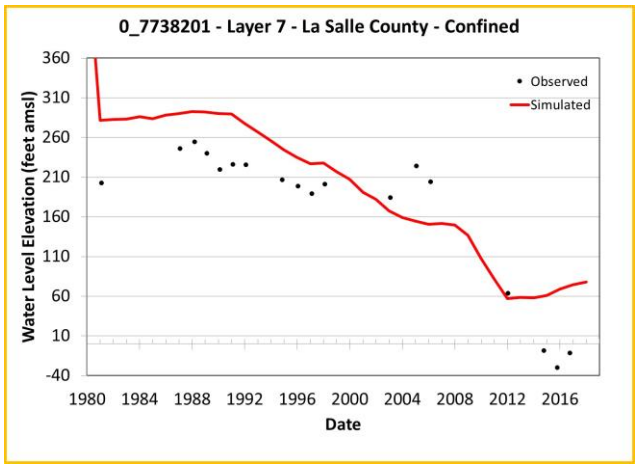
GSI ENVIRONMENTAL

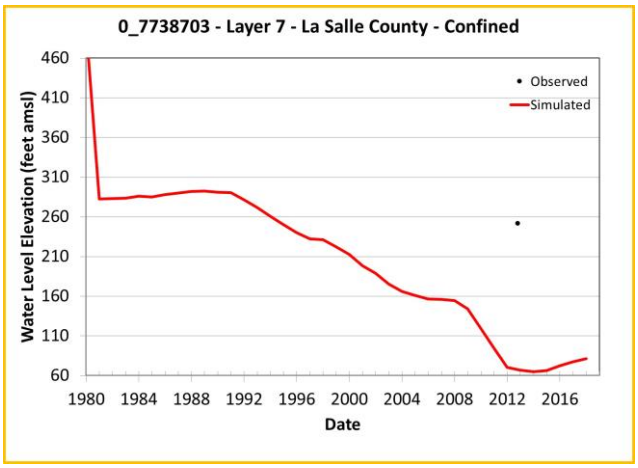












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

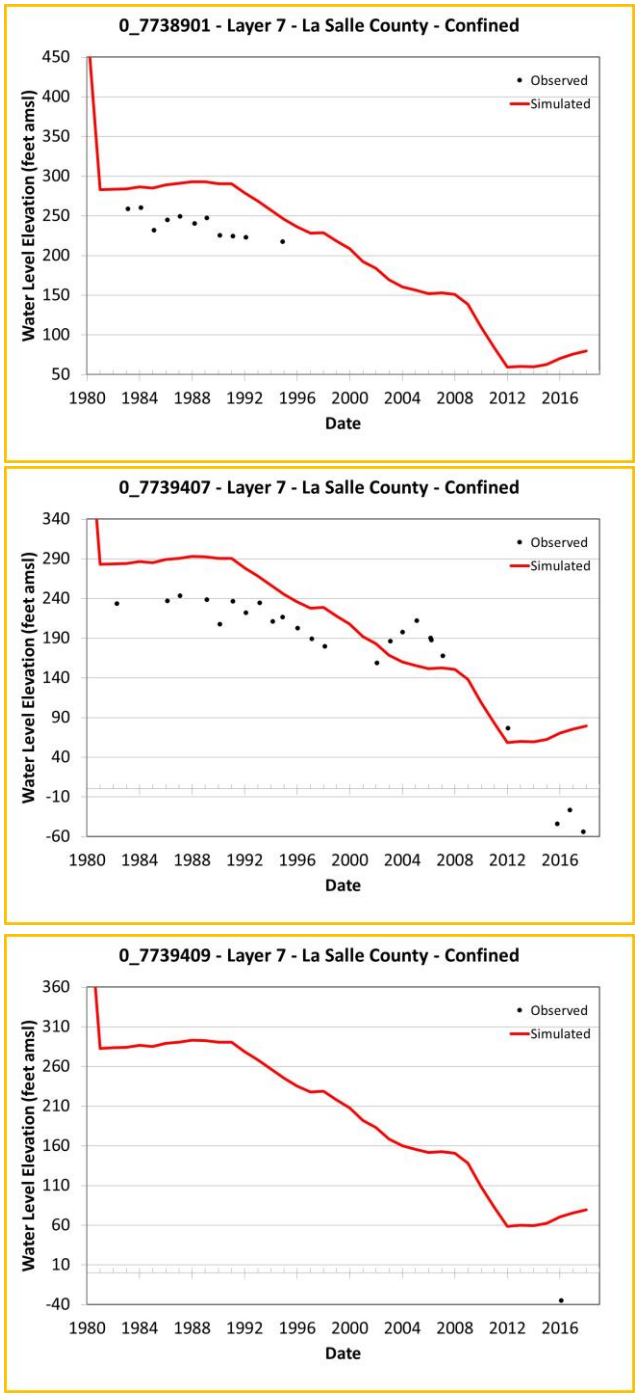
Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-12.3a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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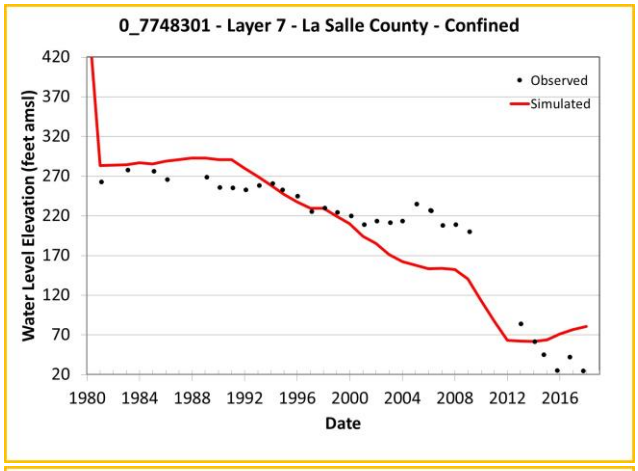
Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

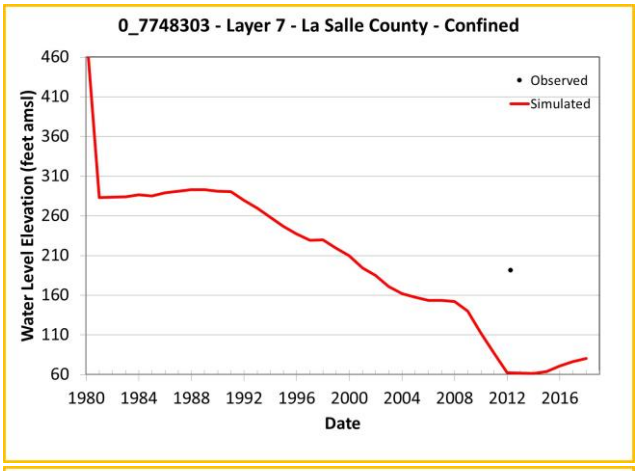
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

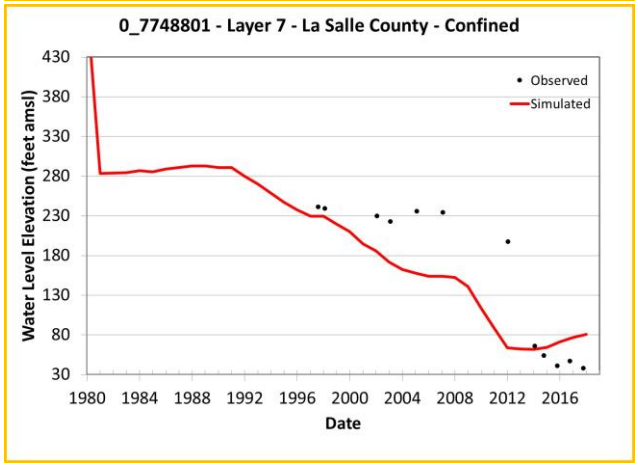
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

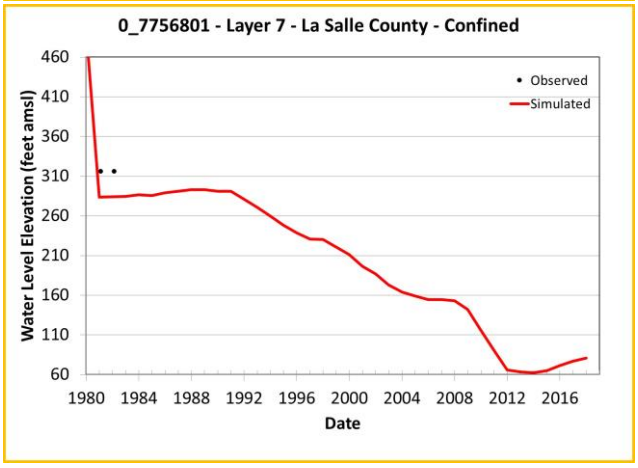
FIGURE I-12.3b

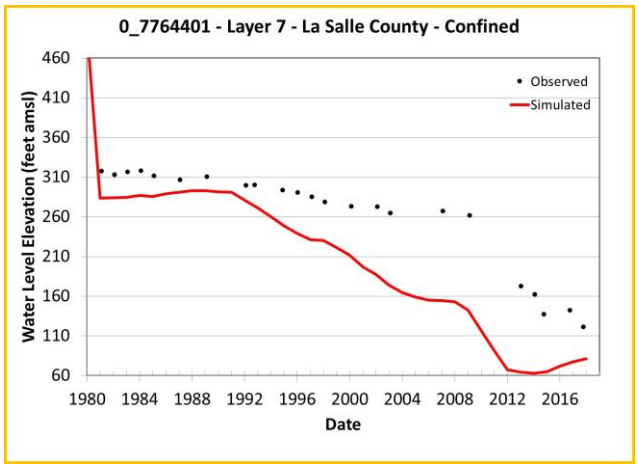
GSI ENVIRONMENTAL

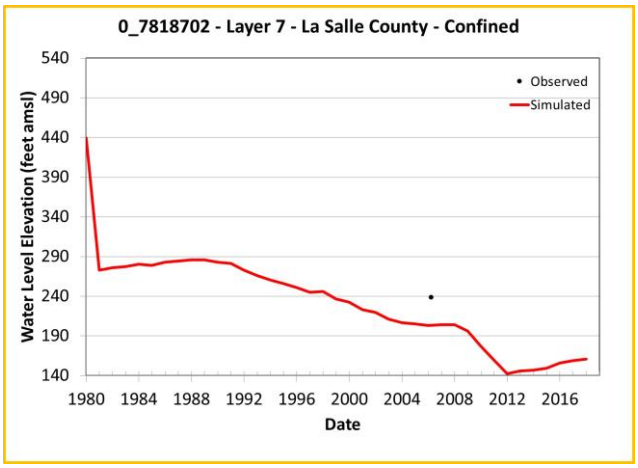












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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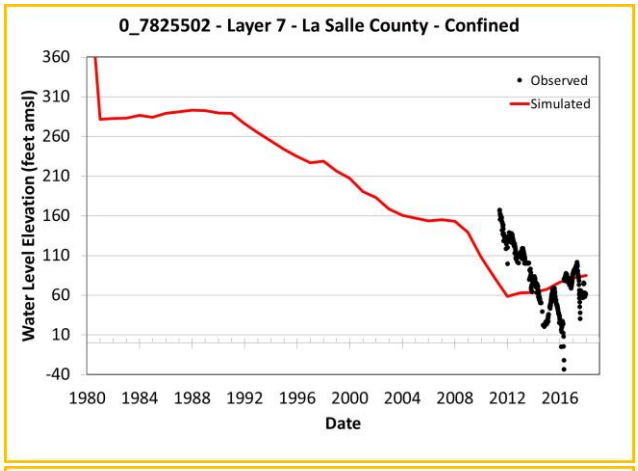
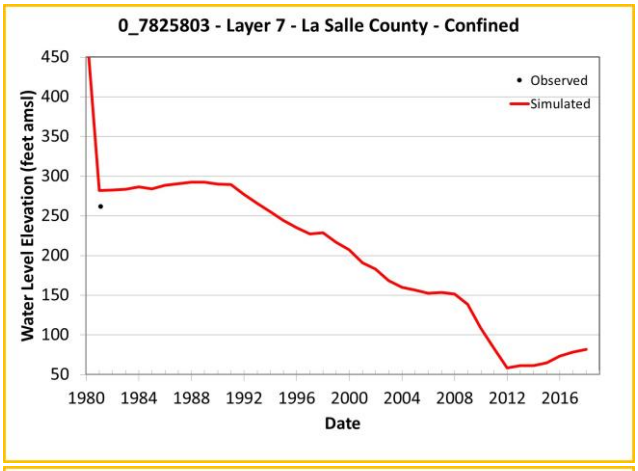
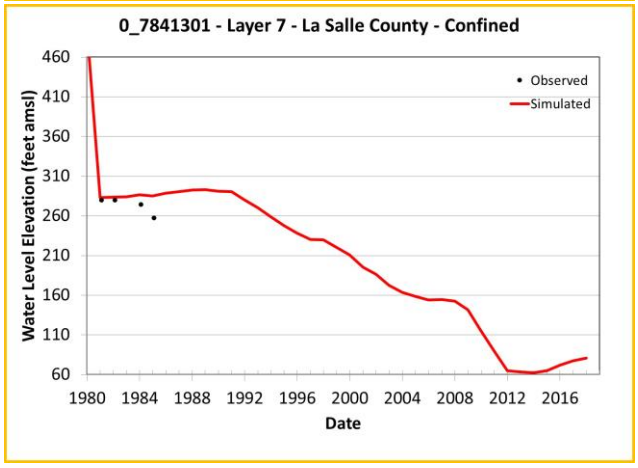
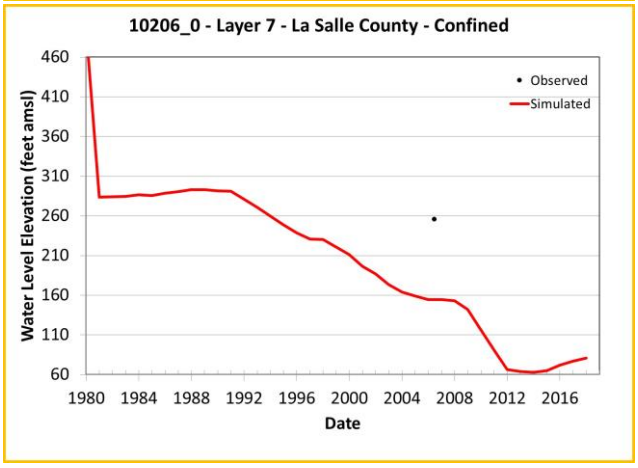
FIGURE I-12.3c

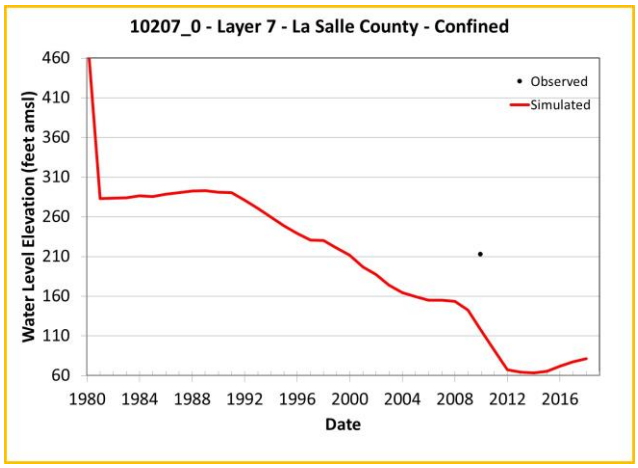
GSI ENVIRONMENTAL

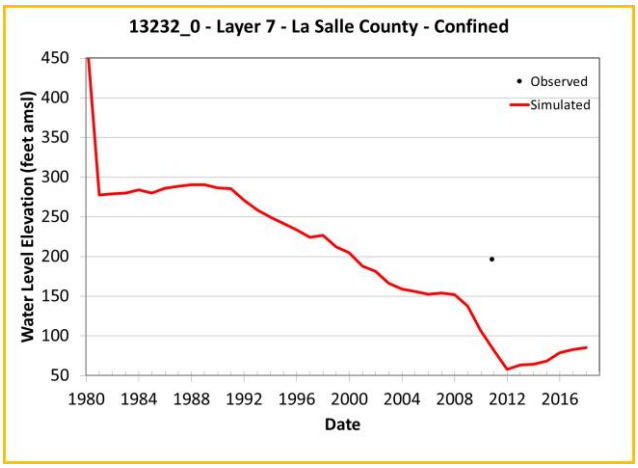












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

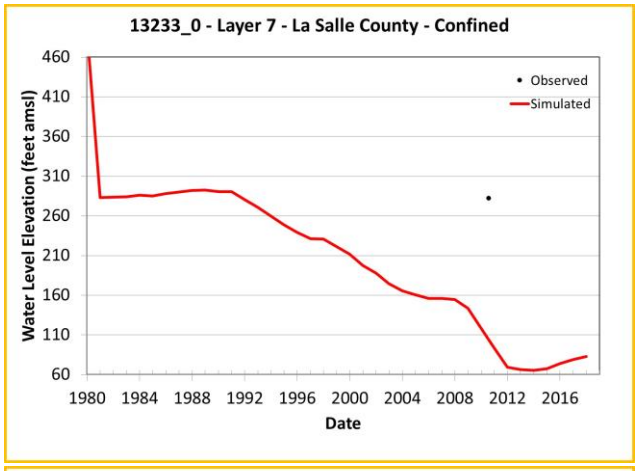
Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

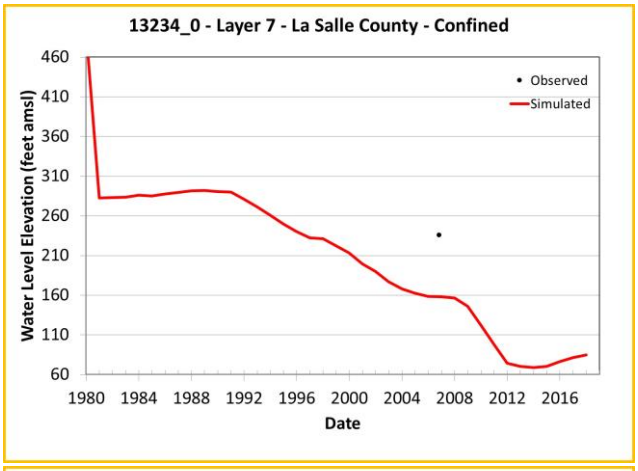
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

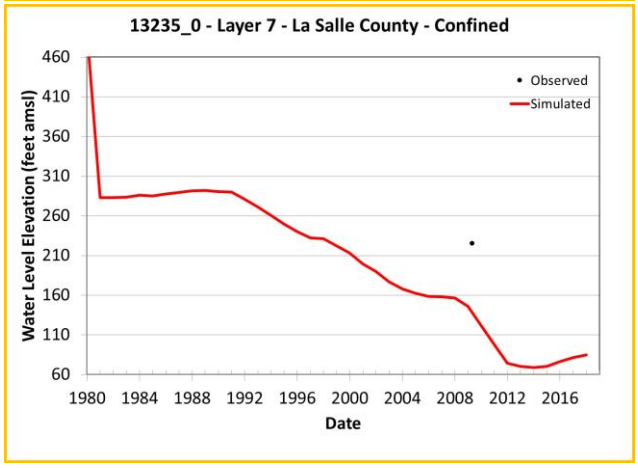
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

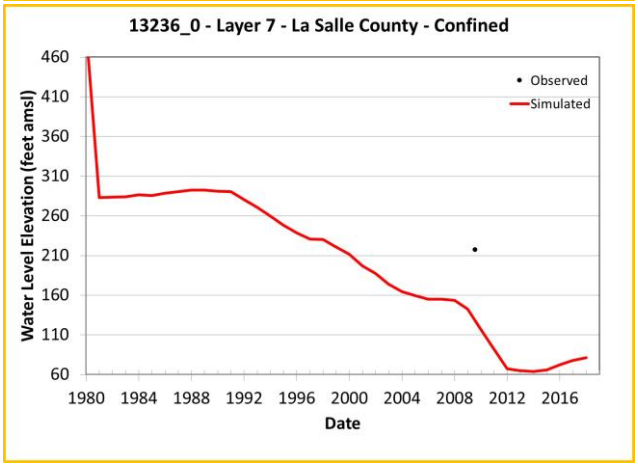
FIGURE I-12.3d

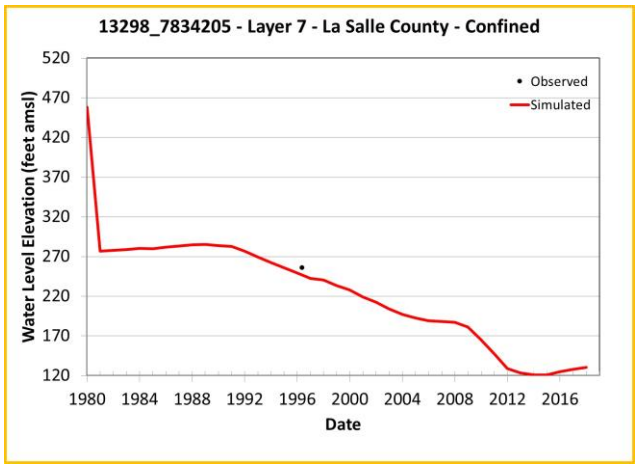
GSI ENVIRONMENTAL

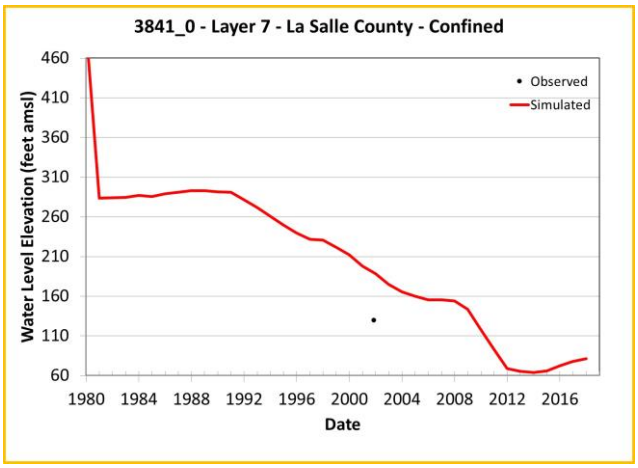












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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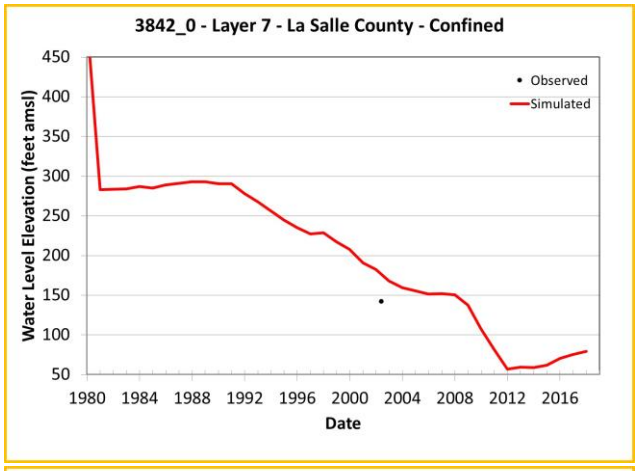
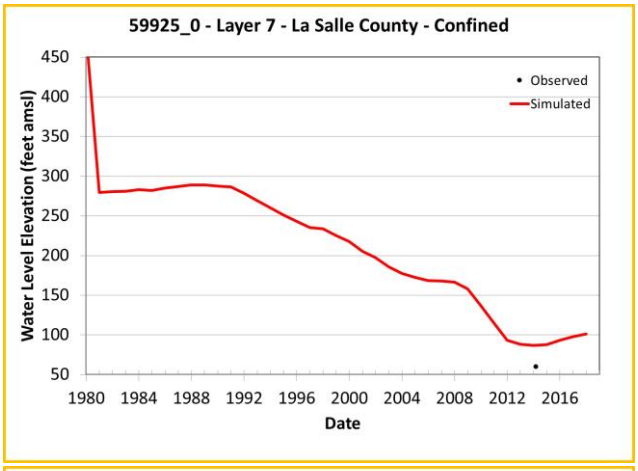
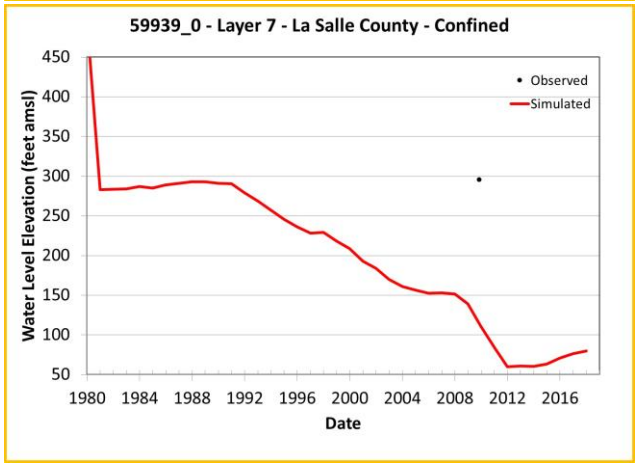
Revised		Aprv'd by	SP

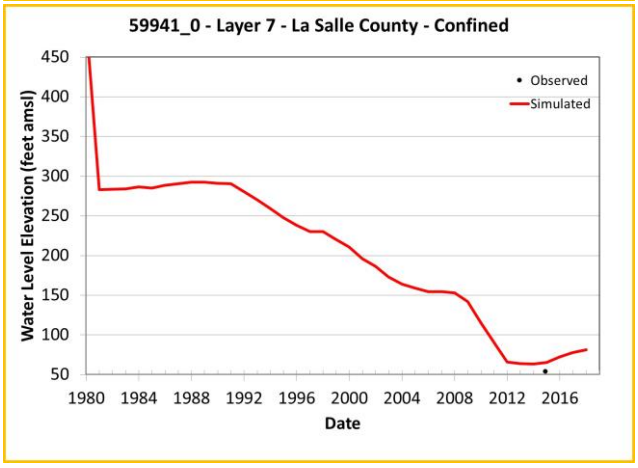
FIGURE I-12.3e

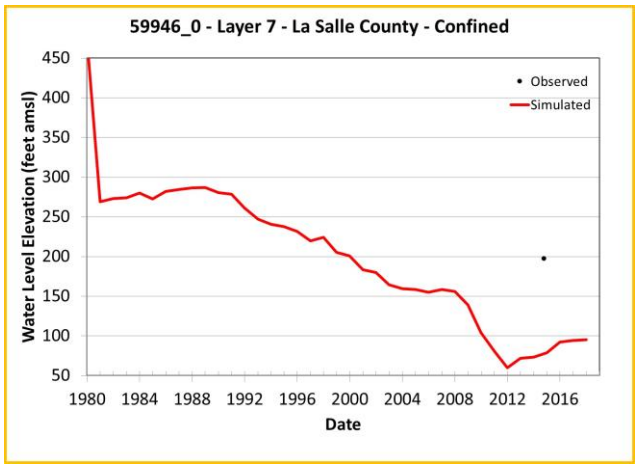
GSI ENVIRONMENTAL

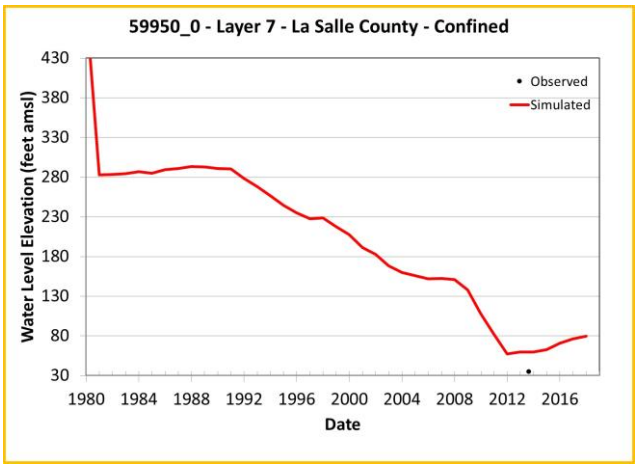












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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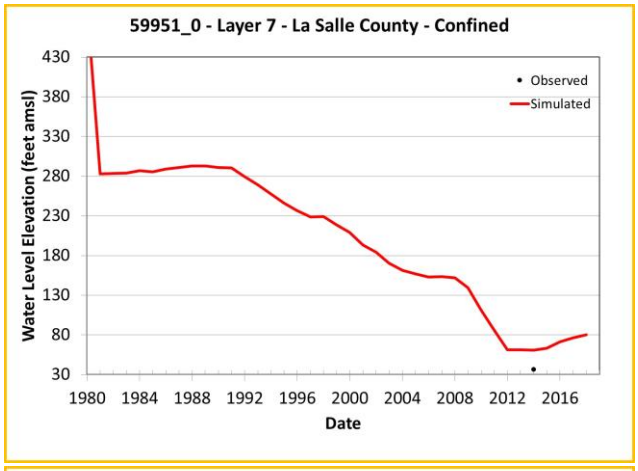
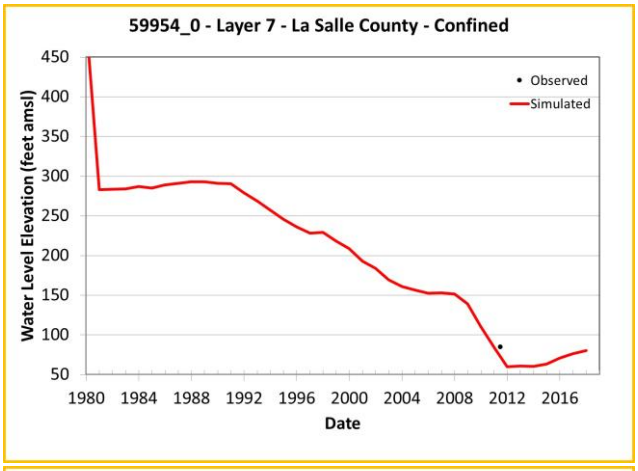
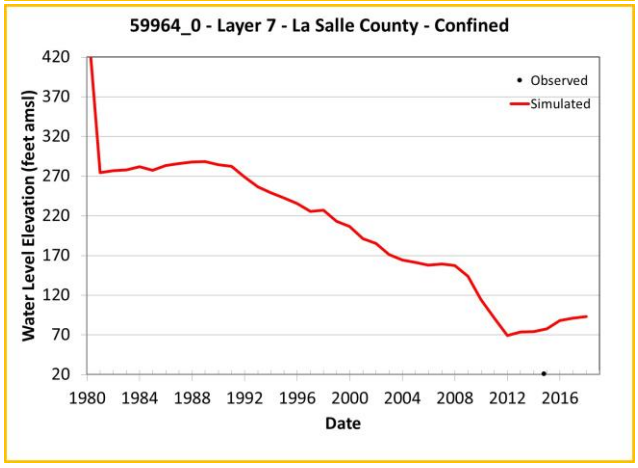
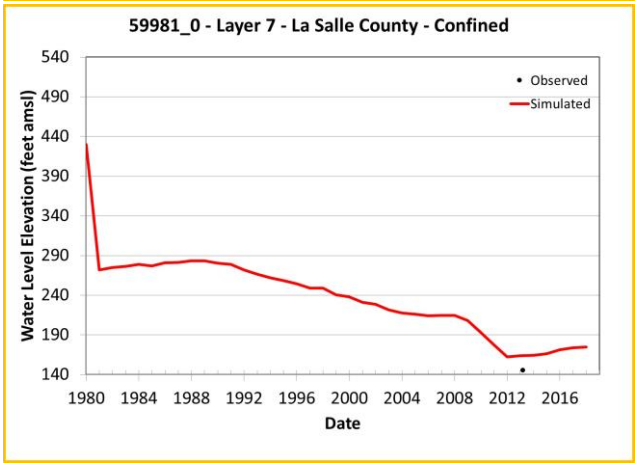
FIGURE I-12.3f

GSI ENVIRONMENTAL









Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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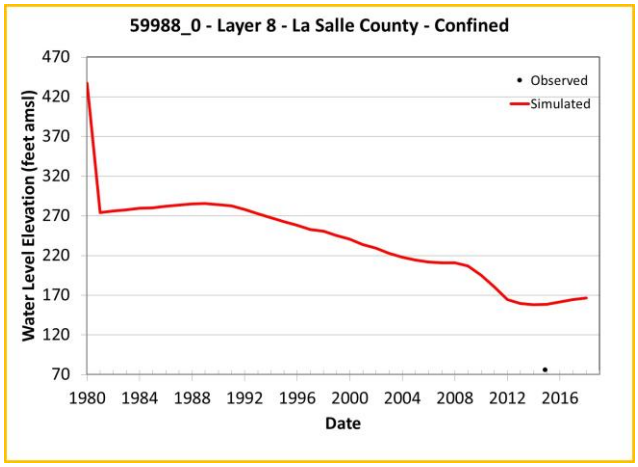
Revised		Aprv'd by	SP

FIGURE I-12.3g

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.

Yellow = 400 feet

Green = 200 feet

Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, La Salle County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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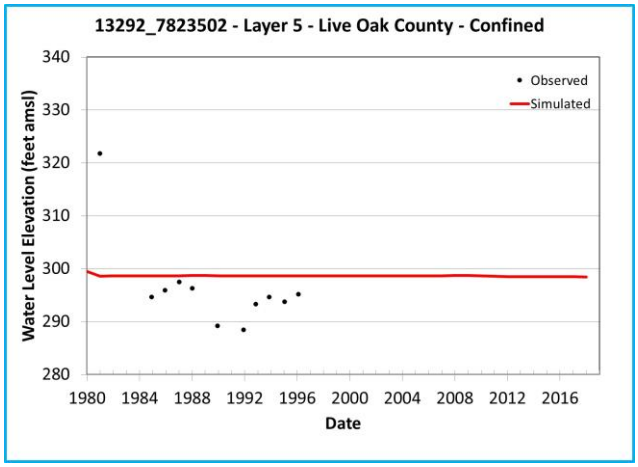
FIGURE I-12.4a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

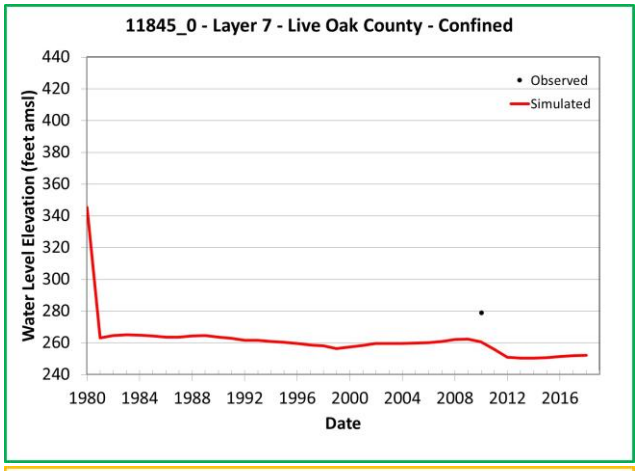
Simulated and Observed Water Level Elevation Hydrographs, Live Oak County, Layer 5

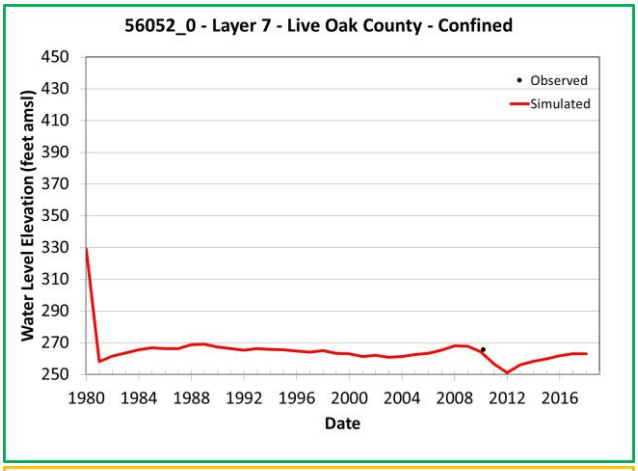
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

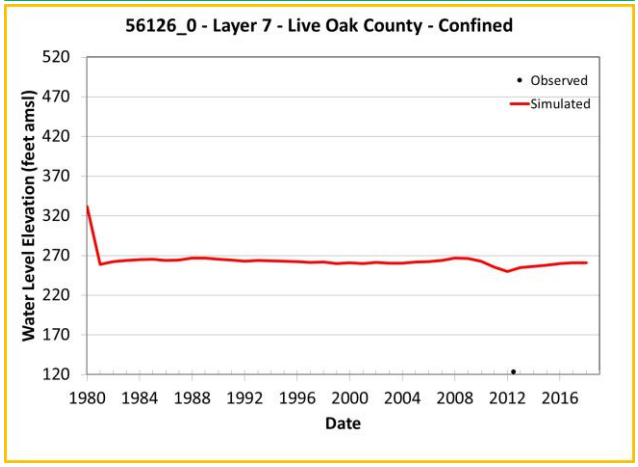
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

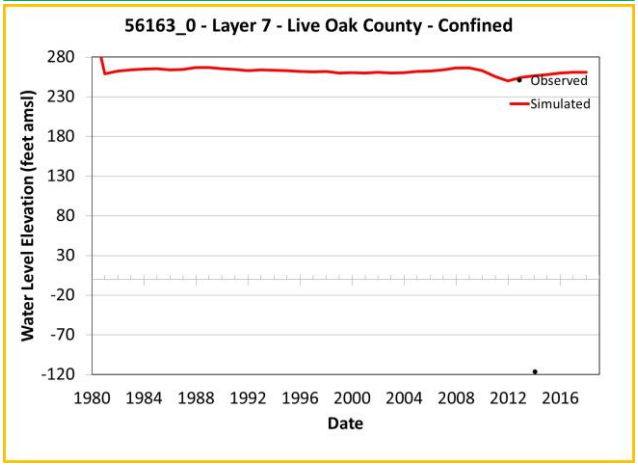
FIGURE I-13.1a

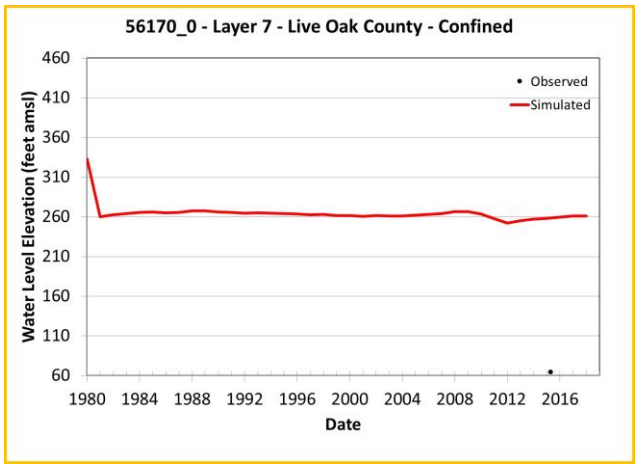
GSI ENVIRONMENTAL

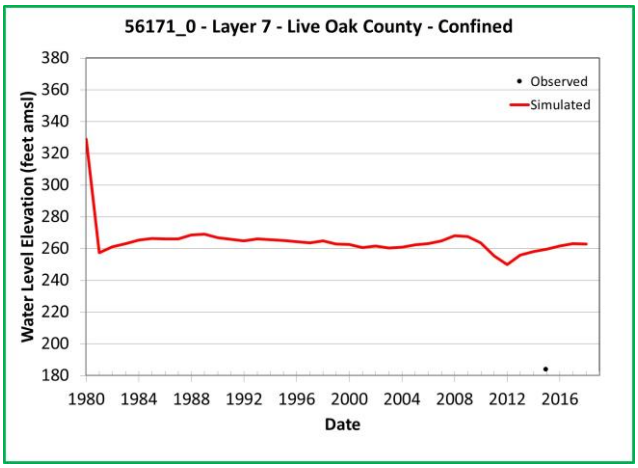












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

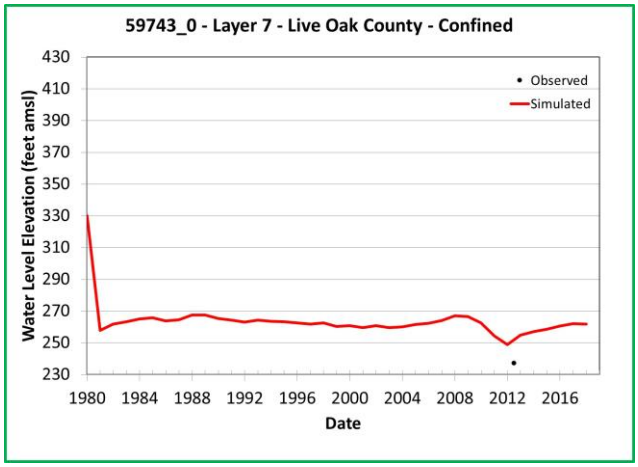
Simulated and Observed Water Level Elevation Hydrographs, Live Oak County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-13.2a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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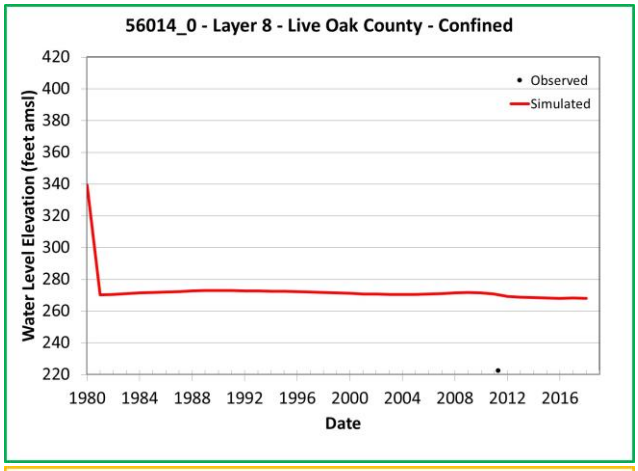
Simulated and Observed Water Level Elevation Hydrographs, Live Oak County, Layer 7

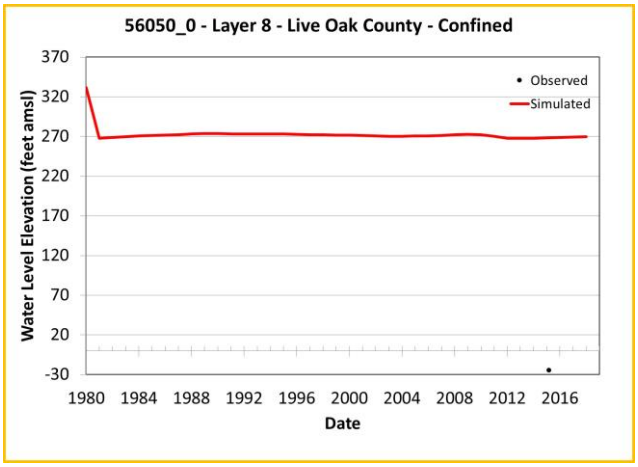
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

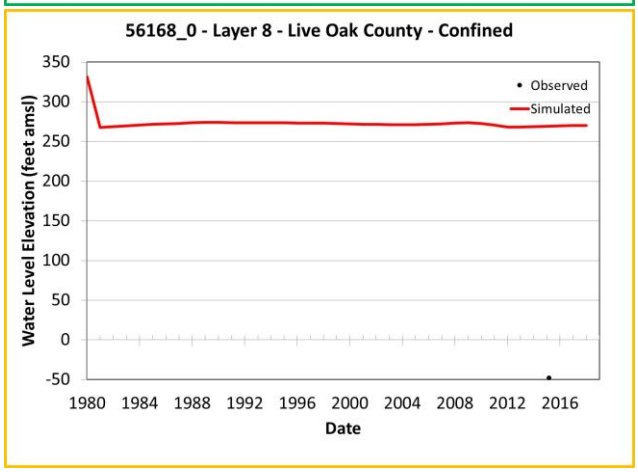
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-13.2b

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.

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Blue = 60 feet

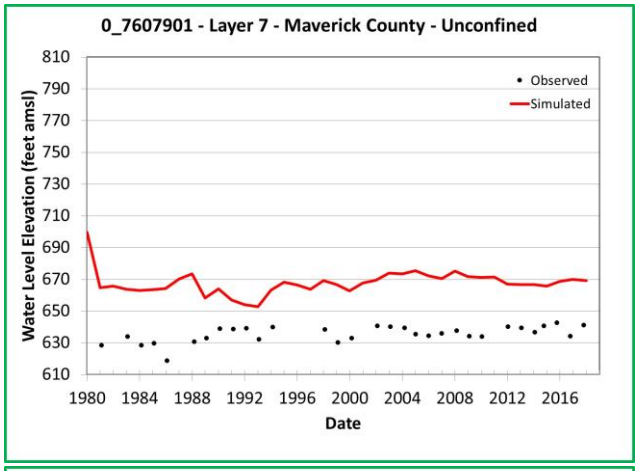
Simulated and Observed Water Level Elevation Hydrographs, Live Oak County, Layer 8

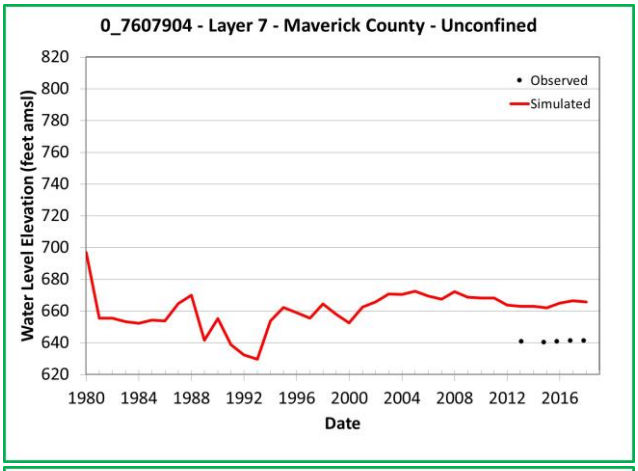
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

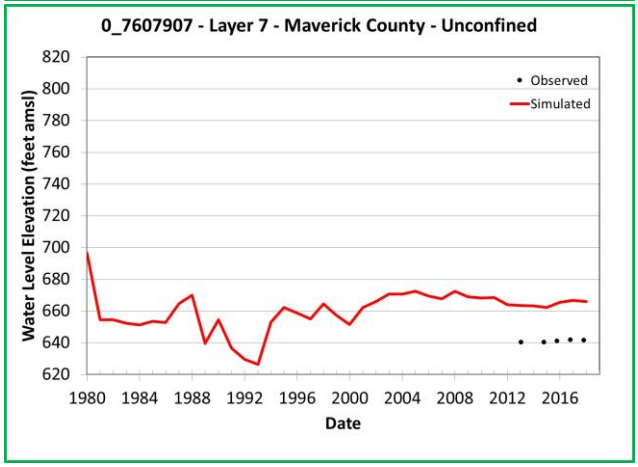
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

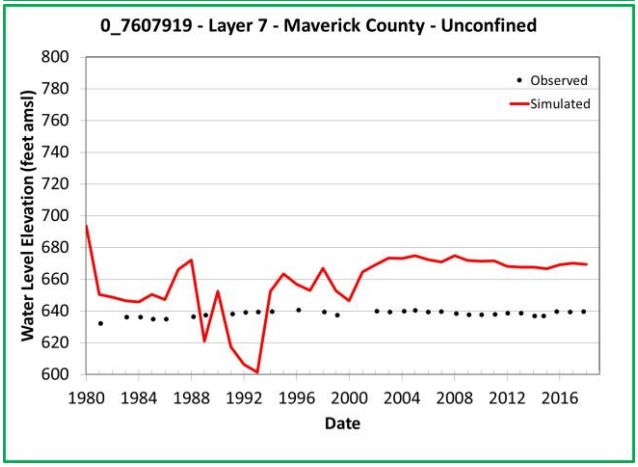
FIGURE I-13.3a

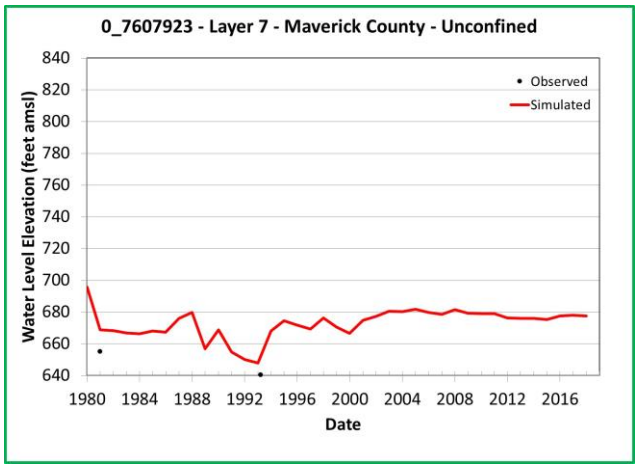
GSI ENVIRONMENTAL

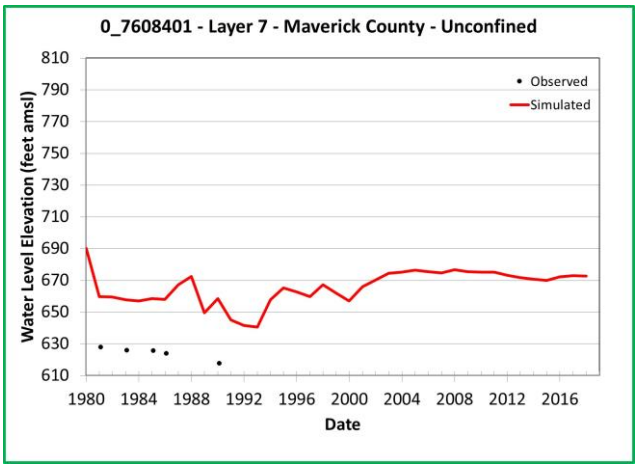












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Maverick County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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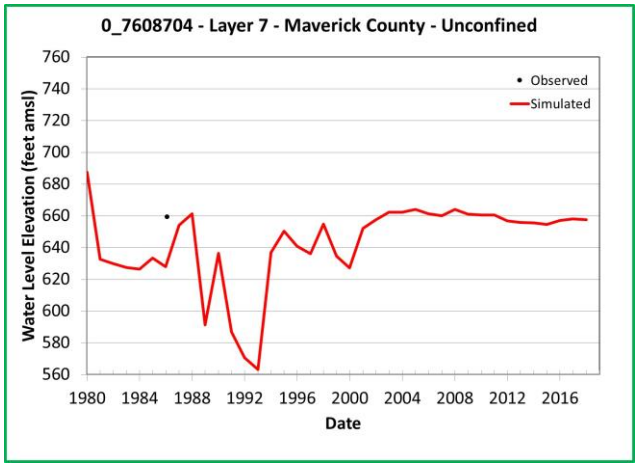
Revised		Aprv'd by	SP

FIGURE I-14.1a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

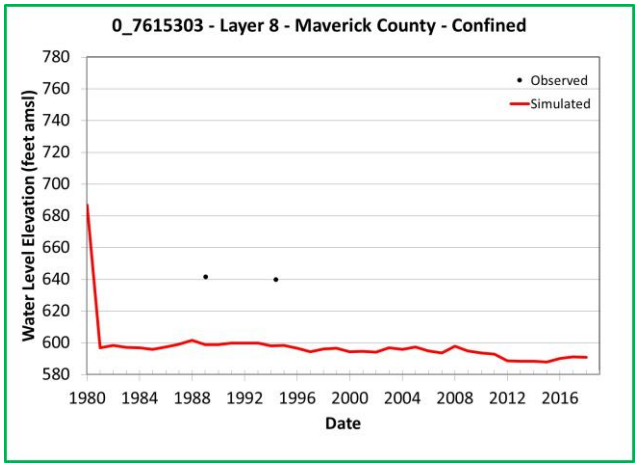
Simulated and Observed Water Level Elevation Hydrographs, Maverick County, Layer 7

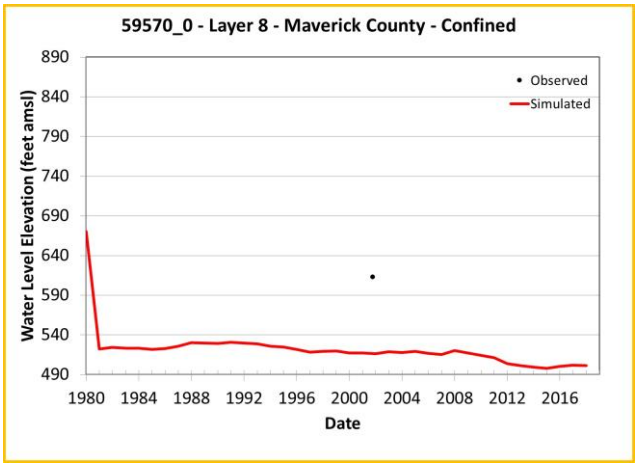
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-14.1b

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

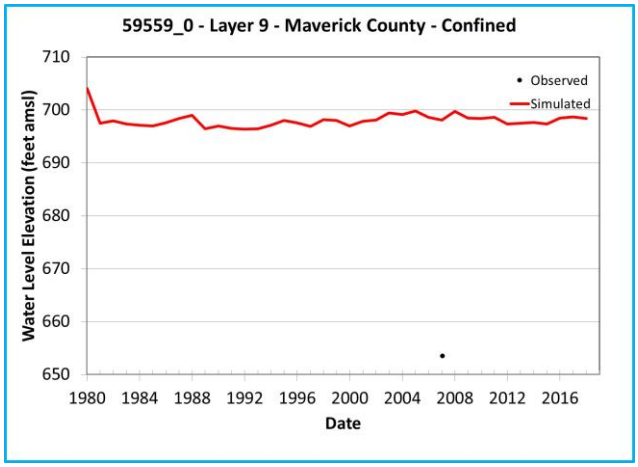
Simulated and Observed Water Level Elevation Hydrographs, Maverick County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-14.2a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

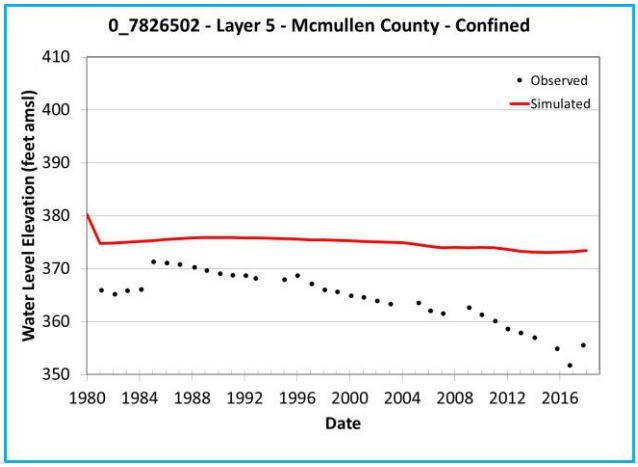
Simulated and Observed Water Level Elevation Hydrographs, Maverick County, Layer 9

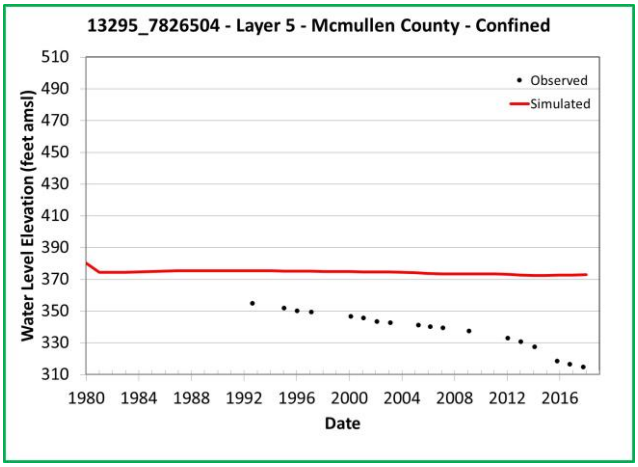
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-14.3a

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.

Yellow = 400 feet

Green = 200 feet

Blue = 60 feet

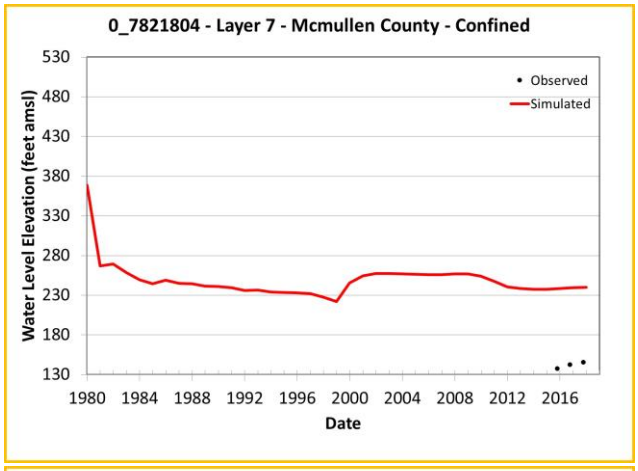
Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 5

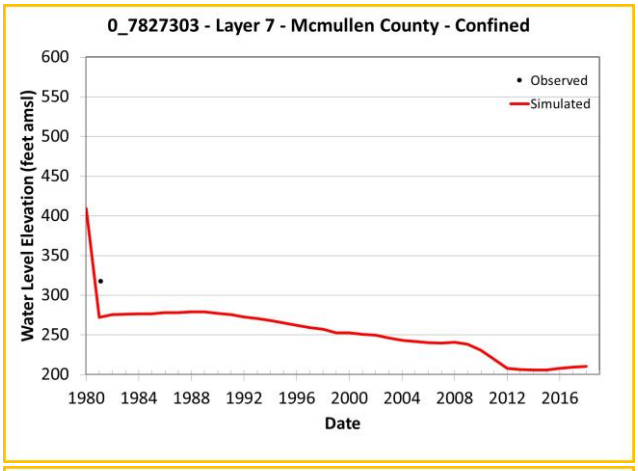
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

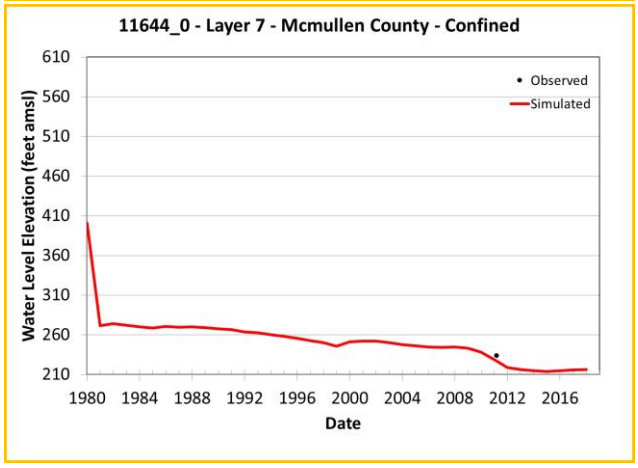
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

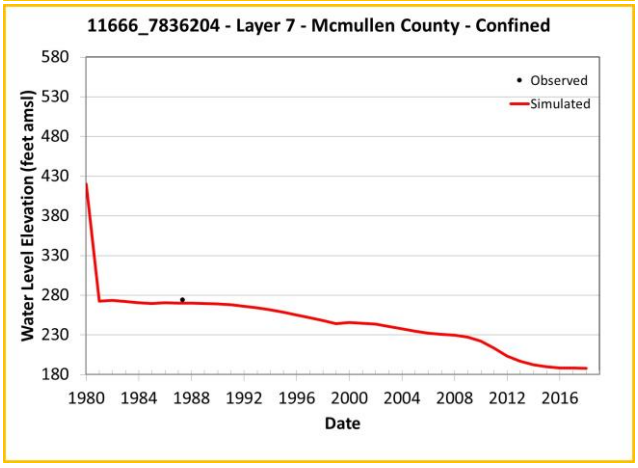
FIGURE I-15.1a

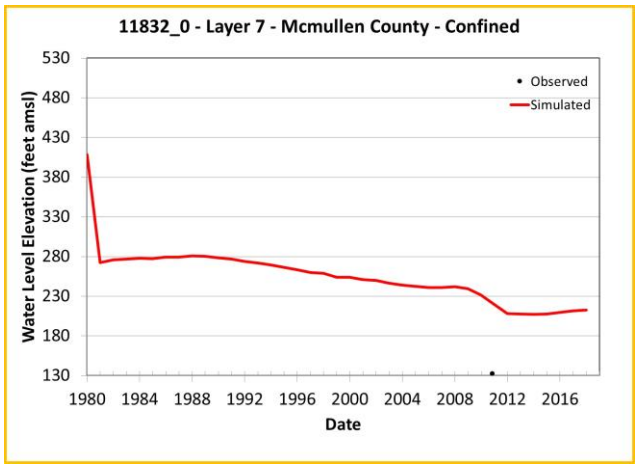
GSI ENVIRONMENTAL

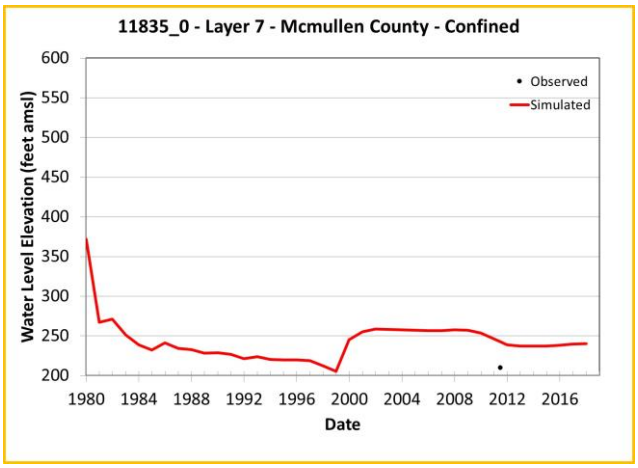












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

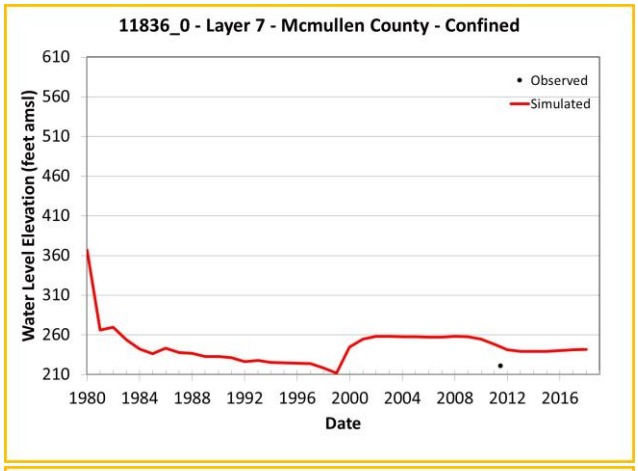
Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

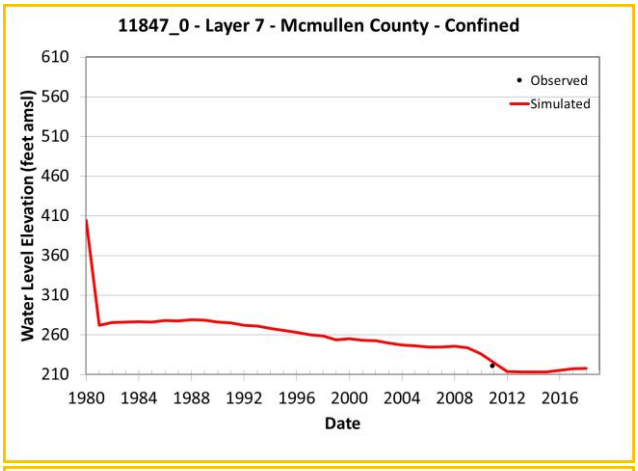
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

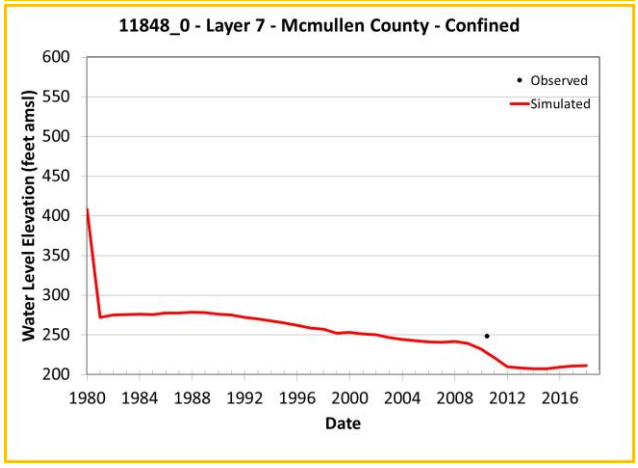
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

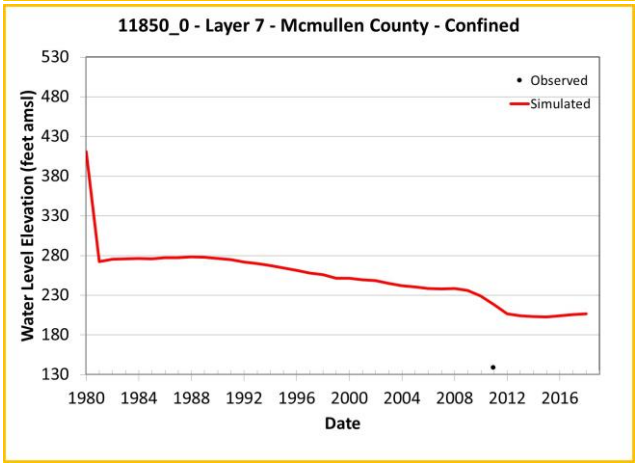
FIGURE I-15.2a

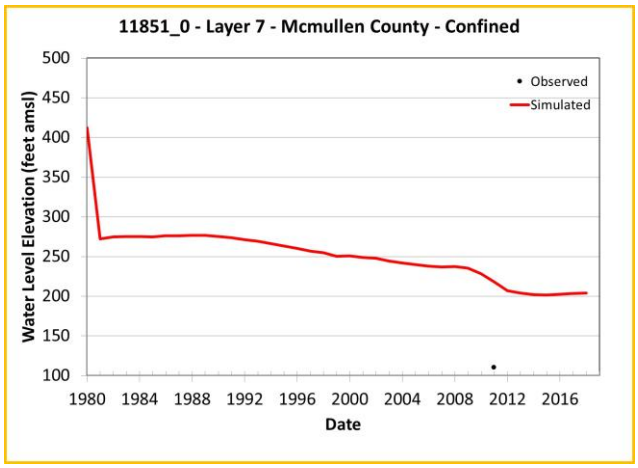
GSI ENVIRONMENTAL

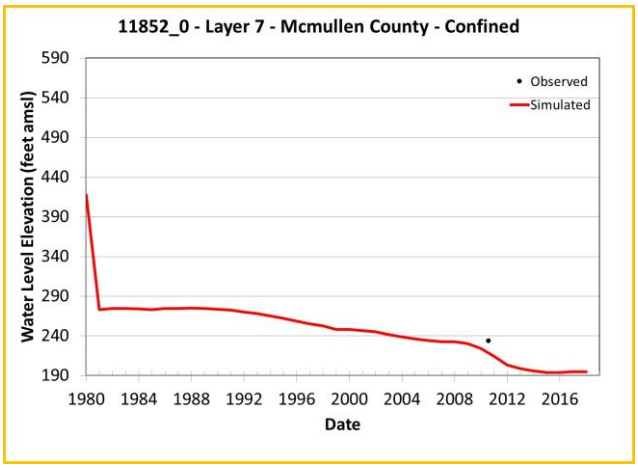












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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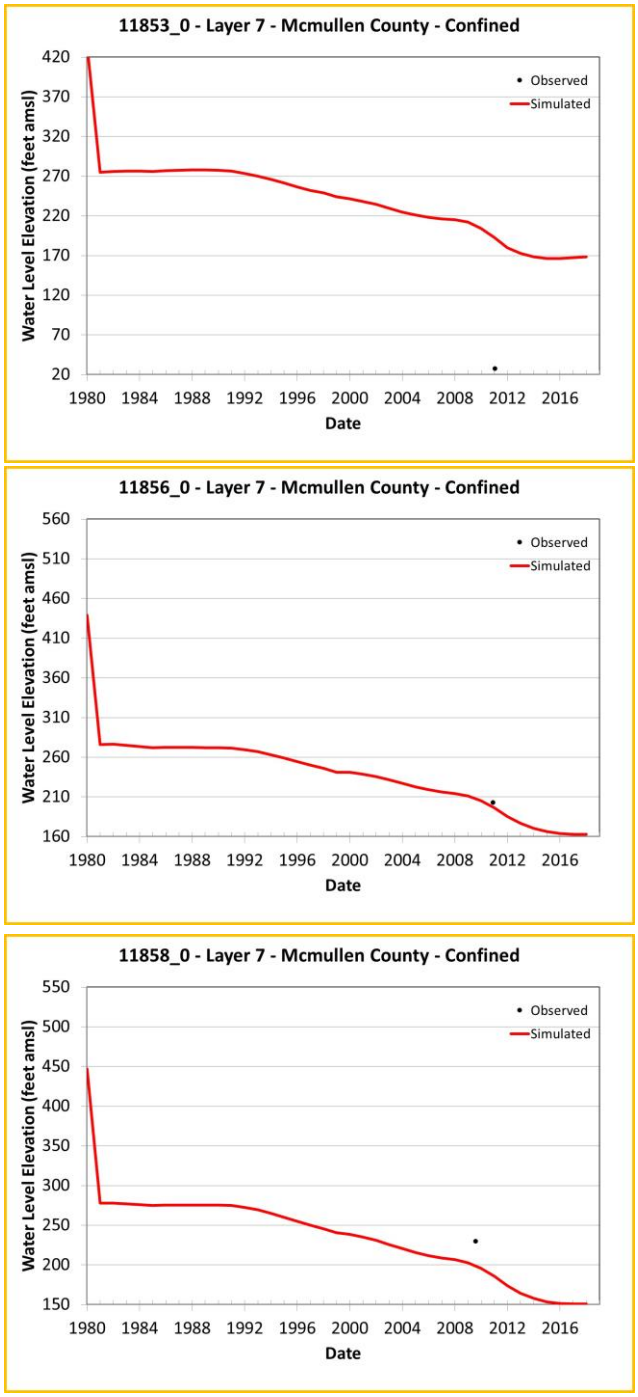
FIGURE I-15.2b

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.

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Green = 200 feet

Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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Issued	January 2023	Chk'd by	GM
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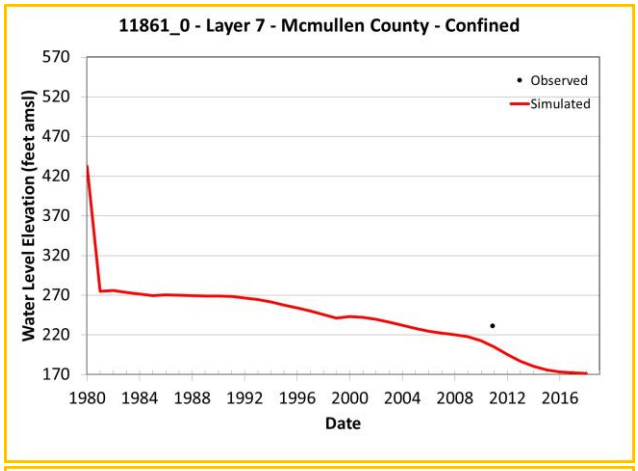
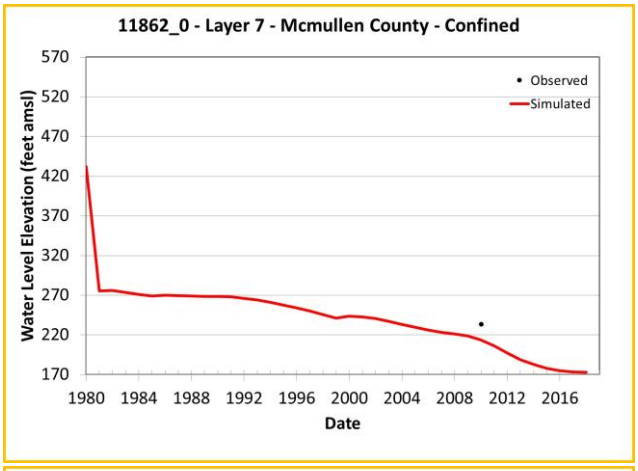
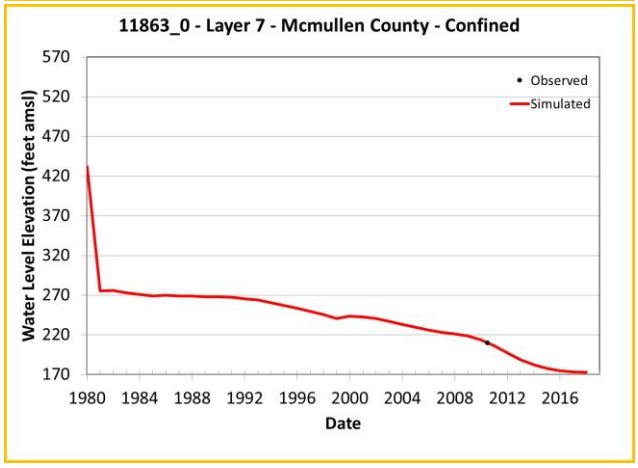
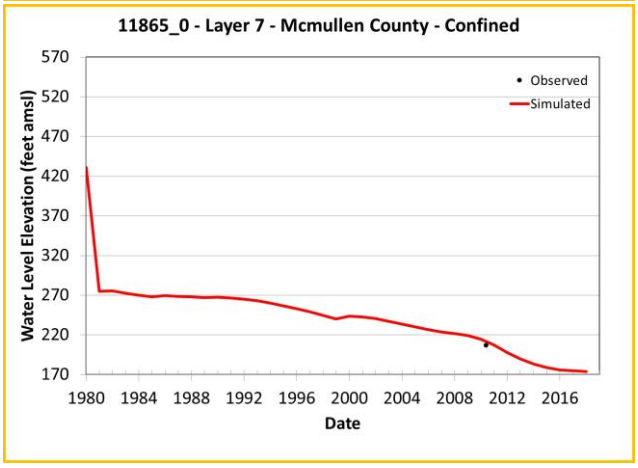
FIGURE I-15.2c

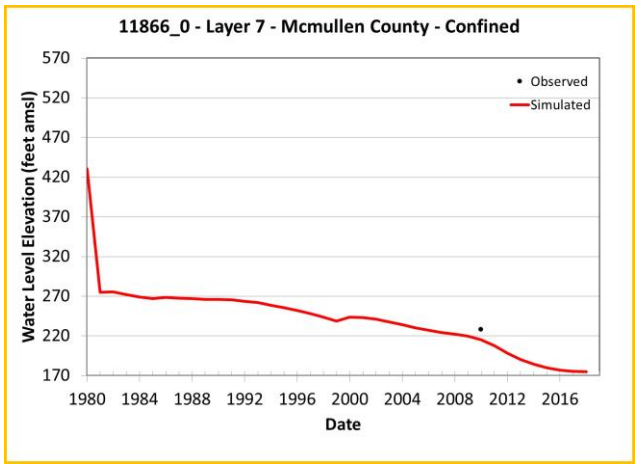
GSI ENVIRONMENTAL

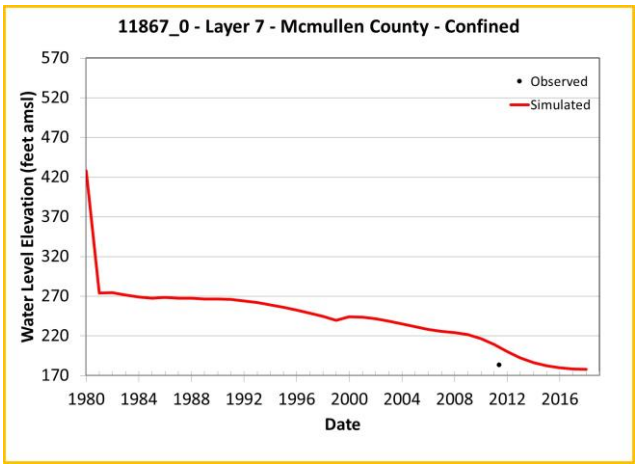












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Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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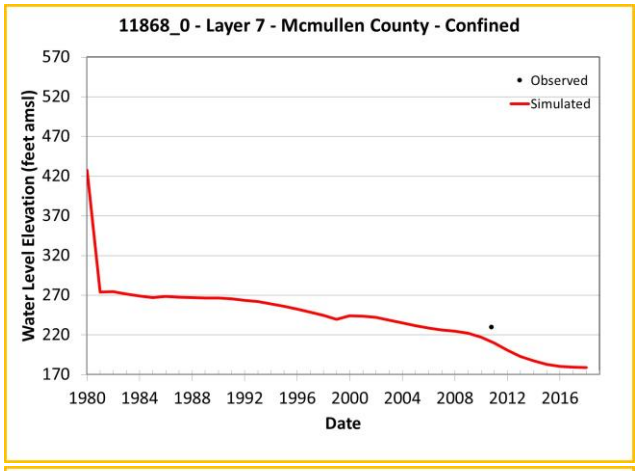
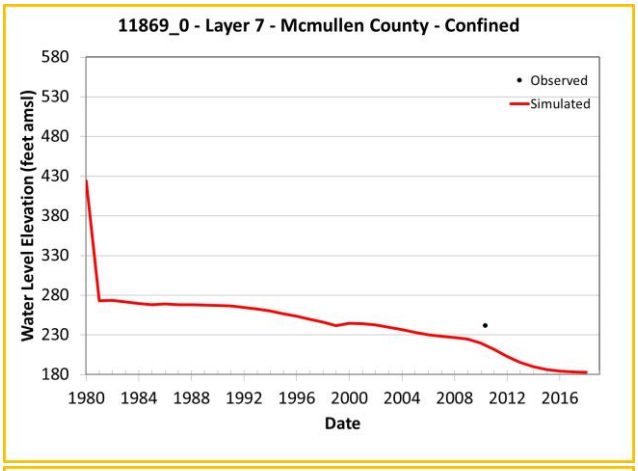
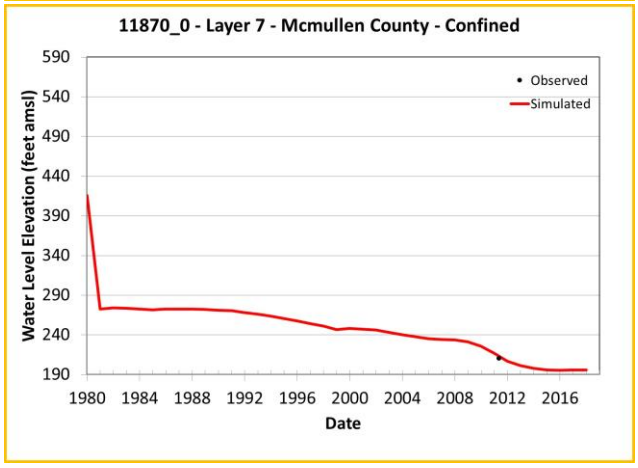
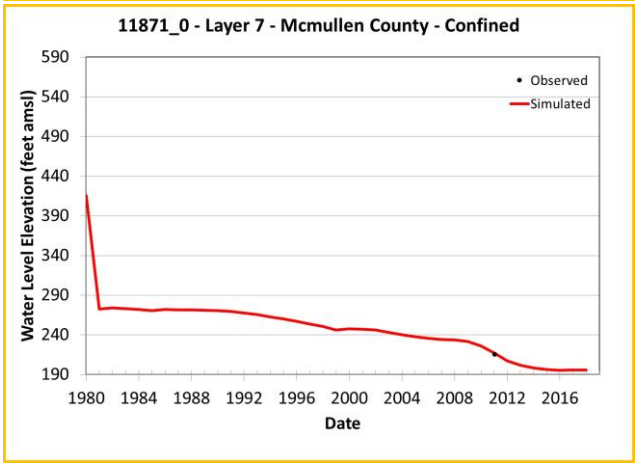
FIGURE I-15.2d

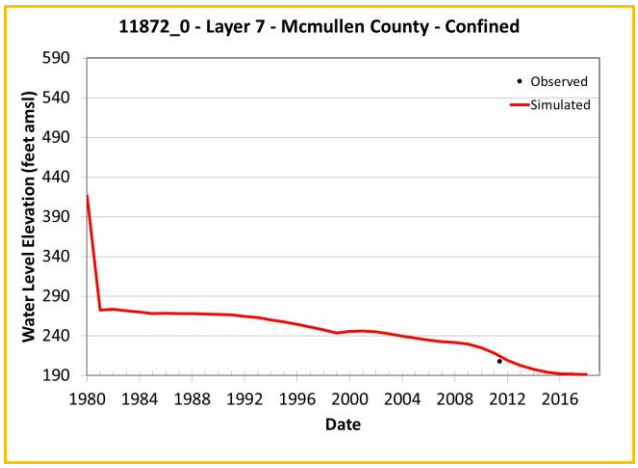
GSI ENVIRONMENTAL

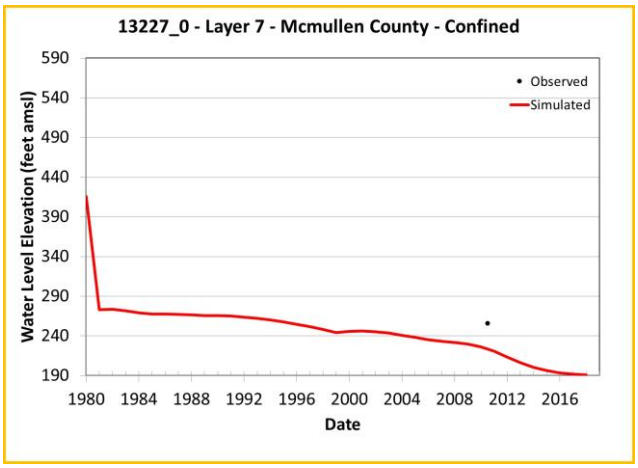












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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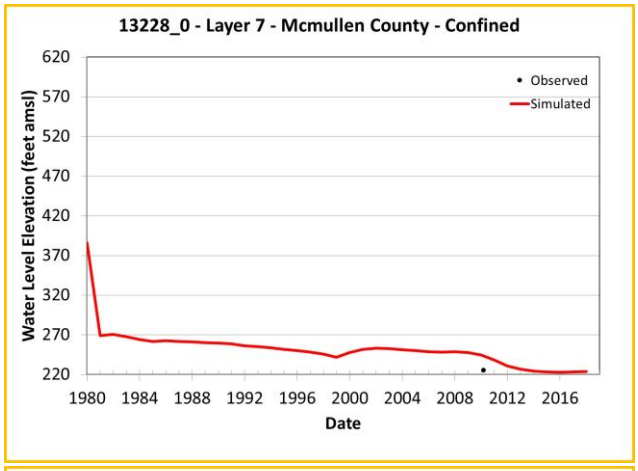
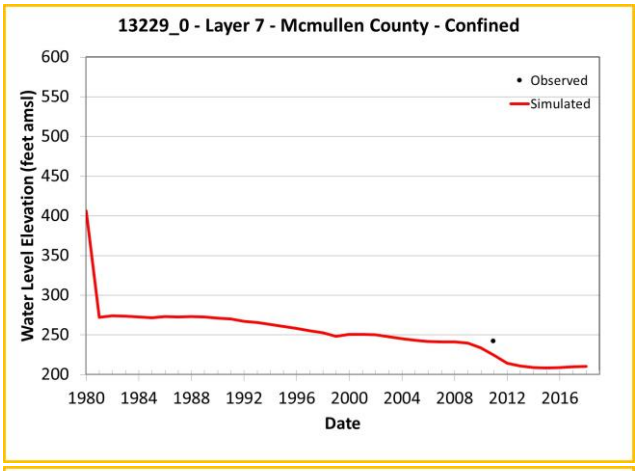
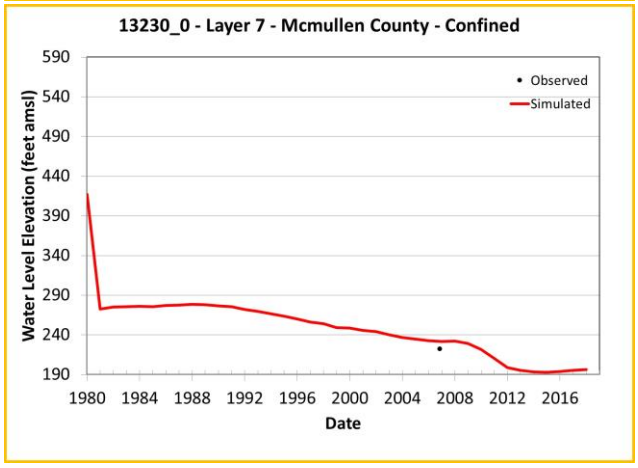
Revised		Aprv'd by	SP

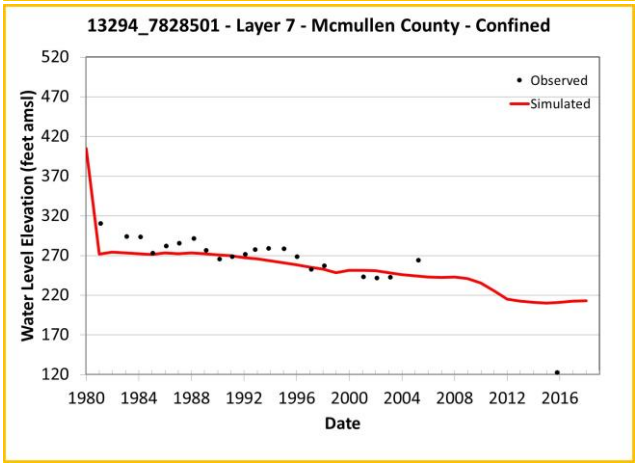
FIGURE I-15.2e

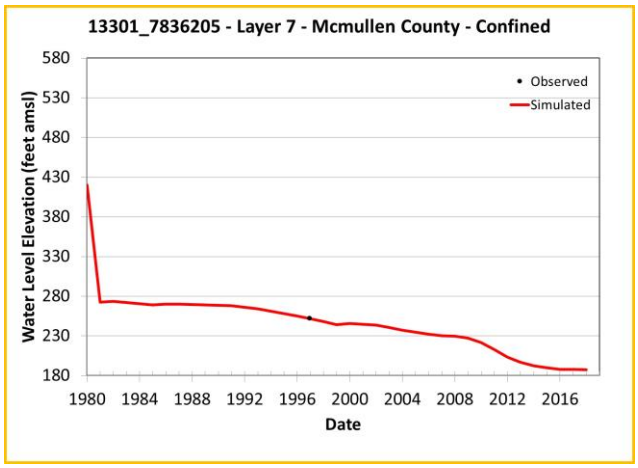
GSI ENVIRONMENTAL

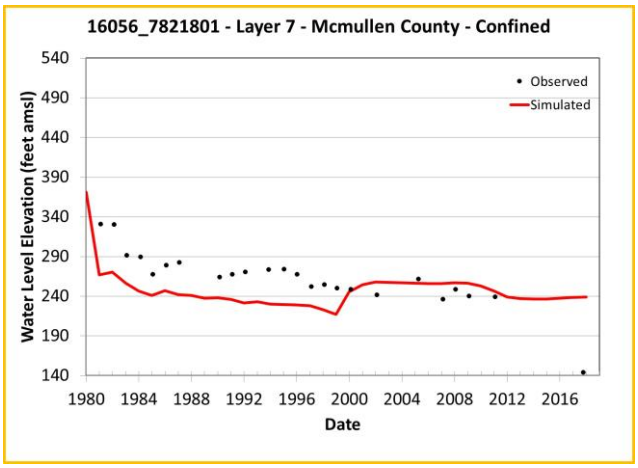












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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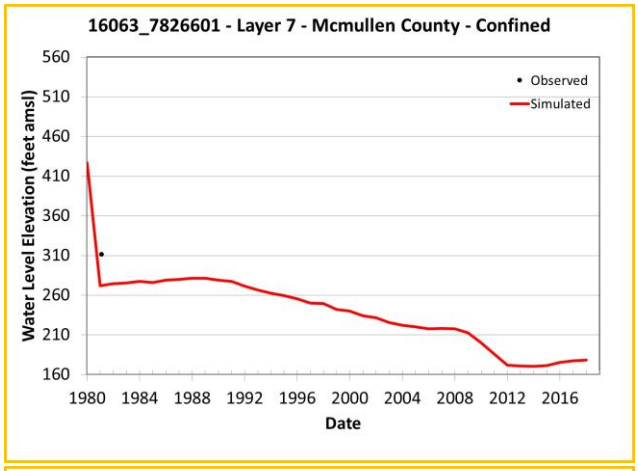
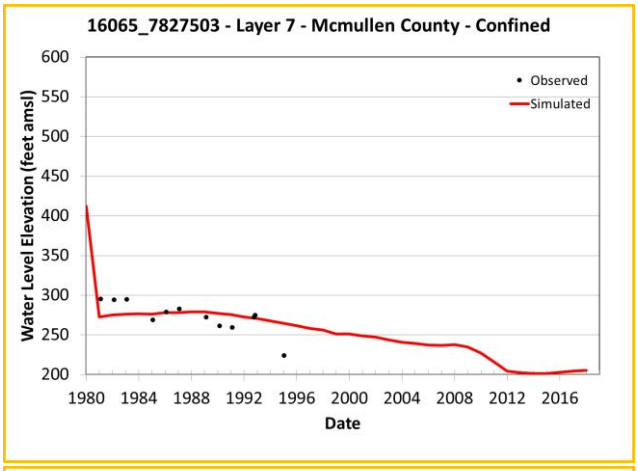
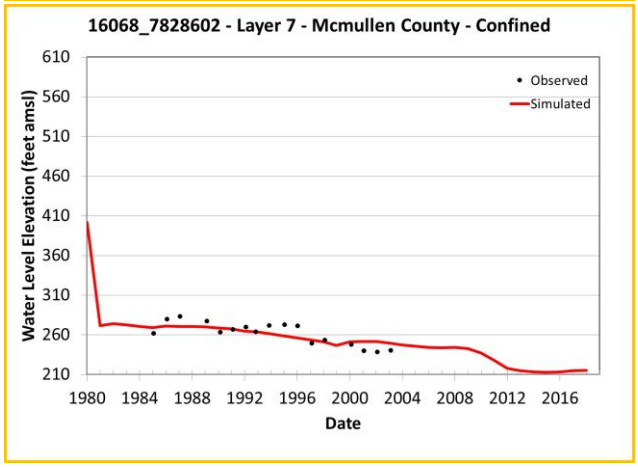
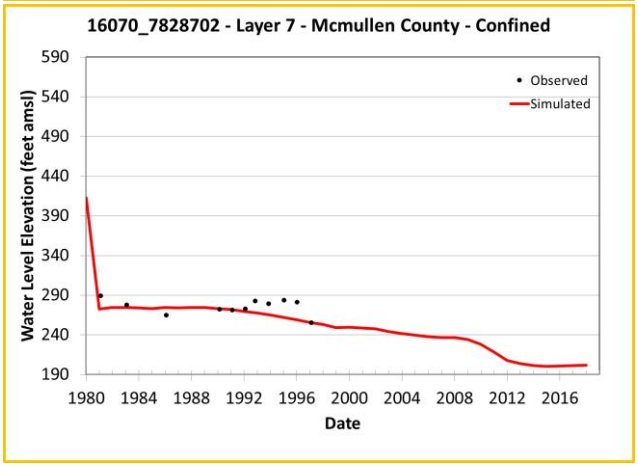
FIGURE I-15.2f

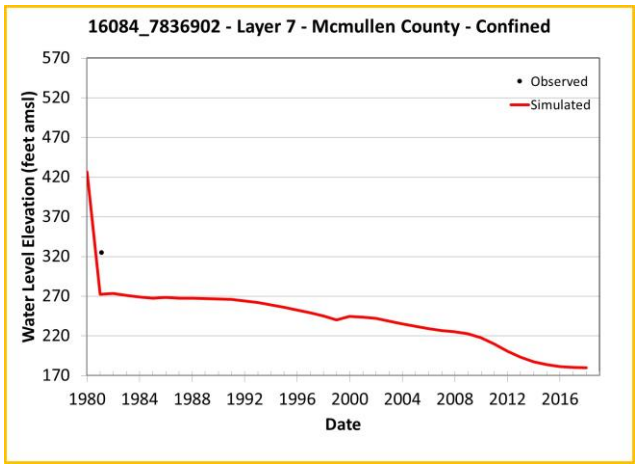
GSI ENVIRONMENTAL

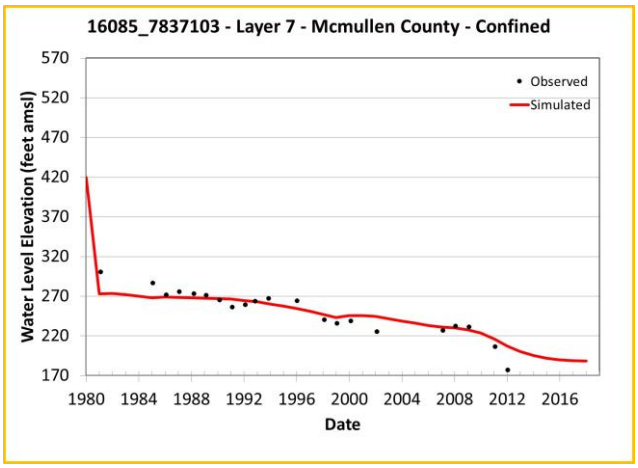












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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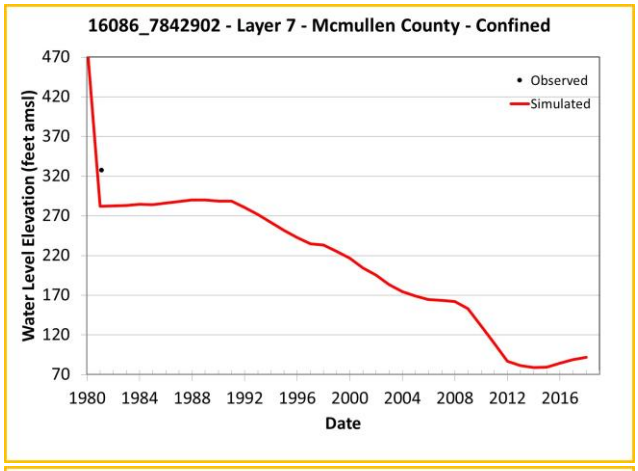
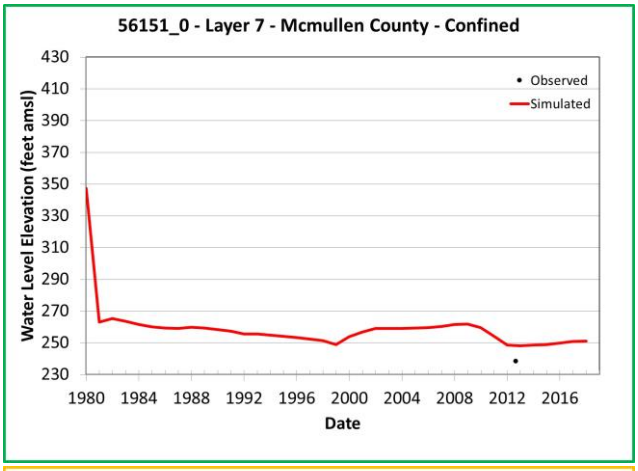
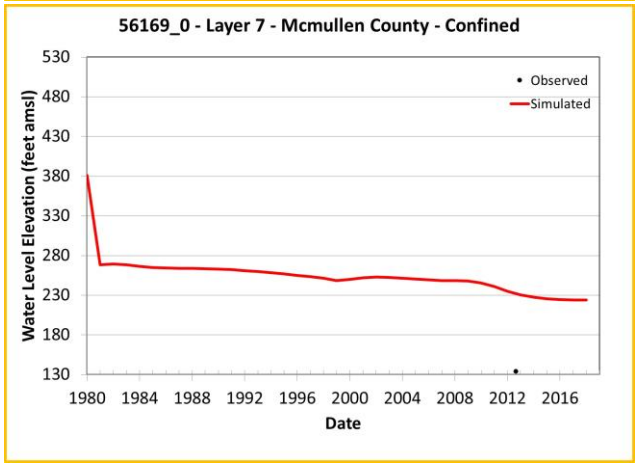
Revised		Aprv'd by	SP

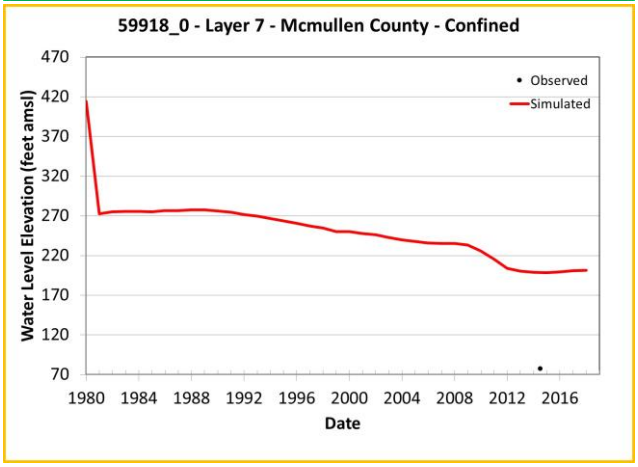
FIGURE I-15.2g

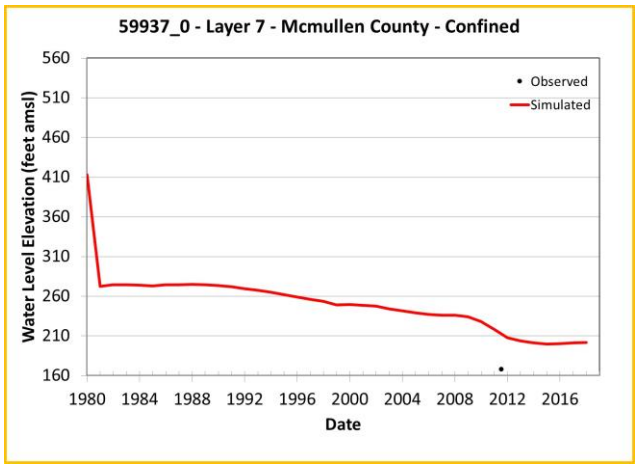
GSI ENVIRONMENTAL

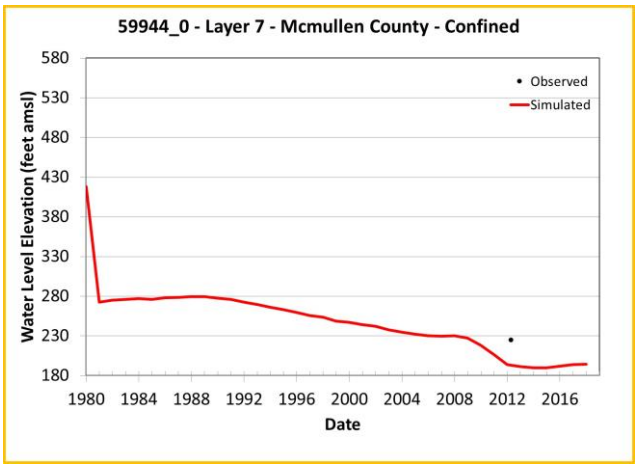












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Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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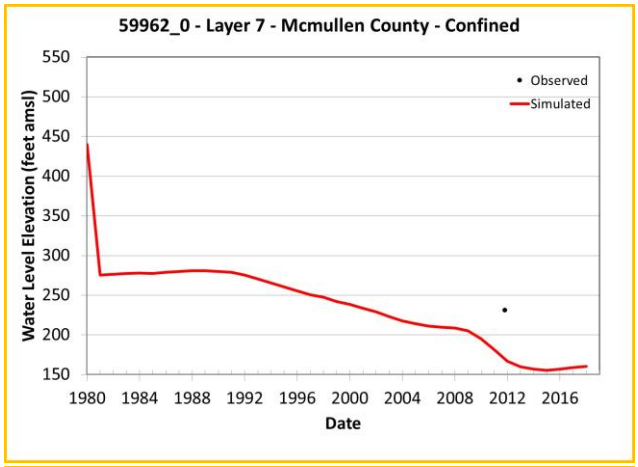
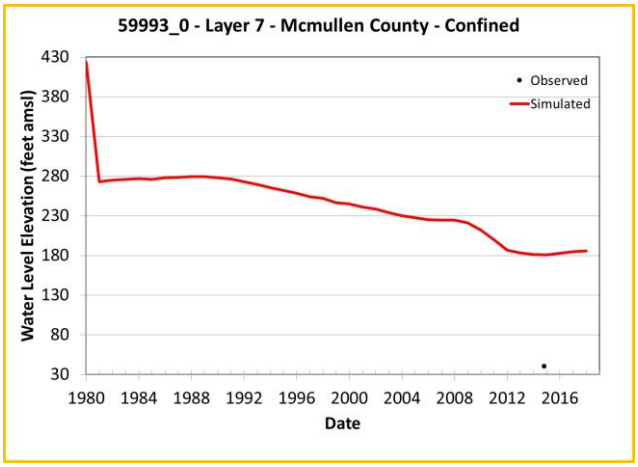
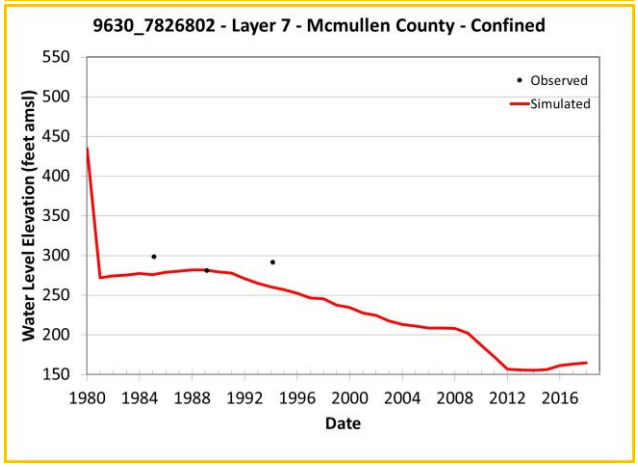
Revised		Aprv'd by	SP

FIGURE I-15.2h

GSI ENVIRONMENTAL







Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

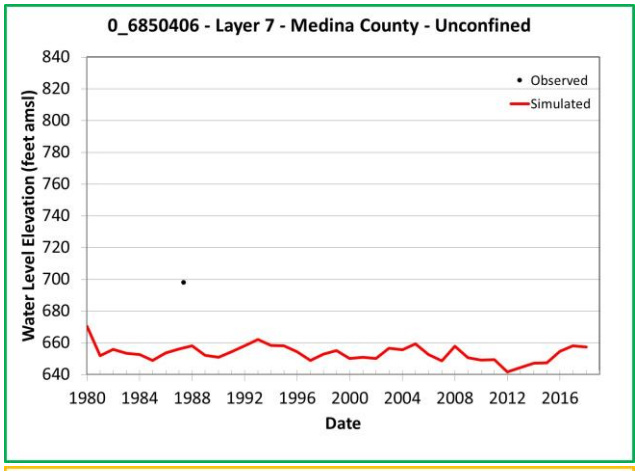
Simulated and Observed Water Level Elevation Hydrographs, Mcmullen County, Layer 7

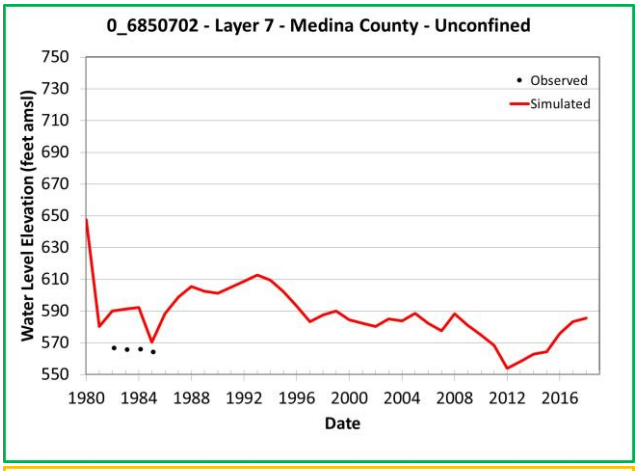
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

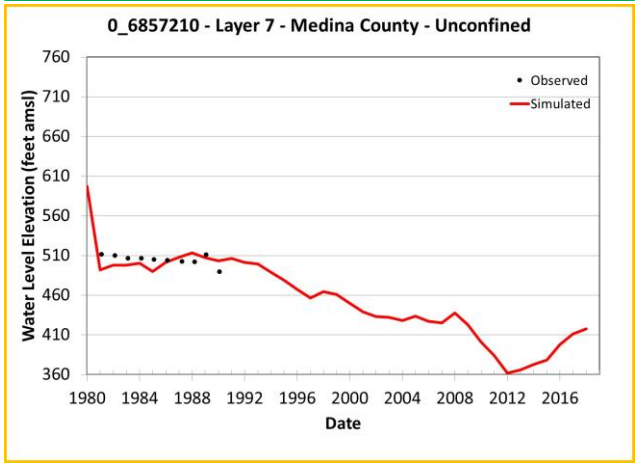
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

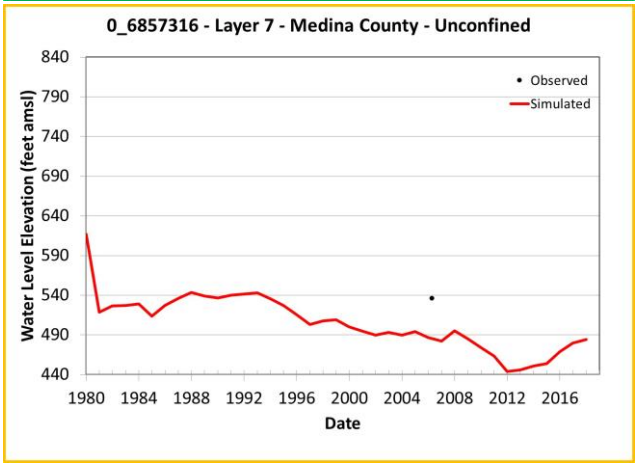
FIGURE I-15.2i

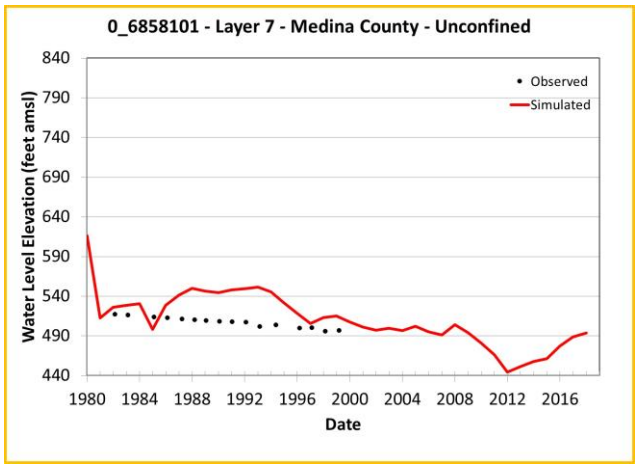
GSI ENVIRONMENTAL

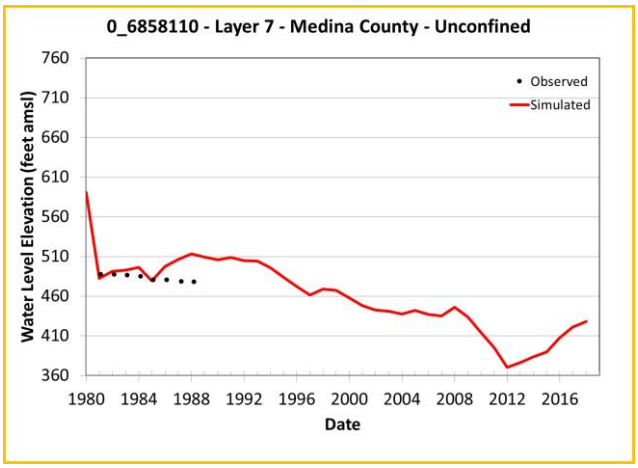












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

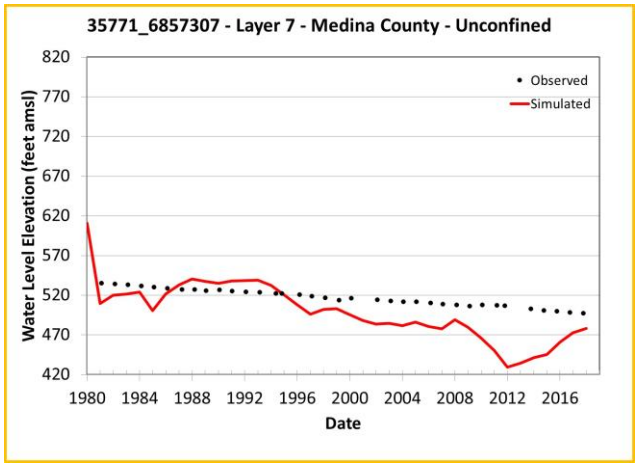
Simulated and Observed Water Level Elevation Hydrographs, Medina County, Layer 7

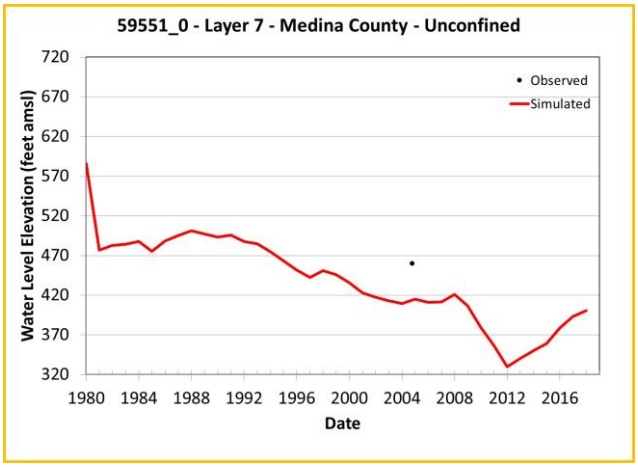
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-16.1j

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

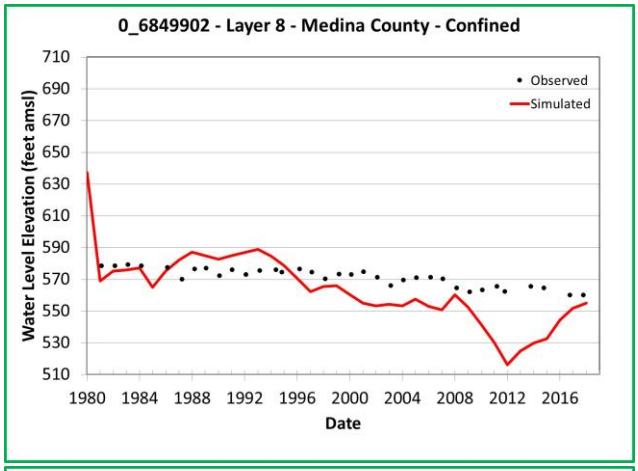
Simulated and Observed Water Level Elevation Hydrographs, Medina County, Layer 7

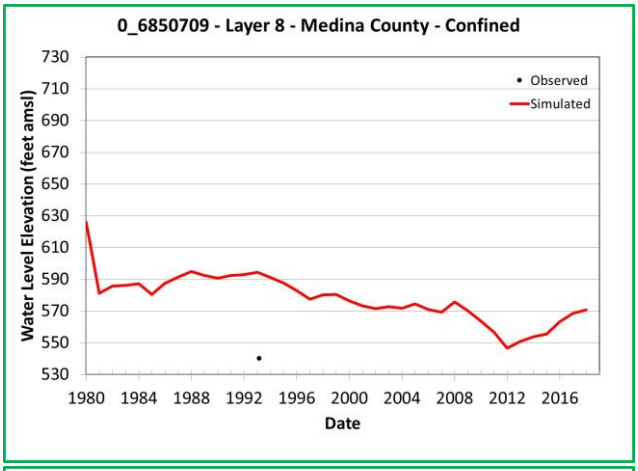
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

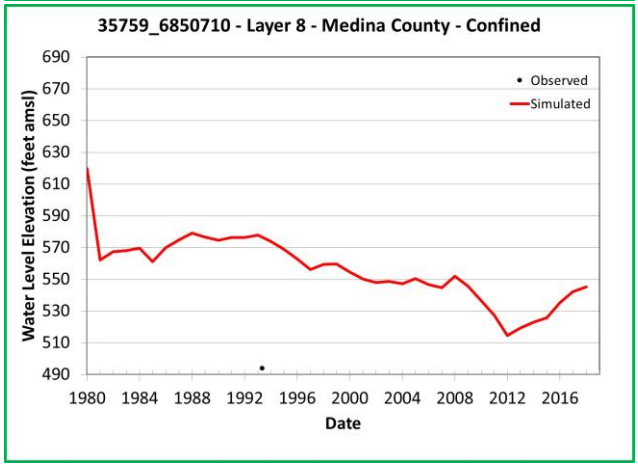
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

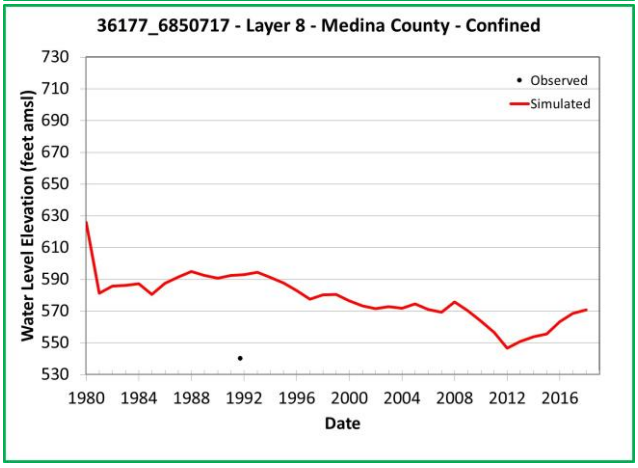
FIGURE I-16.1k

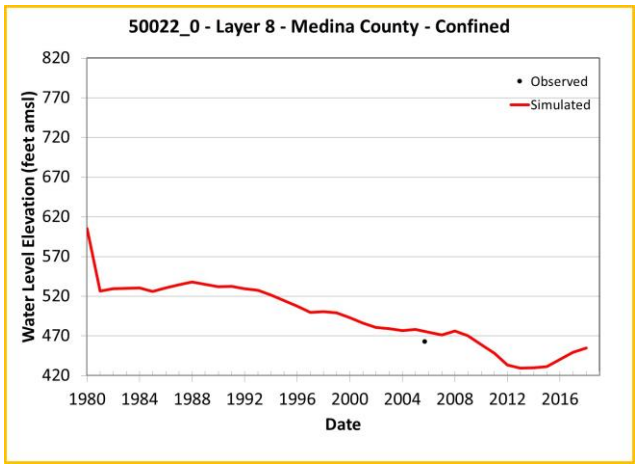
GSI ENVIRONMENTAL

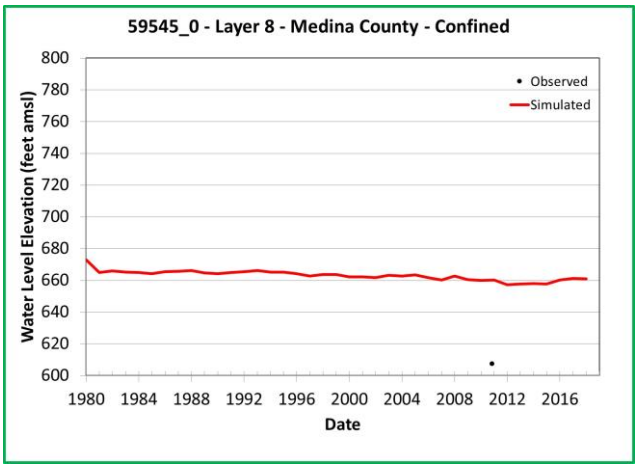












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

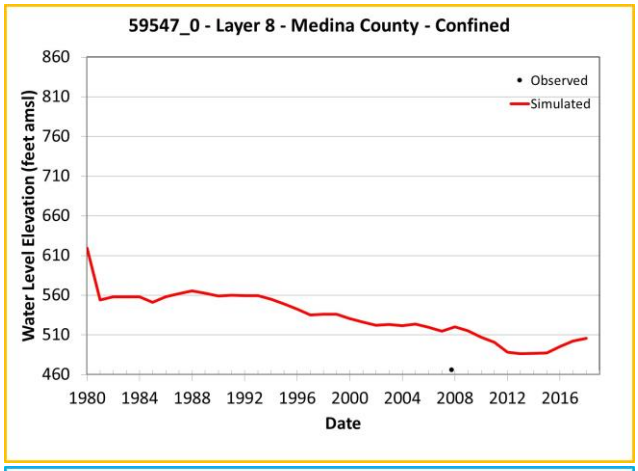
Simulated and Observed Water Level Elevation Hydrographs, Medina County, Layer 8

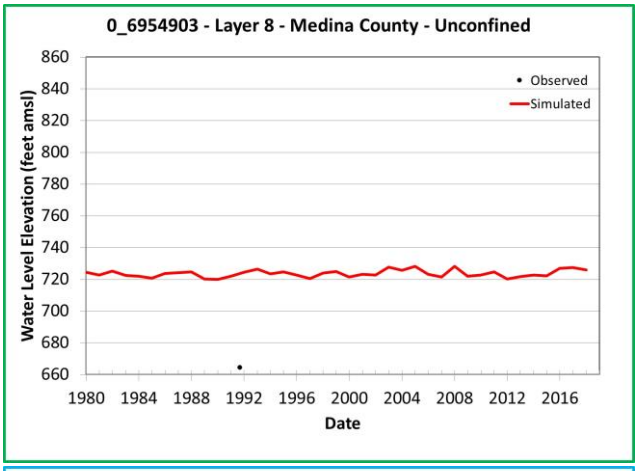
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

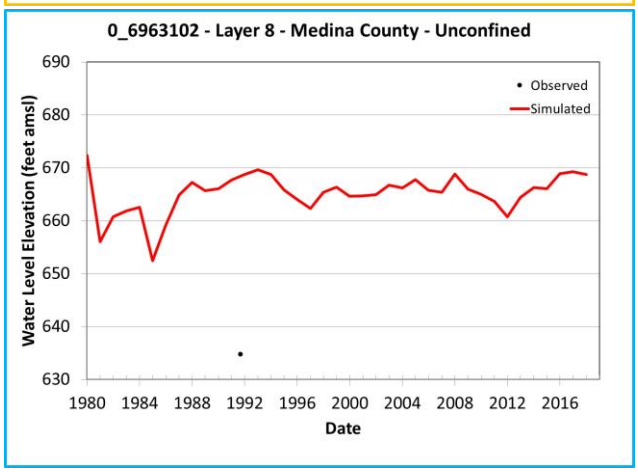
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

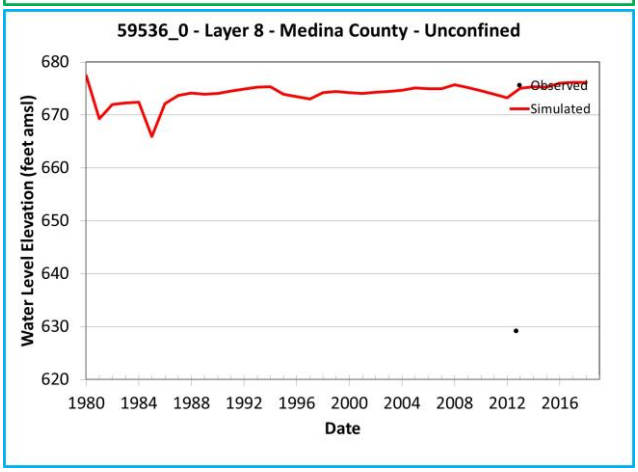
FIGURE I-16.2a

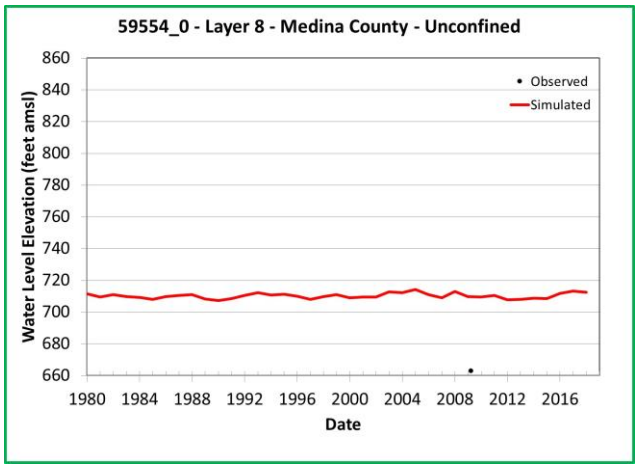
GSI ENVIRONMENTAL











Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

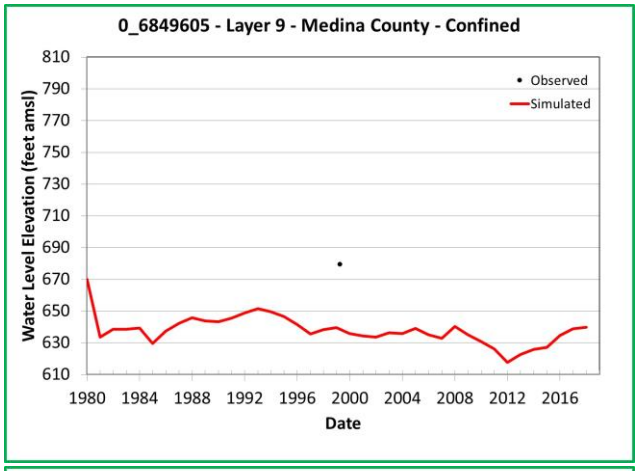
Simulated and Observed Water Level Elevation Hydrographs, Medina County, Layer 8

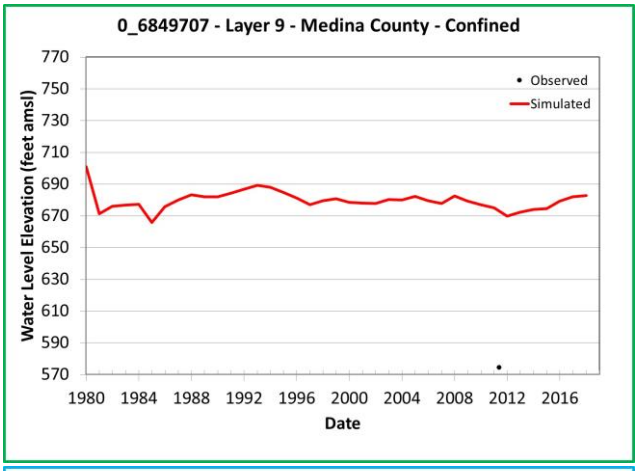
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

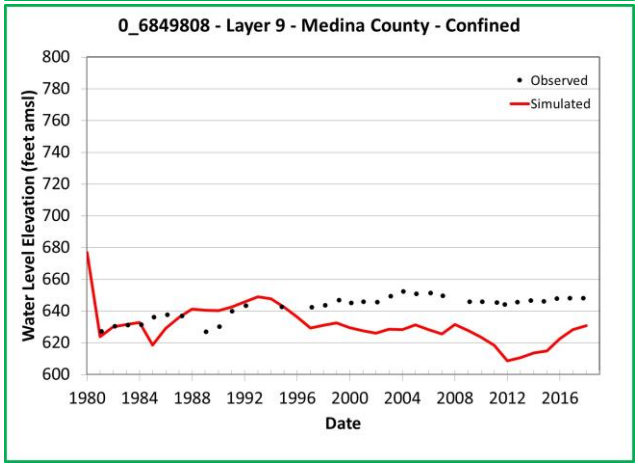
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

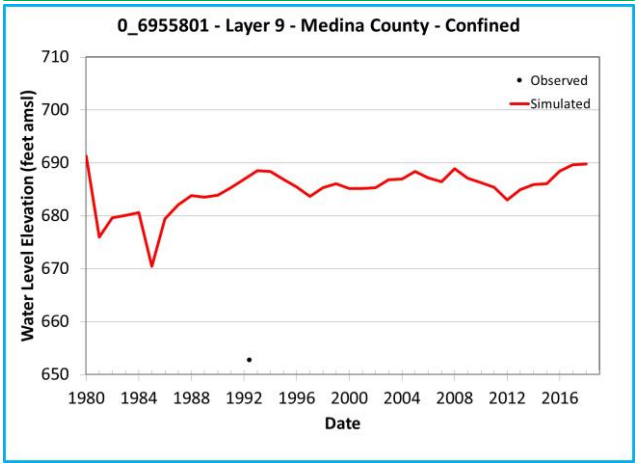
FIGURE I-16.2b

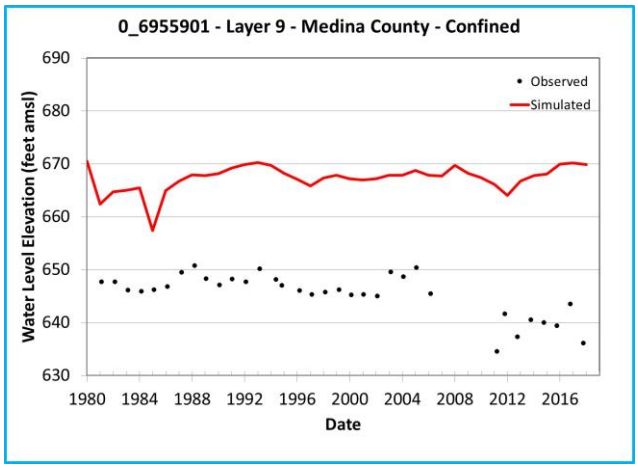
GSI ENVIRONMENTAL

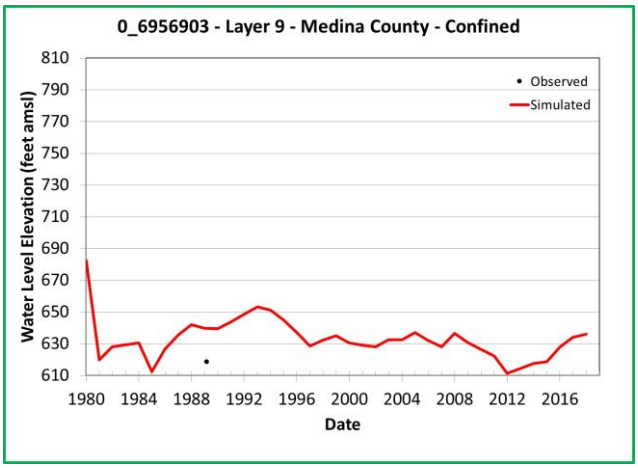












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

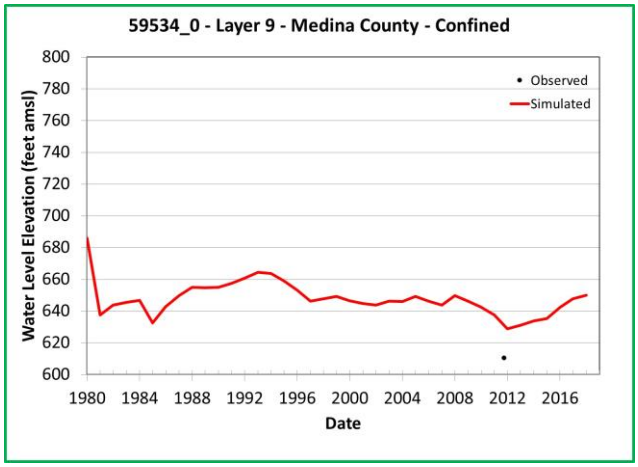
Simulated and Observed Water Level Elevation Hydrographs, Medina County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-16.3a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

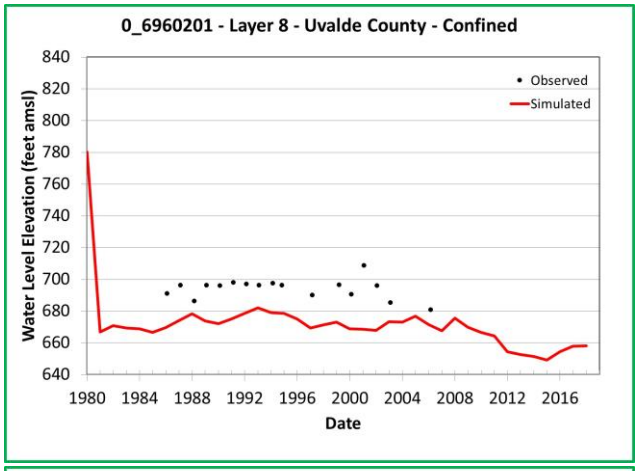
Simulated and Observed Water Level Elevation Hydrographs, Medina County, Layer 9

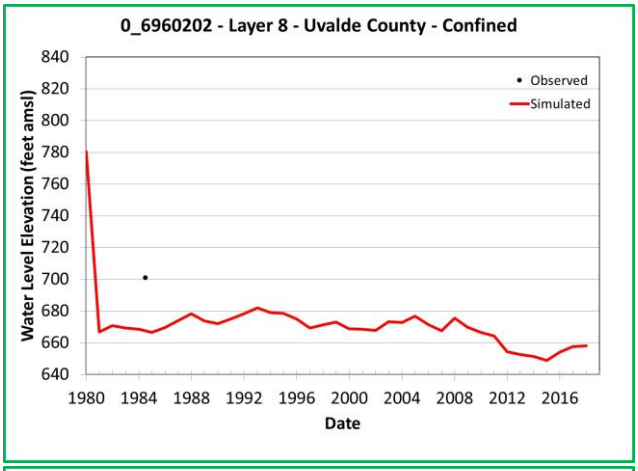
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

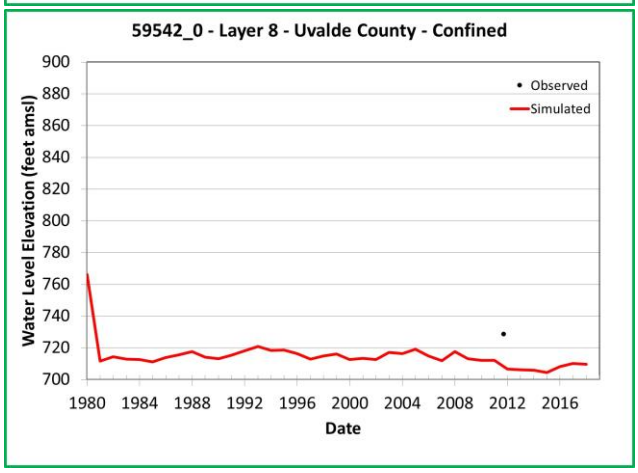
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

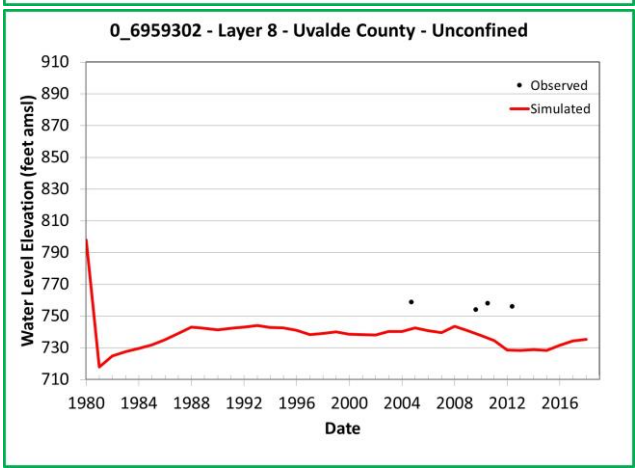
FIGURE I-16.3b

GSI ENVIRONMENTAL









Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

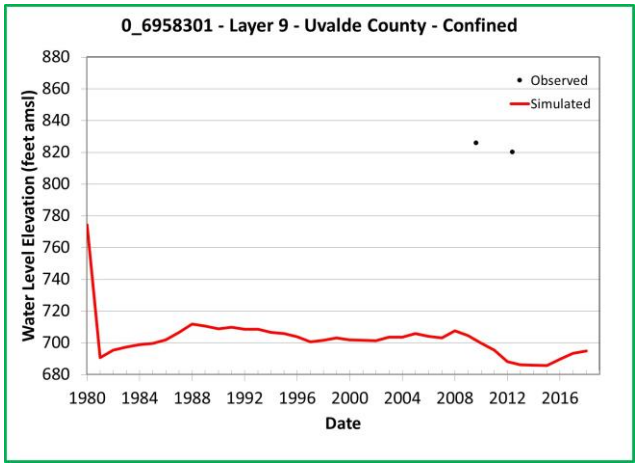
Simulated and Observed Water Level Elevation Hydrographs, Uvalde County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

FIGURE I-17.1a

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

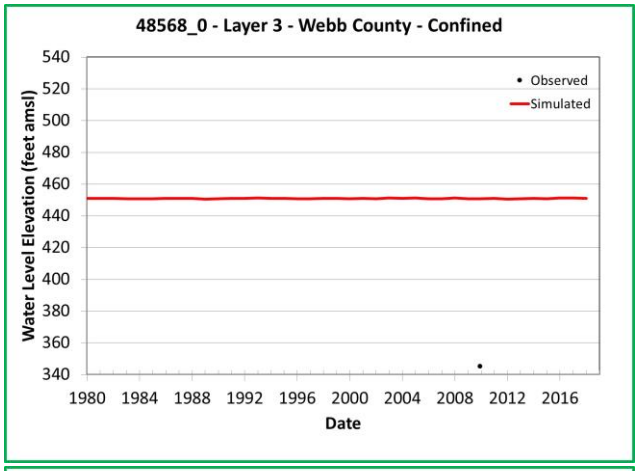
Simulated and Observed Water Level Elevation Hydrographs, Uvalde County, Layer 9

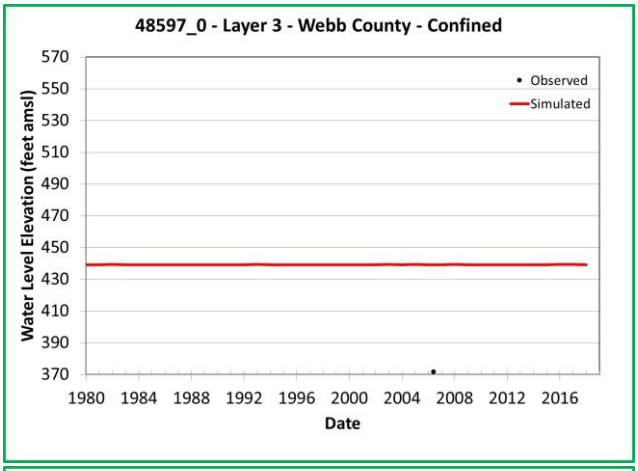
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

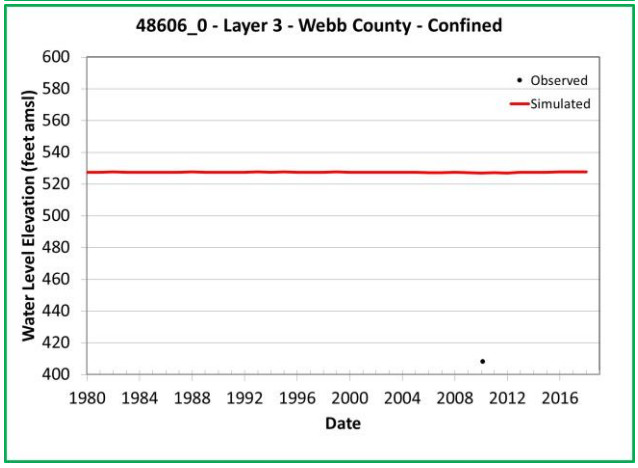
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

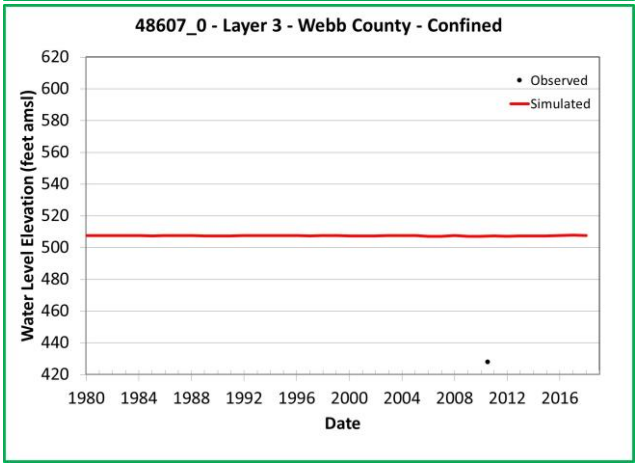
FIGURE I-17.2a

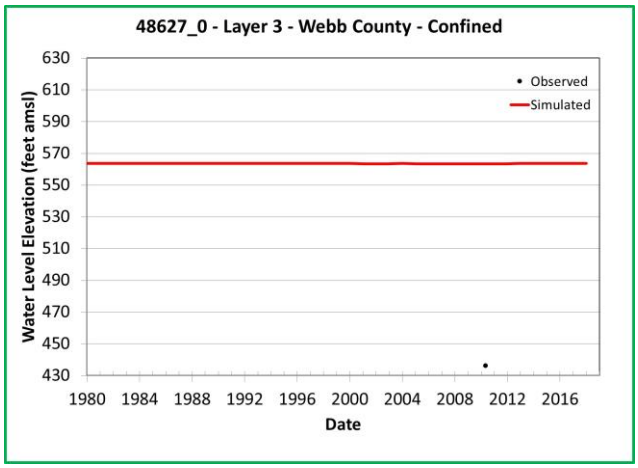
GSI ENVIRONMENTAL

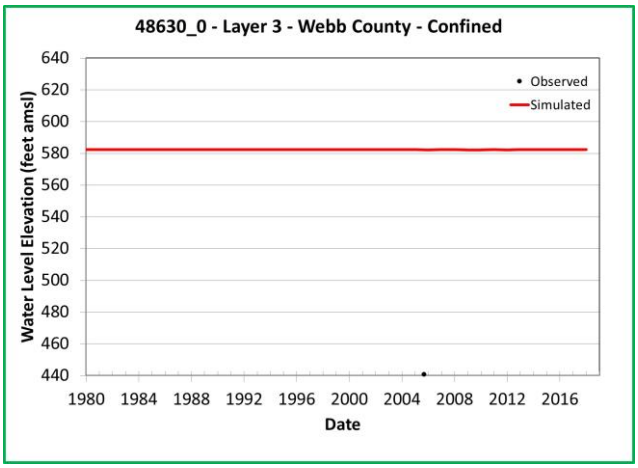












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

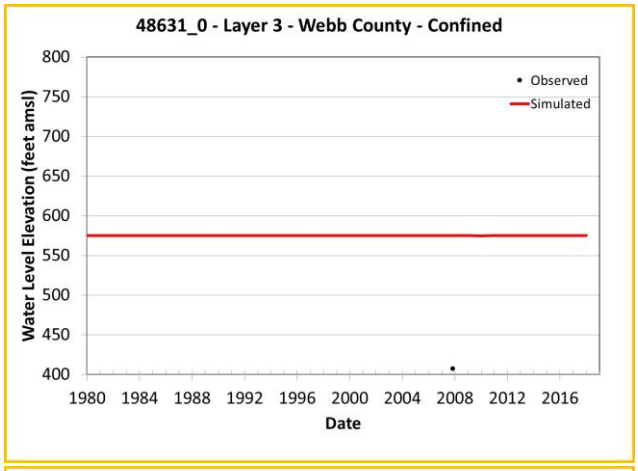
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

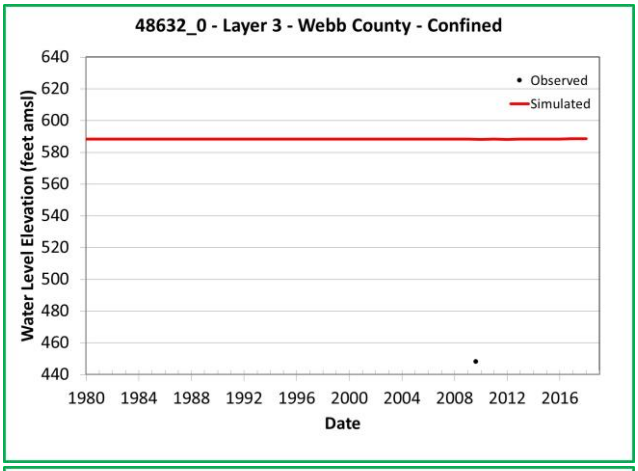
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

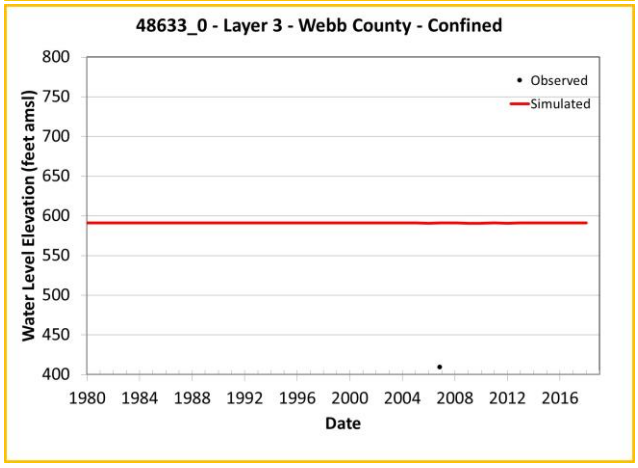
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

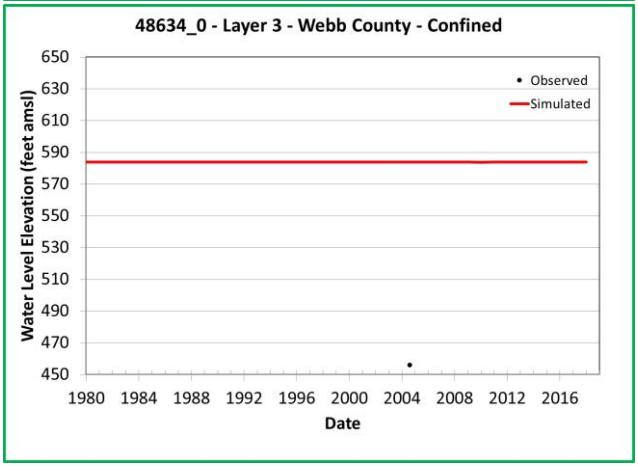
FIGURE I-18.1a

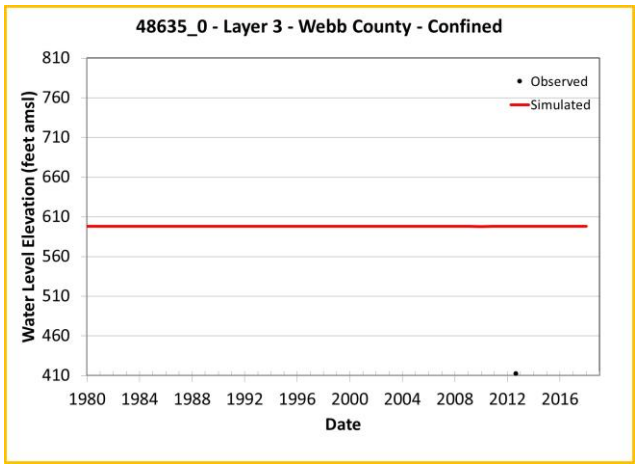
GSI ENVIRONMENTAL

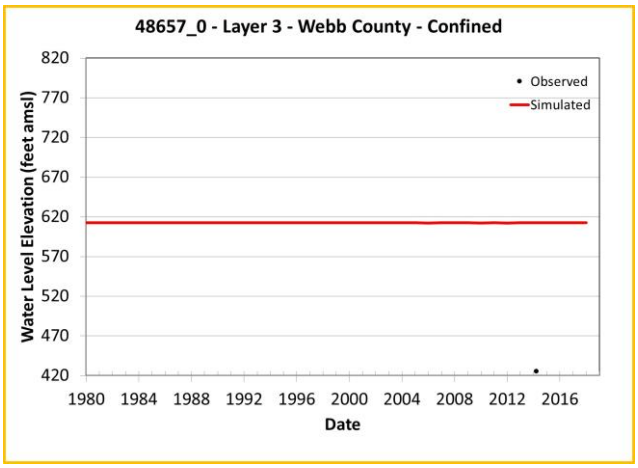












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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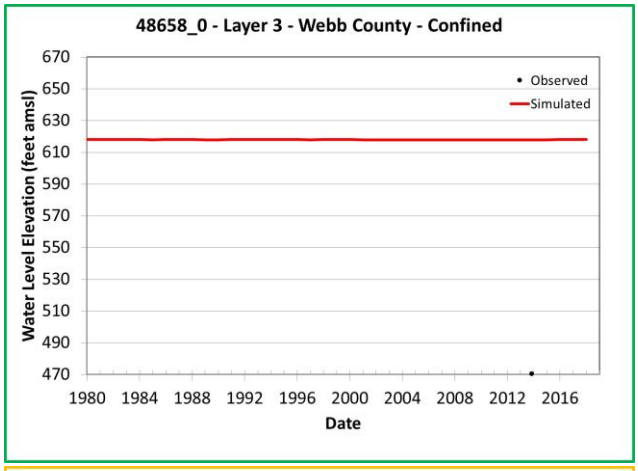
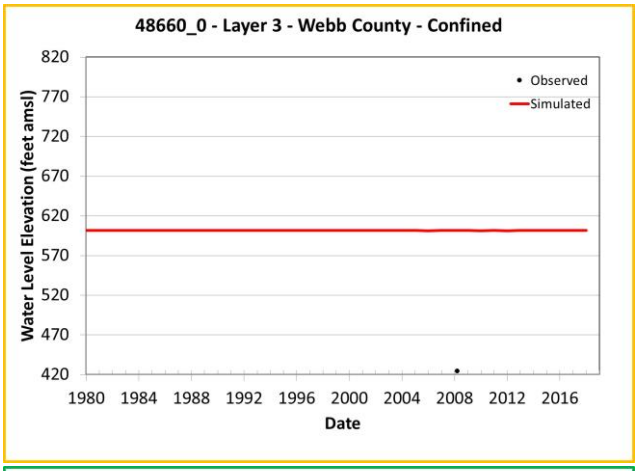
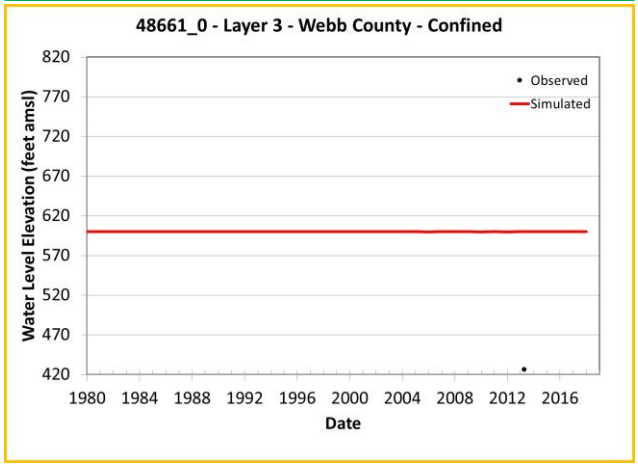
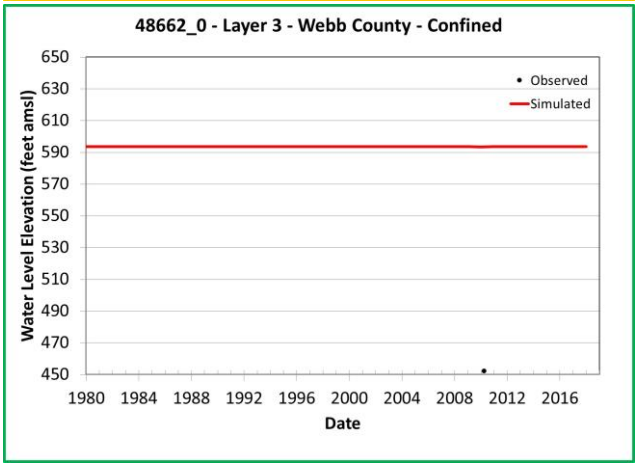
FIGURE I-18.1b

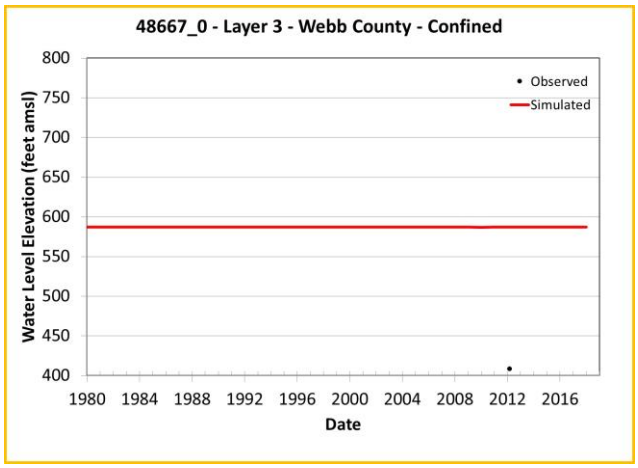
GSI ENVIRONMENTAL

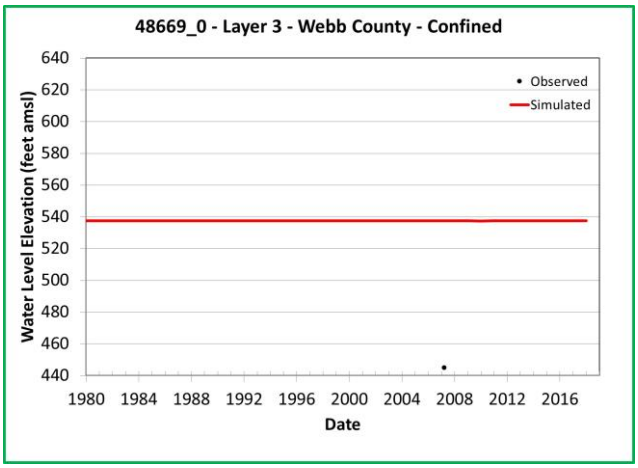












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

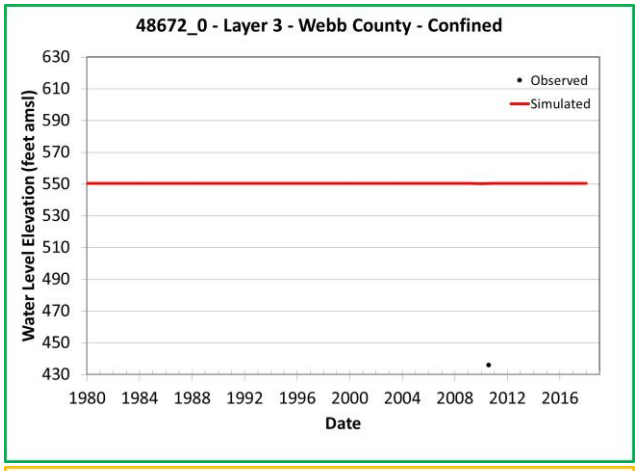
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

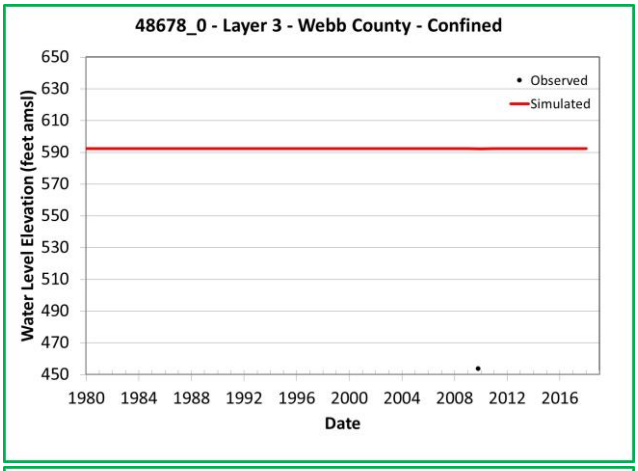
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

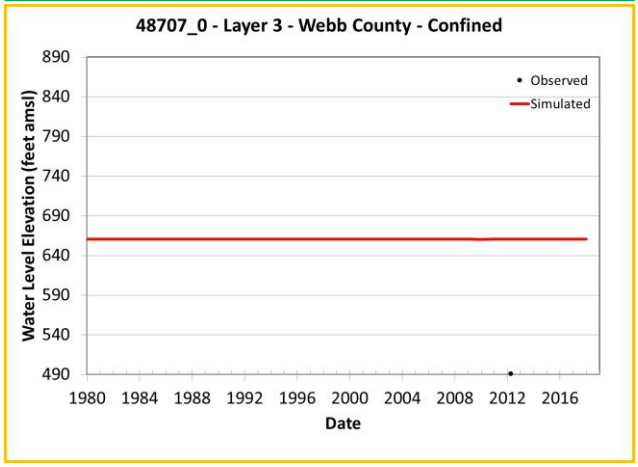
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

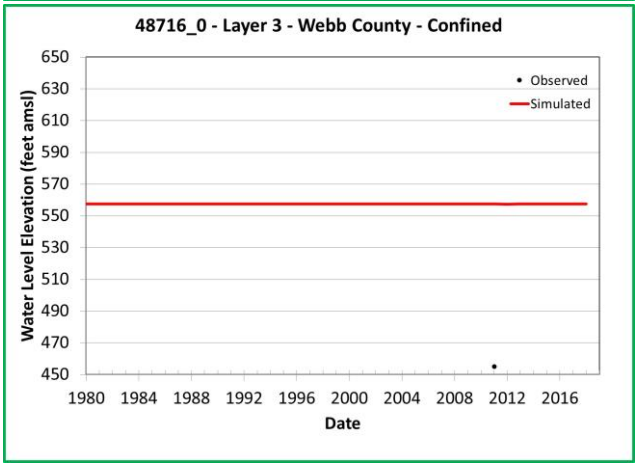
FIGURE I-18.1c

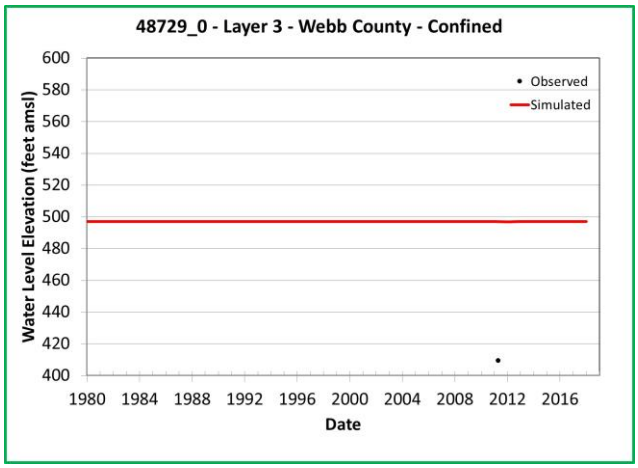
GSI ENVIRONMENTAL

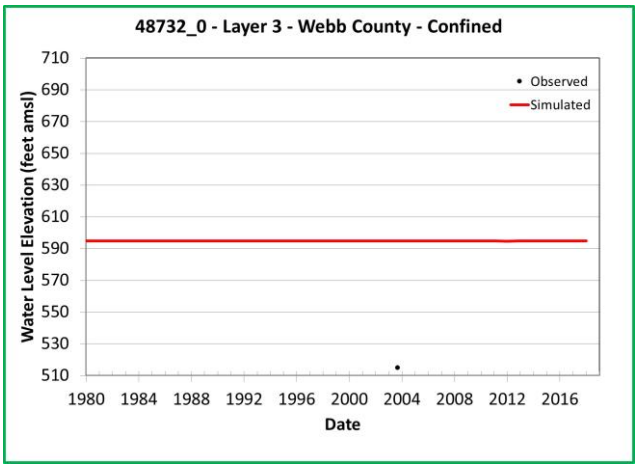












Note: Chart outline color indicates Y-axis range.

Yellow = 400 feet

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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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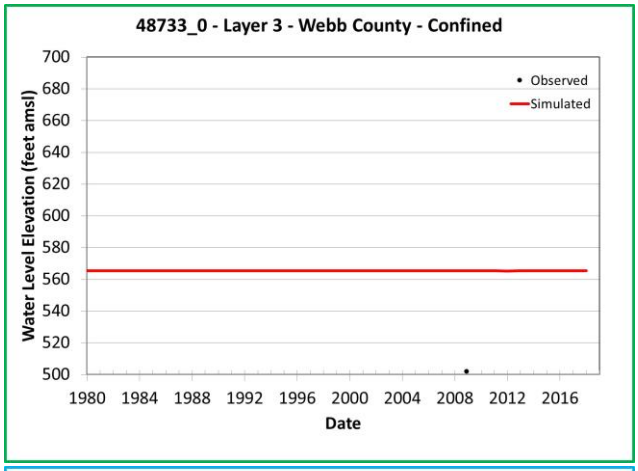
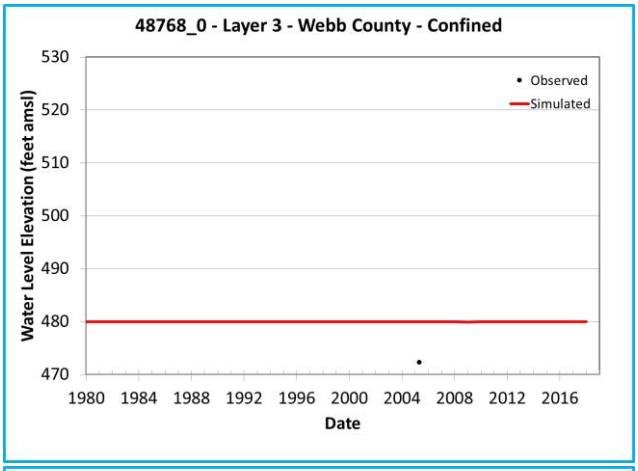
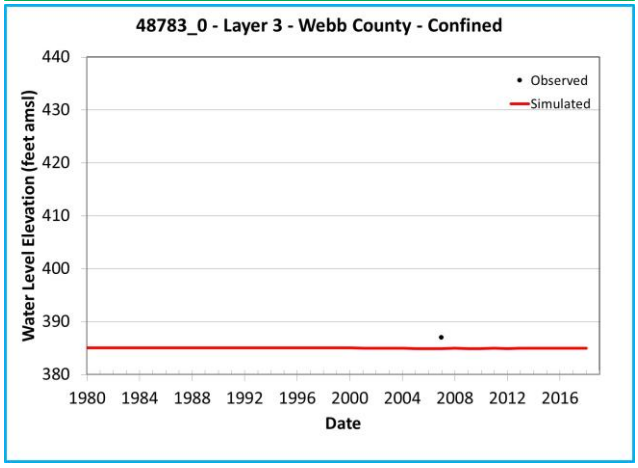
Revised		Aprv'd by	SP

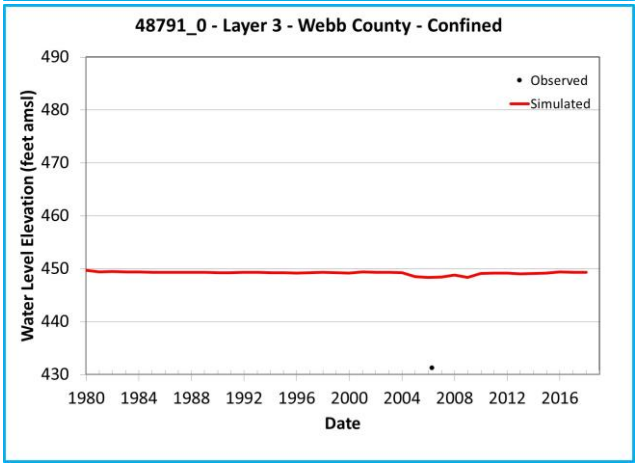
FIGURE I-18.1d

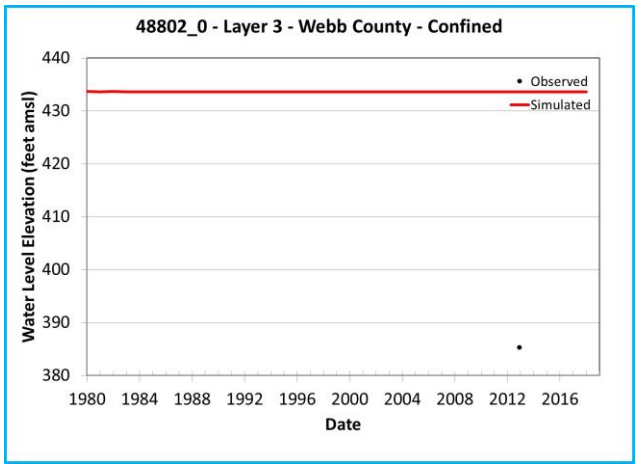
GSI ENVIRONMENTAL

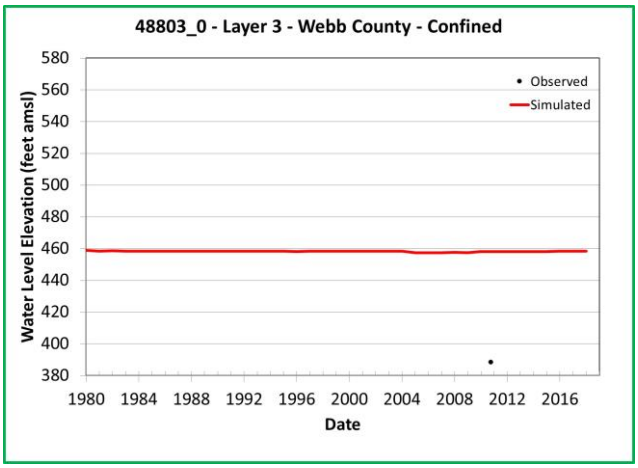












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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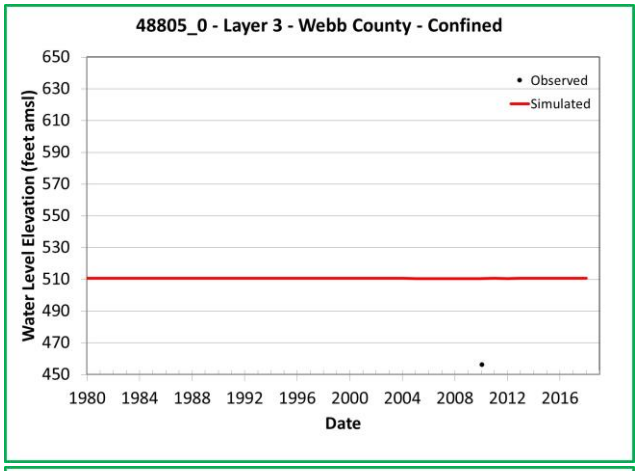
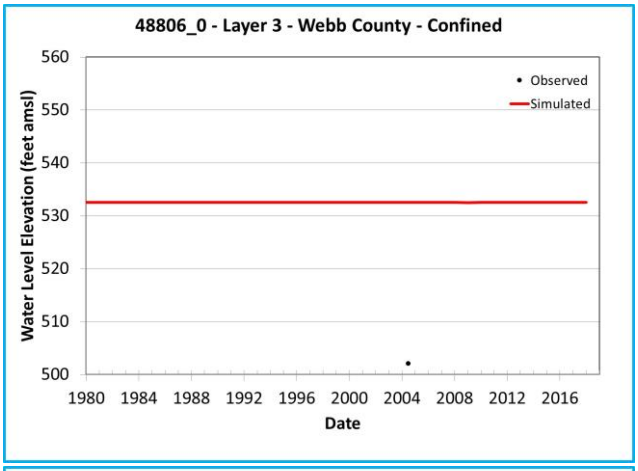
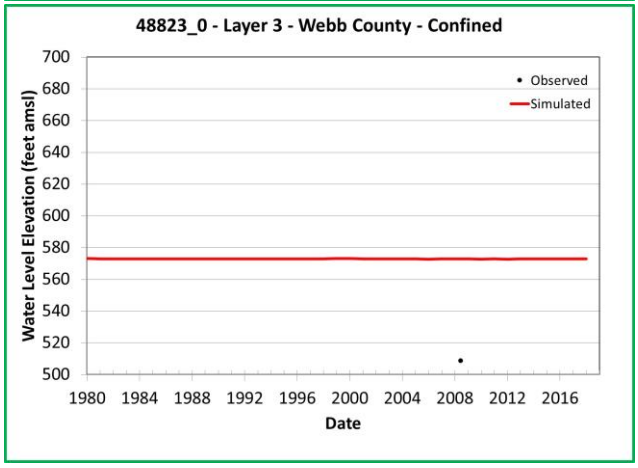
Revised		Aprv'd by	SP

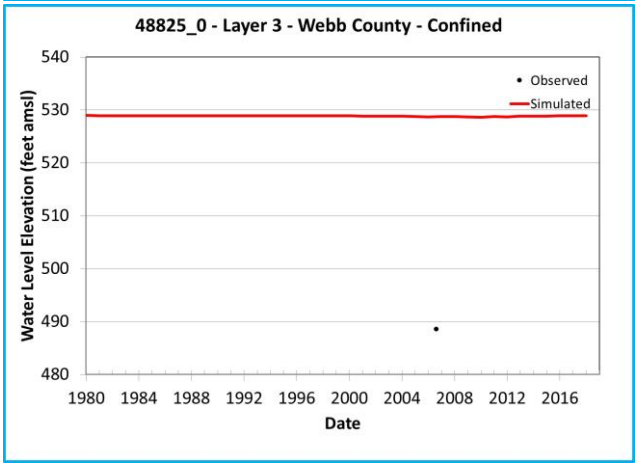
FIGURE I-18.1e

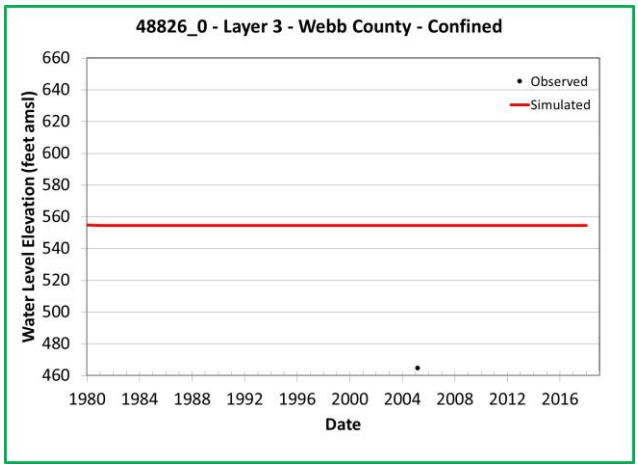
GSI ENVIRONMENTAL

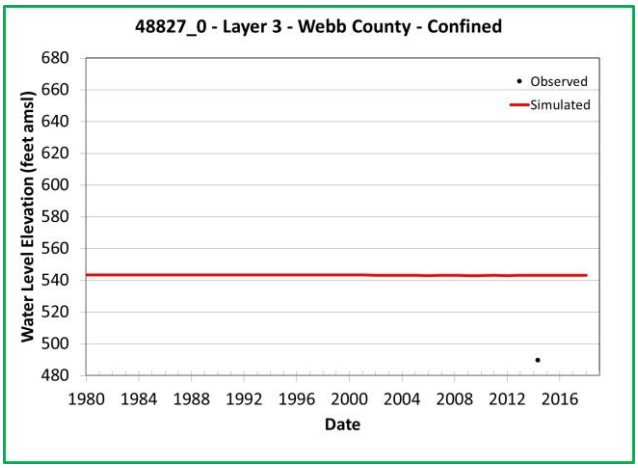












Note: Chart outline color indicates Y-axis range.

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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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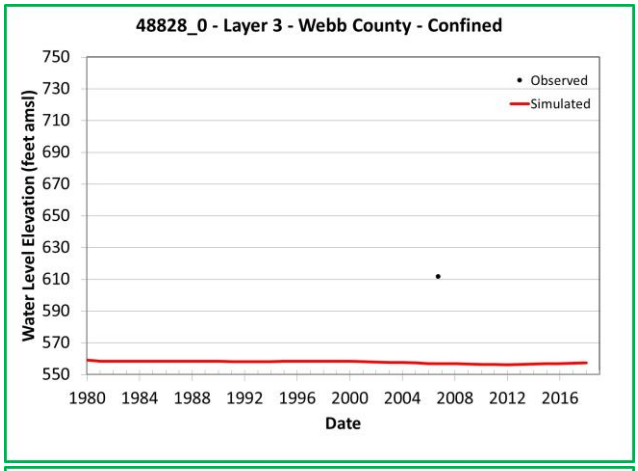
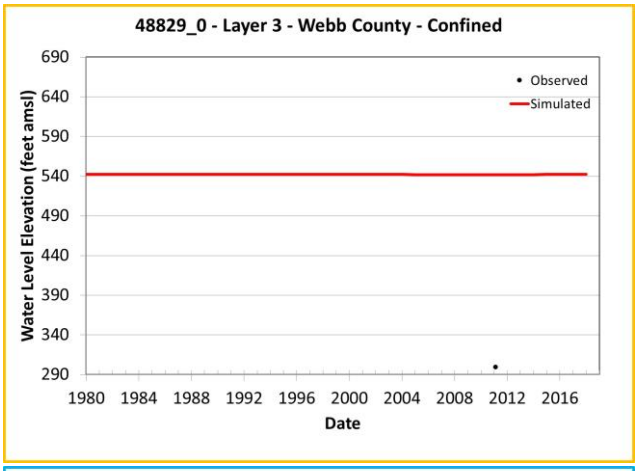
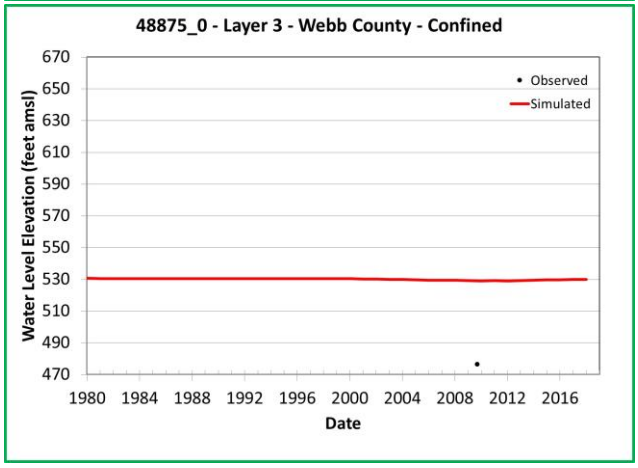
Revised		Aprv'd by	SP

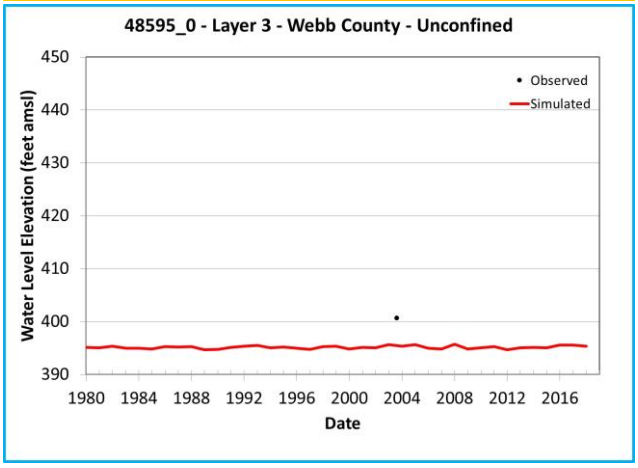
FIGURE I-18.1f

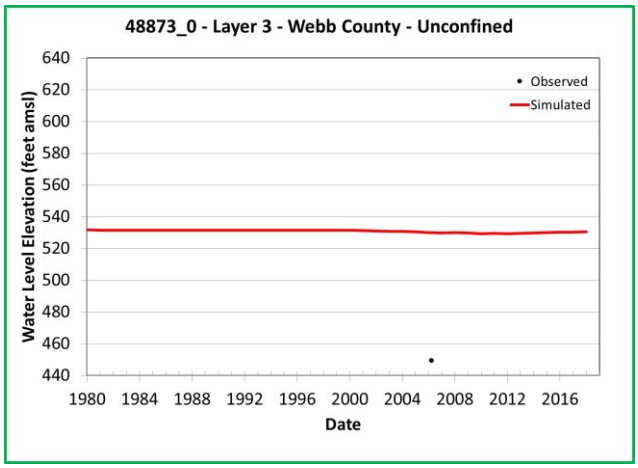
GSI ENVIRONMENTAL

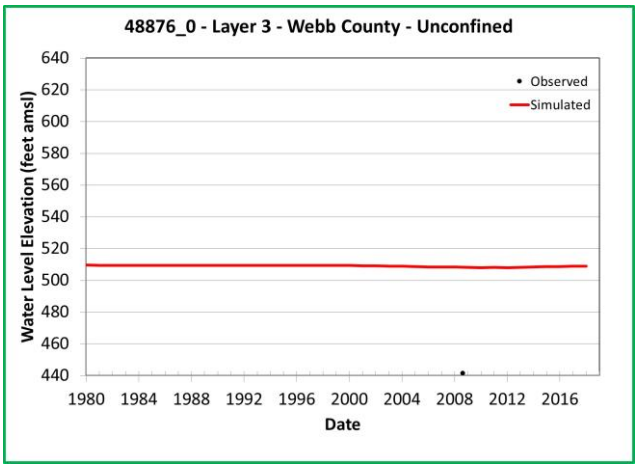












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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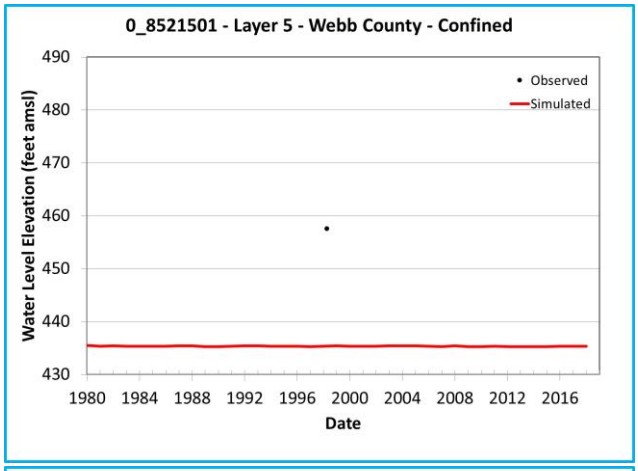
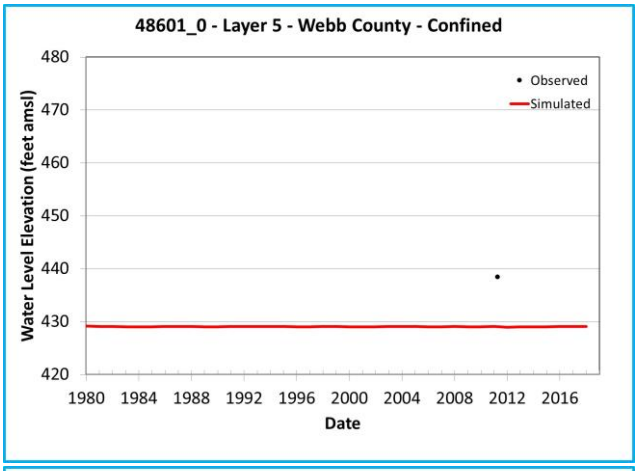
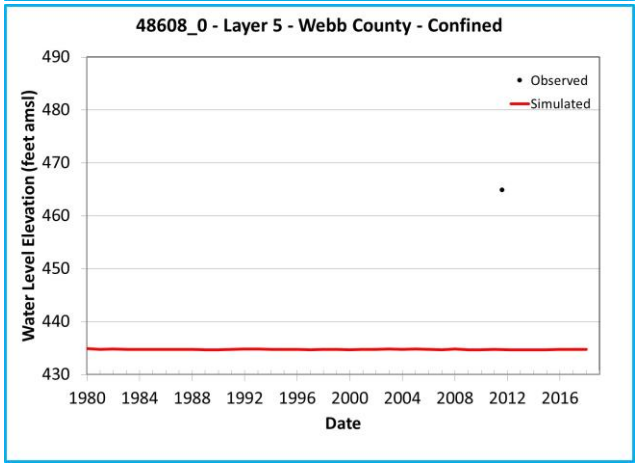
Revised		Aprv'd by	SP

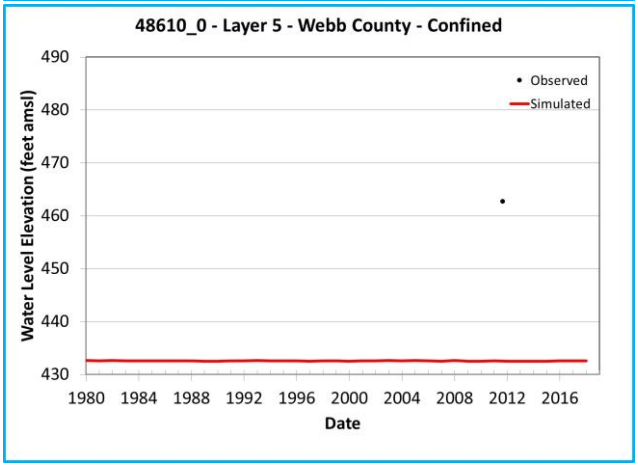
FIGURE I-18.1g

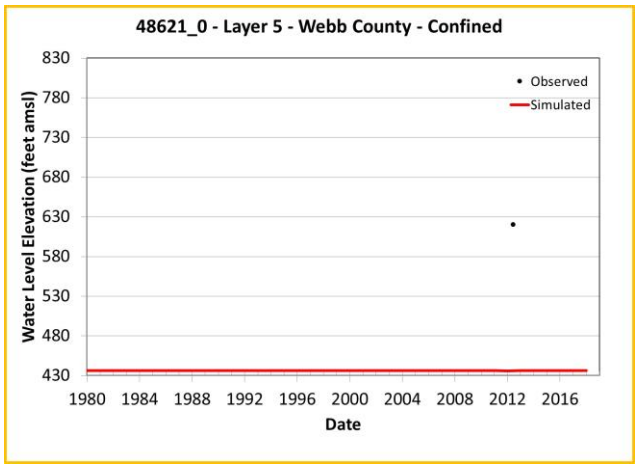
GSI ENVIRONMENTAL

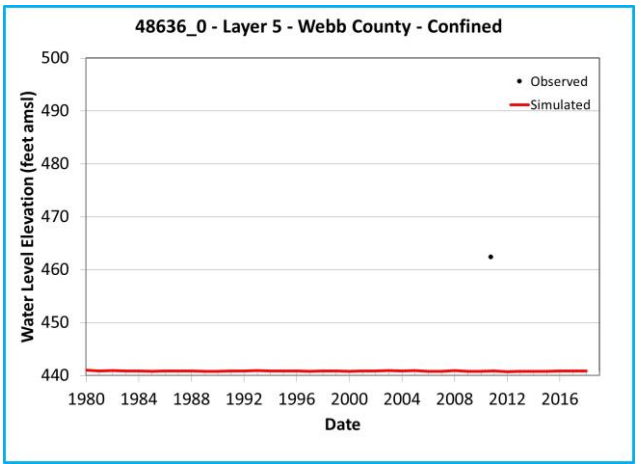












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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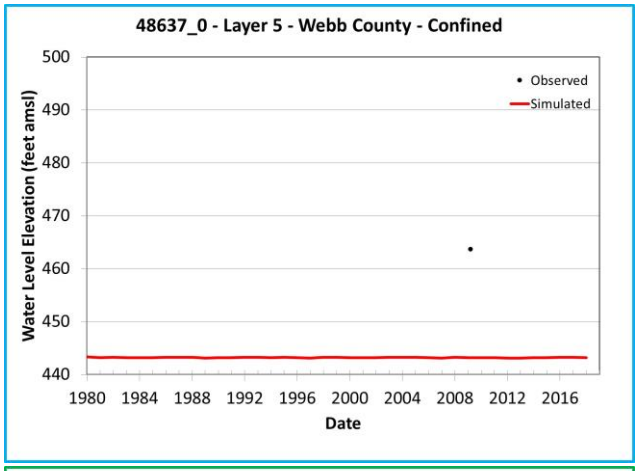
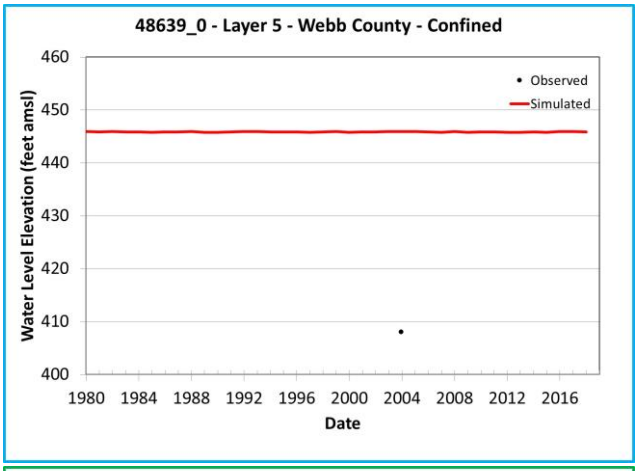
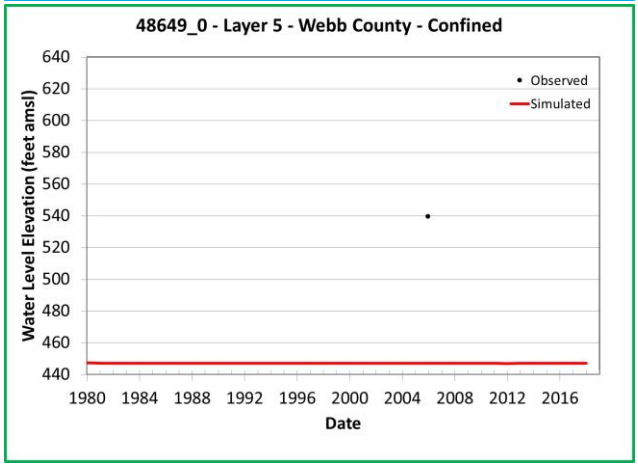
Revised		Aprv'd by	SP

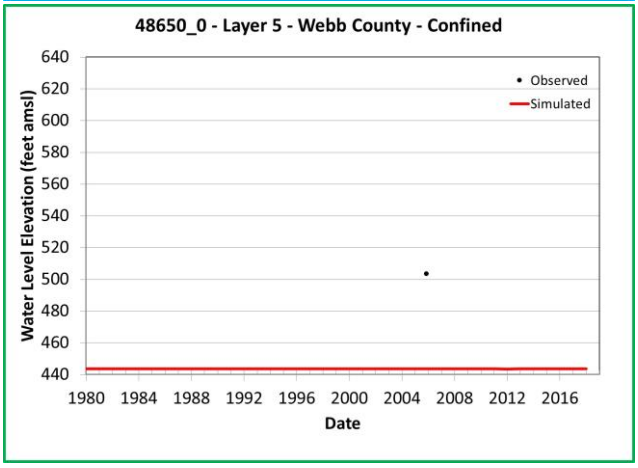
FIGURE I-18.2a

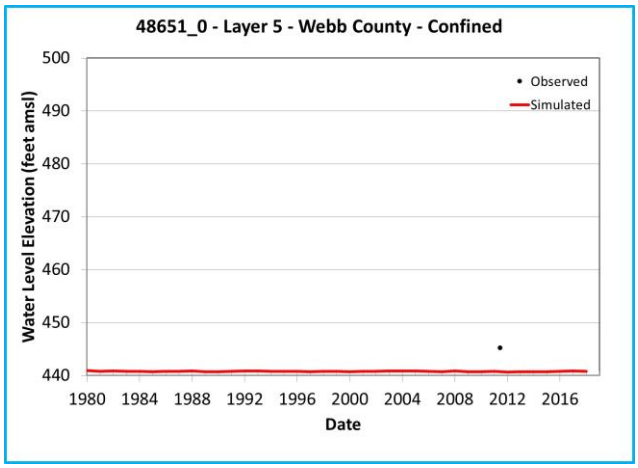
GSI ENVIRONMENTAL

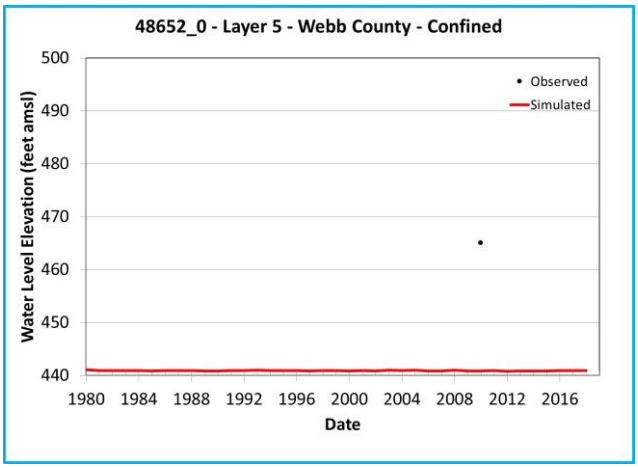












Note: Chart outline color indicates Y-axis range.

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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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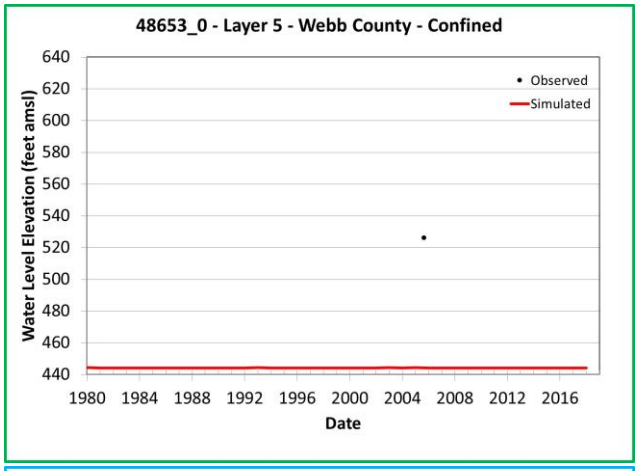
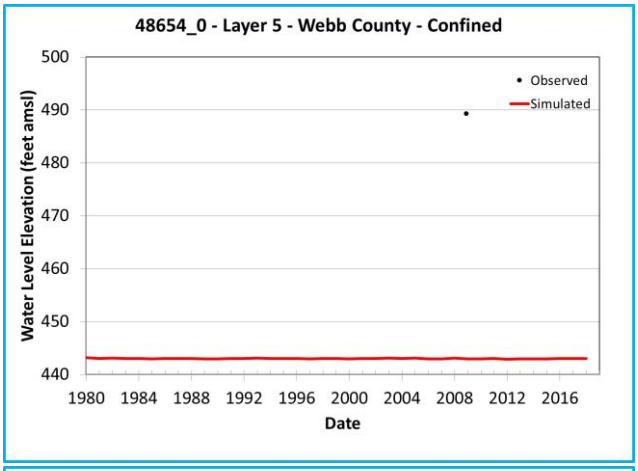
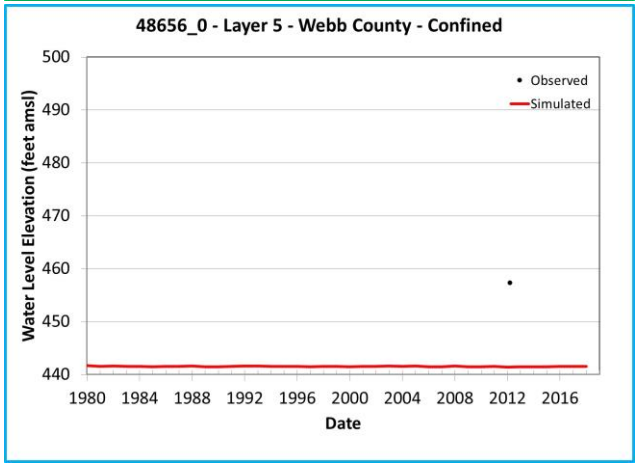
Revised		Aprv'd by	SP

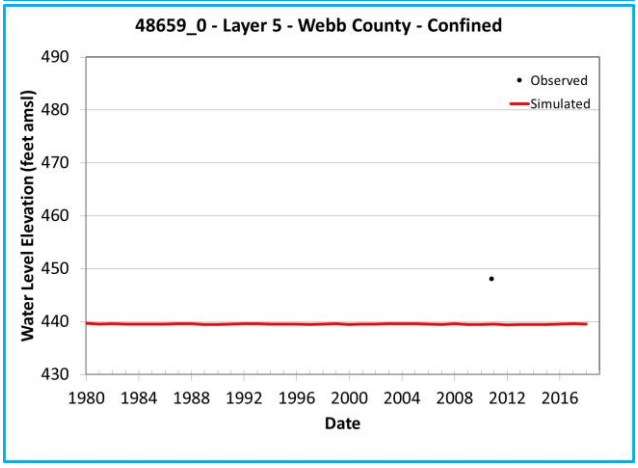
FIGURE I-18.2b

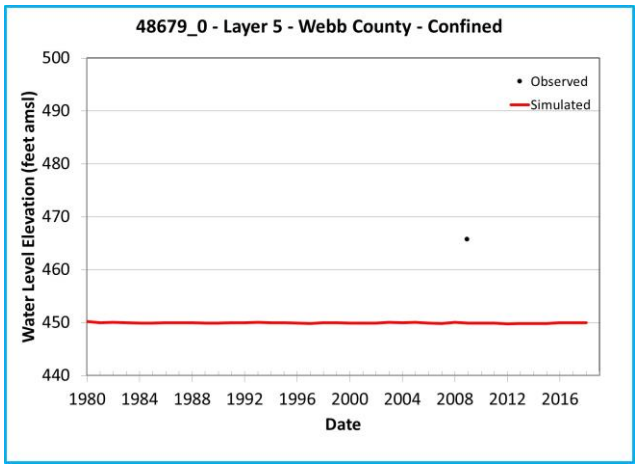
GSI ENVIRONMENTAL

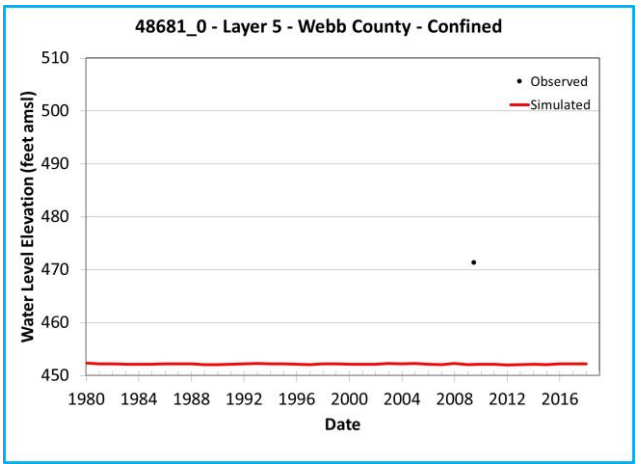












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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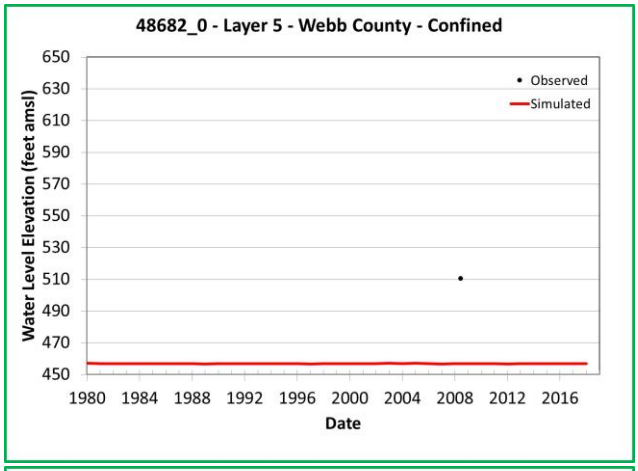
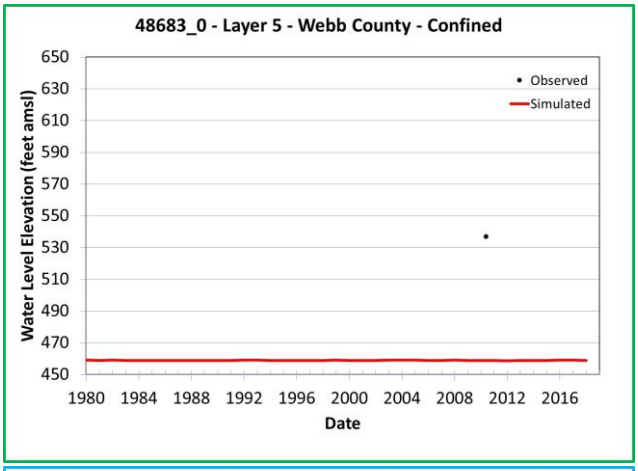
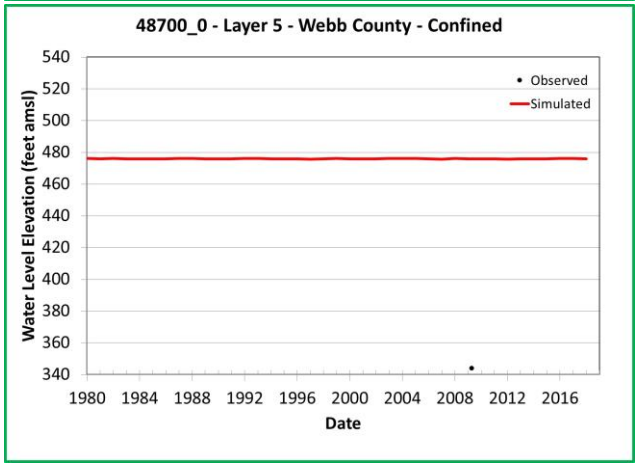
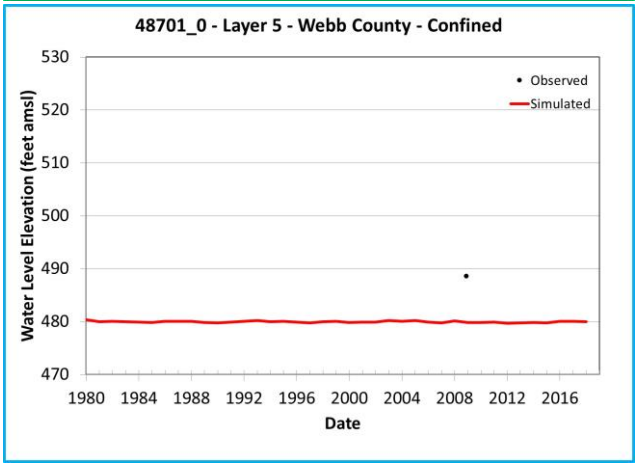
FIGURE I-18.2c

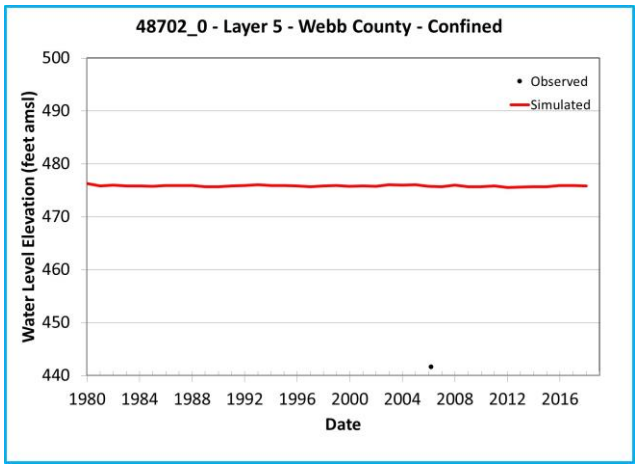
GSI ENVIRONMENTAL

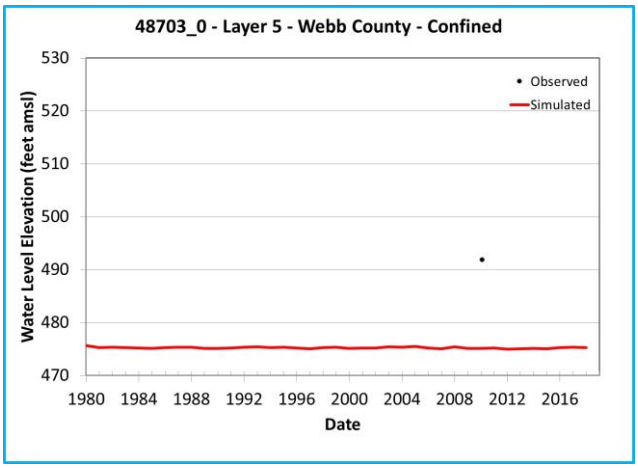












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

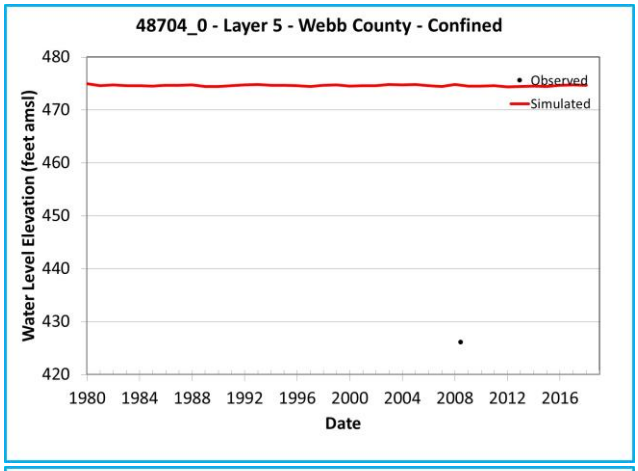
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

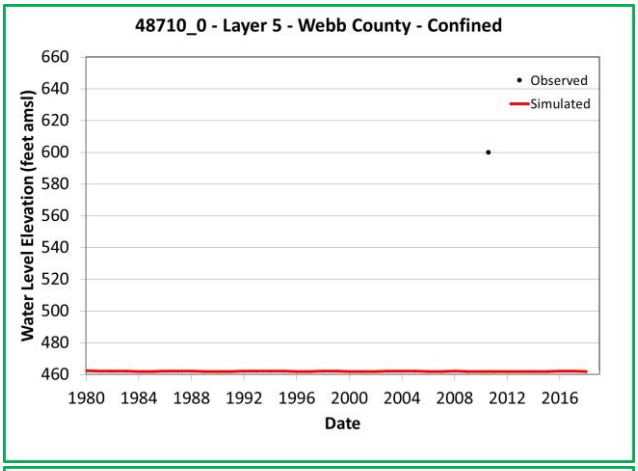
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

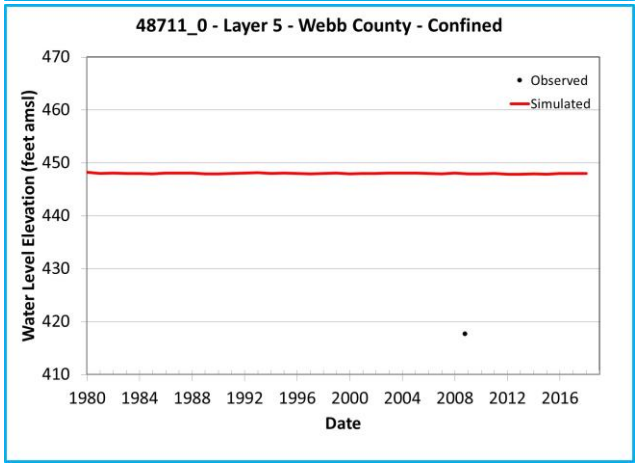
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

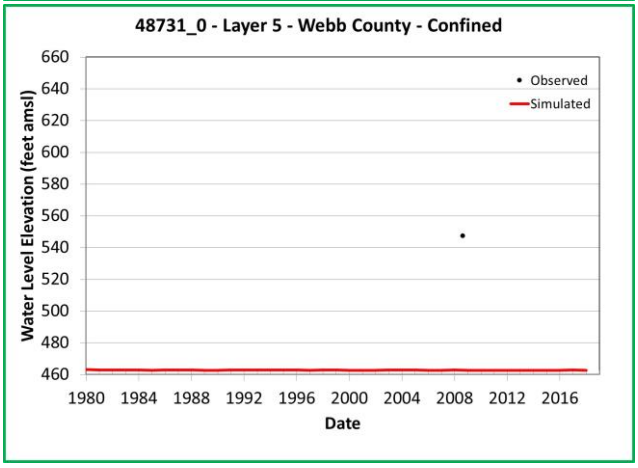
FIGURE I-18.2d

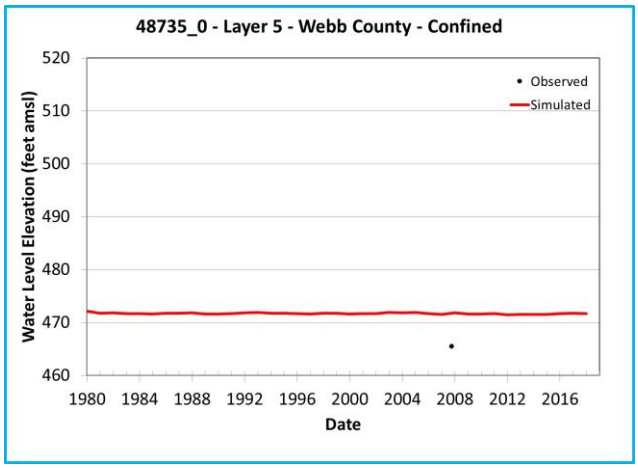
GSI ENVIRONMENTAL

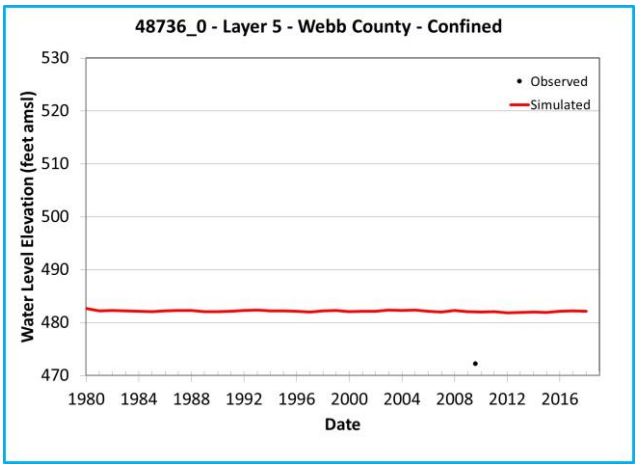












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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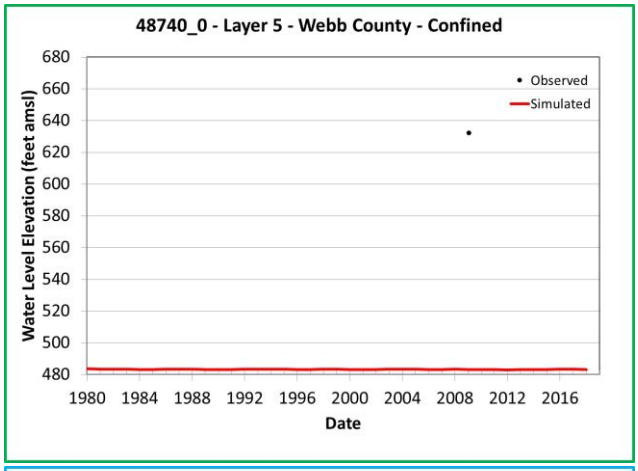
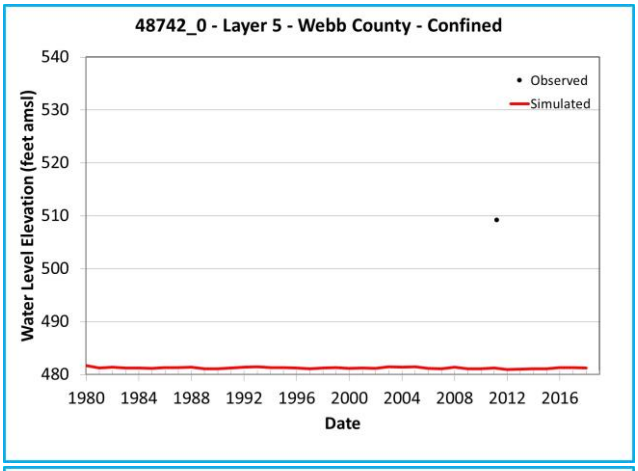
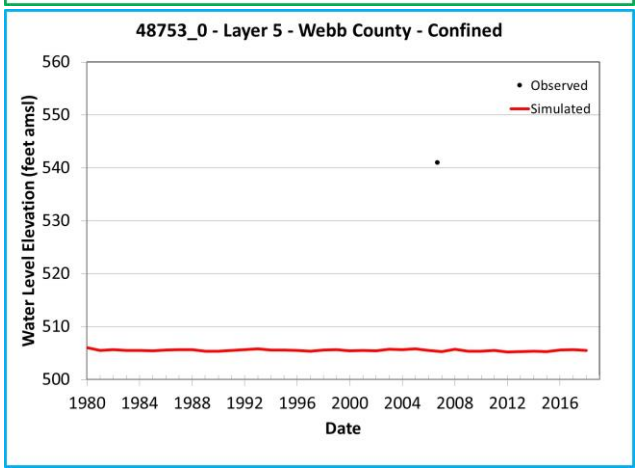
Revised		Aprv'd by	SP

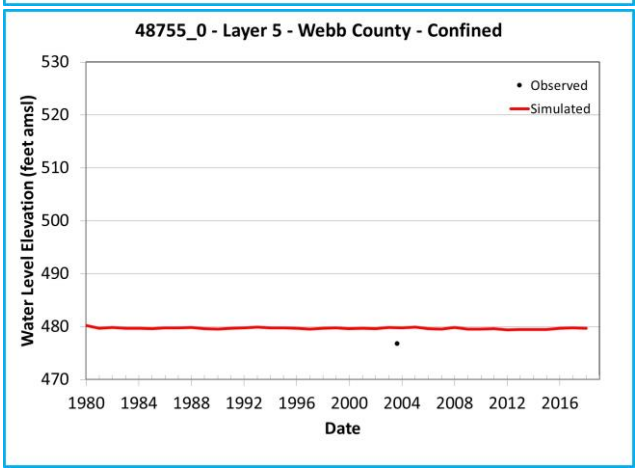
FIGURE I-18.2e

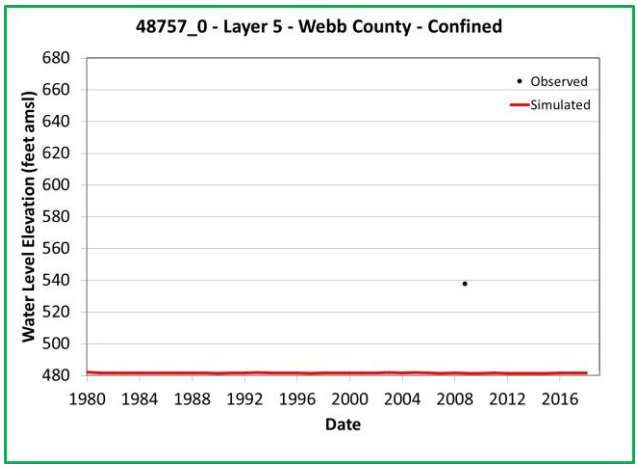
GSI ENVIRONMENTAL

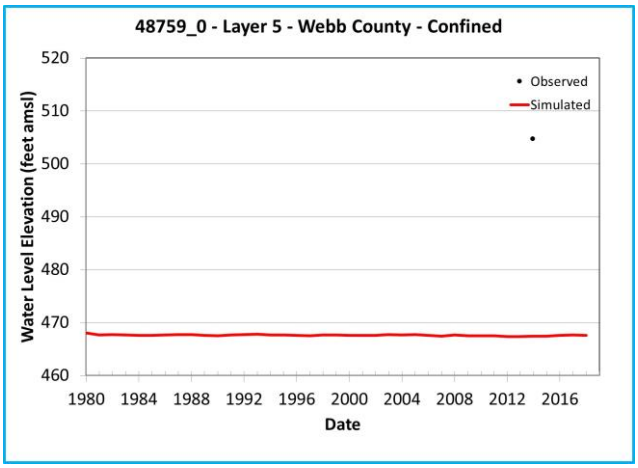












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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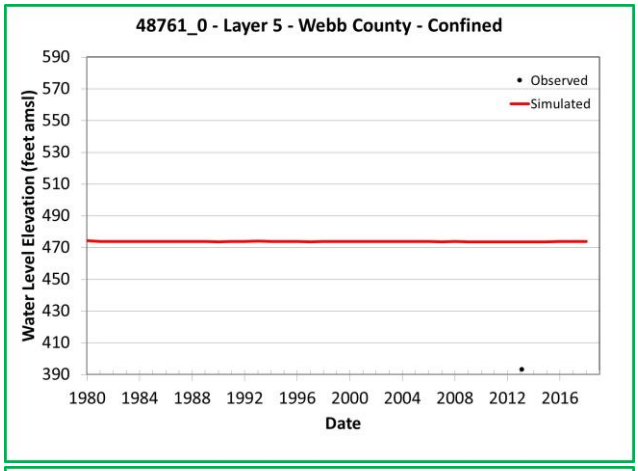
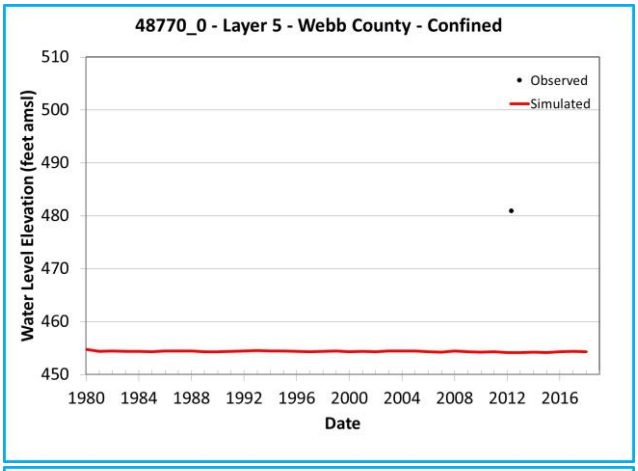
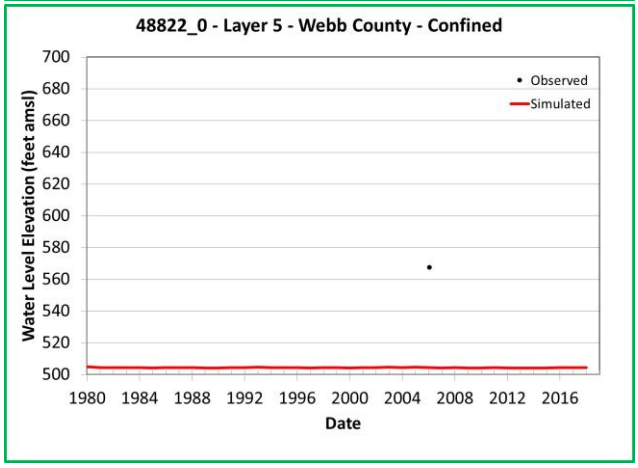
Revised		Aprv'd by	SP

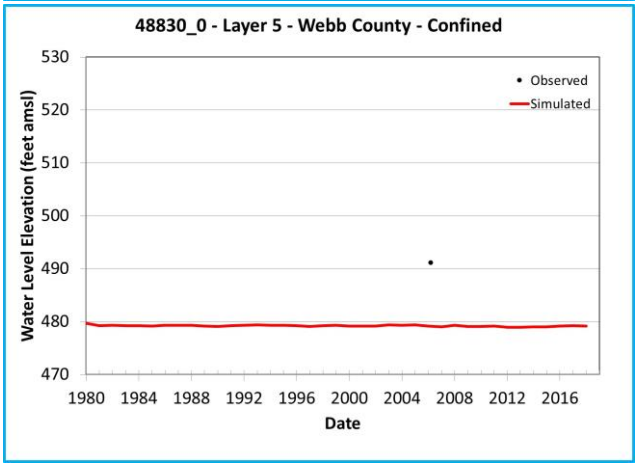
FIGURE I-18.2f

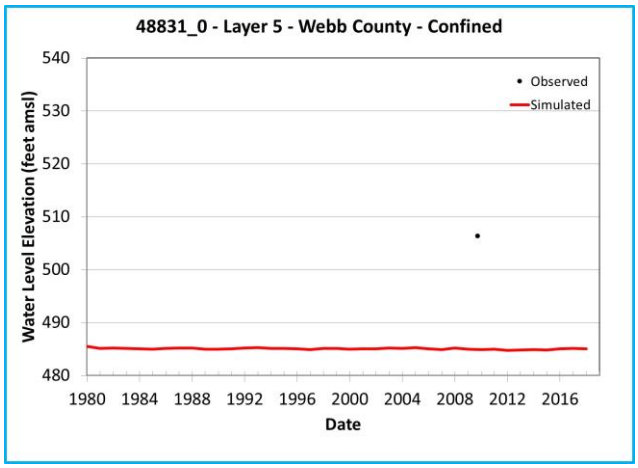
GSI ENVIRONMENTAL

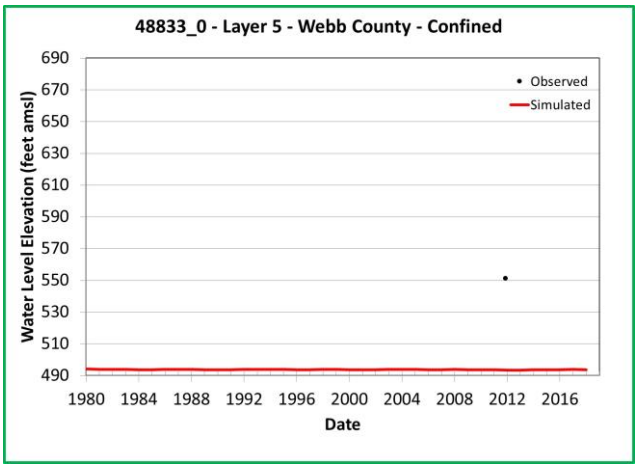












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

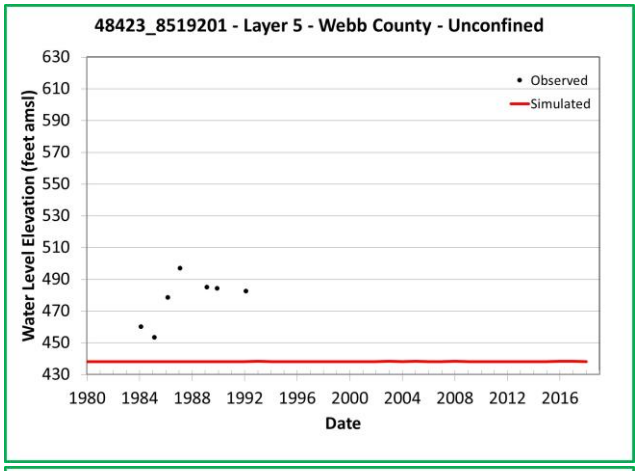
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

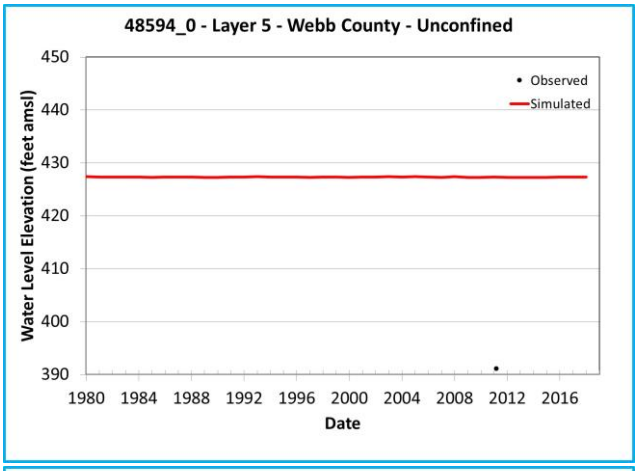
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

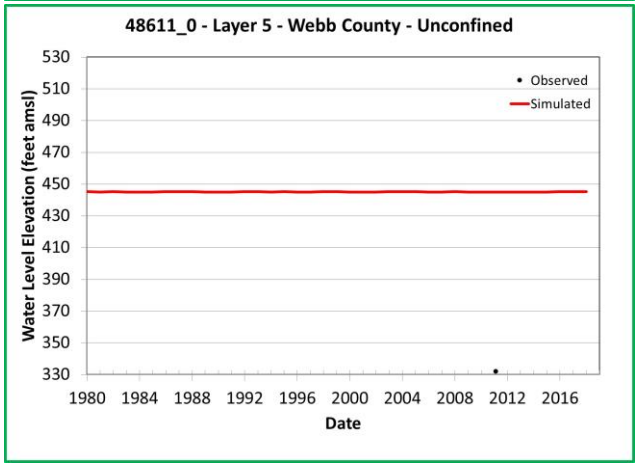
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

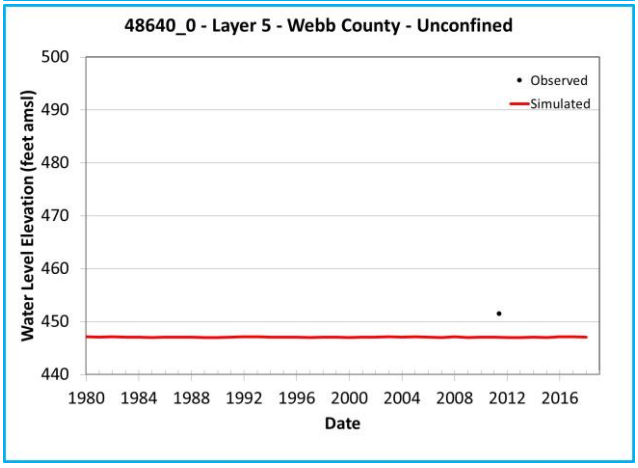
FIGURE I-18.2g

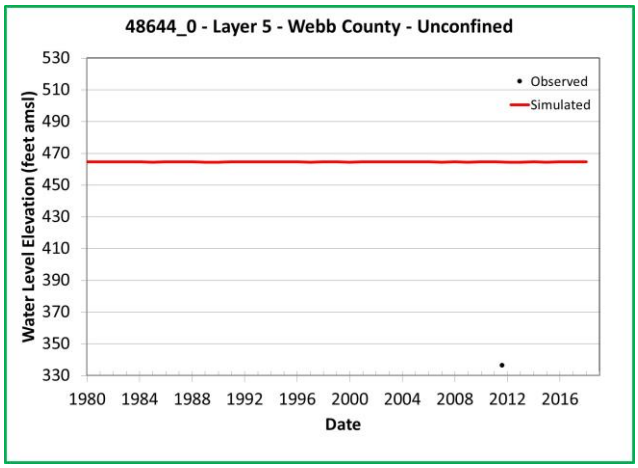
GSI ENVIRONMENTAL

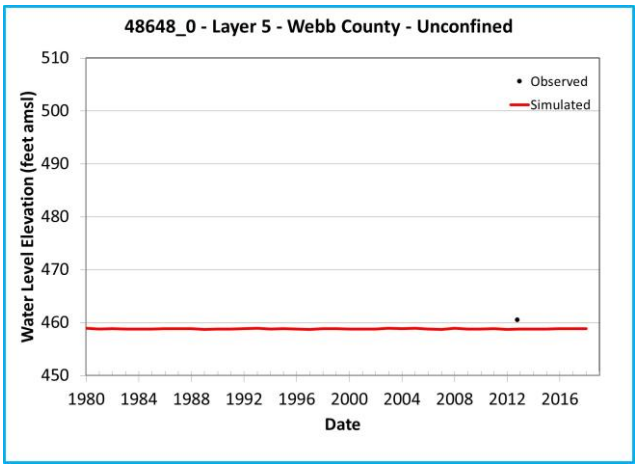












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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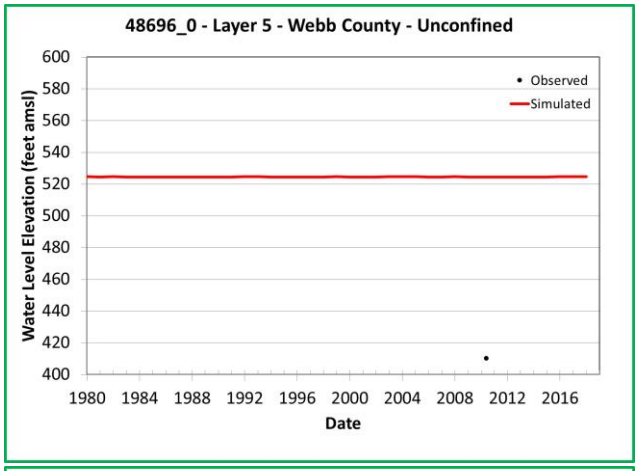
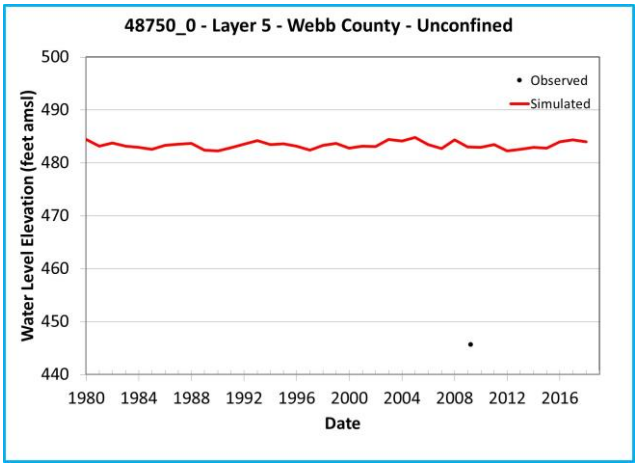
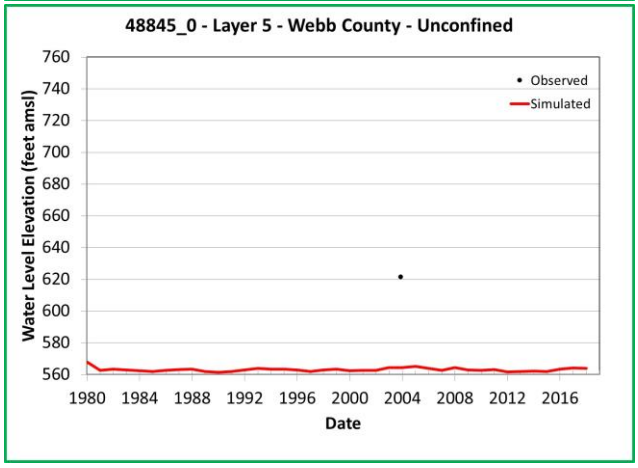
Revised		Aprv'd by	SP

FIGURE I-18.2h

GSI ENVIRONMENTAL







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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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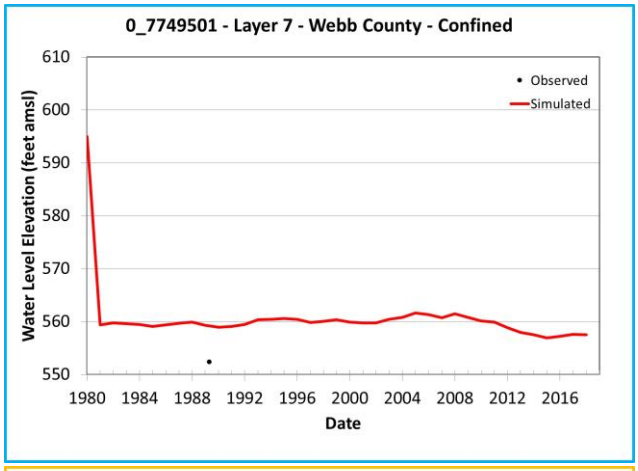
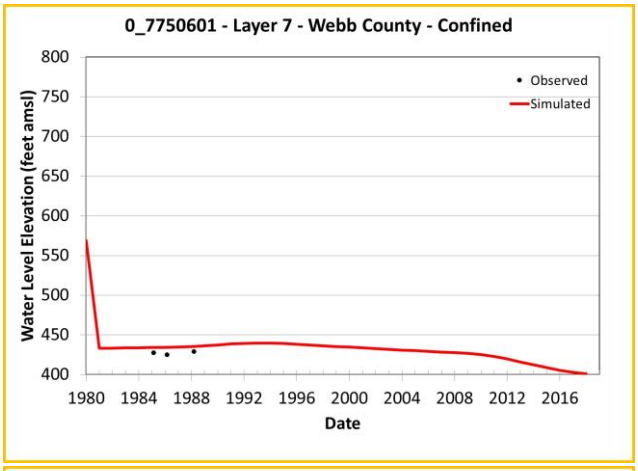
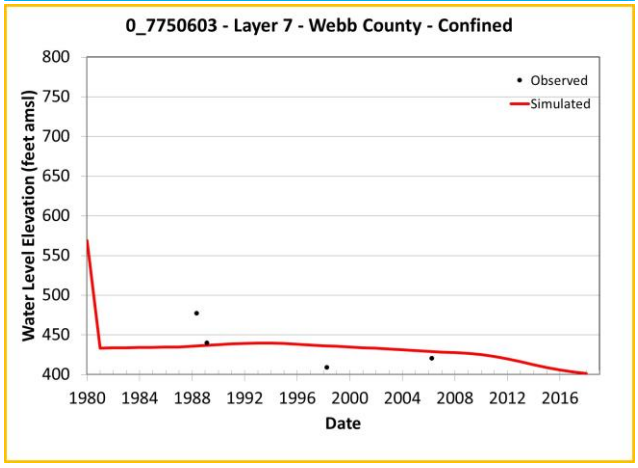
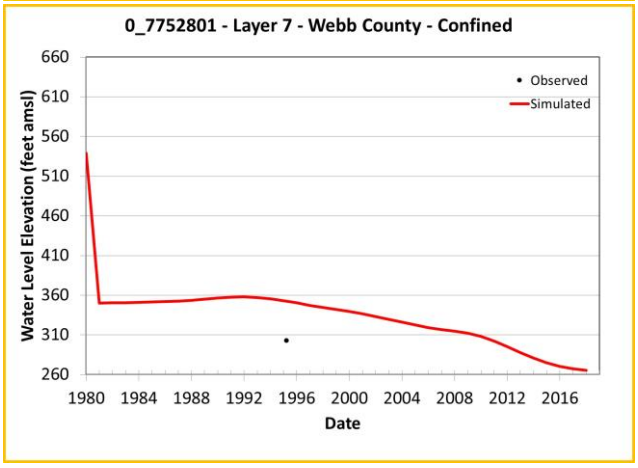
FIGURE I-18.2i

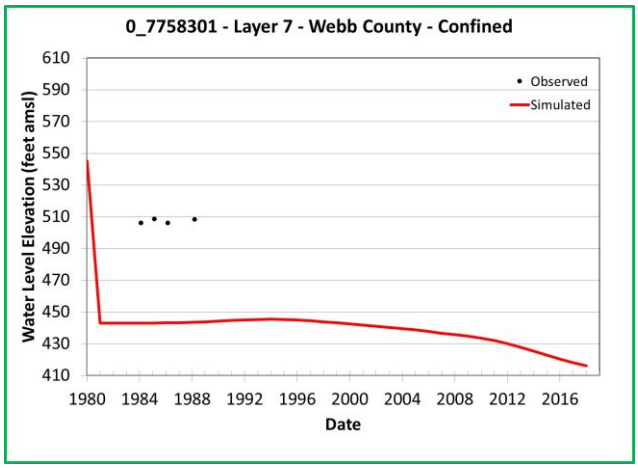
GSI ENVIRONMENTAL

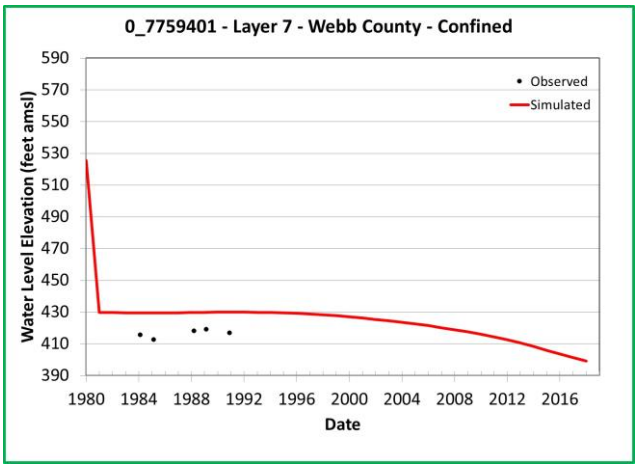












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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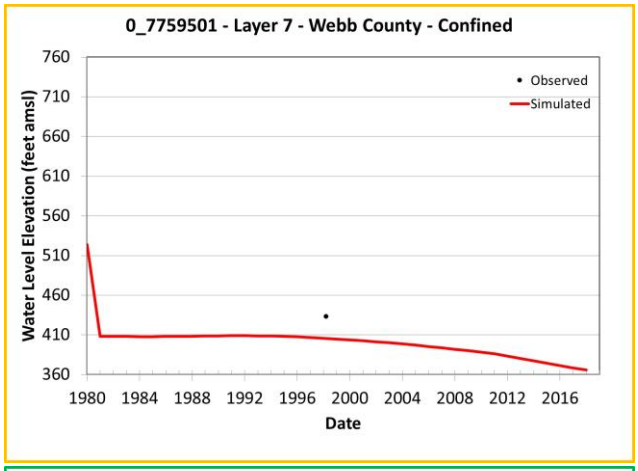
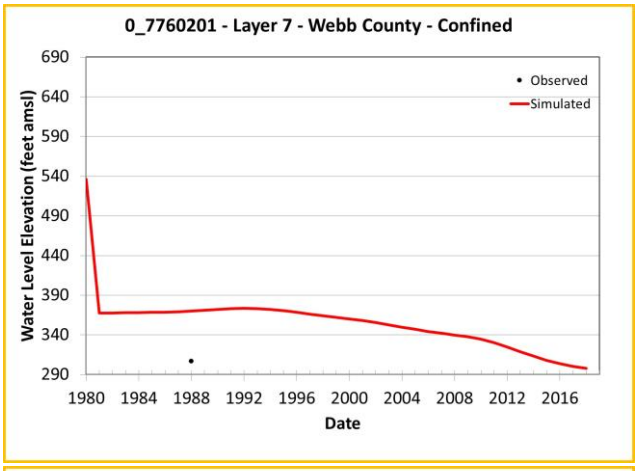
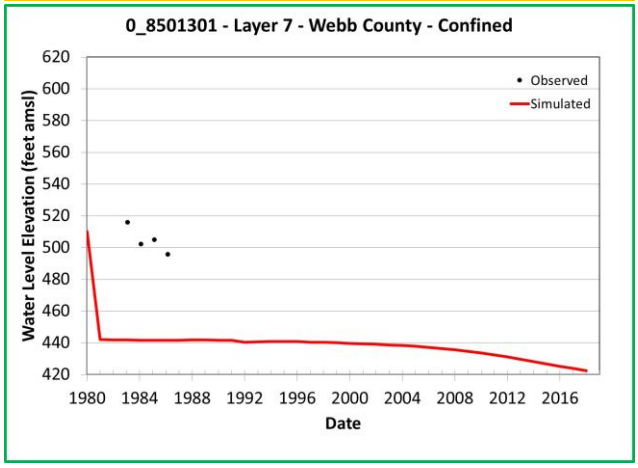
Revised		Aprv'd by	SP

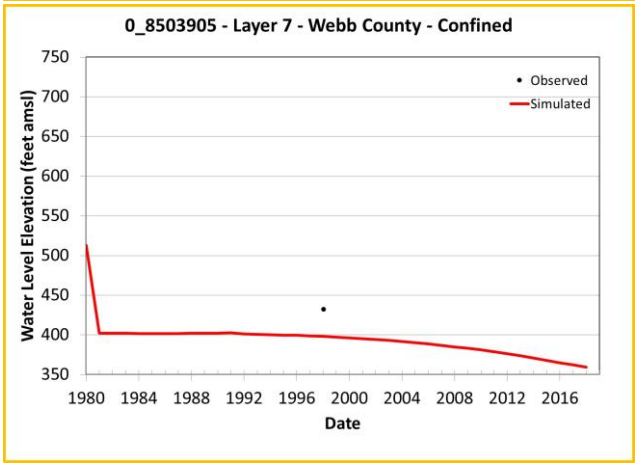
FIGURE I-18.3a

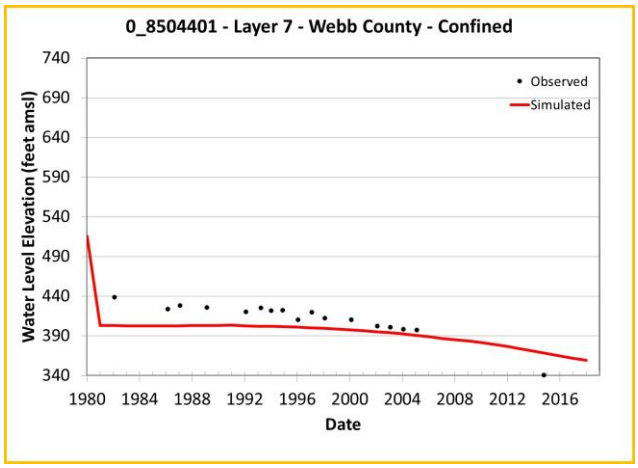
GSI ENVIRONMENTAL

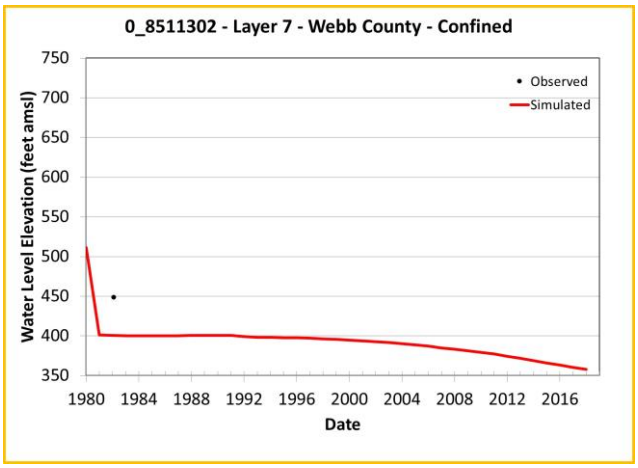












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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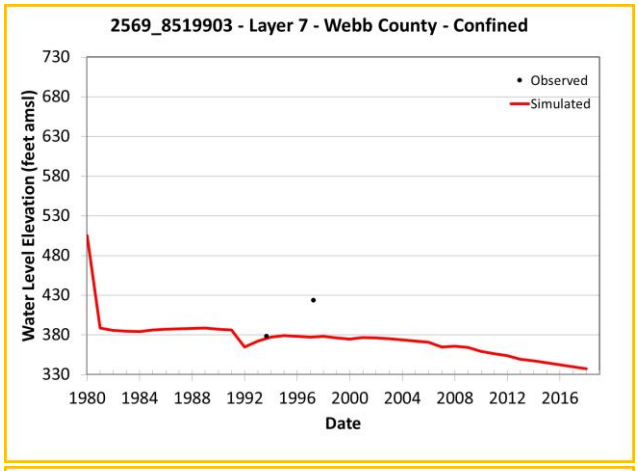
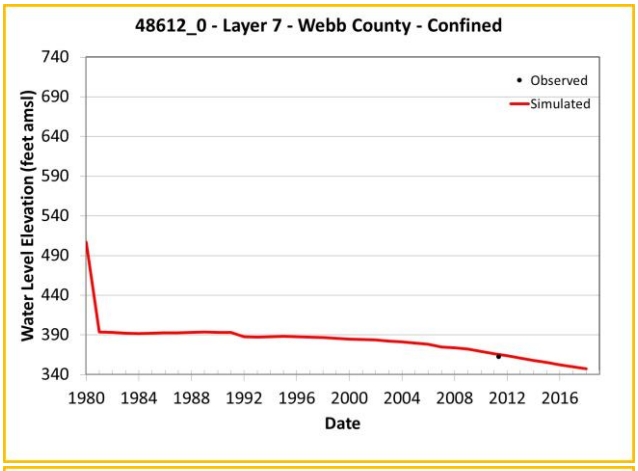
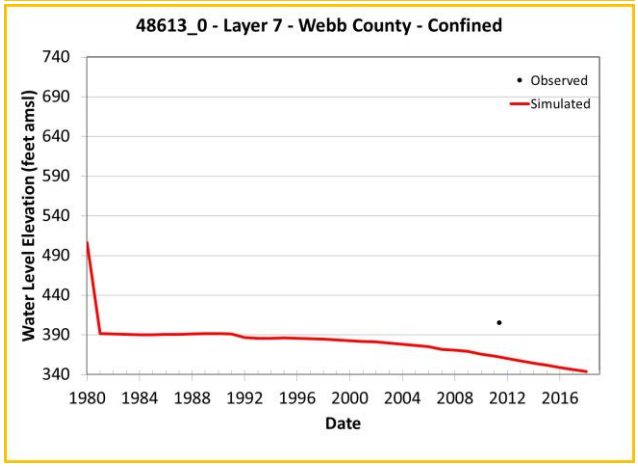
Revised		Aprv'd by	SP

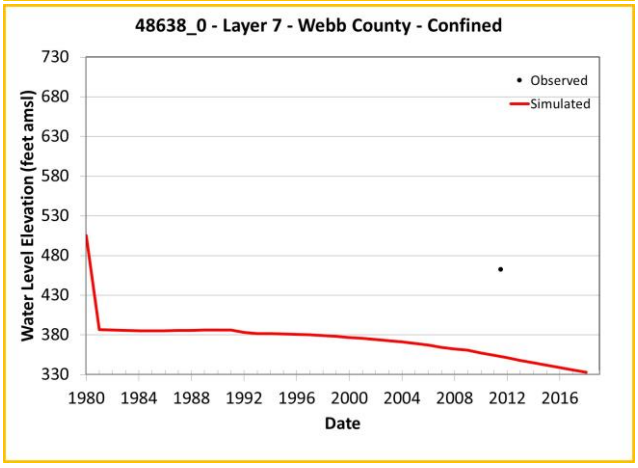
FIGURE I-18.3b

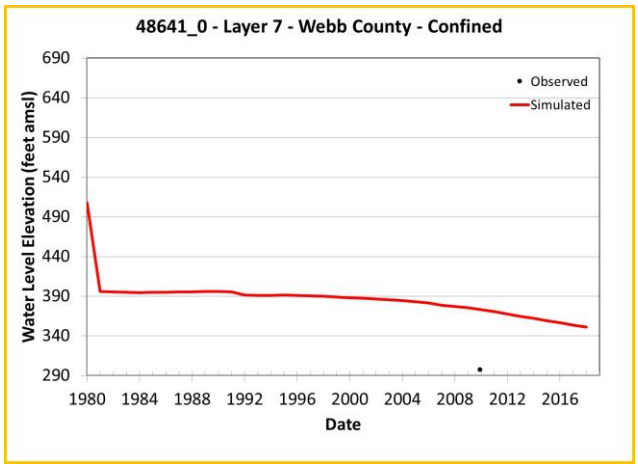
GSI ENVIRONMENTAL

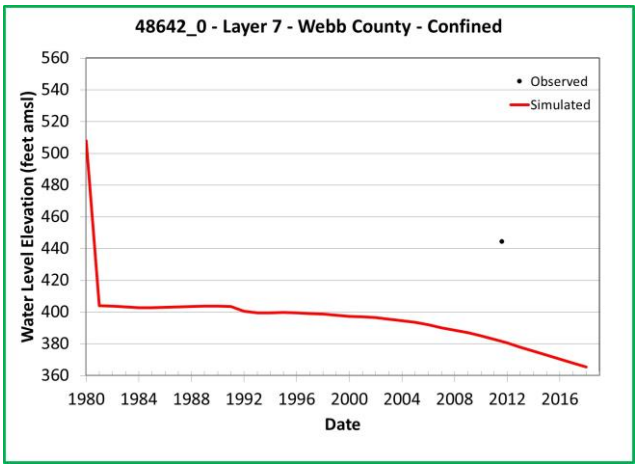












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

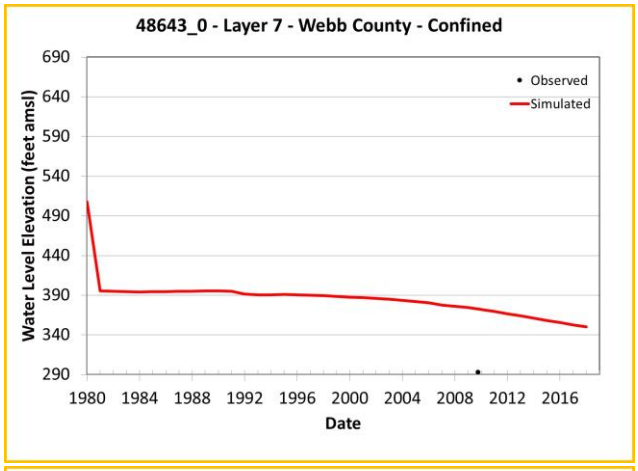
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

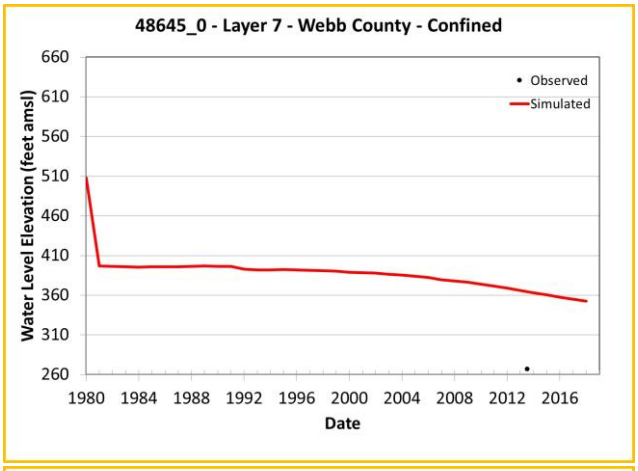
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

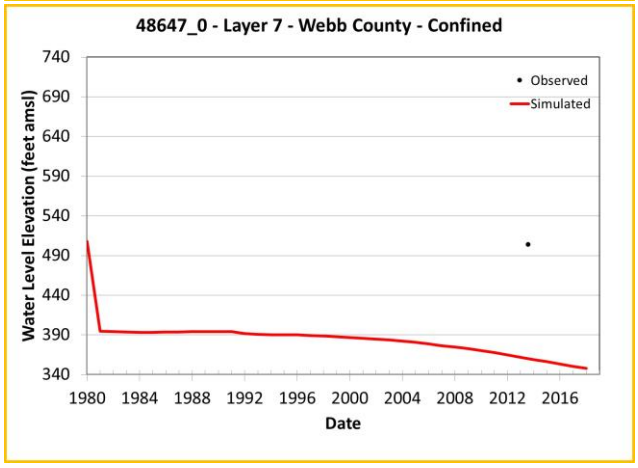
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

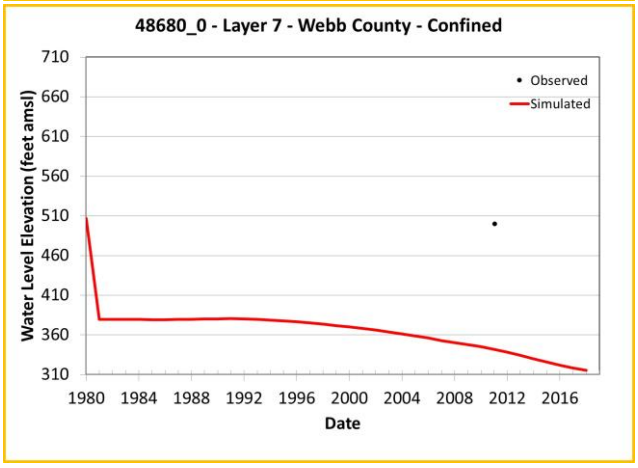
FIGURE I-18.3c

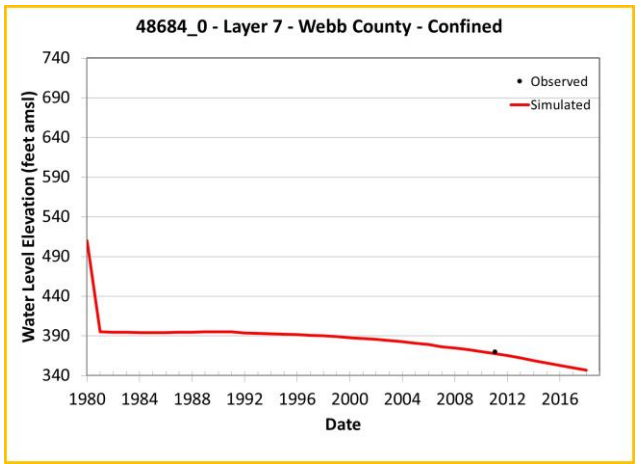
GSI ENVIRONMENTAL

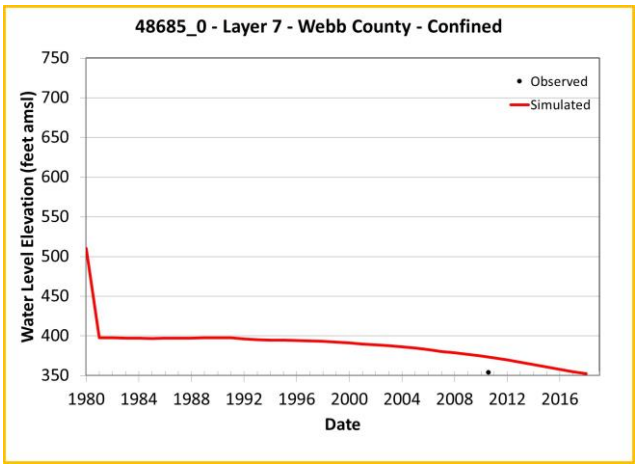












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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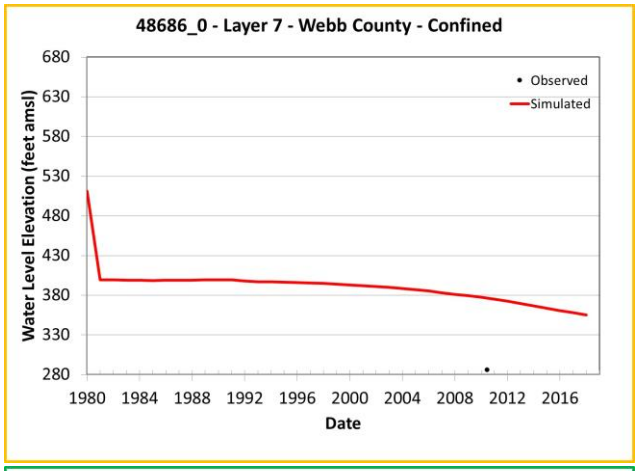
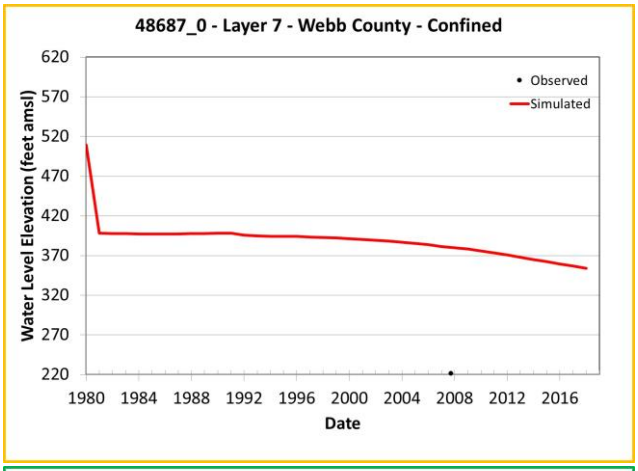
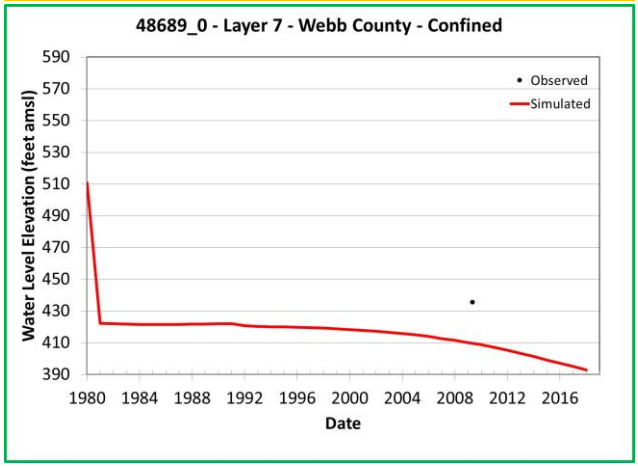
Revised		Aprv'd by	SP

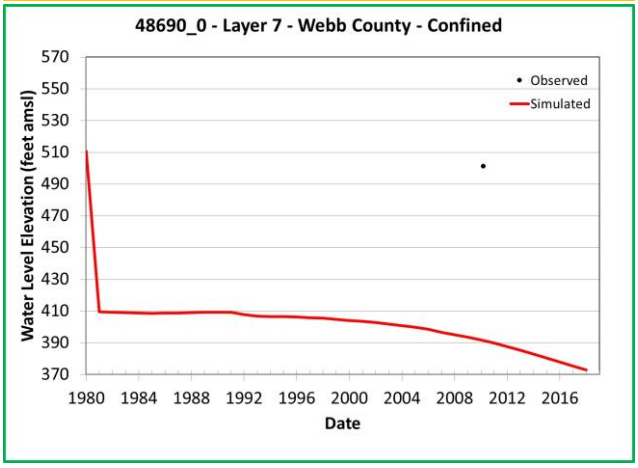
FIGURE I-18.3d

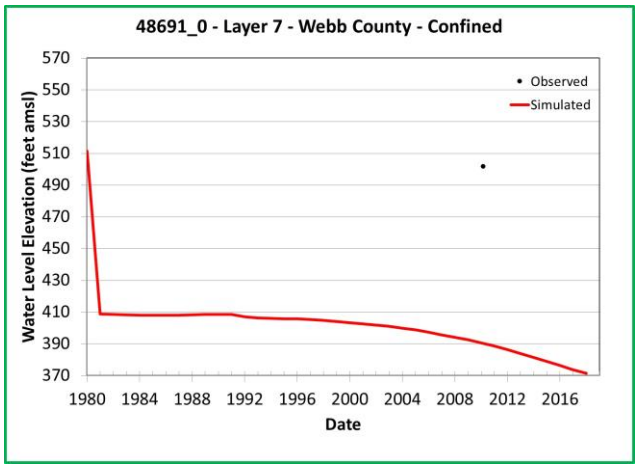
GSI ENVIRONMENTAL

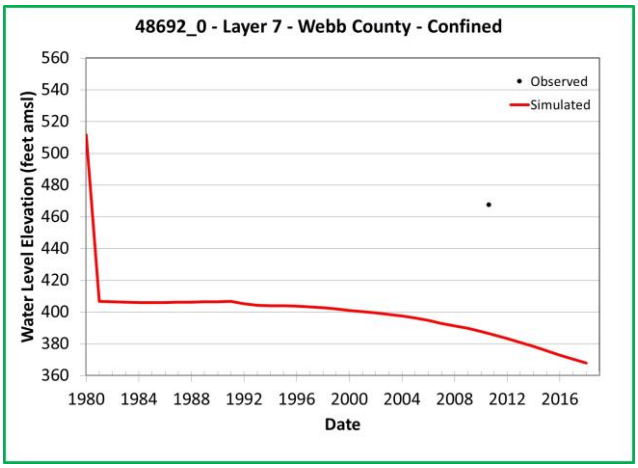












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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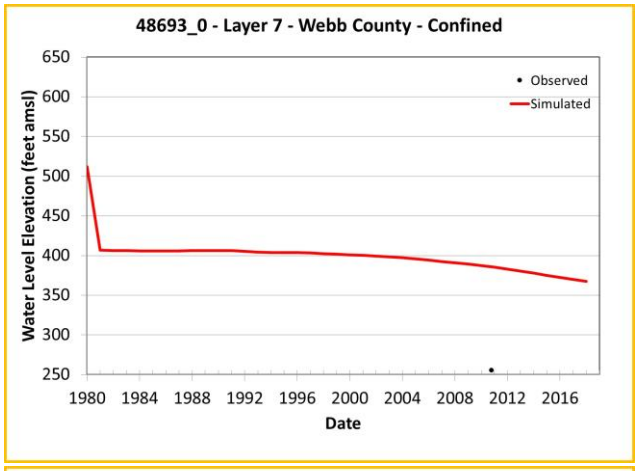
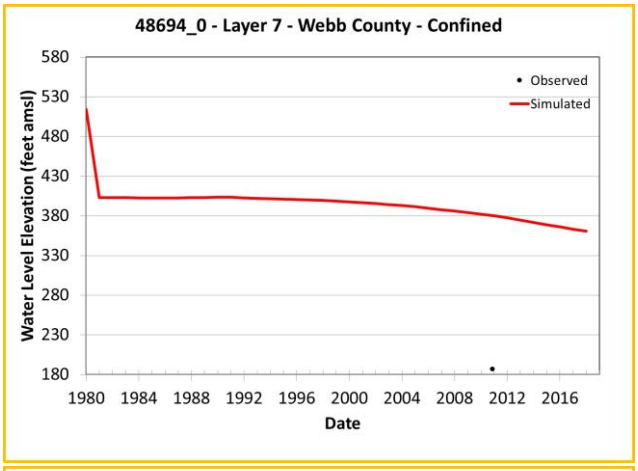
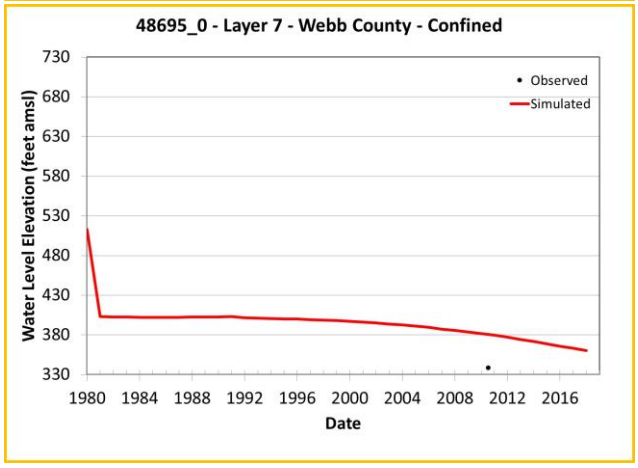
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

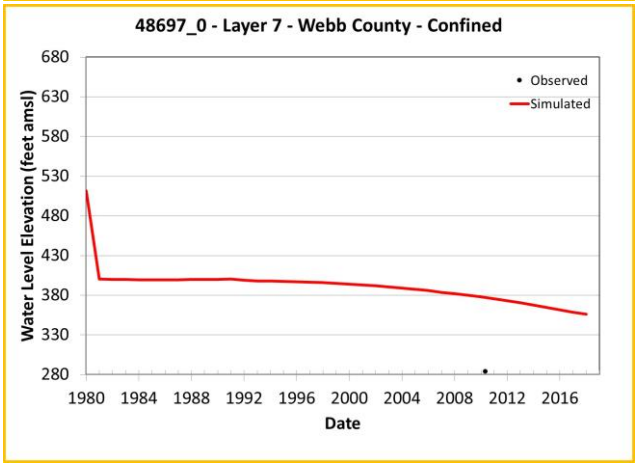
FIGURE I-18.3e

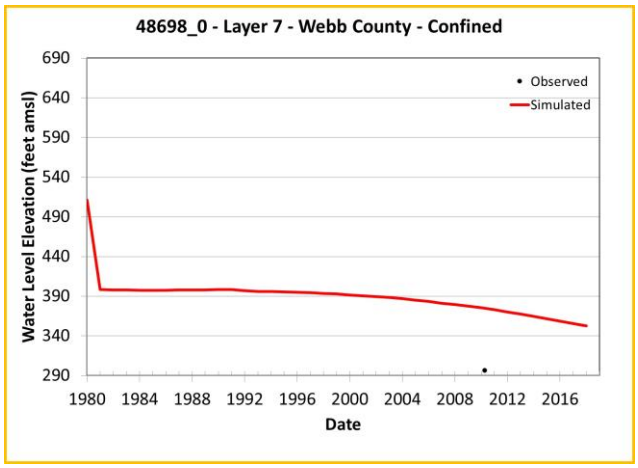
GSI ENVIRONMENTAL

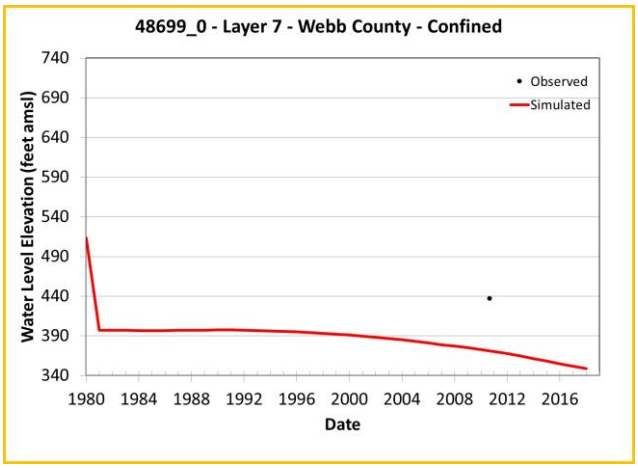












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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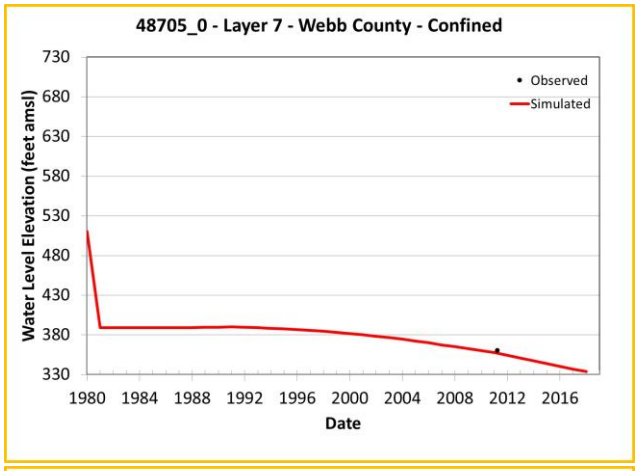
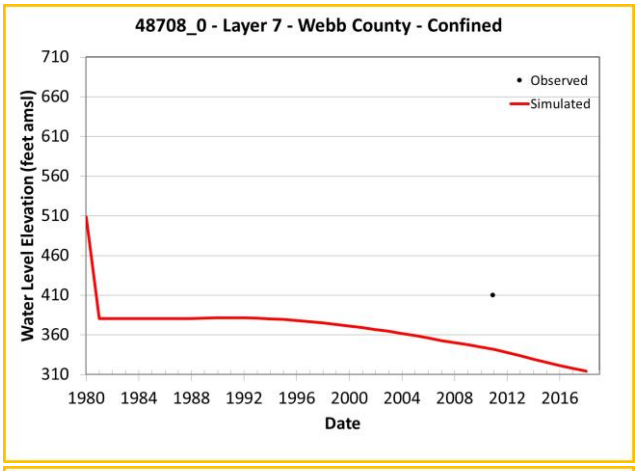
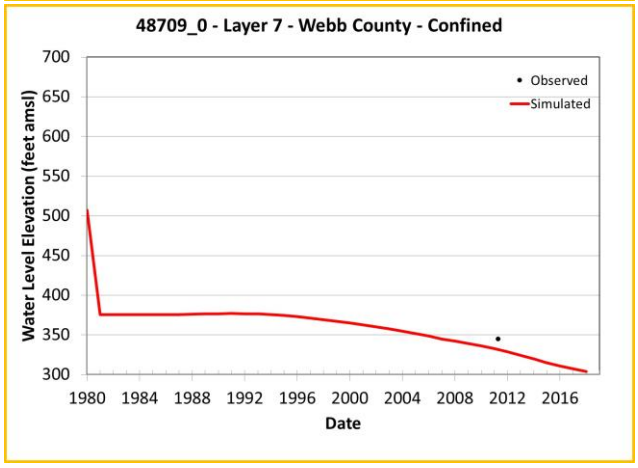
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

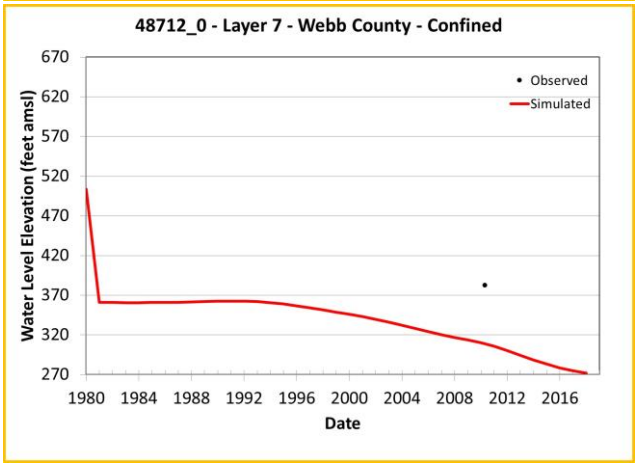
FIGURE I-18.3f

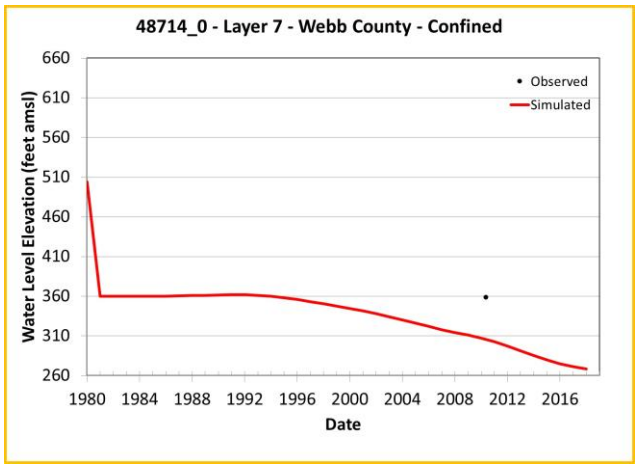
GSI ENVIRONMENTAL

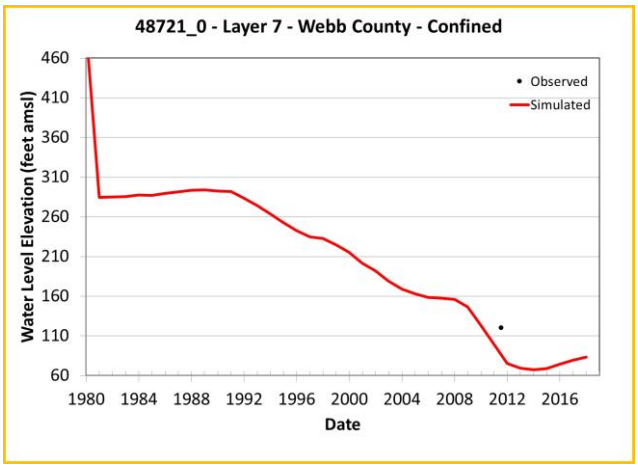












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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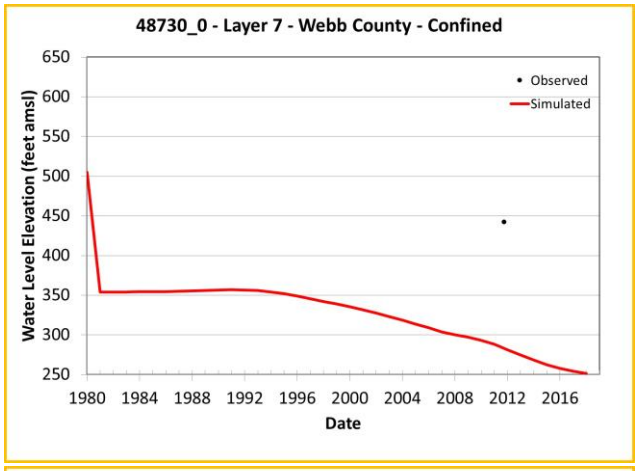
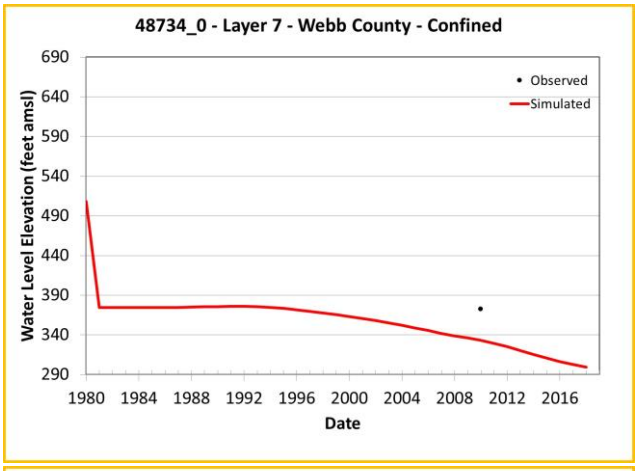
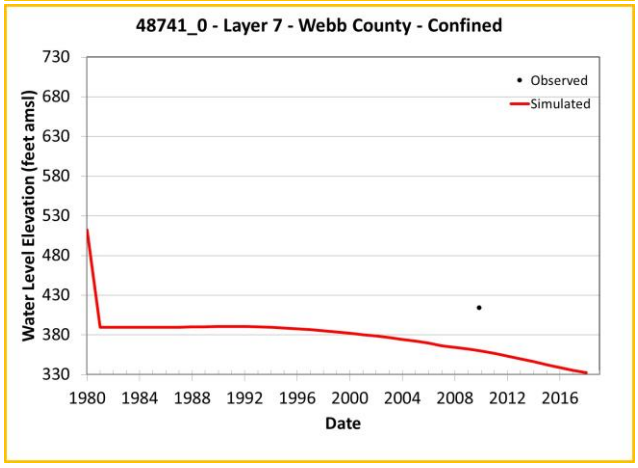
Revised		Aprv'd by	SP

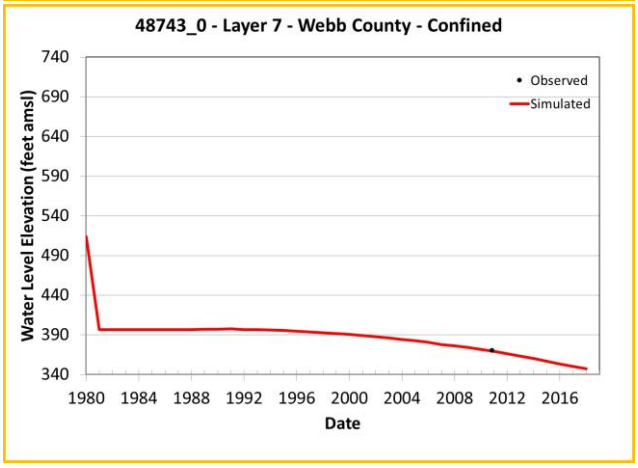
FIGURE I-18.3g

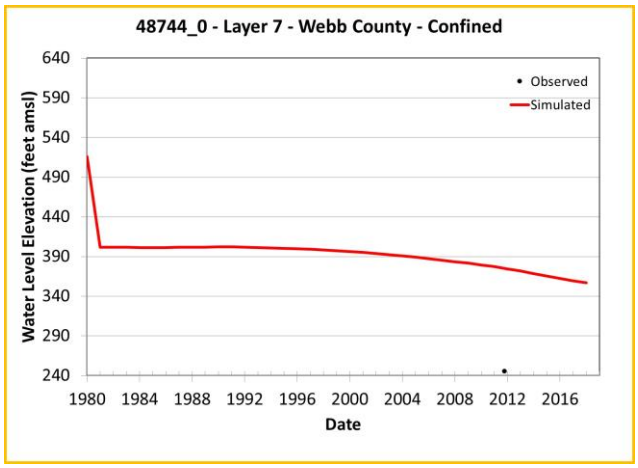
GSI ENVIRONMENTAL

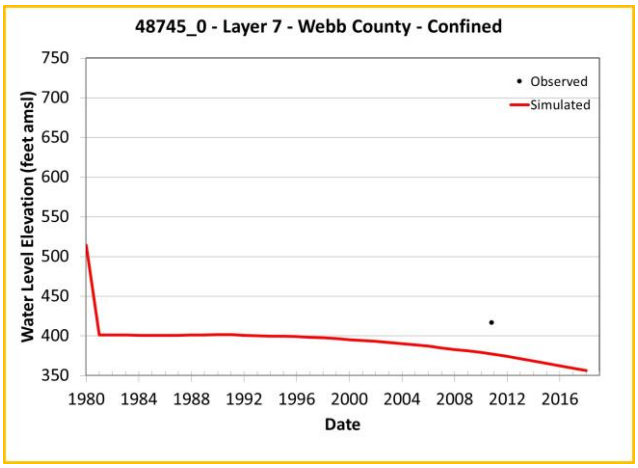












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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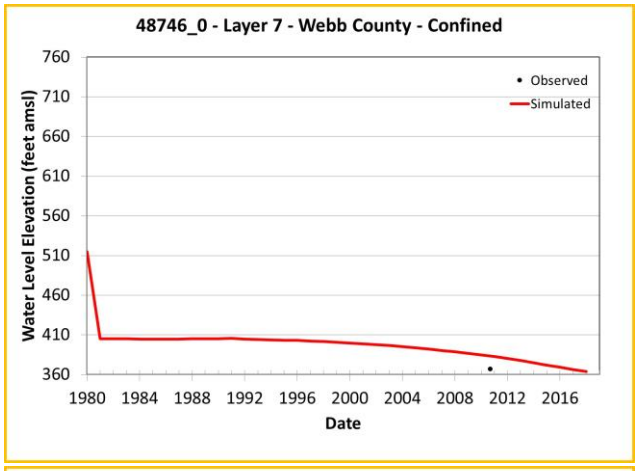
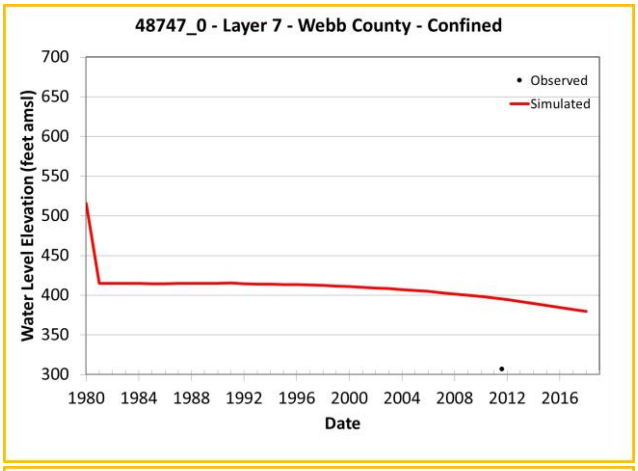
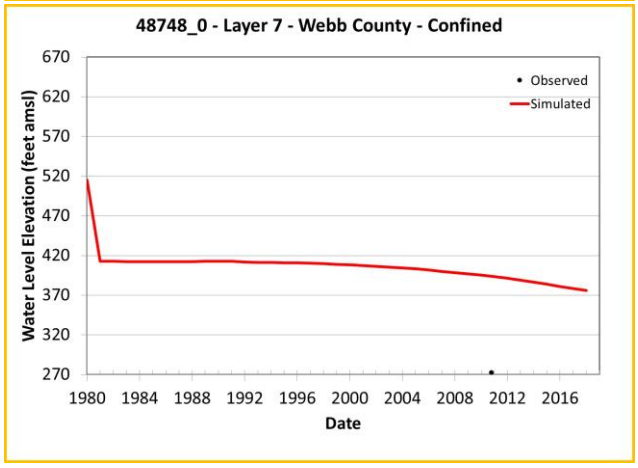
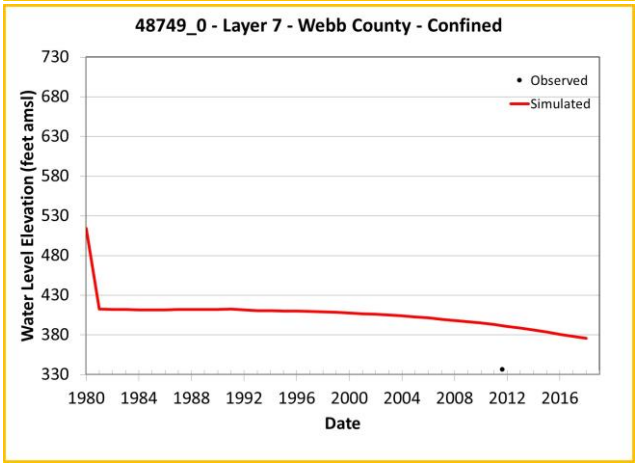
FIGURE I-18.3h

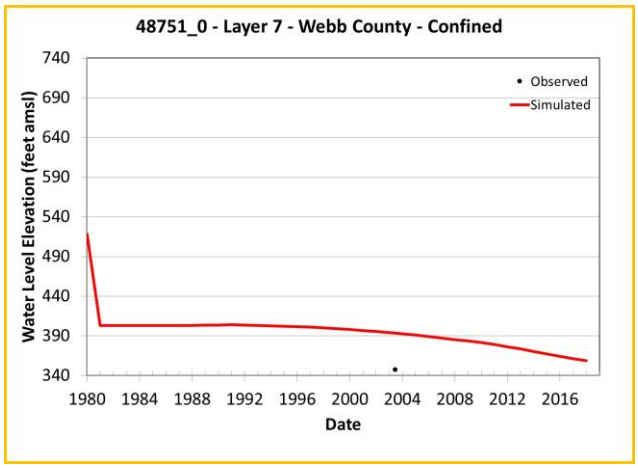
GSI ENVIRONMENTAL

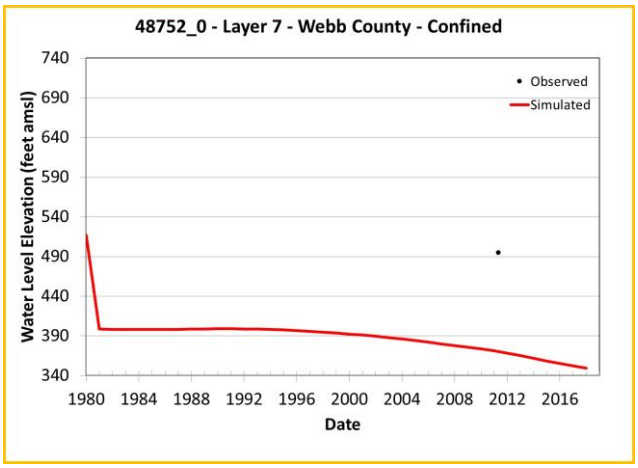












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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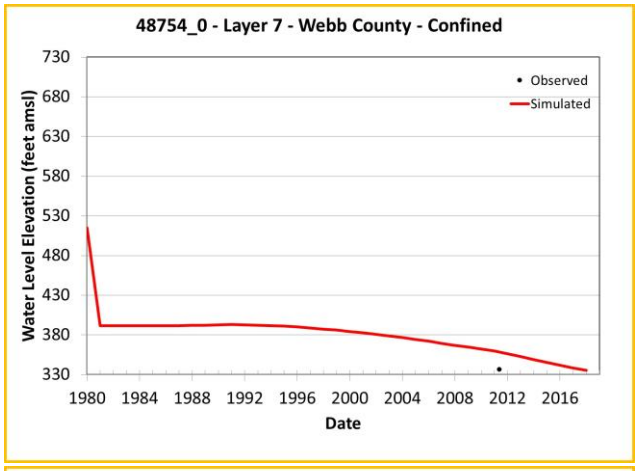
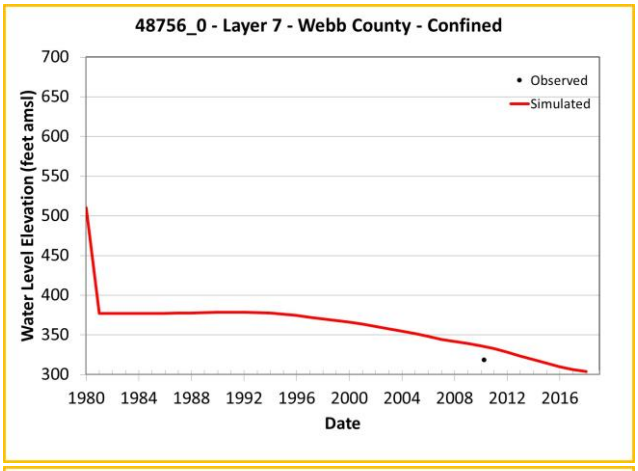
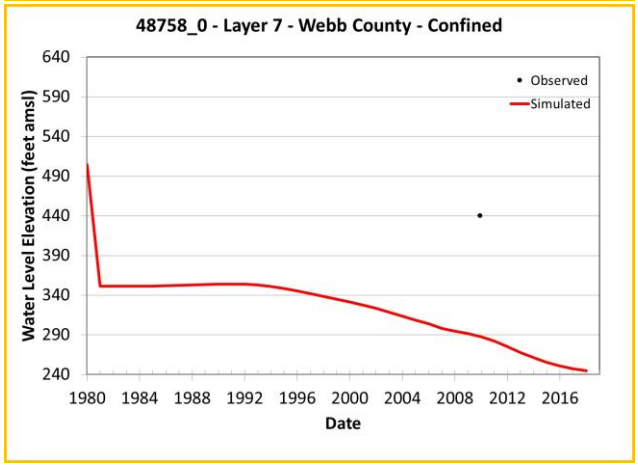
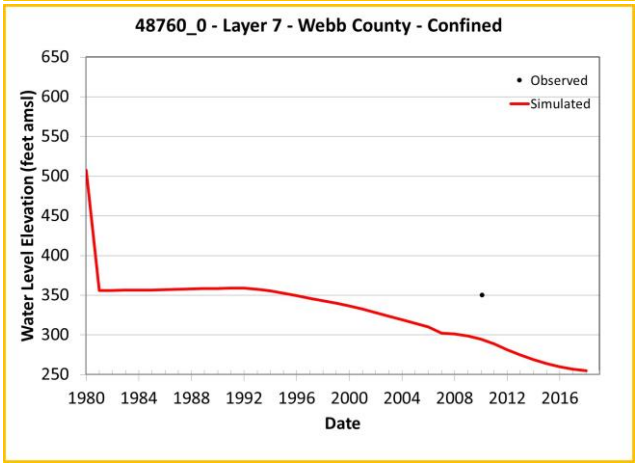
FIGURE I-18.3i

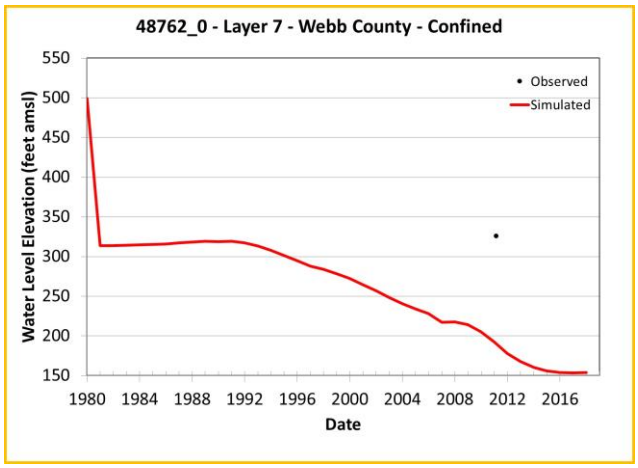
GSI ENVIRONMENTAL

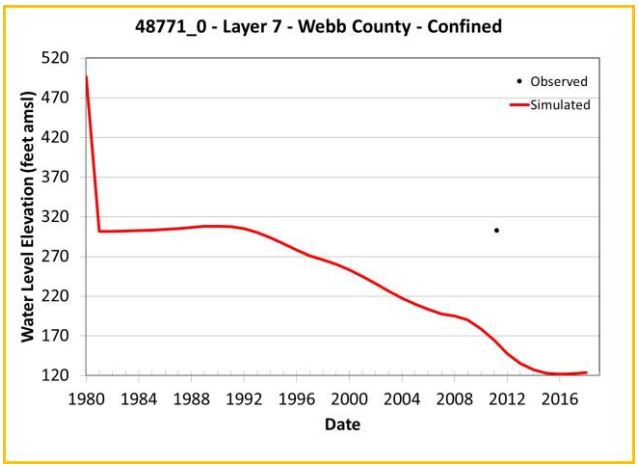












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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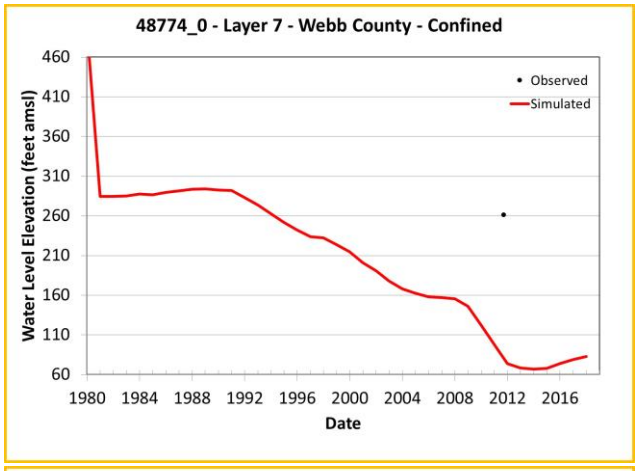
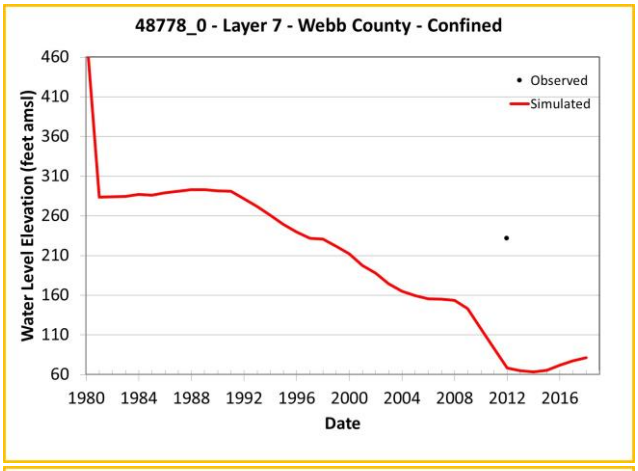
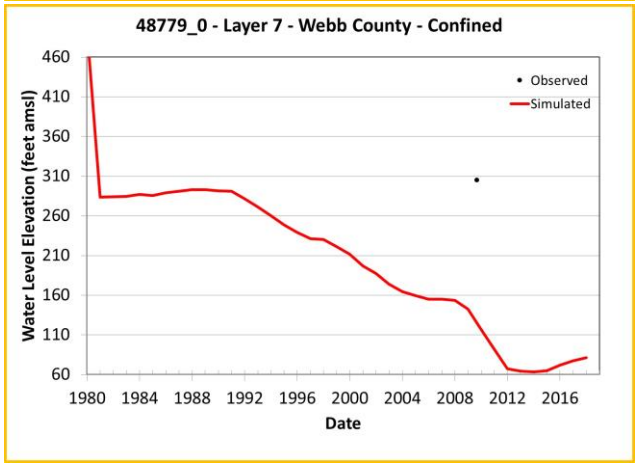
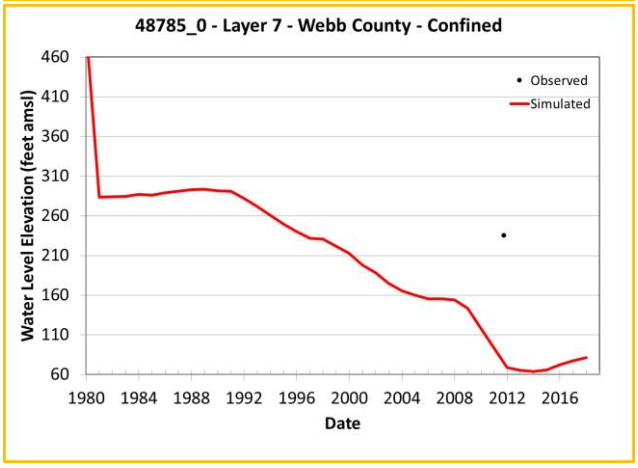
FIGURE I-18.3j

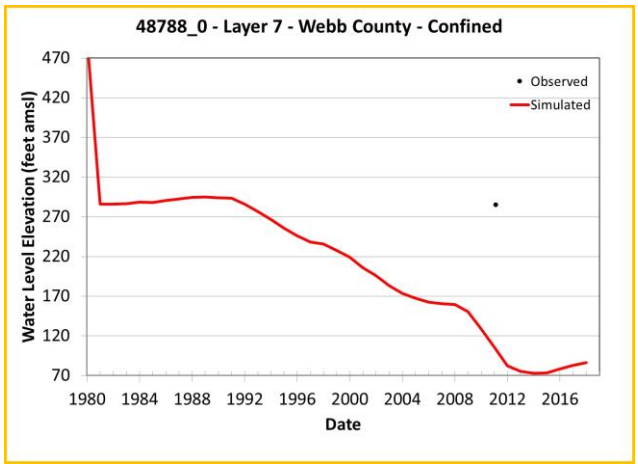
GSI ENVIRONMENTAL

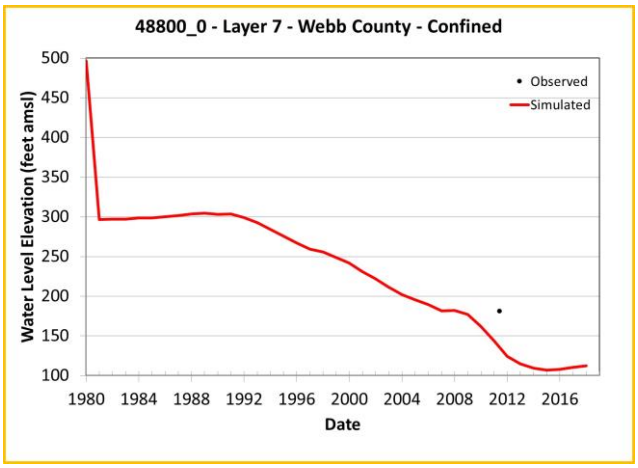












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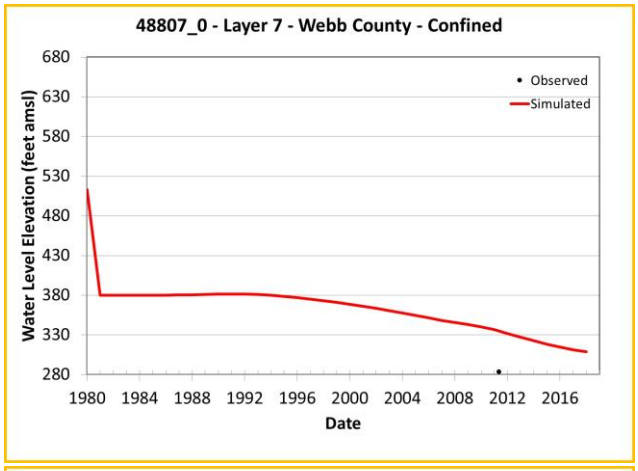
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

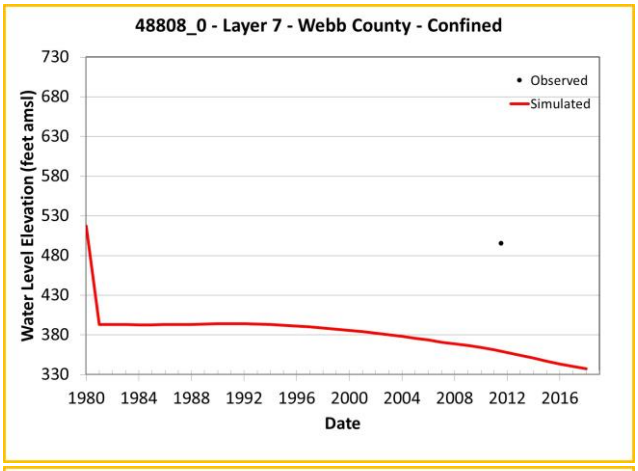
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

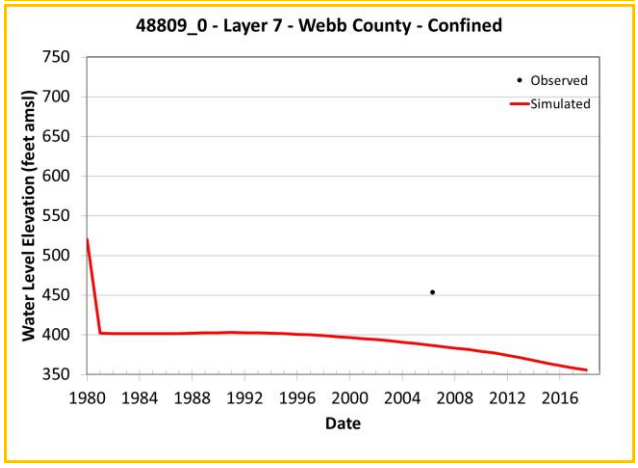
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

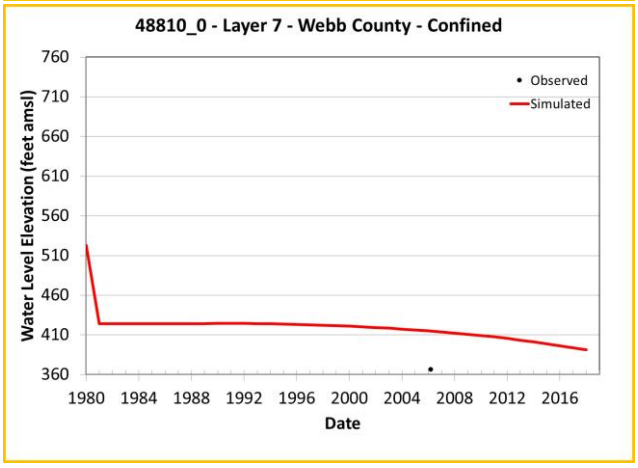
FIGURE I-18.3k

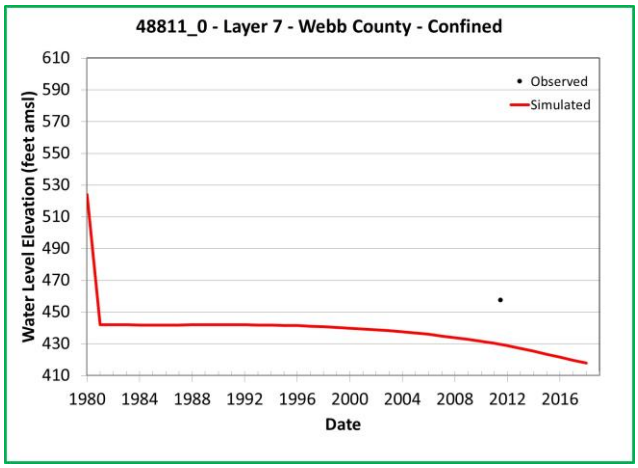
GSI ENVIRONMENTAL

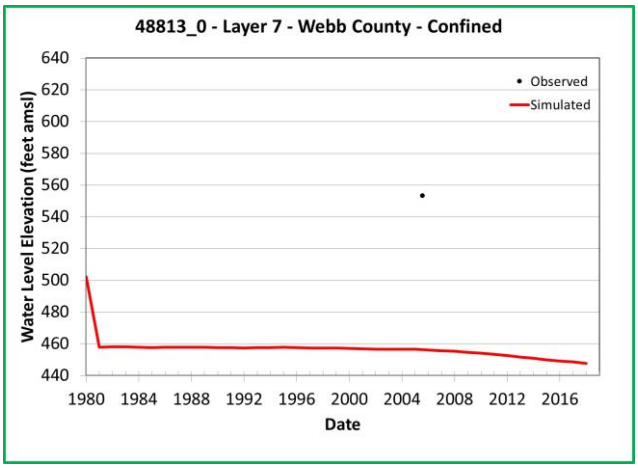












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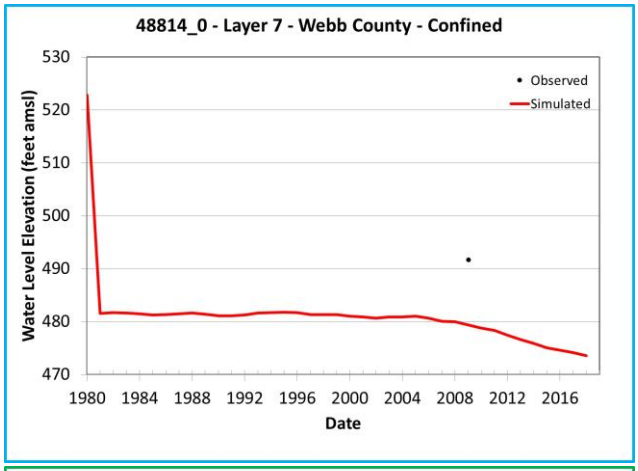
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

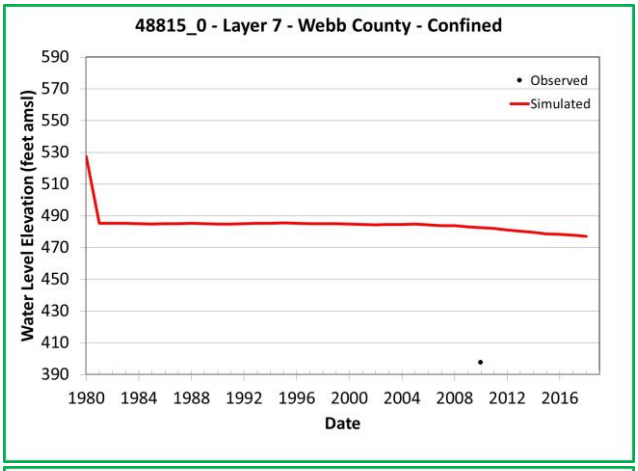
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

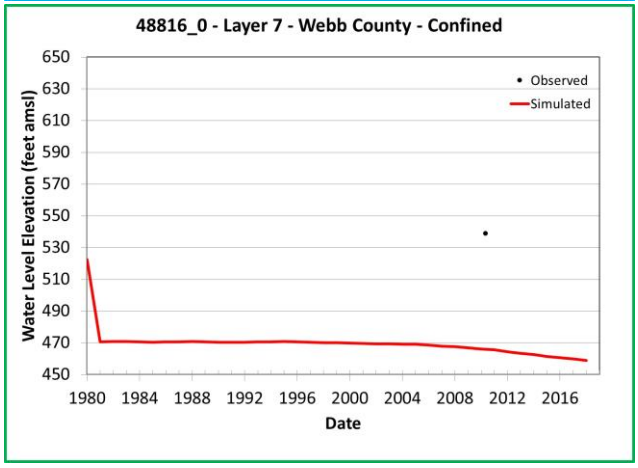
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

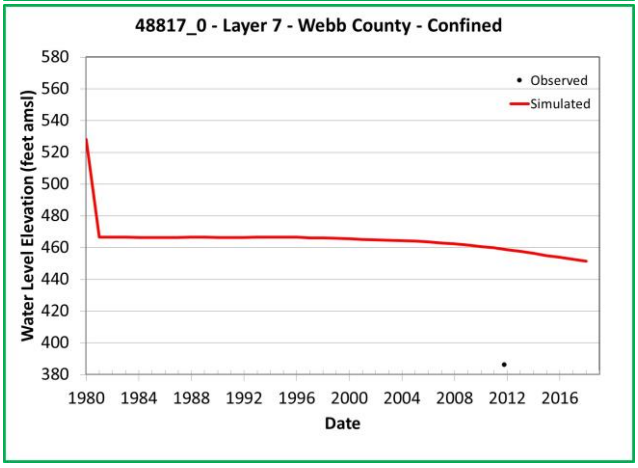
FIGURE I-18.3l

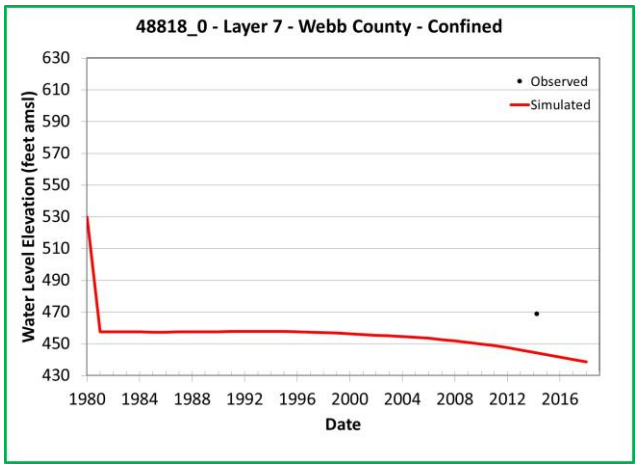
GSI ENVIRONMENTAL

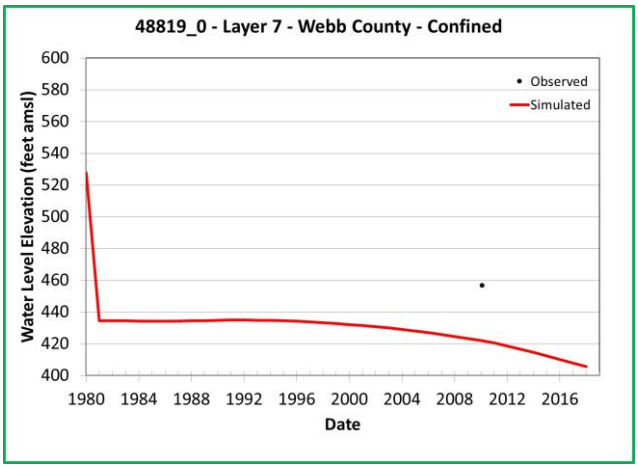












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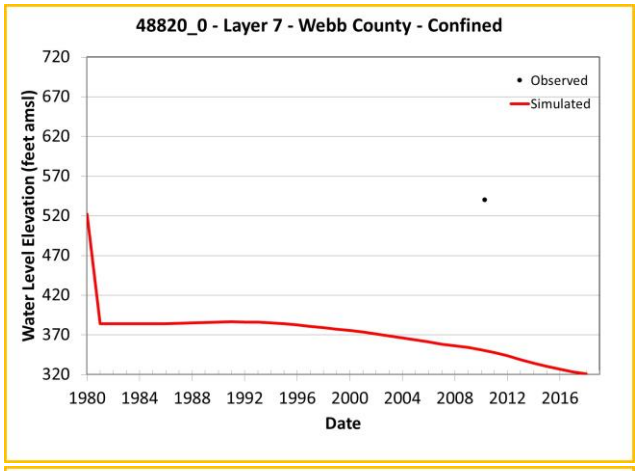
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

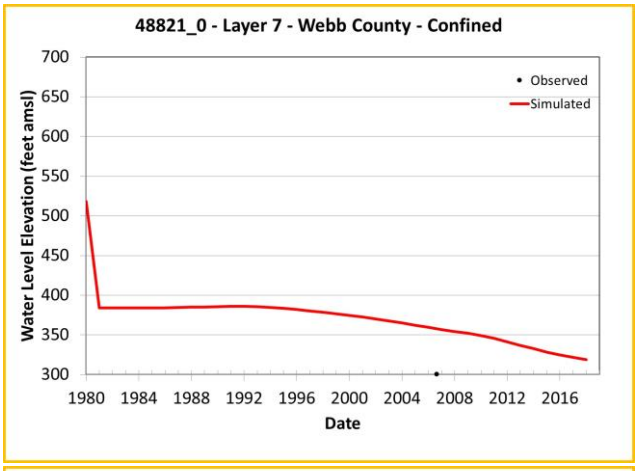
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

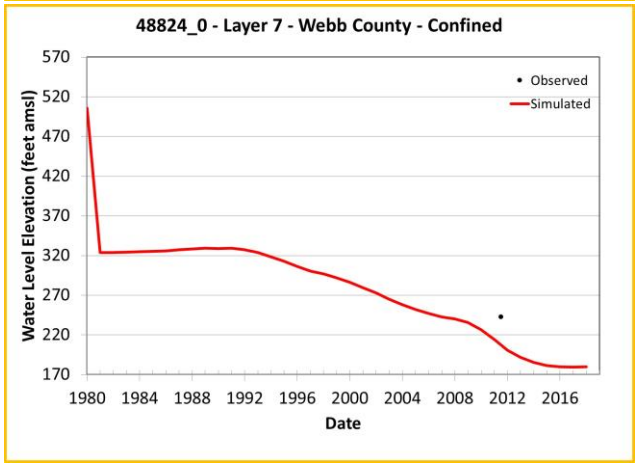
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

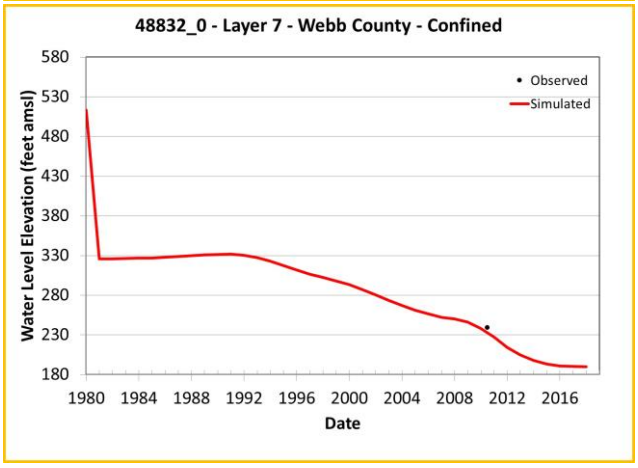
FIGURE I-18.3m

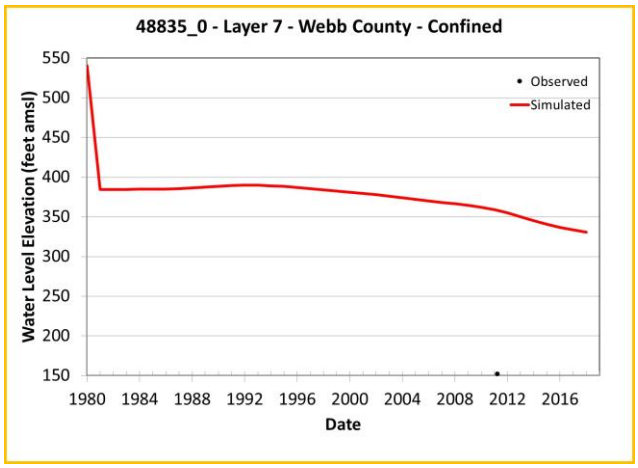
GSI ENVIRONMENTAL

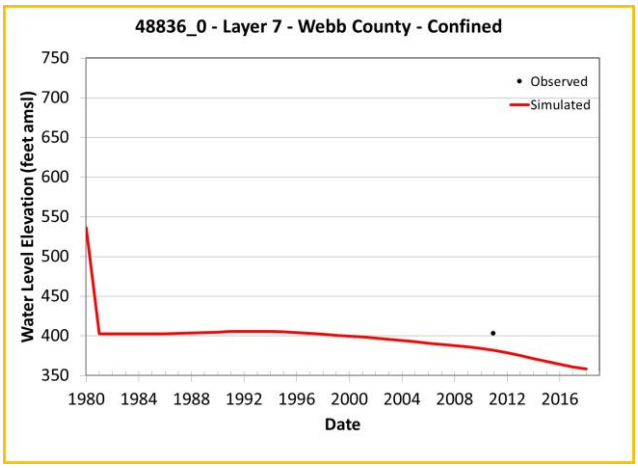












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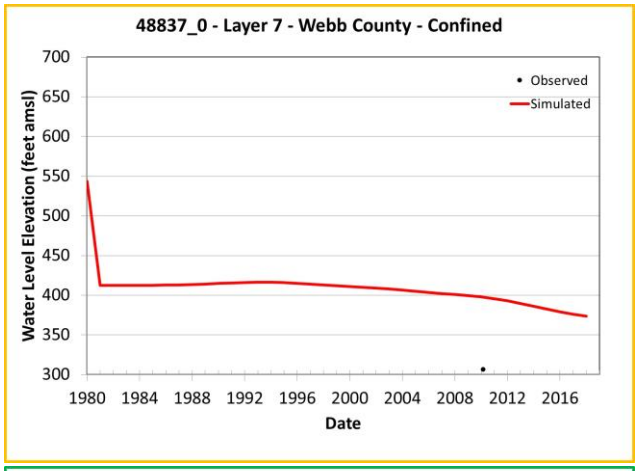
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

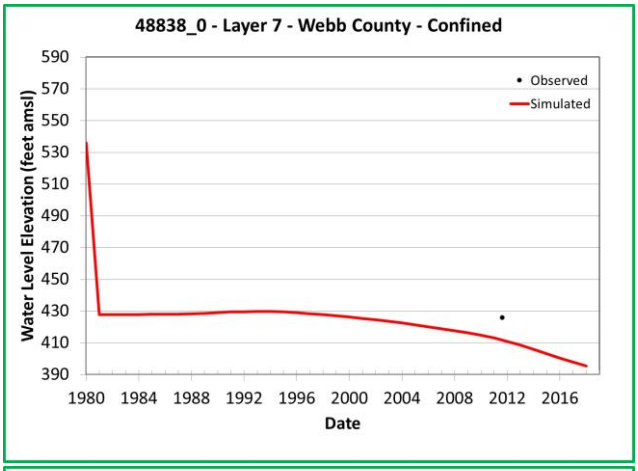
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

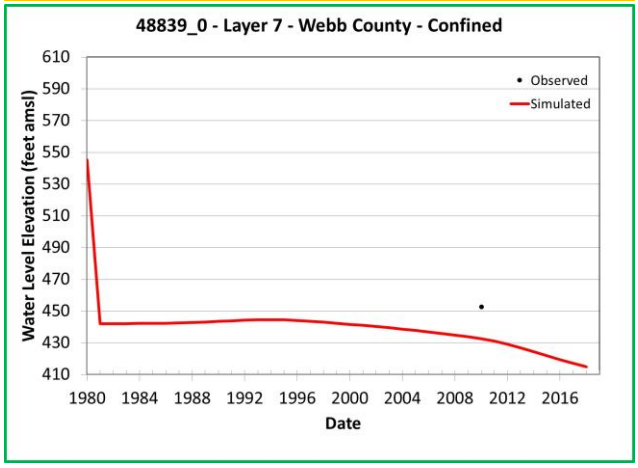
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

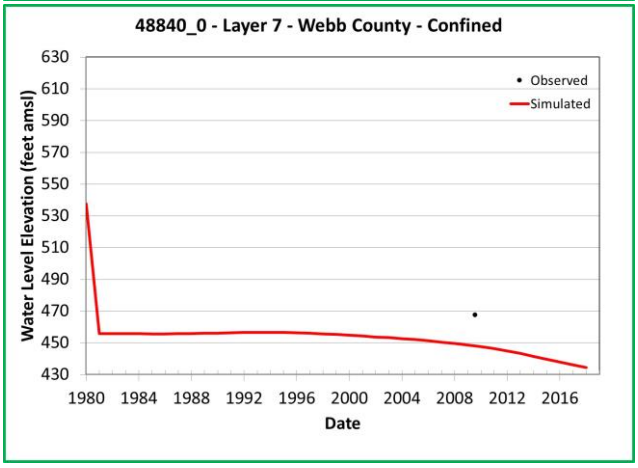
FIGURE I-18.3n

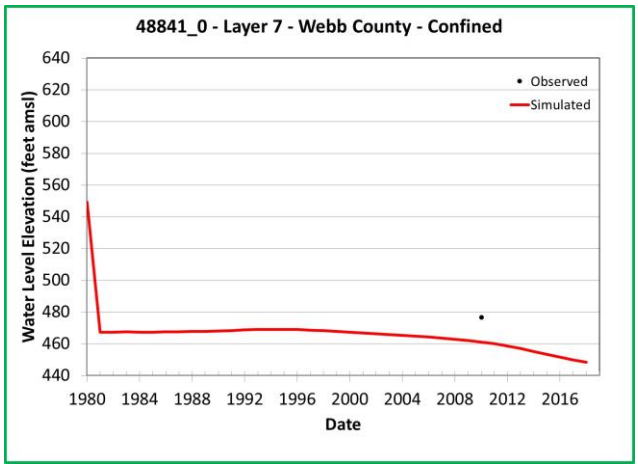
GSI ENVIRONMENTAL

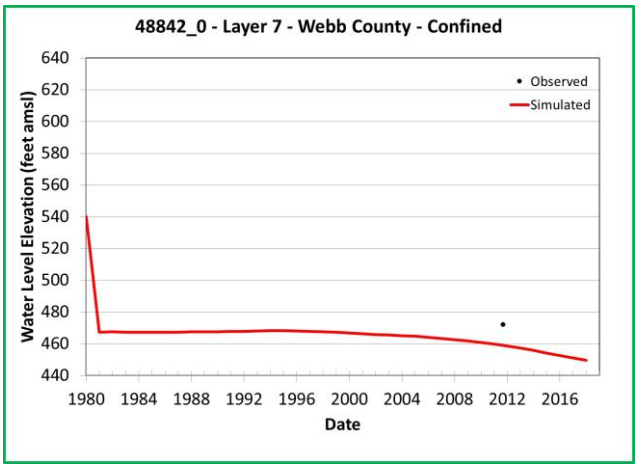












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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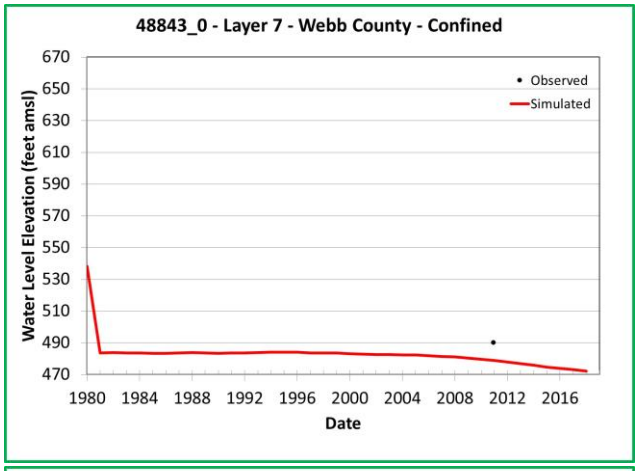
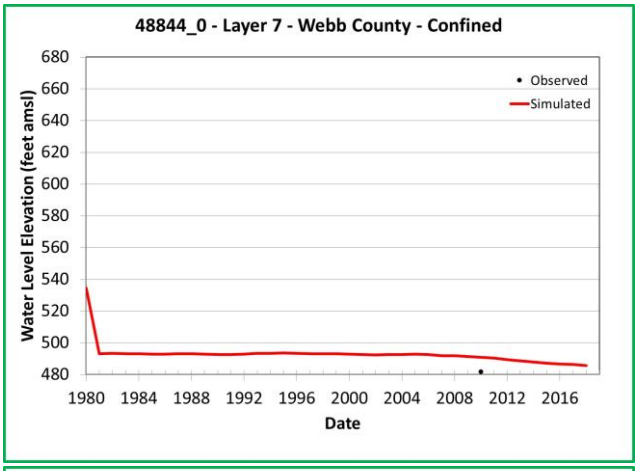
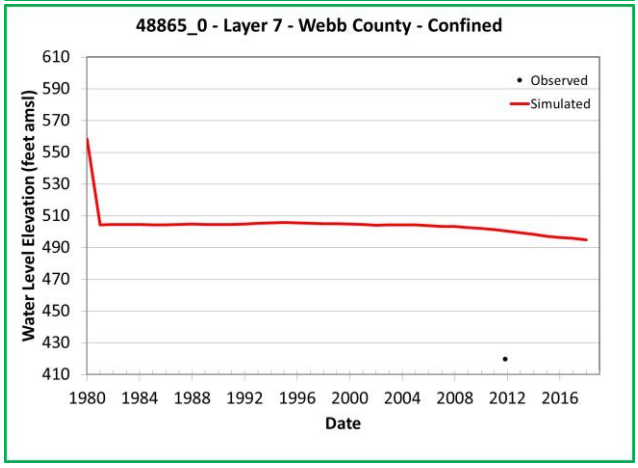
Revised		Aprv'd by	SP

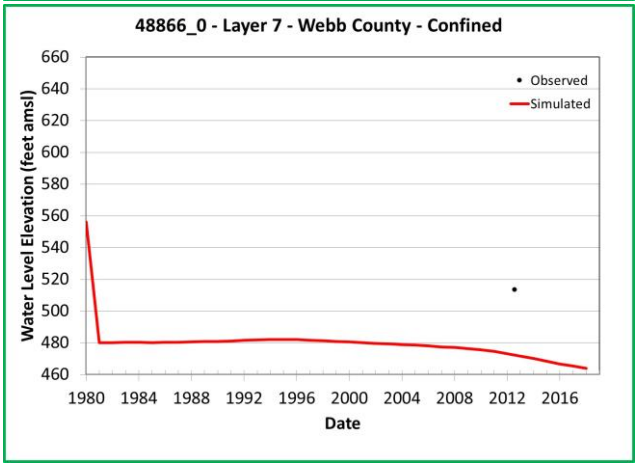
FIGURE I-18.3o

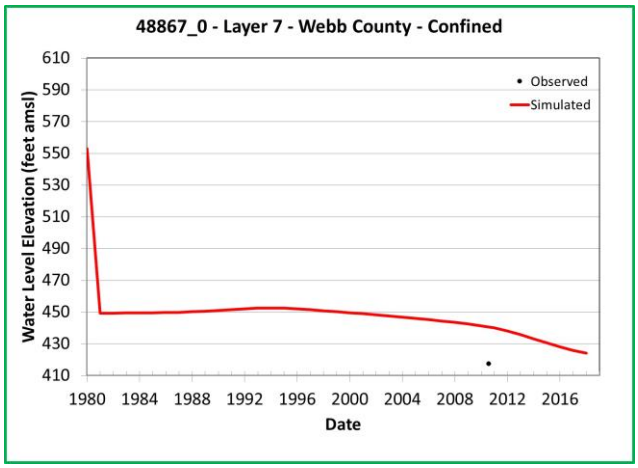
GSI ENVIRONMENTAL

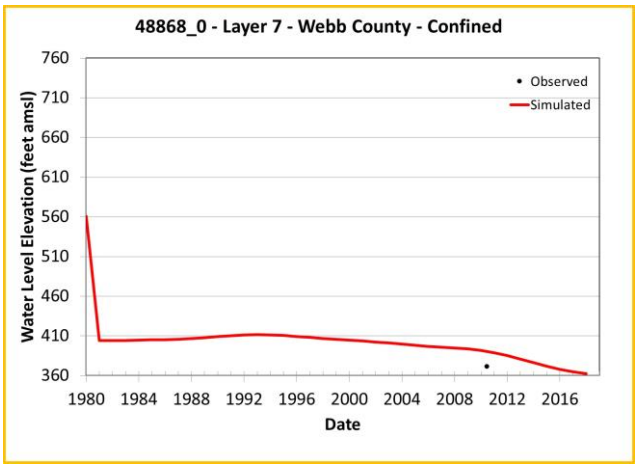












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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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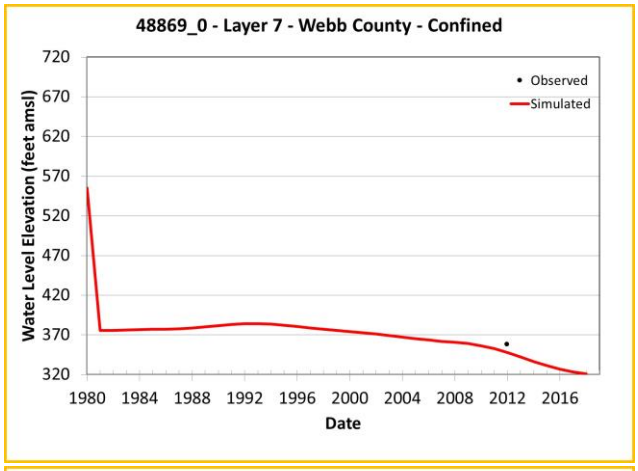
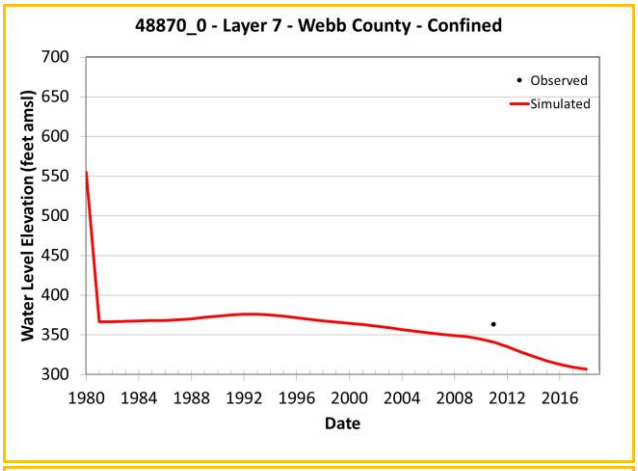
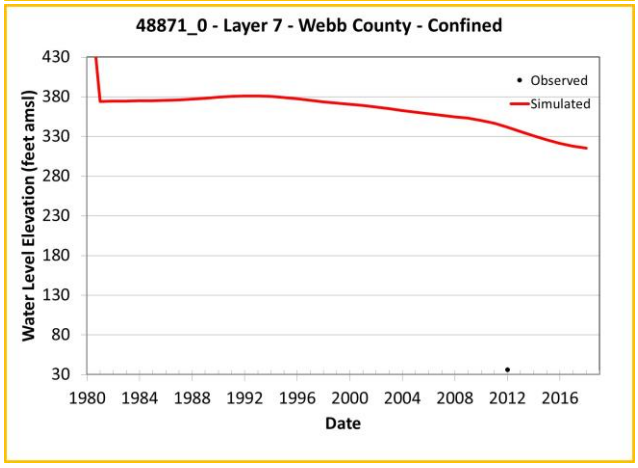
Revised		Aprv'd by	SP

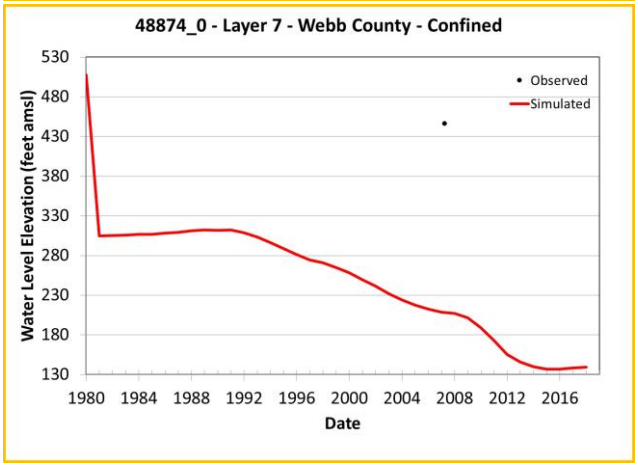
FIGURE I-18.3p

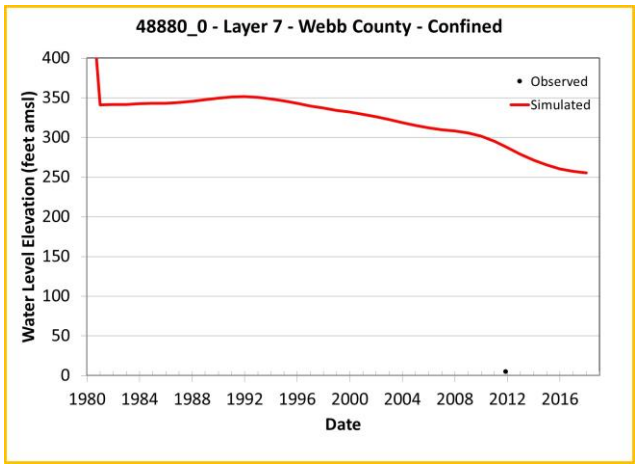
GSI ENVIRONMENTAL

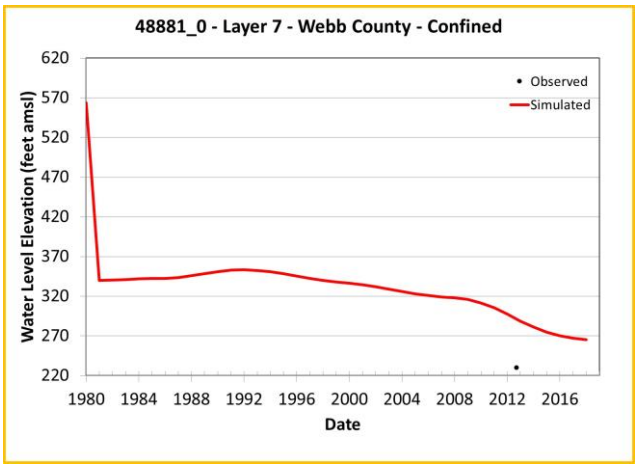












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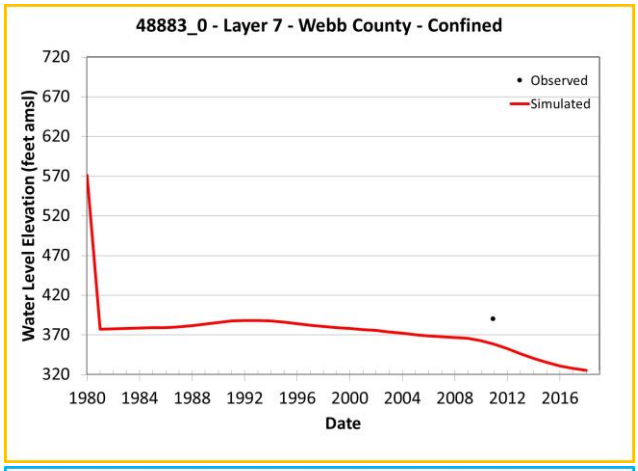
Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

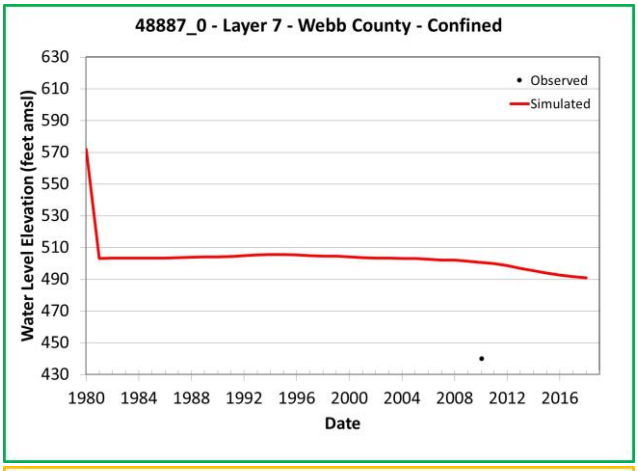
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

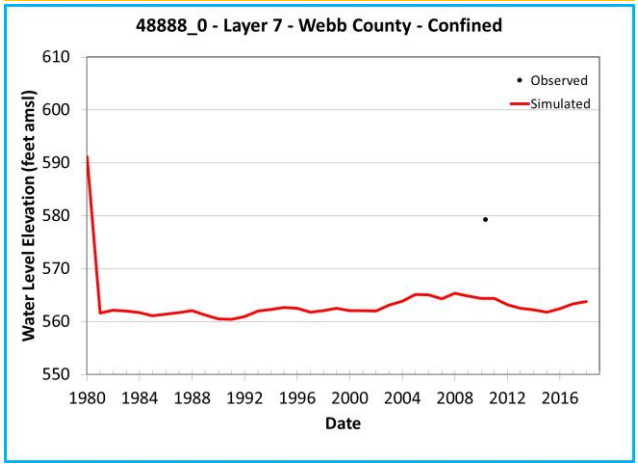
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

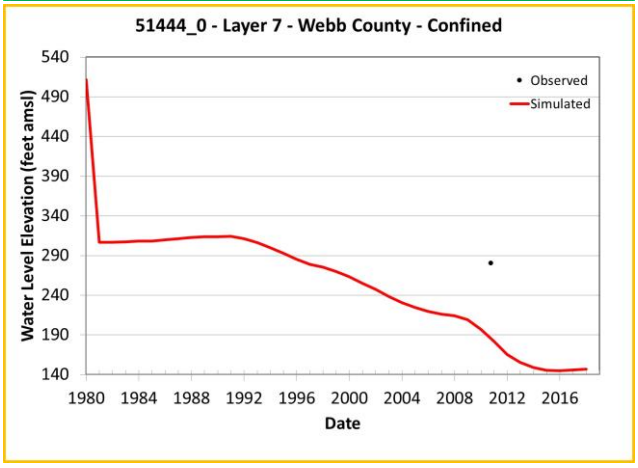
FIGURE I-18.3q

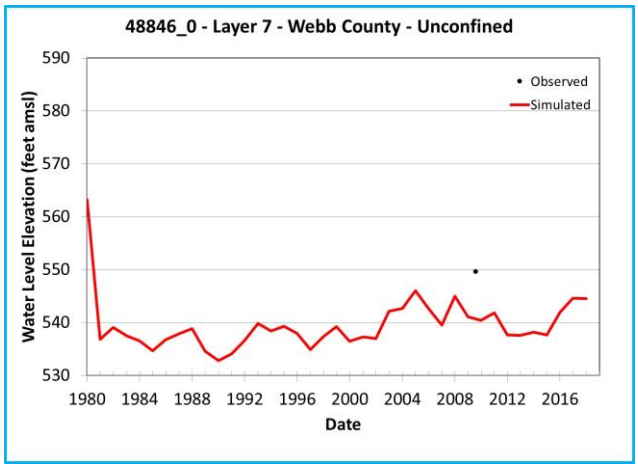
GSI ENVIRONMENTAL











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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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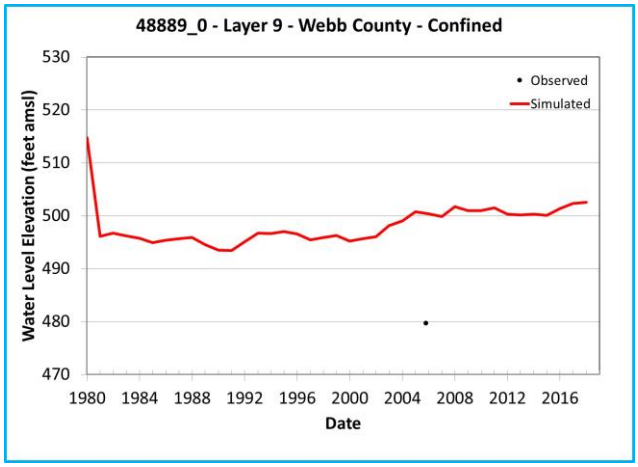
FIGURE I-18.3r

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Webb County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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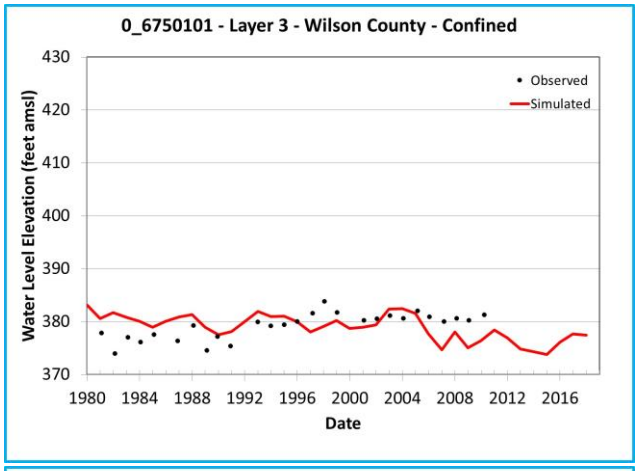
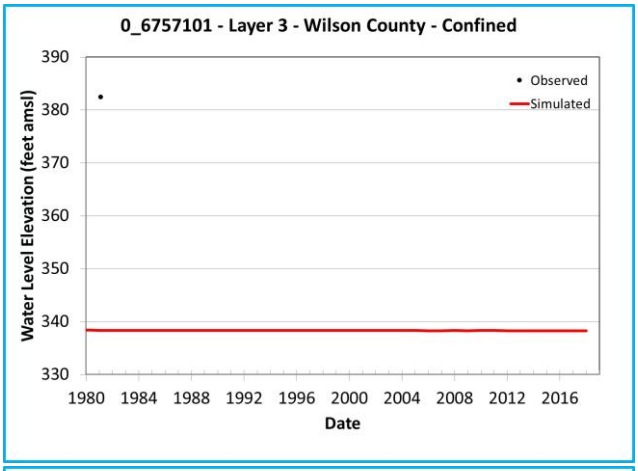
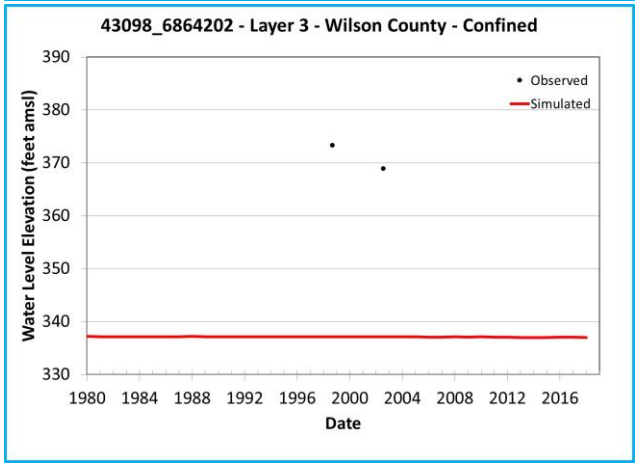
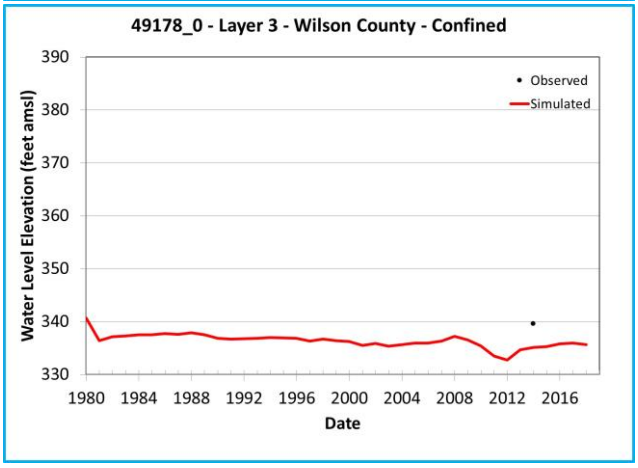
FIGURE I-18.4a

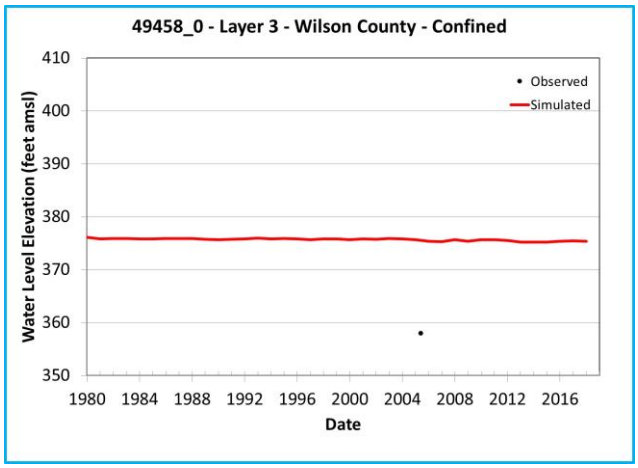
GSI ENVIRONMENTAL

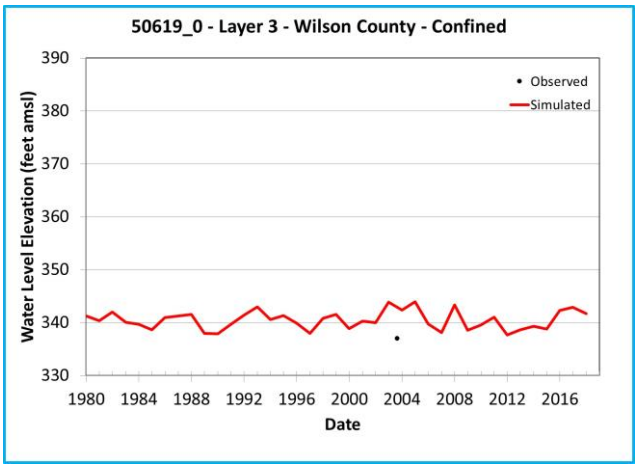












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

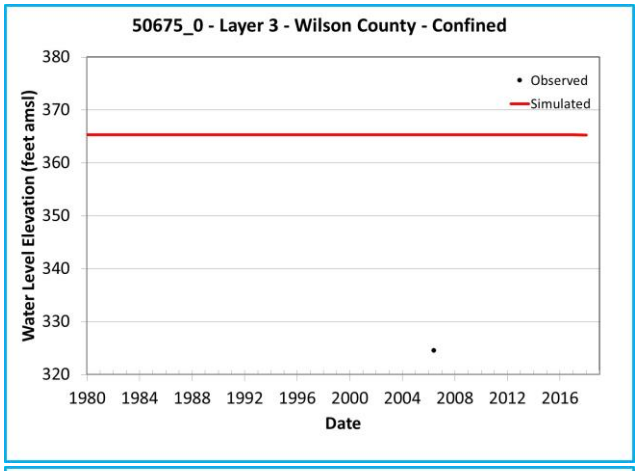
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 3

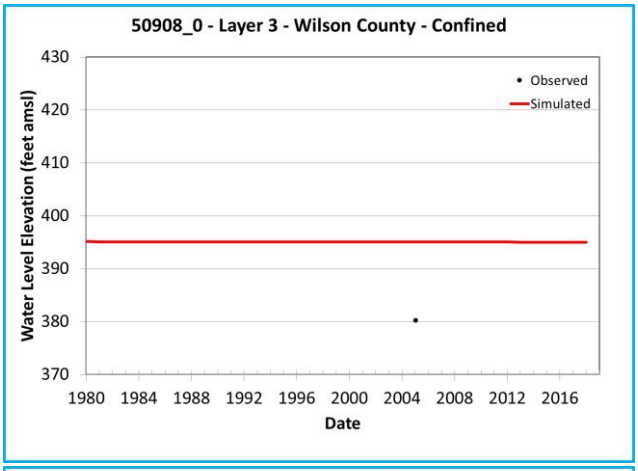
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

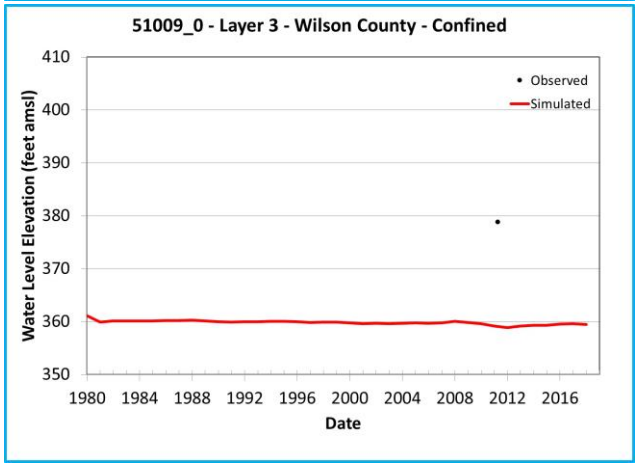
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

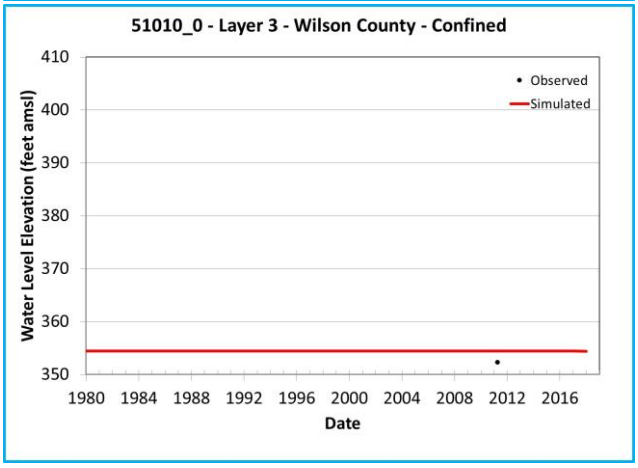
FIGURE I-19.1a

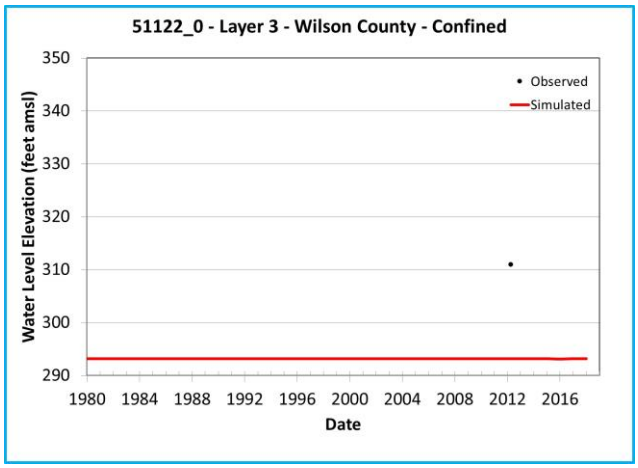
GSI ENVIRONMENTAL

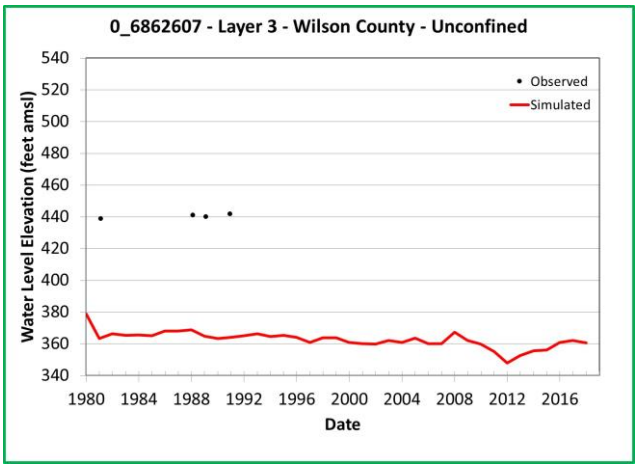












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 3

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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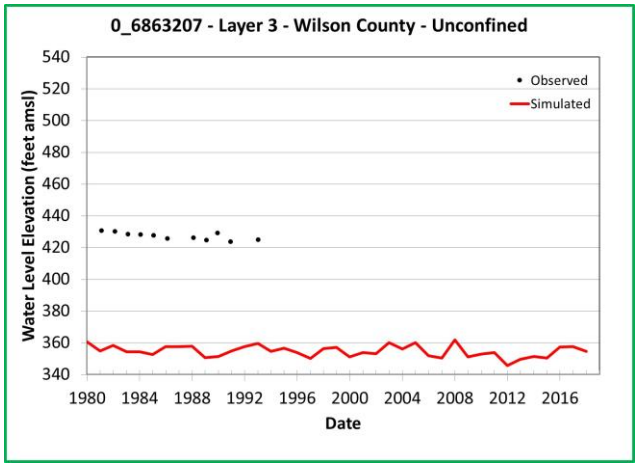
FIGURE I-19.1b

GSI ENVIRONMENTAL



Note: Chart outline color indicates Y-axis range.

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Blue = 60 feet

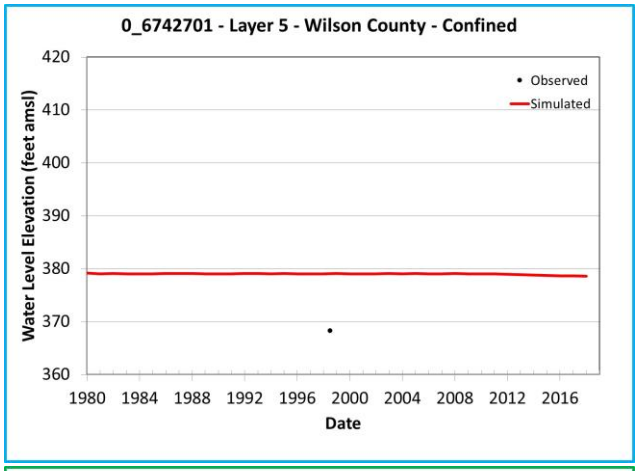
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 3

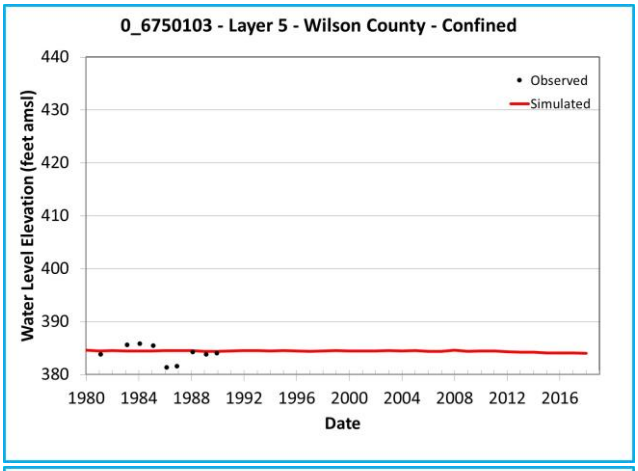
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

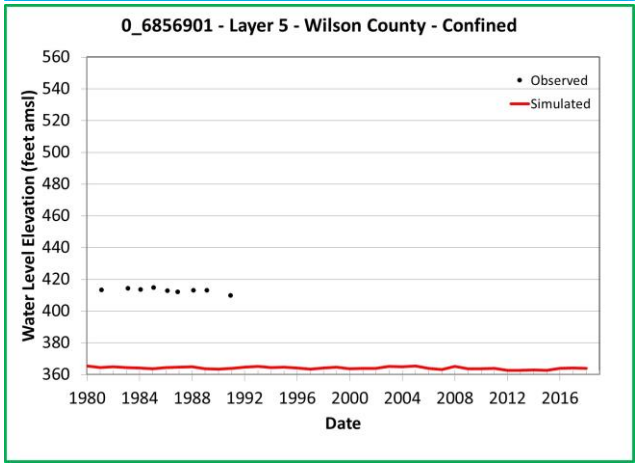
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

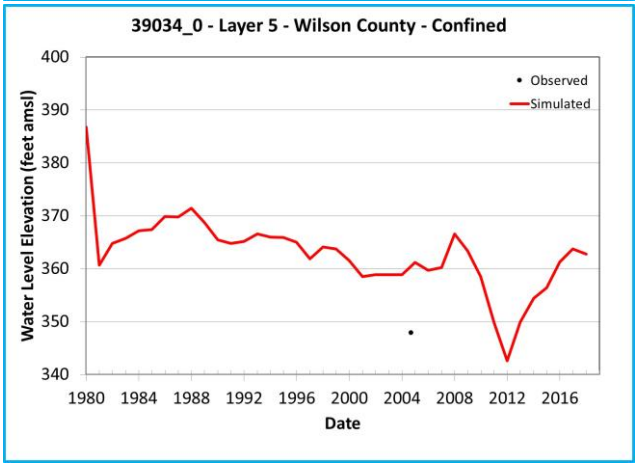
FIGURE I-19.1c

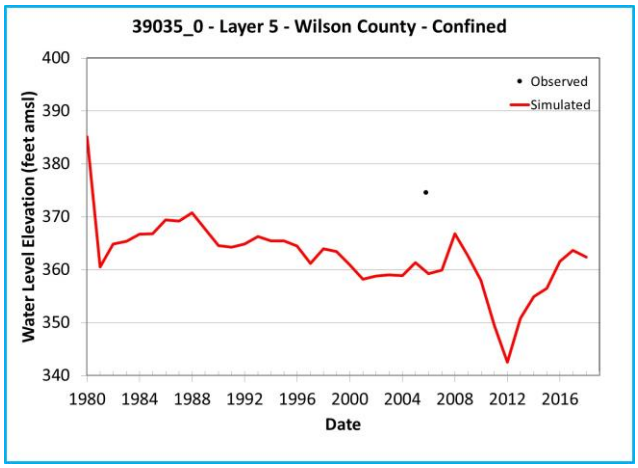
GSI ENVIRONMENTAL

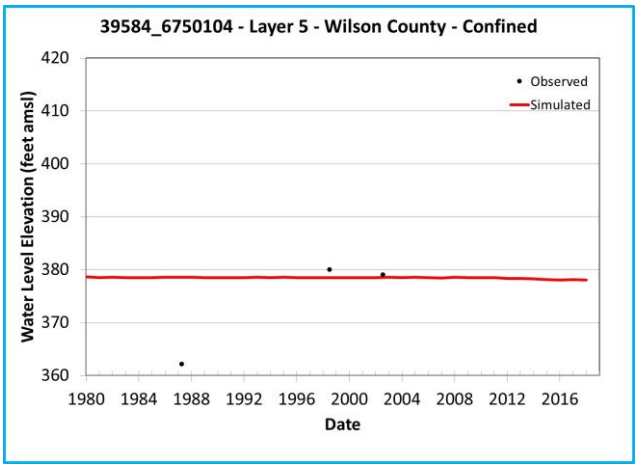












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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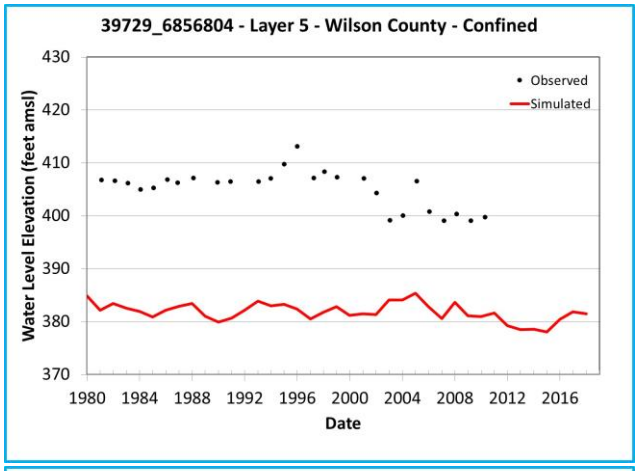
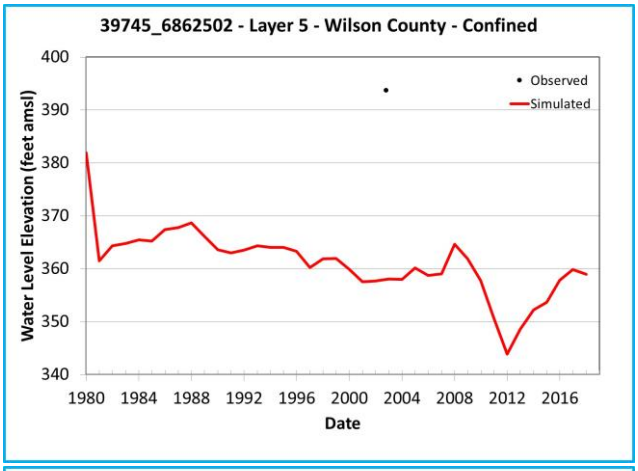
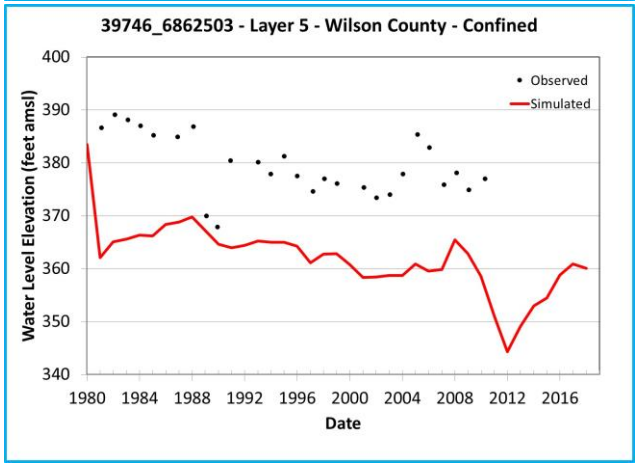
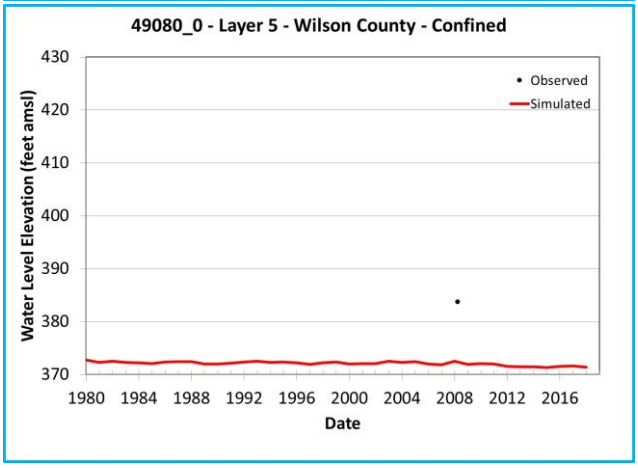
FIGURE I-19.2a

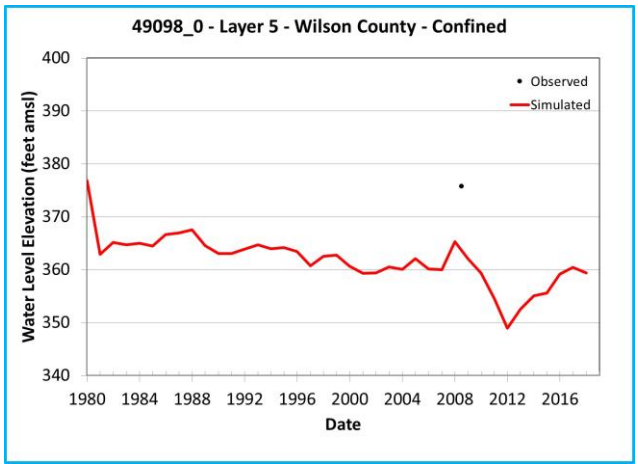
GSI ENVIRONMENTAL

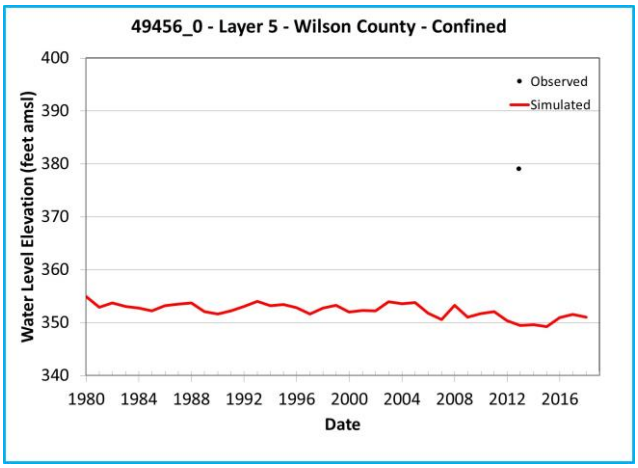












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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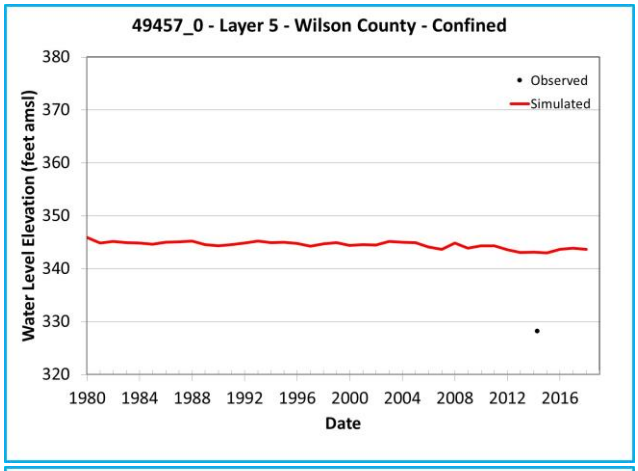
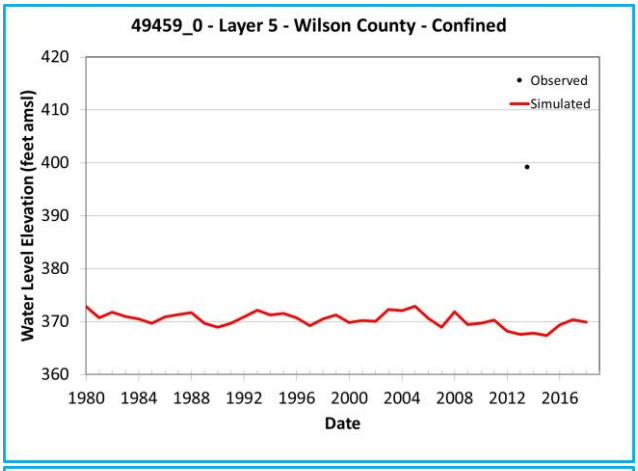
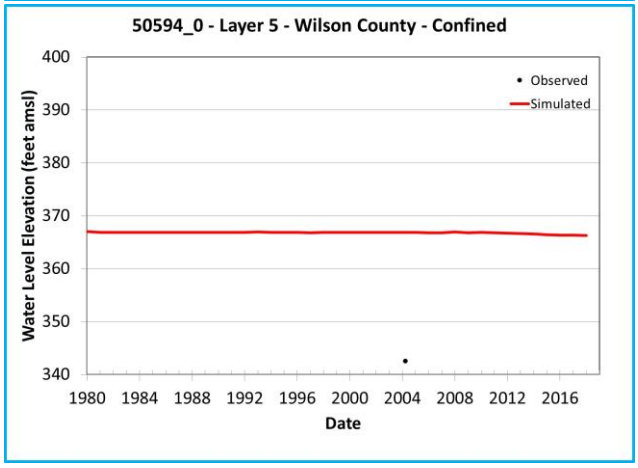
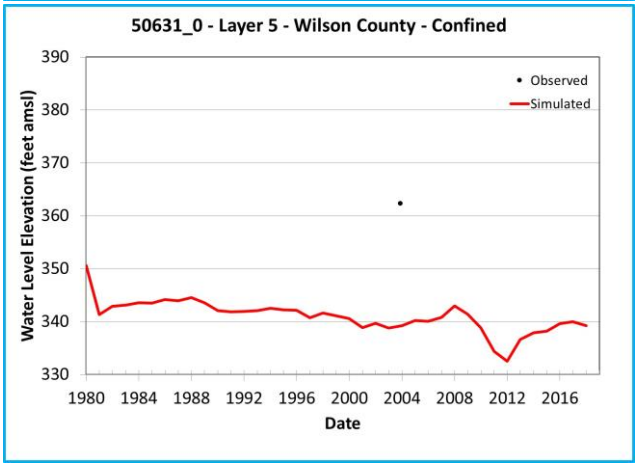
FIGURE I-19.2b

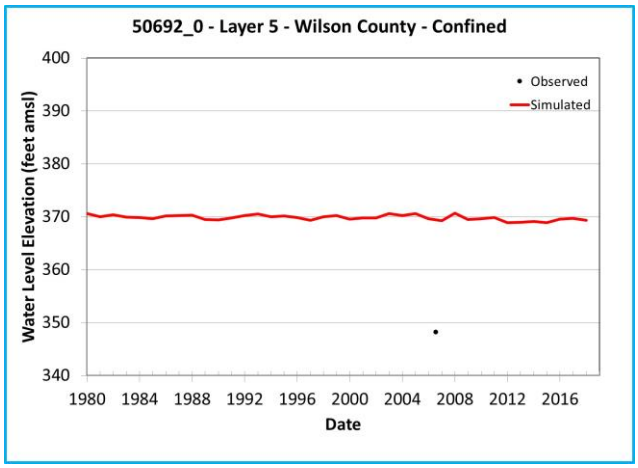
GSI ENVIRONMENTAL

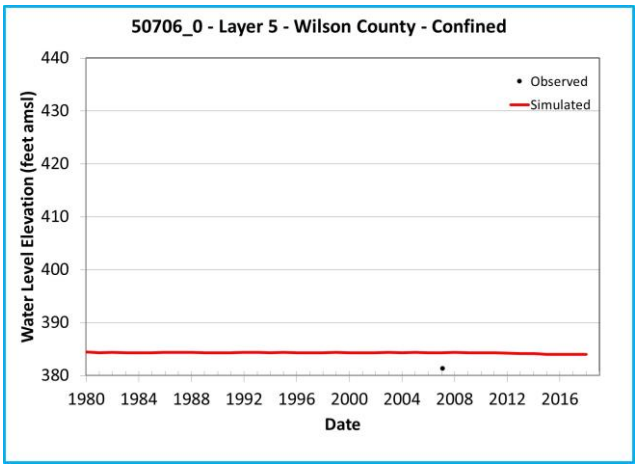












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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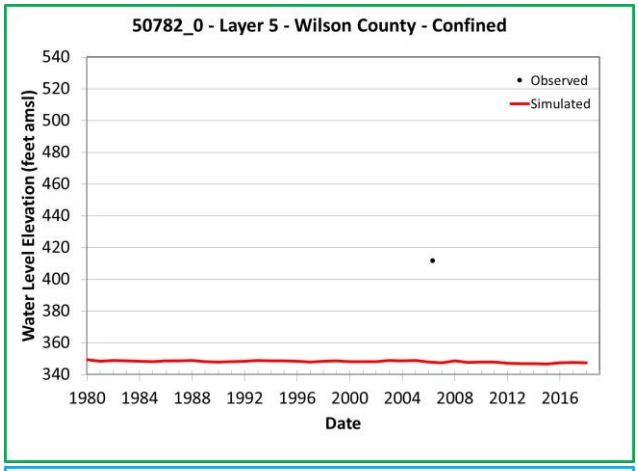
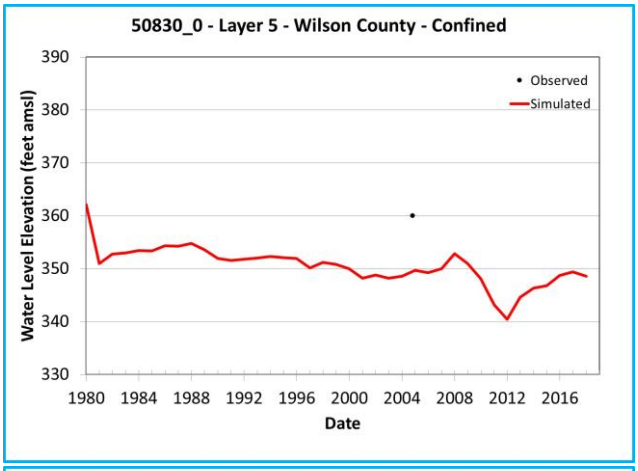
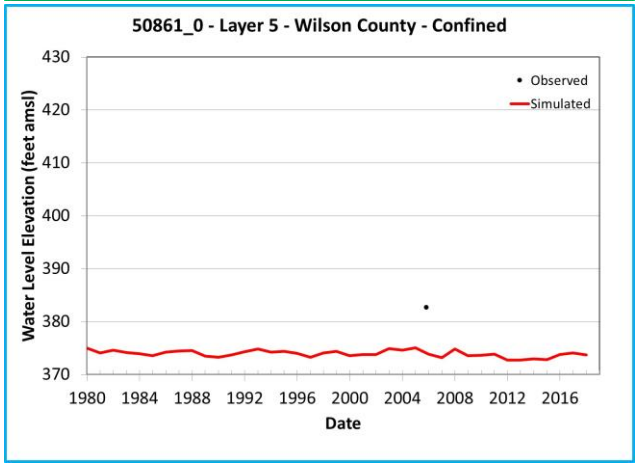
Revised		Aprv'd by	SP

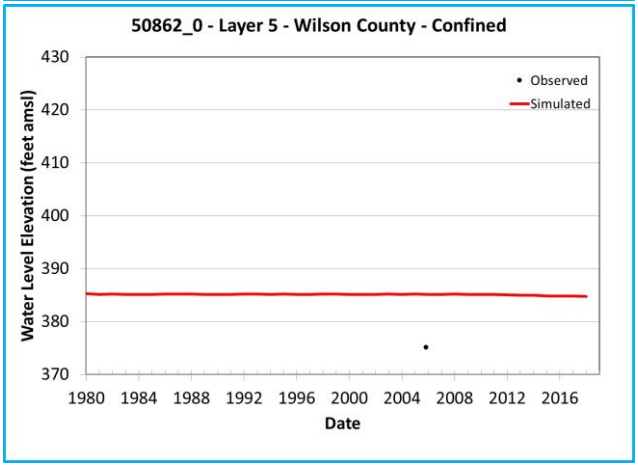
FIGURE I-19.2c

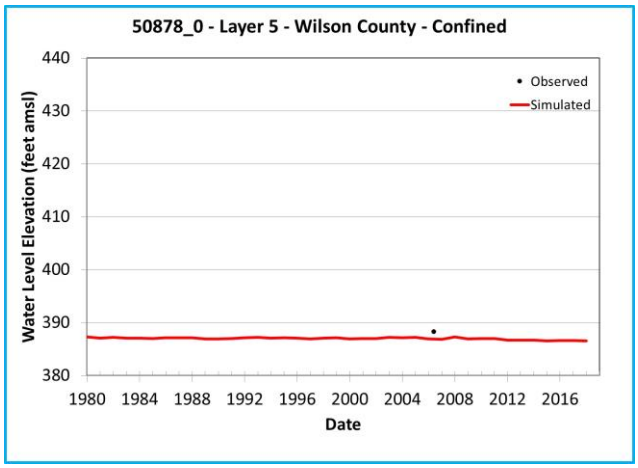
GSI ENVIRONMENTAL

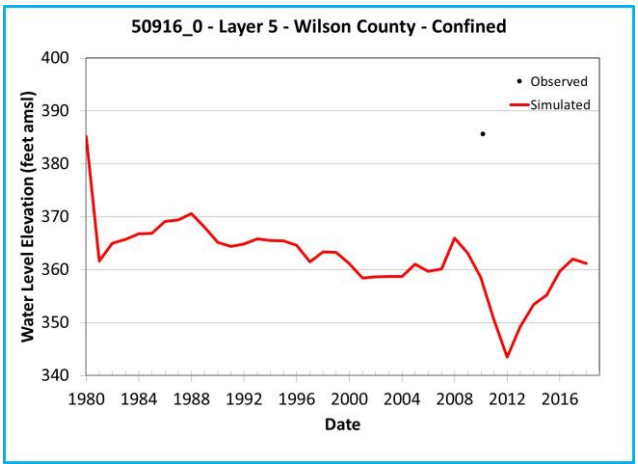












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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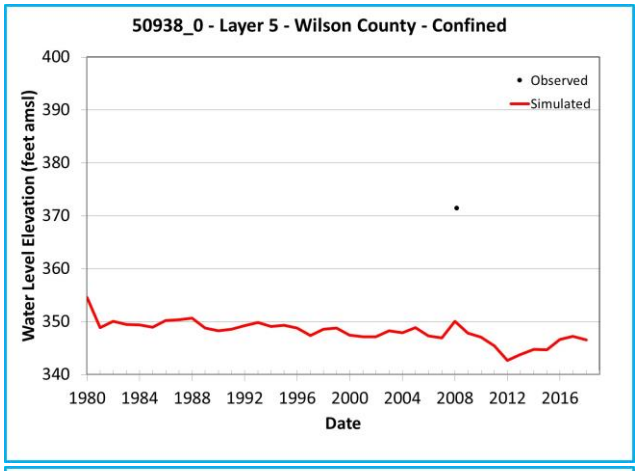
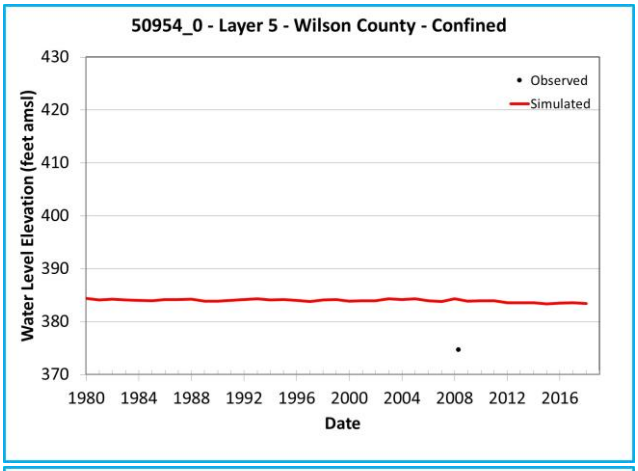
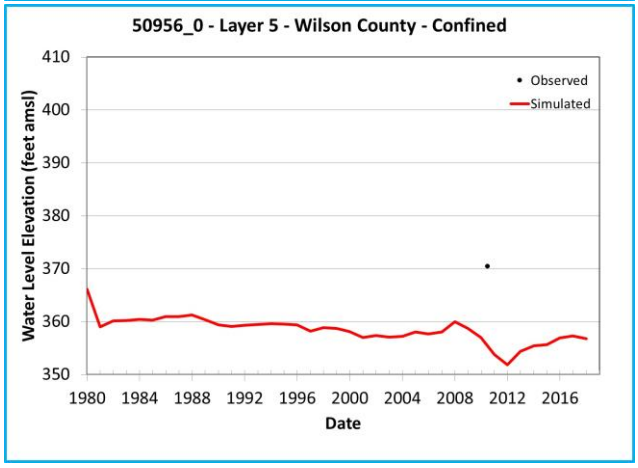
Revised		Aprv'd by	SP

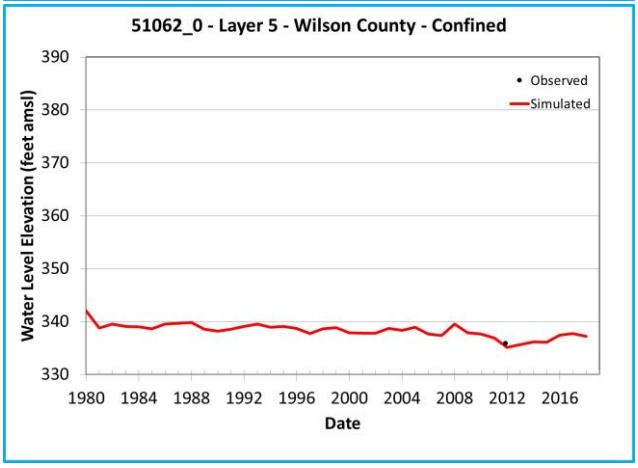
FIGURE I-19.2d

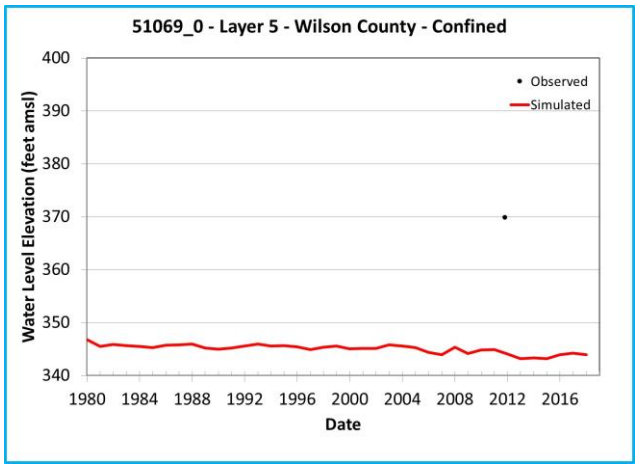
GSI ENVIRONMENTAL

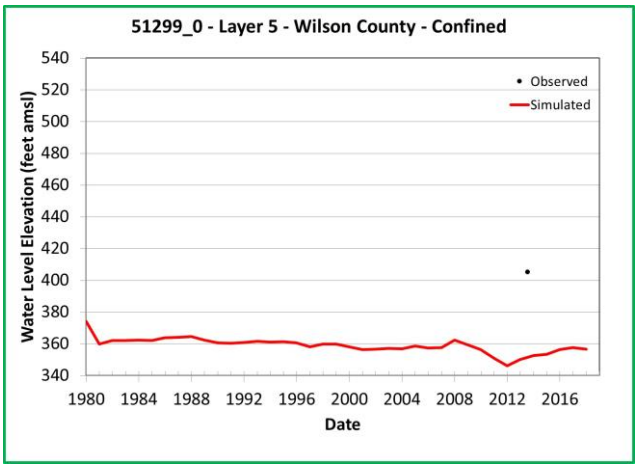












Note: Chart outline color indicates Y-axis range.
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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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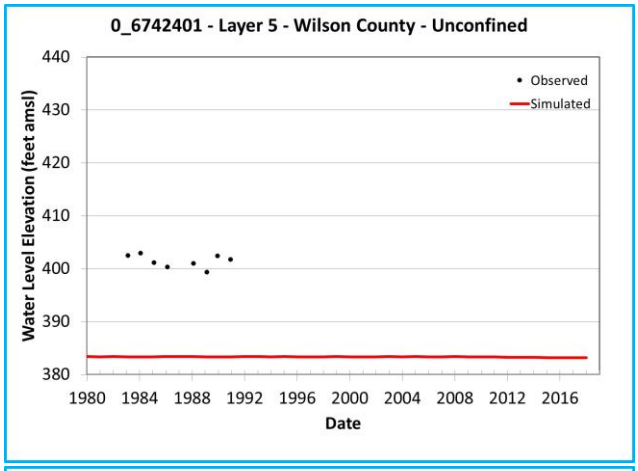
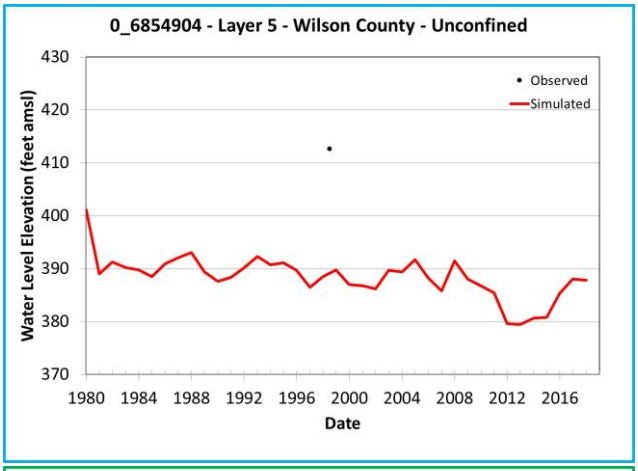
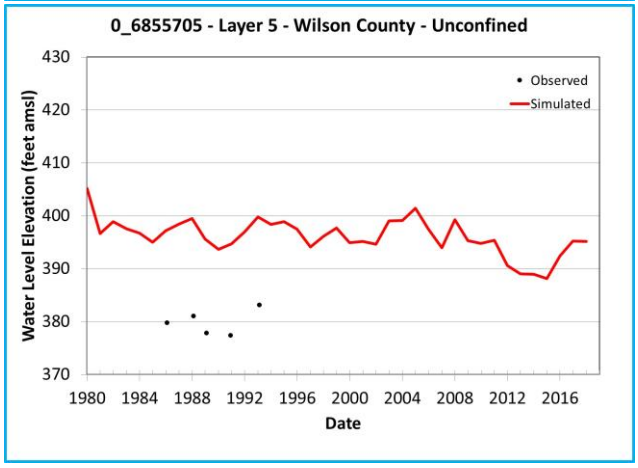
Revised		Aprv'd by	SP

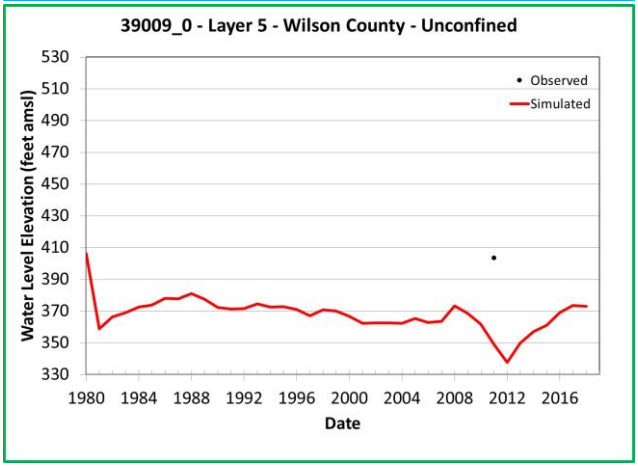
FIGURE I-19.2e

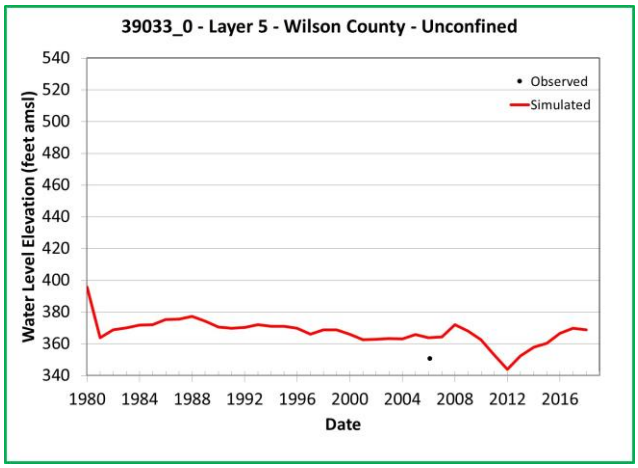
GSI ENVIRONMENTAL

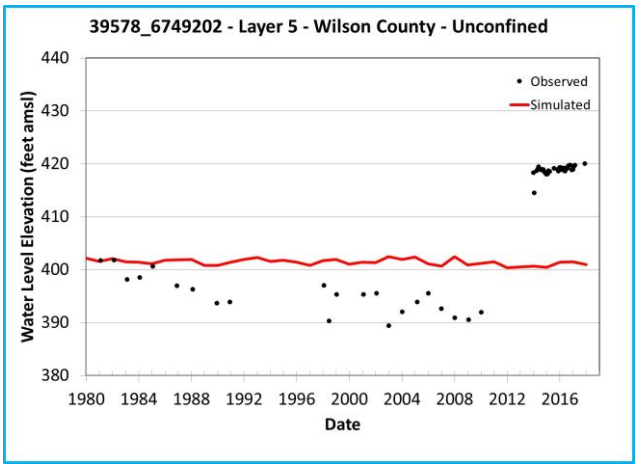












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

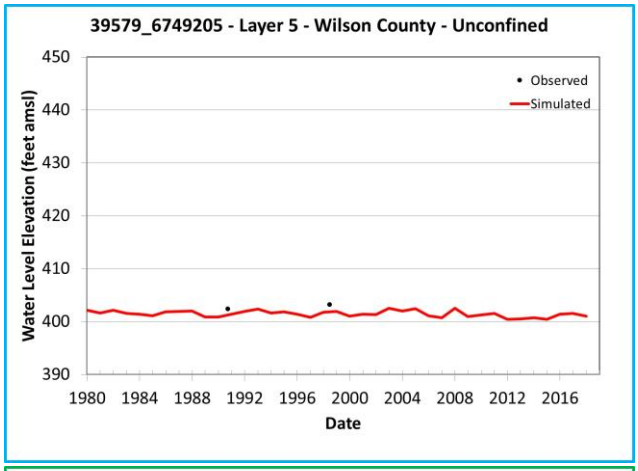
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

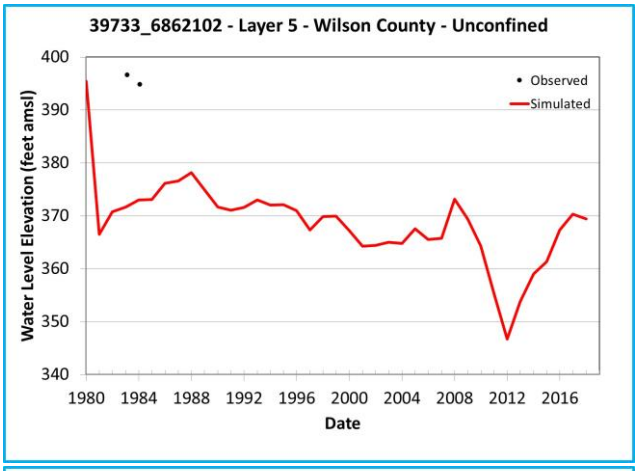
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

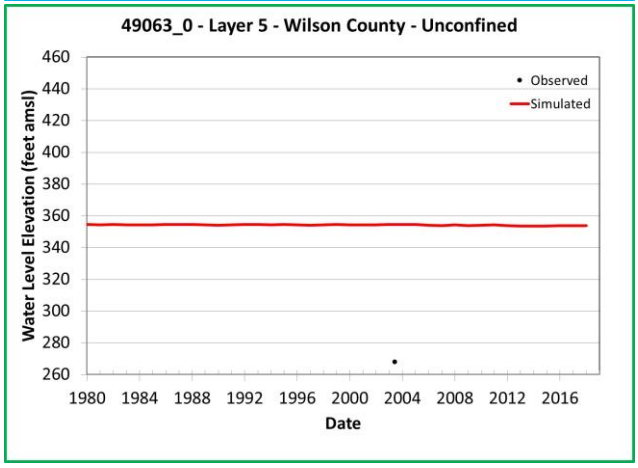
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

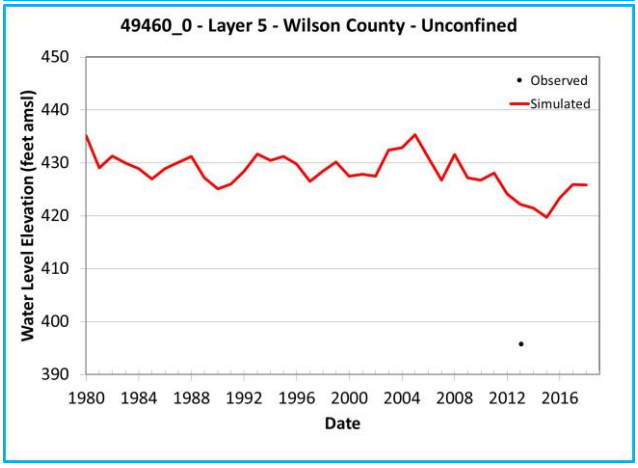
FIGURE I-19.2f

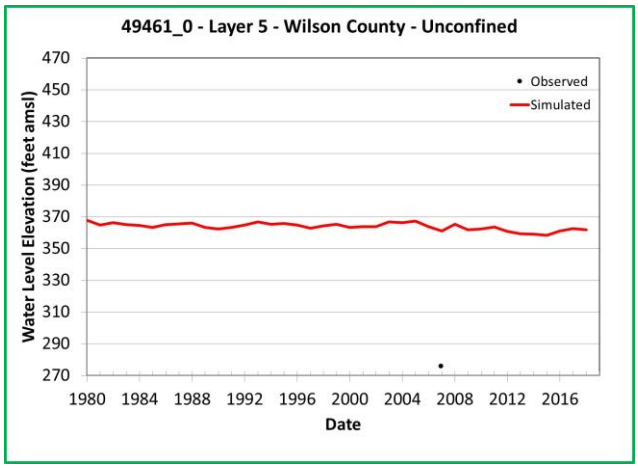
GSI ENVIRONMENTAL

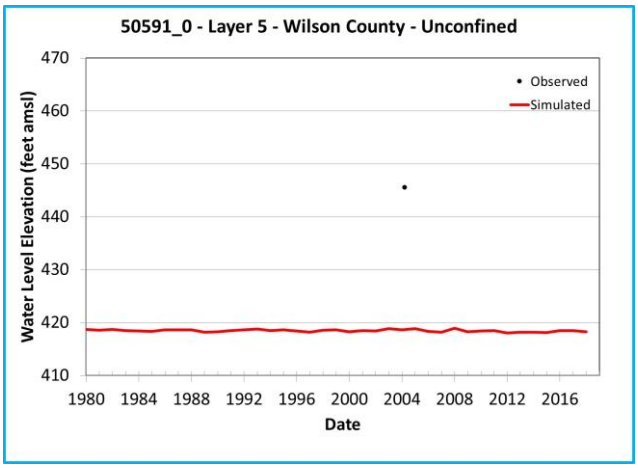












Note: Chart outline color indicates Y-axis range.

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Blue = 60 feet

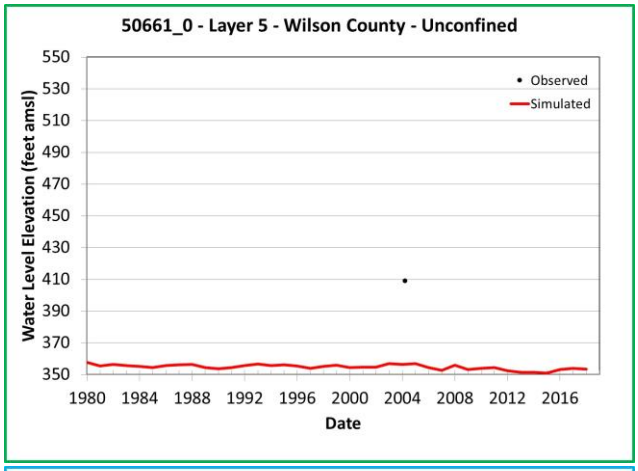
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

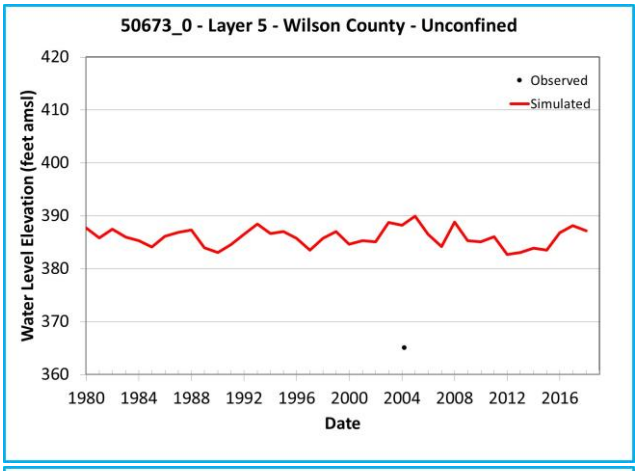
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

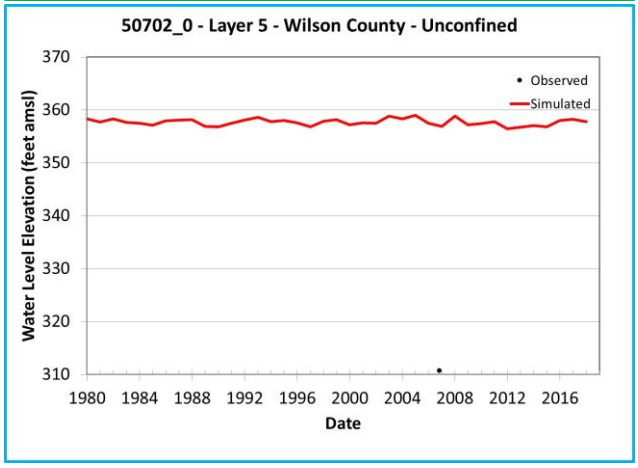
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

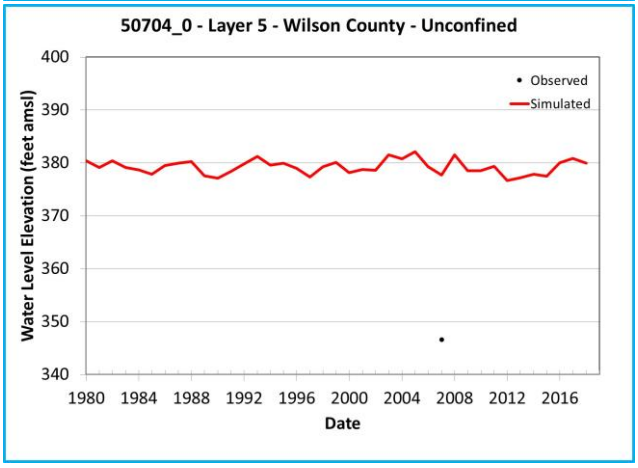
FIGURE I-19.2g

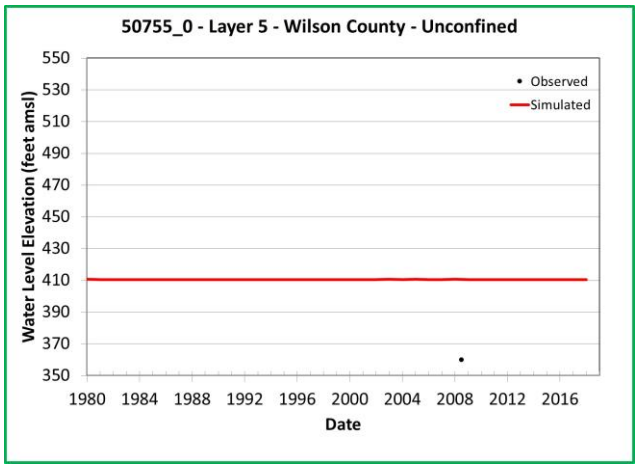
GSI ENVIRONMENTAL

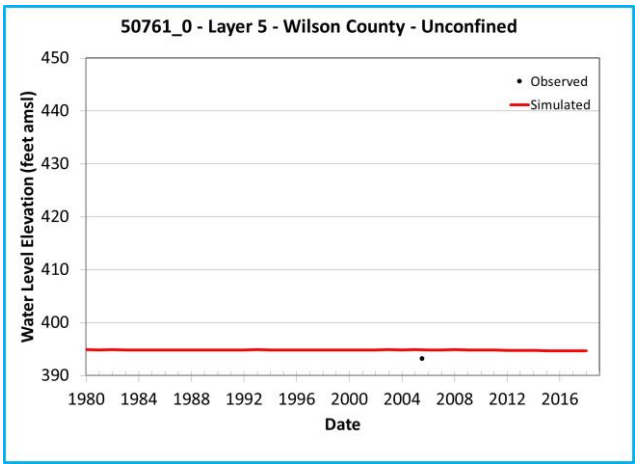












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

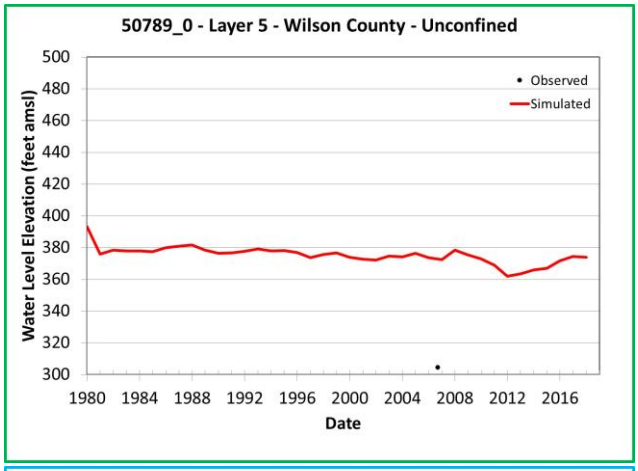
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

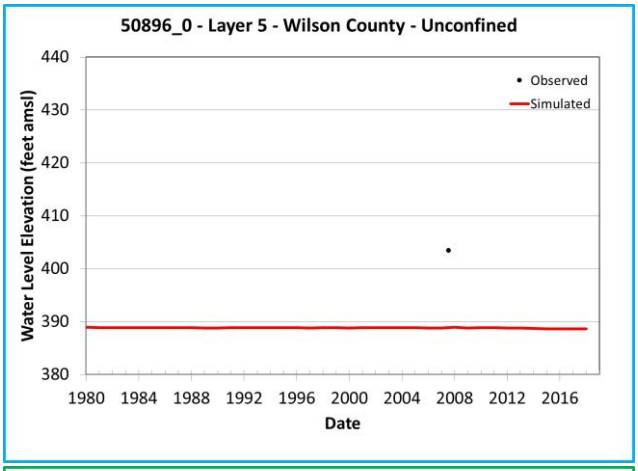
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

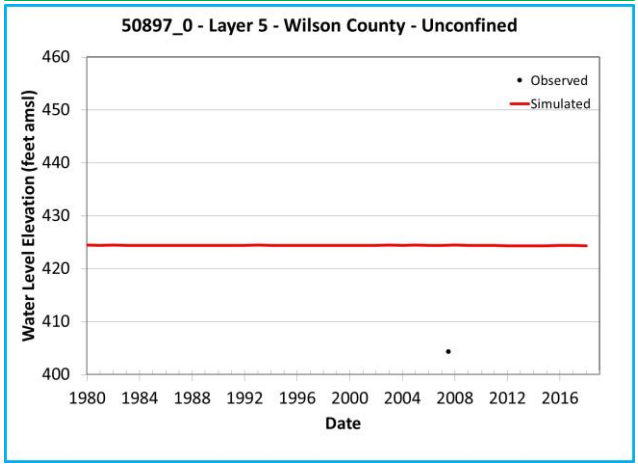
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

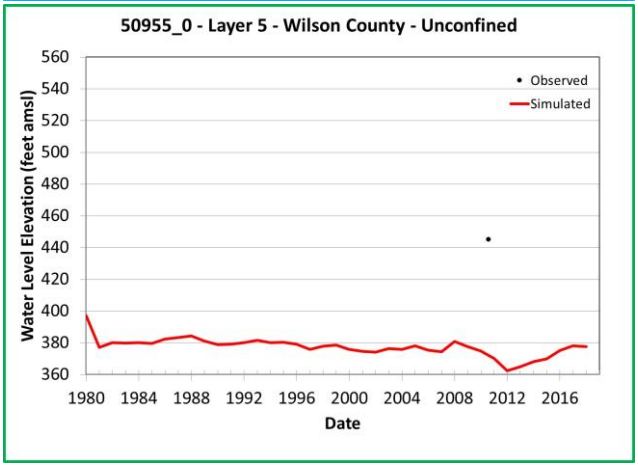
FIGURE I-19.2h

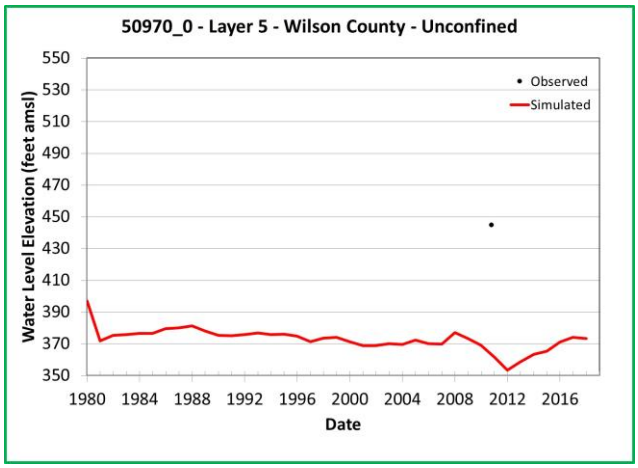
GSI ENVIRONMENTAL

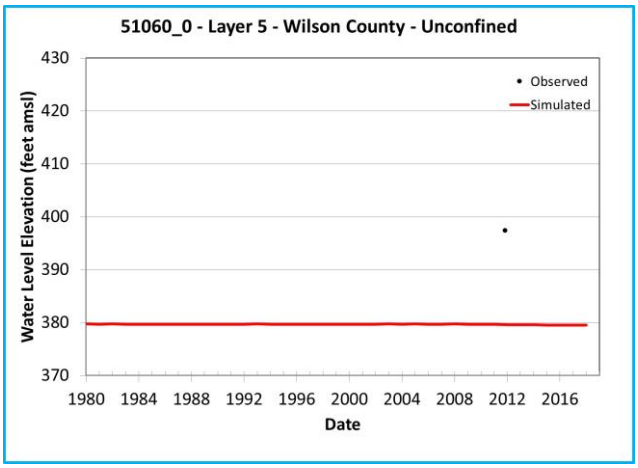












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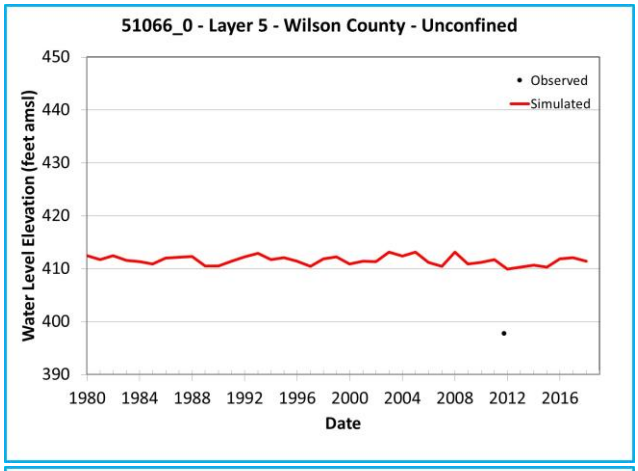
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

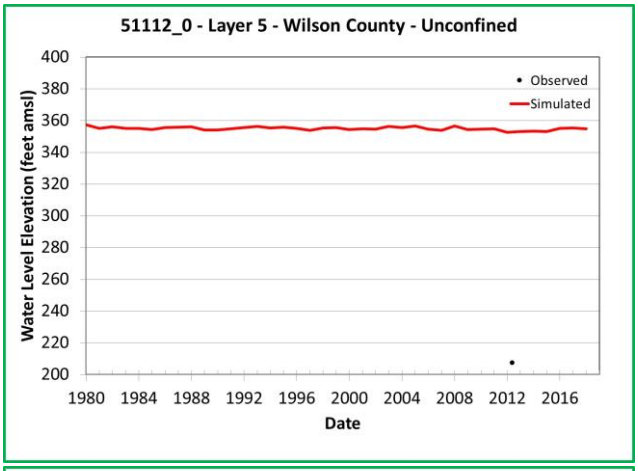
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

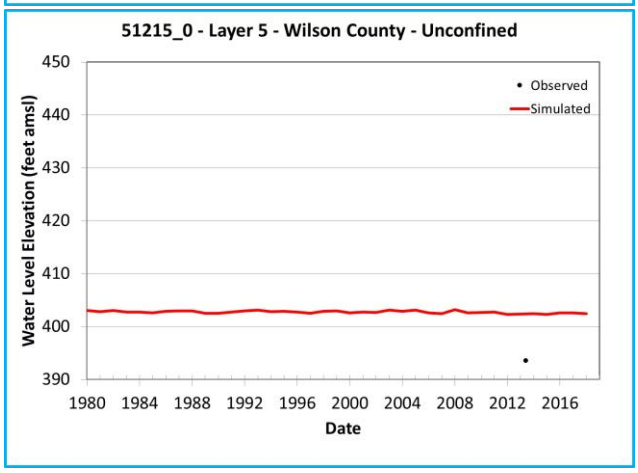
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

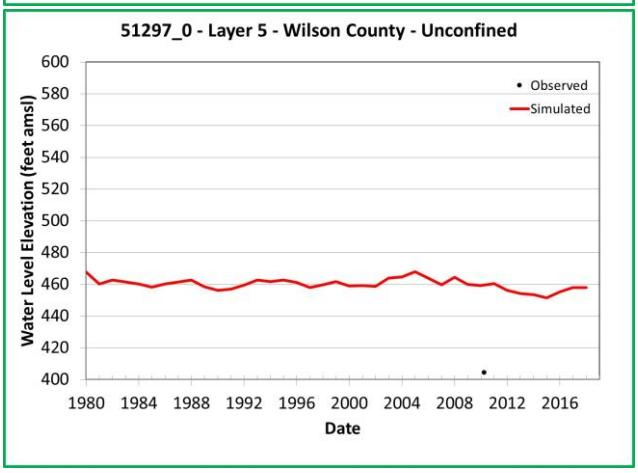
FIGURE I-19.2i

GSI ENVIRONMENTAL









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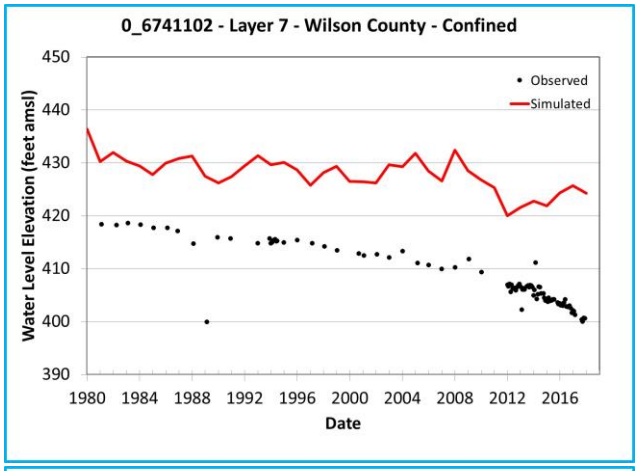
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 5

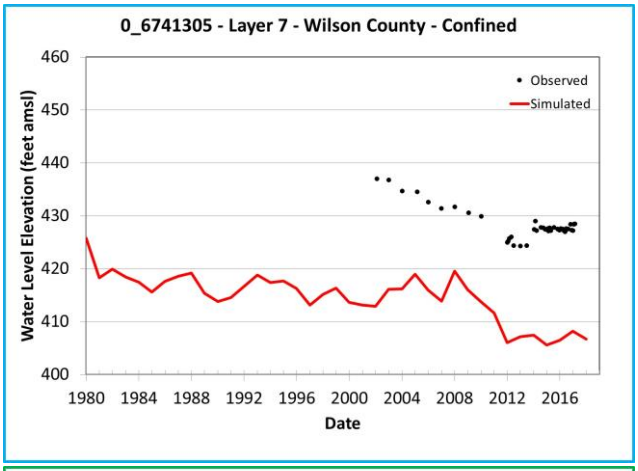
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

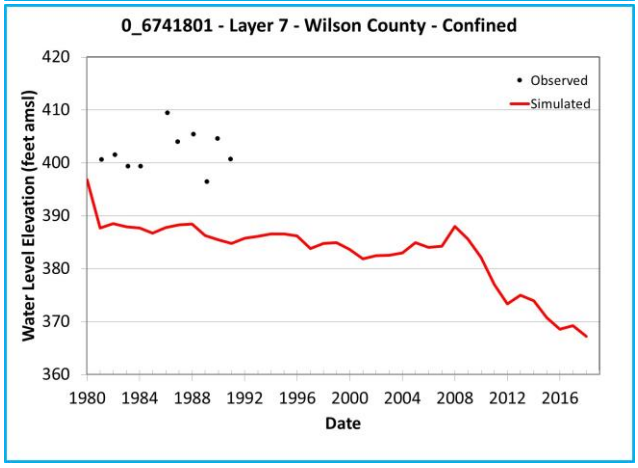
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

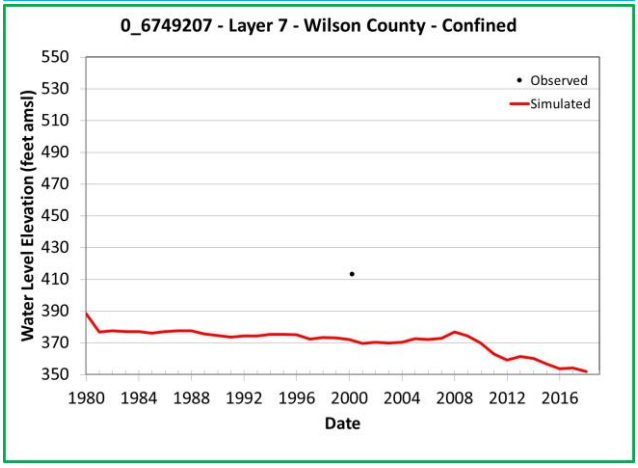
FIGURE I-19.2j

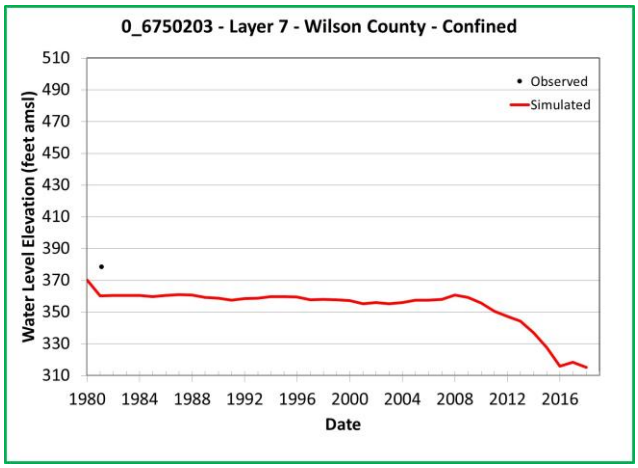
GSI ENVIRONMENTAL

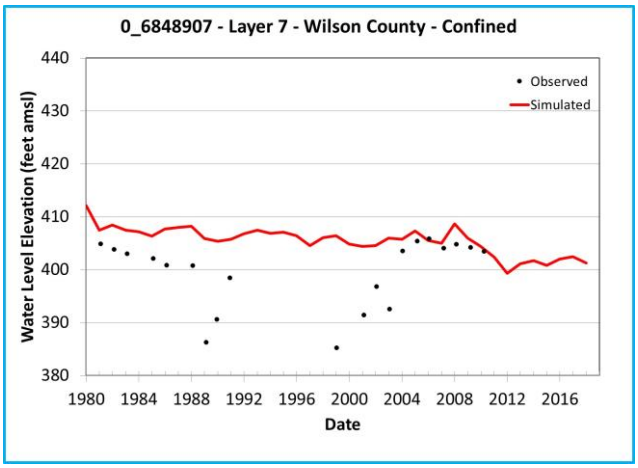












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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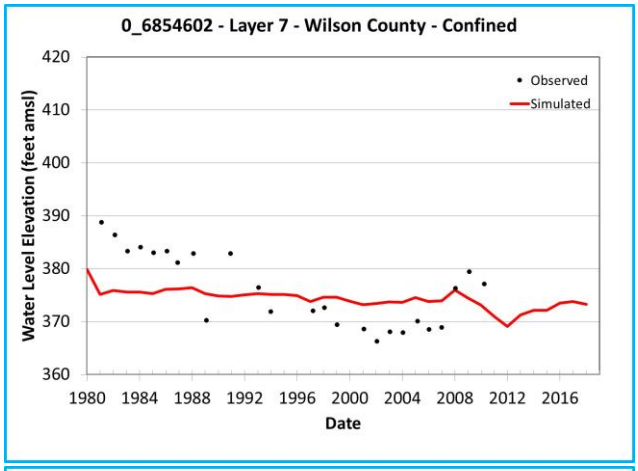
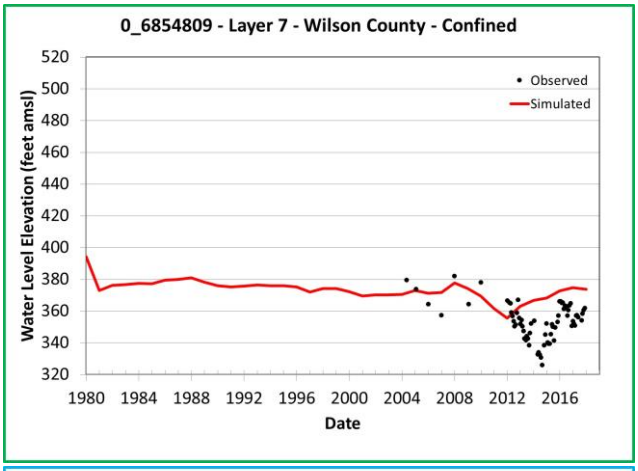
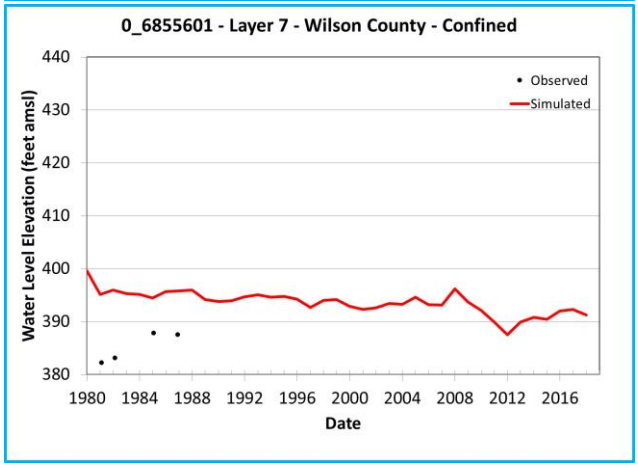
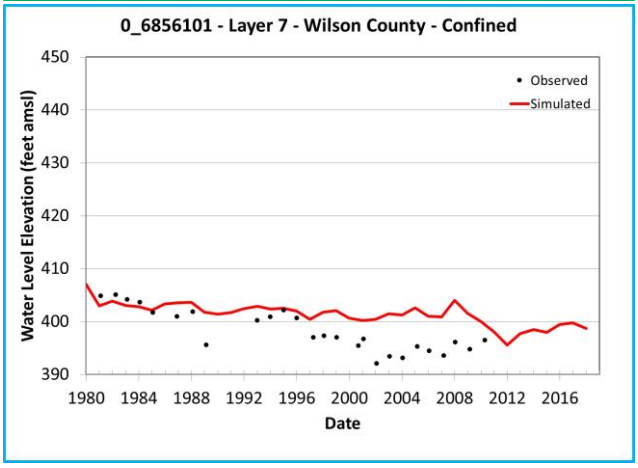
FIGURE I-19.3a

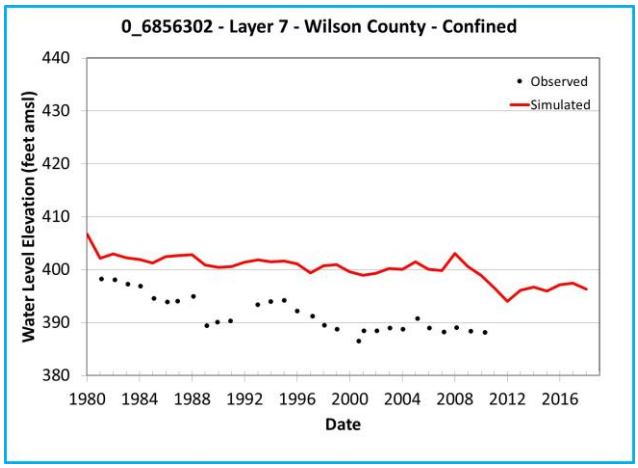
GSI ENVIRONMENTAL

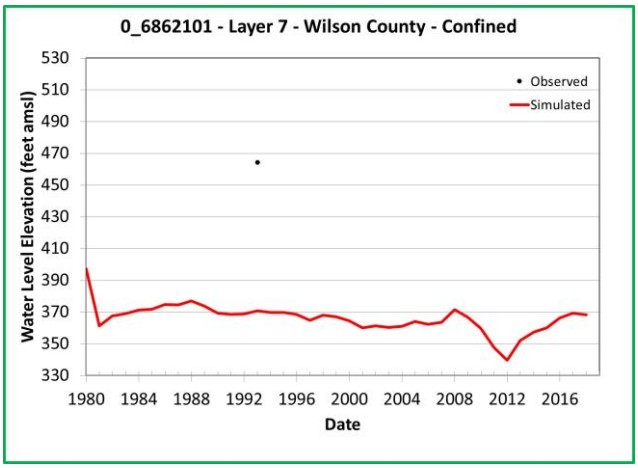












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Blue = 60 feet

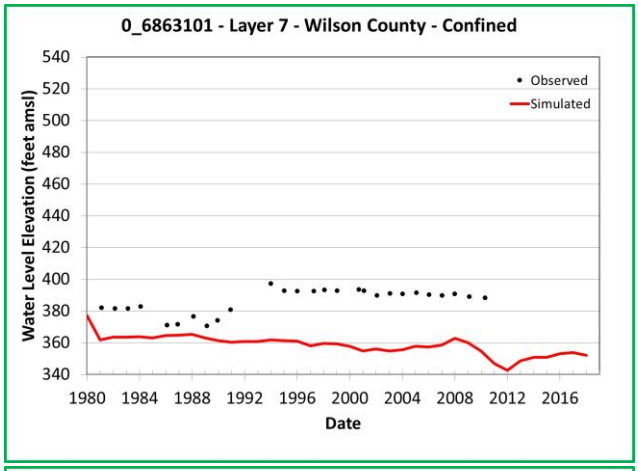
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

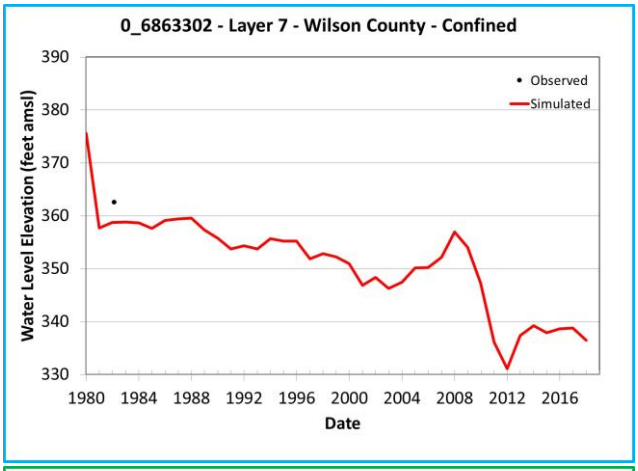
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

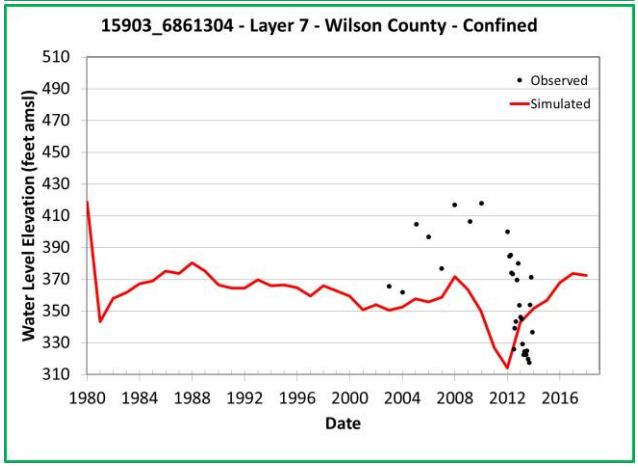
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

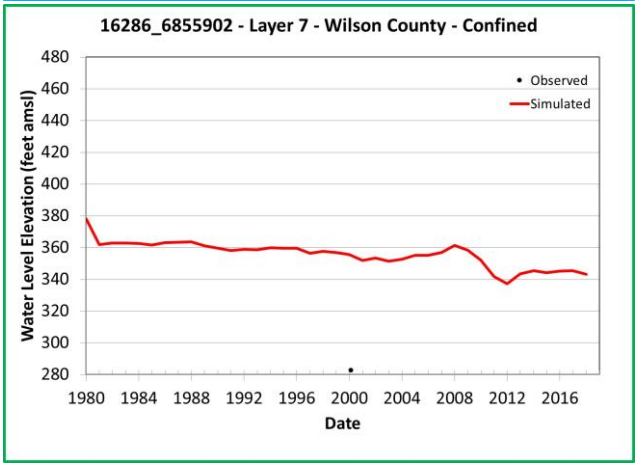
FIGURE I-19.3b

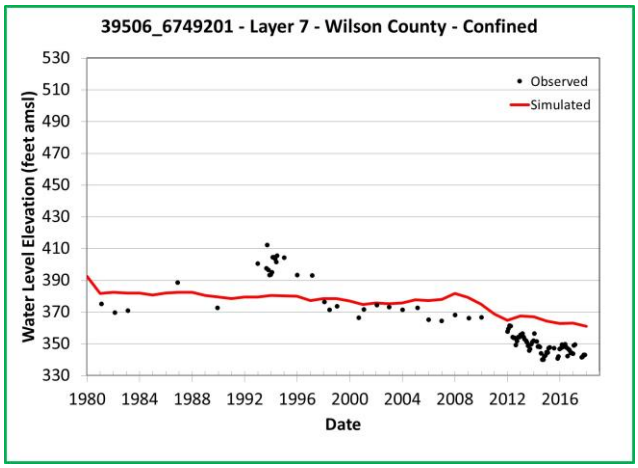
GSI ENVIRONMENTAL

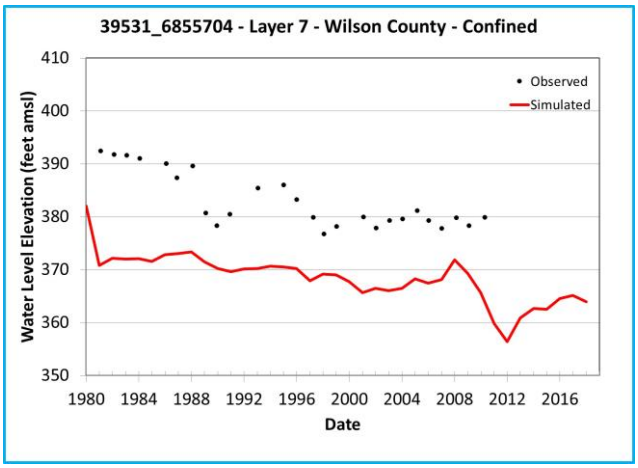












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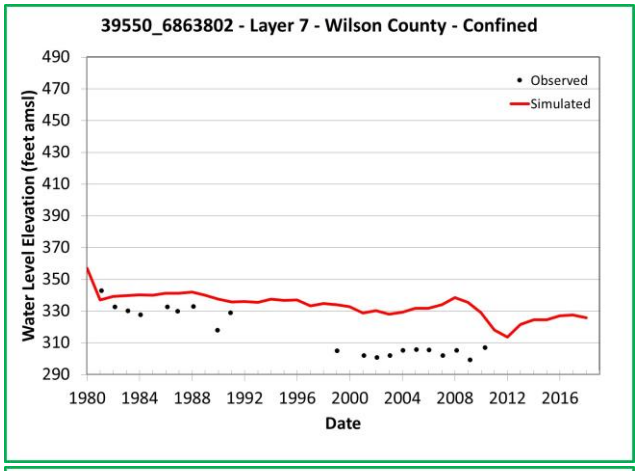
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

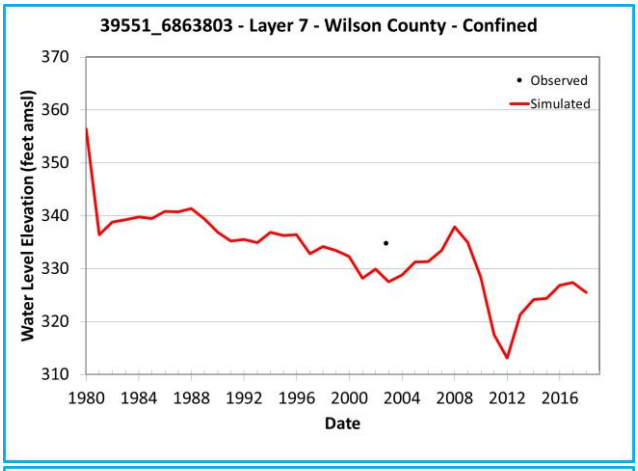
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

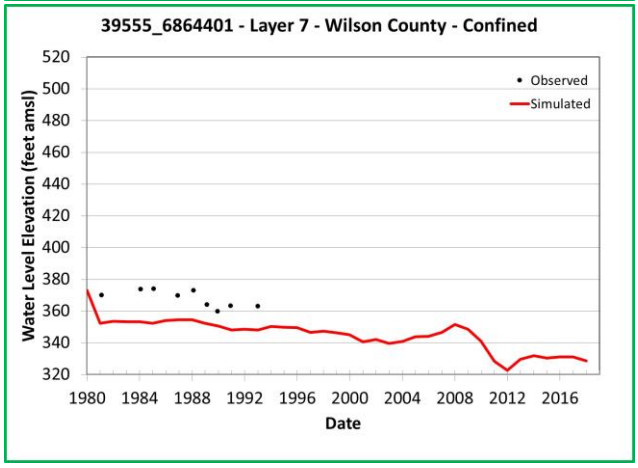
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

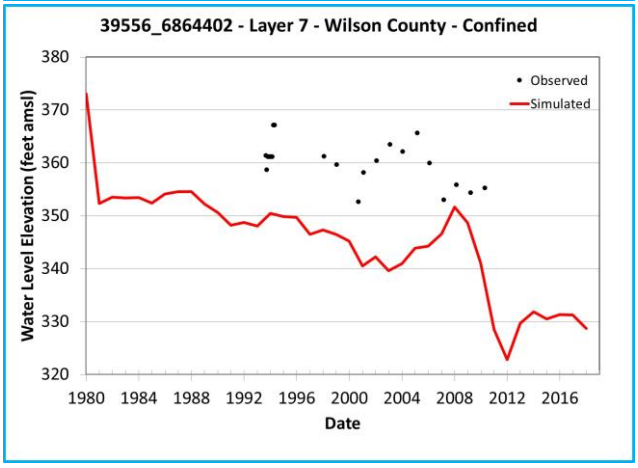
FIGURE I-19.3c

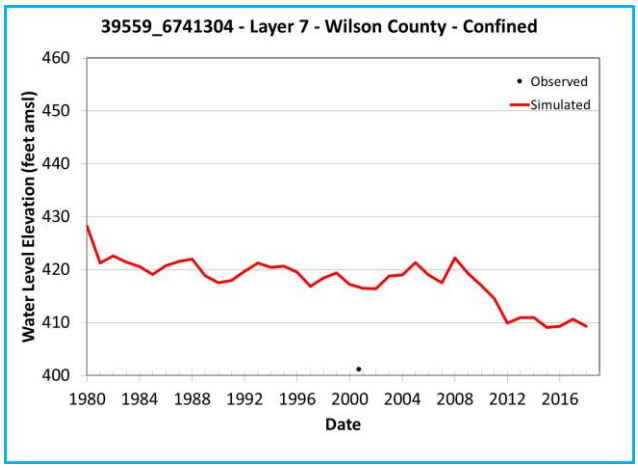
GSI ENVIRONMENTAL

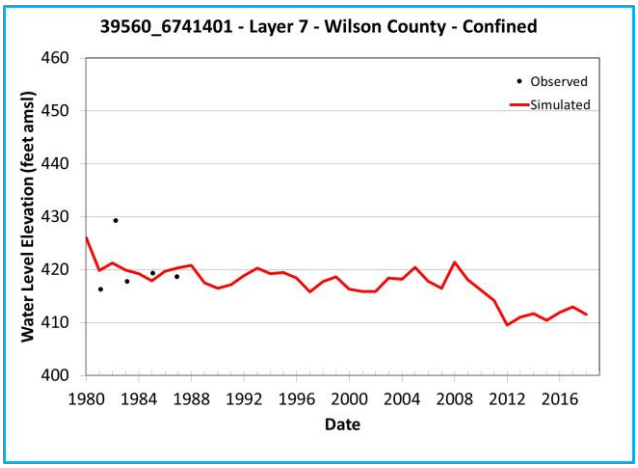












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Blue = 60 feet

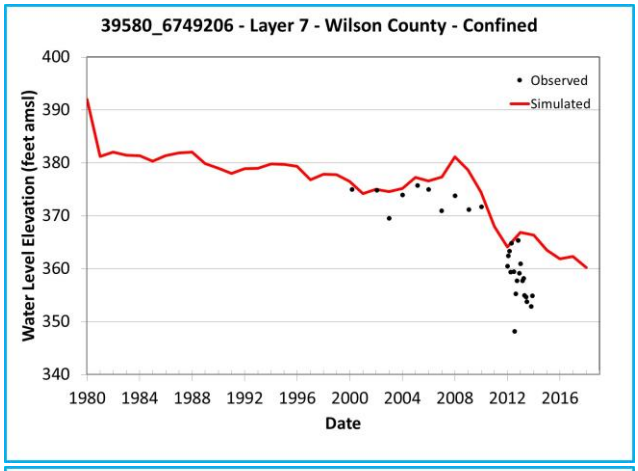
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

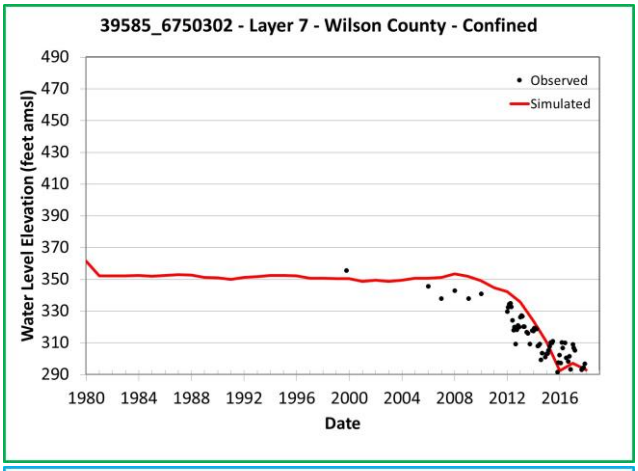
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

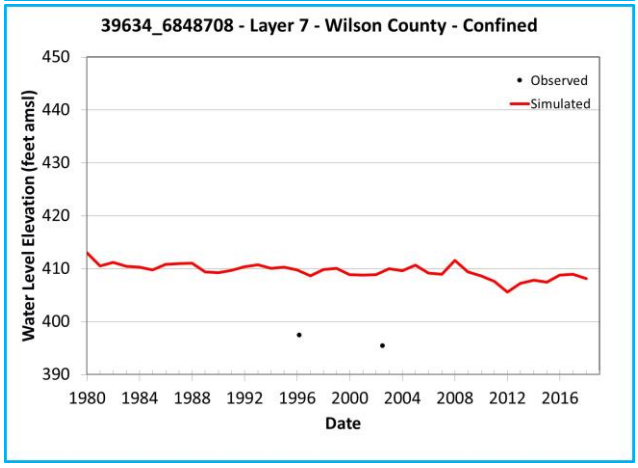
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

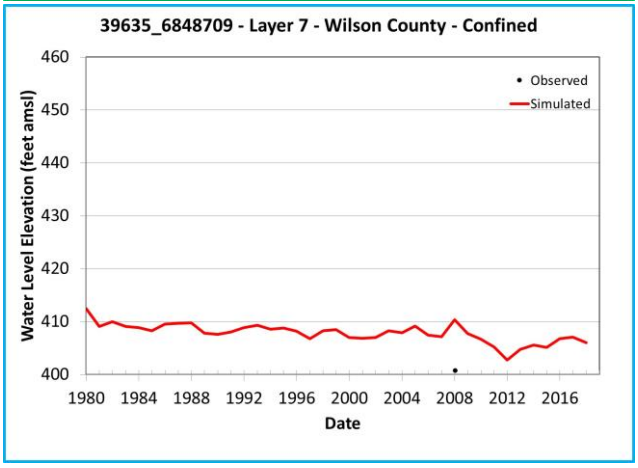
FIGURE I-19.3d

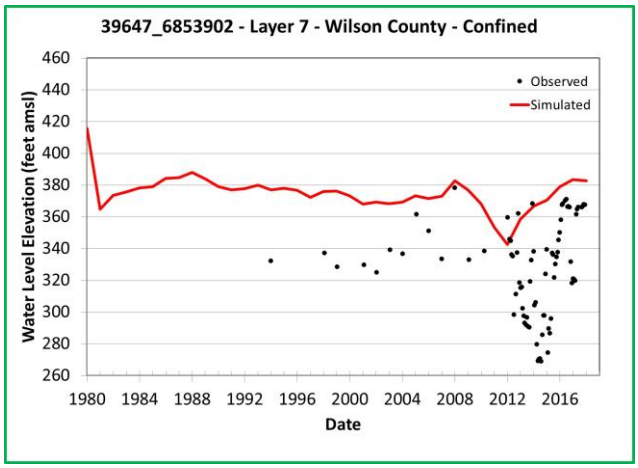
GSI ENVIRONMENTAL

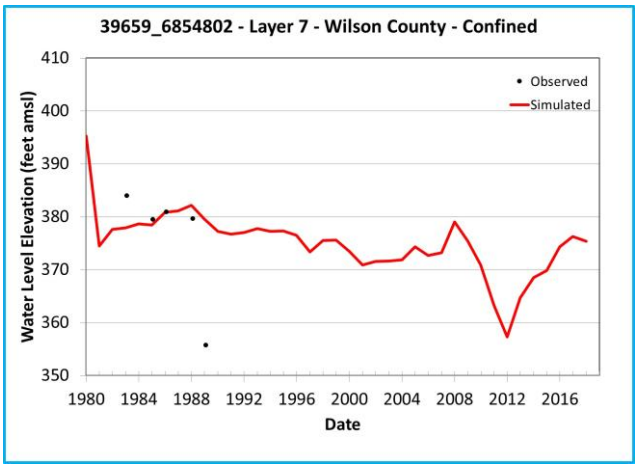












Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

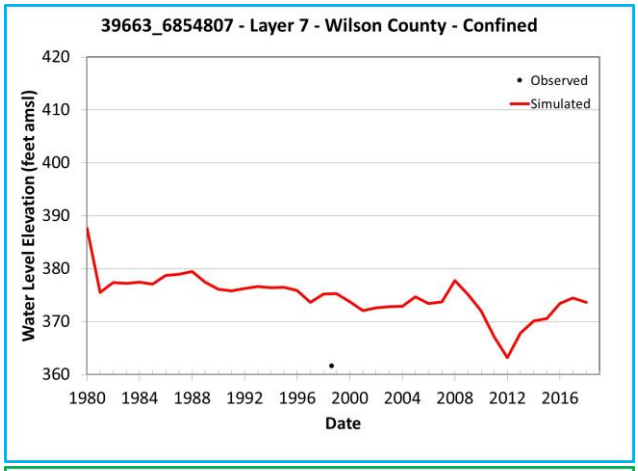
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

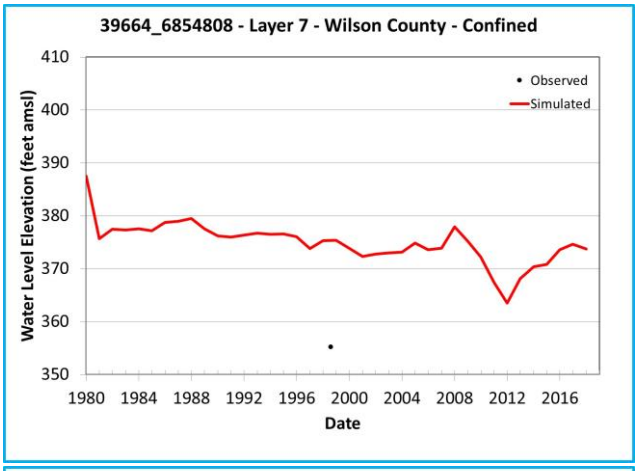
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

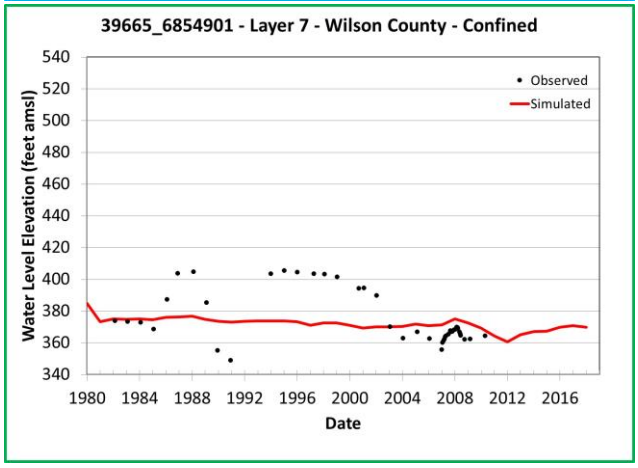
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

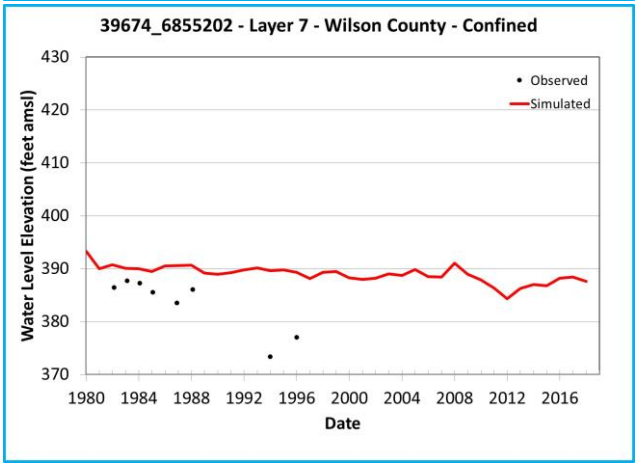
FIGURE I-19.3e

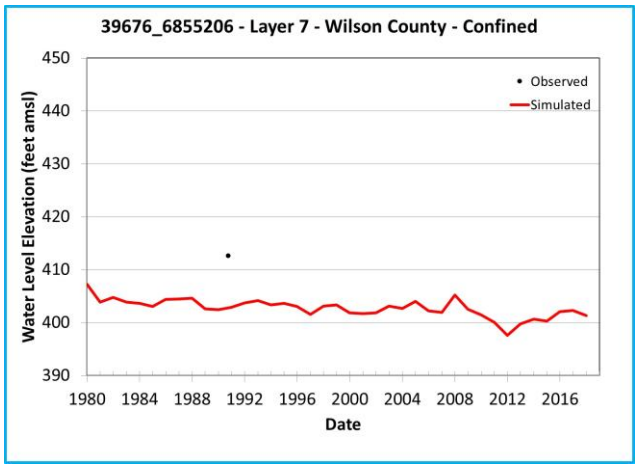
GSI ENVIRONMENTAL

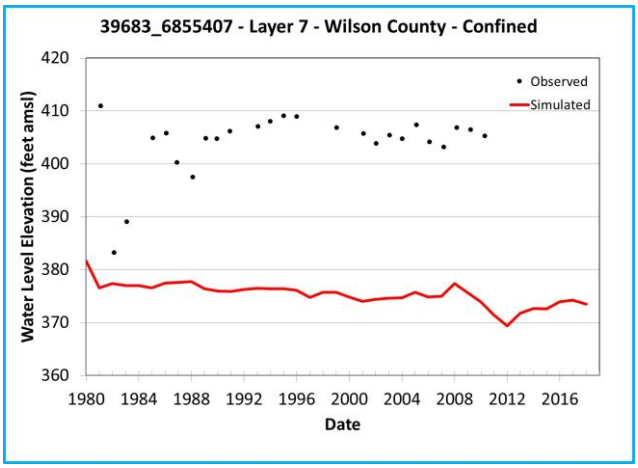












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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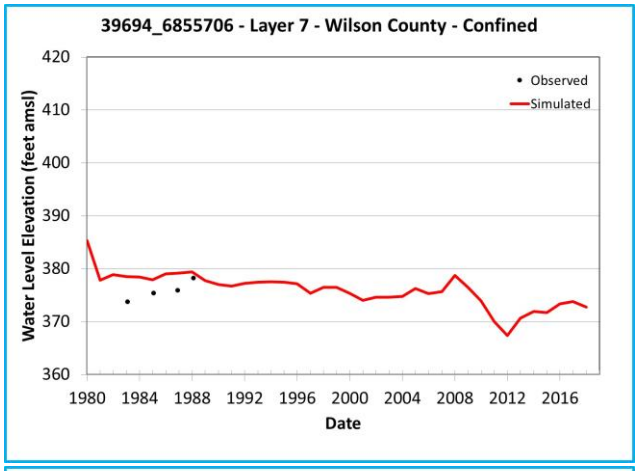
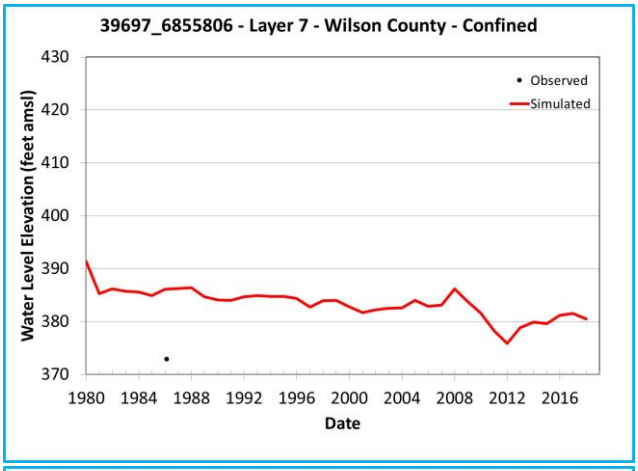
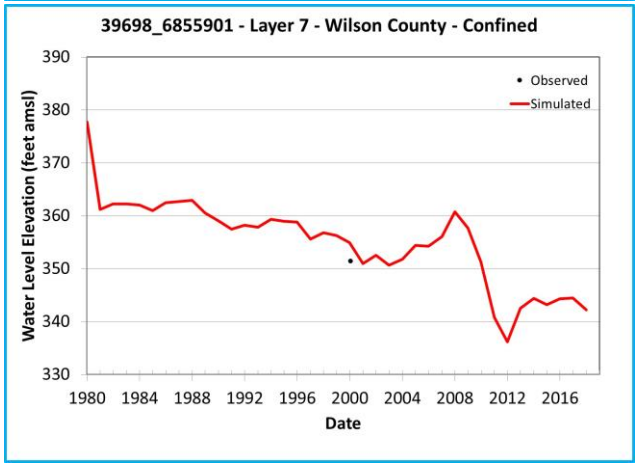
Revised		Aprv'd by	SP

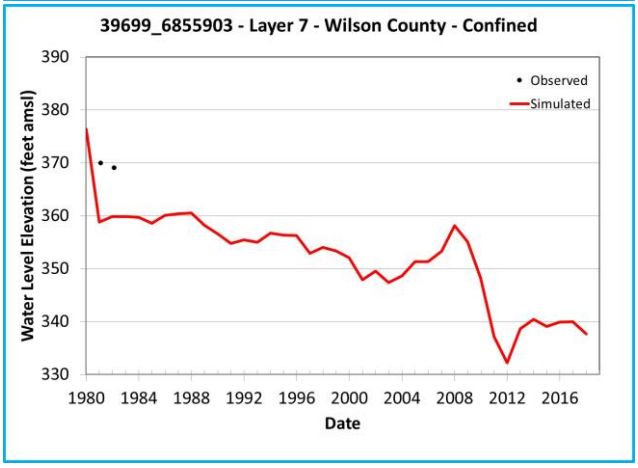
FIGURE I-19.3f

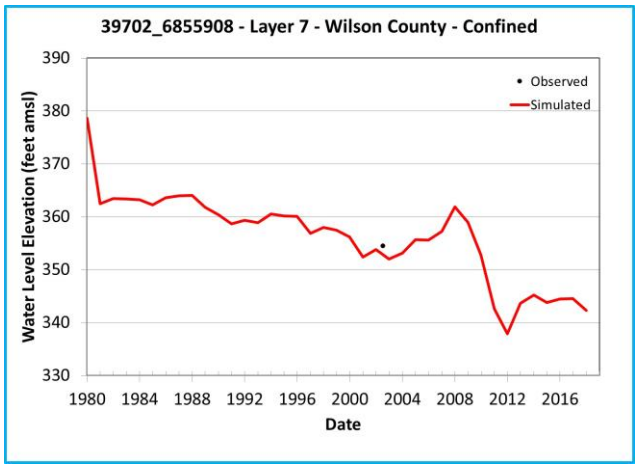
GSI ENVIRONMENTAL

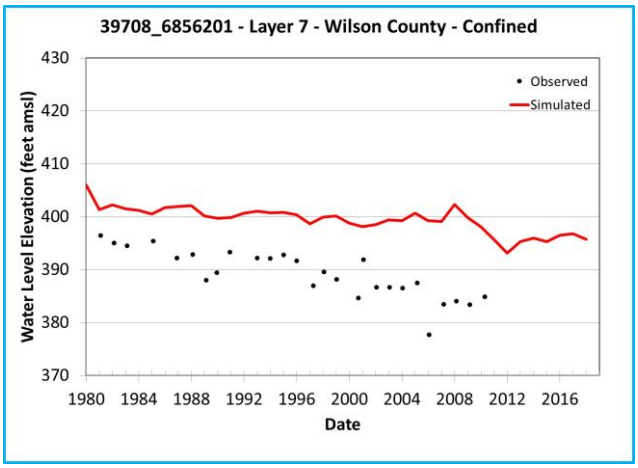












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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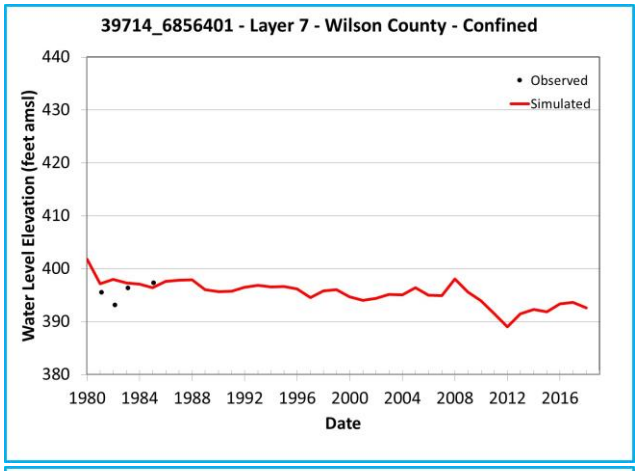
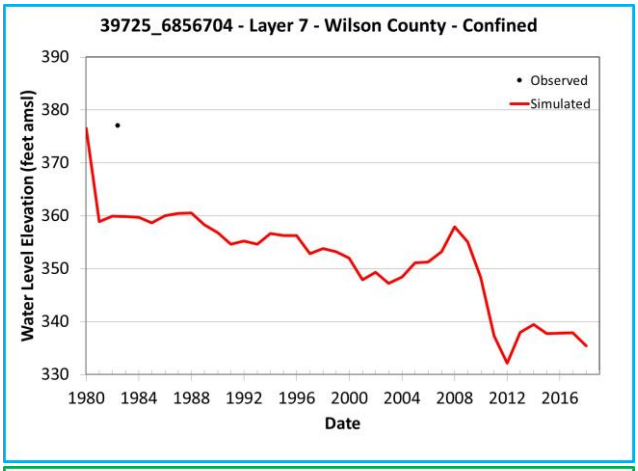
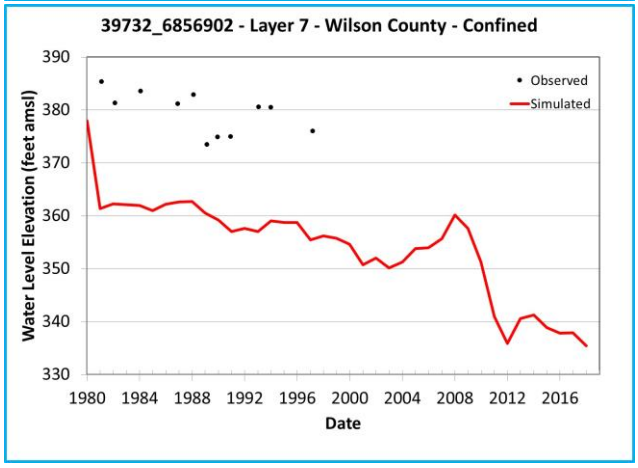
Revised		Aprv'd by	SP

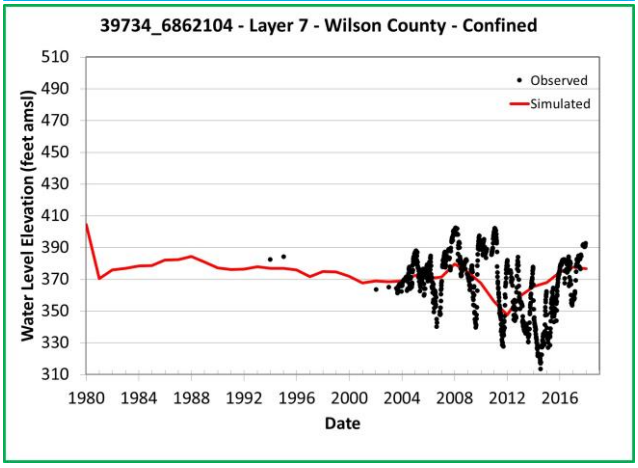
FIGURE I-19.3g

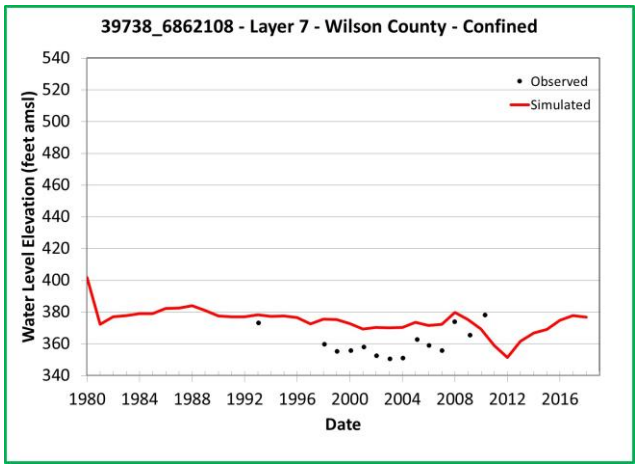
GSI ENVIRONMENTAL

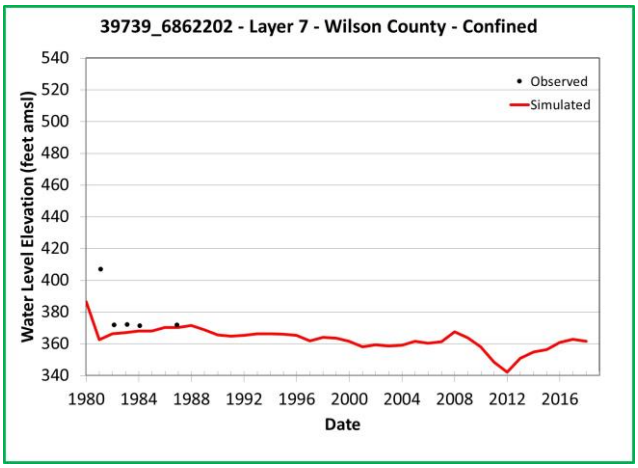












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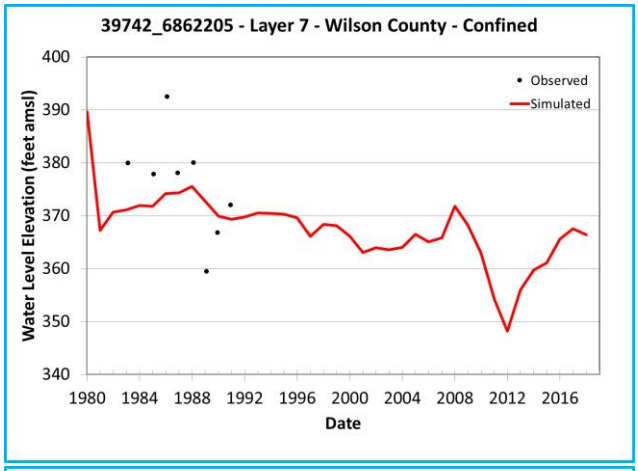
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

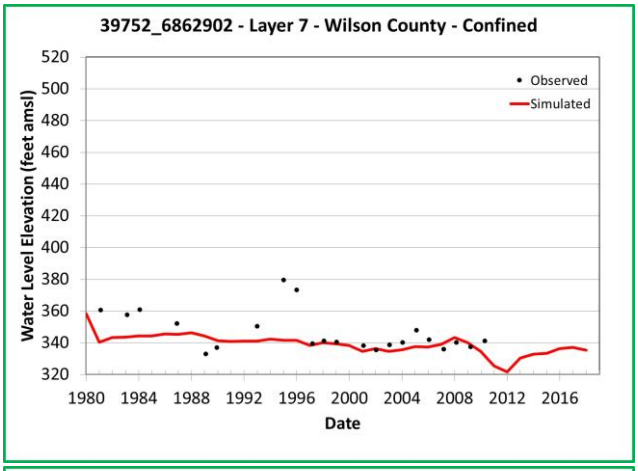
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

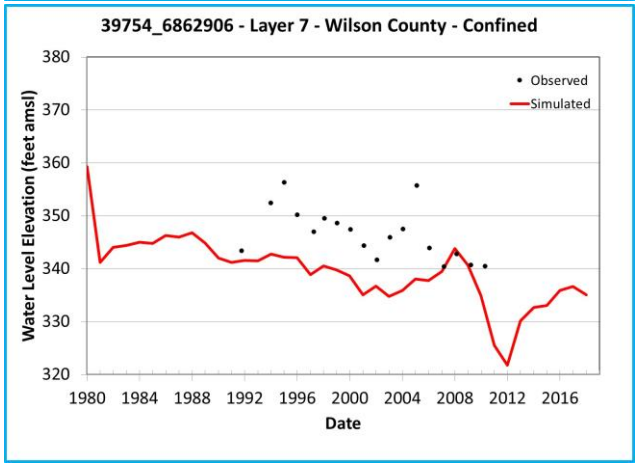
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

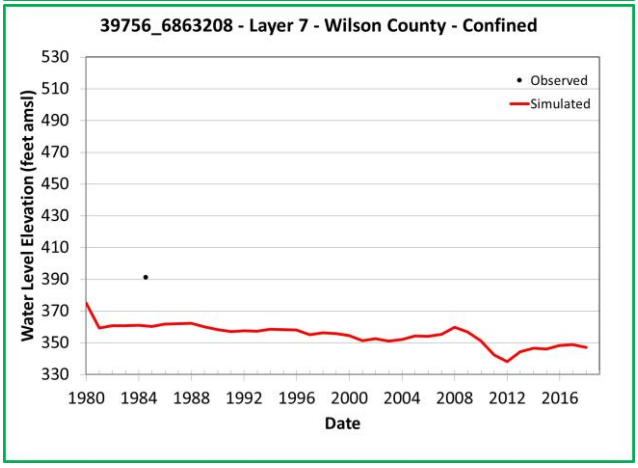
FIGURE I-19.3h

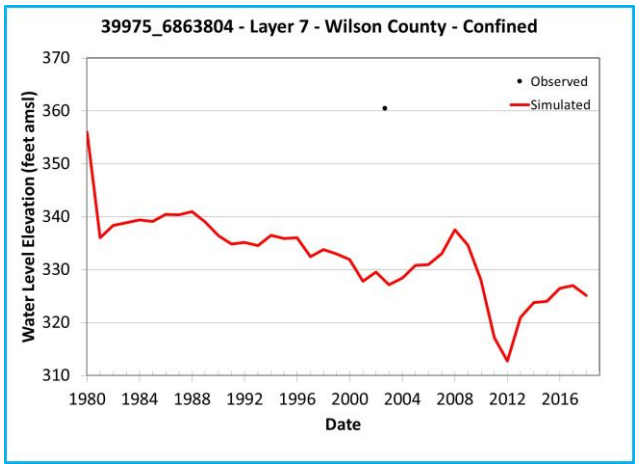
GSI ENVIRONMENTAL

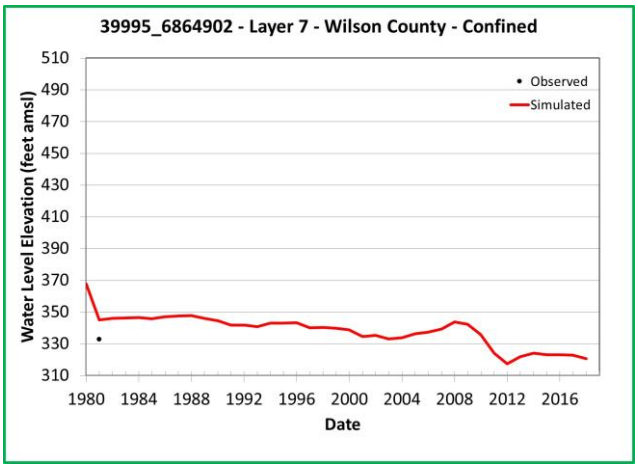












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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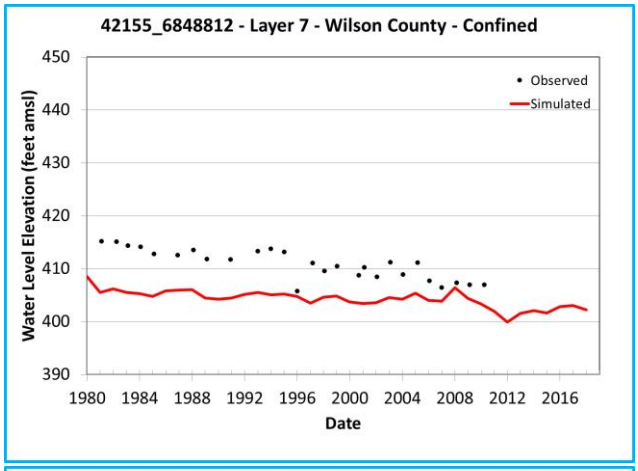
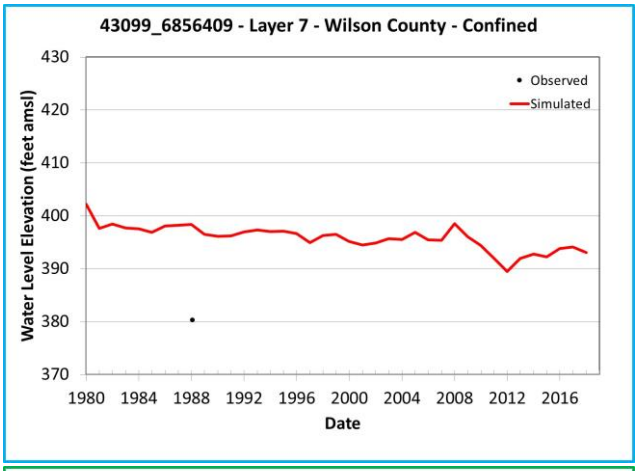
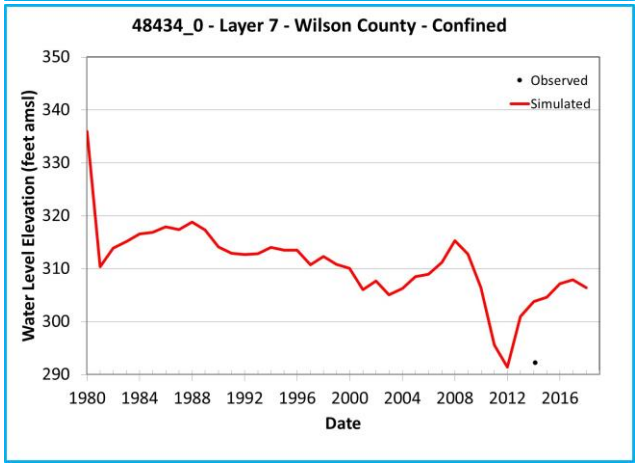
Revised		Aprv'd by	SP

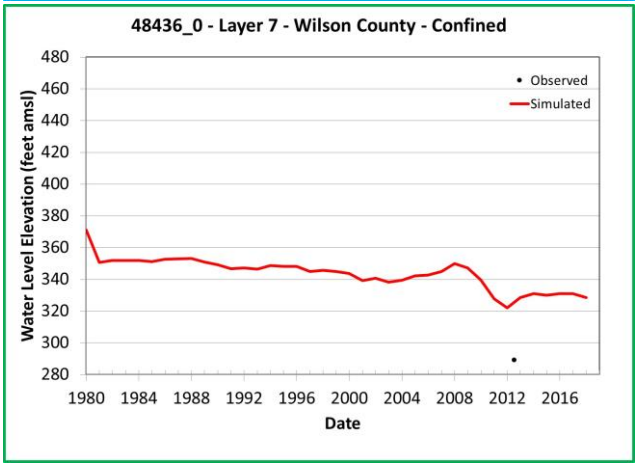
FIGURE I-19.3i

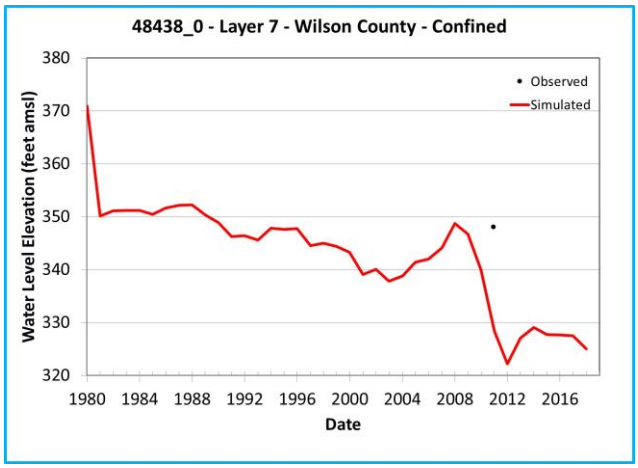
GSI ENVIRONMENTAL

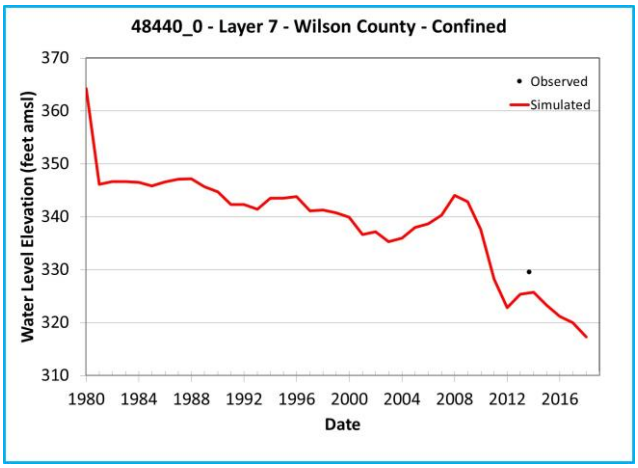












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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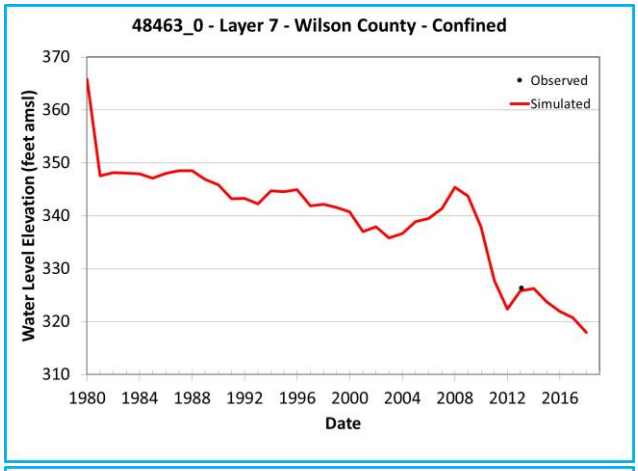
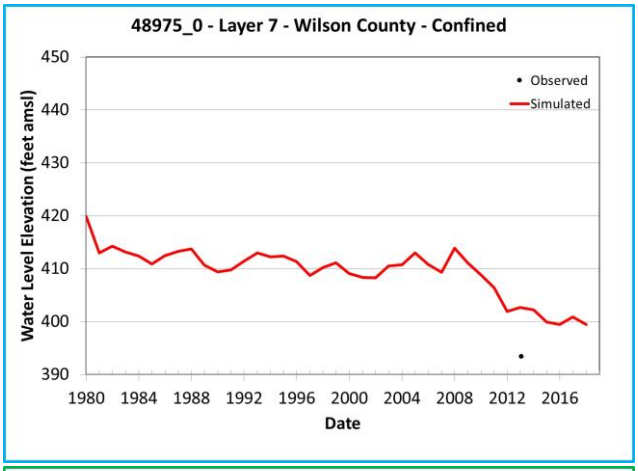
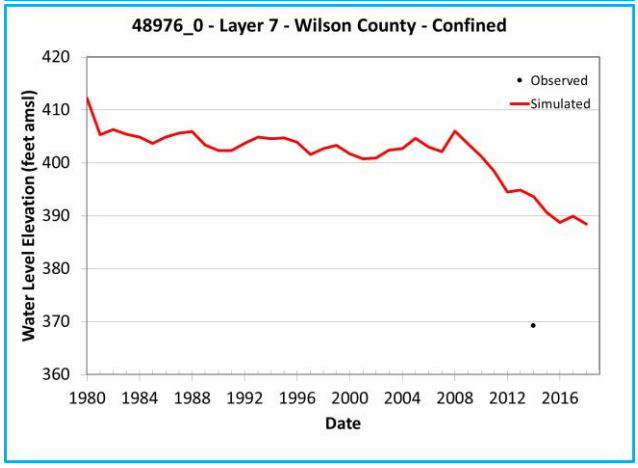
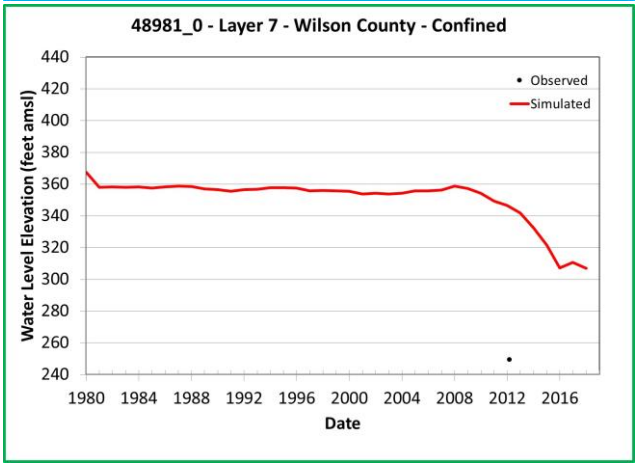
FIGURE I-19.3j

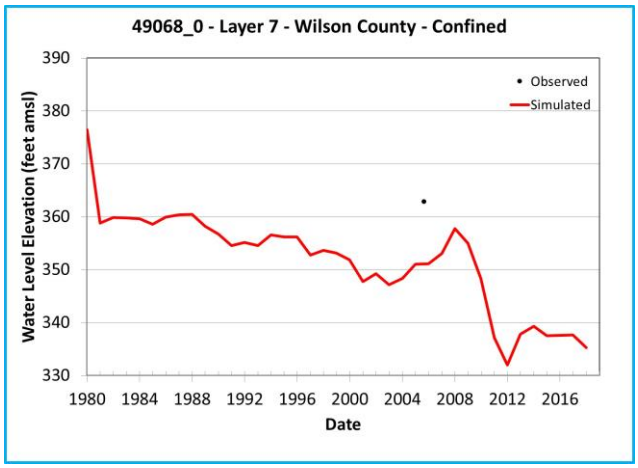
GSI ENVIRONMENTAL

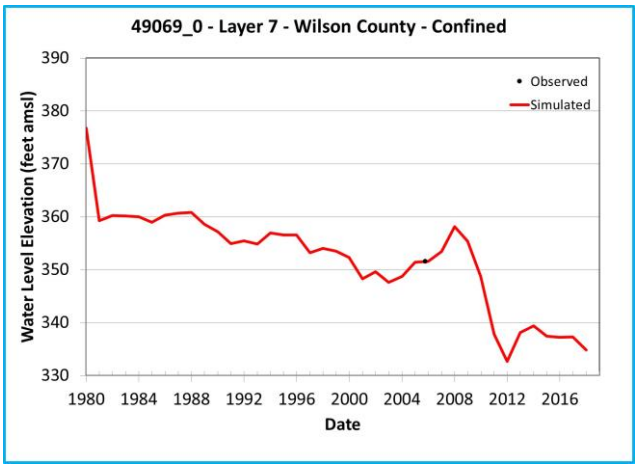












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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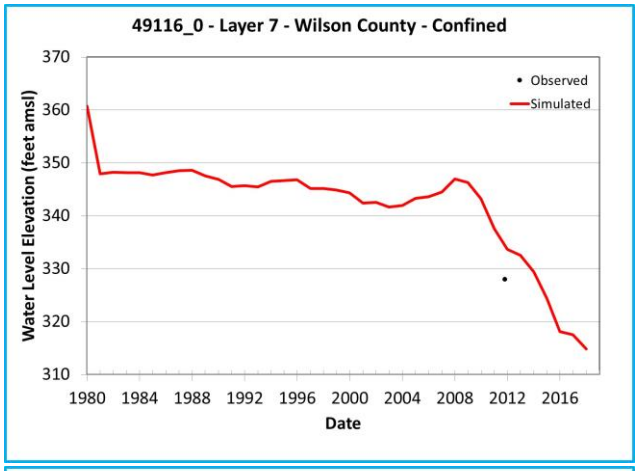
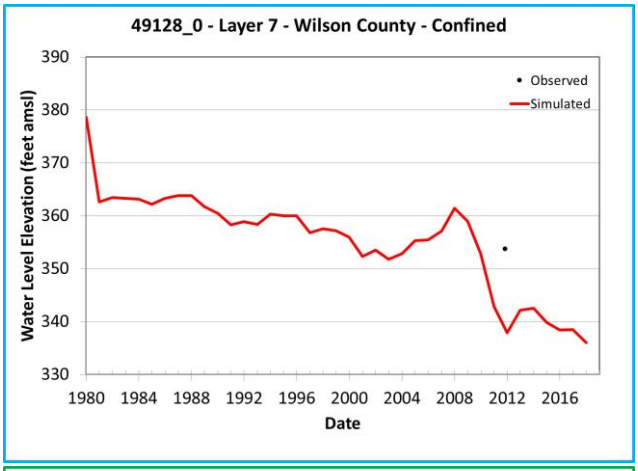
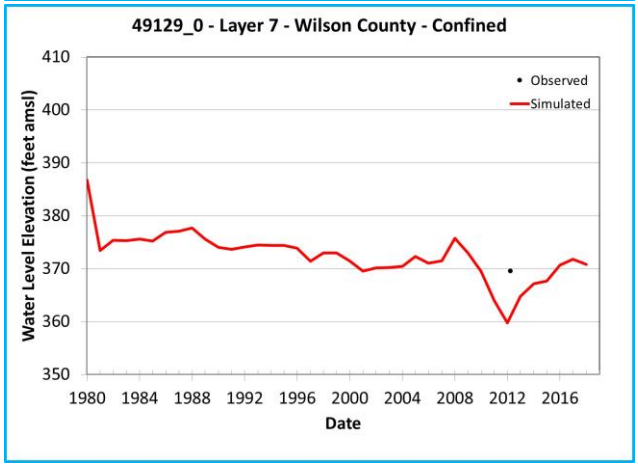
Revised		Aprv'd by	SP

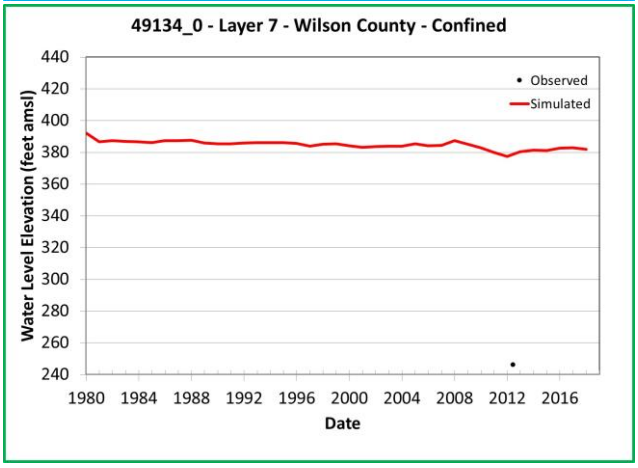
FIGURE I-19.3k

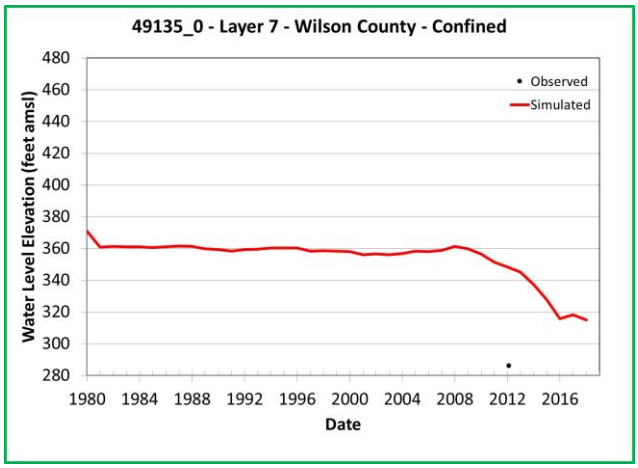
GSI ENVIRONMENTAL

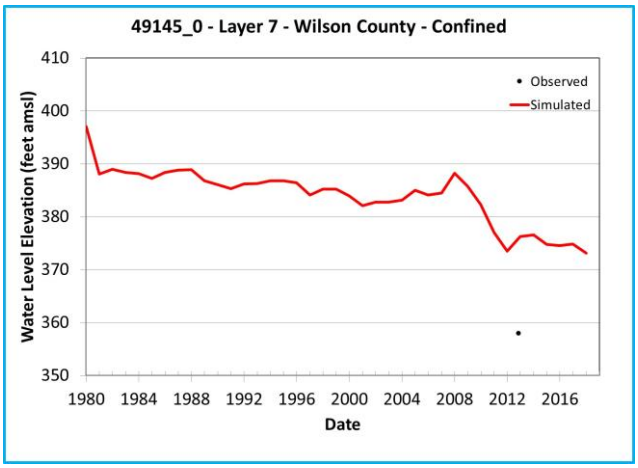












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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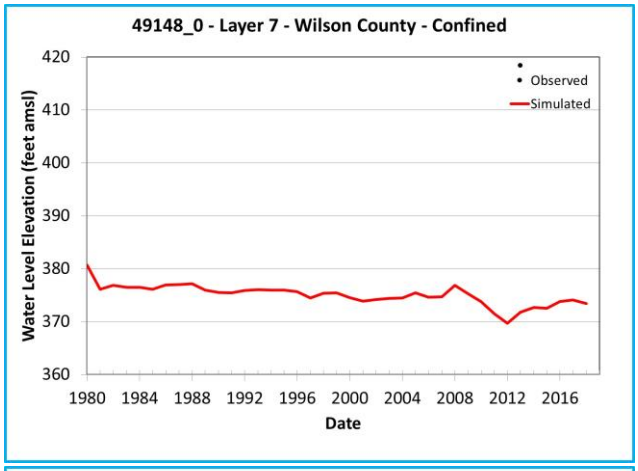
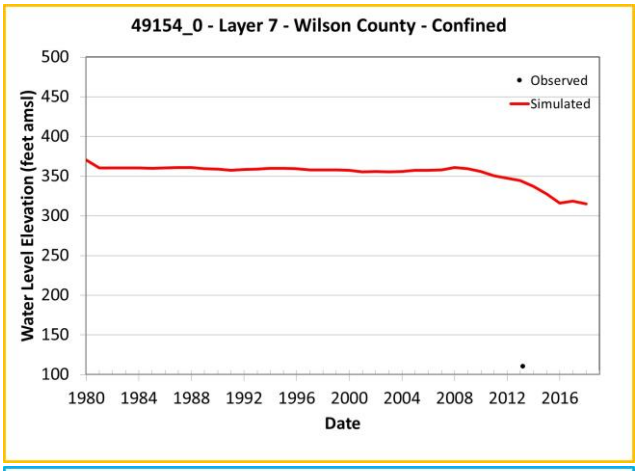
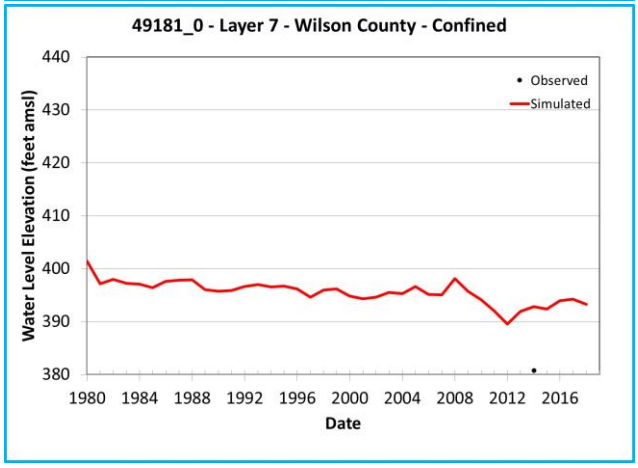
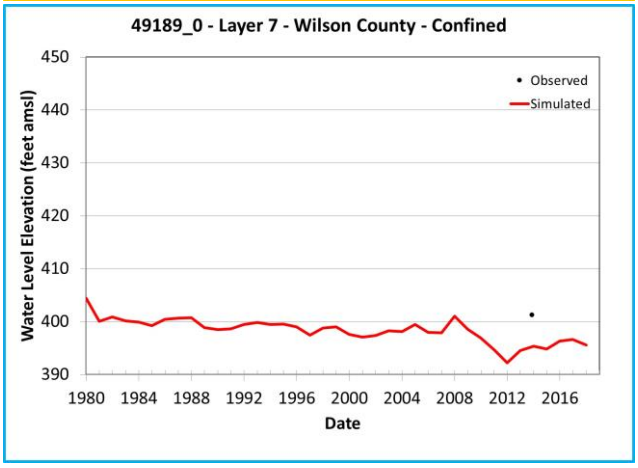
FIGURE I-19.3l

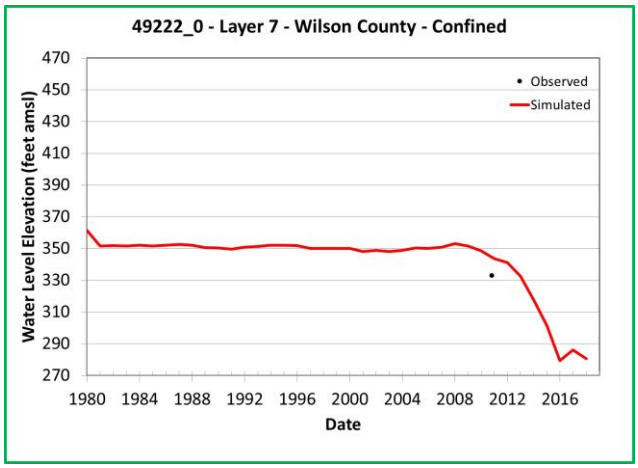
GSI ENVIRONMENTAL

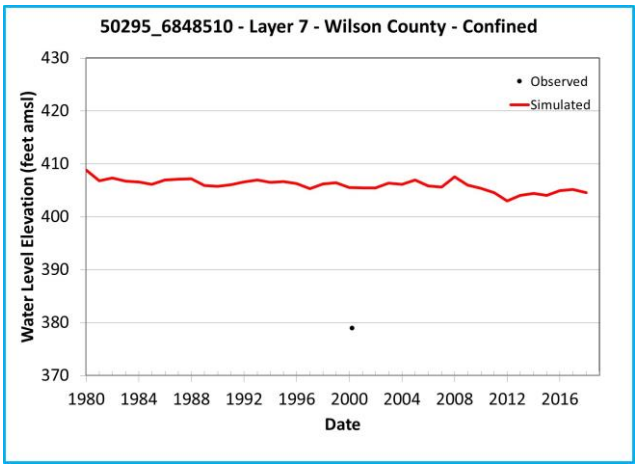












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
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Blue = 60 feet

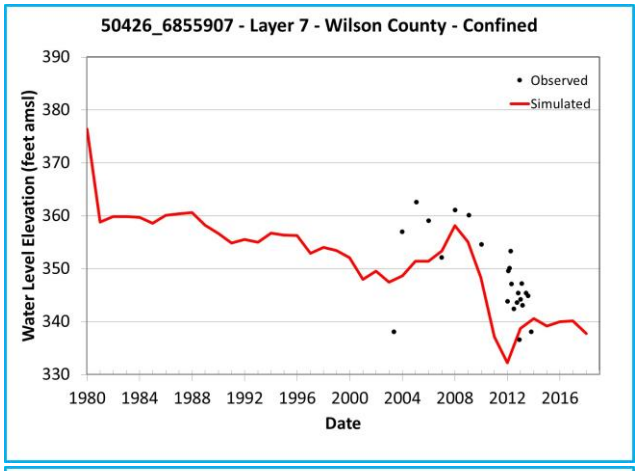
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

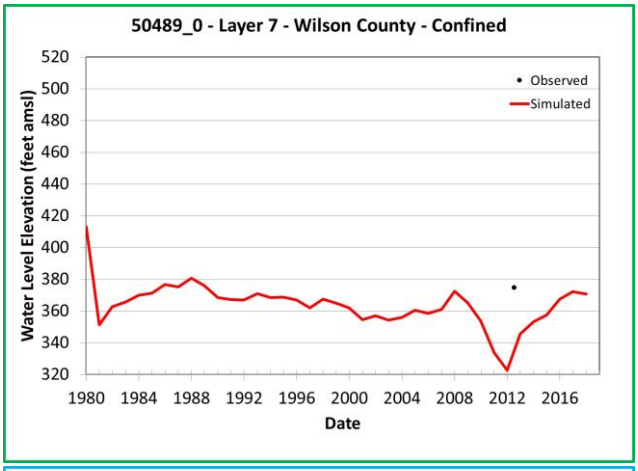
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

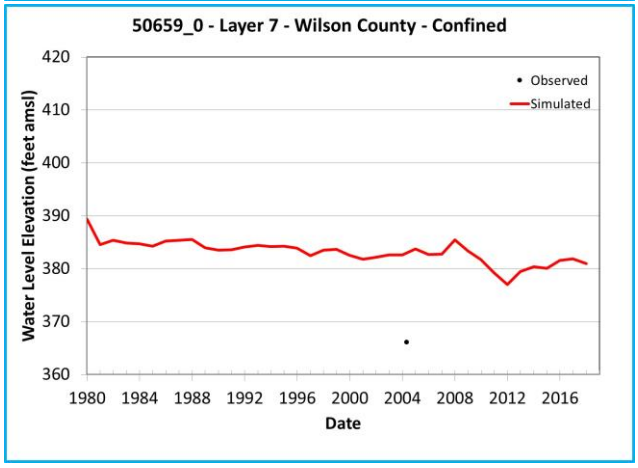
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

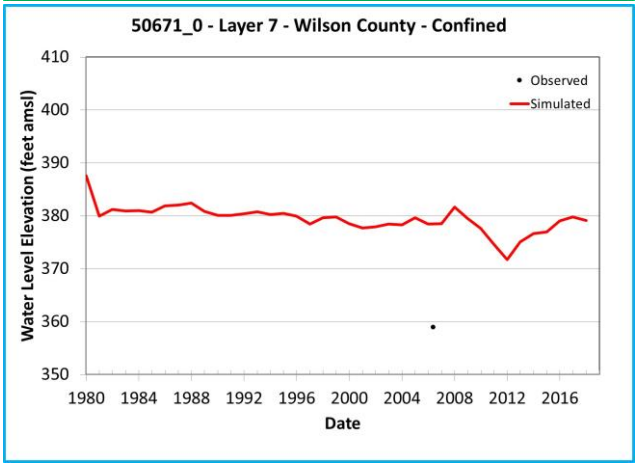
FIGURE I-19.3m

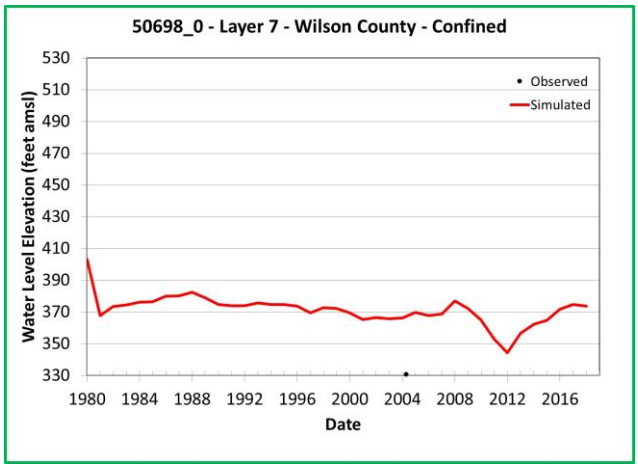
GSI ENVIRONMENTAL

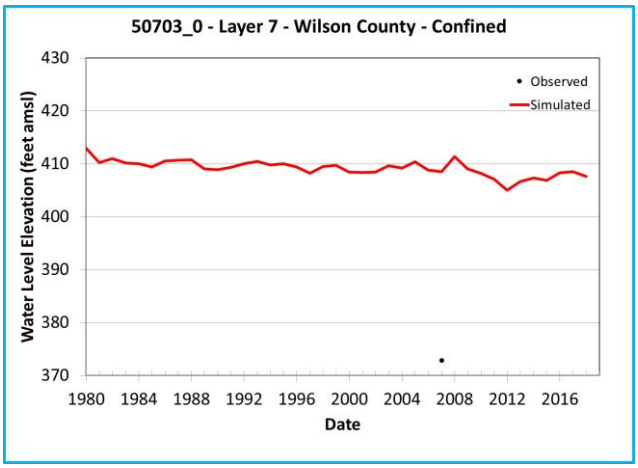












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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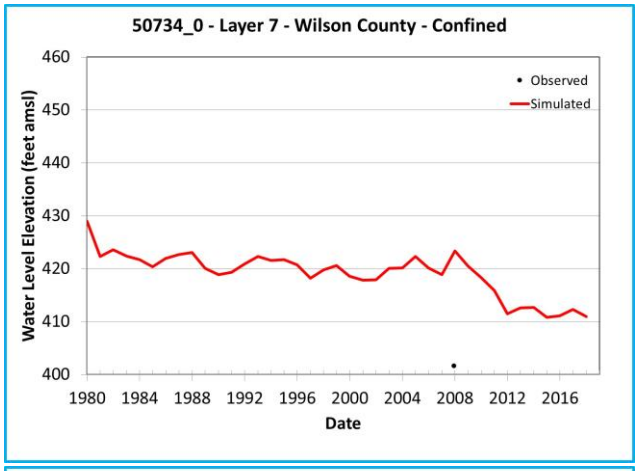
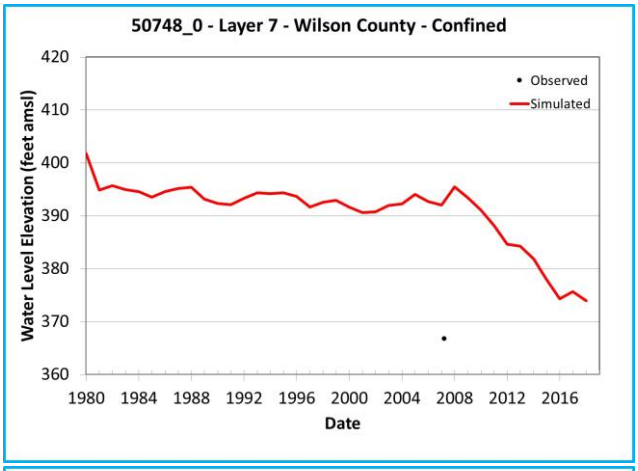
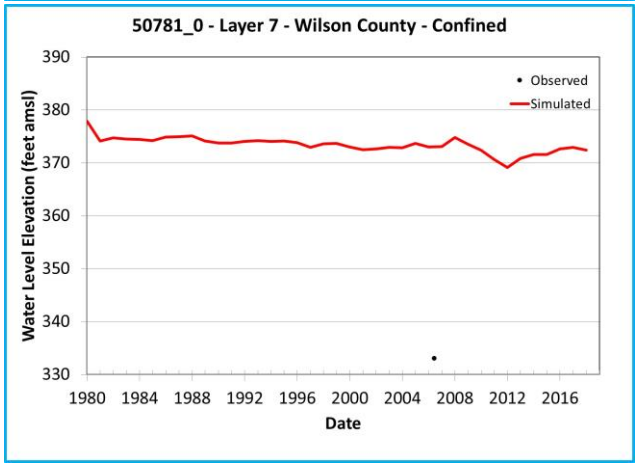
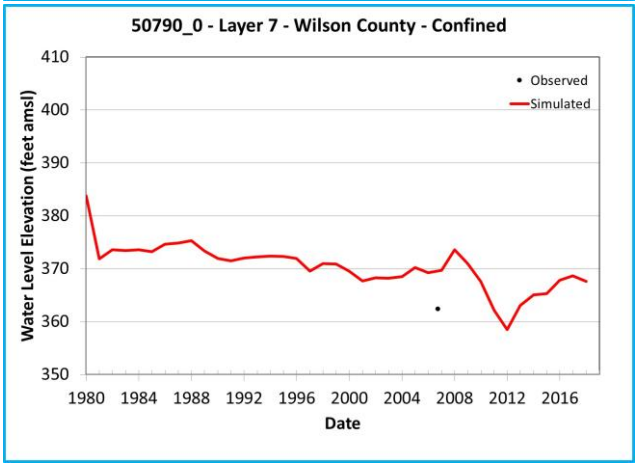
FIGURE I-19.3n

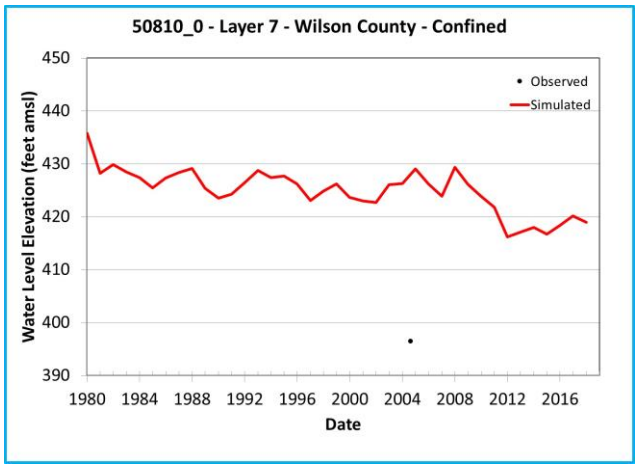
GSI ENVIRONMENTAL

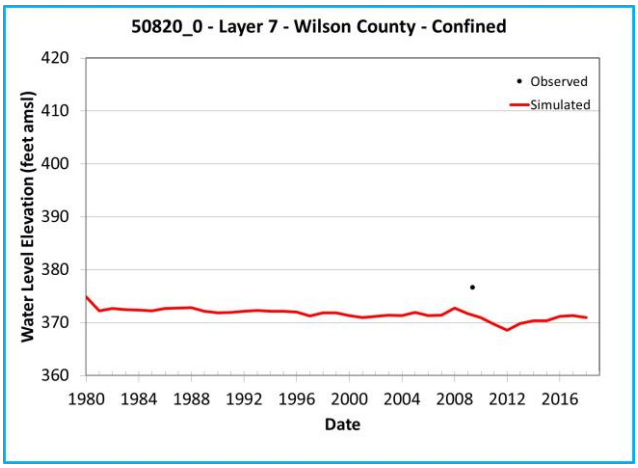












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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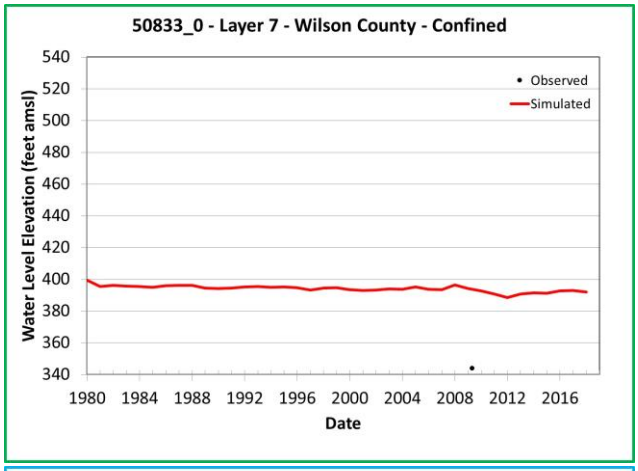
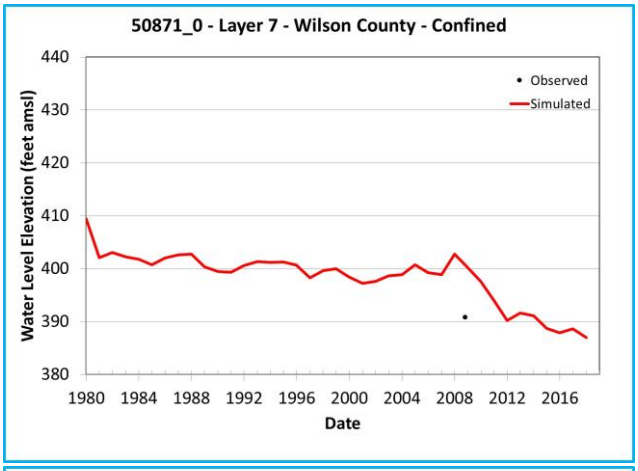
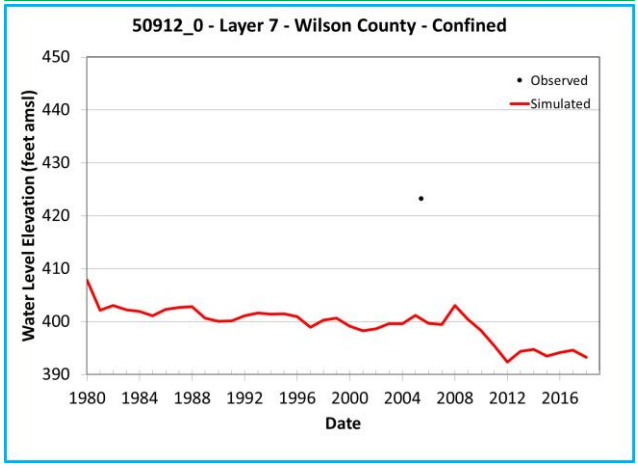
Revised		Aprv'd by	SP

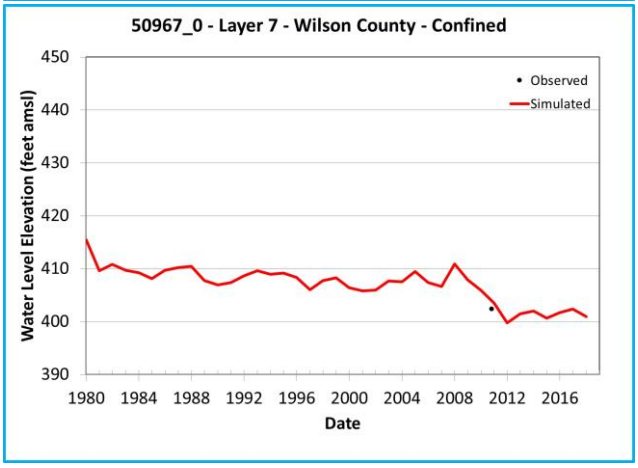
FIGURE I-19.3o

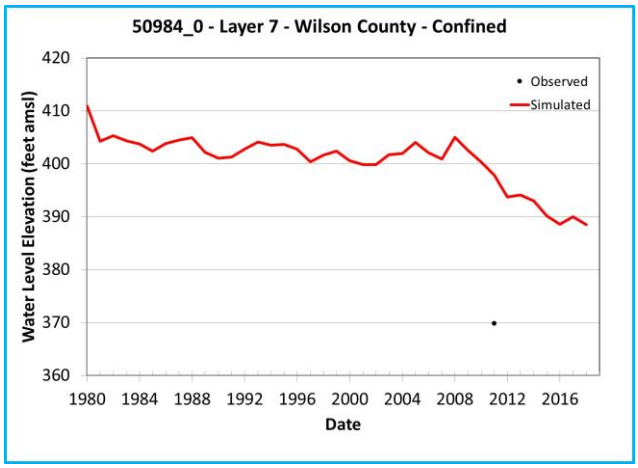
GSI ENVIRONMENTAL

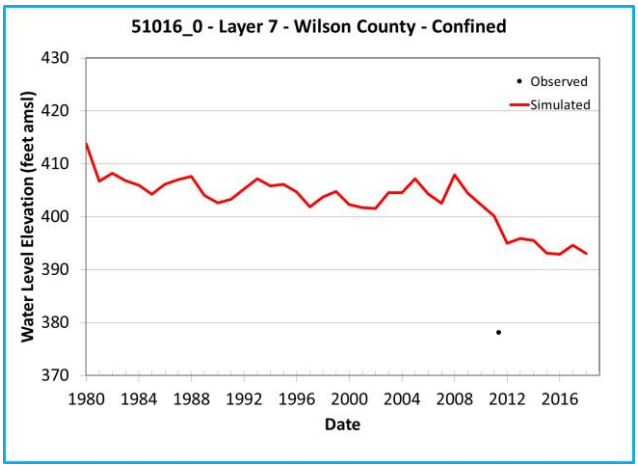












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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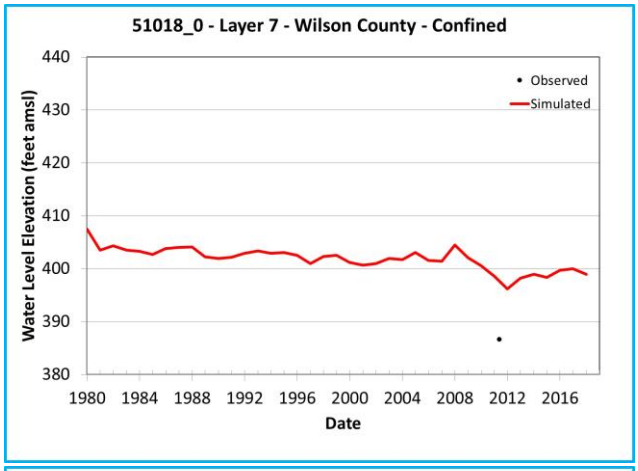
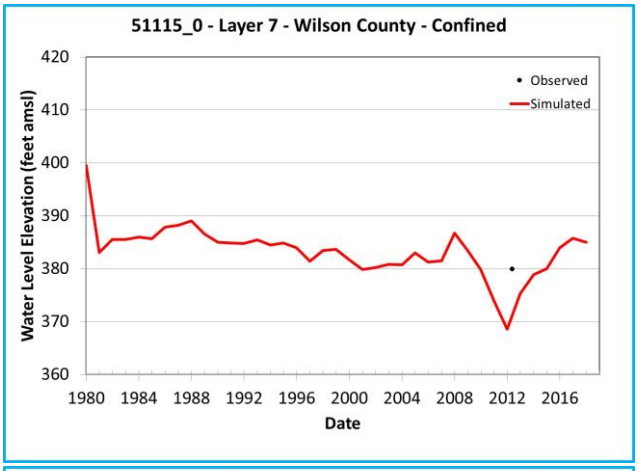
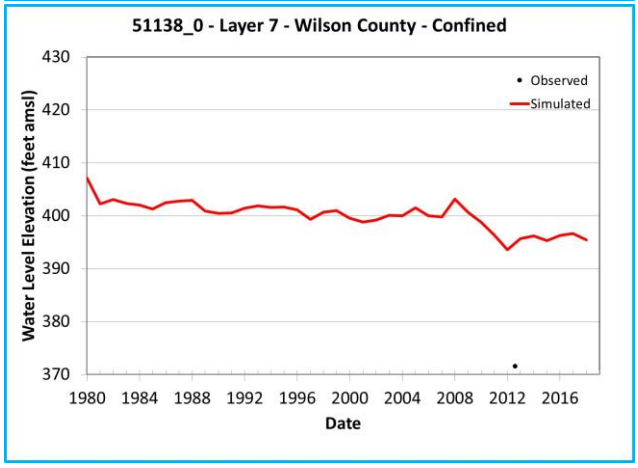
Revised		Aprv'd by	SP

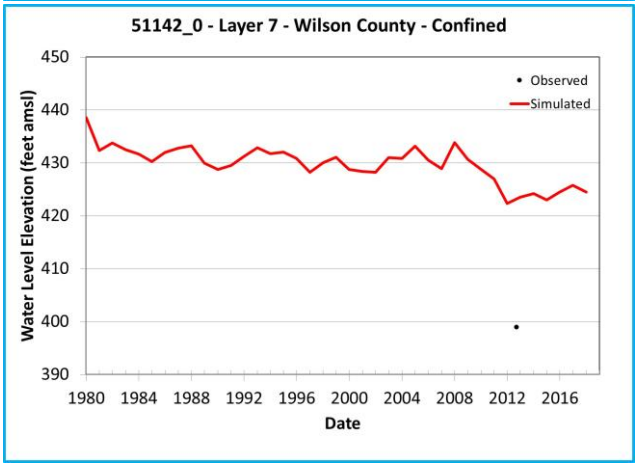
FIGURE I-19.3p

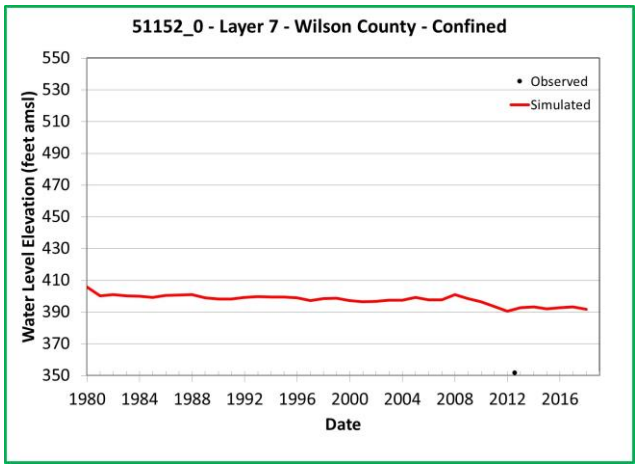
GSI ENVIRONMENTAL

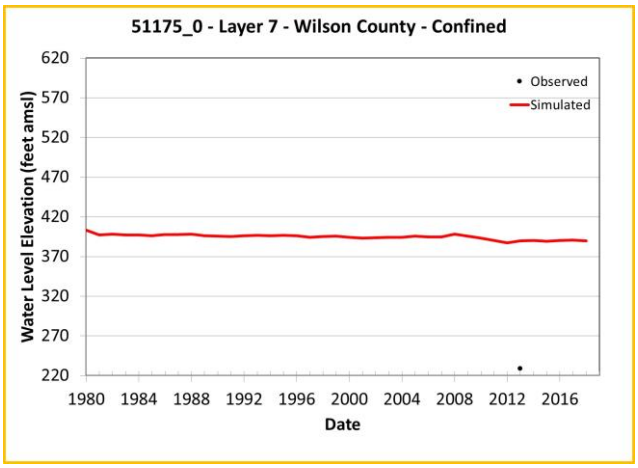












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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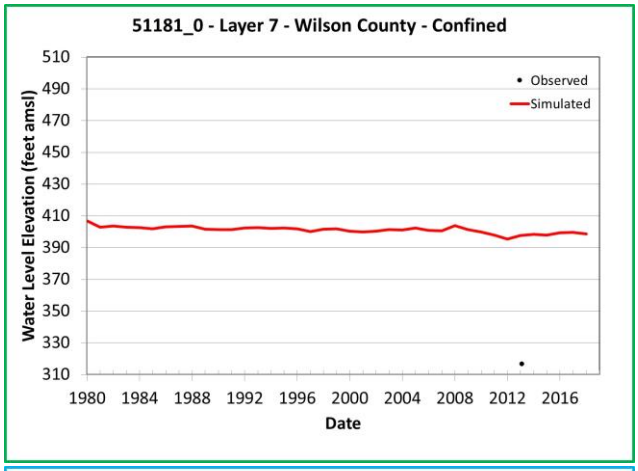
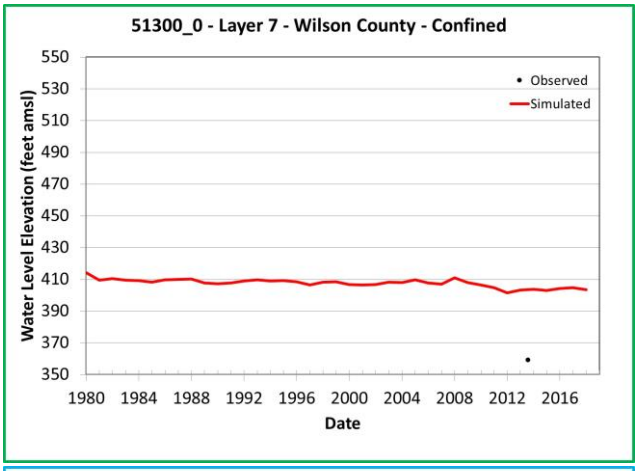
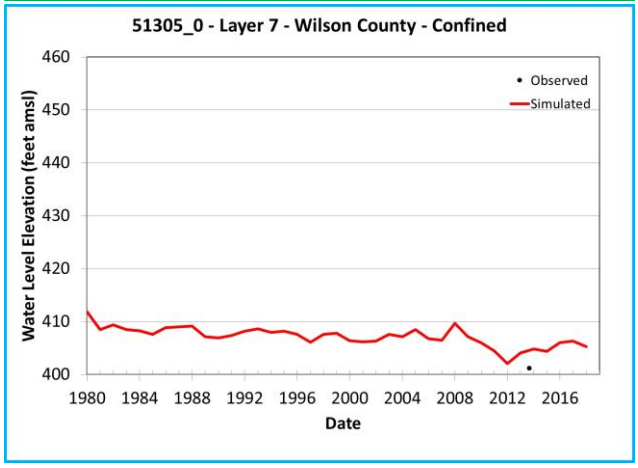
Revised		Aprv'd by	SP

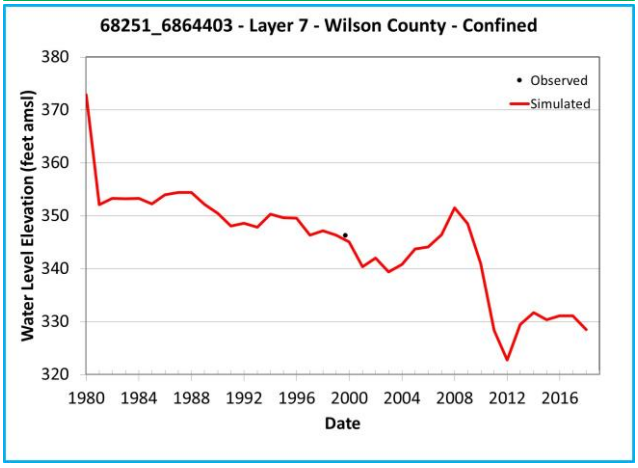
FIGURE I-19.3q

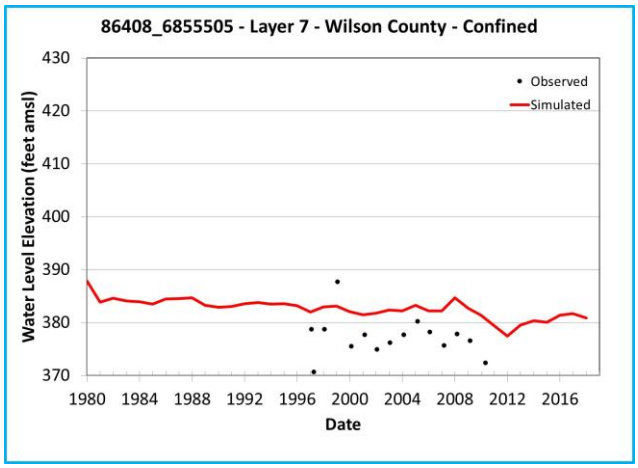
GSI ENVIRONMENTAL

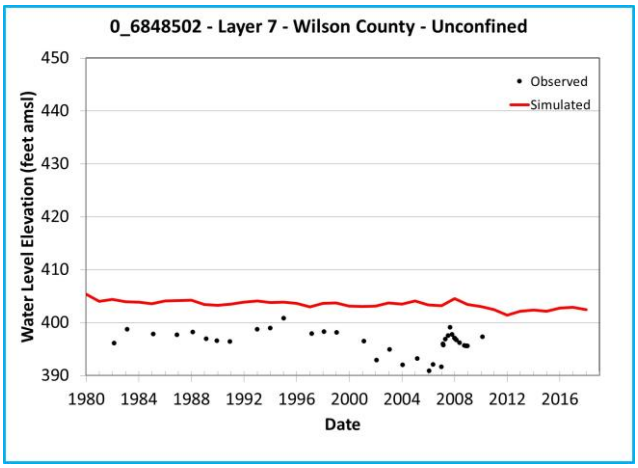












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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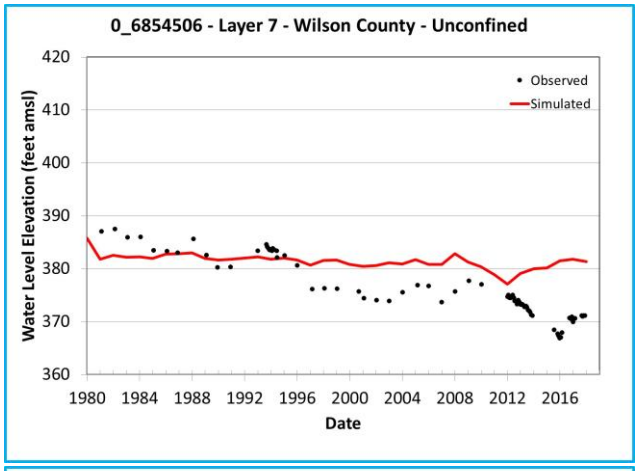
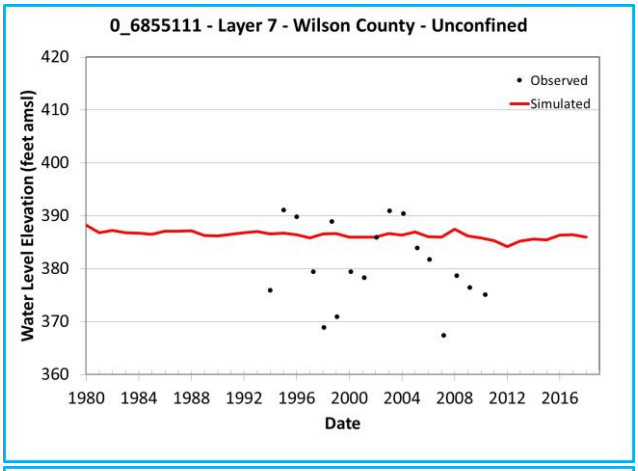
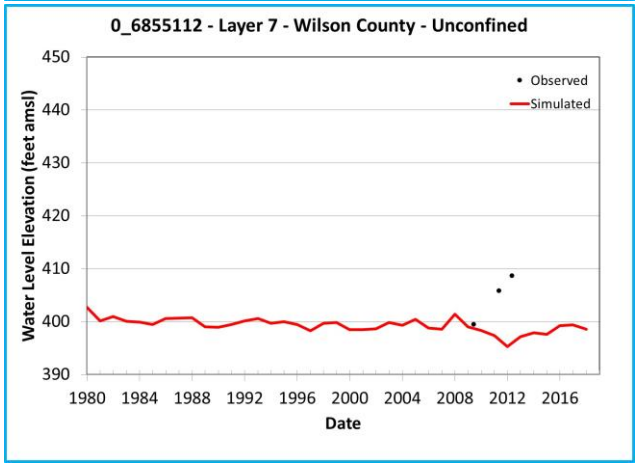
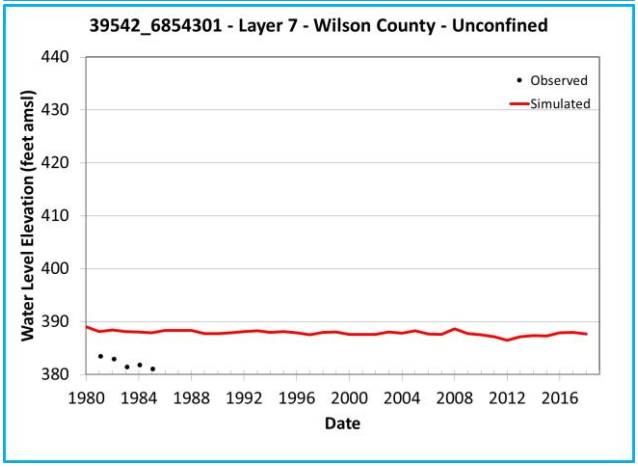
FIGURE I-19.3r

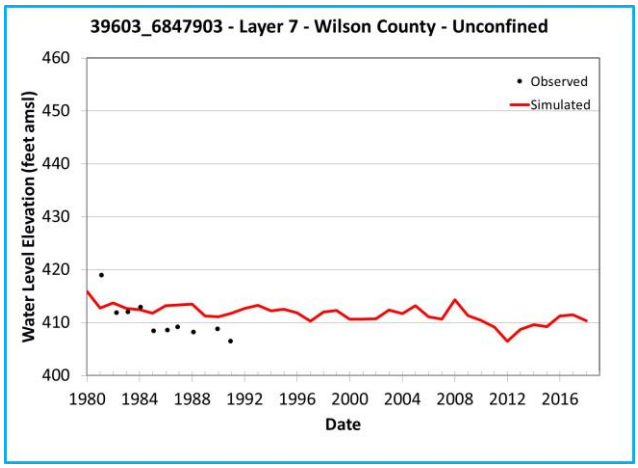
GSI ENVIRONMENTAL

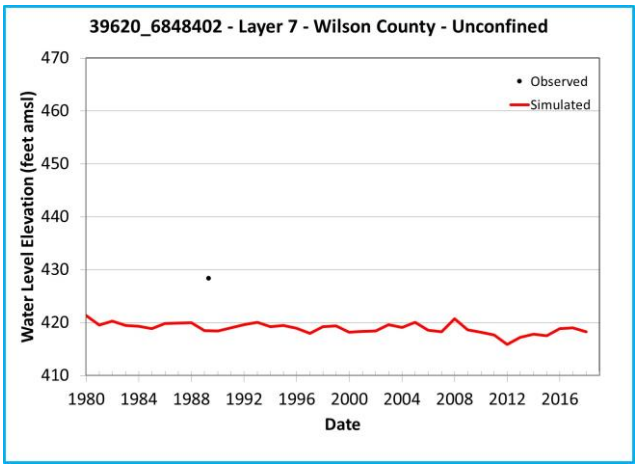












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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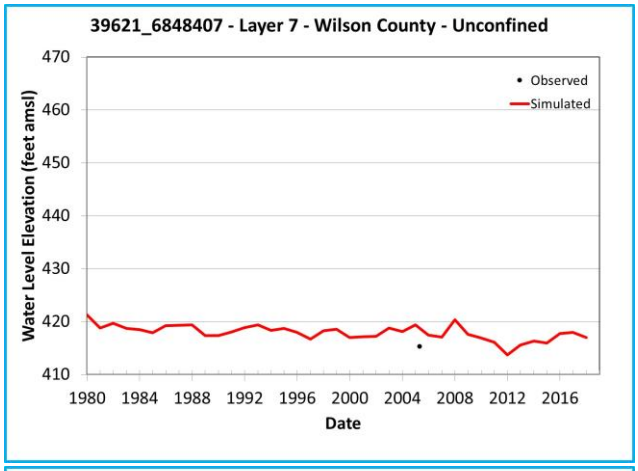
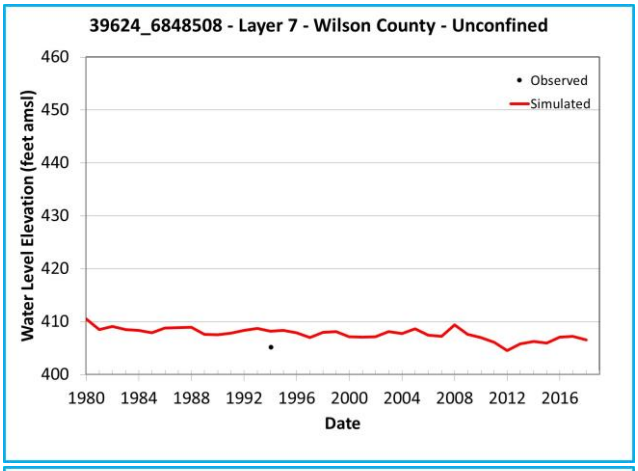
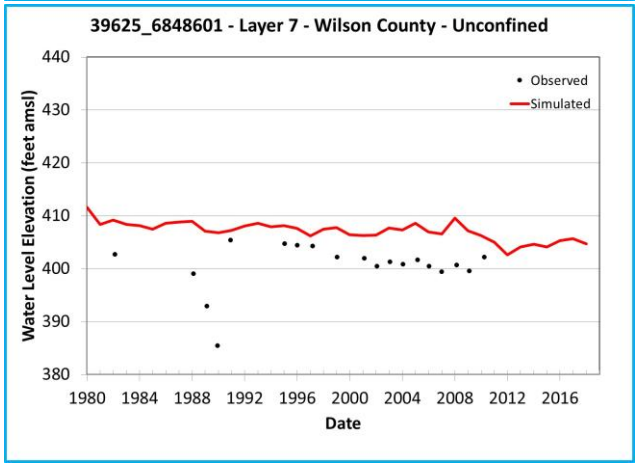
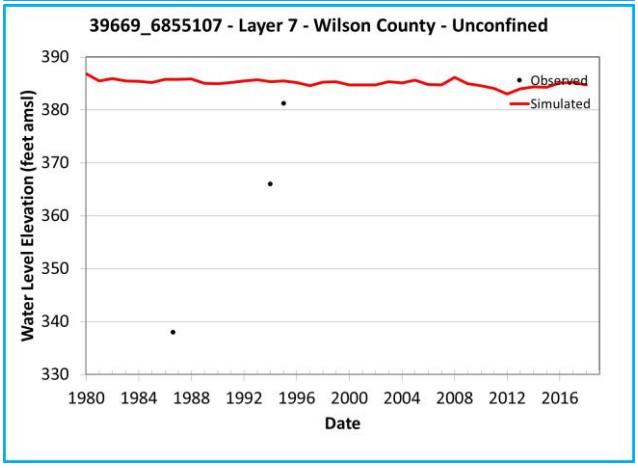
FIGURE I-19.3s

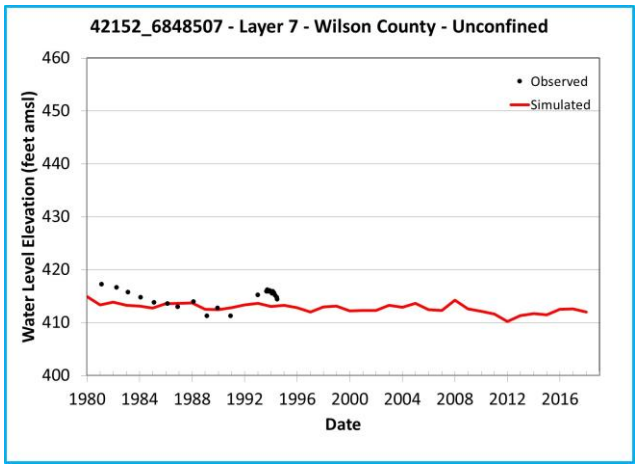
GSI ENVIRONMENTAL

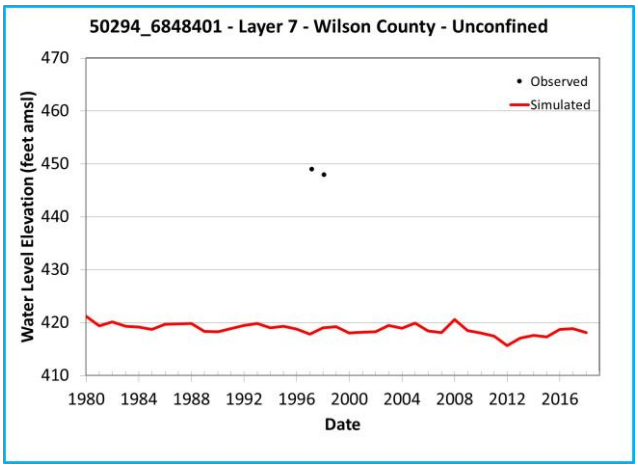












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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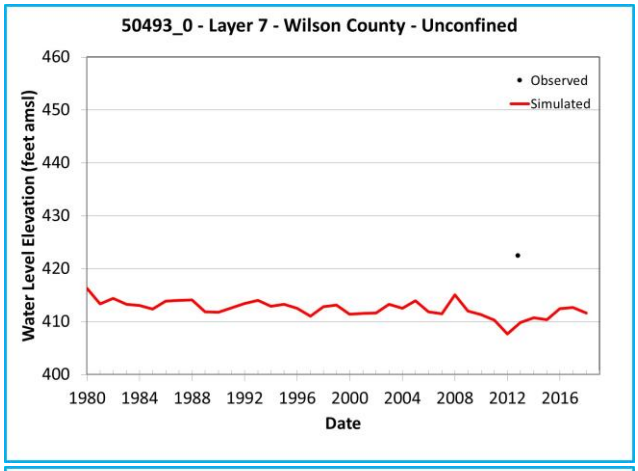
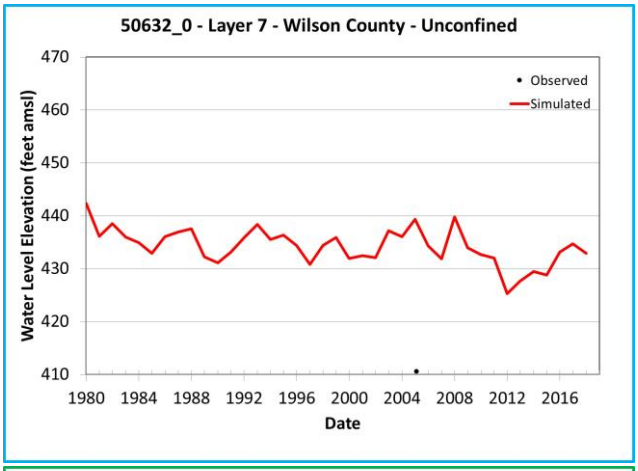
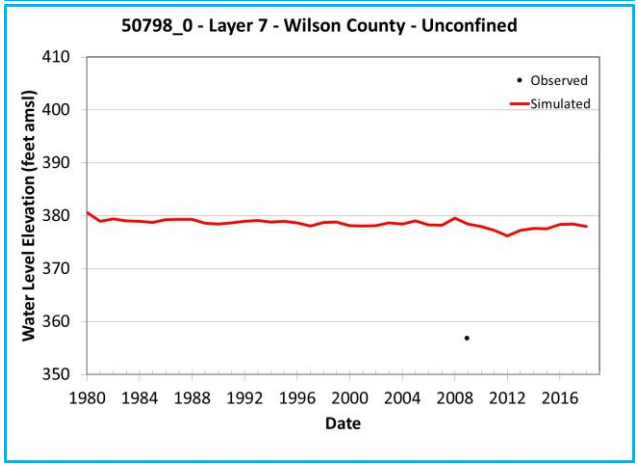
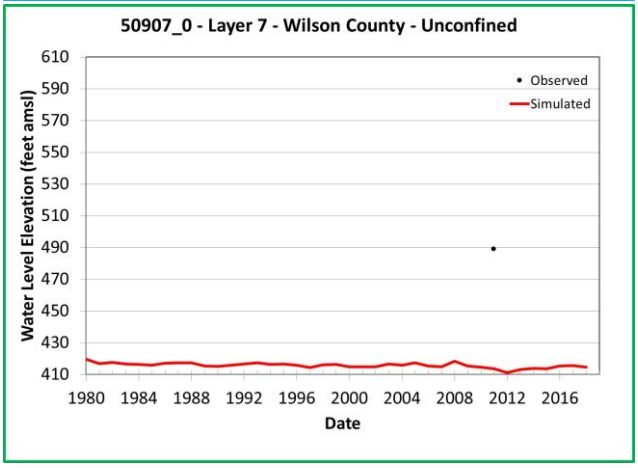
FIGURE I-19.3t

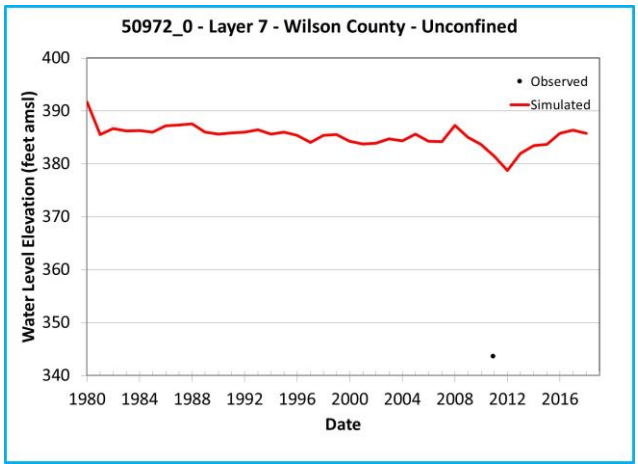
GSI ENVIRONMENTAL

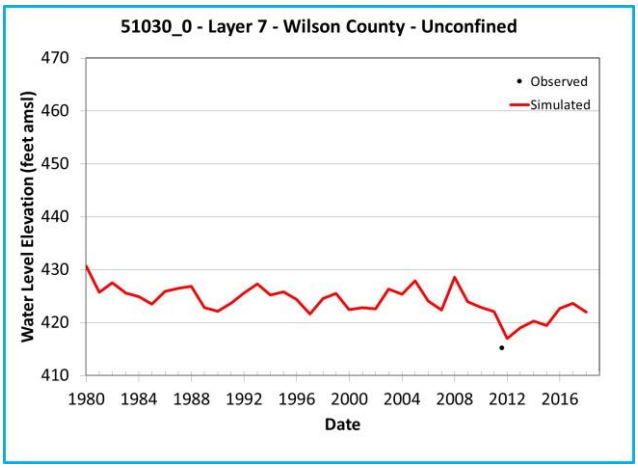












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

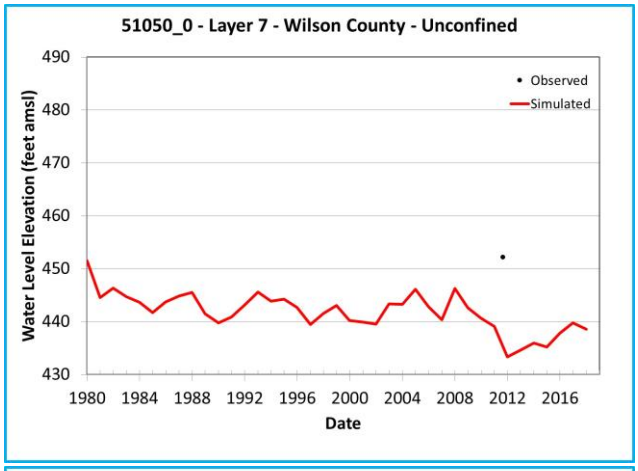
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

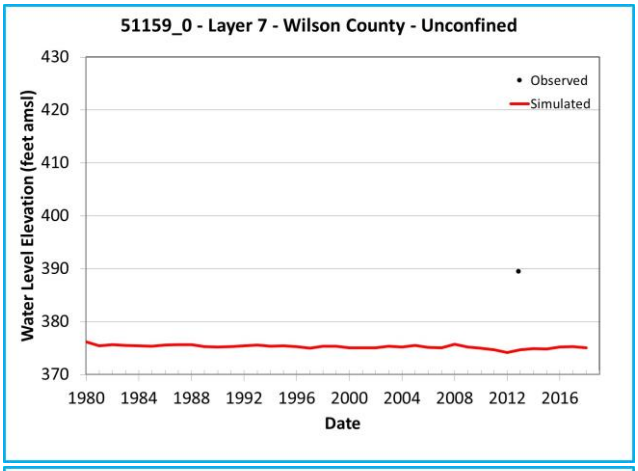
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

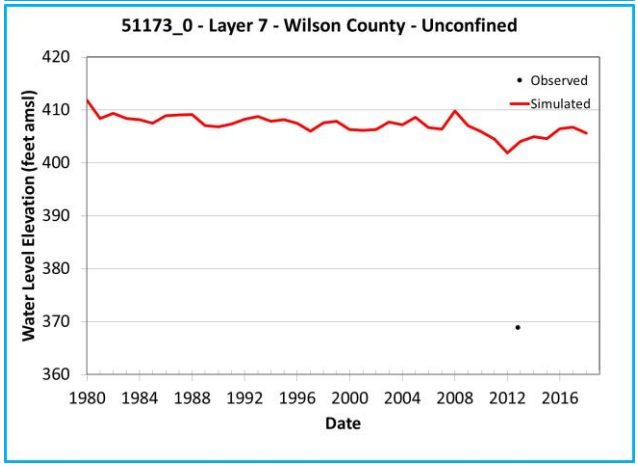
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

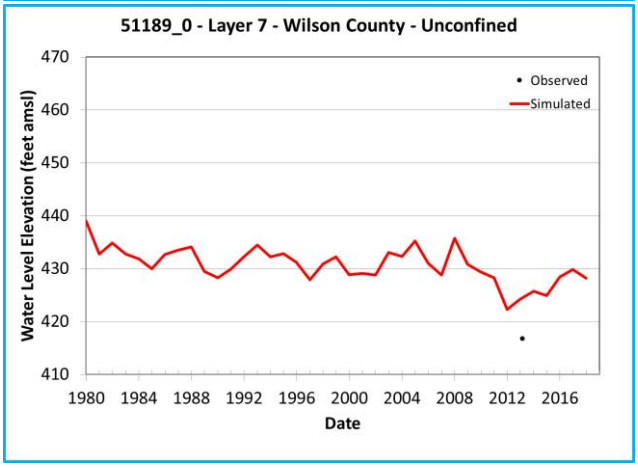
FIGURE I-19.3u

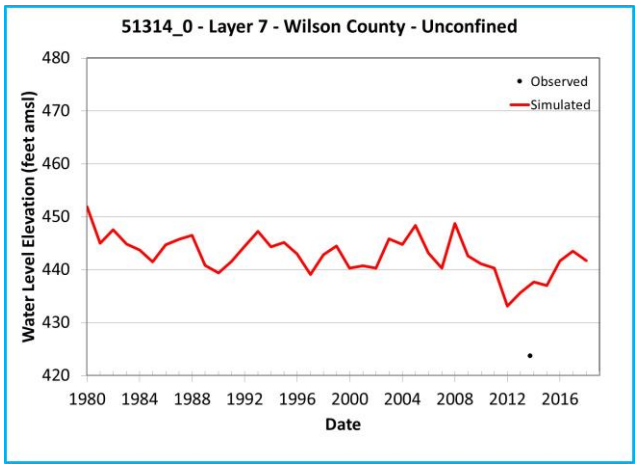
GSI ENVIRONMENTAL

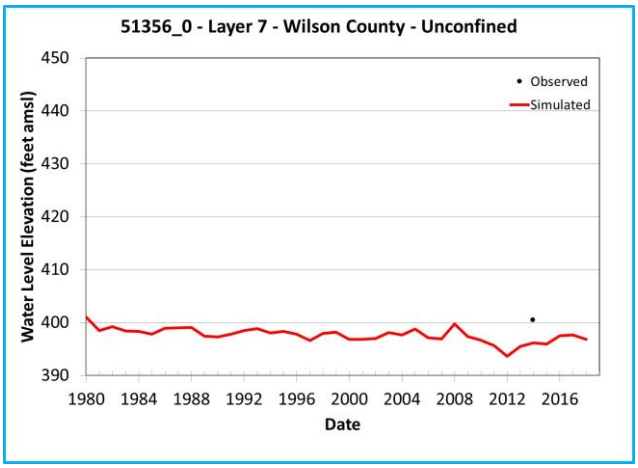












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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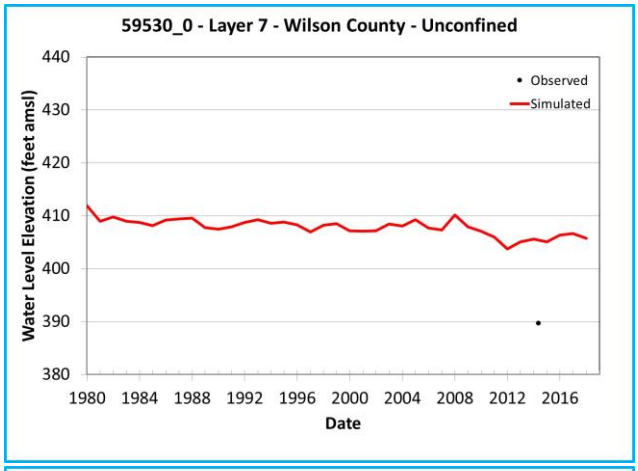
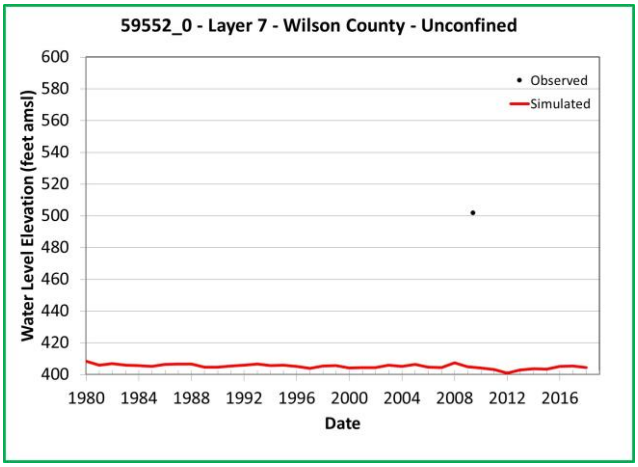
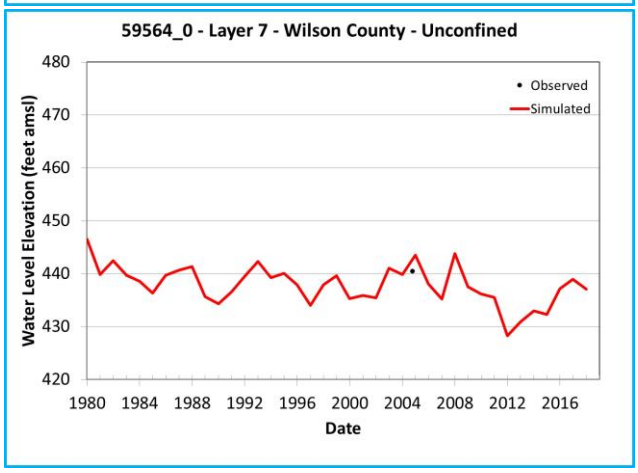
Revised		Aprv'd by	SP

FIGURE I-19.3v

GSI ENVIRONMENTAL







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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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Issued	January 2023	Chk'd by	GM
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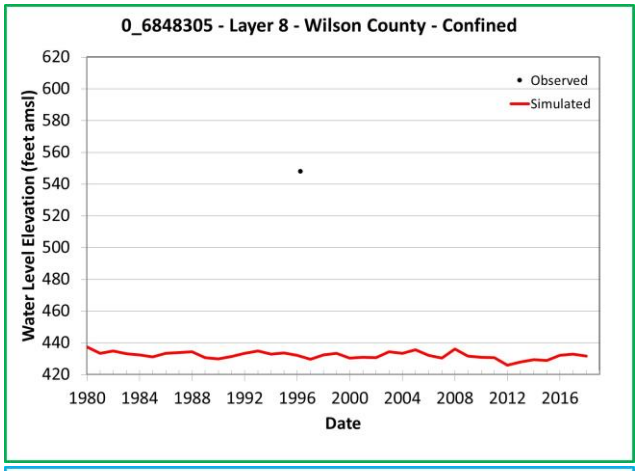
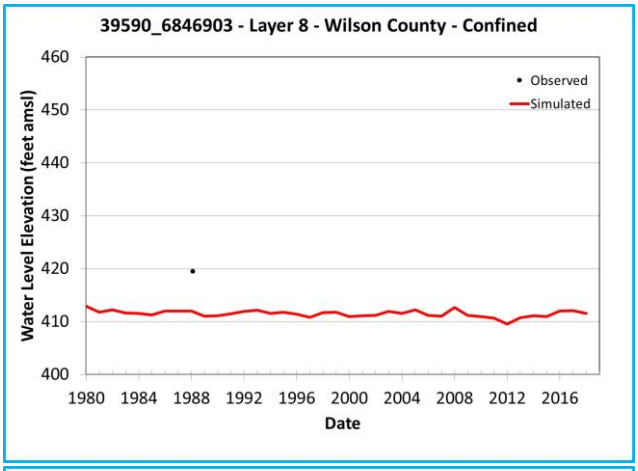
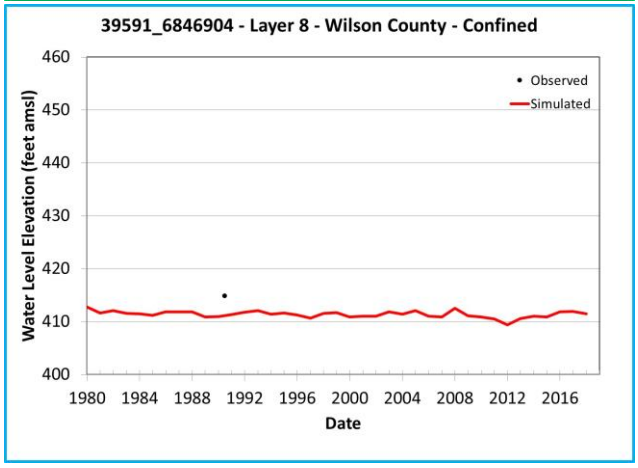
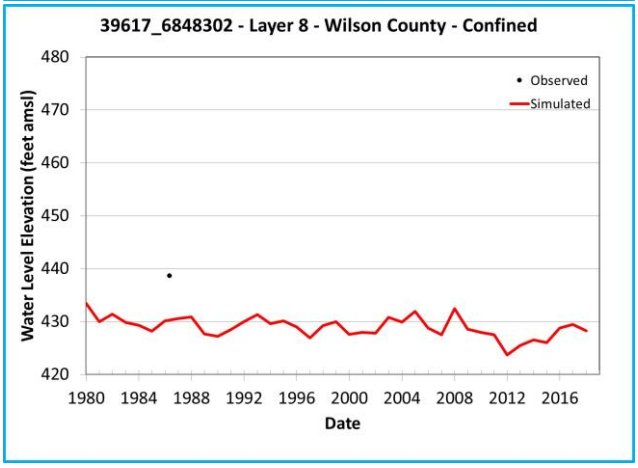
FIGURE I-19.3w

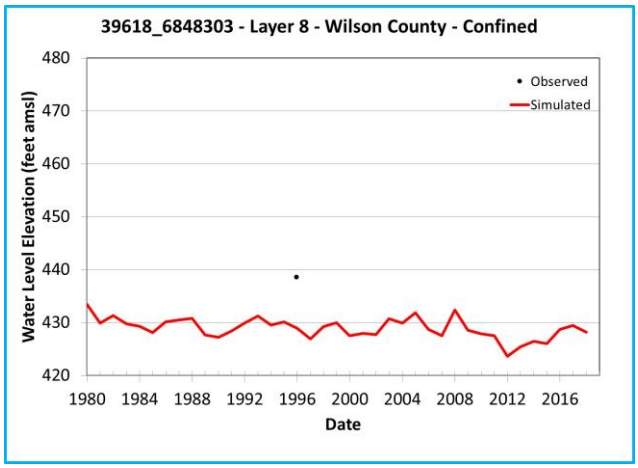
GSI ENVIRONMENTAL

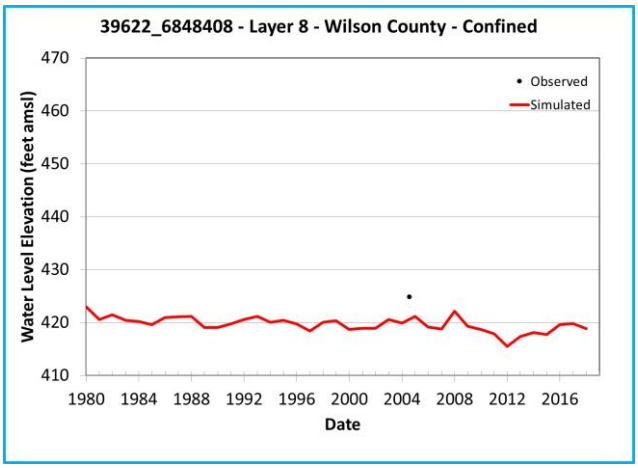












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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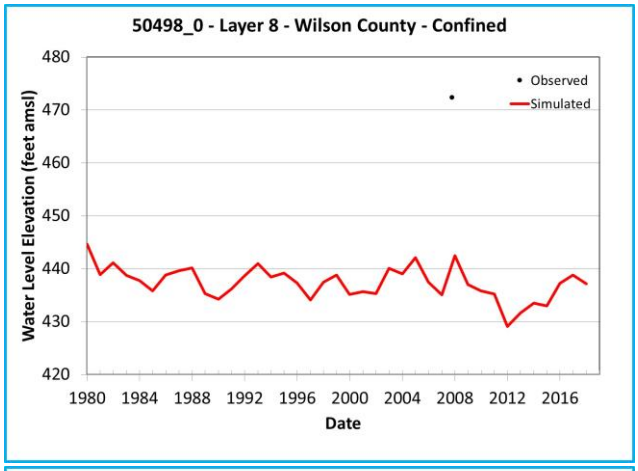
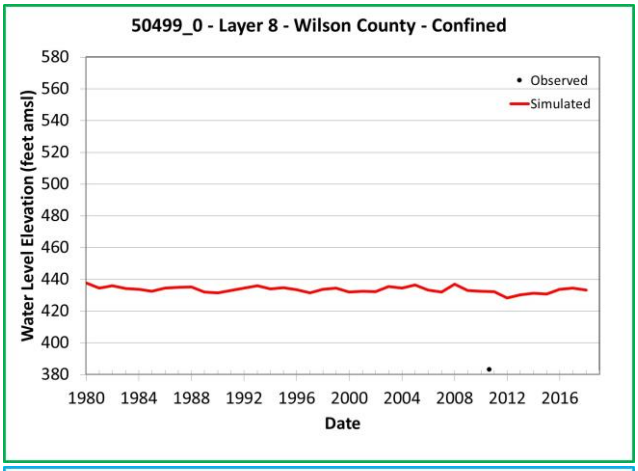
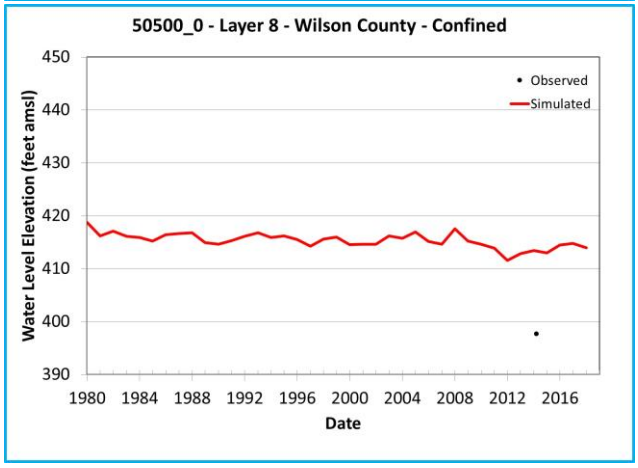
Revised		Aprv'd by	SP

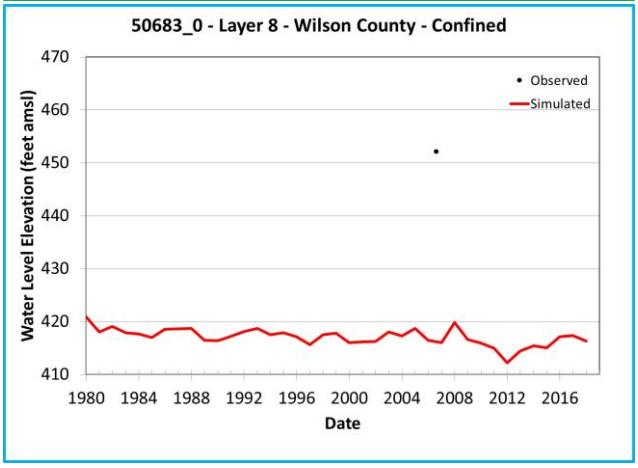
FIGURE I-19.4a

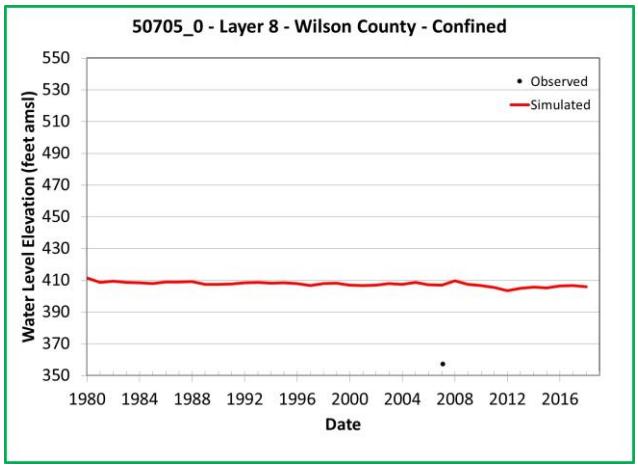
GSI ENVIRONMENTAL

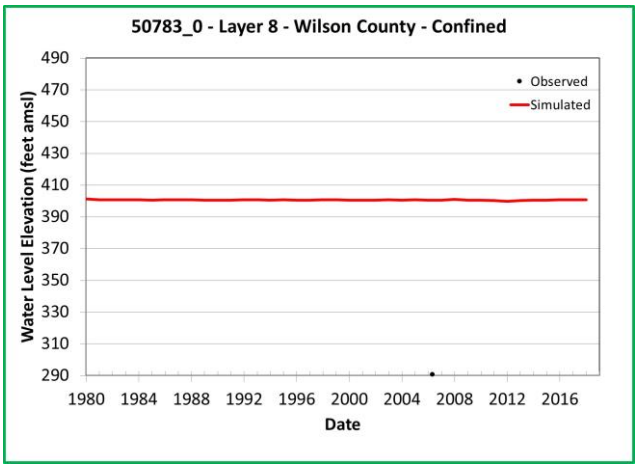












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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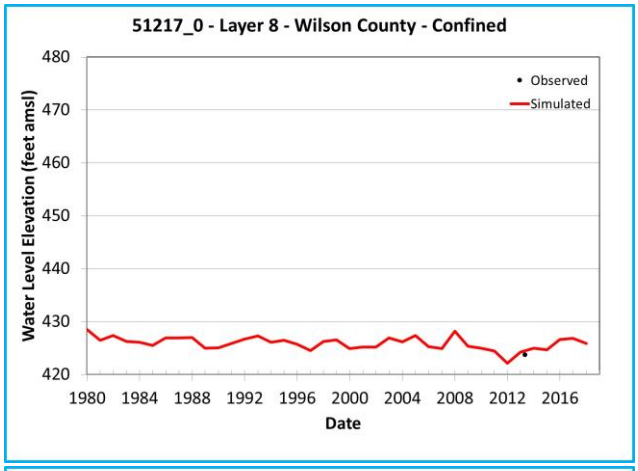
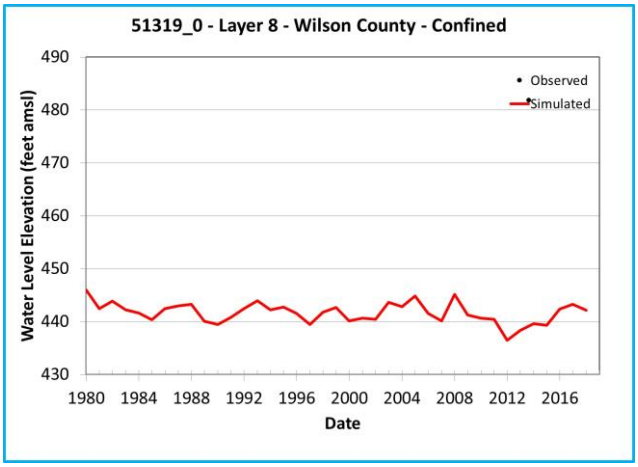
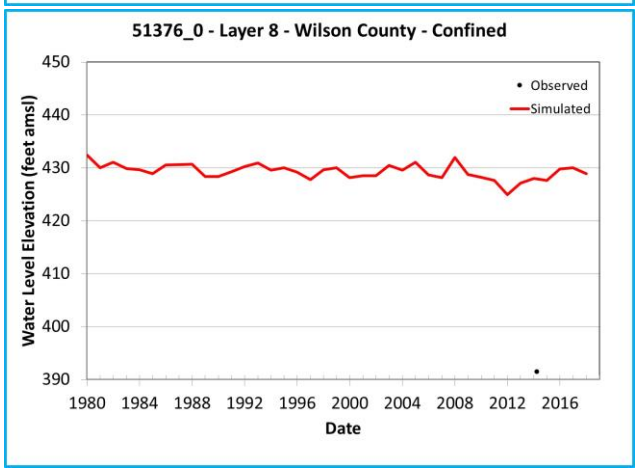
Revised		Aprv'd by	SP

FIGURE I-19.4b

GSI ENVIRONMENTAL







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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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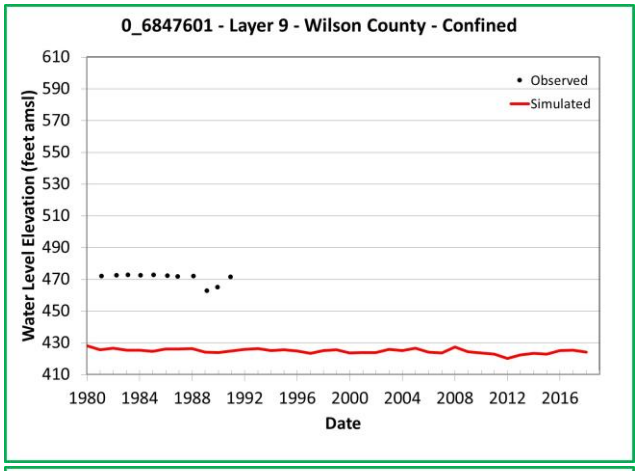
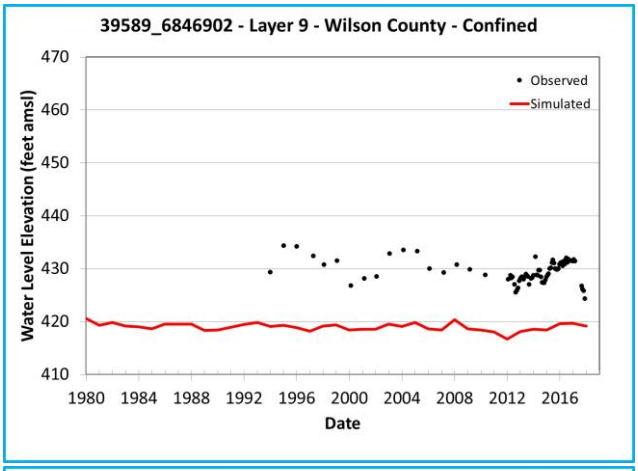
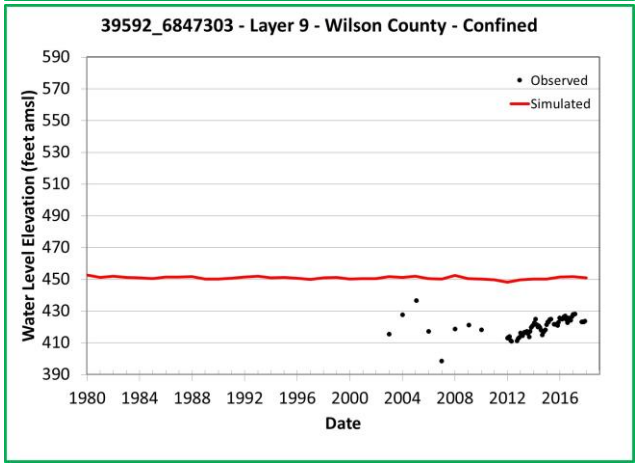
Revised		Aprv'd by	SP

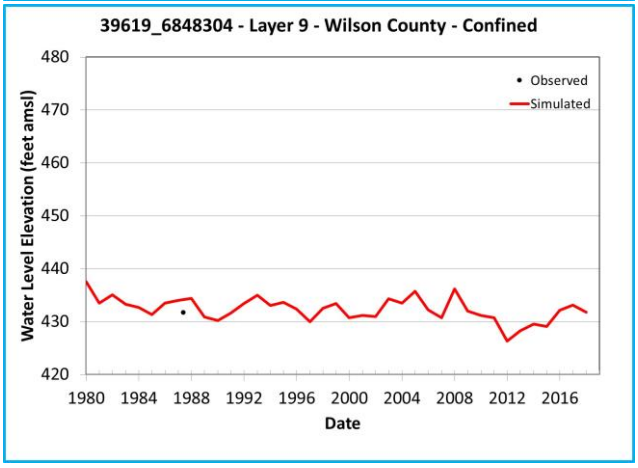
FIGURE I-19.4c

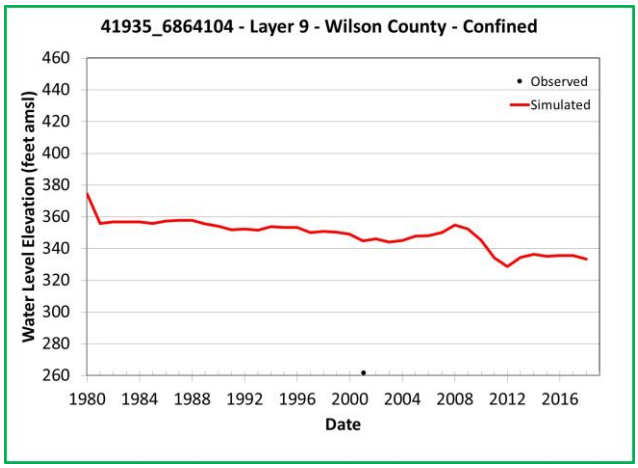
GSI ENVIRONMENTAL

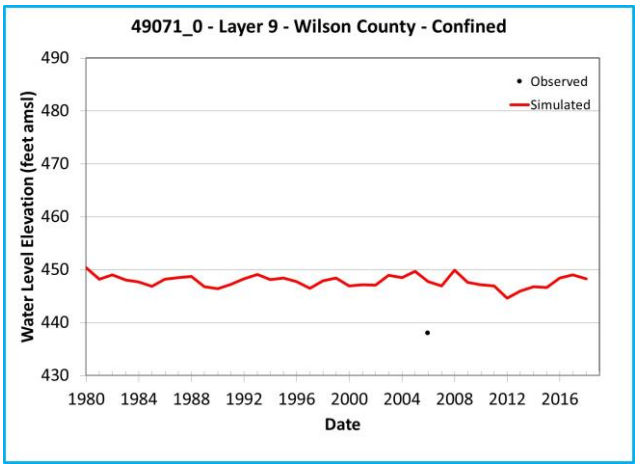












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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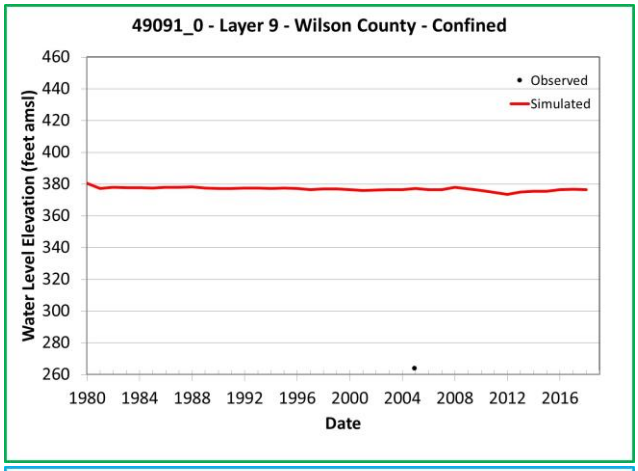
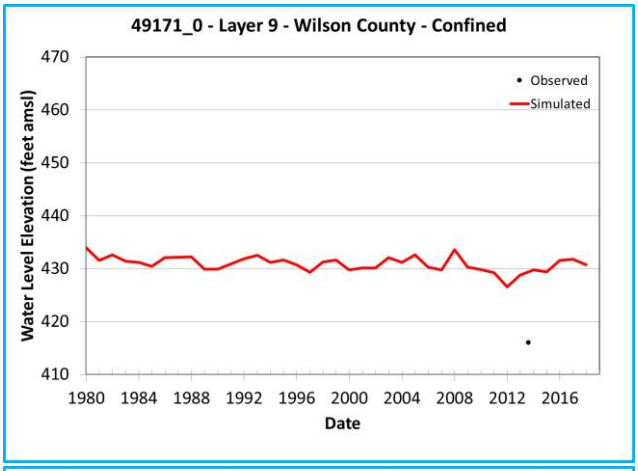
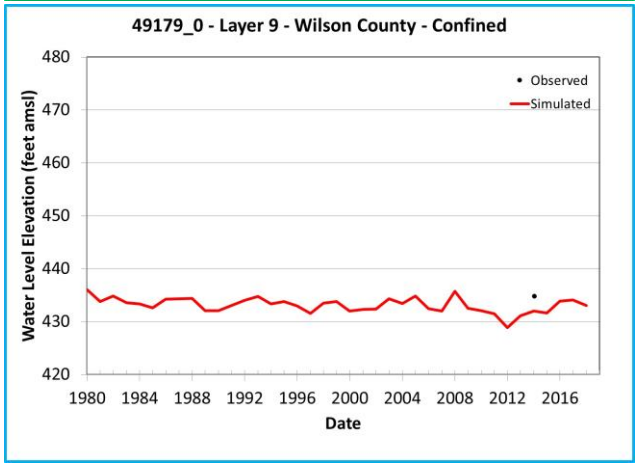
Revised		Aprv'd by	SP

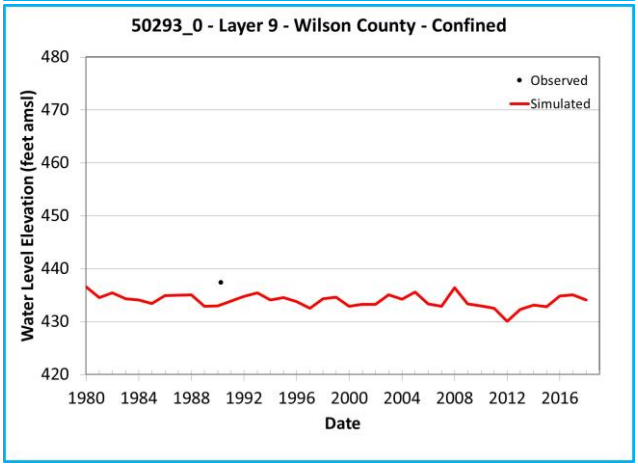
FIGURE I-19.5a

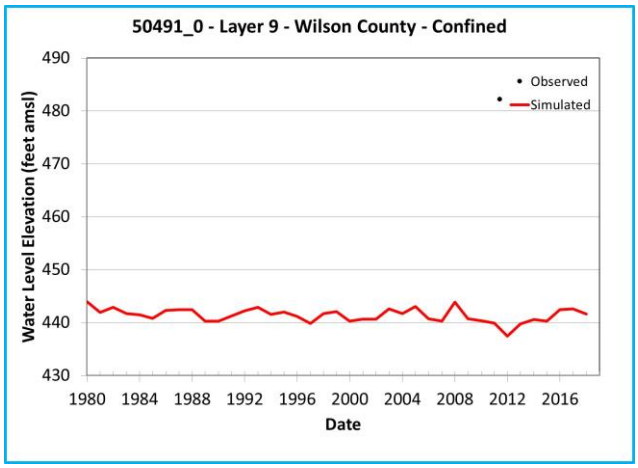
GSI ENVIRONMENTAL

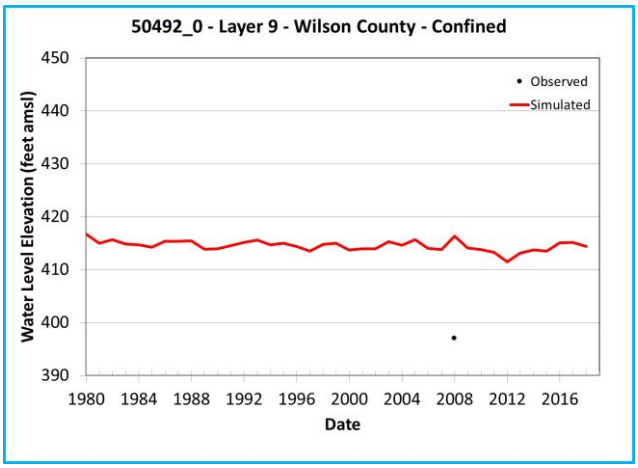












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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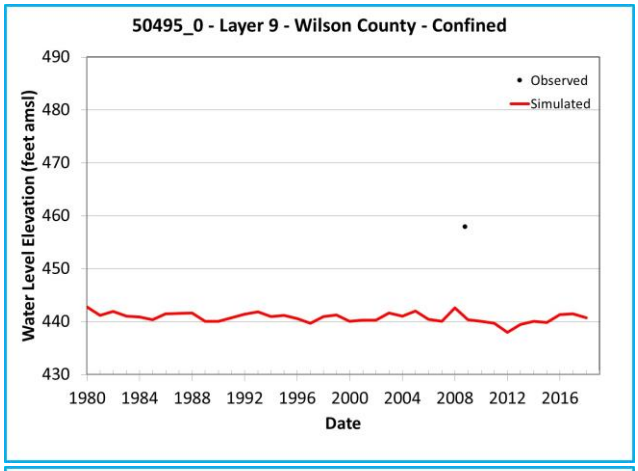
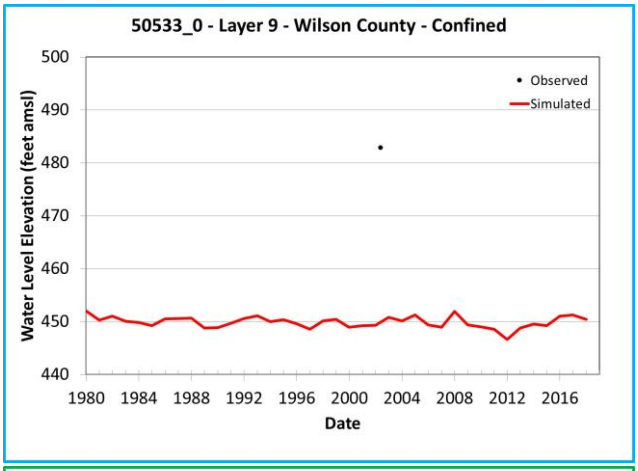
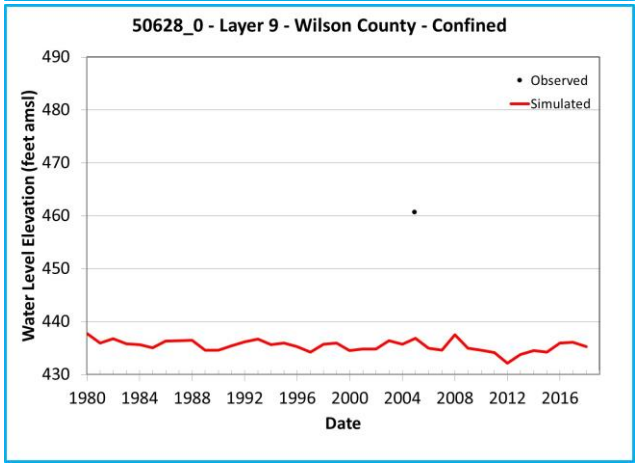
Revised		Aprv'd by	SP

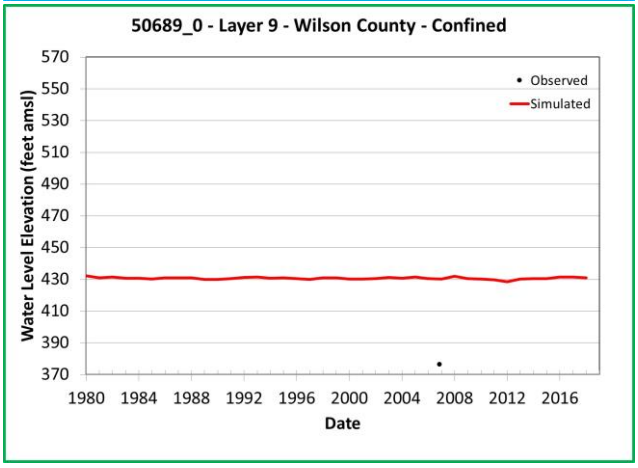
FIGURE I-19.5b

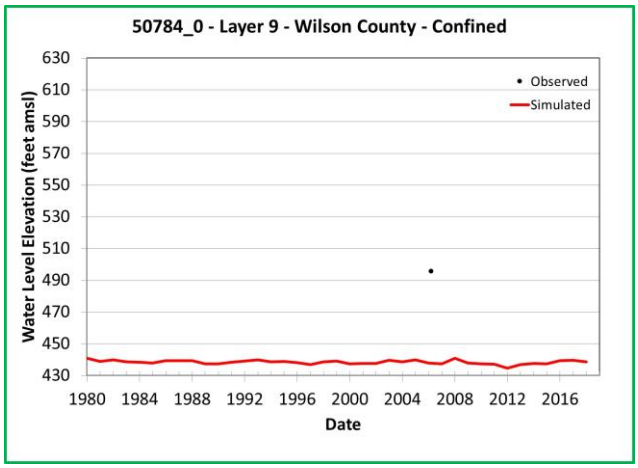
GSI ENVIRONMENTAL

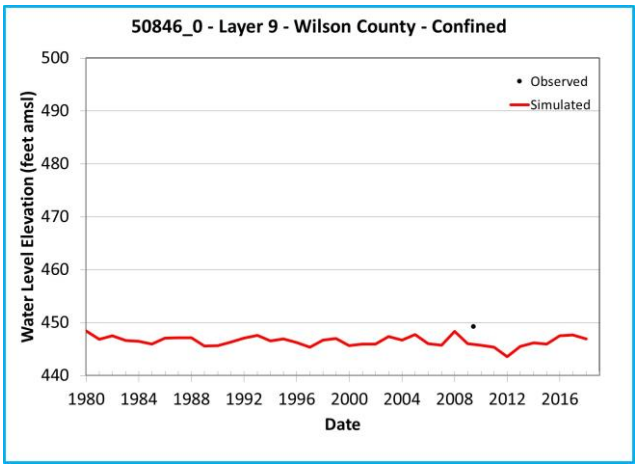












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Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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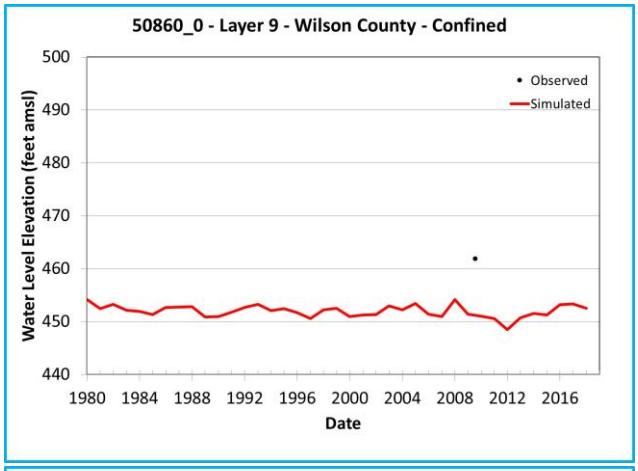
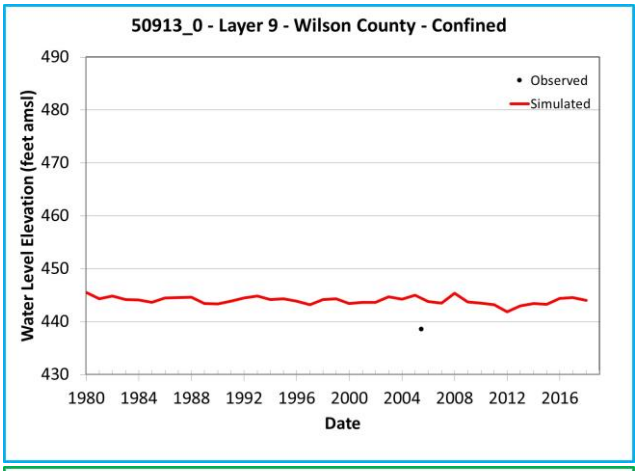
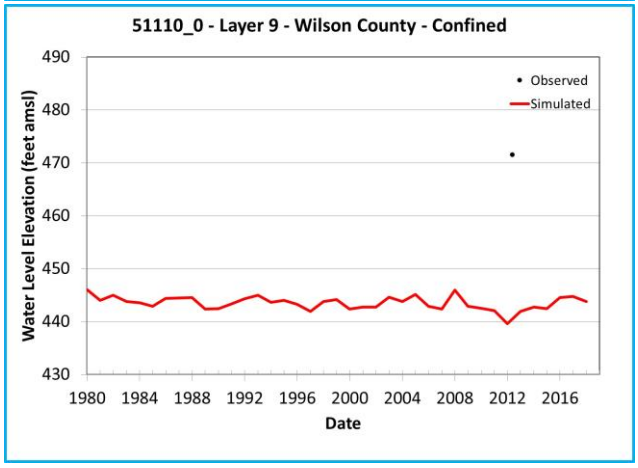
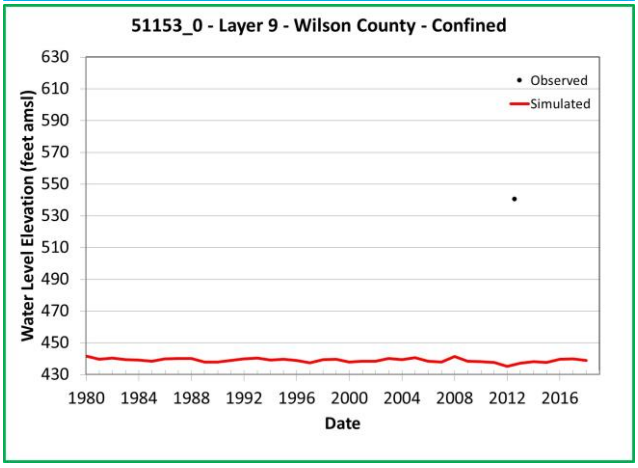
FIGURE I-19.5c

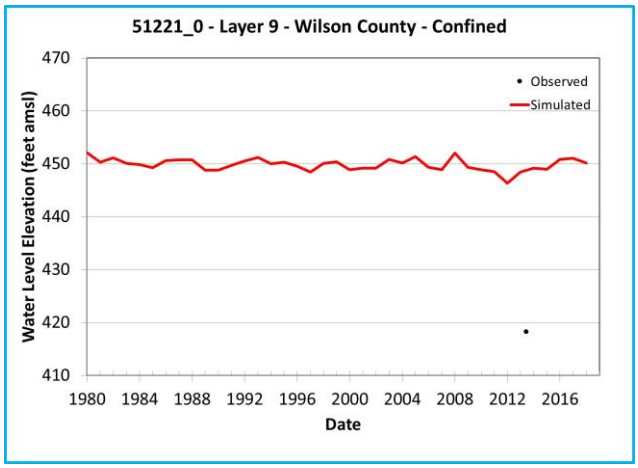
GSI ENVIRONMENTAL

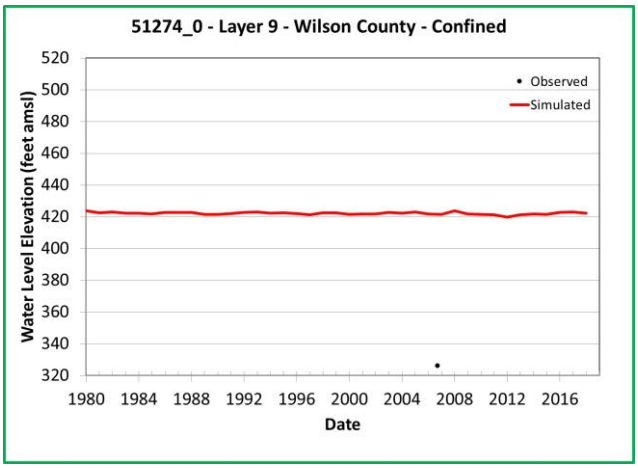












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

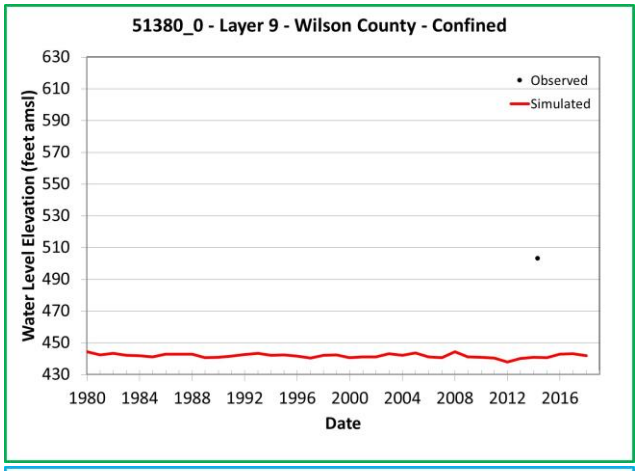
Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 9

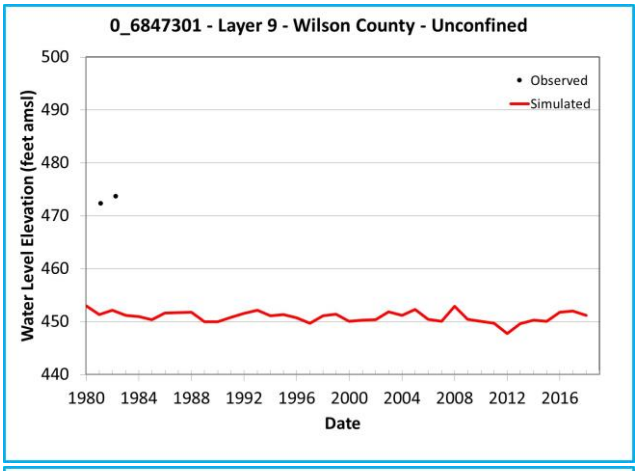
Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

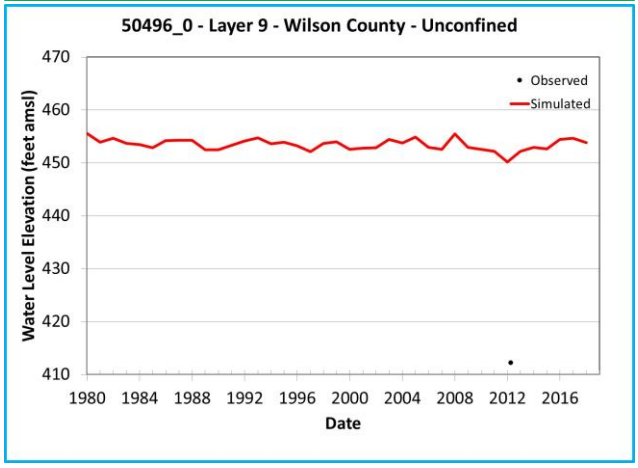
GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
Revised		Aprv'd by	SP

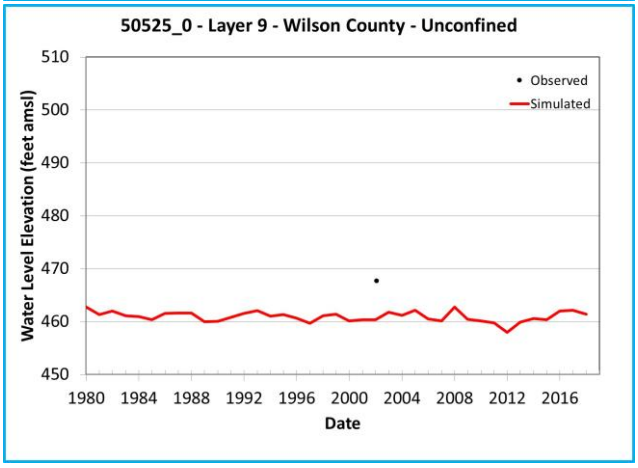
FIGURE I-19.5d

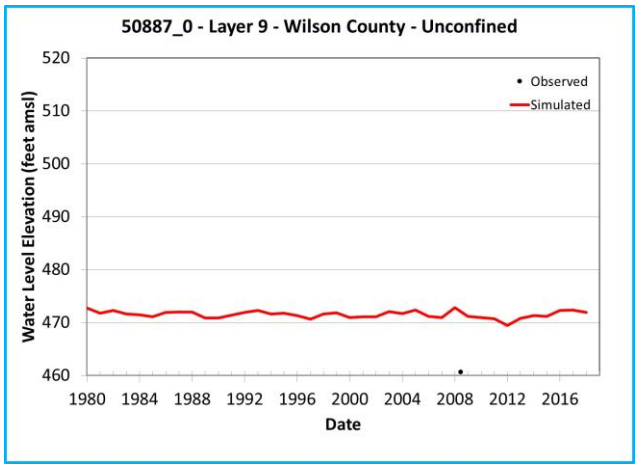
GSI ENVIRONMENTAL

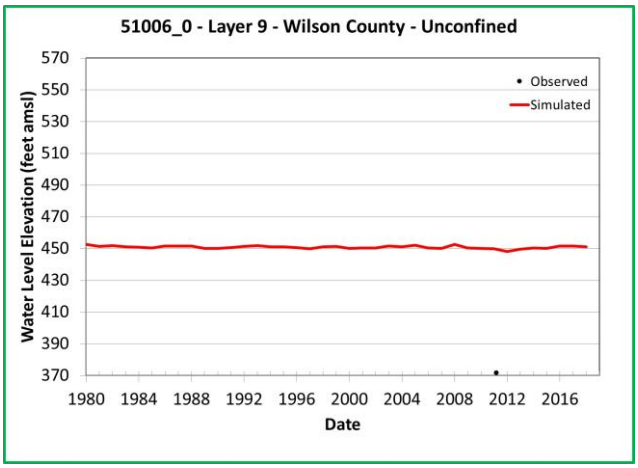












Note: Chart outline color indicates Y-axis range.
Yellow = 400 feet
Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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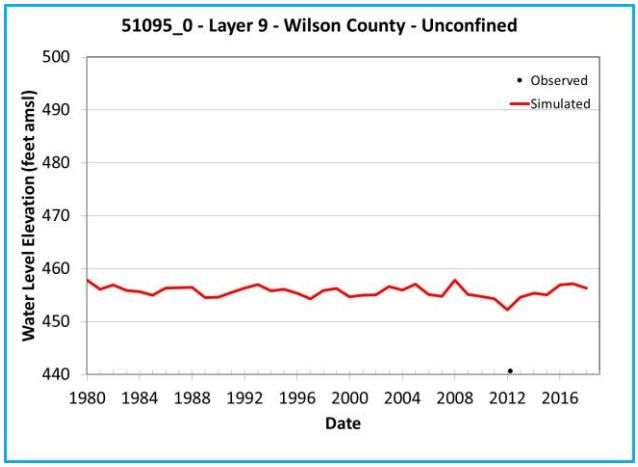
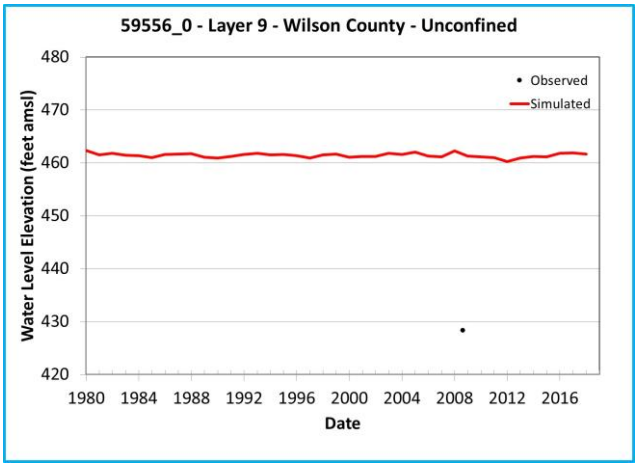
Revised		Aprv'd by	SP

FIGURE I-19.5e

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Wilson County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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Issued	January 2023	Chk'd by	GM
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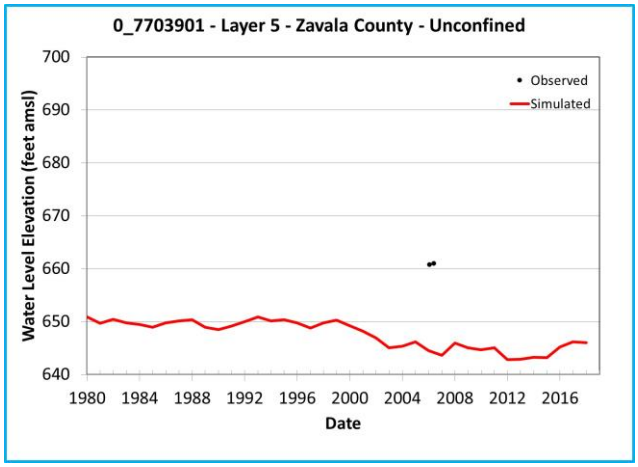
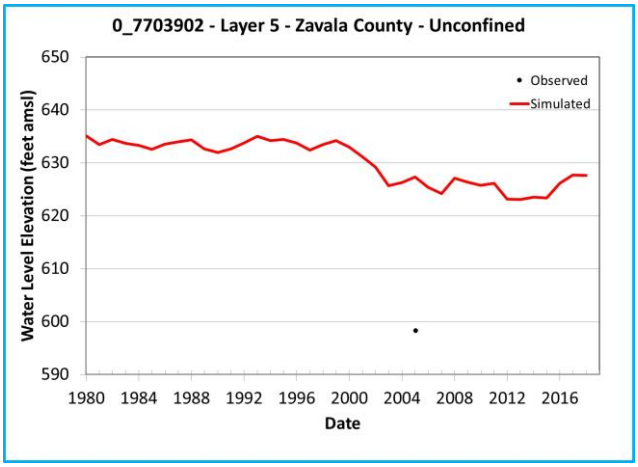
FIGURE I-19.5f

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
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Green = 200 feet
Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 5

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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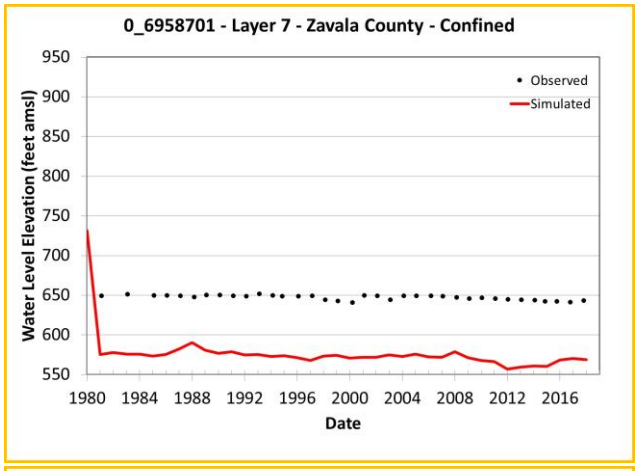
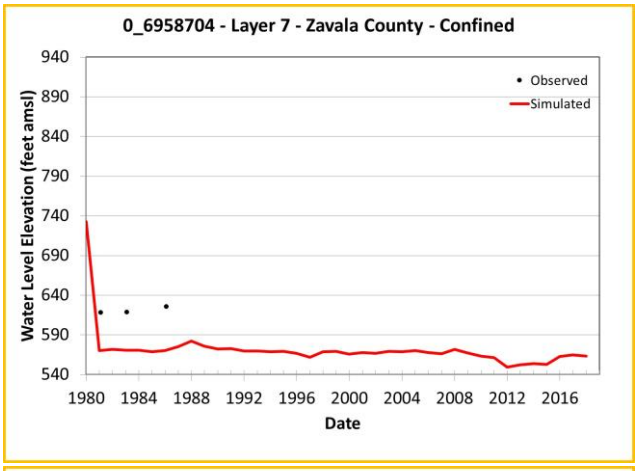
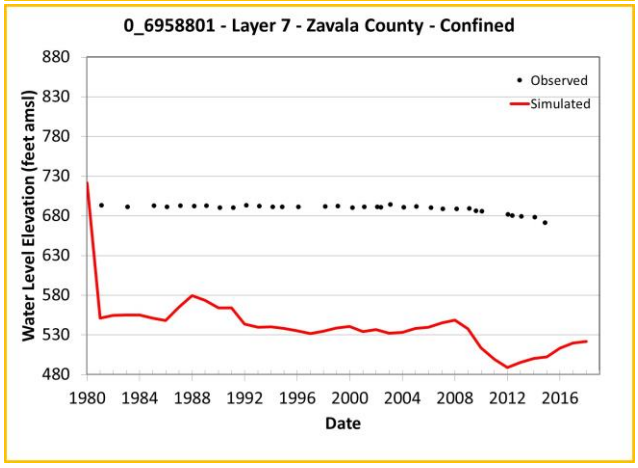
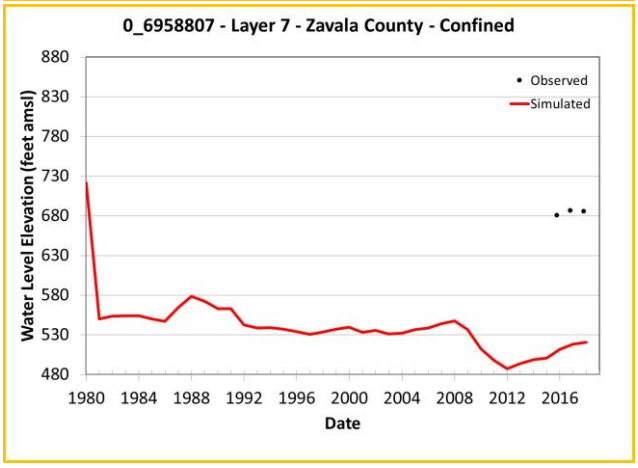
FIGURE I-20.1a

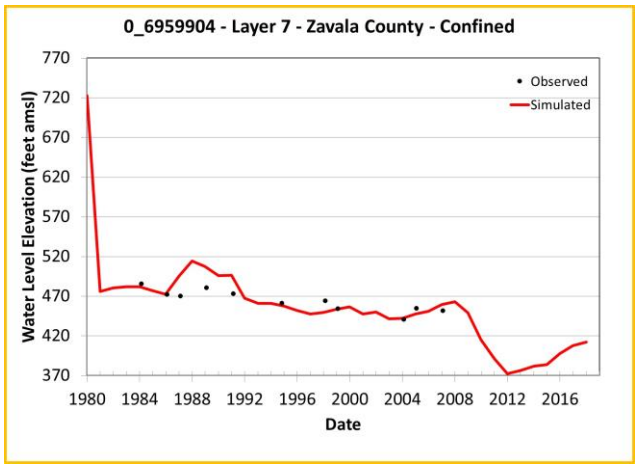
GSI ENVIRONMENTAL

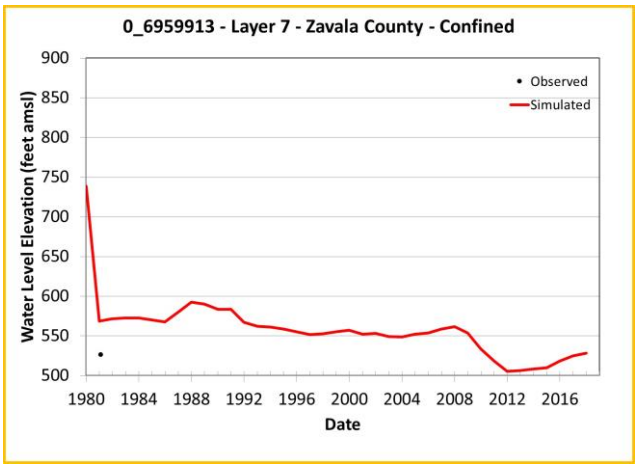












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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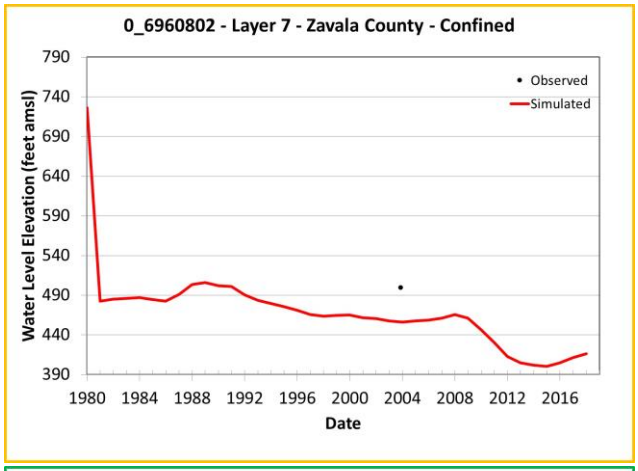
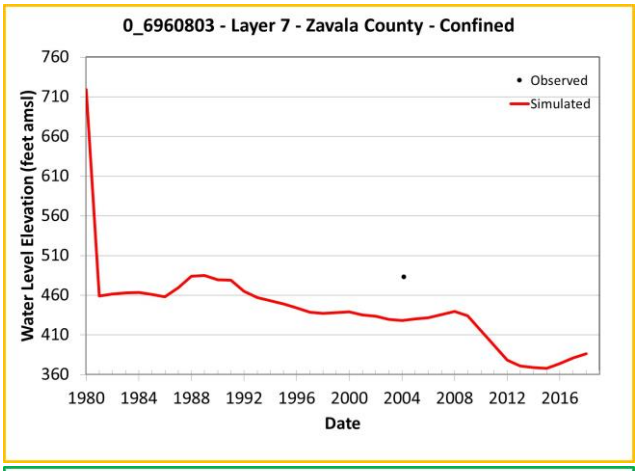
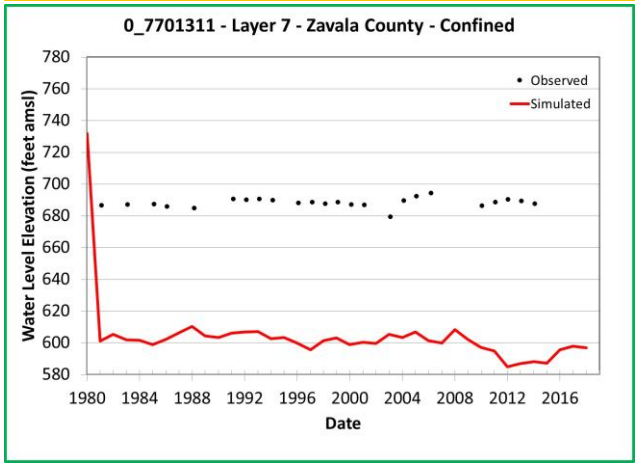
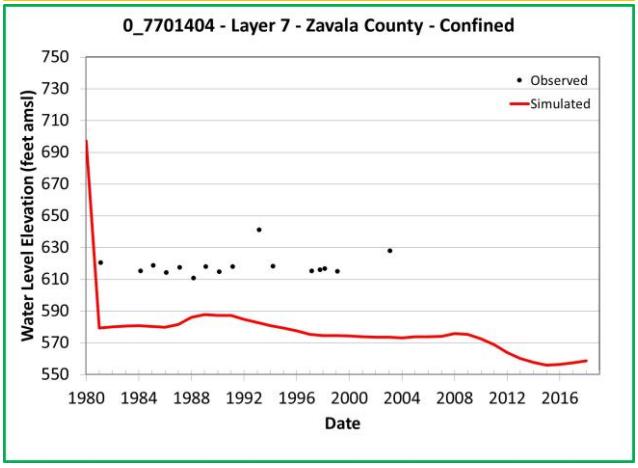
FIGURE I-20.2a

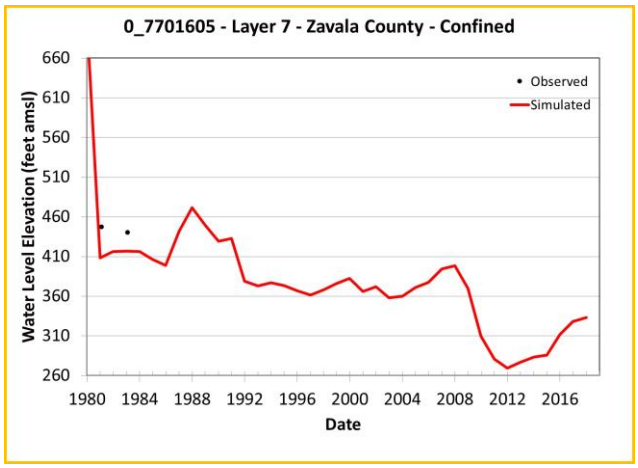
GSI ENVIRONMENTAL

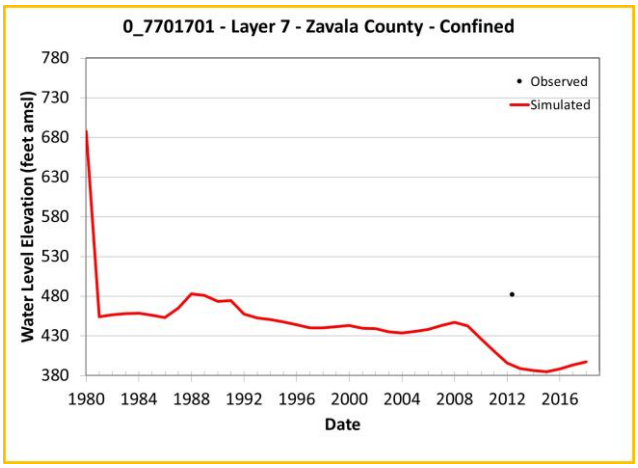












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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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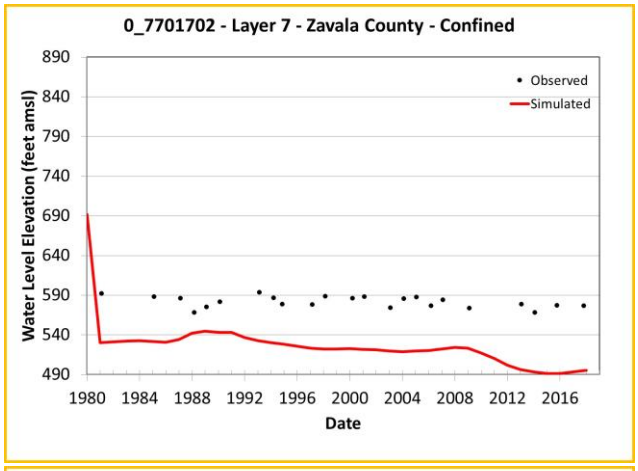
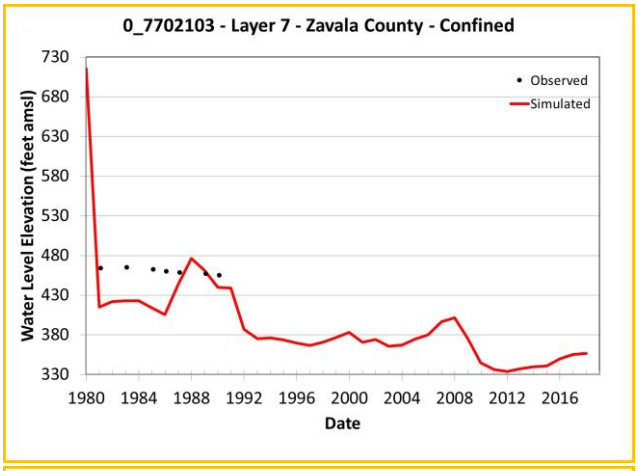
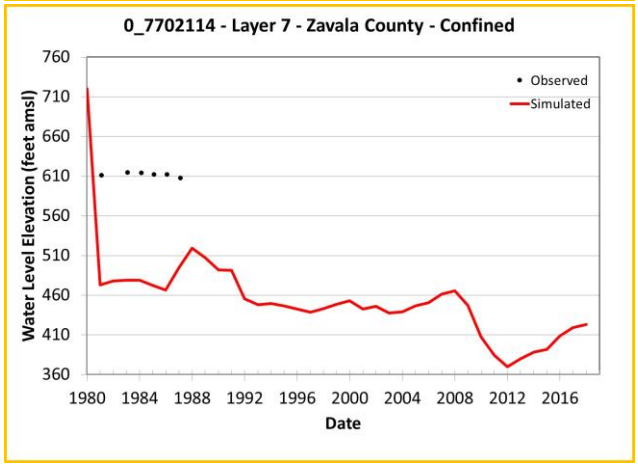
Revised		Aprv'd by	SP

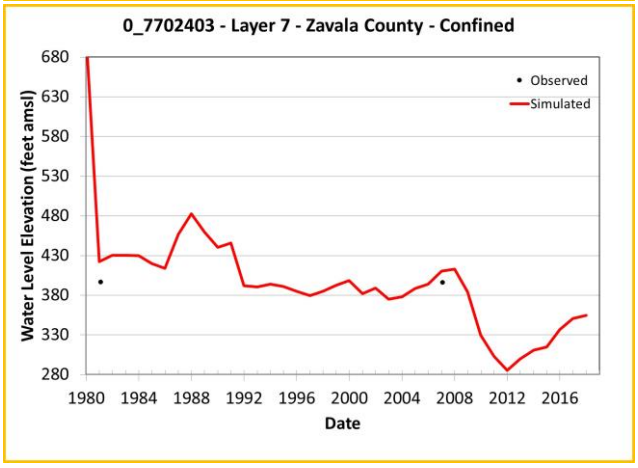
FIGURE I-20.2b

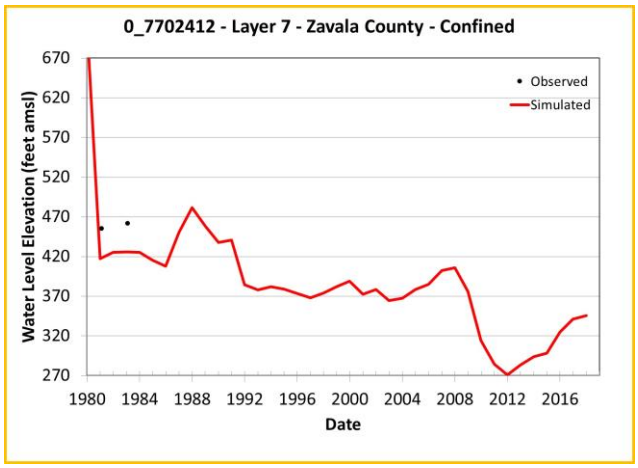
GSI ENVIRONMENTAL

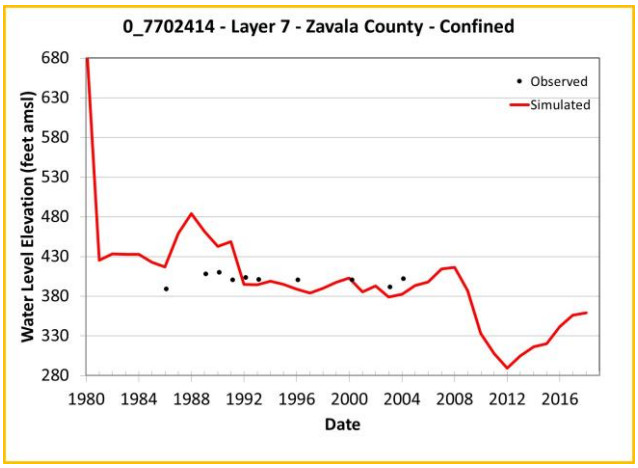












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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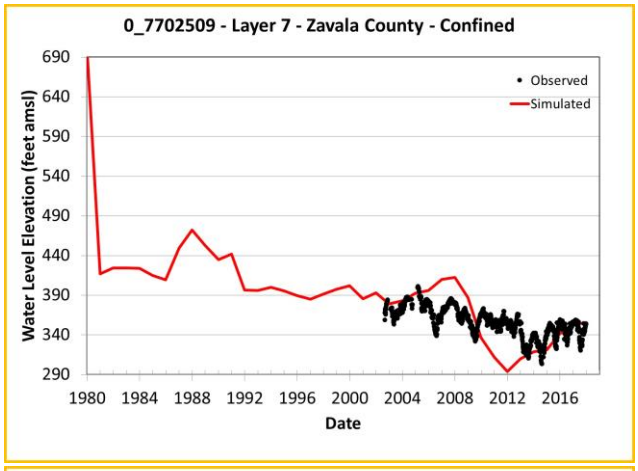
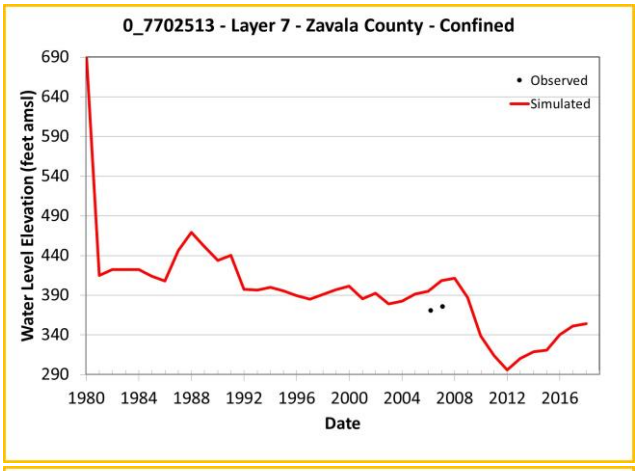
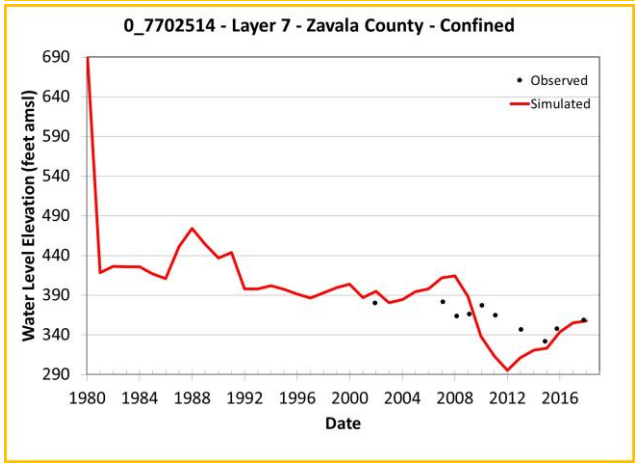
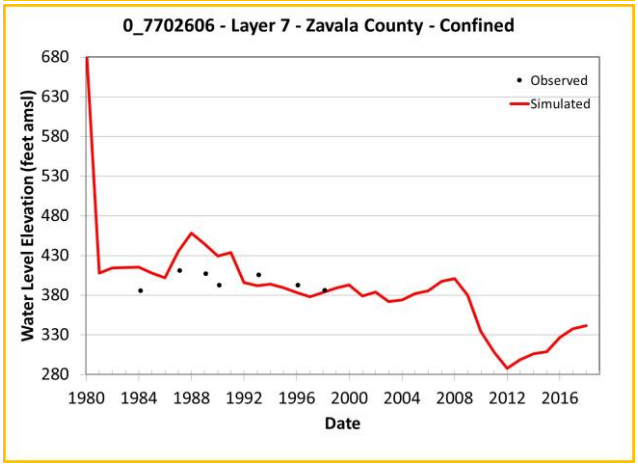
FIGURE I-20.2c

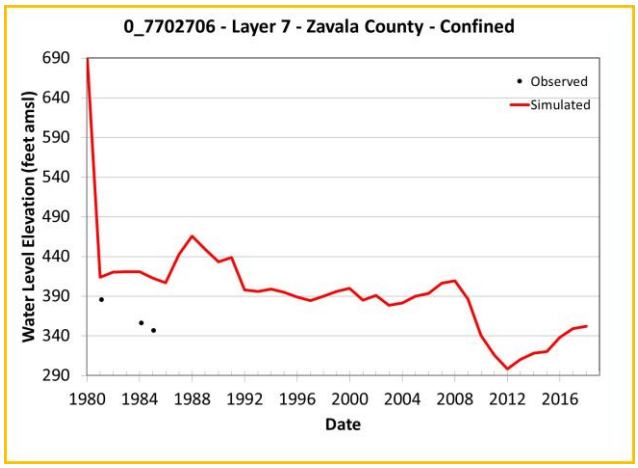
GSI ENVIRONMENTAL

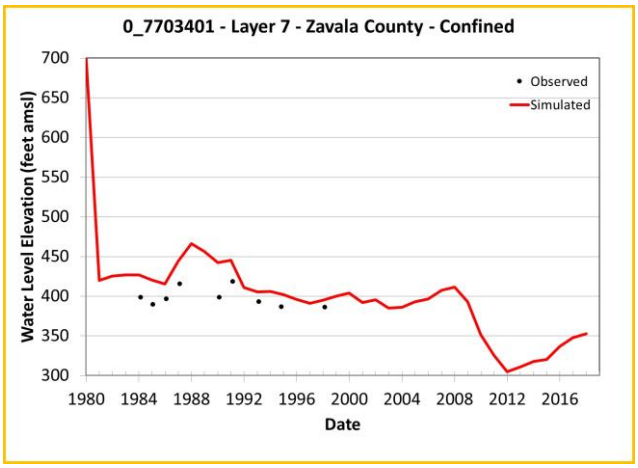












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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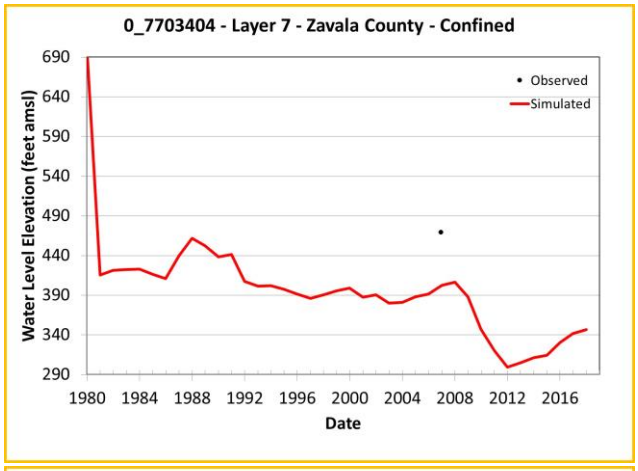
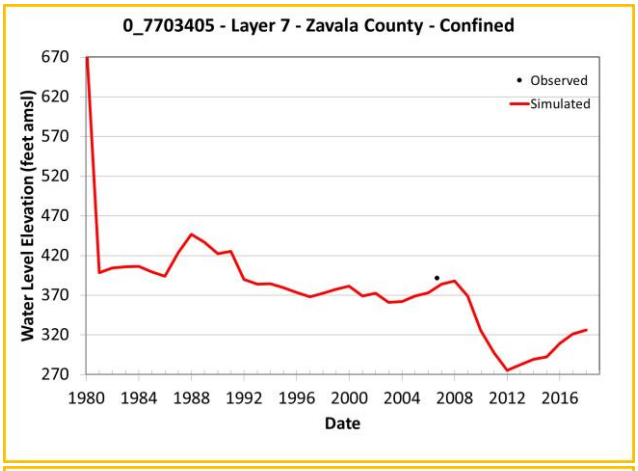
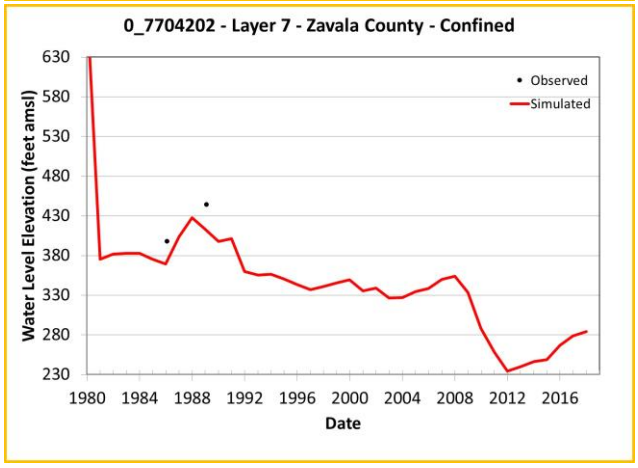
Revised		Aprv'd by	SP

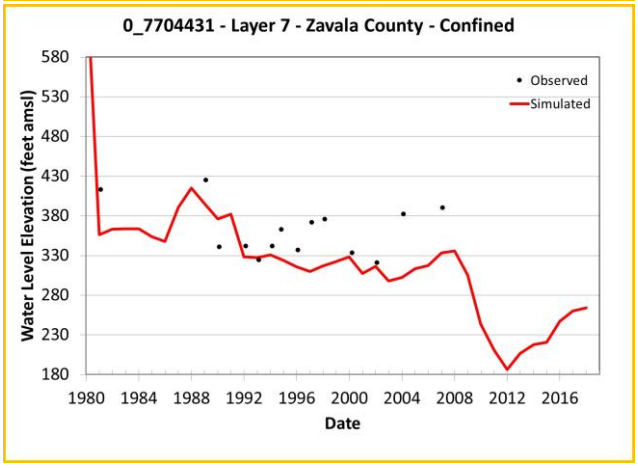
FIGURE I-20.2d

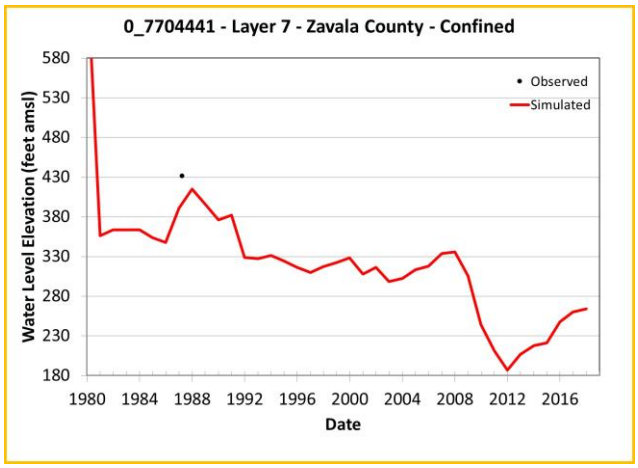
GSI ENVIRONMENTAL

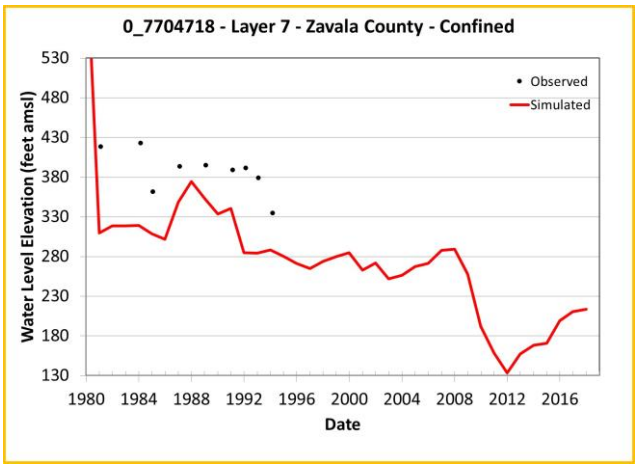












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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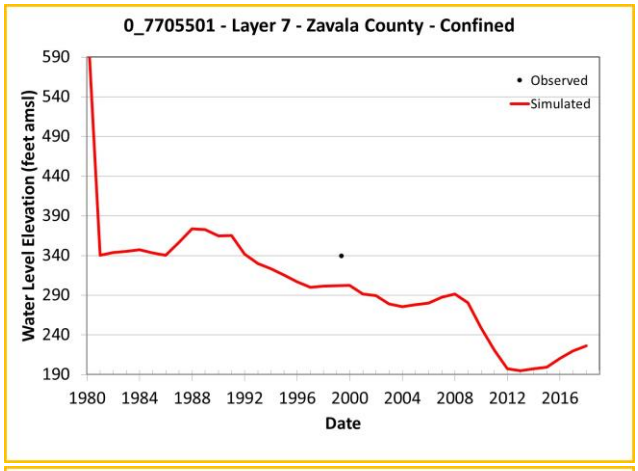
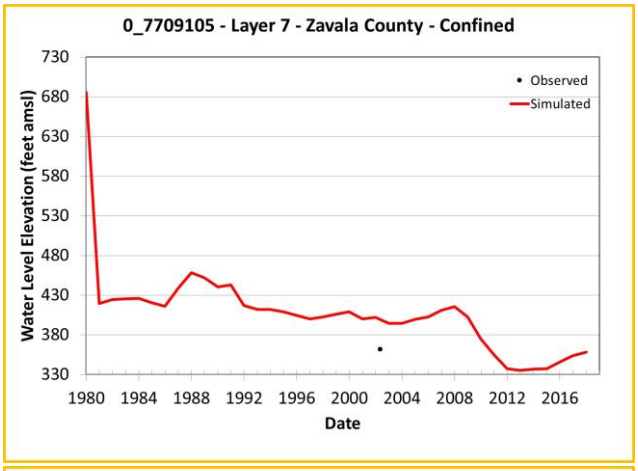
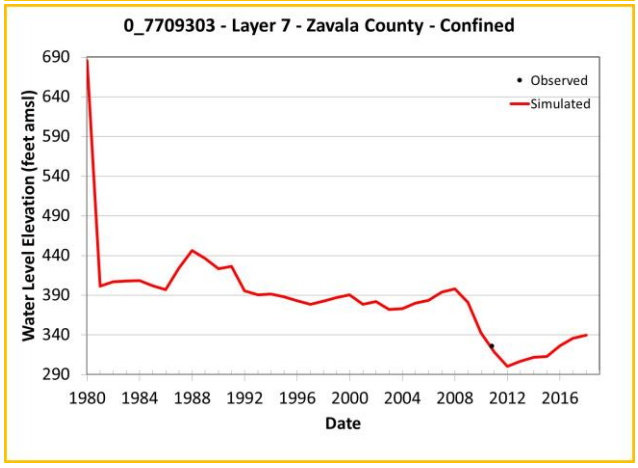
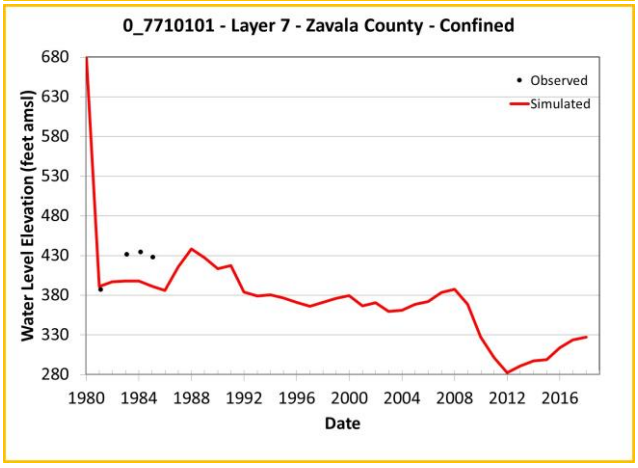
FIGURE I-20.2e

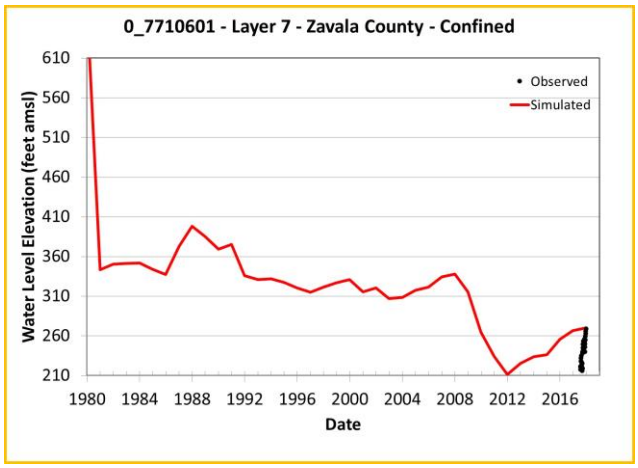
GSI ENVIRONMENTAL

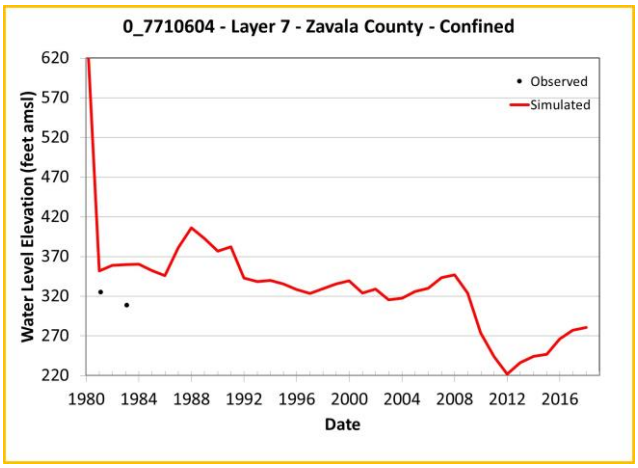












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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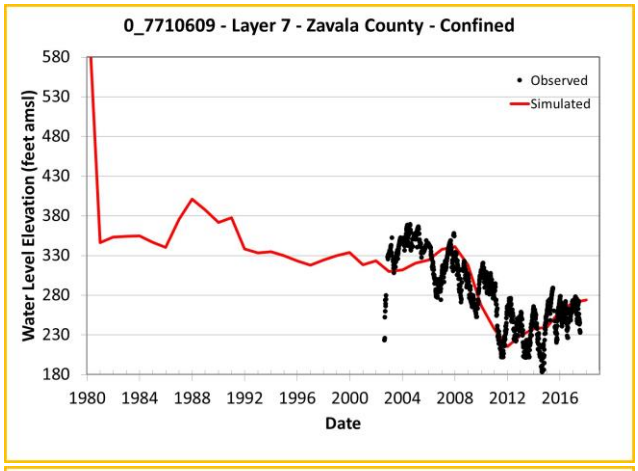
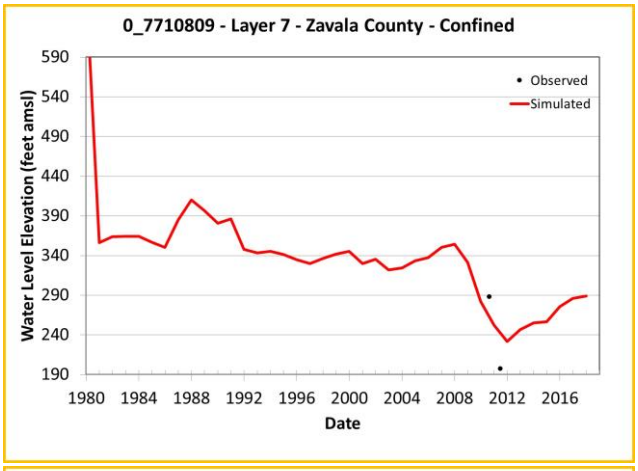
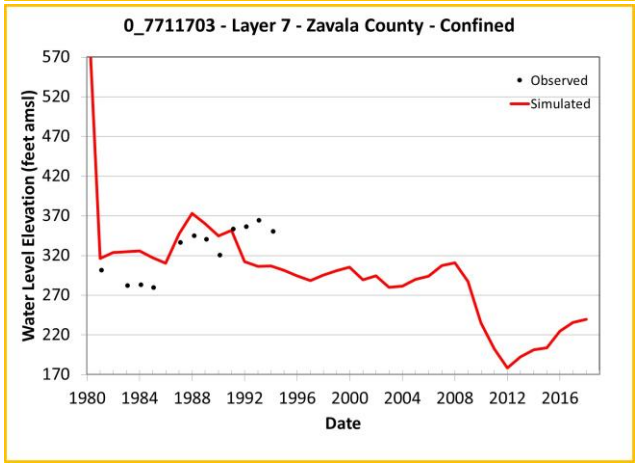
Revised		Aprv'd by	SP

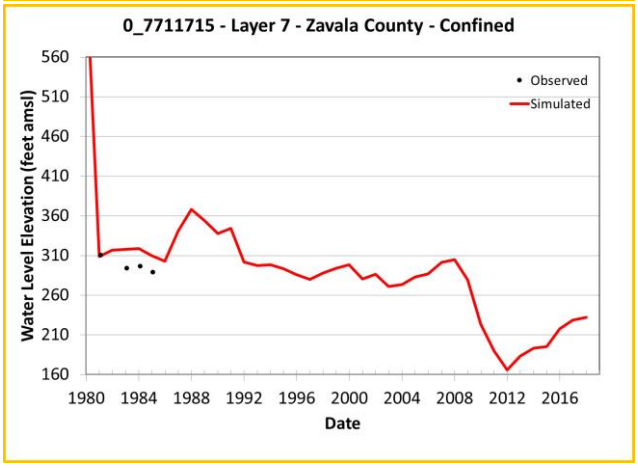
FIGURE I-20.2f

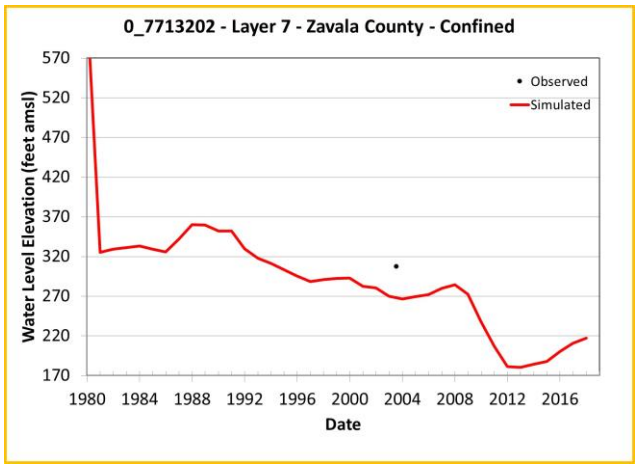
GSI ENVIRONMENTAL

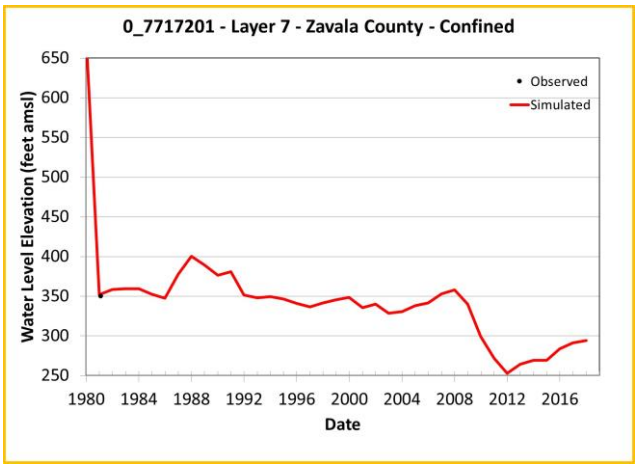












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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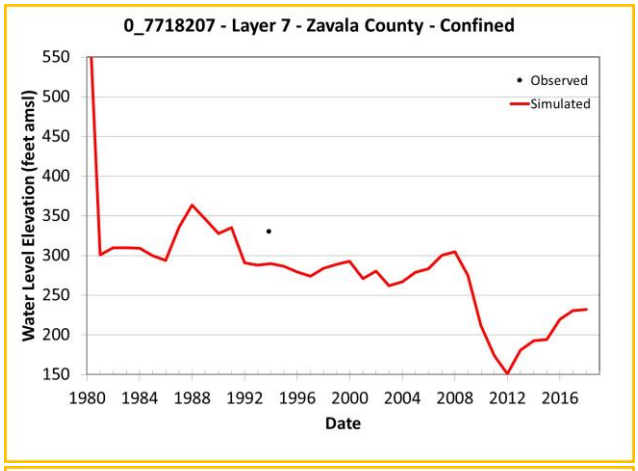
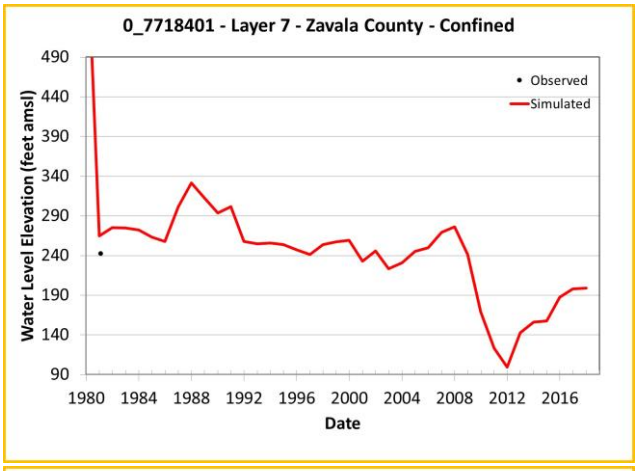
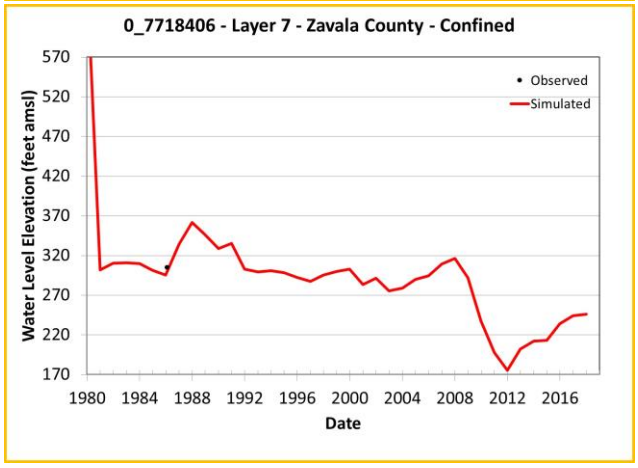
Revised		Aprv'd by	SP

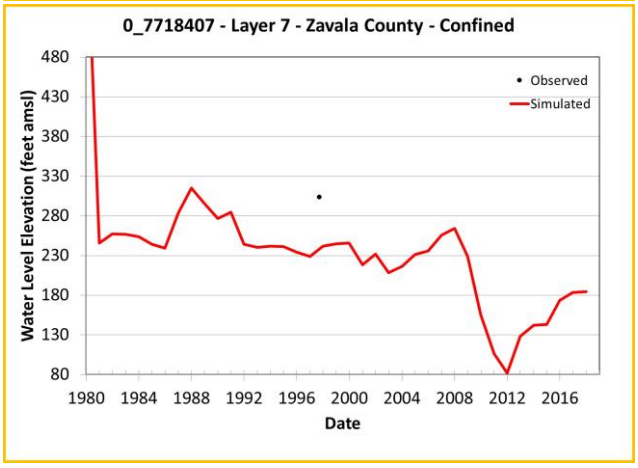
FIGURE I-20.2g

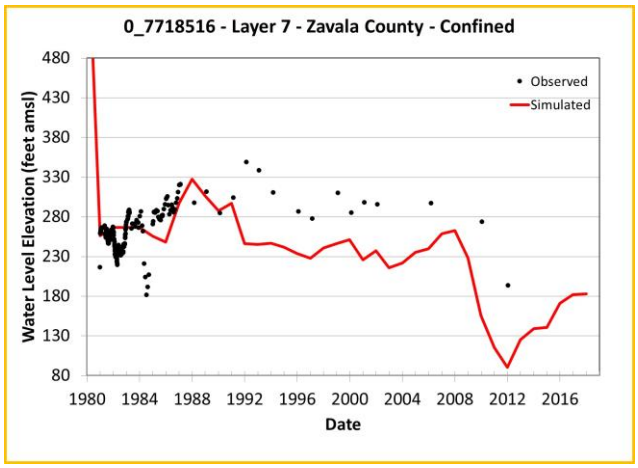
GSI ENVIRONMENTAL

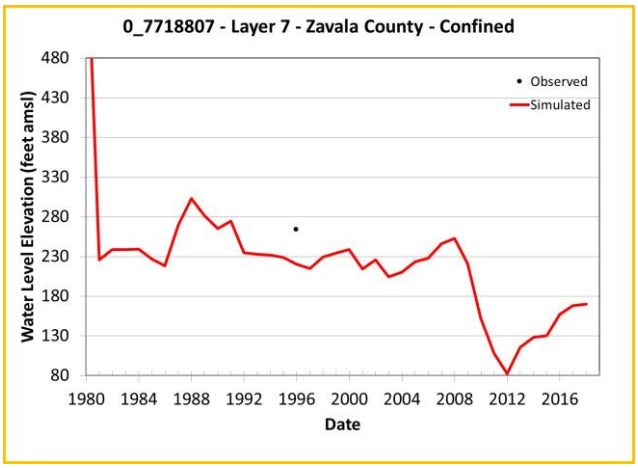












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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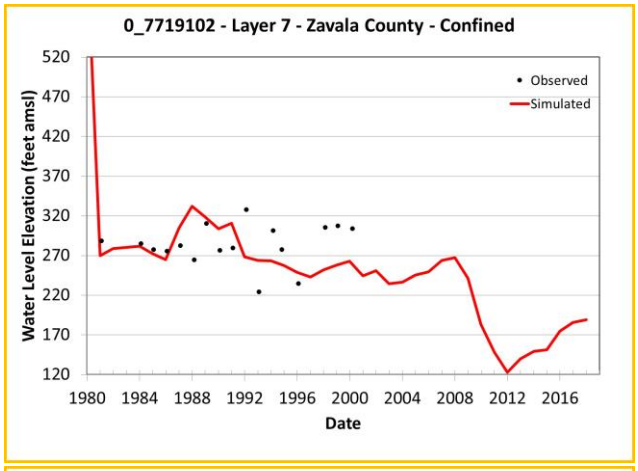
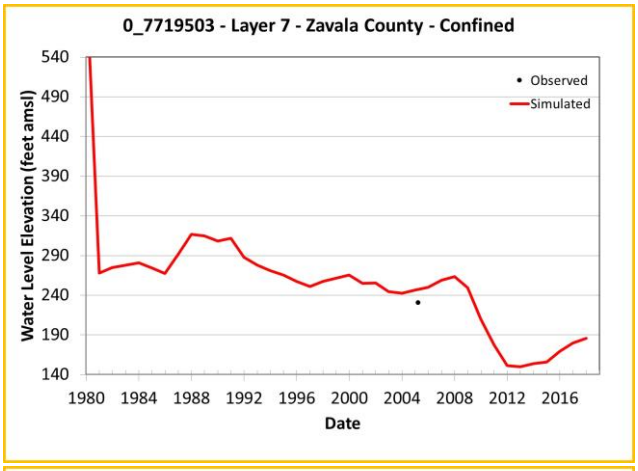
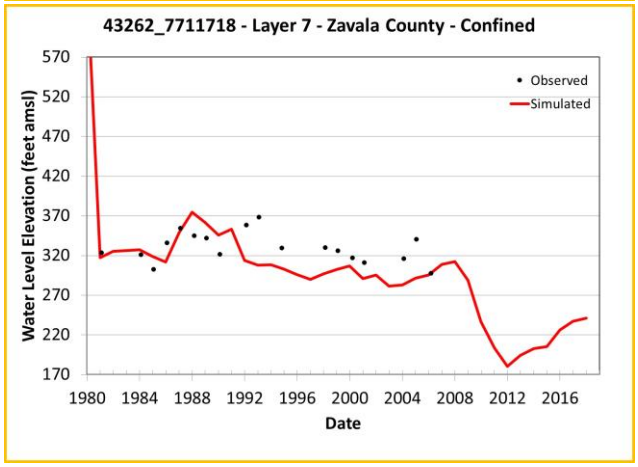
Revised		Aprv'd by	SP

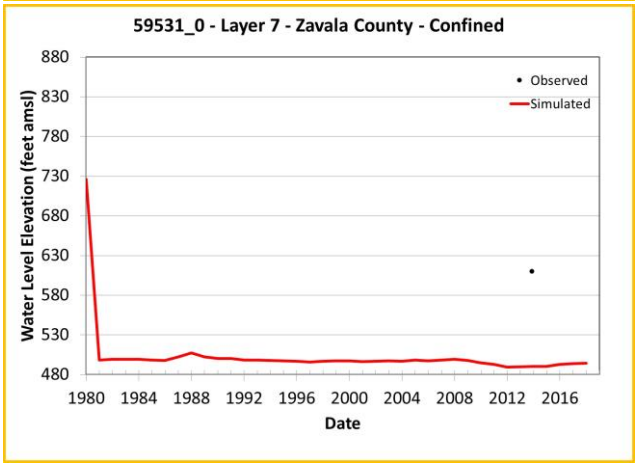
FIGURE I-20.2h

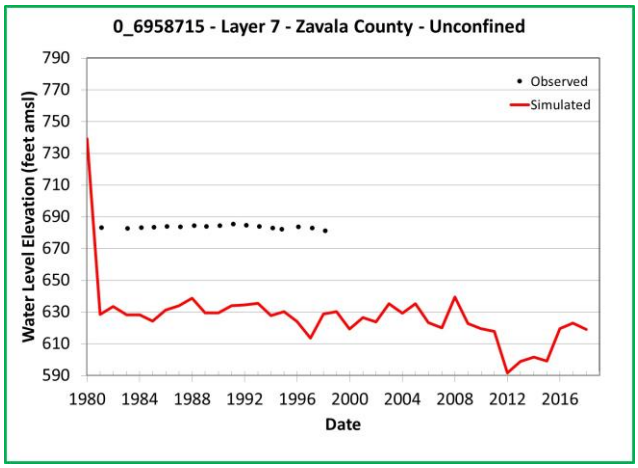
GSI ENVIRONMENTAL

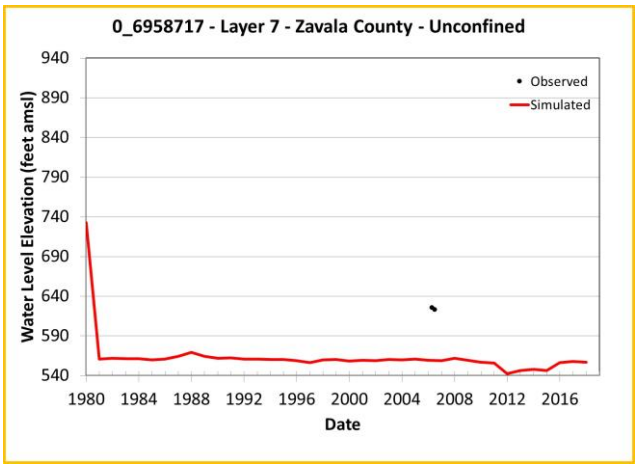












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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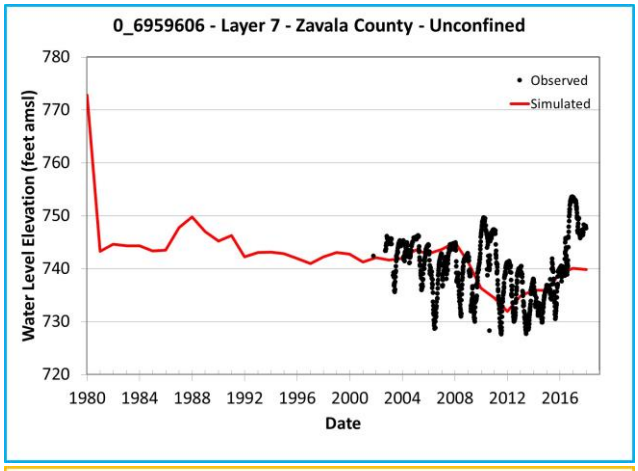
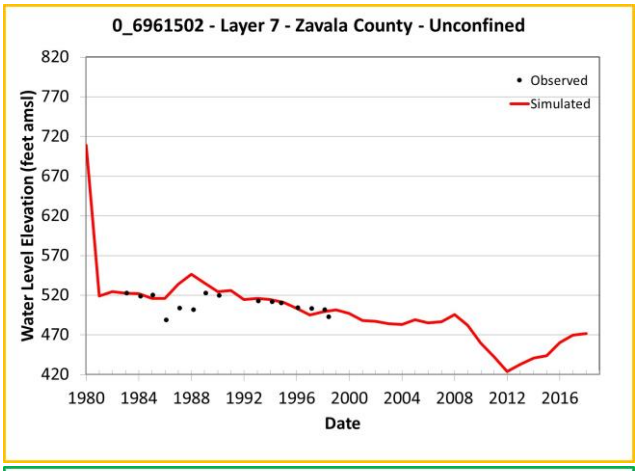
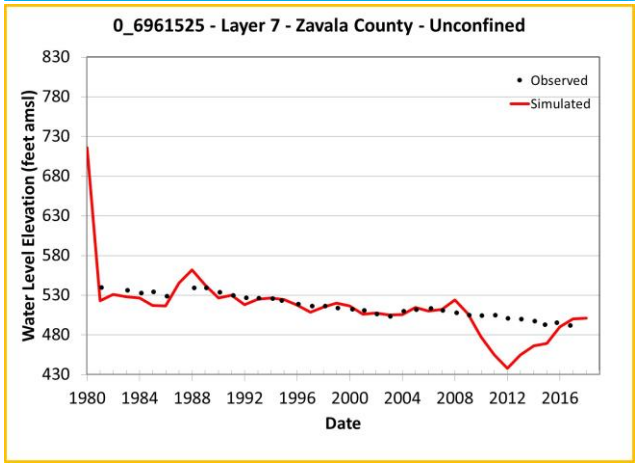
Revised		Aprv'd by	SP

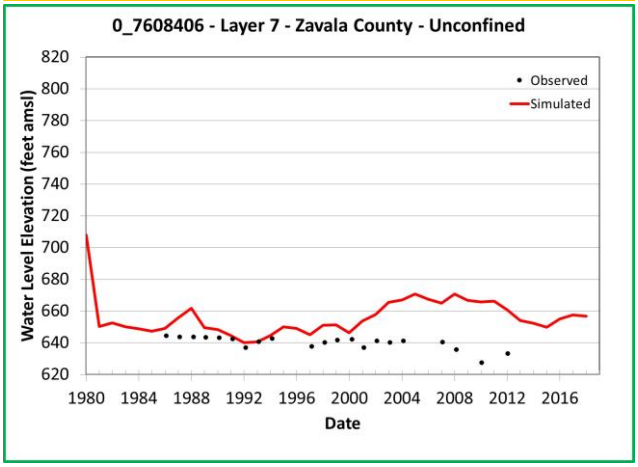
FIGURE I-20.2i

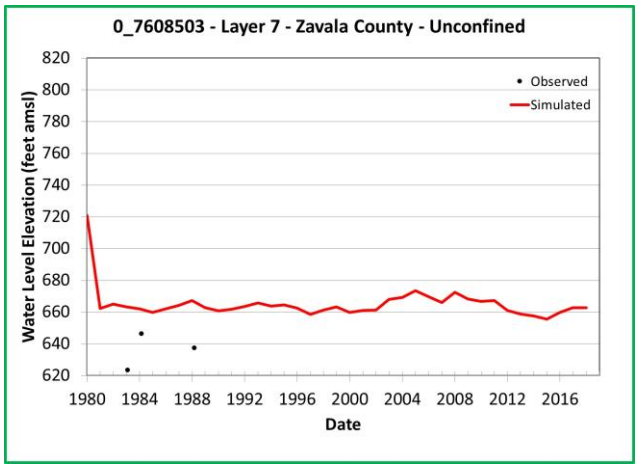
GSI ENVIRONMENTAL

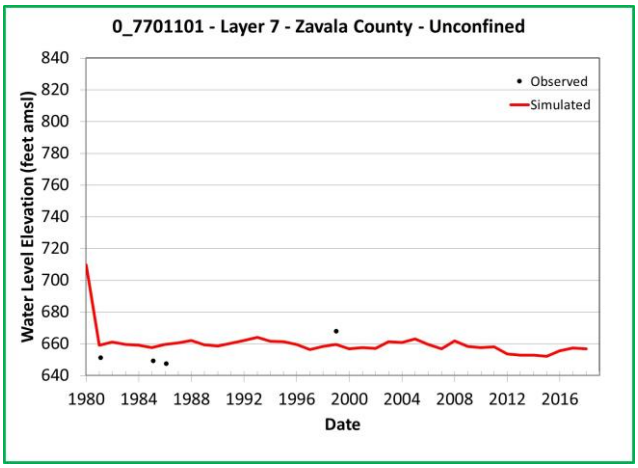












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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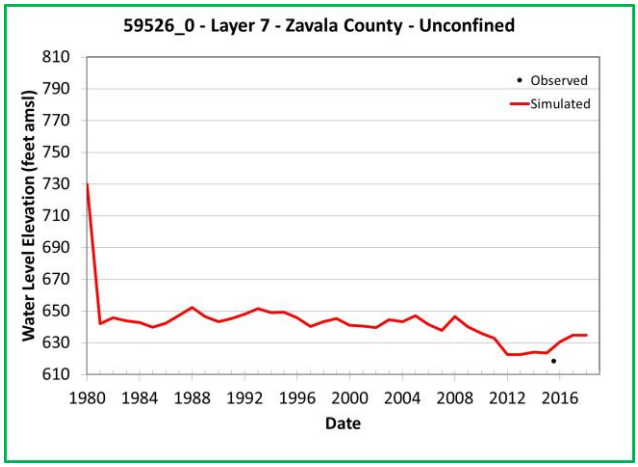
Revised		Aprv'd by	SP

FIGURE I-20.2j

GSI ENVIRONMENTAL



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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 7

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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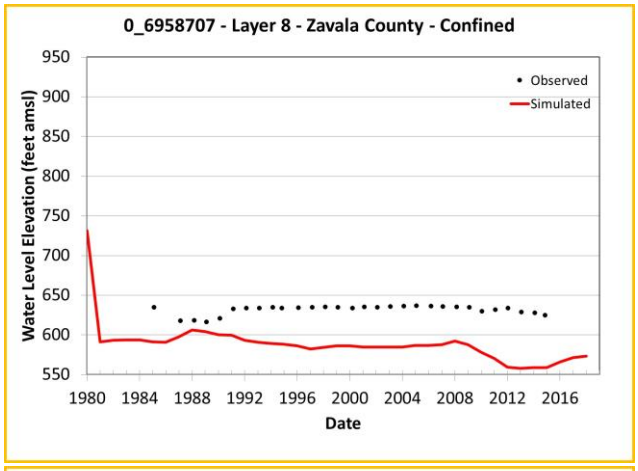
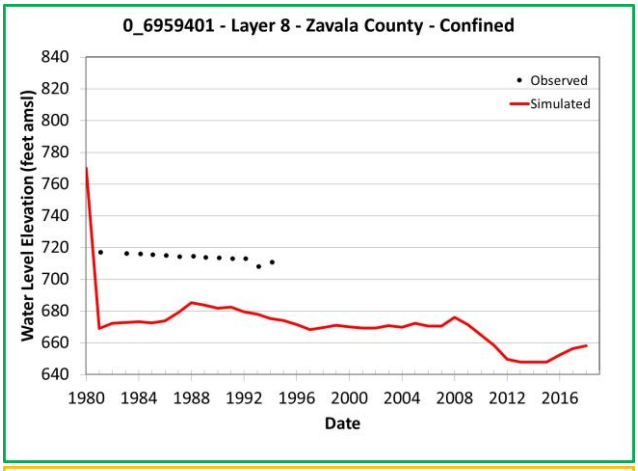
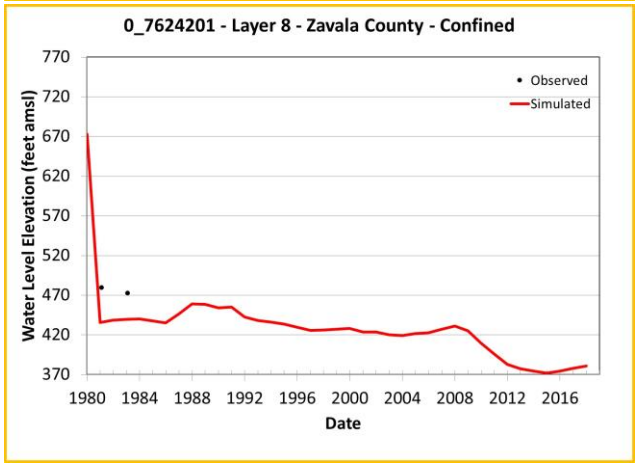
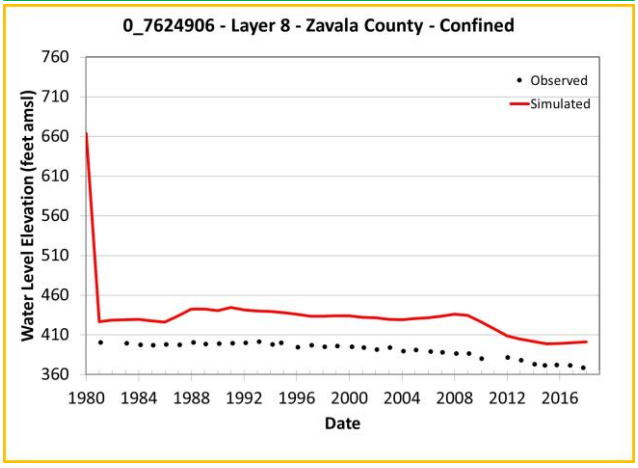
FIGURE I-20.2k

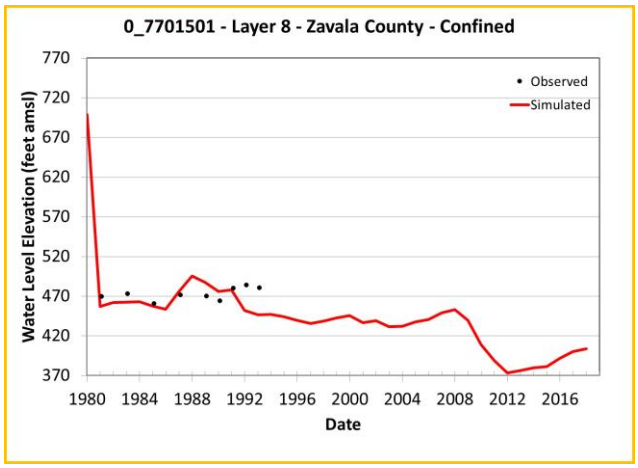
GSI ENVIRONMENTAL

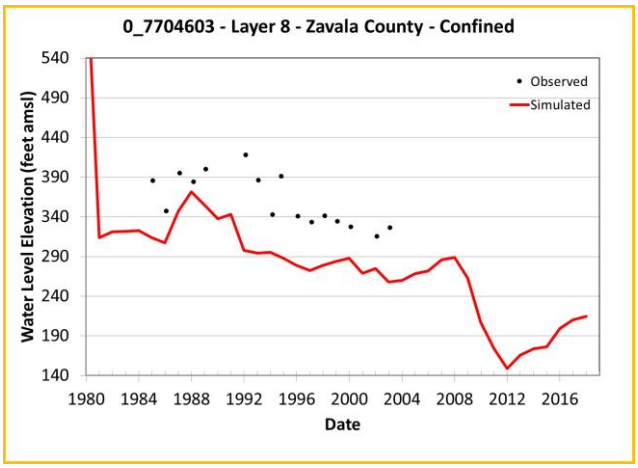












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Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
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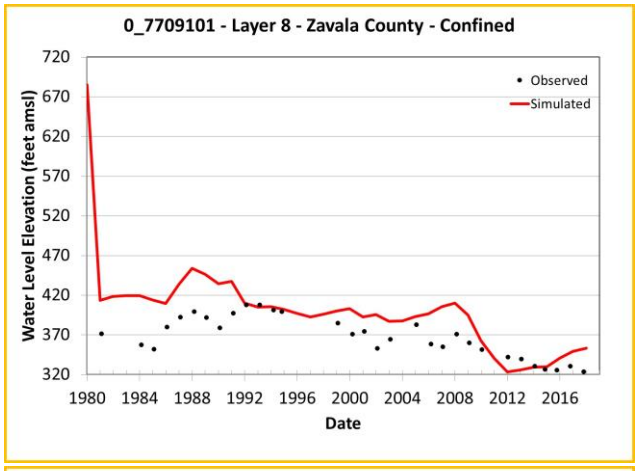
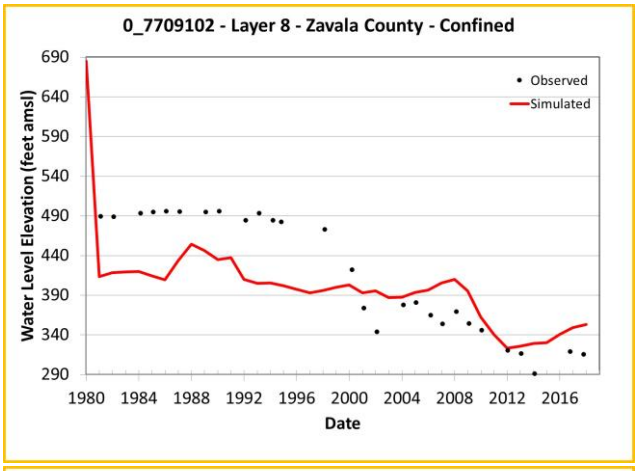
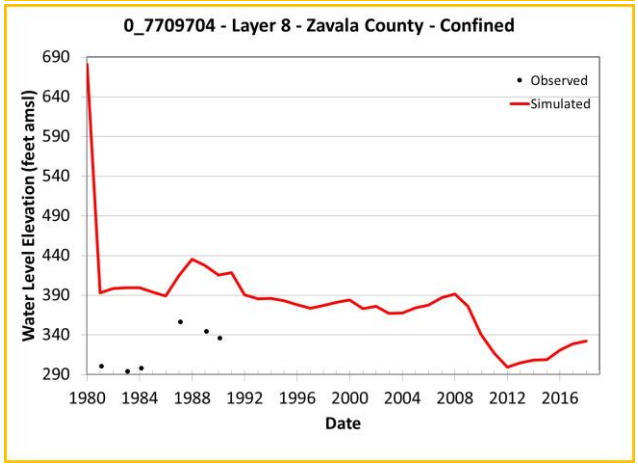
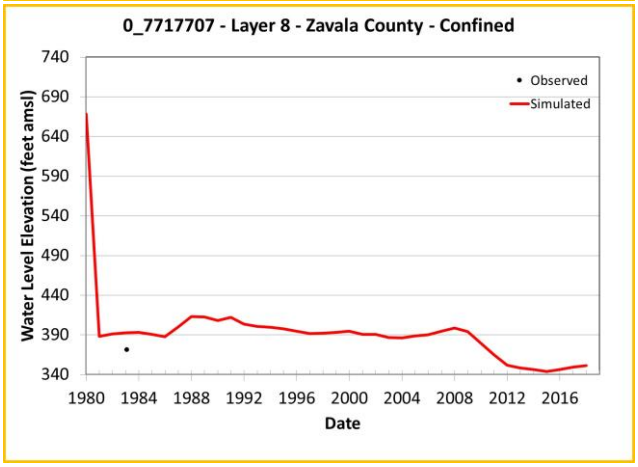
FIGURE I-20.3a

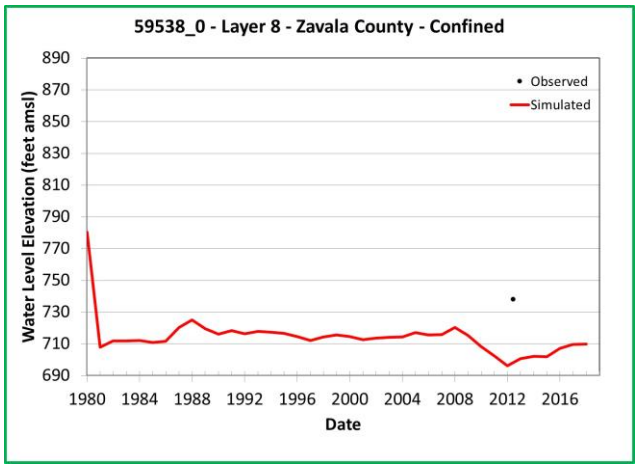
GSI ENVIRONMENTAL

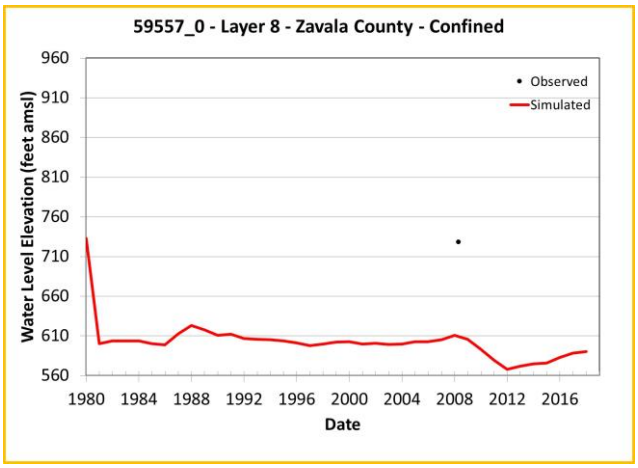












Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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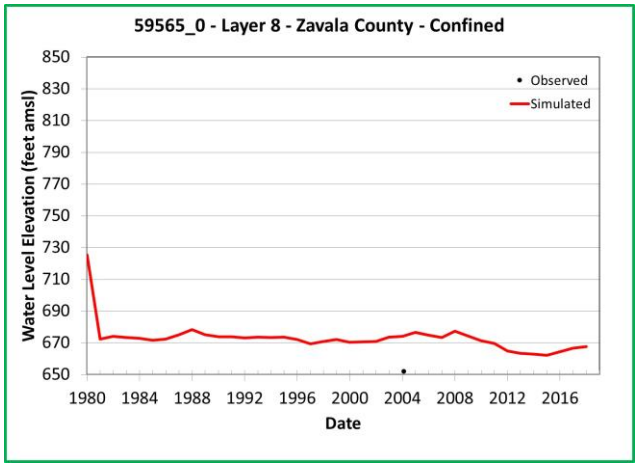
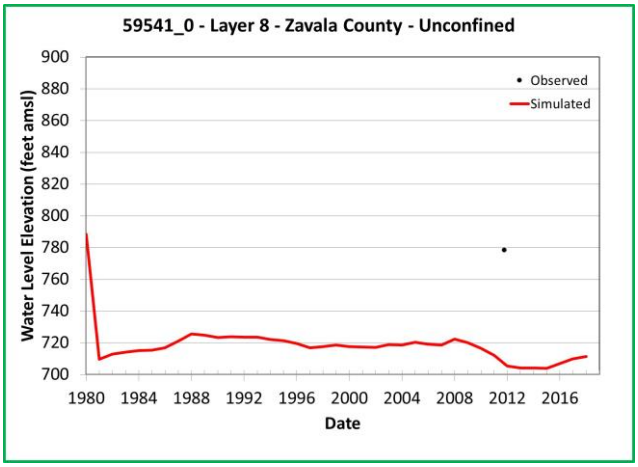
Revised		Aprv'd by	SP

FIGURE I-20.3b

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 8

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI Job No.	5157	Drawn by	JMP
Issued	January 2023	Chk'd by	GM
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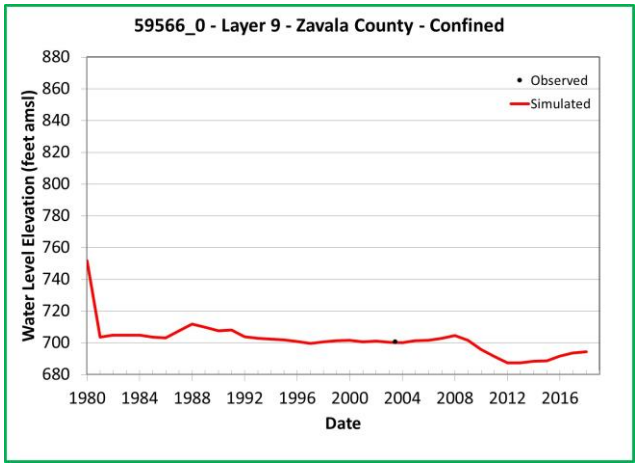
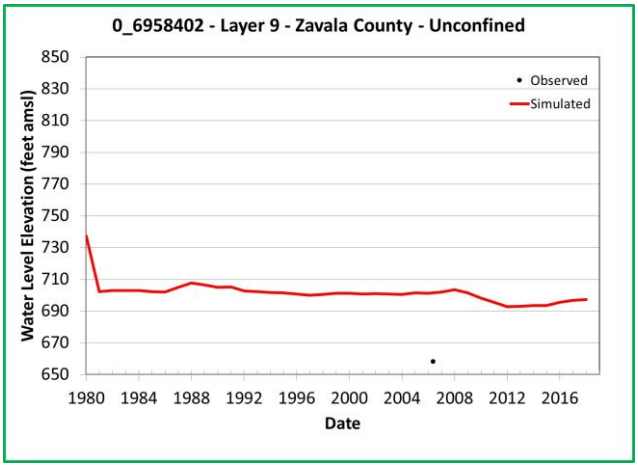
FIGURE I-20.3c

GSI ENVIRONMENTAL





Note: Chart outline color indicates Y-axis range.
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Blue = 60 feet

Simulated and Observed Water Level Elevation Hydrographs, Zavala County, Layer 9

Southern Portions of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

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FIGURE I-20.4a

GSI ENVIRONMENTAL

APPENDIX J

Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation

Appendix J Table J-1.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Quarternary Alluvium (Layer 1)

Simulated Time Period	Inflows				Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Lower Layers		Specific Storage	Specific Yield	River Package	Live Oak UWCD	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	3.56E-12	1.32	1.32	0	0	4.16E-13	0.522	0.796	1.32	5.07E-13	3.85E-11
1980	0	0	3.57E-12	1.32	1.32	0	0	4.16E-13	0.523	0.794	1.32	8.32E-13	6.32E-11
1981	0	0	3.56E-12	1.31	1.31	9.29E-08	1.35E-04	4.15E-13	0.521	0.792	1.31	-1.45E-12	-1.10E-10
1982	0	0	3.56E-12	1.31	1.31	8.38E-08	1.19E-04	4.15E-13	0.521	0.792	1.31	6.74E-13	5.13E-11
1983	0	0	3.56E-12	1.31	1.31	9.75E-08	1.44E-04	4.15E-13	0.521	0.792	1.31	-6.53E-13	-4.97E-11
1984	0	0	3.57E-12	1.32	1.32	1.09E-07	1.66E-04	4.16E-13	0.523	0.794	1.32	-9.17E-13	-6.97E-11
1985	0	0	3.56E-12	1.31	1.31	1.24E-07	1.95E-04	4.15E-13	0.521	0.792	1.31	8.99E-14	6.85E-12
1986	0	0	3.56E-12	1.31	1.31	1.33E-07	2.13E-04	4.15E-13	0.521	0.792	1.31	1.04E-13	7.94E-12
1987	0	0	3.56E-12	1.31	1.31	1.80E-07	2.87E-04	4.15E-13	0.521	0.792	1.31	7.88E-13	6.00E-11
1988	0	0	3.57E-12	1.32	1.32	1.33E-07	2.22E-04	4.16E-13	0.523	0.794	1.32	1.98E-14	1.50E-12
1989	3.58E-10	8.03E-06	3.56E-12	1.31	1.31	5.84E-08	1.30E-04	4.15E-13	0.521	0.792	1.31	-1.72E-13	-1.31E-11
1990	1.47E-08	1.81E-05	3.56E-12	1.31	1.31	2.81E-08	8.00E-05	4.15E-13	0.521	0.792	1.31	1.12E-12	8.51E-11
1991	1.07E-08	9.27E-06	3.56E-12	1.31	1.31	1.99E-08	6.63E-05	4.15E-13	0.521	0.792	1.31	-5.43E-13	-4.13E-11
1992	0	0	3.57E-12	1.32	1.32	5.32E-08	1.18E-04	4.16E-13	0.523	0.794	1.32	1.80E-14	1.37E-12
1993	0	0	3.56E-12	1.31	1.31	5.87E-08	1.23E-04	4.15E-13	0.521	0.792	1.31	-2.91E-13	-2.21E-11
1994	0	0	3.56E-12	1.31	1.31	6.60E-08	1.33E-04	4.15E-13	0.521	0.792	1.31	-1.63E-12	-1.24E-10
1995	3.41E-12	9.04E-08	3.56E-12	1.31	1.31	4.42E-08	1.02E-04	4.15E-13	0.521	0.792	1.31	-1.07E-13	-8.11E-12
1996	1.26E-08	1.68E-05	3.57E-12	1.32	1.32	1.84E-08	6.31E-05	4.16E-13	0.523	0.794	1.32	-6.89E-13	-5.23E-11
1997	0	0	3.56E-12	1.31	1.31	4.56E-08	1.05E-04	4.15E-13	0.521	0.792	1.31	-4.40E-13	-3.35E-11
1998	8.69E-09	1.25E-05	3.56E-12	1.31	1.31	1.82E-08	6.25E-05	4.15E-13	0.521	0.792	1.31	2.24E-13	1.70E-11
1999	9.95E-09	1.13E-05	3.56E-12	1.31	1.31	1.55E-08	5.32E-05	4.15E-13	0.521	0.792	1.31	6.22E-13	4.73E-11
2000	3.24E-08	3.38E-05	3.57E-12	1.32	1.32	8.84E-09	3.03E-05	4.16E-13	0.523	0.794	1.32	1.95E-13	1.48E-11
2001	6.29E-09	4.63E-06	3.56E-12	1.31	1.31	1.11E-08	3.93E-05	4.15E-13	0.521	0.792	1.31	1.23E-12	9.39E-11
2002	8.12E-09	7.41E-06	3.56E-12	1.31	1.31	9.77E-09	3.34E-05	4.15E-13	0.521	0.792	1.31	-2.04E-13	-1.56E-11
2003	9.22E-09	8.98E-06	3.56E-12	1.31	1.31	8.29E-09	2.84E-05	4.15E-13	0.521	0.792	1.31	6.41E-13	4.88E-11
2004	0	0	3.57E-12	1.32	1.32	2.68E-08	5.79E-05	4.16E-13	0.523	0.794	1.32	-8.52E-13	-6.47E-11
2005	3.14E-11	7.81E-07	3.56E-12	1.31	1.31	1.09E-08	3.28E-05	4.15E-13	0.521	0.792	1.31	-3.49E-13	-2.66E-11
2006	0	0	3.56E-12	1.31	1.31	3.64E-08	6.88E-05	4.15E-13	0.521	0.792	1.31	2.02E-13	1.54E-11
2007	0	0	3.56E-12	1.31	1.31	1.72E-07	2.66E-04	4.15E-13	0.521	0.792	1.31	1.01E-12	7.66E-11
2008	0	0	3.57E-12	1.32	1.32	1.19E-07	1.88E-04	4.16E-13	0.523	0.795	1.32	2.63E-13	2.00E-11
2009	5.69E-09	1.65E-05	3.56E-12	1.31	1.31	2.38E-08	6.64E-05	4.15E-13	0.521	0.792	1.31	2.05E-13	1.56E-11
2010	2.48E-07	3.41E-04	3.56E-12	1.31	1.31	0	0	4.15E-13	0.521	0.792	1.31	-2.55E-13	-1.94E-11
2011	5.02E-07	7.29E-04	3.56E-12	1.31	1.31	0	0	4.15E-13	0.521	0.792	1.31	1.35E-13	1.02E-11
2012	4.77E-07	7.11E-04	3.57E-12	1.32	1.32	0	0	4.16E-13	0.523	0.794	1.32	1.11E-13	8.46E-12
2013	5.77E-07	8.96E-04	3.56E-12	1.31	1.31	0	0	4.15E-13	0.521	0.792	1.31	3.18E-13	2.42E-11
2014	7.78E-07	0.001	3.56E-12	1.31	1.31	0	0	4.15E-13	0.521	0.792	1.31	3.77E-13	2.87E-11
2015	1.02E-06	0.002	3.56E-12	1.31	1.31	0	0	4.15E-13	0.521	0.792	1.31	-6.66E-15	-5.07E-13
2016	9.68E-07	0.002	3.57E-12	1.32	1.32	0	0	4.16E-13	0.523	0.794	1.32	-2.47E-13	-1.88E-11
2017	9.82E-07	0.002	3.56E-12	1.31	1.31	0	0	4.15E-13	0.521	0.792	1.31	3.01E-13	2.29E-11

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - (Layer 2) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	4,029	3.33E-04	4.98E-04	0.796	1,010	5,040
1980	0	0	4,053	3.34E-04	4.98E-04	0.794	999.7	5,054
1981	0	0	4,042	3.33E-04	4.97E-04	0.792	997.3	5,040
1982	0	0	4,042	3.33E-04	4.97E-04	0.792	997.4	5,040
1983	0	0	4,042	3.33E-04	4.97E-04	0.792	997.5	5,040
1984	0	0	4,053	3.34E-04	4.98E-04	0.794	1,000	5,054
1985	0	0	4,042	3.33E-04	4.97E-04	0.792	997.8	5,040
1986	0	0	4,041	3.33E-04	4.97E-04	0.792	997.9	5,040
1987	0	0	4,041	3.33E-04	4.97E-04	0.792	998.2	5,040
1988	1.53E-04	3.49E-04	4,052	3.34E-04	4.98E-04	0.794	1,001	5,054
1989	0.013	0.032	4,041	3.33E-04	4.97E-04	0.792	998.0	5,040
1990	0.013	0.030	4,041	3.33E-04	4.97E-04	0.792	997.8	5,040
1991	0.003	0.008	4,041	3.33E-04	4.97E-04	0.792	997.8	5,040
1992	0	0	4,052	3.34E-04	4.98E-04	0.794	1,001	5,054
1993	0	0	4,041	3.33E-04	4.97E-04	0.792	998.0	5,040
1994	0	0	4,041	3.33E-04	4.97E-04	0.792	998.1	5,040
1995	0.001	0.003	4,041	3.33E-04	4.97E-04	0.792	998.0	5,040
1996	0.009	0.022	4,052	3.34E-04	4.98E-04	0.794	1,001	5,054
1997	0	0	4,041	3.33E-04	4.97E-04	0.792	998.0	5,040
1998	0.006	0.015	4,041	3.33E-04	4.97E-04	0.792	997.9	5,040
1999	0.002	0.006	4,041	3.33E-04	4.97E-04	0.792	997.9	5,040
2000	0.009	0.023	4,052	3.34E-04	4.98E-04	0.794	1,001	5,054
2001	0	0	4,041	3.33E-04	4.97E-04	0.792	997.9	5,040
2002	3.80E-04	9.56E-04	4,041	3.33E-04	4.97E-04	0.792	997.8	5,040
2003	0.001	0.003	4,041	3.33E-04	4.97E-04	0.792	997.8	5,040
2004	0	0	4,052	3.34E-04	4.98E-04	0.794	1,001	5,054
2005	0.002	0.006	4,041	3.33E-04	4.97E-04	0.792	997.9	5,040
2006	0	0	4,041	3.33E-04	4.97E-04	0.792	998.0	5,040
2007	0	0	4,041	3.33E-04	4.97E-04	0.792	998.5	5,040
2008	2.23E-04	5.15E-04	4,052	3.34E-04	4.98E-04	0.795	1,001	5,054
2009	0.021	0.050	4,041	3.33E-04	4.97E-04	0.792	998.2	5,040
2010	0.069	0.168	4,042	3.33E-04	4.97E-04	0.792	997.3	5,040
2011	0.083	0.203	4,043	3.33E-04	4.97E-04	0.792	996.4	5,040
2012	0.039	0.095	4,054	3.34E-04	4.98E-04	0.794	998.9	5,054
2013	0.060	0.145	4,044	3.33E-04	4.97E-04	0.792	995.6	5,040
2014	0.092	0.222	4,045	3.33E-04	4.97E-04	0.792	994.7	5,041
2015	0.117	0.285	4,046	3.33E-04	4.97E-04	0.792	993.6	5,041
2016	0.069	0.167	4,058	3.34E-04	4.98E-04	0.794	995.8	5,055
2017	0.073	0.177	4,048	3.33E-04	4.96E-04	0.792	992.4	5,041

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - (Layer 2) - Outflows Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers			
	(acre-feeet)									%
Predevelopment	0	0	1,010	2.73E-04	9.29E-04	1.32	4,028	5,040	3.60E-10	7.15E-12
1980	0	0	999.9	2.73E-04	9.31E-04	1.32	4,053	5,054	5.46E-12	1.08E-13
1981	0.027	0.066	997.5	2.72E-04	9.29E-04	1.31	4,041	5,040	4.55E-12	9.02E-14
1982	0.007	0.018	997.6	2.72E-04	9.29E-04	1.31	4,041	5,040	7.28E-12	1.44E-13
1983	0.011	0.026	997.8	2.72E-04	9.29E-04	1.31	4,041	5,040	-4.55E-12	-9.02E-14
1984	0.012	0.028	1,001	2.73E-04	9.31E-04	1.32	4,052	5,054	7.28E-12	1.44E-13
1985	0.015	0.036	998.0	2.72E-04	9.29E-04	1.31	4,041	5,040	9.09E-13	1.80E-14
1986	0.014	0.034	998.2	2.72E-04	9.29E-04	1.31	4,041	5,040	-1.36E-11	-2.71E-13
1987	0.025	0.061	998.4	2.72E-04	9.29E-04	1.31	4,040	5,040	0	0
1988	0.002	0.004	1,001	2.73E-04	9.31E-04	1.32	4,051	5,054	1.00E-11	1.98E-13
1989	0	0	998.3	2.72E-04	9.29E-04	1.31	4,041	5,040	1.27E-11	2.53E-13
1990	0	0	998.1	2.72E-04	9.29E-04	1.31	4,041	5,040	-1.27E-11	-2.53E-13
1991	0	0	998.1	2.72E-04	9.29E-04	1.31	4,041	5,040	0	0
1992	0.012	0.029	1,001	2.73E-04	9.31E-04	1.32	4,052	5,054	9.09E-12	1.80E-13
1993	0.007	0.017	998.3	2.72E-04	9.29E-04	1.31	4,040	5,040	-9.09E-12	-1.80E-13
1994	0.007	0.018	998.3	2.72E-04	9.29E-04	1.31	4,040	5,040	-4.55E-12	-9.02E-14
1995	2.69E-04	6.51E-04	998.3	2.72E-04	9.29E-04	1.31	4,040	5,040	-3.64E-12	-7.22E-14
1996	0	0	1,001	2.73E-04	9.31E-04	1.32	4,052	5,054	1.73E-11	3.42E-13
1997	0.010	0.025	998.3	2.72E-04	9.29E-04	1.31	4,040	5,040	-1.82E-12	-3.61E-14
1998	0	0	998.2	2.72E-04	9.29E-04	1.31	4,040	5,040	-2.73E-12	-5.41E-14
1999	7.63E-06	1.64E-05	998.2	2.72E-04	9.29E-04	1.31	4,040	5,040	-1.36E-11	-2.71E-13
2000	0	0	1,001	2.73E-04	9.31E-04	1.32	4,052	5,054	1.82E-11	3.60E-13
2001	0.004	0.010	998.1	2.72E-04	9.29E-04	1.31	4,040	5,040	-1.27E-11	-2.53E-13
2002	1.61E-04	3.89E-04	998.1	2.72E-04	9.29E-04	1.31	4,040	5,040	-2.73E-12	-5.41E-14
2003	0	0	998.1	2.72E-04	9.29E-04	1.31	4,041	5,040	-1.36E-11	-2.71E-13
2004	0.007	0.018	1,001	2.73E-04	9.31E-04	1.32	4,051	5,054	1.91E-11	3.78E-13
2005	0	0	998.2	2.72E-04	9.29E-04	1.31	4,040	5,040	-2.73E-12	-5.41E-14
2006	0.007	0.018	998.3	2.72E-04	9.29E-04	1.31	4,040	5,040	3.64E-12	7.22E-14
2007	0.044	0.107	998.8	2.72E-04	9.29E-04	1.31	4,040	5,040	-1.82E-12	-3.61E-14
2008	0.003	0.008	1,002	2.73E-04	9.31E-04	1.32	4,051	5,054	2.27E-11	4.50E-13
2009	0	0	998.5	2.72E-04	9.29E-04	1.31	4,040	5,040	-1.27E-11	-2.53E-13
2010	0	0	997.7	2.72E-04	9.29E-04	1.31	4,041	5,040	-2.82E-11	-5.59E-13
2011	0	0	996.7	2.72E-04	9.29E-04	1.31	4,042	5,040	-1.46E-11	-2.89E-13
2012	0	0	999.2	2.73E-04	9.31E-04	1.32	4,053	5,054	2.09E-11	4.14E-13
2013	0	0	995.9	2.72E-04	9.29E-04	1.31	4,043	5,040	-1.91E-11	-3.79E-13
2014	0	0	995.1	2.72E-04	9.29E-04	1.31	4,044	5,041	-5.46E-12	-1.08E-13
2015	0	0	994.0	2.72E-04	9.29E-04	1.31	4,046	5,041	-2.00E-11	-3.97E-13
2016	0	0	996.1	2.73E-04	9.31E-04	1.32	4,057	5,055	1.91E-11	3.78E-13
2017	0	0	992.7	2.72E-04	9.28E-04	1.31	4,047	5,041	-8.19E-12	-1.62E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Sparta Aquifer (Layer 3)

Simulated Time Period	Inflows					Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers		Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers			
	(acre-feet)														%
Predevelopment	0	39.0	103.9	4,017	1,129	5,289	0	3,044	72.2	103.7	978.7	1,090	5,289	2.03E-08	3.83E-10
1980	0	39.0	103.8	4,042	1,111	5,296	0	3,044	72.3	104.0	968.4	1,107	5,296	2.16E-10	4.09E-12
1981	0	38.9	103.5	4,030	1,109	5,282	0.021	3,036	72.1	103.7	966.1	1,103	5,282	-7.22E-09	-1.37E-10
1982	3.44E-07	38.9	103.5	4,030	1,109	5,282	0.004	3,036	72.1	103.7	966.2	1,103	5,282	5.46E-12	1.03E-13
1983	0	38.9	103.5	4,030	1,109	5,282	0.008	3,036	72.1	103.7	966.3	1,103	5,282	-6.14E-09	-1.16E-10
1984	0	39.1	103.8	4,041	1,112	5,296	0.008	3,045	72.3	104.0	969.1	1,106	5,296	9.76E-09	1.84E-10
1985	0	38.9	103.6	4,030	1,110	5,282	0.010	3,036	72.1	103.7	966.6	1,103	5,282	2.55E-11	4.82E-13
1986	0	38.9	103.6	4,030	1,110	5,282	0.009	3,037	72.1	103.7	966.7	1,103	5,282	-2.09E-09	-3.96E-11
1987	0	38.9	103.6	4,029	1,110	5,282	0.018	3,037	72.1	103.7	967.0	1,102	5,282	1.38E-07	2.62E-09
1988	0.001	39.1	103.9	4,040	1,113	5,296	2.09E-05	3,045	72.3	104.0	969.6	1,106	5,296	5.50E-09	1.04E-10
1989	0.010	38.9	103.6	4,029	1,110	5,282	0	3,037	72.1	103.7	966.8	1,103	5,282	3.94E-10	7.46E-12
1990	0.009	38.9	103.6	4,030	1,110	5,282	0	3,036	72.1	103.7	966.6	1,103	5,282	7.08E-10	1.34E-11
1991	0.002	38.9	103.6	4,030	1,110	5,282	4.14E-05	3,036	72.1	103.7	966.6	1,103	5,282	1.49E-09	2.82E-11
1992	0	39.1	103.8	4,040	1,113	5,296	0.010	3,045	72.3	104.0	969.4	1,106	5,296	2.94E-08	5.55E-10
1993	0	38.9	103.6	4,029	1,110	5,282	0.004	3,037	72.1	103.7	966.8	1,103	5,282	8.73E-11	1.65E-12
1994	0	38.9	103.6	4,029	1,110	5,282	0.005	3,037	72.1	103.7	966.9	1,102	5,282	6.78E-09	1.28E-10
1995	0.002	38.9	103.6	4,029	1,110	5,282	7.07E-06	3,037	72.1	103.7	966.8	1,103	5,282	1.10E-08	2.09E-10
1996	0.007	39.1	103.8	4,040	1,113	5,296	0	3,045	72.3	104.0	969.3	1,106	5,296	-1.89E-07	-3.58E-09
1997	0	39.0	103.6	4,029	1,110	5,282	0.009	3,037	72.1	103.7	966.8	1,102	5,282	3.46E-08	6.56E-10
1998	0.006	39.0	103.6	4,029	1,110	5,282	0	3,037	72.1	103.7	966.7	1,103	5,282	6.78E-10	1.28E-11
1999	0.001	38.9	103.6	4,029	1,110	5,282	3.07E-05	3,037	72.1	103.7	966.7	1,103	5,282	4.00E-11	7.58E-13
2000	0.007	39.1	103.8	4,041	1,113	5,296	0	3,045	72.3	104.0	969.2	1,106	5,296	5.73E-09	1.08E-10
2001	0	38.9	103.6	4,029	1,110	5,282	0.004	3,037	72.1	103.7	966.7	1,103	5,282	-2.46E-11	-4.65E-13
2002	6.78E-04	38.9	103.6	4,029	1,110	5,282	4.06E-05	3,037	72.1	103.7	966.7	1,103	5,282	9.00E-11	1.70E-12
2003	0.001	38.9	103.6	4,029	1,110	5,282	0	3,037	72.1	103.7	966.6	1,103	5,282	8.03E-09	1.52E-10
2004	0	39.1	103.8	4,040	1,113	5,296	0.006	3,045	72.3	104.0	969.4	1,106	5,296	6.64E-11	1.25E-12
2005	0.002	38.9	103.6	4,029	1,110	5,282	0	3,037	72.1	103.7	966.7	1,103	5,282	1.45E-09	2.75E-11
2006	0	38.9	103.6	4,029	1,110	5,282	0.006	3,037	72.1	103.7	966.8	1,103	5,282	-7.23E-10	-1.37E-11
2007	0	39.0	103.6	4,029	1,111	5,282	0.033	3,037	72.1	103.7	967.3	1,102	5,282	4.79E-10	9.07E-12
2008	0.001	39.1	103.9	4,040	1,114	5,297	5.92E-05	3,045	72.3	104.0	969.9	1,105	5,297	3.55E-11	6.70E-13
2009	0.016	39.0	103.6	4,029	1,110	5,282	0	3,037	72.1	103.7	967.0	1,102	5,282	1.55E-09	2.93E-11
2010	0.052	38.9	103.5	4,030	1,109	5,281	0	3,036	72.1	103.7	966.1	1,103	5,281	-2.03E-08	-3.83E-10
2011	0.059	38.9	103.5	4,031	1,107	5,281	0	3,036	72.1	103.7	965.2	1,104	5,281	6.96E-09	1.32E-10
2012	0.022	39.0	103.8	4,042	1,110	5,295	0	3,044	72.3	104.0	967.6	1,108	5,295	1.03E-08	1.94E-10
2013	0.042	38.9	103.5	4,032	1,106	5,281	0	3,035	72.1	103.7	964.4	1,105	5,281	-1.27E-08	-2.40E-10
2014	0.064	38.9	103.5	4,033	1,105	5,280	0	3,034	72.1	103.7	963.6	1,107	5,280	-7.93E-08	-1.50E-09
2015	0.081	38.9	103.5	4,035	1,103	5,280	0	3,034	72.1	103.7	962.5	1,108	5,280	-1.18E-08	-2.24E-10
2016	0.042	39.0	103.7	4,046	1,105	5,294	0	3,041	72.3	104.0	964.6	1,112	5,294	4.85E-07	9.17E-09
2017	0.050	38.9	103.4	4,036	1,101	5,279	0	3,033	72.1	103.7	961.3	1,110	5,279	-8.79E-10	-1.66E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Weches Formation (Layer 4)

Simulated Time Period	Inflows					Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers		Specific Storage	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0.569	2.42	1,090	1,129	2,222	0	0.764	1.99	1,142	1,077	2,222	3.95E-09	1.78E-10
1980	0	0.569	2.41	1,107	1,111	2,220	0	0.766	1.99	1,124	1,094	2,220	4.32E-11	1.95E-12
1981	0	0.567	2.41	1,103	1,108	2,215	0.008	0.764	1.99	1,121	1,091	2,215	-1.41E-09	-6.36E-11
1982	7.09E-06	0.567	2.41	1,103	1,108	2,215	9.31E-04	0.764	1.99	1,121	1,091	2,215	-1.82E-12	-8.21E-14
1983	0	0.567	2.41	1,103	1,108	2,215	0.003	0.764	1.99	1,122	1,090	2,215	-1.20E-09	-5.41E-11
1984	0	0.569	2.41	1,106	1,112	2,221	0.003	0.766	1.99	1,125	1,093	2,221	1.90E-09	8.55E-11
1985	0	0.567	2.41	1,103	1,109	2,215	0.003	0.764	1.99	1,122	1,090	2,215	3.64E-12	1.64E-13
1986	0	0.567	2.41	1,103	1,109	2,215	0.003	0.764	1.99	1,122	1,090	2,215	-4.11E-10	-1.86E-11
1987	0	0.567	2.41	1,102	1,110	2,215	0.006	0.764	1.99	1,123	1,090	2,215	2.69E-08	1.22E-09
1988	7.19E-04	0.569	2.41	1,106	1,113	2,221	0	0.766	1.99	1,126	1,093	2,221	1.08E-09	4.85E-11
1989	0.004	0.567	2.41	1,103	1,109	2,215	0	0.764	1.99	1,122	1,090	2,215	7.41E-11	3.35E-12
1990	0.003	0.567	2.41	1,103	1,109	2,215	0	0.764	1.99	1,122	1,090	2,215	1.35E-10	6.08E-12
1991	4.66E-04	0.567	2.41	1,103	1,109	2,215	4.33E-05	0.764	1.99	1,122	1,090	2,215	2.85E-10	1.29E-11
1992	0	0.569	2.41	1,106	1,112	2,221	0.003	0.766	1.99	1,125	1,093	2,221	5.73E-09	2.58E-10
1993	0	0.567	2.41	1,103	1,109	2,215	0.001	0.764	1.99	1,122	1,090	2,215	1.59E-11	7.19E-13
1994	0	0.567	2.41	1,102	1,109	2,215	0.002	0.764	1.99	1,122	1,090	2,215	1.32E-09	5.96E-11
1995	7.15E-04	0.567	2.41	1,103	1,109	2,215	0	0.764	1.99	1,122	1,090	2,215	2.15E-09	9.70E-11
1996	0.003	0.569	2.41	1,106	1,112	2,221	0	0.766	1.99	1,125	1,093	2,221	-3.69E-08	-1.66E-09
1997	0	0.567	2.41	1,102	1,109	2,215	0.003	0.764	1.99	1,122	1,090	2,215	6.75E-09	3.05E-10
1998	0.002	0.567	2.41	1,103	1,109	2,215	0	0.764	1.99	1,122	1,090	2,215	1.34E-10	6.06E-12
1999	3.54E-04	0.567	2.41	1,103	1,109	2,215	3.66E-05	0.764	1.99	1,122	1,090	2,215	5.00E-12	2.26E-13
2000	0.002	0.569	2.41	1,106	1,112	2,221	0	0.766	1.99	1,125	1,093	2,221	1.11E-09	5.02E-11
2001	0	0.567	2.41	1,103	1,109	2,215	0.002	0.764	1.99	1,122	1,090	2,215	-1.09E-11	-4.93E-13
2002	3.28E-04	0.567	2.41	1,103	1,109	2,215	3.20E-06	0.764	1.99	1,122	1,090	2,215	1.50E-11	6.78E-13
2003	3.45E-04	0.567	2.41	1,103	1,109	2,215	0	0.764	1.99	1,122	1,090	2,215	1.56E-09	7.05E-11
2004	0	0.569	2.41	1,106	1,112	2,221	0.002	0.766	1.99	1,125	1,093	2,221	1.00E-11	4.50E-13
2005	9.46E-04	0.567	2.41	1,103	1,109	2,215	0	0.764	1.99	1,122	1,090	2,215	2.82E-10	1.27E-11
2006	0	0.567	2.41	1,103	1,109	2,215	0.002	0.764	1.99	1,122	1,090	2,215	-1.39E-10	-6.28E-12
2007	0	0.567	2.41	1,102	1,110	2,215	0.012	0.764	1.99	1,123	1,089	2,215	9.37E-11	4.23E-12
2008	0.001	0.569	2.41	1,105	1,113	2,221	0	0.766	1.99	1,126	1,092	2,221	5.91E-12	2.66E-13
2009	0.006	0.567	2.41	1,102	1,110	2,215	0	0.764	1.99	1,123	1,089	2,215	2.96E-10	1.34E-11
2010	0.018	0.567	2.41	1,103	1,108	2,214	0	0.764	1.99	1,121	1,090	2,214	-3.95E-09	-1.78E-10
2011	0.020	0.567	2.41	1,104	1,107	2,214	0	0.764	1.99	1,120	1,091	2,214	1.35E-09	6.11E-11
2012	0.006	0.569	2.41	1,108	1,109	2,220	0	0.766	1.99	1,122	1,095	2,220	2.01E-09	9.04E-11
2013	0.014	0.567	2.41	1,105	1,105	2,214	0	0.764	1.99	1,118	1,092	2,214	-2.47E-09	-1.12E-10
2014	0.021	0.567	2.41	1,107	1,104	2,213	0	0.764	1.99	1,117	1,094	2,213	-1.55E-08	-6.98E-10
2015	0.027	0.566	2.40	1,108	1,102	2,213	0	0.764	1.99	1,115	1,095	2,213	-2.31E-09	-1.04E-10
2016	0.013	0.568	2.41	1,112	1,104	2,219	0	0.766	1.99	1,117	1,099	2,219	9.46E-08	4.27E-09
2017	0.016	0.566	2.40	1,110	1,100	2,213	0	0.764	1.99	1,113	1,097	2,213	-1.75E-10	-7.89E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Queen City Aquifer (Layer 5)

Simulated Time Period	Inflows						Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers		Specific Storage	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers			
	(acre-feet)														%
Predevelopment	0	3,216	513.2	923.8	1,077	22.9	5,753	0	191.7	4,433	1,129	0	5,753	1.38E-05	2.39E-07
1980	0	3,380	468.3	906.6	1,094	0	5,849	0	174.5	4,504	1,111	60.0	5,849	1.38E-07	2.36E-09
1981	0	3,367	468.6	905.0	1,091	0	5,831	0.390	175.8	4,489	1,108	58.1	5,831	-4.81E-06	-8.24E-08
1982	0.001	3,367	467.7	905.0	1,091	0	5,830	0.043	178.6	4,487	1,108	56.2	5,830	2.68E-09	4.59E-11
1983	0	3,365	468.2	905.6	1,090	0	5,830	0.136	180.0	4,487	1,108	54.3	5,830	-4.33E-06	-7.43E-08
1984	0	3,373	470.3	908.5	1,093	0	5,845	0.137	180.8	4,500	1,112	53.0	5,845	6.90E-06	1.18E-07
1985	0	3,362	470.4	906.4	1,090	0	5,829	0.172	178.8	4,489	1,109	52.3	5,829	2.00E-08	3.43E-10
1986	0	3,360	471.5	906.7	1,090	0	5,828	0.154	177.7	4,490	1,109	51.9	5,828	-1.48E-06	-2.54E-08
1987	0	3,357	473.1	907.6	1,090	0	5,827	0.319	178.4	4,488	1,110	50.4	5,827	9.77E-05	1.68E-06
1988	0.043	3,367	473.6	909.8	1,093	0	5,843	0	180.0	4,501	1,113	49.5	5,843	3.87E-06	6.62E-08
1989	0.194	3,359	471.4	906.8	1,090	0	5,828	0	178.4	4,490	1,109	49.8	5,828	2.72E-07	4.67E-09
1990	0.145	3,361	470.9	906.5	1,090	0	5,829	0	177.9	4,491	1,109	50.5	5,829	4.83E-07	8.29E-09
1991	0.022	3,361	471.6	906.8	1,090	0	5,830	0.003	176.0	4,493	1,109	51.3	5,830	1.05E-06	1.79E-08
1992	0	3,368	474.3	909.9	1,093	0	5,846	0.177	176.0	4,506	1,112	51.3	5,846	2.07E-05	3.54E-07
1993	0	3,359	474.0	907.8	1,090	0	5,830	0.060	174.1	4,495	1,109	51.3	5,830	4.76E-08	8.17E-10
1994	0	3,358	475.2	908.3	1,090	0	5,831	0.078	172.4	4,497	1,109	51.6	5,831	4.76E-06	8.16E-08
1995	0.038	3,358	475.5	908.4	1,090	0	5,832	0	171.5	4,499	1,109	52.0	5,832	8.39E-06	1.44E-07
1996	0.130	3,369	476.6	910.9	1,093	0	5,849	0	171.4	4,513	1,112	52.7	5,849	-1.34E-04	-2.28E-06
1997	0	3,358	476.9	909.2	1,090	0	5,834	0.164	169.9	4,502	1,109	52.4	5,834	2.44E-05	4.19E-07
1998	0.119	3,359	477.0	909.1	1,090	0	5,835	0	168.2	4,504	1,109	53.2	5,835	4.58E-07	7.84E-09
1999	0.017	3,359	476.3	908.7	1,090	0	5,834	0.003	168.8	4,502	1,109	53.7	5,834	2.67E-08	4.58E-10
2000	0.126	3,370	476.5	910.3	1,093	0	5,850	0	168.9	4,513	1,112	55.1	5,850	4.15E-06	7.09E-08
2001	0	3,360	475.5	907.9	1,090	0	5,833	0.087	169.0	4,500	1,109	55.1	5,833	-1.90E-08	-3.25E-10
2002	0.017	3,360	475.5	907.7	1,090	0	5,833	1.21E-04	167.8	4,500	1,109	55.8	5,833	5.75E-08	9.87E-10
2003	0.018	3,360	475.5	907.8	1,090	0	5,833	0	168.1	4,500	1,109	56.0	5,833	5.66E-06	9.70E-08
2004	0	3,368	477.6	910.8	1,093	0	5,849	0.108	168.8	4,513	1,112	55.4	5,849	3.42E-08	5.84E-10
2005	0.051	3,359	475.9	908.4	1,090	0	5,834	0	169.4	4,500	1,109	54.5	5,834	1.02E-06	1.75E-08
2006	0	3,358	476.4	908.9	1,090	0	5,833	0.112	170.4	4,500	1,109	53.2	5,833	-5.06E-07	-8.67E-09
2007	0	3,352	479.8	910.6	1,089	0	5,831	0.603	169.9	4,500	1,110	51.0	5,831	3.42E-07	5.87E-09
2008	0.069	3,362	480.0	912.4	1,092	0	5,846	0	171.3	4,512	1,113	50.2	5,846	1.80E-08	3.08E-10
2009	0.306	3,356	477.4	908.9	1,089	0	5,832	0	168.8	4,502	1,110	51.7	5,832	1.09E-06	1.88E-08
2010	0.938	3,366	473.5	906.8	1,090	0	5,837	0	165.2	4,507	1,108	56.6	5,837	-1.44E-05	-2.46E-07
2011	1.01	3,377	470.0	905.6	1,091	0	5,844	0	163.3	4,513	1,107	61.9	5,844	4.90E-06	8.38E-08
2012	0.315	3,389	468.8	908.6	1,095	0	5,862	0	171.0	4,520	1,109	61.9	5,862	7.22E-06	1.23E-07
2013	0.705	3,388	460.4	904.0	1,092	0	5,846	0	180.7	4,499	1,105	60.5	5,846	-8.90E-06	-1.52E-07
2014	1.09	3,400	451.5	900.6	1,094	0	5,847	0	195.3	4,488	1,104	59.3	5,847	-5.59E-05	-9.56E-07
2015	1.36	3,415	440.3	896.1	1,095	0	5,848	0	213.7	4,474	1,102	57.9	5,848	-8.20E-06	-1.40E-07
2016	0.639	3,431	436.0	896.4	1,099	0	5,863	0	223.4	4,479	1,104	56.7	5,863	3.41E-04	5.81E-06
2017	0.824	3,431	428.5	891.2	1,097	0	5,848	0	232.1	4,460	1,100	56.0	5,848	-6.20E-07	-1.06E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Reklaw Formation (Layer 6)

Simulated Time Period	Inflows					Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers		Specific Storage	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0.418	0.779	0	22.3	23.5	0	0	0.539	22.9	0	23.5	4.62E-08	1.97E-07
1980	0	0.079	0.173	60.0	0	60.3	0	0.988	3.61	0	55.7	60.3	-5.86E-10	-9.73E-10
1981	0	0.063	0.162	58.1	0	58.3	0.343	0.921	3.41	0	53.7	58.3	-3.07E-09	-5.26E-09
1982	0	0.049	0.158	56.2	0	56.4	0.335	0.879	3.30	0	51.9	56.4	2.03E-12	3.59E-12
1983	0	0.038	0.154	54.3	0	54.5	0.346	0.841	3.19	0	50.1	54.5	-2.64E-09	-4.84E-09
1984	0	0.035	0.154	53.0	0	53.2	0.266	0.824	3.15	0	48.9	53.2	4.21E-09	7.92E-09
1985	0.002	0.040	0.158	52.3	0	52.5	0.107	0.823	3.18	0	48.4	52.5	1.47E-11	2.80E-11
1986	0	0.045	0.160	51.9	0	52.1	0.072	0.822	3.19	0	48.0	52.1	-8.99E-10	-1.73E-09
1987	0	0.040	0.154	50.4	0	50.6	0.291	0.775	3.06	0	46.5	50.6	5.93E-08	1.17E-07
1988	0	0.042	0.155	49.5	0	49.7	0.176	0.762	3.04	0	45.7	49.7	2.36E-09	4.75E-09
1989	0.099	0.056	0.162	49.8	0	50.1	0.003	0.796	3.14	0	46.2	50.1	1.72E-10	3.44E-10
1990	0.126	0.065	0.165	50.5	0	50.8	0	0.818	3.20	0	46.8	50.8	3.03E-10	5.96E-10
1991	0.146	0.073	0.168	51.3	0	51.7	0	0.836	3.25	0	47.6	51.7	6.39E-10	1.24E-09
1992	0.002	0.072	0.166	51.3	0	51.5	0.041	0.818	3.21	0	47.4	51.5	1.23E-08	2.38E-08
1993	0.034	0.077	0.167	51.3	0	51.6	5.02E-04	0.818	3.23	0	47.6	51.6	4.08E-11	7.90E-11
1994	0.038	0.081	0.169	51.6	0	51.9	0	0.824	3.25	0	47.8	51.9	2.91E-09	5.62E-09
1995	0.080	0.087	0.171	52.0	0	52.3	0	0.835	3.29	0	48.2	52.3	4.79E-09	9.16E-09
1996	0.111	0.093	0.173	52.7	0	53.1	0	0.850	3.34	0	48.9	53.1	-8.14E-08	-1.53E-07
1997	0.001	0.090	0.170	52.4	0	52.7	0.049	0.828	3.28	0	48.5	52.7	1.49E-08	2.83E-08
1998	0.152	0.099	0.175	53.2	0	53.6	0	0.856	3.38	0	49.4	53.6	3.04E-10	5.67E-10
1999	0.095	0.103	0.175	53.7	0	54.1	0	0.865	3.40	0	49.8	54.1	1.59E-11	2.95E-11
2000	0.231	0.111	0.180	55.1	0	55.7	0	0.902	3.49	0	51.3	55.7	2.56E-09	4.60E-09
2001	0.026	0.107	0.175	55.1	0	55.4	0.022	0.885	3.43	0	51.0	55.4	-1.40E-11	-2.52E-11
2002	0.137	0.111	0.177	55.8	0	56.2	0	0.906	3.48	0	51.9	56.2	3.61E-11	6.42E-11
2003	0.027	0.108	0.175	56.0	0	56.3	0.005	0.900	3.46	0	51.9	56.3	3.38E-09	6.00E-09
2004	0	0.101	0.172	55.4	0	55.7	0.128	0.875	3.40	0	51.3	55.7	2.76E-11	4.95E-11
2005	0	0.096	0.169	54.5	0	54.8	0.130	0.853	3.35	0	50.5	54.8	6.23E-10	1.14E-09
2006	0	0.088	0.165	53.2	0	53.5	0.243	0.819	3.26	0	49.1	53.5	-3.09E-10	-5.77E-10
2007	0	0.077	0.158	51.0	0	51.3	0.428	0.761	3.12	0	47.0	51.3	2.09E-10	4.07E-10
2008	0	0.081	0.162	50.2	0	50.5	0.153	0.764	3.14	0	46.4	50.5	1.33E-11	2.64E-11
2009	0.306	0.101	0.173	51.7	0	52.2	0	0.835	3.32	0	48.1	52.2	6.68E-10	1.28E-09
2010	0.947	0.138	0.195	56.6	0	57.9	0	0.992	3.71	0	53.2	57.9	-8.75E-09	-1.51E-08
2011	0.999	0.165	0.206	61.9	0	63.2	0	1.11	4.00	0	58.1	63.2	2.99E-09	4.72E-09
2012	0.113	0.131	0.186	61.9	0	62.3	0.139	1.02	3.75	0	57.4	62.3	4.44E-09	7.11E-09
2013	0.004	0.108	0.176	60.5	0	60.8	0.186	0.956	3.61	0	56.1	60.8	-5.44E-09	-8.94E-09
2014	2.67E-04	0.092	0.170	59.3	0	59.5	0.150	0.929	3.52	0	54.9	59.5	-3.40E-08	-5.71E-08
2015	0	0.075	0.163	57.9	0	58.1	0.164	0.904	3.42	0	53.6	58.1	-5.08E-09	-8.74E-09
2016	0	0.061	0.160	56.7	0	56.9	0.186	0.884	3.35	0	52.5	56.9	2.09E-07	3.66E-07
2017	0	0.054	0.159	56.0	0	56.2	0.043	0.888	3.34	0	51.9	56.2	-3.54E-10	-6.30E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Carrizo-Upper Wilcox (Layer 7)

Simulated Time Period	Inflows						Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers		Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers			
	(acre-feet)															%
Predevelopment	0	0.700	9.03	33.4	0	6.48	49.6	0	0	0.891	16.3	10.1	22.3	49.6	2.04E-06	4.12E-06
1980	0	44.1	112.0	26.9	55.7	25.5	264.1	0	30.0	0	96.5	137.7	0	264.1	-3.63E-08	-1.37E-08
1981	0	43.4	104.6	22.2	53.7	22.9	246.8	41.8	31.9	0	81.9	91.1	0	246.8	-1.88E-09	-7.62E-10
1982	0	42.6	98.1	20.0	51.9	20.7	233.3	40.7	32.7	0	75.8	84.0	0	233.3	3.47E-12	1.49E-12
1983	0	41.7	91.8	18.7	50.1	18.5	220.8	42.3	33.9	0	70.1	74.5	0	220.8	-1.64E-09	-7.43E-10
1984	0	41.0	88.5	18.7	48.9	17.0	214.2	31.9	35.9	0	68.7	77.7	0	214.2	3.35E-09	1.56E-09
1985	0.706	40.4	88.9	20.4	48.4	16.8	215.5	11.9	33.5	0	72.1	98.1	0	215.5	1.77E-10	8.22E-11
1986	0	40.2	89.9	20.8	48.0	16.8	215.7	8.10	31.1	0	73.9	102.6	0	215.7	-4.45E-10	-2.06E-10
1987	0	39.6	86.0	18.4	46.5	15.1	205.5	35.1	31.3	0	64.9	74.2	0	205.5	2.93E-08	1.42E-08
1988	0	39.1	85.4	19.0	45.7	14.5	203.8	20.7	32.2	0	65.7	85.2	0	203.8	1.46E-09	7.17E-10
1989	12.7	39.0	89.5	21.8	46.2	15.8	225.0	0.510	33.1	0	75.7	115.7	0	225.0	4.78E-10	2.13E-10
1990	14.3	39.2	92.8	22.7	46.8	17.1	233.0	0	33.3	0	79.7	119.9	0	233.0	2.90E-10	1.25E-10
1991	18.4	39.5	96.2	23.8	47.6	18.5	244.0	0	32.8	0	82.5	128.7	0	244.0	5.10E-10	2.09E-10
1992	1.14	39.7	95.7	22.5	47.4	18.6	225.0	5.40	32.7	0	77.4	109.5	0	225.0	8.63E-09	3.83E-09
1993	6.34	39.7	97.1	23.3	47.6	19.0	233.0	0.013	40.1	0	78.6	114.3	0	233.0	3.49E-10	1.50E-10
1994	5.56	39.8	98.5	23.7	47.8	19.6	235.0	0	34.7	0	80.1	120.1	0	235.0	1.87E-09	7.96E-10
1995	10.6	40.0	100.7	24.4	48.2	20.4	244.3	0	36.3	0	82.5	125.5	0	244.3	4.26E-09	1.74E-09
1996	13.6	40.4	103.3	25.2	48.9	21.3	252.7	0	37.0	0	85.2	130.4	0	252.7	-4.84E-08	-1.92E-08
1997	0.696	40.3	101.9	23.9	48.5	21.0	236.3	5.95	37.1	0	80.0	113.3	0	236.3	1.01E-08	4.25E-09
1998	20.3	40.6	105.7	26.2	49.4	22.2	264.4	0	37.8	0	87.1	139.6	0	264.4	7.92E-10	3.00E-10
1999	11.5	40.9	107.4	26.0	49.8	22.9	258.5	0	38.3	0	87.6	132.6	0	258.5	1.74E-11	6.73E-12
2000	29.3	41.5	112.1	27.6	51.3	24.4	286.2	0	49.6	0	94.4	142.2	0	286.2	6.51E-09	2.28E-09
2001	3.44	41.6	110.6	25.7	51.0	24.1	256.4	4.23	40.6	0	88.7	122.9	0	256.4	-5.85E-11	-2.28E-11
2002	18.4	41.9	113.0	27.0	51.9	24.9	277.1	0	50.3	0	93.2	133.7	0	277.1	7.25E-11	2.62E-11
2003	3.10	42.0	112.4	26.0	51.9	24.8	260.3	1.49	44.0	0	90.4	124.5	0	260.3	-1.35E-09	-5.19E-10
2004	0	42.0	109.6	24.4	51.3	23.9	251.3	16.0	38.5	0	84.5	112.3	0	251.3	2.49E-10	9.93E-11
2005	0	41.6	107.1	23.8	50.5	22.8	245.8	16.0	38.4	0	81.6	109.8	0	245.8	3.23E-10	1.31E-10
2006	0	41.0	102.9	22.0	49.1	21.2	236.3	30.3	31.7	0	75.7	98.6	0	236.3	-1.97E-10	-8.35E-11
2007	0	40.1	96.2	19.5	47.0	18.6	221.4	50.5	23.7	0	65.8	81.4	0	221.4	1.71E-10	7.73E-11
2008	0.110	39.6	96.3	21.1	46.4	18.0	221.5	17.2	34.6	0	70.6	99.2	0	221.5	5.20E-12	2.35E-12
2009	38.6	39.8	104.1	25.9	48.1	20.1	276.6	0	51.5	0	87.6	137.5	0	276.6	7.45E-10	2.69E-10
2010	114.9	41.6	122.0	34.1	53.2	26.1	391.9	0	76.7	0	117.8	197.4	0	391.9	-7.09E-09	-1.81E-09
2011	116.7	44.0	136.2	37.8	58.1	32.0	424.7	0	76.7	0	133.1	214.9	0	424.7	1.72E-09	4.06E-10
2012	13.1	44.9	127.6	29.0	57.4	30.6	302.6	24.7	52.8	0	103.7	121.5	0	302.6	3.84E-09	1.27E-09
2013	0.481	44.7	119.9	26.0	56.1	28.4	275.5	25.5	52.6	0	90.8	106.5	0	275.5	-2.76E-09	-1.00E-09
2014	0	44.3	114.3	23.9	54.9	26.5	263.9	24.5	52.6	0	87.4	99.4	0	263.9	-1.71E-08	-6.46E-09
2015	0	43.8	107.9	21.4	53.6	24.4	251.2	29.8	52.6	0	83.2	85.5	0	251.2	-3.65E-09	-1.45E-09
2016	0	43.3	102.7	20.4	52.5	22.6	241.4	28.6	52.8	0	79.1	81.0	0	241.4	1.34E-07	5.54E-08
2017	0	42.8	100.0	20.6	51.9	21.7	237.0	11.1	52.6	0	81.4	91.9	0	237.0	7.45E-10	3.14E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Middle Wilcox (Layer 8)

Simulated Time Period	Inflows					Total Inflows	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Lower Layers		Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0.033	0	8.15	5.21	13.4	0	0	3.19	2.08	1.65	6.48	0	13.4	8.49E-07	6.34E-06
1980	0	33.1	5.44	2.61	17.4	58.6	0	14.9	0	2.98	8.47	25.5	6.72	58.6	-1.44E-08	-2.46E-08
1981	0.007	33.0	5.42	2.66	16.8	57.9	1.39	15.9	0	2.87	7.95	22.9	6.83	57.9	-4.53E-11	-7.83E-11
1982	0	33.0	5.39	2.69	16.1	57.1	2.78	16.3	0	2.78	7.49	20.7	7.01	57.1	1.31E-12	2.29E-12
1983	0	32.9	5.33	2.72	15.4	56.3	3.93	16.9	0	2.68	7.00	18.5	7.20	56.3	-4.59E-11	-8.16E-11
1984	0	32.8	5.29	2.80	15.0	55.9	4.42	17.9	0	2.60	6.56	17.0	7.40	55.9	9.42E-11	1.68E-10
1985	0	32.6	5.24	2.70	14.7	55.3	5.29	16.7	0	2.53	6.53	16.8	7.42	55.3	5.12E-12	9.27E-12
1986	0	32.5	5.22	2.58	14.5	54.8	6.02	15.5	0	2.47	6.67	16.8	7.35	54.8	-1.76E-11	-3.21E-11
1987	0	32.3	5.21	2.53	14.1	54.1	7.22	15.6	0	2.33	6.46	15.1	7.34	54.1	7.81E-10	1.44E-09
1988	0	32.2	5.23	2.52	14.0	53.9	7.48	16.1	0	2.22	6.29	14.5	7.33	53.9	3.85E-11	7.14E-11
1989	0	31.9	5.24	2.53	14.5	54.2	6.22	16.5	0	2.17	6.32	15.8	7.13	54.2	1.43E-11	2.64E-11
1990	0	31.7	5.25	2.52	15.1	54.6	5.34	16.7	0	2.15	6.45	17.1	6.91	54.6	5.54E-12	1.01E-11
1991	0.203	31.6	5.27	2.38	15.9	55.3	4.23	16.4	0	2.12	7.29	18.5	6.71	55.3	1.41E-11	2.54E-11
1992	0	31.5	5.29	2.39	16.1	55.3	4.23	16.4	0	2.09	7.43	18.6	6.60	55.3	2.46E-10	4.46E-10
1993	0.629	31.3	5.32	2.48	17.0	56.7	2.12	20.0	0	2.03	6.98	19.0	6.54	56.7	5.33E-12	9.40E-12
1994	0	31.2	5.34	2.42	17.0	56.0	3.27	17.4	0	2.04	7.30	19.6	6.44	56.0	4.79E-11	8.56E-11
1995	0.003	31.2	5.37	2.44	17.3	56.3	1.98	18.1	0	2.05	7.44	20.4	6.35	56.3	1.41E-10	2.50E-10
1996	0.109	31.2	5.41	2.46	17.8	57.0	1.23	18.5	0	2.07	7.61	21.3	6.28	57.0	-1.34E-09	-2.35E-09
1997	0	31.1	5.42	2.47	17.8	56.7	1.36	18.5	0	2.04	7.62	21.0	6.23	56.7	2.87E-10	5.05E-10
1998	0.424	31.0	5.46	2.49	18.3	57.7	0.500	18.9	0	2.07	7.82	22.2	6.17	57.7	1.89E-11	3.27E-11
1999	0.668	31.0	5.49	2.51	18.6	58.3	0.168	19.1	0	2.08	7.95	22.9	6.11	58.3	1.28E-12	2.19E-12
2000	5.03	31.2	5.58	2.71	20.3	64.8	0	24.8	0	2.09	7.43	24.4	6.12	64.8	2.28E-10	3.51E-10
2001	1.38	31.1	5.59	2.59	20.0	60.6	0.284	20.3	0	2.11	7.77	24.1	6.06	60.6	-2.12E-12	-3.49E-12
2002	5.05	31.2	5.64	2.78	21.0	65.6	0	25.1	0	2.11	7.41	24.9	6.08	65.6	4.26E-13	6.50E-13
2003	2.41	31.3	5.66	2.70	20.7	62.8	0.087	22.0	0	2.15	7.67	24.8	6.07	62.8	-6.46E-11	-1.03E-10
2004	0.934	31.4	5.67	2.61	19.7	60.4	0.891	19.2	0	2.17	8.13	23.9	6.11	60.4	1.01E-11	1.68E-11
2005	0.427	31.4	5.66	2.58	19.0	59.0	0.445	19.2	0	2.16	8.23	22.8	6.18	59.0	4.67E-12	7.91E-12
2006	0.065	31.4	5.64	2.53	17.6	57.2	3.00	15.9	0	2.14	8.69	21.2	6.27	57.2	-7.29E-12	-1.27E-11
2007	0	31.3	5.59	2.44	15.5	54.8	6.58	11.8	0	2.10	9.27	18.6	6.39	54.8	3.52E-12	6.42E-12
2008	0.281	31.3	5.62	2.46	15.7	55.3	2.81	17.3	0	2.02	8.65	18.0	6.58	55.3	2.98E-13	5.40E-13
2009	4.51	31.2	5.68	2.73	18.2	62.3	0.326	25.7	0	1.96	7.51	20.1	6.63	62.3	2.54E-11	4.08E-11
2010	14.9	31.3	5.85	4.13	23.6	79.8	0	38.3	0	2.00	6.86	26.1	6.51	79.8	-2.15E-10	-2.70E-10
2011	16.1	31.6	5.97	4.48	27.4	85.6	0	38.3	0	2.17	6.96	32.0	6.15	85.6	4.88E-11	5.70E-11
2012	6.56	32.0	5.96	3.36	25.8	73.7	1.09	26.4	0	2.28	7.48	30.6	5.92	73.7	1.08E-10	1.47E-10
2013	5.33	32.1	5.91	3.10	24.1	70.6	0.025	26.3	0	2.28	7.65	28.4	5.98	70.6	-7.28E-11	-1.03E-10
2014	4.91	32.3	5.88	3.03	22.8	69.0	0	26.3	0	2.29	7.68	26.5	6.22	69.0	-4.17E-10	-6.04E-10
2015	4.11	32.5	5.83	3.06	21.7	67.2	0	26.3	0	2.29	7.61	24.4	6.53	67.2	-1.01E-10	-1.50E-10
2016	3.36	32.7	5.77	3.15	20.7	65.7	0.018	26.4	0	2.28	7.58	22.6	6.86	65.7	3.65E-09	5.56E-09
2017	3.37	32.8	5.68	3.18	20.0	65.0	0	26.3	0	2.30	7.57	21.7	7.11	65.0	2.12E-11	3.27E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-1.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bee GCD - Lower Wilcox (Layer 9)

Simulated Time Period	Inflows					Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers		Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Upper Layers			
	(acre-feet)														%
Predevelopment	0	0.020	0	33.2	0	33.2	0	0	3.43	15.0	9.63	5.21	33.2	2.00E-06	6.02E-06
1980	0	34.0	33.1	8.70	6.72	82.5	0	14.9	0	14.7	35.4	17.4	82.5	-3.22E-08	-3.90E-08
1981	0	33.9	33.0	8.67	6.83	82.4	1.15	15.9	0	14.4	34.1	16.8	82.4	-6.09E-11	-7.38E-11
1982	0	33.9	32.7	8.60	7.01	82.2	3.04	16.3	0	14.0	32.7	16.1	82.2	-8.54E-12	-1.04E-11
1983	0	33.8	32.2	8.51	7.20	81.7	4.83	16.9	0	13.6	31.0	15.4	81.7	-6.67E-11	-8.17E-11
1984	0	33.8	31.8	8.44	7.40	81.4	6.15	17.9	0	13.1	29.3	15.0	81.4	1.26E-10	1.55E-10
1985	0	33.6	31.3	8.30	7.42	80.6	7.95	16.7	0	12.5	28.7	14.7	80.6	8.95E-12	1.11E-11
1986	0	33.4	31.2	8.19	7.35	80.1	9.30	15.5	0	12.0	28.8	14.5	80.1	-2.35E-11	-2.94E-11
1987	0	33.3	31.1	8.12	7.34	79.8	10.8	15.6	0	11.2	28.1	14.1	79.8	1.04E-09	1.30E-09
1988	0	33.1	31.3	8.11	7.33	79.9	11.8	16.1	0	10.5	27.5	14.0	79.9	3.67E-11	4.60E-11
1989	0	32.8	31.4	8.11	7.13	79.4	11.1	16.5	0	10.1	27.3	14.5	79.4	1.03E-11	1.30E-11
1990	0	32.6	31.5	8.16	6.91	79.2	9.83	16.7	0	9.88	27.7	15.1	79.2	2.49E-12	3.14E-12
1991	0	32.5	31.7	8.19	6.71	79.1	7.83	16.4	0	9.78	29.2	15.9	79.1	1.69E-11	2.14E-11
1992	0	32.4	31.9	8.24	6.60	79.2	7.23	16.4	0	9.73	29.8	16.1	79.2	3.16E-10	3.99E-10
1993	0.044	32.2	32.2	8.39	6.54	79.3	4.05	20.0	0	9.55	28.8	17.0	79.3	1.07E-11	1.35E-11
1994	0	32.1	32.4	8.40	6.44	79.3	5.43	17.4	0	9.59	29.9	17.0	79.3	4.35E-11	5.48E-11
1995	0	32.0	32.6	8.48	6.35	79.5	3.87	18.1	0	9.62	30.5	17.3	79.5	1.81E-10	2.27E-10
1996	0.014	32.0	33.0	8.59	6.28	79.9	2.65	18.5	0	9.72	31.2	17.8	79.9	-1.68E-09	-2.11E-09
1997	0.002	31.9	33.2	8.64	6.23	79.9	2.34	18.5	0	9.67	31.6	17.8	79.9	3.63E-10	4.54E-10
1998	0.218	31.9	33.5	8.74	6.17	80.4	1.26	18.9	0	9.74	32.3	18.3	80.4	1.89E-11	2.35E-11
1999	0.638	31.9	33.7	8.84	6.11	81.2	0.602	19.1	0	9.84	33.0	18.6	81.2	-1.57E-11	-1.93E-11
2000	5.20	32.0	34.4	9.16	6.12	86.8	0.013	24.8	0	9.93	31.8	20.3	86.8	3.19E-10	3.68E-10
2001	2.11	32.0	34.5	9.13	6.06	83.8	0.038	20.3	0	10.1	33.3	20.0	83.8	-1.60E-11	-1.91E-11
2002	6.29	32.0	34.9	9.34	6.08	88.7	0	25.1	0	10.2	32.4	21.0	88.7	1.01E-11	1.13E-11
2003	4.00	32.1	35.1	9.33	6.07	86.6	0	22.0	0	10.5	33.5	20.7	86.6	-9.04E-11	-1.04E-10
2004	1.82	32.3	35.2	9.26	6.11	84.7	0.121	19.2	0	10.6	34.9	19.7	84.7	6.00E-12	7.08E-12
2005	1.19	32.2	35.1	9.18	6.18	83.9	0.003	19.2	0	10.6	35.1	19.0	83.9	8.36E-12	9.96E-12
2006	0.077	32.2	34.9	9.00	6.27	82.5	2.40	15.9	0	10.5	36.2	17.6	82.5	-9.86E-12	-1.20E-11
2007	0	32.1	34.6	8.73	6.39	81.9	6.93	11.8	0	10.2	37.4	15.5	81.9	5.04E-12	6.16E-12
2008	0.016	32.2	34.8	8.80	6.58	82.3	4.09	17.3	0	9.72	35.5	15.7	82.3	6.69E-12	8.13E-12
2009	3.06	32.1	35.1	9.11	6.63	86.0	0.669	25.7	0	9.32	32.1	18.2	86.0	3.56E-11	4.14E-11
2010	14.5	32.2	36.1	9.82	6.51	99.1	0	38.3	0	9.41	27.8	23.6	99.1	-2.88E-10	-2.90E-10
2011	18.6	32.5	37.0	10.3	6.15	104.5	0	38.3	0	10.3	28.4	27.4	104.5	5.69E-11	5.44E-11
2012	11.1	32.8	37.1	10.1	5.92	97.1	0.046	26.4	0	11.2	33.6	25.8	97.1	1.20E-10	1.24E-10
2013	11.1	33.0	36.9	10.0	5.98	96.9	0	26.3	0	11.6	34.9	24.1	96.9	-7.24E-11	-7.46E-11
2014	10.2	33.2	36.6	9.94	6.22	96.1	0	26.3	0	11.8	35.2	22.8	96.1	-4.46E-10	-4.64E-10
2015	8.78	33.4	36.2	9.85	6.53	94.7	0	26.3	0	11.8	34.9	21.7	94.7	-1.34E-10	-1.41E-10
2016	7.38	33.6	35.7	9.75	6.86	93.3	0	26.4	0	11.8	34.5	20.7	93.3	4.29E-09	4.59E-09
2017	6.74	33.7	34.9	9.60	7.11	92.1	0	26.3	0	11.8	34.0	20.0	92.1	1.75E-11	1.90E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows												Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Wintergarden GCD	Bexar	Lower Layers	
	(acre-feet)												
Predevelopment	0	0	4.85E+05	12,831	6.02	29.0	0.028	0.001	85.6	21.4	15.9	4.66E+05	9.64E+05
1980	0	0	5.36E+05	12,110	6.06	27.3	0.028	0.001	37.3	19.2	12.2	4.30E+05	9.78E+05
1981	1.16E-09	9.78E-06	5.28E+05	15,524	6.03	27.7	0.028	0.001	37.4	20.1	12.8	4.32E+05	9.76E+05
1982	0.854	437.5	5.31E+05	10,489	6.05	27.2	0.028	0.001	38.5	19.7	12.3	4.30E+05	9.71E+05
1983	0.563	257.4	5.29E+05	10,752	6.05	27.2	0.028	0.001	37.7	19.2	12.2	4.30E+05	9.70E+05
1984	1.32	614.4	5.33E+05	9,133	6.07	27.3	0.028	0.001	37.9	18.3	11.8	4.30E+05	9.72E+05
1985	3.60E-04	0.415	5.23E+05	14,637	6.04	27.2	0.028	0.001	36.1	19.0	12.7	4.33E+05	9.71E+05
1986	0.014	13.4	5.22E+05	13,822	6.04	27.3	0.028	0.001	37.1	19.5	12.9	4.33E+05	9.69E+05
1987	1.96E-06	0.002	5.20E+05	13,987	6.04	27.5	0.028	0.001	38.2	20.1	13.0	4.35E+05	9.68E+05
1988	3.12	1,521	5.30E+05	6,470	6.07	27.3	0.028	0.001	38.7	18.5	11.7	4.30E+05	9.68E+05
1989	1.83	905.6	5.31E+05	8,596	6.07	27.2	0.028	0.001	37.0	17.4	11.5	4.28E+05	9.68E+05
1990	0.050	38.8	5.28E+05	12,783	6.06	27.2	0.028	0.001	35.6	17.6	12.0	4.29E+05	9.70E+05
1991	0.141	78.9	5.29E+05	15,252	6.04	27.2	0.028	0.001	37.1	18.7	12.3	4.31E+05	9.75E+05
1992	0.080	43.9	5.30E+05	17,211	6.05	27.8	0.028	0.001	39.5	20.3	12.7	4.34E+05	9.80E+05
1993	1.20	700.1	5.36E+05	11,008	6.04	27.3	0.028	0.001	41.3	20.1	11.9	4.29E+05	9.77E+05
1994	0.197	139.9	5.38E+05	13,885	6.04	27.3	0.028	0.001	41.1	20.4	12.2	4.29E+05	9.81E+05
1995	1.36	714.0	5.43E+05	10,742	6.05	27.3	0.028	0.001	42.1	19.9	11.6	4.27E+05	9.81E+05
1996	2.75	1,335	5.51E+05	7,627	6.07	27.4	0.028	0.001	41.1	18.5	10.7	4.24E+05	9.84E+05
1997	0.008	10.6	5.40E+05	14,960	6.04	27.2	0.028	0.001	37.3	19.1	11.8	4.28E+05	9.83E+05
1998	0.068	57.7	5.43E+05	14,993	6.04	27.3	0.028	0.001	38.1	20.0	12.1	4.27E+05	9.85E+05
1999	2.33	1,164	5.52E+05	8,595	6.05	27.3	0.028	0.001	39.9	19.0	11.0	4.23E+05	9.84E+05
2000	0.719	373.1	5.58E+05	13,041	6.06	27.3	0.028	0.001	38.5	16.8	10.8	4.23E+05	9.95E+05
2001	0.791	367.2	5.58E+05	11,699	6.05	27.3	0.028	0.001	38.4	14.4	10.9	4.21E+05	9.92E+05
2002	0.261	130.2	5.56E+05	19,890	6.03	27.6	0.028	0.001	37.0	12.7	11.7	4.24E+05	1.00E+06
2003	0.469	280.1	5.60E+05	14,507	6.04	27.3	0.028	0.001	39.6	12.6	11.4	4.23E+05	9.97E+05
2004	0.066	41.5	5.55E+05	19,048	6.05	28.2	0.028	0.001	38.5	13.4	12.4	4.27E+05	1.00E+06
2005	2.65	1,257	5.62E+05	9,620	6.05	27.3	0.028	0.001	41.3	13.3	11.1	4.21E+05	9.94E+05
2006	2.35	1,050	5.63E+05	8,603	6.08	27.3	0.028	0.001	39.5	13.1	11.0	4.20E+05	9.93E+05
2007	0.007	4.50	5.48E+05	20,600	6.02	28.7	0.028	0.001	34.9	13.5	13.4	4.29E+05	9.98E+05
2008	3.07	1,550	5.65E+05	8,172	6.14	27.4	0.028	0.001	39.8	13.0	11.6	4.22E+05	9.97E+05
2009	1.55	738.9	5.76E+05	11,746	6.12	27.3	0.028	0.001	39.4	12.9	10.7	4.18E+05	1.01E+06
2010	1.05	491.5	5.89E+05	14,632	6.07	27.3	0.028	0.001	39.5	13.1	9.46	4.13E+05	1.02E+06
2011	3.63	1,704	6.08E+05	6,766	6.12	27.4	0.028	0.001	43.8	13.1	7.59	4.07E+05	1.02E+06
2012	0.808	385.8	5.94E+05	11,674	6.19	27.4	0.028	0.001	39.5	13.0	10.2	4.13E+05	1.02E+06
2013	0.318	170.6	5.86E+05	12,774	6.23	27.3	0.028	0.001	37.8	12.9	11.3	4.14E+05	1.01E+06
2014	0.585	295.7	5.83E+05	11,344	6.29	27.3	0.028	0.001	37.1	12.9	11.5	4.14E+05	1.01E+06
2015	0.009	7.30	5.70E+05	18,748	6.28	27.5	0.028	0.001	32.8	12.9	13.1	4.19E+05	1.01E+06
2016	0.009	8.08	5.66E+05	17,878	6.24	27.9	0.028	0.001	32.7	13.3	13.7	4.22E+05	1.01E+06
2017	0.215	123.5	5.65E+05	14,599	6.18	27.4	0.028	0.001	33.5	13.5	13.1	4.19E+05	9.99E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows												Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Wintergarden GCD	Bexar	Lower Layers			
	(acre-feet)														%
Predevelopment	0	0	4.66E+05	1,486	1.59	45.1	0.641	3.86	92.7	13.5	25.3	4.97E+05	9.64E+05	5.54E-07	5.75E-11
1980	0	0	4.31E+05	109.8	1.08	43.3	0.639	3.87	24.1	11.6	21.0	5.47E+05	9.78E+05	-4.83E-07	-4.94E-11
1981	1.96	946.0	4.33E+05	119.1	1.26	43.8	0.638	3.86	23.9	12.0	21.8	5.41E+05	9.76E+05	-3.02E-06	-3.09E-10
1982	0.146	84.6	4.31E+05	114.0	1.13	42.9	0.638	3.86	24.0	11.8	21.2	5.40E+05	9.71E+05	-3.13E-06	-3.22E-10
1983	0.290	160.6	4.31E+05	111.3	1.04	42.7	0.638	3.86	24.0	11.6	21.1	5.38E+05	9.70E+05	-3.50E-06	-3.61E-10
1984	0.168	104.8	4.31E+05	103.9	0.887	41.9	0.639	3.87	24.4	11.2	20.7	5.41E+05	9.72E+05	1.52E-06	1.56E-10
1985	1.89	986.7	4.34E+05	113.4	1.04	43.2	0.638	3.86	23.9	11.6	21.8	5.35E+05	9.71E+05	-2.88E-06	-2.96E-10
1986	1.06	513.7	4.35E+05	119.6	1.14	43.5	0.638	3.86	23.8	11.8	22.0	5.34E+05	9.69E+05	-1.60E-06	-1.65E-10
1987	1.35	684.7	4.36E+05	126.2	1.22	43.6	0.638	3.86	23.8	12.0	22.1	5.31E+05	9.68E+05	-2.25E-06	-2.32E-10
1988	0.006	3.28	4.31E+05	108.9	0.893	42.1	0.639	3.87	24.1	11.2	20.7	5.37E+05	9.68E+05	2.56E-06	2.65E-10
1989	0.005	2.70	4.29E+05	99.9	0.739	41.7	0.637	3.86	24.2	10.8	20.4	5.39E+05	9.68E+05	-1.17E-06	-1.21E-10
1990	0.603	333.1	4.31E+05	104.3	0.834	42.4	0.637	3.86	23.9	11.0	20.9	5.39E+05	9.70E+05	-2.12E-06	-2.18E-10
1991	1.60	770.8	4.32E+05	112.8	1.04	43.3	0.637	3.86	23.9	11.4	21.2	5.42E+05	9.75E+05	-2.04E-06	-2.09E-10
1992	2.65	1,264	4.35E+05	128.3	1.33	44.1	0.639	3.87	24.0	12.2	21.7	5.44E+05	9.80E+05	1.51E-06	1.54E-10
1993	0.039	15.3	4.30E+05	120.0	1.19	43.2	0.637	3.86	24.2	11.9	20.7	5.46E+05	9.77E+05	-3.37E-06	-3.46E-10
1994	0.576	242.7	4.30E+05	122.6	1.25	43.4	0.637	3.86	24.2	12.1	21.1	5.50E+05	9.81E+05	-3.93E-06	-4.00E-10
1995	0.002	0.989	4.28E+05	114.7	1.12	42.8	0.637	3.86	24.5	11.9	20.5	5.53E+05	9.81E+05	-3.19E-06	-3.25E-10
1996	1.09E-04	0.109	4.25E+05	99.5	0.874	41.8	0.639	3.87	25.3	11.3	19.5	5.59E+05	9.84E+05	2.48E-06	2.52E-10
1997	1.61	813.5	4.29E+05	108.0	1.03	43.0	0.637	3.86	24.5	11.7	20.7	5.53E+05	9.83E+05	-2.43E-06	-2.47E-10
1998	1.06	463.0	4.29E+05	114.4	1.18	43.5	0.637	3.86	24.6	12.0	20.9	5.56E+05	9.85E+05	-2.62E-06	-2.66E-10
1999	1.02E-04	0.051	4.24E+05	101.2	0.969	42.2	0.637	3.86	25.7	11.5	19.7	5.60E+05	9.84E+05	-1.78E-06	-1.81E-10
2000	0.158	91.8	4.24E+05	100.7	1.05	42.5	0.639	3.87	25.7	11.2	19.6	5.70E+05	9.95E+05	-8.82E-07	-8.86E-11
2001	0.017	6.60	4.23E+05	95.8	1.05	42.4	0.637	3.86	25.7	11.4	19.6	5.69E+05	9.92E+05	-2.91E-06	-2.94E-10
2002	2.75	1,294	4.26E+05	111.4	1.54	43.9	0.637	3.86	24.8	12.8	20.6	5.73E+05	1.00E+06	-2.26E-06	-2.25E-10
2003	0.466	176.5	4.24E+05	110.4	1.55	43.4	0.637	3.86	25.3	11.8	20.2	5.73E+05	9.97E+05	-2.92E-06	-2.93E-10
2004	2.36	1,046	4.29E+05	122.7	1.73	44.6	0.639	3.87	24.8	12.3	21.3	5.72E+05	1.00E+06	2.09E-06	2.09E-10
2005	0.003	1.22	4.22E+05	104.3	1.21	42.7	0.637	3.86	26.2	11.8	19.9	5.72E+05	9.94E+05	-2.88E-06	-2.90E-10
2006	0.017	13.9	4.21E+05	89.7	0.855	42.1	0.637	3.86	26.2	11.4	19.7	5.71E+05	9.93E+05	-1.59E-06	-1.60E-10
2007	3.93	1,927	4.31E+05	109.5	1.19	44.9	0.637	3.86	24.7	12.1	22.5	5.65E+05	9.98E+05	-2.41E-06	-2.42E-10
2008	0.001	0.694	4.23E+05	93.0	0.868	42.8	0.639	3.87	26.4	11.6	20.4	5.74E+05	9.97E+05	1.65E-06	1.66E-10
2009	0.015	7.34	4.19E+05	87.8	0.840	42.2	0.637	3.86	26.5	11.5	19.4	5.88E+05	1.01E+06	3.64E-06	3.62E-10
2010	0.334	170.7	4.15E+05	88.8	0.978	41.9	0.637	3.86	26.5	11.6	18.0	6.03E+05	1.02E+06	-2.49E-06	-2.45E-10
2011	4.66E-04	0.581	4.08E+05	75.0	0.748	40.1	0.637	3.86	28.5	11.0	16.1	6.16E+05	1.02E+06	-1.42E-06	-1.39E-10
2012	0.552	294.3	4.14E+05	71.7	0.710	41.8	0.639	3.87	27.7	10.9	18.8	6.05E+05	1.02E+06	2.19E-06	2.15E-10
2013	0.550	278.4	4.15E+05	70.6	0.719	42.5	0.637	3.86	27.3	10.8	20.0	5.97E+05	1.01E+06	-2.93E-06	-2.89E-10
2014	0.284	146.2	4.14E+05	67.9	0.653	42.4	0.637	3.86	27.7	10.7	20.2	5.94E+05	1.01E+06	-3.95E-07	-3.92E-11
2015	2.92	1,486	4.20E+05	78.6	0.954	44.0	0.637	3.86	26.1	11.2	22.0	5.86E+05	1.01E+06	-4.22E-06	-4.19E-10
2016	2.43	1,164	4.23E+05	87.8	1.13	44.6	0.639	3.87	25.9	11.7	22.6	5.81E+05	1.01E+06	2.30E-06	2.28E-10
2017	0.744	311.9	4.20E+05	89.5	1.10	43.8	0.637	3.86	26.1	11.8	21.9	5.78E+05	9.99E+05	-2.23E-06	-2.23E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - (Layer 2) - Inflows

Simulated Time Period	Inflows												Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)												
Predevelopment	0	0	55,545	809.3	2.73E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,696	73,699	1.37E+05
1980	0	0	82,850	763.8	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,658	59,437	1.50E+05
1981	5.84E-05	0.002	78,887	979.2	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,692	60,950	1.48E+05
1982	0.130	11.9	77,676	661.6	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,616	61,321	1.46E+05
1983	0.072	4.28	76,069	678.2	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,619	61,948	1.45E+05
1984	0.051	6.48	75,656	576.1	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,613	62,291	1.45E+05
1985	0.014	0.152	74,090	923.2	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,678	62,565	1.44E+05
1986	0.427	8.42	74,876	871.8	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,665	62,128	1.45E+05
1987	7.15E-04	0.006	73,133	882.2	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,667	63,006	1.44E+05
1988	0.671	32.3	74,631	408.1	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,570	62,454	1.44E+05
1989	1.49	32.9	76,929	542.2	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,584	61,032	1.45E+05
1990	0.330	3.45	76,875	806.2	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,648	61,010	1.45E+05
1991	0.219	3.31	77,038	962.0	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,686	60,959	1.46E+05
1992	7.66E-04	0.038	76,097	1,086	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,734	61,773	1.46E+05
1993	0.247	21.3	76,514	694.3	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,621	61,325	1.45E+05
1994	0.183	5.04	76,842	875.8	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,664	61,216	1.46E+05
1995	0.282	15.4	77,555	677.5	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,617	60,940	1.46E+05
1996	0.812	27.4	79,280	481.0	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,588	60,466	1.47E+05
1997	0.039	0.315	77,573	943.6	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,681	61,009	1.46E+05
1998	0.859	14.7	79,026	945.6	2.72E-04	1.37E-13	2.70E-04	6.18E-04	3.95E-04	1.77E-05	6,682	60,344	1.47E+05
1999	0.345	22.1	79,796	542.1	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,586	60,148	1.47E+05
2000	1.24	28.0	82,200	822.5	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,671	59,352	1.49E+05
2001	0.009	3.05	81,187	737.9	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,633	59,694	1.48E+05
2002	0.766	15.4	82,499	1,255	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,758	59,224	1.50E+05
2003	0.121	7.88	82,436	915.0	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,677	59,340	1.49E+05
2004	0.205	4.03	82,574	1,201	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.77E-05	6,764	59,664	1.50E+05
2005	0.358	42.4	83,154	606.8	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,606	59,161	1.50E+05
2006	0.025	16.5	82,095	542.6	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,590	59,661	1.49E+05
2007	2.21E-04	0.028	78,247	1,299	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,769	61,494	1.48E+05
2008	1.33	58.0	81,331	515.4	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.77E-05	6,602	60,285	1.49E+05
2009	1.69	38.3	83,715	740.8	2.72E-04	1.37E-13	2.70E-04	6.17E-04	3.95E-04	1.77E-05	6,637	58,991	1.50E+05
2010	4.28	75.3	90,988	922.9	2.72E-04	1.37E-13	2.69E-04	6.17E-04	3.95E-04	1.77E-05	6,685	56,353	1.55E+05
2011	2.64	55.4	95,346	426.8	2.72E-04	1.37E-13	2.69E-04	6.17E-04	3.95E-04	1.77E-05	6,572	55,132	1.58E+05
2012	0.501	11.2	89,121	736.3	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,662	57,671	1.54E+05
2013	0.738	4.72	86,952	805.7	2.72E-04	1.37E-13	2.69E-04	6.17E-04	3.95E-04	1.77E-05	6,661	58,093	1.53E+05
2014	1.19	6.27	85,795	715.5	2.72E-04	1.37E-13	2.69E-04	6.17E-04	3.95E-04	1.77E-05	6,640	58,391	1.52E+05
2015	1.42	5.22	83,126	1,182	2.72E-04	1.37E-13	2.69E-04	6.17E-04	3.95E-04	1.77E-05	6,749	59,334	1.50E+05
2016	0.695	2.46	82,062	1,128	2.73E-04	1.37E-13	2.70E-04	6.19E-04	3.96E-04	1.78E-05	6,754	59,938	1.50E+05
2017	1.25	15.8	82,444	920.8	2.72E-04	1.37E-13	2.69E-04	6.17E-04	3.95E-04	1.77E-05	6,687	59,309	1.49E+05

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows												Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)														%
Predevelopment	0	0	76,356	19.2	3.33E-04	4.52E-04	6.05E-04	1.78E-04	5.92E-04	6.30E-05	4,667	55,707	1.37E+05	9.02E-10	6.60E-13
1980	0	0	62,076	13.3	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.33E-05	4,628	82,992	1.50E+05	-4.22E-09	-2.82E-12
1981	2.13	50.1	63,674	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,623	79,138	1.48E+05	3.35E-09	2.27E-12
1982	0.693	13.1	63,885	9.78	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,618	77,760	1.46E+05	5.24E-09	3.58E-12
1983	0.848	15.5	64,516	8.14	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,619	76,160	1.45E+05	3.09E-09	2.12E-12
1984	0.378	6.46	64,811	1.82	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.32E-05	4,629	75,693	1.45E+05	1.01E-08	6.94E-12
1985	0.674	22.8	65,262	19.7	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,621	74,329	1.44E+05	3.73E-09	2.58E-12
1986	0.131	5.21	64,808	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,619	75,097	1.45E+05	1.86E-09	1.29E-12
1987	1.08	22.2	65,684	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,622	73,339	1.44E+05	2.42E-09	1.68E-12
1988	0.002	0.035	64,903	0	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.32E-05	4,626	74,566	1.44E+05	1.65E-08	1.14E-11
1989	0.003	0.201	63,541	0	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,611	76,969	1.45E+05	2.50E-09	1.72E-12
1990	0.082	9.13	63,650	10.4	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,615	77,057	1.45E+05	2.21E-09	1.52E-12
1991	0.074	11.3	63,687	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,617	77,313	1.46E+05	2.79E-09	1.92E-12
1992	0.692	31.1	64,568	20.1	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.32E-05	4,633	76,436	1.46E+05	1.08E-08	7.43E-12
1993	0.149	1.78	63,914	12.5	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.30E-05	4,615	76,633	1.45E+05	2.91E-09	2.00E-12
1994	0.101	2.88	63,902	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,617	77,061	1.46E+05	3.46E-09	2.38E-12
1995	0.009	0.038	63,518	9.43	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,613	77,664	1.46E+05	4.10E-09	2.81E-12
1996	6.36E-06	0.003	62,953	0	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.33E-05	4,622	79,268	1.47E+05	7.71E-09	5.25E-12
1997	0.761	24.6	63,718	18.2	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,617	77,828	1.46E+05	4.95E-10	3.38E-13
1998	0.020	9.21	63,065	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,615	79,304	1.47E+05	4.31E-09	2.93E-12
1999	0.324	2.59	62,658	2.14	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.31E-05	4,610	79,821	1.47E+05	3.32E-09	2.26E-12
2000	0.127	3.16	62,026	9.75	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.34E-05	4,623	82,413	1.49E+05	1.10E-08	7.36E-12
2001	0.599	10.2	62,305	6.72	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.32E-05	4,611	81,322	1.48E+05	2.82E-09	1.90E-12
2002	0.108	34.7	62,123	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.32E-05	4,617	82,957	1.50E+05	3.38E-09	2.25E-12
2003	0.210	4.26	62,059	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.32E-05	4,613	82,679	1.49E+05	2.30E-09	1.54E-12
2004	0.442	32.1	62,519	20.1	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.34E-05	4,629	83,008	1.50E+05	1.14E-08	7.61E-12
2005	0.004	0.206	61,708	4.77	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.33E-05	4,608	83,249	1.50E+05	1.89E-09	1.26E-12
2006	0.692	12.3	62,163	0	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.33E-05	4,608	82,121	1.49E+05	8.41E-09	5.65E-12
2007	2.34	73.1	64,377	20.1	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.32E-05	4,623	78,714	1.48E+05	4.13E-09	2.80E-12
2008	0.005	0.023	62,790	0	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.35E-05	4,620	81,383	1.49E+05	1.23E-08	8.25E-12
2009	0.088	4.53	61,611	4.90	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.32E-05	4,608	83,896	1.50E+05	2.18E-09	1.45E-12
2010	0.016	4.54	59,098	17.5	3.33E-04	4.52E-04	6.06E-04	1.78E-04	5.92E-04	6.32E-05	4,604	91,305	1.55E+05	2.33E-09	1.50E-12
2011	1.51E-05	0.002	57,631	0	3.33E-04	4.52E-04	6.07E-04	1.78E-04	5.92E-04	6.32E-05	4,597	95,307	1.58E+05	1.54E-09	9.79E-13
2012	3.08	66.6	60,265	0	3.34E-04	4.53E-04	6.08E-04	1.79E-04	5.93E-04	6.36E-05	4,618	89,249	1.54E+05	1.28E-08	8.32E-12
2013	0.796	20.7	60,721	0	3.33E-04	4.52E-04	6.07E-04	1.78E-04	5.92E-04	6.35E-05	4,606	87,167	1.53E+05	1.48E-09	9.73E-13
2014	0.427	11.1	60,973	0	3.33E-04	4.52E-04	6.07E-04	1.78E-04	5.92E-04	6.34E-05	4,605	85,959	1.52E+05	2.27E-09	1.50E-12
2015	0.951	38.7	62,161	20.1	3.33E-04	4.52E-04	6.07E-04	1.78E-04	5.92E-04	6.33E-05	4,613	83,565	1.50E+05	2.44E-09	1.63E-12
2016	0.492	25.2	62,740	20.1	3.34E-04	4.54E-04	6.08E-04	1.79E-04	5.93E-04	6.35E-05	4,626	82,473	1.50E+05	1.24E-08	8.27E-12
2017	0.024	1.86	62,008	16.0	3.33E-04	4.52E-04	6.07E-04	1.78E-04	5.92E-04	6.34E-05	4,608	82,744	1.49E+05	1.57E-09	1.05E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows												Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)												
Predevelopment	0	0	608.7	7,612	72.2	8.54	41.9	147.0	173.9	413.1	58,388	63,004	1.30E+05
1980	0	0	612.3	7,185	72.3	8.72	42.0	147.9	174.5	396.2	85,920	48,498	1.43E+05
1981	0.002	0	610.6	9,210	72.1	8.87	41.8	147.4	174.0	411.5	82,178	50,056	1.43E+05
1982	23.1	640.9	610.6	6,223	72.1	8.80	41.8	147.4	174.0	396.9	80,552	50,469	1.39E+05
1983	4.89	363.3	610.6	6,379	72.1	8.75	41.8	147.4	174.0	393.2	78,946	51,124	1.38E+05
1984	11.0	717.8	612.2	5,419	72.3	8.67	42.0	147.8	174.5	383.8	78,396	51,458	1.37E+05
1985	0.159	2.91	610.5	8,684	72.1	8.79	41.8	147.4	174.0	400.4	77,262	51,720	1.39E+05
1986	4.65	6.62	610.5	8,200	72.1	8.87	41.8	147.4	174.0	405.7	77,995	51,221	1.39E+05
1987	0.002	0	610.4	8,298	72.1	8.94	41.8	147.4	174.0	411.4	76,222	52,148	1.38E+05
1988	42.1	1,930	612.1	3,838	72.3	8.69	42.0	147.8	174.5	383.6	77,149	51,566	1.36E+05
1989	21.3	886.1	610.5	5,100	72.1	8.56	41.8	147.4	174.0	375.7	79,662	50,151	1.37E+05
1990	2.02	64.7	610.5	7,584	72.1	8.67	41.8	147.4	174.0	384.3	79,926	50,117	1.39E+05
1991	2.55	24.9	610.5	9,049	72.1	8.82	41.8	147.4	174.0	401.0	80,283	50,043	1.41E+05
1992	0.071	2.92	612.1	10,211	72.3	9.04	42.0	147.8	174.5	417.1	79,478	50,799	1.42E+05
1993	35.3	837.1	610.4	6,531	72.1	8.96	41.8	147.4	174.0	404.9	79,423	50,444	1.39E+05
1994	2.38	40.1	610.4	8,238	72.1	9.01	41.8	147.4	174.0	412.2	79,990	50,329	1.40E+05
1995	20.3	819.2	610.4	6,373	72.1	8.91	41.8	147.5	174.0	398.9	80,465	50,084	1.39E+05
1996	27.5	1,710	612.1	4,525	72.3	8.73	42.0	147.9	174.5	382.0	81,954	49,609	1.39E+05
1997	0.349	25.7	610.4	8,875	72.1	8.85	41.8	147.5	174.0	399.8	80,818	50,164	1.41E+05
1998	8.38	71.0	610.4	8,895	72.1	8.97	41.8	147.5	174.0	410.3	82,300	49,456	1.42E+05
1999	33.8	1,542	610.4	5,099	72.1	8.81	41.8	147.4	174.0	387.4	82,543	49,320	1.40E+05
2000	14.2	382.4	612.1	7,737	72.3	8.71	42.0	147.8	174.5	336.5	85,408	48,434	1.43E+05
2001	5.46	407.3	610.4	6,941	72.1	8.66	41.8	147.4	174.0	303.3	84,261	48,839	1.42E+05
2002	9.34	185.8	610.4	11,800	72.1	8.98	41.8	147.4	174.0	288.2	86,384	48,224	1.48E+05
2003	22.7	345.5	610.4	8,606	72.1	9.10	41.8	147.4	174.0	282.0	85,809	48,434	1.45E+05
2004	3.54	105.0	612.1	11,301	72.3	9.90	42.0	147.8	174.5	285.3	86,352	48,915	1.48E+05
2005	63.2	1,906	610.4	5,707	72.1	9.94	41.8	147.4	174.0	276.3	86,184	48,595	1.44E+05
2006	19.0	1,516	610.4	5,104	72.1	9.74	41.8	147.4	174.0	269.1	84,997	49,153	1.42E+05
2007	0.030	4.03	610.3	12,222	72.1	9.75	41.8	147.4	174.0	278.7	82,061	50,861	1.46E+05
2008	67.8	2,054	612.0	4,848	72.3	9.80	42.0	147.8	174.5	275.0	84,189	49,778	1.42E+05
2009	19.4	589.7	610.4	6,968	72.1	9.14	41.8	147.4	174.0	269.7	86,896	48,207	1.44E+05
2010	38.6	645.2	610.5	8,681	72.1	8.96	41.8	147.4	174.0	271.3	94,541	45,449	1.51E+05
2011	55.5	2,613	610.6	4,014	72.1	8.68	41.8	147.5	174.0	266.0	98,279	44,330	1.51E+05
2012	6.25	388.2	612.4	6,926	72.3	9.37	41.9	147.9	174.5	266.9	92,365	47,251	1.48E+05
2013	1.99	139.2	610.9	7,578	72.1	9.63	41.8	147.5	174.0	266.4	90,268	47,729	1.47E+05
2014	6.05	306.6	611.1	6,730	72.1	9.67	41.8	147.5	174.1	265.4	88,946	48,032	1.45E+05
2015	1.78	4.82	611.5	11,123	72.1	9.91	41.8	147.5	174.1	272.6	86,832	48,944	1.48E+05
2016	0.765	1.75	613.3	10,606	72.3	10.1	41.9	147.9	174.5	281.7	85,663	49,492	1.47E+05
2017	19.5	184.5	611.8	8,661	72.1	9.75	41.8	147.5	174.1	283.3	85,786	48,872	1.45E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows													Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	0	2,746	1,444	39.0	465.5	149.5	54.0	208.4	445.1	77,196	47,722	1.30E+05	6.60E-07	5.06E-10
1980	0	0	933.0	2,745	1,044	39.0	467.1	149.8	53.3	209.0	435.1	62,257	74,723	1.43E+05	-7.42E-09	-5.19E-12
1981	42.3	1,179	857.7	2,738	1,287	38.9	466.9	149.4	53.2	208.4	435.8	63,968	71,486	1.43E+05	-9.14E-08	-6.40E-11
1982	7.83	155.9	766.7	2,738	1,027	38.9	465.7	149.4	53.2	208.4	435.1	64,199	69,115	1.39E+05	1.11E-09	7.94E-13
1983	9.59	244.2	682.9	2,738	952.0	38.9	465.6	149.4	53.2	208.4	434.2	64,814	67,474	1.38E+05	-7.40E-08	-5.35E-11
1984	4.72	215.5	608.4	2,746	795.6	39.1	466.4	149.8	53.3	209.0	433.7	65,085	66,636	1.37E+05	1.72E-07	1.25E-10
1985	29.5	1,408	606.3	2,738	1,115	38.9	466.5	149.4	53.2	208.4	432.3	65,534	66,344	1.39E+05	1.95E-09	1.40E-12
1986	7.12	684.2	609.5	2,738	1,187	38.9	466.5	149.4	53.2	208.4	433.3	65,113	67,198	1.39E+05	-2.25E-08	-1.62E-11
1987	16.6	774.9	621.0	2,739	1,244	38.9	466.7	149.4	53.2	208.4	434.5	66,060	65,328	1.38E+05	2.51E-06	1.81E-09
1988	0.461	100.6	654.0	2,746	709.8	39.1	465.9	149.8	53.3	209.0	433.4	65,189	65,216	1.36E+05	6.47E-08	4.76E-11
1989	1.05	20.8	738.5	2,739	669.7	38.9	464.7	149.4	53.1	208.4	430.0	63,691	68,047	1.37E+05	9.78E-09	7.12E-12
1990	13.7	732.1	770.4	2,738	911.9	38.9	465.7	149.4	53.1	208.4	430.0	63,806	68,814	1.39E+05	5.25E-08	3.77E-11
1991	22.6	1,167	758.7	2,738	1,178	38.9	466.7	149.4	53.1	208.4	430.5	63,914	69,731	1.41E+05	2.60E-08	1.85E-11
1992	34.7	1,450	758.9	2,746	1,428	39.1	468.8	149.8	53.3	209.0	437.4	64,938	69,252	1.42E+05	4.40E-07	3.10E-10
1993	0.615	27.2	785.4	2,739	1,114	38.9	466.0	149.4	53.1	208.4	433.8	64,261	68,454	1.39E+05	-5.41E-09	-3.90E-12
1994	10.3	293.2	821.1	2,739	1,219	38.9	466.6	149.4	53.1	208.4	436.2	64,216	69,415	1.40E+05	4.33E-08	3.09E-11
1995	0.073	5.96	859.7	2,739	1,022	38.9	465.8	149.4	53.1	208.4	436.2	63,808	69,429	1.39E+05	2.70E-07	1.94E-10
1996	0.007	0.482	886.8	2,746	712.9	39.1	466.0	149.8	53.2	209.0	435.8	63,150	70,417	1.39E+05	-2.51E-06	-1.80E-09
1997	29.5	1,223	909.6	2,739	1,096	39.0	466.4	149.4	53.1	208.4	434.8	63,927	70,064	1.41E+05	5.08E-07	3.59E-10
1998	13.9	690.3	937.2	2,739	1,247	39.0	466.8	149.4	53.0	208.4	436.9	63,324	71,890	1.42E+05	8.73E-09	6.14E-12
1999	2.13	0.223	968.6	2,739	850.6	38.9	465.2	149.4	53.2	208.4	435.7	62,883	71,186	1.40E+05	1.28E-09	9.15E-13
2000	9.11	300.2	881.7	2,746	999.2	39.1	467.0	149.8	53.3	209.0	450.7	62,111	74,953	1.43E+05	8.27E-06	5.77E-09
2001	4.67	13.6	923.7	2,739	951.8	38.9	465.5	149.4	53.2	208.4	454.9	62,394	73,415	1.42E+05	-1.57E-09	-1.11E-12
2002	53.4	1,929	1,037	2,739	1,448	38.9	467.9	149.4	53.2	208.4	589.5	62,201	77,031	1.48E+05	8.35E-09	5.65E-12
2003	3.16	147.3	1,088	2,739	1,314	38.9	467.0	149.4	53.2	208.4	528.6	62,219	75,598	1.45E+05	8.24E-08	5.70E-11
2004	40.9	1,126	2,454	2,746	1,573	39.1	470.7	149.8	53.4	209.0	536.2	62,729	75,893	1.48E+05	3.43E-09	2.32E-12
2005	0.398	18.4	2,673	2,739	1,001	38.9	467.3	149.4	53.2	208.4	550.2	61,872	74,018	1.44E+05	4.60E-09	3.20E-12
2006	5.81	13.0	2,529	2,739	760.1	38.9	466.6	149.4	53.3	208.4	551.8	62,234	72,365	1.42E+05	-8.50E-09	-5.98E-12
2007	80.3	2,759	1,924	2,739	1,453	39.0	469.0	149.4	53.3	208.4	530.5	64,541	71,534	1.46E+05	1.07E-08	7.33E-12
2008	0.073	6.89	2,738	2,747	854.5	39.1	468.1	149.8	53.4	209.0	511.0	62,918	71,576	1.42E+05	2.33E-10	1.64E-13
2009	5.01	71.8	1,276	2,739	910.2	39.0	466.0	149.4	53.2	208.4	521.9	61,594	75,971	1.44E+05	1.44E-05	1.00E-08
2010	11.7	527.1	1,129	2,739	1,097	38.9	466.5	149.4	53.2	208.4	525.9	58,981	84,755	1.51E+05	-5.83E-07	-3.87E-10
2011	0.002	0.057	1,230	2,738	630.9	38.9	464.5	149.4	53.1	208.4	566.0	57,453	87,081	1.51E+05	3.62E-08	2.41E-11
2012	35.5	400.0	3,154	2,745	750.1	39.0	468.0	149.8	53.0	209.0	574.5	60,090	79,594	1.48E+05	1.72E-07	1.16E-10
2013	14.8	491.6	3,226	2,737	846.5	38.9	467.5	149.4	52.8	208.4	566.8	60,568	77,672	1.47E+05	-4.40E-08	-2.99E-11
2014	7.20	159.7	3,124	2,736	796.3	38.9	467.3	149.4	52.8	208.4	565.7	60,849	76,188	1.45E+05	-8.20E-07	-5.64E-10
2015	51.8	2,285	3,014	2,735	1,238	38.9	469.2	149.4	52.9	208.4	536.8	62,130	75,326	1.48E+05	-1.93E-07	-1.30E-10
2016	29.8	1,387	3,029	2,742	1,392	39.0	470.7	149.8	53.0	209.0	530.7	62,867	74,208	1.47E+05	3.11E-06	2.12E-09
2017	2.77	281.5	3,060	2,733	1,276	38.9	467.8	149.4	52.9	208.4	531.5	62,137	73,923	1.45E+05	-7.39E-09	-5.10E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows											Total Inflows
	Specific Storage	Specific Yield	Recharge	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)											
Predevelopment	0	0	2,250	0.764	0.205	0.705	4.45	0.381	2.99	47,826	63,119	1.13E+05
1980	0	0	2,124	0.766	0.205	0.710	4.75	0.382	2.95	75,069	48,474	1.26E+05
1981	0	0	2,723	0.764	0.206	0.707	4.73	0.381	3.03	71,793	50,041	1.25E+05
1982	2.18	118.5	1,840	0.764	0.204	0.707	4.72	0.381	2.93	69,407	50,449	1.22E+05
1983	0.451	38.8	1,886	0.764	0.204	0.707	4.71	0.381	2.91	67,756	51,104	1.21E+05
1984	1.04	87.9	1,602	0.766	0.204	0.709	4.71	0.382	2.85	66,913	51,432	1.20E+05
1985	0.101	2.00	2,567	0.764	0.206	0.708	4.69	0.381	2.96	66,618	51,691	1.21E+05
1986	1.41	8.43	2,424	0.764	0.206	0.708	4.69	0.381	2.98	67,471	51,194	1.21E+05
1987	8.12E-05	0	2,453	0.764	0.206	0.707	4.69	0.381	3.01	65,582	52,122	1.20E+05
1988	5.67	357.1	1,135	0.766	0.191	0.709	4.70	0.382	2.83	65,484	51,532	1.19E+05
1989	6.04	156.8	1,508	0.764	0.203	0.708	4.69	0.381	2.79	68,350	50,113	1.20E+05
1990	0.794	14.0	2,242	0.764	0.205	0.708	4.70	0.381	2.87	69,118	50,086	1.21E+05
1991	1.61	14.9	2,675	0.764	0.206	0.708	4.71	0.381	2.97	70,022	50,021	1.23E+05
1992	0.221	4.12	3,018	0.766	0.207	0.710	4.72	0.382	3.06	69,518	50,780	1.23E+05
1993	5.32	237.2	1,931	0.764	0.204	0.708	4.71	0.381	2.96	68,724	50,423	1.21E+05
1994	1.38	23.9	2,435	0.764	0.206	0.708	4.71	0.381	3.01	69,692	50,307	1.22E+05
1995	3.76	174.4	1,884	0.764	0.204	0.708	4.72	0.381	2.93	69,717	50,057	1.22E+05
1996	5.23	278.7	1,338	0.766	0.203	0.710	4.74	0.382	2.83	70,731	49,569	1.22E+05
1997	0.082	0.864	2,624	0.764	0.206	0.708	4.73	0.381	2.96	70,370	50,135	1.23E+05
1998	3.45	31.4	2,629	0.764	0.206	0.708	4.74	0.381	3.02	72,194	49,429	1.24E+05
1999	5.12	303.6	1,507	0.764	0.204	0.708	4.72	0.381	2.87	71,503	49,280	1.23E+05
2000	5.70	112.2	2,287	0.766	0.206	0.710	4.73	0.382	2.45	75,314	48,393	1.26E+05
2001	1.04	65.6	2,052	0.764	0.205	0.708	4.72	0.381	2.21	73,765	48,800	1.25E+05
2002	3.52	33.6	3,488	0.764	0.208	0.708	4.73	0.381	1.76	77,392	48,197	1.29E+05
2003	3.48	117.2	2,544	0.764	0.206	0.708	4.74	0.381	1.79	75,948	48,403	1.27E+05
2004	0.872	4.25	3,341	0.766	0.208	0.710	4.77	0.382	1.82	76,226	48,889	1.28E+05
2005	7.58	368.5	1,687	0.764	0.204	0.708	4.77	0.381	1.78	74,361	48,553	1.25E+05
2006	1.68	182.2	1,509	0.764	0.204	0.708	4.77	0.381	1.75	72,709	49,108	1.24E+05
2007	0	0	3,613	0.764	0.208	0.707	4.75	0.381	1.81	71,833	50,837	1.26E+05
2008	10.2	468.7	1,433	0.766	0.204	0.709	4.77	0.382	1.83	71,889	49,737	1.24E+05
2009	7.85	184.3	2,060	0.764	0.205	0.708	4.75	0.381	1.79	76,342	48,163	1.27E+05
2010	15.6	296.2	2,566	0.764	0.206	0.709	4.77	0.381	1.79	85,241	45,409	1.34E+05
2011	13.9	574.9	1,187	0.764	0.194	0.709	4.80	0.381	1.73	87,634	44,270	1.34E+05
2012	0.726	24.0	2,047	0.766	0.206	0.710	4.82	0.383	1.73	80,028	47,197	1.29E+05
2013	0.445	7.87	2,240	0.764	0.206	0.708	4.81	0.382	1.73	78,069	47,676	1.28E+05
2014	0.794	23.6	1,990	0.764	0.206	0.708	4.80	0.382	1.73	76,560	47,977	1.27E+05
2015	0.559	4.83E-04	3,288	0.764	0.209	0.707	4.79	0.382	1.78	75,659	48,907	1.28E+05
2016	0.199	0.368	3,135	0.766	0.209	0.709	4.79	0.383	1.83	74,507	49,461	1.27E+05
2017	2.54	66.7	2,560	0.764	0.207	0.707	4.77	0.382	1.85	74,217	48,833	1.26E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows											Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0	268.7	0.569	0.410	2.78	1.85	0.377	4.21	63,294	49,631	1.13E+05	1.17E-07	1.04E-10
1980	0	0	185.1	0.569	0.412	2.78	1.47	0.378	4.10	48,616	76,866	1.26E+05	-3.48E-09	-2.77E-12
1981	9.75	292.9	302.1	0.567	0.414	2.77	1.48	0.377	4.11	50,192	73,760	1.25E+05	-1.49E-08	-1.20E-11
1982	3.61	54.7	147.1	0.567	0.410	2.77	1.48	0.377	4.09	50,604	71,006	1.22E+05	3.20E-10	2.63E-13
1983	4.45	107.0	137.4	0.567	0.410	2.77	1.48	0.377	4.09	51,264	69,272	1.21E+05	-1.10E-08	-9.13E-12
1984	2.51	66.7	88.9	0.569	0.410	2.78	1.49	0.378	4.09	51,599	68,279	1.20E+05	2.68E-08	2.23E-11
1985	6.13	307.9	247.2	0.567	0.414	2.77	1.50	0.377	4.08	51,861	68,456	1.21E+05	7.71E-10	6.38E-13
1986	1.01	82.1	252.9	0.567	0.413	2.77	1.50	0.377	4.09	51,359	69,404	1.21E+05	-1.34E-09	-1.11E-12
1987	5.03	149.8	262.1	0.567	0.413	2.77	1.50	0.377	4.09	52,295	67,445	1.20E+05	3.78E-07	3.15E-10
1988	0.123	4.28	39.5	0.569	0.408	2.78	1.50	0.378	4.09	51,688	66,781	1.19E+05	1.02E-08	8.58E-12
1989	0.068	3.86	64.9	0.567	0.408	2.77	1.49	0.377	4.07	50,263	69,801	1.20E+05	5.08E-09	4.23E-12
1990	1.74	137.5	167.6	0.567	0.412	2.77	1.49	0.377	4.07	50,239	70,915	1.21E+05	4.86E-09	4.00E-12
1991	2.30	172.2	277.7	0.567	0.414	2.77	1.48	0.377	4.07	50,176	72,106	1.23E+05	6.36E-09	5.18E-12
1992	5.02	243.3	366.9	0.569	0.417	2.78	1.48	0.378	4.11	50,946	71,760	1.23E+05	6.88E-08	5.58E-11
1993	0.082	0.572	165.6	0.567	0.411	2.77	1.47	0.377	4.07	50,576	70,578	1.21E+05	-1.41E-09	-1.16E-12
1994	0.788	42.1	238.5	0.567	0.413	2.77	1.47	0.377	4.10	50,461	71,718	1.22E+05	-2.76E-10	-2.26E-13
1995	0.002	0	136.5	0.567	0.410	2.77	1.47	0.377	4.09	50,206	71,494	1.22E+05	3.88E-08	3.18E-11
1996	0	0	43.3	0.569	0.408	2.78	1.47	0.378	4.09	49,716	72,162	1.22E+05	-3.83E-07	-3.14E-10
1997	4.97	267.6	230.5	0.567	0.413	2.77	1.46	0.377	4.09	50,287	72,340	1.23E+05	7.87E-08	6.39E-11
1998	1.08	80.4	279.8	0.567	0.414	2.77	1.45	0.377	4.10	49,576	74,350	1.24E+05	2.65E-09	2.13E-12
1999	0.617	1.63E-04	76.2	0.567	0.408	2.77	1.47	0.377	4.08	49,426	73,097	1.23E+05	4.37E-11	3.56E-14
2000	0.744	57.4	178.4	0.569	0.412	2.78	1.48	0.378	4.08	48,535	77,340	1.26E+05	1.14E-07	9.01E-11
2001	1.15	5.34	151.9	0.567	0.410	2.77	1.48	0.377	4.07	48,941	75,583	1.25E+05	2.47E-10	1.98E-13
2002	4.98	321.7	417.7	0.567	0.418	2.77	1.47	0.377	4.62	48,335	80,033	1.29E+05	6.07E-09	4.70E-12
2003	0.389	8.95	283.8	0.567	0.414	2.77	1.46	0.377	4.46	48,540	78,181	1.27E+05	8.41E-09	6.62E-12
2004	4.79	212.2	415.7	0.569	0.420	2.78	1.45	0.378	4.59	49,028	78,798	1.28E+05	1.35E-09	1.05E-12
2005	0.012	0.008	110.4	0.567	0.411	2.77	1.44	0.377	4.73	48,693	76,172	1.25E+05	6.26E-10	5.01E-13
2006	1.71	8.34	57.4	0.567	0.410	2.77	1.44	0.377	4.84	49,248	74,192	1.24E+05	-1.46E-09	-1.18E-12
2007	13.5	606.5	413.6	0.567	0.420	2.77	1.46	0.377	4.75	50,992	74,255	1.26E+05	1.89E-09	1.50E-12
2008	0	0	72.9	0.569	0.412	2.78	1.45	0.378	4.68	49,880	73,584	1.24E+05	-1.46E-11	-1.18E-14
2009	0.362	22.7	125.1	0.567	0.411	2.77	1.45	0.377	4.73	48,302	78,305	1.27E+05	2.67E-07	2.11E-10
2010	0.802	70.8	222.6	0.567	0.414	2.77	1.43	0.377	4.76	45,539	87,693	1.34E+05	-8.66E-08	-6.48E-11
2011	0	0	29.1	0.567	0.407	2.77	1.40	0.377	5.04	44,404	89,244	1.34E+05	7.83E-09	5.86E-12
2012	12.1	284.0	102.2	0.569	0.413	2.78	1.39	0.378	5.21	47,329	81,568	1.29E+05	2.38E-08	1.84E-11
2013	4.86	174.6	155.0	0.567	0.414	2.77	1.39	0.377	5.23	47,813	79,844	1.28E+05	-8.80E-09	-6.88E-12
2014	3.40	79.2	126.2	0.567	0.414	2.77	1.39	0.377	5.28	48,117	78,223	1.27E+05	-1.10E-07	-8.69E-11
2015	10.0	485.2	365.9	0.566	0.420	2.77	1.40	0.377	5.12	49,055	77,936	1.28E+05	-2.90E-08	-2.27E-11
2016	6.30	260.3	384.4	0.568	0.421	2.78	1.42	0.378	5.06	49,616	76,835	1.27E+05	5.14E-07	4.04E-10
2017	1.13	52.0	278.0	0.566	0.416	2.77	1.42	0.377	5.04	48,986	76,360	1.26E+05	-2.97E-09	-2.36E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows												Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)												
Predevelopment	0	0	773.3	18,584	191.7	34,239	2,768	1,614	1,099	47,277	4.32E+05	37,886	5.77E+05
1980	0	0	919.7	17,540	174.5	34,298	2,840	1,803	1,234	46,936	4.99E+05	4,996	6.10E+05
1981	0	0	913.7	22,485	175.8	34,197	2,826	1,783	1,226	46,939	4.92E+05	6,512	6.09E+05
1982	86.1	1,138	914.3	15,193	178.6	34,190	2,824	1,805	1,222	46,814	4.88E+05	6,711	5.99E+05
1983	23.9	341.4	913.3	15,573	180.0	34,181	2,823	1,818	1,216	46,756	4.84E+05	7,564	5.96E+05
1984	127.3	2,096	914.4	13,229	180.8	34,272	2,830	1,830	1,214	46,795	4.85E+05	7,293	5.96E+05
1985	8.64	2.31	909.3	21,200	178.8	34,183	2,824	1,811	1,214	46,782	4.81E+05	7,504	5.98E+05
1986	146.2	105.9	907.3	20,019	177.7	34,193	2,825	1,822	1,216	46,861	4.81E+05	6,640	5.96E+05
1987	0.009	0	904.0	20,259	178.4	34,189	2,821	1,821	1,210	46,929	4.77E+05	7,886	5.94E+05
1988	481.6	5,802	907.4	9,371	180.0	34,266	2,830	1,834	1,199	46,813	4.80E+05	7,030	5.91E+05
1989	823.6	5,842	906.6	12,450	178.4	34,168	2,826	1,834	1,198	46,651	4.85E+05	5,644	5.97E+05
1990	118.8	575.5	908.0	18,514	177.9	34,156	2,828	1,839	1,196	46,785	4.86E+05	5,617	5.98E+05
1991	536.0	5,703	907.4	22,091	176.0	34,173	2,830	1,848	1,206	46,938	4.91E+05	5,320	6.12E+05
1992	210.5	3,092	907.7	24,928	176.0	34,275	2,836	1,848	1,211	47,196	4.93E+05	6,026	6.15E+05
1993	688.6	9,036	903.9	15,944	174.1	34,197	2,829	1,848	1,213	46,925	4.94E+05	5,884	6.13E+05
1994	461.2	6,206	902.3	20,111	172.4	34,204	2,830	1,849	1,221	46,943	4.98E+05	5,804	6.19E+05
1995	586.9	7,860	902.3	15,559	171.5	34,202	2,831	1,850	1,223	46,843	5.01E+05	5,763	6.18E+05
1996	679.2	8,741	905.9	11,046	171.4	34,290	2,840	1,857	1,225	46,803	5.05E+05	5,567	6.19E+05
1997	12.4	54.8	901.2	21,668	169.9	34,198	2,831	1,859	1,228	46,853	5.00E+05	6,291	6.16E+05
1998	617.9	4,495	901.7	21,715	168.2	34,202	2,835	1,873	1,234	46,985	5.05E+05	5,314	6.26E+05
1999	695.8	10,111	902.2	12,449	168.8	34,204	2,831	1,815	1,231	46,830	5.08E+05	5,352	6.24E+05
2000	1,142	11,822	906.1	18,888	168.9	34,298	2,840	1,805	1,238	46,872	5.20E+05	4,552	6.44E+05
2001	304.9	5,513	902.9	16,945	169.0	34,205	2,829	1,793	1,233	46,650	5.18E+05	5,200	6.34E+05
2002	641.1	5,236	902.7	28,809	167.8	34,215	2,831	1,795	1,243	46,498	5.26E+05	4,564	6.53E+05
2003	337.5	4,917	903.0	21,011	168.1	34,217	2,831	1,799	1,241	46,715	5.24E+05	5,045	6.44E+05
2004	115.5	256.0	904.3	27,589	168.8	34,302	2,839	1,813	1,244	46,983	5.25E+05	5,671	6.47E+05
2005	456.2	6,556	902.8	13,934	169.4	34,198	2,831	1,811	1,231	46,598	5.22E+05	5,988	6.37E+05
2006	91.1	2,317	901.9	12,460	170.4	34,185	2,829	1,807	1,224	46,472	5.19E+05	6,966	6.29E+05
2007	0	0	895.1	29,837	169.9	34,206	2,824	1,793	1,235	46,895	5.16E+05	7,867	6.42E+05
2008	1,085	12,822	898.7	11,836	171.3	34,289	2,834	1,805	1,226	46,857	5.22E+05	6,662	6.42E+05
2009	1,729	19,802	898.7	17,012	168.8	34,209	2,830	1,798	1,232	46,678	5.37E+05	4,868	6.69E+05
2010	2,598	22,551	907.4	21,193	165.2	34,213	2,841	1,821	1,245	46,775	5.58E+05	3,599	6.96E+05
2011	2,235	25,919	917.5	9,800	163.3	34,203	2,848	1,844	1,247	46,425	5.69E+05	3,686	6.99E+05
2012	96.7	1,446	926.4	16,909	171.0	34,147	2,845	1,843	1,202	46,601	5.55E+05	6,765	6.68E+05
2013	48.7	560.9	935.9	18,501	180.7	33,867	2,832	1,833	1,126	46,551	5.48E+05	6,758	6.61E+05
2014	62.2	682.7	954.2	16,431	195.3	33,665	2,828	1,827	1,038	46,504	5.43E+05	7,216	6.54E+05
2015	44.8	0.393	977.6	27,154	213.7	33,428	2,821	1,818	927.7	46,817	5.36E+05	8,066	6.59E+05
2016	14.4	0.024	991.5	25,894	223.4	33,492	2,826	1,816	885.5	47,043	5.31E+05	7,879	6.53E+05
2017	94.3	364.1	1,002	21,145	232.1	33,339	2,817	1,811	831.2	46,832	5.28E+05	7,073	6.44E+05

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows													Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	0	338.0	2,047	513.2	1.63E+05	6,085	643.4	600.8	29,383	3.56E+05	18,003	5.77E+05	4.94E-04	8.56E-08
1980	0	0	5,122	260.7	140.0	468.3	1.64E+05	6,189	294.4	471.7	28,106	3.15E+05	89,740	6.10E+05	3.03E-07	4.98E-11
1981	1,128	8,038	4,283	261.6	187.5	468.6	1.64E+05	6,166	307.8	475.9	28,090	3.17E+05	78,992	6.09E+05	-1.77E-04	-2.91E-08
1982	541.5	3,261	3,448	261.0	139.5	467.7	1.64E+05	6,161	319.2	470.7	28,039	3.17E+05	75,719	5.99E+05	7.74E-07	1.29E-10
1983	716.2	5,368	2,606	261.3	128.8	468.2	1.64E+05	6,159	331.5	469.7	28,036	3.18E+05	69,961	5.96E+05	-1.01E-04	-1.69E-08
1984	384.3	2,542	1,767	262.7	99.9	470.3	1.64E+05	6,175	343.1	470.8	28,044	3.18E+05	72,947	5.96E+05	7.79E-05	1.31E-08
1985	851.3	9,012	1,319	263.4	156.9	470.4	1.64E+05	6,162	352.9	478.3	28,057	3.20E+05	67,415	5.98E+05	2.87E-06	4.81E-10
1986	179.0	3,333	1,716	264.6	172.1	471.5	1.63E+05	6,164	353.1	482.8	28,103	3.19E+05	72,212	5.96E+05	-2.65E-05	-4.45E-09
1987	692.3	5,521	1,387	266.2	190.7	473.1	1.64E+05	6,161	359.7	485.8	28,158	3.21E+05	65,592	5.94E+05	0.003	4.51E-07
1988	13.8	29.9	1,755	266.2	92.4	473.6	1.64E+05	6,176	361.4	474.2	28,108	3.19E+05	70,224	5.91E+05	8.76E-05	1.48E-08
1989	0.113	4.08	2,180	264.7	78.0	471.4	1.64E+05	6,163	353.0	470.2	27,976	3.16E+05	80,039	5.97E+05	2.91E-05	4.87E-09
1990	104.6	1,188	1,971	264.0	115.1	470.9	1.64E+05	6,164	348.7	467.6	28,032	3.17E+05	79,056	5.98E+05	3.05E-05	5.10E-09
1991	64.3	1,051	2,009	264.6	148.0	471.6	1.64E+05	6,168	342.9	475.2	27,957	3.17E+05	93,436	6.12E+05	3.61E-05	5.89E-09
1992	347.0	2,824	1,754	266.5	190.3	474.3	1.64E+05	6,185	344.2	482.7	27,975	3.19E+05	91,870	6.15E+05	5.03E-04	8.18E-08
1993	5.35	0	1,998	266.6	121.9	474.0	1.63E+05	6,171	339.4	484.6	27,728	3.15E+05	96,893	6.13E+05	-2.76E-05	-4.50E-09
1994	13.7	244.4	1,139	267.7	130.5	475.2	1.63E+05	6,174	335.8	490.6	27,629	3.15E+05	1.03E+05	6.19E+05	5.56E-05	8.98E-09
1995	0.149	0	1,196	267.8	102.4	475.5	1.63E+05	6,176	330.7	488.5	27,513	3.14E+05	1.05E+05	6.18E+05	3.18E-04	5.15E-08
1996	0	0	1,221	267.9	70.2	476.6	1.64E+05	6,195	325.8	483.5	27,481	3.13E+05	1.06E+05	6.19E+05	-2.86E-03	-4.62E-07
1997	643.5	6,968	1,018	268.5	108.1	476.9	1.64E+05	6,179	323.9	490.2	27,564	3.15E+05	94,221	6.16E+05	6.65E-04	1.08E-07
1998	23.4	552.8	1,126	268.5	124.0	477.0	1.64E+05	6,183	317.2	490.5	27,558	3.13E+05	1.12E+05	6.26E+05	1.35E-05	2.16E-09
1999	76.6	0	1,142	268.1	80.3	476.3	1.64E+05	6,181	317.5	485.1	27,417	3.11E+05	1.13E+05	6.24E+05	1.27E-06	2.03E-10
2000	25.2	182.4	1,223	268.2	93.3	476.5	1.64E+05	6,199	313.1	484.3	27,390	3.10E+05	1.33E+05	6.44E+05	4.84E-04	7.51E-08
2001	114.0	76.4	1,054	267.8	89.0	475.5	1.64E+05	6,180	310.8	483.2	27,249	3.10E+05	1.24E+05	6.34E+05	8.97E-07	1.42E-10
2002	80.7	1,931	1,120	268.2	150.2	475.5	1.64E+05	6,182	303.9	489.8	27,243	3.10E+05	1.41E+05	6.53E+05	2.67E-05	4.08E-09
2003	28.6	77.3	2,279	268.0	129.0	475.5	1.64E+05	6,181	295.0	486.8	27,189	3.09E+05	1.33E+05	6.44E+05	1.15E-04	1.79E-08
2004	247.8	3,139	6,877	269.3	159.1	477.6	1.64E+05	6,197	276.7	491.0	27,371	3.11E+05	1.26E+05	6.47E+05	2.60E-06	4.02E-10
2005	0.525	0	8,089	267.8	85.4	475.9	1.64E+05	6,179	264.9	479.7	27,222	3.09E+05	1.22E+05	6.37E+05	1.69E-05	2.66E-09
2006	246.0	1,101	8,201	268.1	56.4	476.4	1.64E+05	6,177	263.2	477.2	27,216	3.09E+05	1.12E+05	6.29E+05	-1.32E-05	-2.10E-09
2007	1,269	12,348	4,995	271.9	130.1	479.8	1.64E+05	6,175	279.5	500.6	27,410	3.14E+05	1.10E+05	6.42E+05	1.17E-05	1.82E-09
2008	0	0	8,075	271.8	63.4	480.0	1.64E+05	6,191	271.7	488.6	27,280	3.10E+05	1.25E+05	6.42E+05	1.17E-06	1.82E-10
2009	20.1	87.2	1,263	270.0	73.9	477.4	1.64E+05	6,179	279.6	486.6	26,902	3.06E+05	1.63E+05	6.69E+05	1.93E-04	2.89E-08
2010	12.6	328.5	1,242	265.8	93.7	473.5	1.64E+05	6,190	258.8	473.9	26,688	3.02E+05	1.95E+05	6.96E+05	-5.12E-04	-7.36E-08
2011	0	0	1,305	260.7	55.1	470.0	1.64E+05	6,198	234.7	452.7	26,372	2.98E+05	2.02E+05	6.99E+05	-3.44E-05	-4.92E-09
2012	1,646	9,999	4,907	256.9	55.6	468.8	1.64E+05	6,201	228.4	414.1	26,577	3.03E+05	1.50E+05	6.68E+05	1.94E-04	2.90E-08
2013	813.0	7,973	5,678	248.2	57.7	460.4	1.65E+05	6,168	226.6	349.7	26,646	3.03E+05	1.45E+05	6.61E+05	-1.37E-04	-2.08E-08
2014	710.9	7,499	5,610	237.9	53.6	451.5	1.65E+05	6,147	230.9	270.7	26,735	3.03E+05	1.38E+05	6.54E+05	-1.06E-03	-1.62E-07
2015	1,390	16,778	4,996	225.5	79.6	440.3	1.66E+05	6,121	240.0	176.8	26,979	3.06E+05	1.30E+05	6.59E+05	-2.00E-04	-3.04E-08
2016	981.6	12,257	4,940	220.2	88.3	436.0	1.66E+05	6,125	249.8	153.3	27,192	3.08E+05	1.26E+05	6.53E+05	0.006	9.53E-07
2017	335.6	5,397	5,348	212.7	75.7	428.5	1.66E+05	6,096	252.7	116.0	27,145	3.06E+05	1.26E+05	6.44E+05	9.74E-06	1.51E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows														Total Inflows
	Specific Storage	Specific Yield	Recharge	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Upper Layers	Lower Layers	
	(acre-feet)														
Predevelopment	0	0	2,008	0	1.81	0.488	8.42	9.82	0.347	0.029	6.92	2.18	19,282	34,602	55,922
1980	0	0	1,895	0.988	2.08	0.358	4.92	7.23	0	1.00	6.24	1.17	92,208	2,623	96,750
1981	2.82E-06	0	2,429	0.921	2.11	0.405	4.97	6.90	0	0.998	6.21	0.957	81,381	3,868	87,701
1982	15.7	166.6	1,641	0.879	2.09	0.355	5.06	8.27	0	1.08	6.19	0.941	77,971	4,092	83,911
1983	4.71	34.6	1,682	0.841	2.09	0.334	5.12	8.94	0	1.11	6.12	0.742	72,134	4,842	78,723
1984	18.8	223.2	1,429	0.824	2.09	0.296	5.18	9.24	0	1.10	6.18	0.688	75,094	4,792	81,583
1985	2.25	0	2,290	0.823	2.10	0.355	5.23	8.54	0	1.06	6.05	0.502	69,540	4,969	76,826
1986	11.1	8.41	2,163	0.822	2.10	0.375	5.17	9.11	0	1.01	6.04	0.710	74,307	4,408	80,922
1987	0.175	0	2,188	0.775	2.10	0.389	5.21	9.14	0	0.982	6.00	0.456	67,597	5,481	75,291
1988	42.7	650.5	1,012	0.762	2.05	0.282	5.26	9.50	0	0.955	6.06	0.697	72,173	4,740	78,644
1989	68.1	424.6	1,345	0.796	1.99	0.261	5.22	9.43	0	0.936	6.12	0.924	82,121	3,579	87,564
1990	13.7	17.7	2,000	0.818	1.98	0.307	5.19	9.54	0	0.921	6.12	0.760	81,206	3,506	86,769
1991	72.5	224.4	2,386	0.836	2.01	0.352	5.15	9.80	0	0.908	6.41	0.769	95,688	3,459	1.02E+05
1992	34.5	122.0	2,693	0.818	2.05	0.403	5.17	9.51	0	0.890	6.78	0.521	94,126	3,994	1.01E+05
1993	70.1	755.9	1,722	0.818	2.02	0.350	5.14	9.62	0	0.874	7.14	0.654	99,122	3,820	1.06E+05
1994	56.6	382.0	2,172	0.824	2.02	0.365	5.13	9.49	0	0.865	7.51	0.658	1.06E+05	3,711	1.12E+05
1995	57.6	645.6	1,681	0.835	1.99	0.325	5.10	9.38	0	0.858	7.68	0.801	1.07E+05	3,539	1.13E+05
1996	67.0	782.0	1,193	0.850	1.96	0.258	5.09	9.30	0	0.855	7.75	0.861	1.08E+05	3,164	1.14E+05
1997	3.94	26.5	2,341	0.828	1.99	0.321	5.08	9.55	0	0.848	7.55	0.581	96,645	3,638	1.03E+05
1998	74.3	234.7	2,346	0.856	2.00	0.350	5.04	9.86	0	0.841	7.75	0.818	1.14E+05	3,105	1.20E+05
1999	66.7	869.2	1,345	0.865	1.96	0.280	5.00	6.98	0	0.840	7.94	0.974	1.15E+05	2,981	1.21E+05
2000	124.6	612.0	2,040	0.902	1.97	0.298	4.98	6.56	0	0.845	8.29	1.04	1.36E+05	2,330	1.41E+05
2001	29.0	391.5	1,830	0.885	1.97	0.288	4.97	6.38	0	0.845	8.46	0.979	1.27E+05	2,654	1.32E+05
2002	78.9	106.9	3,112	0.906	2.03	0.370	4.96	6.37	0	0.851	8.69	0.969	1.44E+05	2,237	1.49E+05
2003	30.7	381.6	2,270	0.900	2.02	0.359	4.96	6.33	0	0.856	8.82	0.990	1.36E+05	2,441	1.41E+05
2004	6.10	22.3	2,980	0.875	2.07	0.418	5.01	6.30	0	0.861	8.87	0.923	1.29E+05	2,847	1.35E+05
2005	32.4	676.9	1,505	0.853	2.01	0.328	5.02	6.25	0	0.857	8.87	1.09	1.24E+05	2,891	1.29E+05
2006	6.74	239.8	1,346	0.819	1.97	0.273	5.07	6.13	0	0.853	8.80	1.06	1.14E+05	3,449	1.19E+05
2007	1.95	6.69	3,223	0.761	2.05	0.408	5.13	5.93	0	0.845	8.75	0.716	1.13E+05	4,620	1.21E+05
2008	111.1	1,086	1,279	0.764	1.98	0.312	5.18	6.00	0	0.837	8.89	1.06	1.28E+05	3,655	1.34E+05
2009	220.0	1,143	1,838	0.835	1.96	0.302	5.10	6.16	0	0.832	9.26	1.14	1.66E+05	2,331	1.72E+05
2010	270.2	1,178	2,289	0.992	1.97	0.302	4.91	6.73	0	0.844	10.3	1.13	1.98E+05	994.2	2.03E+05
2011	220.3	1,615	1,059	1.11	1.92	0.198	4.70	7.10	0	0.867	11.1	0.878	2.05E+05	650.8	2.09E+05
2012	13.3	80.2	1,827	1.02	1.88	0.226	4.70	6.60	0	0.879	11.0	0.954	1.54E+05	2,285	1.58E+05
2013	12.4	27.6	1,999	0.956	1.79	0.252	4.74	6.30	0	0.998	10.6	1.10	1.48E+05	2,448	1.53E+05
2014	19.0	55.4	1,775	0.929	1.73	0.237	4.79	6.08	0	1.25	10.1	1.11	1.41E+05	2,842	1.46E+05
2015	18.5	6.74	2,933	0.904	1.78	0.309	4.83	5.85	0	1.62	9.53	0.860	1.33E+05	3,777	1.39E+05
2016	6.51	4.38	2,797	0.884	1.84	0.338	4.88	5.71	0	1.75	9.03	0.898	1.28E+05	3,907	1.35E+05
2017	18.4	67.5	2,284	0.888	1.84	0.307	4.89	5.66	0	1.87	8.61	1.17	1.29E+05	3,401	1.35E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows													Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	685.9	0.418	17.5	0.314	0.667	4.13	0.735	1.17	2.75	39,208	16,001	55,922	9.20E-06	1.65E-08
1980	0	0	1.01	0.079	16.5	0.315	3.85	1.06	0.323	3.97	2.62	5,728	90,992	96,750	-2.47E-07	-2.56E-10
1981	85.9	636.2	10.7	0.063	17.0	0.307	3.64	1.29	0.328	4.01	1.79	7,253	79,686	87,701	7.93E-07	9.05E-10
1982	38.0	116.4	0.052	0.049	16.5	0.314	3.53	1.54	0.304	3.93	1.46	7,450	76,279	83,911	5.22E-08	6.23E-11
1983	58.1	268.8	0	0.038	16.3	0.320	3.43	1.79	0.302	3.95	1.40	8,309	70,060	78,723	-9.67E-07	-1.23E-09
1984	25.6	76.8	0	0.035	15.9	0.327	3.41	1.95	0.319	3.85	1.22	8,034	73,420	81,583	-1.07E-05	-1.31E-08
1985	75.7	702.6	1.25	0.040	16.5	0.318	3.48	2.03	0.349	4.15	0.775	8,261	67,758	76,826	2.38E-07	3.10E-10
1986	21.3	202.9	6.74	0.045	16.6	0.312	3.48	2.01	0.374	3.95	0.395	7,400	73,264	80,922	1.15E-06	1.42E-09
1987	60.8	376.2	8.95	0.040	16.7	0.308	3.35	2.16	0.385	3.72	0.391	8,656	66,162	75,291	3.14E-06	4.17E-09
1988	2.80	0.191	0	0.042	15.9	0.324	3.35	2.18	0.360	3.49	0.204	7,785	70,830	78,644	8.25E-08	1.05E-10
1989	1.45	0.034	0	0.056	15.7	0.330	3.46	2.00	0.371	3.39	0.055	6,387	81,149	87,564	4.83E-06	5.52E-09
1990	8.34	202.8	0	0.065	16.0	0.321	3.52	1.97	0.351	3.37	0.550	6,364	80,168	86,769	9.16E-07	1.06E-09
1991	6.09	111.8	1.40	0.073	16.3	0.317	3.58	1.92	0.363	3.45	0.214	6,061	95,650	1.02E+05	2.09E-06	2.06E-09
1992	27.0	249.3	16.7	0.072	16.7	0.321	3.54	1.97	0.371	3.60	0.392	6,773	93,903	1.01E+05	5.87E-07	5.81E-10
1993	6.16	0	0	0.077	16.2	0.322	3.56	1.92	0.403	3.42	0.909	6,614	98,870	1.06E+05	-2.49E-06	-2.36E-09
1994	1.99	26.9	0.374	0.081	16.3	0.323	3.59	1.88	0.425	3.35	0.368	6,527	1.05E+05	1.12E+05	-5.11E-06	-4.56E-09
1995	1.42	0	0	0.087	16.0	0.331	3.63	1.82	0.429	3.23	0.158	6,474	1.06E+05	1.13E+05	6.90E-08	6.12E-11
1996	0.773	0	0	0.093	15.4	0.339	3.69	1.77	0.423	3.01	0.066	6,266	1.07E+05	1.14E+05	4.02E-07	3.54E-10
1997	59.9	621.1	0	0.090	16.1	0.335	3.63	1.88	0.424	2.94	0.265	7,004	94,971	1.03E+05	9.60E-07	9.35E-10
1998	1.62	45.8	0	0.099	16.3	0.328	3.74	1.83	0.417	2.83	0.040	6,021	1.14E+05	1.20E+05	7.56E-07	6.31E-10
1999	13.8	0	0	0.103	15.5	0.335	3.74	1.62	0.410	2.52	0.015	6,042	1.15E+05	1.21E+05	7.31E-08	6.06E-11
2000	2.71	18.9	0	0.111	15.7	0.338	3.83	1.35	0.386	2.37	0	5,231	1.36E+05	1.41E+05	4.59E-06	3.25E-09
2001	12.1	5.07	0	0.107	15.5	0.337	3.75	1.31	0.380	2.15	0	5,874	1.26E+05	1.32E+05	3.58E-07	2.71E-10
2002	4.77	245.1	0.690	0.111	16.4	0.360	3.81	1.18	0.365	2.29	0	5,239	1.44E+05	1.49E+05	4.40E-06	2.95E-09
2003	5.01	2.00	0	0.108	16.1	0.330	3.78	1.18	0.362	2.22	0	5,715	1.36E+05	1.41E+05	-1.89E-06	-1.34E-09
2004	32.3	426.6	1.58	0.101	16.8	0.351	3.71	1.20	0.375	2.26	0.027	6,353	1.28E+05	1.35E+05	-7.28E-08	-5.41E-11
2005	3.06	0.447	0	0.096	15.8	0.331	3.66	1.20	0.377	2.03	8.63E-04	6,657	1.23E+05	1.29E+05	-1.61E-08	-1.25E-11
2006	33.7	36.3	0	0.088	15.4	0.339	3.56	1.28	0.387	1.72	0.007	7,635	1.12E+05	1.19E+05	-6.45E-07	-5.40E-10
2007	98.0	1,181	9.92	0.077	16.9	0.369	3.41	1.46	0.429	1.79	0.074	8,559	1.11E+05	1.21E+05	1.82E-07	1.51E-10
2008	0.963	0	0	0.081	15.8	0.339	3.44	1.41	0.428	1.67	0.044	7,332	1.27E+05	1.34E+05	1.06E-07	7.89E-11
2009	0.056	0.010	0	0.101	15.7	0.337	3.65	1.32	0.397	1.76	0	5,510	1.66E+05	1.72E+05	6.27E-07	3.65E-10
2010	0.126	14.7	0	0.138	15.5	0.337	4.08	1.20	0.321	1.84	0.263	4,220	1.99E+05	2.03E+05	-1.32E-06	-6.53E-10
2011	0	0	0	0.165	14.3	0.332	4.38	1.21	0.247	1.71	0.695	4,284	2.05E+05	2.09E+05	-1.44E-08	-6.91E-12
2012	168.9	656.5	0	0.131	16.2	0.323	4.08	1.57	0.119	1.55	0	7,379	1.50E+05	1.58E+05	9.32E-07	5.90E-10
2013	66.3	499.3	0	0.108	18.6	0.316	3.91	1.76	0.030	1.43	0	7,377	1.45E+05	1.53E+05	1.97E-07	1.29E-10
2014	59.4	375.2	0	0.092	20.4	0.313	3.80	1.89	0.007	1.39	0	7,838	1.38E+05	1.46E+05	1.23E-05	8.42E-09
2015	117.7	1,242	4.51	0.075	24.2	0.311	3.67	2.05	0.012	1.40	0.034	8,706	1.29E+05	1.39E+05	-6.21E-07	-4.45E-10
2016	80.9	767.0	7.67	0.061	23.2	0.300	3.59	2.16	0.017	1.46	0.026	8,534	1.26E+05	1.35E+05	8.05E-08	5.95E-11
2017	30.3	229.7	3.21	0.054	23.4	0.299	3.57	2.16	0.021	1.52	0.018	7,727	1.27E+05	1.35E+05	1.49E-06	1.10E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows																Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Uvalde County UWCD	Wintergarden GCD	Bexar	Upper Layers	Lower Layers	
	(acre-feet)																
Predevelopment	0	0	8.72	15,798	16.3	606.2	333.7	436.1	2,880	5,124	0.192	0	5,889	2,983	95,109	76,016	2.05E+05
1980	0	0	39.2	14,910	96.5	736.6	292.0	938.8	233.7	5,204	140.8	2.38	6,133	3,032	1.75E+05	83,266	2.90E+05
1981	1.33	4.01	38.9	19,113	81.9	743.6	305.6	593.4	111.8	5,665	140.3	1.79	6,223	2,948	1.63E+05	79,399	2.79E+05
1982	1,058	705.0	38.9	12,914	75.8	749.8	292.2	567.6	893.0	5,573	156.1	2.31	6,139	2,893	1.60E+05	80,020	2.72E+05
1983	408.3	164.7	38.9	13,238	70.1	767.6	282.0	463.1	1,372	5,391	161.6	2.37	4,486	2,826	1.54E+05	78,001	2.62E+05
1984	1,550	2,137	38.8	11,245	68.7	763.1	266.6	468.5	1,580	4,492	159.2	2.97	7,474	2,790	1.58E+05	79,515	2.71E+05
1985	250.9	0	38.3	18,021	72.1	762.6	279.8	651.9	1,171	5,164	150.4	2.06	3,358	2,803	1.52E+05	76,339	2.61E+05
1986	653.9	19.8	38.0	17,017	73.9	761.5	288.2	552.1	1,514	5,646	142.6	1.80	5,031	2,866	1.57E+05	78,822	2.70E+05
1987	23.1	0.002	37.5	17,221	64.9	743.6	295.5	324.8	1,564	5,887	137.3	1.46	5,039	2,813	1.50E+05	76,609	2.60E+05
1988	2,069	4,132	37.2	7,966	65.7	721.0	268.2	441.4	1,772	5,782	133.5	2.45	7,137	2,820	1.56E+05	79,666	2.69E+05
1989	3,313	3,799	36.8	10,583	75.7	682.5	251.7	667.5	1,693	5,889	130.2	2.59	8,556	2,913	1.66E+05	81,645	2.87E+05
1990	649.6	258.0	36.7	15,738	79.7	646.8	264.2	650.6	1,744	6,068	127.8	2.15	7,069	2,891	1.65E+05	79,970	2.82E+05
1991	6,009	3,735	36.6	18,778	82.5	670.1	280.1	697.2	1,888	7,338	125.4	1.87	18,728	2,906	1.80E+05	86,154	3.28E+05
1992	2,223	2,179	36.5	21,190	77.4	675.2	303.8	518.9	1,708	7,834	122.1	1.56	19,264	2,886	1.78E+05	83,313	3.21E+05
1993	3,900	5,919	36.3	13,553	78.6	681.1	286.6	614.4	1,793	7,830	119.5	2.31	22,446	2,799	1.83E+05	84,645	3.28E+05
1994	3,438	4,568	36.1	17,095	80.1	681.6	288.7	619.2	1,716	7,764	118.1	2.32	25,529	2,859	1.90E+05	85,530	3.40E+05
1995	2,499	5,962	36.0	13,225	82.5	672.9	275.8	652.4	1,644	7,281	116.9	2.91	24,426	2,854	1.91E+05	84,680	3.36E+05
1996	2,517	6,805	36.0	9,390	85.2	641.1	255.4	674.4	1,579	6,613	116.4	3.66	21,545	2,878	1.94E+05	85,008	3.32E+05
1997	193.9	98.1	35.8	18,419	80.0	639.2	269.3	523.3	1,775	6,396	115.1	2.86	12,304	2,840	1.80E+05	79,643	3.04E+05
1998	5,650	3,833	35.8	18,459	87.1	636.3	283.2	746.5	1,955	7,177	114.0	2.75	23,657	2,949	1.99E+05	88,217	3.53E+05
1999	3,096	7,640	35.8	10,582	87.6	632.2	262.4	629.6	261.4	6,961	113.7	3.60	25,099	2,939	2.01E+05	85,966	3.45E+05
2000	7,419	9,330	36.0	16,056	94.4	603.3	263.1	796.9	118.6	7,455	114.4	3.47	34,391	3,027	2.23E+05	92,233	3.95E+05
2001	747.6	3,747	35.9	14,404	88.7	617.8	258.6	624.0	105.3	7,165	114.4	3.68	27,776	2,975	2.12E+05	85,633	3.57E+05
2002	5,223	4,331	36.1	24,489	93.2	609.6	290.3	799.4	141.2	7,958	115.3	2.83	34,755	3,065	2.30E+05	91,752	4.04E+05
2003	920.5	2,628	36.2	17,861	90.4	623.4	291.4	687.9	136.4	7,765	116.1	3.29	29,990	3,024	2.22E+05	87,665	3.74E+05
2004	86.2	182.3	36.2	23,452	84.5	651.1	314.5	579.7	121.0	7,923	116.6	2.75	24,966	3,039	2.13E+05	85,747	3.60E+05
2005	851.4	4,306	36.0	11,844	81.6	640.2	286.8	571.2	115.9	7,314	116.2	3.82	24,191	2,994	2.09E+05	86,451	3.48E+05
2006	62.1	2,136	35.8	10,591	75.7	647.6	263.8	449.2	97.3	6,691	115.5	4.21	19,098	2,946	1.98E+05	83,165	3.24E+05
2007	234.8	18.9	35.4	25,363	65.8	690.0	304.6	293.5	95.8	7,555	114.1	2.71	20,836	2,959	1.95E+05	82,990	3.37E+05
2008	6,778	10,108	35.2	10,061	70.6	654.0	279.6	482.7	127.9	7,574	112.9	4.07	33,272	2,972	2.12E+05	91,588	3.76E+05
2009	14,385	18,188	35.1	14,461	87.6	598.7	269.0	821.3	209.9	8,192	112.3	4.27	56,404	3,046	2.53E+05	1.02E+05	4.72E+05
2010	13,776	19,008	35.7	18,015	117.8	523.3	267.5	1,406	272.3	8,046	115.1	4.42	59,130	3,192	2.88E+05	1.05E+05	5.17E+05
2011	10,227	23,610	36.7	8,330	133.1	499.1	232.3	1,443	321.3	7,096	120.7	5.69	59,174	3,165	2.96E+05	1.03E+05	5.13E+05
2012	217.0	902.2	37.4	14,373	103.7	323.4	251.4	423.2	198.6	6,731	128.2	5.38	28,405	3,168	2.39E+05	85,729	3.80E+05
2013	313.8	281.3	37.6	15,727	90.8	186.5	276.9	431.4	168.7	6,773	148.6	5.08	26,715	3,209	2.33E+05	89,162	3.77E+05
2014	665.1	321.2	37.8	13,967	87.4	181.8	293.1	369.8	146.2	6,597	189.7	5.11	22,557	3,200	2.26E+05	88,810	3.64E+05
2015	698.1	0.354	38.2	23,082	83.2	214.2	338.4	249.5	117.3	7,130	250.5	3.88	17,171	3,209	2.17E+05	86,711	3.56E+05
2016	213.0	0	38.7	22,011	79.1	212.2	358.9	224.4	104.7	7,532	272.7	3.49	17,573	3,252	2.13E+05	87,147	3.52E+05
2017	715.4	377.7	39.0	17,974	81.4	215.6	357.5	305.7	98.8	7,562	294.9	3.62	18,381	3,298	2.14E+05	88,647	3.52E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net In-Out, and Percent Discrepancy

Simulated Time Period	Outflows																Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Uvalde County UWCD	Wintergarden GCD	Bexar	Upper Layers	Lower Layers			
	(acre-feet)																		%
Predevelopment	0	0	0	1,172	9.03	5,633	541.5	21.6	111.7	243.3	115.7	3.34	6,221	171.8	1.58E+05	32,676	2.05E+05	0.001	5.45E-07
1980	0	0	1.17E+05	128.1	112.0	4,985	618.5	466.2	99.4	304.4	42.2	0	8,657	312.0	1.22E+05	36,194	2.90E+05	-2.20E-04	-7.59E-08
1981	3,657	5,605	91,886	182.5	104.6	5,052	585.3	427.1	511.7	307.2	43.3	0	8,469	246.8	1.24E+05	37,868	2.79E+05	4.71E-04	1.69E-07
1982	1,610	1,561	94,619	116.3	98.1	5,052	618.9	367.1	768.0	291.9	39.0	0	8,484	208.3	1.23E+05	35,431	2.72E+05	4.30E-05	1.58E-08
1983	2,921	2,829	80,047	112.7	91.8	4,959	634.1	319.0	1,151	281.9	39.0	0	9,351	191.5	1.24E+05	35,307	2.62E+05	4.01E-04	1.53E-07
1984	876.2	894.1	95,383	83.0	88.5	4,835	665.7	303.9	1,388	309.0	42.5	0	8,133	172.4	1.23E+05	34,417	2.71E+05	0.002	6.36E-07
1985	3,924	6,091	71,198	158.3	88.9	4,895	623.3	294.7	1,398	298.0	46.9	0	10,571	142.4	1.25E+05	36,397	2.61E+05	2.26E-04	8.67E-08
1986	783.0	2,320	90,939	166.3	89.9	4,916	611.0	317.4	1,307	287.2	50.6	0	9,021	128.7	1.24E+05	35,185	2.70E+05	5.11E-04	1.89E-07
1987	2,766	3,754	75,546	191.6	86.0	4,995	600.6	298.8	1,573	282.5	52.6	0	8,621	118.3	1.25E+05	36,071	2.60E+05	-1.60E-03	-6.16E-07
1988	111.5	5.80	97,202	62.7	85.4	4,955	671.9	304.7	1,560	261.3	49.6	0	7,330	119.0	1.23E+05	33,120	2.69E+05	8.19E-05	3.05E-08
1989	89.3	1.91	1.17E+05	67.8	89.5	4,889	689.3	337.0	1,272	256.4	51.1	0	6,837	135.6	1.21E+05	33,772	2.87E+05	0.001	5.17E-07
1990	492.3	1,192	1.07E+05	123.0	92.8	4,768	660.3	335.4	1,291	263.3	46.9	0	7,668	140.3	1.22E+05	35,486	2.82E+05	3.05E-04	1.08E-07
1991	183.9	1,333	1.56E+05	158.7	96.2	4,696	624.8	347.7	1,365	292.3	49.0	0	4,670	139.0	1.22E+05	35,566	3.28E+05	3.24E-04	9.88E-08
1992	1,157	2,915	1.43E+05	196.6	95.7	4,645	587.8	326.5	1,654	320.4	50.0	0	4,894	130.6	1.24E+05	37,423	3.21E+05	3.22E-05	1.00E-08
1993	296.2	0	1.57E+05	101.2	97.1	4,735	627.6	345.0	1,712	319.7	56.2	0	4,199	145.2	1.22E+05	35,901	3.28E+05	8.27E-04	2.52E-07
1994	77.2	305.4	1.68E+05	116.9	98.5	4,710	617.2	351.7	1,768	347.2	60.4	0	3,676	131.8	1.22E+05	37,176	3.40E+05	-4.08E-04	-1.20E-07
1995	85.8	0	1.65E+05	65.1	100.7	4,728	646.2	363.8	1,807	353.7	61.5	0	4,007	133.8	1.22E+05	36,727	3.36E+05	-6.04E-04	-1.80E-07
1996	90.7	0	1.63E+05	13.6	103.3	4,578	694.6	372.1	1,902	345.1	61.3	0	4,970	142.7	1.20E+05	35,746	3.32E+05	9.23E-04	2.78E-07
1997	3,954	5,517	1.18E+05	84.7	101.9	4,639	647.3	356.0	2,203	347.1	61.3	0	7,714	130.6	1.22E+05	38,642	3.04E+05	2.28E-04	7.50E-08
1998	41.9	646.4	1.79E+05	95.4	105.7	4,619	625.6	393.4	2,229	357.9	60.3	0	5,090	135.7	1.22E+05	37,432	3.53E+05	0.001	3.34E-07
1999	1,417	0	1.74E+05	11.7	107.4	4,465	678.9	399.6	2,012	347.2	59.5	0	4,578	140.4	1.20E+05	36,680	3.45E+05	1.09E-04	3.15E-08
2000	300.7	71.7	2.25E+05	34.6	112.1	4,344	672.6	436.5	1,882	365.6	55.2	0	3,687	172.6	1.19E+05	38,585	3.95E+05	0.003	8.23E-07
2001	862.4	61.4	1.84E+05	18.0	110.6	4,310	678.2	420.8	2,102	367.1	54.4	0	4,454	160.6	1.19E+05	39,350	3.57E+05	6.11E-05	1.71E-08
2002	91.4	2,306	2.27E+05	118.2	113.0	4,308	606.6	441.9	2,097	402.4	51.1	0	4,035	177.0	1.20E+05	41,519	4.04E+05	6.88E-04	1.70E-07
2003	408.1	39.6	1.99E+05	58.1	112.4	4,301	619.4	428.5	2,307	403.6	50.9	0	4,770	165.2	1.20E+05	41,005	3.74E+05	-3.64E-04	-9.73E-08
2004	2,028	4,485	1.74E+05	112.5	109.6	4,426	574.5	419.3	2,545	416.3	52.7	0	5,964	152.8	1.22E+05	42,438	3.60E+05	4.04E-04	1.12E-07
2005	269.6	132.4	1.74E+05	6.31	107.1	4,408	640.0	415.4	2,674	387.9	53.7	0	6,316	150.5	1.20E+05	38,892	3.48E+05	5.46E-06	1.57E-09
2006	2,559	1,520	1.44E+05	0.798	102.9	4,443	678.3	401.3	2,898	362.2	55.7	0	7,676	139.7	1.20E+05	38,692	3.24E+05	1.17E-05	3.62E-09
2007	3,523	9,356	1.40E+05	72.2	96.2	4,675	574.1	392.2	3,257	389.2	61.5	0	7,471	124.0	1.25E+05	41,071	3.37E+05	1.47E-04	4.36E-08
2008	44.4	0	2.04E+05	1.63	96.3	4,631	652.8	399.7	3,258	375.3	61.9	0	5,268	129.7	1.21E+05	36,209	3.76E+05	8.96E-05	2.38E-08
2009	2.06	0.118	3.01E+05	3.32	104.1	4,387	665.0	435.9	3,151	395.5	56.6	0	4,230	170.3	1.19E+05	38,338	4.72E+05	3.58E-04	7.58E-08
2010	0.266	17.8	3.44E+05	7.15	122.0	3,981	668.8	573.6	2,736	423.1	44.7	0	4,449	249.1	1.16E+05	43,321	5.17E+05	1.81E-04	3.51E-08
2011	0	0	3.44E+05	0	136.2	3,620	757.5	598.8	2,818	408.1	35.8	0	4,755	289.7	1.13E+05	43,528	5.13E+05	6.87E-04	1.34E-07
2012	11,441	10,863	1.74E+05	0	127.6	5,227	721.2	434.4	4,027	401.3	21.1	0	8,186	170.3	1.17E+05	47,191	3.80E+05	0.001	3.27E-07
2013	3,283	7,145	1.83E+05	0	119.9	7,565	691.4	441.0	4,454	392.8	7.20	0	9,127	136.1	1.18E+05	42,152	3.77E+05	-1.72E-04	-4.56E-08
2014	3,424	6,650	1.67E+05	0	114.3	9,743	693.0	426.2	4,734	381.4	1.52	0	10,526	115.9	1.18E+05	41,097	3.64E+05	0.004	1.16E-06
2015	6,062	15,337	1.38E+05	9.72	107.9	13,129	629.8	414.0	4,998	395.8	1.18	0	12,026	104.4	1.21E+05	43,481	3.56E+05	1.85E-04	5.21E-08
2016	3,645	11,075	1.42E+05	21.8	102.7	11,894	603.6	414.5	5,156	403.2	1.50	0	12,242	95.6	1.22E+05	42,057	3.52E+05	-5.16E-05	-1.47E-08
2017	1,382	5,341	1.54E+05	12.1	100.0	12,494	621.0	404.8	5,107	393.7	1.78	0	12,033	92.0	1.20E+05	40,198	3.52E+05	7.21E-05	2.05E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows															Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Upper Layers	Lower Layers	
	(acre-feet)															
Predevelopment	0	0	6.80	863.1	2.08	204.2	2,699	9.63	379.7	1,153	0	434.6	2,779	34,183	50,063	92,778
1980	0	0	35.5	814.6	2.98	209.9	2,354	1.05	23.1	2,067	20.9	294.6	3,370	38,019	57,300	1.05E+05
1981	0.249	0	35.4	1,044	2.87	214.8	2,476	0.950	2.86	2,074	20.9	293.6	3,196	39,637	54,523	1.04E+05
1982	192.2	122.3	35.4	705.5	2.78	209.9	2,331	0.985	35.2	2,056	22.3	288.2	3,105	37,222	55,309	1.02E+05
1983	98.9	15.2	35.5	723.2	2.68	206.3	2,245	1.22	65.3	2,004	23.0	263.0	3,010	37,087	54,218	100,000
1984	794.7	99.0	35.6	614.3	2.60	201.7	2,086	1.55	82.3	1,889	23.1	286.8	2,955	36,260	55,338	1.01E+05
1985	20.8	0	35.5	984.5	2.53	206.8	2,257	1.86	67.2	1,921	22.4	228.5	2,935	38,142	52,710	99,536
1986	226.8	0	35.3	929.7	2.47	208.9	2,328	2.05	83.8	1,954	21.7	286.5	2,965	36,921	53,824	99,789
1987	7.50	0.009	35.0	940.8	2.33	211.2	2,389	2.26	84.8	1,938	21.0	313.2	2,896	37,779	52,484	99,105
1988	933.3	334.7	34.8	435.2	2.22	201.8	2,105	2.45	100.5	1,973	20.4	326.1	2,901	34,927	55,473	99,772
1989	1,605	76.7	34.4	578.2	2.17	196.1	1,975	2.59	112.2	2,026	19.9	337.1	2,992	35,603	56,851	1.02E+05
1990	309.4	0	34.1	859.8	2.15	201.5	2,119	2.79	114.5	2,037	19.5	328.6	3,036	37,286	55,115	1.01E+05
1991	3,230	0	33.9	1,026	2.12	206.5	2,276	3.09	114.9	2,214	19.2	363.4	2,992	37,336	58,032	1.08E+05
1992	1,505	0	33.7	1,158	2.09	213.8	2,481	3.42	98.8	2,298	18.8	399.3	2,975	39,156	55,854	1.06E+05
1993	2,207	187.8	33.4	740.4	2.03	205.0	2,309	3.67	100.1	2,386	18.4	461.1	2,928	37,676	57,315	1.07E+05
1994	2,089	3.27	33.2	933.9	2.04	205.6	2,348	3.91	96.2	2,450	18.2	522.9	2,982	38,962	57,617	1.08E+05
1995	1,541	160.5	33.0	722.5	2.05	200.8	2,221	4.11	91.7	2,484	18.0	546.5	2,953	38,556	57,535	1.07E+05
1996	1,427	266.0	32.9	513.0	2.07	194.3	2,023	4.31	87.2	2,500	17.8	542.7	2,982	37,654	58,665	1.07E+05
1997	53.4	0	32.6	1,006	2.04	200.7	2,204	4.55	94.3	2,421	17.6	474.5	2,958	40,461	54,614	1.05E+05
1998	2,881	4.86	32.5	1,008	2.07	205.6	2,324	4.86	104.4	2,553	17.5	584.6	3,023	39,267	59,384	1.11E+05
1999	1,803	293.6	32.4	578.1	2.08	196.8	2,097	4.76	28.7	2,632	17.4	638.8	3,009	38,588	59,151	1.09E+05
2000	4,024	44.5	32.4	877.2	2.09	199.1	2,123	4.33	14.5	2,814	17.4	748.9	3,078	40,535	62,832	1.17E+05
2001	603.5	39.1	32.3	786.9	2.11	197.2	2,093	3.69	9.39	2,858	17.4	738.2	3,065	41,280	58,687	1.10E+05
2002	2,888	9.09	32.3	1,338	2.11	209.9	2,410	3.10	16.0	2,993	17.5	803.1	3,125	43,419	61,339	1.19E+05
2003	683.1	97.2	32.3	975.8	2.15	209.0	2,389	2.60	13.9	3,030	17.5	790.4	3,108	42,902	59,141	1.13E+05
2004	72.1	0	32.5	1,281	2.17	216.1	2,606	2.21	7.93	3,024	17.6	766.4	3,117	44,286	57,278	1.13E+05
2005	476.4	349.2	32.4	647.1	2.16	204.8	2,312	1.93	5.02	2,996	17.6	762.9	3,076	40,804	58,972	1.11E+05
2006	40.0	143.2	32.3	578.6	2.14	196.3	2,116	1.74	0.233	2,939	17.6	734.9	3,047	40,624	57,532	1.08E+05
2007	146.0	0	32.2	1,386	2.10	210.9	2,556	1.59	0.013	2,945	17.4	725.9	3,039	42,873	55,235	1.09E+05
2008	3,591	434.6	32.1	549.6	2.02	201.0	2,246	1.39	0.585	3,073	17.3	795.6	3,024	38,123	62,110	1.14E+05
2009	7,801	224.3	31.9	790.1	1.96	199.4	2,155	1.21	26.4	3,396	17.2	930.8	3,073	40,337	68,566	1.28E+05
2010	7,374	426.3	32.0	984.2	2.00	203.6	2,142	1.21	90.4	3,659	17.3	1,027	3,238	45,437	70,966	1.36E+05
2011	5,774	756.2	32.3	455.1	2.17	192.7	1,774	1.66	131.7	3,892	17.7	1,074	3,325	45,794	71,181	1.34E+05
2012	197.7	0	32.7	785.2	2.28	209.2	2,045	2.21	59.3	3,813	17.9	806.0	3,443	49,251	60,320	1.21E+05
2013	189.9	0	32.9	859.2	2.28	230.9	2,265	2.63	29.8	3,721	18.4	753.8	3,405	44,154	61,270	1.17E+05
2014	337.9	19.5	33.3	763.1	2.29	250.3	2,374	2.74	14.1	3,601	22.5	699.8	3,341	43,094	61,349	1.16E+05
2015	347.2	0	33.8	1,261	2.29	287.6	2,781	2.66	7.33	3,469	28.6	671.2	3,276	45,379	59,016	1.17E+05
2016	150.4	0	34.4	1,203	2.28	292.0	2,969	2.46	3.01	3,355	31.9	672.2	3,251	43,914	58,703	1.15E+05
2017	365.3	62.1	34.8	982.0	2.30	294.8	2,925	2.17	1.11	3,262	34.4	669.1	3,245	42,070	59,869	1.14E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows															Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Upper Layers	Lower Layers			
	(acre-feet)																	%
Predevelopment	0	0	0	0.989	0	698.2	328.8	0.667	8.56	102.1	15.0	93.7	1,025	79,610	10,895	92,778	2.22E-04	2.40E-07
1980	0	0	3,801	0.010	5.44	663.5	383.4	11.5	5.02	462.7	7.33	281.7	338.7	85,436	13,116	1.05E+05	-7.00E-05	-6.70E-08
1981	1,561	210.9	3,670	0.251	5.42	669.1	373.2	11.1	60.8	440.1	7.36	273.0	358.2	81,742	14,139	1.04E+05	1.54E-04	1.49E-07
1982	696.6	0	3,653	0	5.39	665.2	381.1	10.9	76.6	428.3	6.56	273.4	369.5	82,310	12,761	1.02E+05	1.33E-05	1.31E-08
1983	1,334	35.1	3,028	0	5.33	662.8	391.4	10.8	107.9	416.6	6.38	285.4	395.9	80,345	12,975	100,000	1.17E-04	1.17E-07
1984	352.5	0	4,193	0	5.29	657.0	409.3	10.9	124.9	465.7	6.75	287.6	413.3	81,770	11,972	1.01E+05	4.22E-04	4.19E-07
1985	1,891	299.9	2,566	0.007	5.24	663.9	398.4	11.0	151.2	419.4	7.50	325.3	463.7	78,806	13,529	99,536	7.17E-05	7.20E-08
1986	431.5	77.3	3,388	0.096	5.22	664.7	389.6	11.3	127.2	388.2	8.19	266.2	489.7	81,355	12,187	99,789	1.67E-04	1.67E-07
1987	1,309	110.1	3,222	0.159	5.21	665.2	382.3	11.2	156.3	365.4	8.58	237.3	543.7	79,271	12,816	99,105	-7.85E-04	-7.92E-07
1988	80.4	0	4,120	0	5.23	655.0	405.9	11.4	148.9	370.0	8.31	242.2	514.8	82,121	11,089	99,772	2.60E-05	2.61E-08
1989	50.9	3.31	4,637	0	5.24	652.5	424.5	11.6	115.2	380.9	8.58	253.2	470.0	84,011	11,388	1.02E+05	4.81E-04	4.69E-07
1990	233.5	130.1	4,176	0	5.25	648.3	421.1	11.8	115.0	375.9	8.39	255.0	474.6	82,392	12,218	1.01E+05	1.03E-04	1.01E-07
1991	96.6	158.2	4,472	0.032	5.27	650.2	406.0	11.9	102.2	397.7	8.49	261.2	514.3	88,614	12,151	1.08E+05	1.19E-04	1.10E-07
1992	411.5	202.5	4,329	0.289	5.29	648.2	389.0	11.8	135.8	407.8	8.62	270.2	566.1	85,924	12,885	1.06E+05	1.37E-05	1.29E-08
1993	151.0	0	4,648	0	5.32	652.5	403.1	11.8	139.5	431.3	9.10	258.2	560.4	87,118	12,184	1.07E+05	2.35E-04	2.20E-07
1994	43.9	66.7	5,097	0.092	5.34	651.1	403.8	11.9	147.2	472.8	9.50	256.5	542.6	87,992	12,569	1.08E+05	-2.00E-04	-1.85E-07
1995	36.9	0	4,926	0	5.37	650.8	416.9	12.0	153.4	510.3	9.65	267.6	527.9	87,012	12,542	1.07E+05	-1.92E-04	-1.80E-07
1996	28.0	0	4,725	0	5.41	636.1	438.6	12.2	164.5	545.8	9.61	288.2	483.4	87,183	12,392	1.07E+05	3.24E-04	3.03E-07
1997	1,905	273.6	3,305	0	5.42	645.9	431.9	12.1	206.6	529.6	9.52	313.6	511.5	81,987	14,407	1.05E+05	8.12E-05	7.77E-08
1998	28.6	54.5	5,345	0.090	5.46	645.5	421.5	12.4	190.3	538.4	9.36	296.2	508.6	90,527	12,814	1.11E+05	3.66E-04	3.28E-07
1999	231.7	0	5,345	0	5.49	635.5	439.1	12.5	220.2	565.1	9.21	293.6	466.8	88,108	12,741	1.09E+05	3.34E-05	3.07E-08
2000	89.7	22.4	6,910	0	5.58	628.7	453.2	12.8	216.0	609.3	8.72	327.9	463.8	94,306	13,293	1.17E+05	0.001	9.51E-07
2001	282.7	0.562	5,661	0	5.59	631.3	453.0	12.7	254.4	626.3	8.47	335.5	429.0	87,681	14,032	1.10E+05	2.21E-05	2.00E-08
2002	72.8	293.5	7,018	0.253	5.64	632.3	434.4	12.8	252.0	644.2	8.07	370.6	473.8	93,918	14,469	1.19E+05	2.59E-04	2.19E-07
2003	123.8	5.49	6,137	0.103	5.66	630.3	424.8	12.7	279.1	653.5	7.93	381.1	453.8	89,780	14,499	1.13E+05	-1.74E-04	-1.54E-07
2004	878.5	245.5	5,383	0.618	5.67	641.4	402.5	12.4	312.0	643.5	8.10	387.3	477.3	88,020	15,292	1.13E+05	1.26E-04	1.12E-07
2005	129.8	0	5,355	0	5.66	631.6	416.4	12.3	329.0	648.9	8.23	390.9	439.4	88,517	13,775	1.11E+05	1.99E-06	1.79E-09
2006	1,255	0	4,427	0	5.64	636.0	433.7	12.1	363.2	650.1	8.49	391.7	405.2	85,165	14,252	1.08E+05	9.52E-09	8.81E-12
2007	1,646	599.7	3,320	0.775	5.59	660.9	398.4	11.9	416.8	626.4	9.15	408.7	471.9	85,334	15,260	1.09E+05	4.56E-05	4.18E-08
2008	55.1	0	4,829	0	5.62	645.1	418.7	12.2	404.2	659.9	9.38	438.0	453.7	93,629	12,642	1.14E+05	2.74E-05	2.40E-08
2009	5.33	0	7,179	0	5.68	624.4	442.2	12.8	377.5	735.6	8.87	517.3	443.5	1.04E+05	13,419	1.28E+05	1.14E-04	8.91E-08
2010	0.067	0	10,694	0	5.85	595.5	468.3	13.9	351.7	812.4	7.45	557.7	462.5	1.07E+05	15,066	1.36E+05	3.14E-05	2.32E-08
2011	0	0	10,693	0	5.97	573.7	514.0	14.6	377.5	893.0	5.93	588.0	399.0	1.05E+05	15,657	1.34E+05	2.14E-04	1.59E-07
2012	5,327	632.7	4,302	0	5.96	642.8	474.3	13.7	503.3	877.2	3.76	594.8	272.8	87,323	20,012	1.21E+05	3.88E-04	3.21E-07
2013	1,670	315.9	4,437	0	5.91	729.7	458.5	13.0	554.9	846.8	0.936	603.3	263.6	90,835	16,200	1.17E+05	-4.90E-05	-4.19E-08
2014	1,781	127.8	4,091	0	5.88	808.3	460.1	12.7	593.8	821.3	0.355	614.7	270.1	90,516	15,800	1.16E+05	0.002	1.61E-06
2015	3,182	497.4	3,407	0.134	5.83	940.4	453.2	12.4	640.1	765.8	0.417	605.7	326.6	88,727	16,997	1.17E+05	7.46E-05	6.40E-08
2016	1,959	222.8	3,553	0.296	5.77	932.1	431.2	12.4	667.6	720.9	0.478	605.5	388.3	89,325	15,759	1.15E+05	6.09E-05	5.31E-08
2017	846.1	28.4	3,799	0.090	5.68	944.3	433.8	12.4	662.0	689.1	0.531	600.3	417.8	90,812	14,567	1.14E+05	3.52E-05	3.09E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows														Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Upper Layers	
	(acre-feet)														
Predevelopment	0	0	6.56	661.6	15.0	163.6	8,341	55.7	86.0	2,679	0	329.2	35,213	36,202	83,753
1980	0	0	36.1	624.4	14.7	185.1	7,984	12.8	4.54	2,289	69.8	306.8	37,508	42,093	91,128
1981	0.295	0	36.0	800.5	14.4	188.3	8,013	10.7	1.97	2,510	69.6	318.2	36,893	42,347	91,204
1982	323.2	105.1	36.0	540.9	14.0	185.3	7,923	8.76	12.1	2,469	72.8	317.7	36,881	41,275	90,165
1983	176.3	15.6	36.1	554.4	13.6	183.3	7,852	7.59	23.4	2,435	75.2	289.2	36,614	41,298	89,573
1984	1,039	135.9	36.3	470.9	13.1	180.1	7,660	7.33	30.9	1,971	75.9	319.8	36,548	41,229	89,716
1985	34.0	0	36.2	754.7	12.5	183.5	7,848	8.12	26.5	2,489	74.3	249.5	36,249	41,479	89,445
1986	338.4	4.58	36.0	712.7	12.0	184.8	7,936	8.65	30.8	2,650	72.2	313.7	36,316	40,078	88,693
1987	10.1	0	35.8	721.2	11.2	185.8	8,004	8.94	32.3	2,666	70.2	351.3	36,049	40,261	88,406
1988	1,521	235.9	35.5	333.6	10.5	178.8	7,848	9.32	36.4	2,554	68.4	364.0	36,575	39,522	89,292
1989	2,480	15.4	35.1	443.2	10.1	173.5	7,656	9.94	37.9	2,574	66.7	369.9	36,770	39,967	90,609
1990	593.2	3.88	34.8	659.1	9.88	176.0	7,763	10.9	39.6	2,662	65.3	359.6	36,772	40,611	89,760
1991	3,921	0	34.5	786.4	9.78	179.6	7,907	12.5	43.0	2,770	64.2	416.3	36,587	40,192	92,923
1992	1,828	0	34.4	887.4	9.73	184.7	8,089	14.0	41.3	2,860	63.1	461.0	36,495	40,436	91,403
1993	2,773	122.1	34.0	567.6	9.55	178.9	8,024	15.1	42.5	2,762	61.8	531.6	36,352	40,086	91,561
1994	2,548	8.33	33.8	715.9	9.59	179.0	8,067	16.3	42.2	2,570	60.9	599.2	36,261	40,456	91,567
1995	2,009	101.2	33.6	553.9	9.62	175.5	7,978	17.4	41.6	2,452	60.2	622.4	36,298	40,875	91,226
1996	2,243	146.6	33.5	393.2	9.72	170.4	7,854	18.6	41.0	2,372	59.8	618.0	36,806	41,387	92,154
1997	74.7	0	33.2	771.4	9.67	174.8	7,941	19.3	44.0	2,550	59.1	538.2	36,374	42,464	91,054
1998	3,667	37.8	33.0	773.1	9.74	178.2	8,046	20.8	49.0	2,674	58.6	670.5	36,590	41,110	93,918
1999	2,514	171.8	32.9	443.2	9.84	172.0	7,890	21.1	22.1	2,581	58.3	732.6	36,863	41,621	93,133
2000	5,590	31.2	32.9	672.4	9.93	173.7	7,913	20.8	9.78	2,646	58.3	835.7	37,002	42,527	97,523
2001	759.8	1.22	32.8	603.2	10.1	172.9	7,871	19.4	4.54	2,676	58.2	829.2	37,002	42,998	93,037
2002	3,817	0	32.8	1,026	10.2	182.4	8,103	18.4	2.87	2,826	58.3	888.0	36,695	43,022	96,681
2003	861.5	63.0	32.8	748.0	10.5	182.4	8,115	17.3	1.93	2,793	58.6	879.2	36,846	43,151	93,760
2004	90.4	0	32.9	982.2	10.6	187.7	8,289	15.7	1.33	2,909	59.0	864.4	36,713	43,353	93,508
2005	738.5	228.3	32.8	496.0	10.6	179.2	8,078	14.1	1.05	2,752	58.9	864.9	36,956	42,556	92,965
2006	73.6	46.3	32.8	443.6	10.5	172.5	7,909	12.3	0.391	2,725	58.8	841.6	37,087	43,112	92,526
2007	166.6	0	32.7	1,062	10.2	182.7	8,200	9.93	0.063	2,982	58.5	837.1	36,440	42,583	92,565
2008	4,833	332.4	32.7	421.3	9.72	175.1	8,036	8.22	0.027	2,803	58.2	898.2	36,925	41,393	95,927
2009	10,511	113.5	32.5	605.6	9.32	173.1	7,939	8.29	2.14	2,831	57.7	1,002	36,951	42,883	1.03E+05
2010	10,988	148.1	32.5	754.5	9.41	177.7	7,937	11.8	13.3	2,850	58.0	1,083	37,350	45,593	1.07E+05
2011	8,478	303.4	32.7	348.9	10.3	174.5	7,666	18.7	23.4	2,822	58.9	1,122	38,216	47,379	1.07E+05
2012	421.4	0	33.1	601.9	11.2	181.5	7,855	21.3	17.9	3,054	59.7	879.6	39,096	49,327	1.02E+05
2013	479.3	0	33.3	658.6	11.6	187.7	7,996	20.8	14.0	3,149	59.3	837.8	38,741	44,968	97,157
2014	864.7	20.2	33.7	584.9	11.8	194.5	8,087	18.7	10.3	3,095	67.9	788.7	38,589	44,534	96,900
2015	918.0	0	34.2	966.7	11.8	212.3	8,352	15.7	6.79	3,223	83.6	764.4	38,007	44,645	97,240
2016	420.3	0	34.8	921.8	11.8	216.6	8,547	13.1	3.67	3,214	94.1	770.7	37,910	43,156	95,315
2017	907.6	86.2	35.3	752.8	11.8	216.4	8,518	10.8	1.68	3,123	101.2	770.7	37,936	42,216	94,687

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-2.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Evergreen UWCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows													Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Bee GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Upper Layers			
	(acre-feet)															%
Predevelopment	0	0	0	0	571.5	2,526	4.41	2.38	44.2	46.4	41.1	14,820	65,697	83,753	-2.29E-04	-2.73E-07
1980	0	0	2,712	33.1	524.9	2,641	56.4	0.851	608.8	22.4	240.8	13,749	70,538	91,128	-2.89E-06	-3.17E-09
1981	2,606	122.7	2,588	33.0	529.9	2,620	55.7	6.69	529.9	22.4	228.4	13,663	68,197	91,204	3.95E-06	4.33E-09
1982	1,168	0	2,580	32.7	525.5	2,646	55.3	6.95	523.4	21.0	225.0	13,713	68,668	90,165	7.06E-07	7.83E-10
1983	1,993	31.9	1,916	32.2	526.3	2,659	55.5	11.0	509.8	20.5	230.8	13,903	67,683	89,573	-4.12E-09	-4.60E-12
1984	645.6	0	2,170	31.8	521.5	2,721	56.3	14.5	836.6	21.0	235.8	14,139	68,323	89,716	-9.40E-06	-1.05E-08
1985	2,753	235.6	1,887	31.3	529.8	2,651	56.8	17.5	506.2	22.6	267.1	13,991	66,496	89,445	2.54E-06	2.84E-09
1986	666.1	19.9	2,462	31.2	530.5	2,633	57.7	16.4	433.5	24.2	203.5	13,969	67,646	88,693	4.59E-06	5.17E-09
1987	2,018	59.1	1,688	31.1	527.8	2,619	59.2	19.7	384.5	25.3	168.2	14,221	66,586	88,406	-1.28E-04	-1.45E-07
1988	162.7	0	2,193	31.3	514.6	2,676	60.5	20.2	421.6	24.8	180.8	14,163	68,844	89,292	6.20E-07	6.95E-10
1989	121.4	3.23	2,464	31.4	514.6	2,706	60.4	18.1	447.1	25.4	198.8	13,959	70,059	90,609	1.97E-05	2.17E-08
1990	355.8	74.8	2,892	31.5	509.7	2,682	60.1	18.7	418.2	25.1	194.9	13,963	68,534	89,760	4.31E-06	4.80E-09
1991	241.5	101.1	2,952	31.7	514.1	2,647	59.8	18.7	418.2	25.2	230.4	13,925	71,759	92,923	6.88E-06	7.41E-09
1992	803.7	114.7	2,444	31.9	509.5	2,623	60.2	21.9	407.8	25.5	222.0	14,114	70,025	91,403	2.43E-06	2.66E-09
1993	356.4	0	2,015	32.2	512.6	2,628	60.6	22.6	448.5	26.5	199.5	14,197	71,062	91,561	1.94E-07	2.11E-10
1994	119.3	41.7	1,846	32.4	511.2	2,619	61.1	23.6	511.8	27.5	191.5	14,137	71,445	91,567	-1.89E-05	-2.07E-08
1995	90.8	0	1,871	32.6	509.9	2,642	61.7	24.5	596.7	28.0	190.7	14,167	71,010	91,226	-4.44E-06	-4.87E-09
1996	61.9	0	2,042	33.0	493.3	2,687	62.5	25.6	701.9	28.0	192.6	14,137	71,690	92,154	2.18E-05	2.37E-08
1997	2,648	205.8	1,640	33.2	503.3	2,647	63.0	29.6	648.3	27.7	192.3	14,119	68,295	91,054	6.77E-06	7.44E-09
1998	72.6	25.8	2,910	33.5	501.9	2,627	63.7	29.7	638.6	27.3	177.2	13,869	72,942	93,918	9.29E-06	9.89E-09
1999	291.2	0	2,624	33.7	492.5	2,669	64.3	30.9	712.8	26.8	161.8	13,862	72,165	93,133	1.06E-06	1.13E-09
2000	132.5	21.5	3,393	34.4	480.5	2,679	65.1	29.3	773.6	25.7	174.5	13,932	75,782	97,523	7.02E-05	7.20E-08
2001	474.5	19.3	2,781	34.5	486.9	2,674	65.0	31.6	808.0	24.8	161.3	13,795	71,682	93,037	1.26E-06	1.35E-09
2002	161.6	164.6	3,440	34.9	483.5	2,621	65.3	30.3	775.8	23.8	177.3	13,898	74,804	96,681	1.52E-05	1.58E-08
2003	239.8	0.327	3,010	35.1	482.0	2,623	65.2	32.0	796.0	23.3	170.4	13,851	72,432	93,760	-2.72E-05	-2.90E-08
2004	1,512	157.4	2,635	35.2	494.6	2,589	65.0	35.0	751.2	23.6	163.2	13,902	71,144	93,508	2.87E-06	3.06E-09
2005	220.9	0	2,628	35.1	484.7	2,632	64.5	36.9	815.0	24.0	156.9	13,799	72,068	92,965	-9.16E-08	-9.86E-11
2006	1,803	2.28	2,175	34.9	493.5	2,663	64.2	40.6	864.6	24.6	146.2	13,701	70,512	92,526	-1.10E-06	-1.19E-09
2007	3,108	392.1	1,624	34.6	524.0	2,579	64.1	46.7	737.3	26.2	153.4	13,778	69,498	92,565	2.13E-06	2.30E-09
2008	124.9	0	2,369	34.8	502.1	2,646	64.7	47.0	841.0	27.1	171.2	13,821	75,278	95,927	2.36E-06	2.46E-09
2009	19.5	0	3,527	35.1	473.7	2,664	65.3	44.3	972.2	26.1	224.4	13,836	81,231	1.03E+05	4.62E-06	4.48E-09
2010	0.406	0	5,257	36.1	432.7	2,684	66.7	45.0	1,124	22.8	248.3	14,036	83,054	1.07E+05	-9.25E-06	-8.65E-09
2011	0	0	5,257	37.0	413.0	2,756	68.9	50.0	1,384	18.7	256.3	13,980	82,434	1.07E+05	5.69E-06	5.33E-09
2012	7,897	428.4	2,313	37.1	450.6	2,710	68.7	60.8	1,257	13.1	238.8	13,106	72,978	1.02E+05	1.13E-05	1.11E-08
2013	2,631	122.3	2,451	36.9	484.8	2,676	67.6	66.2	1,179	4.18	233.2	12,969	74,236	97,157	3.10E-06	3.19E-09
2014	2,475	11.0	2,317	36.6	520.1	2,677	66.4	70.4	1,147	0.928	238.9	13,023	74,316	96,900	2.99E-04	3.09E-07
2015	4,497	263.7	1,865	36.2	585.5	2,633	65.3	75.1	966.2	1.16	226.5	13,154	72,872	97,240	8.29E-06	8.53E-09
2016	2,774	64.3	1,844	35.7	634.4	2,610	65.0	78.5	872.5	1.41	224.2	13,278	72,832	95,315	2.70E-05	2.84E-08
2017	1,088	0.357	2,155	34.9	636.4	2,617	64.1	79.2	829.4	1.62	224.9	13,267	73,689	94,687	2.19E-06	2.32E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Quarternary Alluvium (Layer 1)

Simulated Time Period	Inflows						Total Inflows	Outflows				Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Recharge	Lost Pines GCD	Lower Layers		Specific Storage	Specific Yield	Evapo-transpiration	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0	57.4	29.0	17.3	7.08	110.7	0	0	0	110.7	110.7	1.36E-08	1.23E-08
1980	0	0	59.2	27.4	15.3	6.01	107.9	0	0	0	107.9	107.9	4.78E-09	4.43E-09
1981	0	0	55.5	35.1	17.0	7.94	115.5	0.003	1.55	0	114.0	115.5	-2.16E-09	-1.87E-09
1982	0.002	1.14	59.7	23.7	16.2	5.83	106.6	0	0	0	106.6	106.6	-4.11E-09	-3.86E-09
1983	0.001	0.695	60.2	24.3	15.1	5.43	105.7	0	0	0	105.7	105.7	5.69E-10	5.38E-10
1984	0.002	1.31	62.6	20.6	13.5	3.77	101.8	0	0	0	101.8	101.8	-2.91E-09	-2.85E-09
1985	0	0	57.4	33.1	14.9	6.83	112.2	0.002	1.66	0	110.5	112.2	2.69E-09	2.40E-09
1986	0	0	57.2	31.2	16.1	7.02	111.6	0.001	0.742	0	110.8	111.6	1.41E-09	1.26E-09
1987	0	0	56.5	31.6	17.1	7.46	112.7	0.001	0.634	0	112.1	112.7	-6.79E-09	-6.02E-09
1988	0.004	2.96	64.3	14.6	14.1	3.11	99.0	0	0	0	99.0	99.0	4.98E-09	5.03E-09
1989	0.001	1.20	63.9	19.4	11.9	2.44	98.9	4.00E-09	5.98E-06	0	98.9	98.9	9.08E-11	9.18E-11
1990	0	0	60.0	28.9	12.7	5.04	106.7	0.001	1.17	0	105.5	106.7	-6.18E-09	-5.80E-09
1991	0	0	56.7	34.5	15.0	7.14	113.3	0.003	1.87	0	111.5	113.3	-4.51E-09	-3.98E-09
1992	0	0	53.8	38.9	20.2	8.84	121.7	0.004	2.12	0.023	119.5	121.7	-1.98E-09	-1.63E-09
1993	0.002	1.15	58.6	24.9	17.5	6.57	108.6	0	0	0	108.6	108.6	4.19E-10	3.86E-10
1994	0	0	56.3	31.4	17.8	7.63	113.2	9.21E-04	0.485	0	112.7	113.2	3.45E-09	3.05E-09
1995	0.002	1.07	59.3	24.3	16.7	6.10	107.5	0	0	0	107.5	107.5	-1.16E-09	-1.08E-09
1996	0.003	2.24	63.6	17.2	13.9	3.42	100.3	0	0	0	100.3	100.3	7.54E-09	7.51E-09
1997	0	0	57.0	33.8	15.2	7.04	113.0	0.002	1.79	0	111.2	113.0	-8.26E-09	-7.31E-09
1998	0	0	55.9	33.9	16.9	7.73	114.4	0.002	1.20	0	113.2	114.4	-1.38E-09	-1.20E-09
1999	0.003	1.99	61.8	19.4	15.1	4.62	102.9	0	0	0	102.9	102.9	9.02E-10	8.77E-10
2000	0	0	58.6	29.5	15.3	6.34	109.7	8.63E-04	0.594	0	109.1	109.7	-4.25E-09	-3.87E-09
2001	2.94E-04	0.198	59.4	26.4	15.1	5.80	107.0	0	0	0	107.0	107.0	1.60E-10	1.50E-10
2002	0	0	51.1	44.9	23.5	10.00	129.6	0.007	3.46	0.115	126.0	129.6	-4.68E-09	-3.61E-09
2003	5.93E-08	1.98E-04	54.4	32.8	24.9	8.62	120.7	1.57E-04	0.083	0.118	120.5	120.7	-2.52E-09	-2.09E-09
2004	1.37E-09	1.23E-04	50.0	43.0	31.9	10.6	135.5	0.005	1.92	0.314	133.3	135.5	-4.28E-09	-3.16E-09
2005	0.007	2.56	58.1	21.7	23.1	7.08	112.6	0	0	0.046	112.6	112.6	-8.73E-09	-7.75E-09
2006	0.004	2.34	61.0	19.4	16.8	5.33	104.9	0	0	0	104.9	104.9	5.93E-10	5.66E-10
2007	0	0	50.1	46.5	25.9	10.4	133.0	0.007	3.54	0.180	129.2	133.0	-4.38E-09	-3.30E-09
2008	0.006	2.87	60.7	18.5	17.8	5.77	105.6	0	0	0	105.6	105.6	1.03E-08	9.78E-09
2009	7.84E-04	0.468	58.8	26.5	16.5	6.33	108.6	3.46E-08	3.10E-04	0	108.6	108.6	4.60E-09	4.24E-09
2010	0	0	56.0	33.1	17.3	7.71	114.1	0.002	0.946	0	113.2	114.1	-9.00E-09	-7.88E-09
2011	0.004	2.88	63.7	15.3	14.3	3.42	99.6	0	0	0	99.6	99.6	-9.98E-10	-1.00E-09
2012	4.30E-10	3.90E-05	60.6	26.4	13.7	5.01	105.7	2.07E-04	0.169	0	105.6	105.7	-6.43E-09	-6.08E-09
2013	0	0	59.1	28.9	14.3	5.81	108.1	7.77E-04	0.600	0	107.5	108.1	-1.77E-09	-1.64E-09
2014	3.25E-04	0.244	60.3	25.6	14.1	5.19	105.5	0	0	0	105.5	105.5	-4.53E-09	-4.30E-09
2015	0	0	52.7	42.4	19.8	9.20	124.1	0.005	3.14	0.017	120.9	124.1	-5.04E-09	-4.06E-09
2016	6.28E-11	5.66E-06	51.9	40.4	27.2	9.76	129.3	0.004	1.73	0.193	127.3	129.3	7.61E-09	5.89E-09
2017	3.81E-04	0.137	53.9	33.0	27.4	8.86	123.3	0	0	0.174	123.1	123.3	-5.49E-09	-4.45E-09

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - (Layer 2) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	2,833	4.11E-05	1.86E-06	9.54E-05	54.6	9,436	12,324
1980	0	0	2,862	4.13E-05	1.82E-06	9.57E-05	54.8	9,388	12,305
1981	0.015	0.080	2,842	4.12E-05	1.83E-06	9.54E-05	54.6	9,397	12,293
1982	0.037	0.587	2,853	4.12E-05	1.82E-06	9.54E-05	54.7	9,368	12,276
1983	0.005	0.111	2,857	4.12E-05	1.81E-06	9.54E-05	54.7	9,363	12,274
1984	0.012	0.256	2,872	4.13E-05	1.80E-06	9.57E-05	54.8	9,373	12,300
1985	0.006	0.074	2,850	4.12E-05	1.82E-06	9.54E-05	54.7	9,387	12,291
1986	0.007	0.038	2,845	4.12E-05	1.83E-06	9.54E-05	54.6	9,396	12,295
1987	0.007	0.094	2,842	4.12E-05	1.84E-06	9.54E-05	54.6	9,400	12,297
1988	0.048	1.08	2,874	4.13E-05	1.81E-06	9.57E-05	54.8	9,363	12,293
1989	0.011	0.154	2,872	4.12E-05	1.79E-06	9.54E-05	54.7	9,329	12,255
1990	0.010	0.060	2,860	4.12E-05	1.79E-06	9.54E-05	54.7	9,362	12,277
1991	0.013	0.127	2,846	4.12E-05	1.81E-06	9.54E-05	54.7	9,397	12,297
1992	0.008	0.062	2,839	4.13E-05	1.84E-06	9.57E-05	54.8	9,454	12,348
1993	0.065	1.09	2,849	4.12E-05	1.83E-06	9.54E-05	54.7	9,382	12,287
1994	0.063	0.880	2,853	4.12E-05	1.84E-06	9.54E-05	54.6	9,378	12,287
1995	0.015	0.362	2,861	4.12E-05	1.83E-06	9.54E-05	54.7	9,357	12,273
1996	0.024	0.574	2,884	4.13E-05	1.80E-06	9.57E-05	54.8	9,347	12,286
1997	0.006	0.038	2,859	4.12E-05	1.82E-06	9.54E-05	54.7	9,370	12,283
1998	0.004	0.026	2,844	4.12E-05	1.85E-06	9.54E-05	54.6	9,401	12,299
1999	0.043	0.898	2,862	4.12E-05	1.84E-06	9.54E-05	54.7	9,351	12,269
2000	2.13E-05	6.82E-05	2,859	4.13E-05	1.85E-06	9.57E-05	54.8	9,415	12,328
2001	0.019	0.198	2,853	4.12E-05	1.84E-06	9.54E-05	54.7	9,381	12,289
2002	0.013	0.086	2,824	4.11E-05	1.88E-06	9.54E-05	54.6	9,454	12,333
2003	0.085	0.943	2,832	4.12E-05	1.88E-06	9.54E-05	54.6	9,423	12,311
2004	0.488	3.58	2,845	4.13E-05	1.89E-06	9.57E-05	54.7	9,415	12,319
2005	0.193	2.31	2,870	4.12E-05	1.86E-06	9.54E-05	54.6	9,304	12,231
2006	0.019	0.511	2,885	4.12E-05	1.83E-06	9.54E-05	54.7	9,273	12,213
2007	0	0	2,842	4.12E-05	1.87E-06	9.54E-05	54.6	9,398	12,295
2008	0.326	3.45	2,887	4.13E-05	1.85E-06	9.57E-05	54.8	9,306	12,252
2009	6.41E-06	8.25E-04	2,860	4.12E-05	1.84E-06	9.54E-05	54.7	9,363	12,277
2010	0.001	0.005	2,848	4.12E-05	1.85E-06	9.54E-05	54.6	9,393	12,295
2011	0.050	1.04	2,870	4.12E-05	1.83E-06	9.54E-05	54.7	9,332	12,258
2012	0.209	1.52	2,881	4.13E-05	1.78E-06	9.57E-05	54.8	9,340	12,278
2013	0.010	0.035	2,856	4.12E-05	1.78E-06	9.54E-05	54.7	9,366	12,277
2014	0.165	1.33	2,864	4.12E-05	1.78E-06	9.54E-05	54.7	9,336	12,255
2015	0.053	0.272	2,841	4.12E-05	1.80E-06	9.55E-05	54.6	9,392	12,288
2016	0.085	0.550	2,842	4.13E-05	1.83E-06	9.57E-05	54.8	9,427	12,324
2017	0.030	0.435	2,840	4.12E-05	1.79E-06	9.55E-05	54.6	9,384	12,280

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	9,491	2.35E-04	2.40E-06	1.77E-04	0.307	2,833	12,324	2.00E-10	1.62E-12
1980	0	0	9,443	2.36E-04	2.44E-06	1.77E-04	0.306	2,862	12,305	-1.33E-10	-1.08E-12
1981	0.036	0.717	9,451	2.35E-04	2.43E-06	1.77E-04	0.306	2,841	12,293	3.09E-11	2.52E-13
1982	0.011	0.136	9,423	2.35E-04	2.43E-06	1.77E-04	0.305	2,853	12,276	6.18E-11	5.04E-13
1983	0.014	0.183	9,417	2.35E-04	2.43E-06	1.77E-04	0.305	2,857	12,274	2.36E-11	1.93E-13
1984	0.013	0.161	9,428	2.36E-04	2.44E-06	1.77E-04	0.305	2,872	12,300	-3.46E-11	-2.81E-13
1985	0.037	0.726	9,441	2.35E-04	2.42E-06	1.77E-04	0.306	2,849	12,291	-3.27E-11	-2.66E-13
1986	0.006	0.147	9,450	2.35E-04	2.42E-06	1.77E-04	0.306	2,845	12,295	1.82E-12	1.48E-14
1987	0.005	0.084	9,455	2.35E-04	2.42E-06	1.77E-04	0.306	2,842	12,297	3.46E-11	2.81E-13
1988	0.009	0.050	9,418	2.36E-04	2.43E-06	1.77E-04	0.304	2,874	12,293	-5.46E-12	-4.44E-14
1989	0.001	0.022	9,383	2.35E-04	2.43E-06	1.77E-04	0.304	2,871	12,255	7.09E-11	5.79E-13
1990	0.038	0.744	9,416	2.35E-04	2.43E-06	1.77E-04	0.305	2,860	12,277	9.09E-12	7.41E-14
1991	0.084	0.867	9,451	2.35E-04	2.43E-06	1.77E-04	0.306	2,845	12,297	-8.73E-11	-7.10E-13
1992	0.024	0.524	9,508	2.36E-04	2.43E-06	1.77E-04	0.308	2,839	12,348	-3.27E-11	-2.65E-13
1993	9.01E-04	0.003	9,437	2.35E-04	2.43E-06	1.77E-04	0.305	2,849	12,287	1.27E-11	1.04E-13
1994	0.006	0.098	9,434	2.35E-04	2.42E-06	1.77E-04	0.306	2,853	12,287	-1.46E-11	-1.18E-13
1995	0.009	0.093	9,412	2.35E-04	2.42E-06	1.77E-04	0.305	2,861	12,273	-5.09E-11	-4.15E-13
1996	0.010	0.089	9,402	2.36E-04	2.43E-06	1.77E-04	0.304	2,884	12,286	-1.02E-10	-8.29E-13
1997	0.040	0.866	9,424	2.35E-04	2.42E-06	1.77E-04	0.306	2,858	12,283	-1.09E-10	-8.89E-13
1998	0.067	1.15	9,455	2.35E-04	2.40E-06	1.77E-04	0.306	2,843	12,299	-7.64E-11	-6.21E-13
1999	0.003	0.028	9,407	2.35E-04	2.40E-06	1.77E-04	0.304	2,862	12,269	-2.58E-10	-2.11E-12
2000	0.157	1.43	9,468	2.36E-04	2.41E-06	1.77E-04	0.307	2,858	12,328	-1.24E-10	-1.00E-12
2001	1.40E-04	5.14E-04	9,436	2.35E-04	2.40E-06	1.77E-04	0.305	2,852	12,289	-1.46E-11	-1.18E-13
2002	0.052	1.21	9,507	2.35E-04	2.39E-06	1.77E-04	0.308	2,824	12,333	-4.00E-11	-3.24E-13
2003	6.19E-07	8.02E-05	9,479	2.35E-04	2.40E-06	1.77E-04	0.306	2,832	12,311	0	0
2004	8.90E-04	0.135	9,473	2.35E-04	2.40E-06	1.77E-04	0.306	2,846	12,319	-4.91E-11	-3.99E-13
2005	0	0	9,361	2.35E-04	2.41E-06	1.77E-04	0.301	2,870	12,231	-1.15E-10	-9.37E-13
2006	0.030	0.202	9,328	2.35E-04	2.41E-06	1.77E-04	0.300	2,885	12,213	0	0
2007	0.301	3.43	9,450	2.35E-04	2.40E-06	1.77E-04	0.306	2,841	12,295	-9.28E-11	-7.55E-13
2008	0	0	9,363	2.35E-04	2.41E-06	1.77E-04	0.301	2,888	12,252	-1.46E-11	-1.19E-13
2009	0.545	4.39	9,414	2.35E-04	2.40E-06	1.77E-04	0.305	2,858	12,277	-4.18E-11	-3.41E-13
2010	0.092	0.999	9,447	2.35E-04	2.40E-06	1.77E-04	0.306	2,847	12,295	2.55E-11	2.07E-13
2011	0.002	0.010	9,388	2.35E-04	2.40E-06	1.77E-04	0.303	2,870	12,258	-2.36E-11	-1.93E-13
2012	8.02E-04	0.052	9,396	2.36E-04	2.45E-06	1.77E-04	0.304	2,881	12,278	-1.35E-10	-1.10E-12
2013	0.344	2.70	9,419	2.35E-04	2.44E-06	1.77E-04	0.305	2,855	12,277	-5.09E-11	-4.15E-13
2014	0	0	9,391	2.35E-04	2.44E-06	1.77E-04	0.303	2,864	12,255	-2.91E-11	-2.37E-13
2015	0.032	0.872	9,446	2.35E-04	2.44E-06	1.77E-04	0.305	2,841	12,288	-3.09E-11	-2.52E-13
2016	0.002	0.150	9,482	2.36E-04	2.44E-06	1.77E-04	0.306	2,842	12,324	-9.28E-11	-7.53E-13
2017	0.037	0.258	9,439	2.35E-04	2.46E-06	1.77E-04	0.304	2,840	12,280	-1.27E-11	-1.04E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	3,630	164.4	103.3	163.1	75.5	2,943	4,915	11,995
1980	0	0	3,647	155.2	103.1	156.3	75.6	2,970	4,915	12,022
1981	0.014	0	3,635	198.9	105.7	163.4	75.4	2,954	4,918	12,051
1982	0.328	22.3	3,636	134.4	102.8	157.3	75.4	2,960	4,897	11,985
1983	0.133	9.64	3,635	137.8	102.7	153.3	75.4	2,963	4,896	11,973
1984	0.229	16.5	3,645	117.0	102.7	147.6	75.6	2,976	4,902	11,981
1985	0.008	0	3,633	187.5	104.1	156.4	75.4	2,960	4,913	12,030
1986	0.006	0	3,633	177.1	104.5	160.9	75.4	2,955	4,913	12,020
1987	0.010	0	3,634	179.2	104.8	163.7	75.4	2,953	4,914	12,024
1988	0.695	48.6	3,646	82.9	102.6	148.4	75.6	2,975	4,893	11,973
1989	0.170	11.1	3,636	110.1	102.2	142.0	75.4	2,972	4,884	11,933
1990	0.009	0	3,634	163.8	102.8	148.4	75.4	2,966	4,902	11,992
1991	0.016	0	3,633	195.4	105.5	158.8	75.4	2,956	4,917	12,041
1992	0.008	0	3,642	220.5	107.4	167.6	75.6	2,957	4,943	12,112
1993	0.452	27.7	3,634	141.0	102.9	161.8	75.4	2,958	4,902	12,004
1994	0.098	0	3,636	177.9	104.3	163.8	75.4	2,965	4,915	12,038
1995	0.258	18.3	3,637	137.6	103.0	158.1	75.4	2,968	4,901	11,999
1996	0.439	31.2	3,647	97.7	102.7	147.0	75.6	2,986	4,898	11,985
1997	0.006	0	3,635	191.7	104.2	156.6	75.4	2,969	4,916	12,049
1998	0.004	0	3,632	192.1	105.6	164.2	75.4	2,956	4,919	12,044
1999	0.508	34.6	3,634	110.1	102.7	154.1	75.4	2,966	4,890	11,968
2000	1.04E-05	0	3,642	167.1	103.3	157.7	75.6	2,967	4,917	12,030
2001	0.060	2.51	3,633	149.9	103.0	156.8	75.4	2,960	4,901	11,981
2002	0.013	0	3,630	254.8	108.3	170.6	75.4	2,947	4,940	12,127
2003	0.238	9.81	3,632	185.9	105.1	170.1	75.4	2,951	4,916	12,046
2004	0.531	0	3,645	244.0	108.4	175.6	75.7	2,976	4,943	12,168
2005	0.915	50.8	3,638	123.3	103.1	163.8	75.4	2,982	4,884	12,021
2006	0.463	32.5	3,639	110.2	102.8	153.8	75.4	2,991	4,872	11,977
2007	0	0	3,633	263.9	108.5	169.6	75.4	2,967	4,934	12,153
2008	1.11	52.4	3,649	104.7	103.1	158.9	75.7	2,994	4,892	12,031
2009	0.029	1.74	3,634	150.5	102.9	157.0	75.4	2,967	4,899	11,987
2010	0.001	0	3,633	187.5	104.9	163.2	75.4	2,959	4,913	12,036
2011	0.636	44.1	3,635	86.7	102.5	149.3	75.4	2,971	4,878	11,943
2012	0.230	0.105	3,646	149.6	103.1	149.1	75.6	2,988	4,899	12,010
2013	0.006	0	3,633	163.7	102.9	152.5	75.4	2,963	4,876	11,966
2014	0.245	3.31	3,635	145.3	102.9	151.8	75.4	2,970	4,863	11,947
2015	0.041	0	3,633	240.2	108.0	165.1	75.4	2,960	4,888	12,069
2016	0.084	0	3,644	229.1	107.6	170.5	75.6	2,967	4,901	12,094
2017	0.197	12.4	3,635	187.0	105.2	166.8	75.4	2,961	4,867	12,010

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	0	1,280	7.77	328.9	23.6	141.7	9,448	764.4	11,995	1.23E-08	1.02E-10
1980	0	0	71.5	1,282	6.31	329.2	24.9	142.1	9,400	766.3	12,022	1.09E-10	9.08E-13
1981	0.369	23.8	68.1	1,278	11.9	328.7	23.9	141.7	9,409	765.6	12,051	-2.01E-09	-1.67E-11
1982	0.014	0	63.9	1,278	5.37	328.1	24.6	141.7	9,379	764.0	11,985	-5.46E-12	-4.55E-14
1983	0.020	0	57.9	1,278	4.50	328.0	24.9	141.7	9,374	763.2	11,973	-2.51E-09	-2.10E-11
1984	0.017	0	52.6	1,282	2.22	328.6	25.9	142.1	9,384	763.9	11,981	4.95E-09	4.13E-11
1985	0.425	29.6	55.1	1,278	9.19	328.4	24.5	141.7	9,399	763.9	12,030	2.91E-11	2.42E-13
1986	0.144	9.70	55.2	1,278	9.67	328.4	24.3	141.7	9,408	764.5	12,020	-9.37E-10	-7.79E-12
1987	0.093	6.19	58.0	1,278	10.1	328.5	23.9	141.7	9,412	765.0	12,024	8.03E-08	6.68E-10
1988	0.008	0	56.5	1,282	5.63E-04	328.5	25.9	142.1	9,374	763.7	11,973	2.00E-09	1.67E-11
1989	0.004	0.150	57.6	1,278	0.634	327.5	26.4	141.7	9,340	761.0	11,933	7.28E-11	6.10E-13
1990	0.338	23.0	53.4	1,278	5.96	328.0	25.6	141.7	9,373	762.4	11,992	2.93E-10	2.44E-12
1991	0.472	29.3	53.4	1,278	11.2	328.6	24.7	141.7	9,408	765.1	12,041	7.40E-10	6.15E-12
1992	0.411	27.5	56.0	1,282	15.7	329.8	23.7	142.1	9,466	769.4	12,112	1.01E-08	8.33E-11
1993	5.97E-04	0	65.9	1,278	6.69	328.2	24.0	141.7	9,394	765.1	12,004	-4.18E-11	-3.49E-13
1994	0.075	5.98	94.6	1,278	9.17	328.3	23.5	141.7	9,391	765.4	12,038	2.69E-09	2.24E-11
1995	0.013	0	88.3	1,278	5.19	328.0	24.1	141.7	9,369	764.1	11,999	6.45E-09	5.38E-11
1996	0.011	0	84.5	1,282	0.417	328.4	25.7	142.1	9,359	763.8	11,985	-8.50E-08	-7.10E-10
1997	0.486	34.4	86.1	1,278	9.16	328.3	24.2	141.7	9,382	764.1	12,049	1.62E-08	1.35E-10
1998	0.354	17.9	63.6	1,278	11.6	328.5	23.8	141.7	9,413	765.4	12,044	3.42E-10	2.84E-12
1999	0.003	0	66.1	1,278	2.88	327.8	25.0	141.7	9,363	763.0	11,968	7.28E-12	6.08E-14
2000	0.338	12.6	39.0	1,282	6.83	329.2	24.4	142.1	9,427	766.9	12,030	6.74E-09	5.60E-11
2001	7.56E-05	0	44.3	1,279	5.93	328.2	24.6	141.7	9,393	764.5	11,981	9.09E-11	7.59E-13
2002	0.817	54.4	47.5	1,279	16.9	329.3	22.9	141.7	9,466	768.5	12,127	-1.27E-11	-1.05E-13
2003	0.004	0.239	58.6	1,279	12.5	328.7	23.0	141.7	9,435	767.7	12,046	4.57E-09	3.79E-11
2004	0.318	24.1	153.8	1,281	17.0	329.2	23.2	142.1	9,428	769.4	12,168	1.27E-10	1.05E-12
2005	0	0	169.6	1,277	5.17	327.0	22.6	141.7	9,316	762.1	12,021	2.87E-10	2.39E-12
2006	0.034	0	161.3	1,277	1.57	326.7	23.8	141.7	9,285	759.9	11,977	-2.73E-10	-2.28E-12
2007	1.24	65.8	121.6	1,278	16.9	328.5	22.6	141.7	9,411	765.8	12,153	3.46E-11	2.84E-13
2008	0	0	174.0	1,281	3.16	327.7	23.6	142.1	9,317	762.5	12,031	-6.37E-11	-5.29E-13
2009	0.667	1.30	70.0	1,278	5.24	327.9	23.8	141.7	9,375	763.3	11,987	1.17E-08	9.76E-11
2010	0.345	19.8	64.1	1,278	10.0	328.4	23.4	141.7	9,405	765.2	12,036	-1.53E-08	-1.27E-10
2011	2.94E-04	0	64.1	1,278	0.262	327.5	25.4	141.7	9,343	762.2	11,943	-1.45E-08	-1.21E-10
2012	0.090	9.73	102.2	1,281	4.36	328.5	25.4	142.1	9,352	764.4	12,010	6.64E-09	5.53E-11
2013	0.561	13.5	27.7	1,278	6.59	328.6	25.1	141.7	9,378	766.6	11,966	-2.22E-09	-1.86E-11
2014	1.19E-04	0.007	55.8	1,278	5.26	328.1	25.4	141.7	9,346	766.6	11,947	1.09E-07	9.12E-10
2015	0.684	48.7	56.5	1,277	16.8	329.0	23.6	141.7	9,404	771.6	12,069	-1.68E-08	-1.39E-10
2016	0.263	17.6	69.5	1,280	17.0	329.9	23.4	142.0	9,438	776.0	12,094	4.44E-08	3.67E-10
2017	0.039	0	58.0	1,277	12.5	328.6	23.3	141.7	9,396	773.9	12,010	5.09E-10	4.24E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	98.5	0.117	0.441	0.084	764.4	4,887	5,751
1980	0	0	92.9	0.115	0.436	0.084	766.3	4,886	5,746
1981	4.08E-04	0	119.1	0.133	0.437	0.084	765.6	4,890	5,776
1982	0.381	0.619	80.5	0.114	0.436	0.084	764.0	4,869	5,715
1983	0.013	2.82E-05	82.5	0.114	0.429	0.084	763.2	4,867	5,714
1984	0.039	0.457	70.1	0.113	0.417	0.084	763.9	4,873	5,708
1985	2.55E-04	0	112.3	0.123	0.427	0.084	763.9	4,885	5,762
1986	0.066	0.012	106.1	0.125	0.433	0.084	764.5	4,885	5,756
1987	3.52E-04	0	107.3	0.127	0.436	0.084	765.0	4,886	5,759
1988	0.304	1.72	49.6	0.113	0.415	0.084	763.7	4,864	5,680
1989	0.009	0	66.0	0.112	0.405	0.084	761.0	4,856	5,683
1990	7.71E-04	0	98.1	0.114	0.420	0.084	762.4	4,874	5,735
1991	5.04E-04	0	117.0	0.132	0.429	0.084	765.1	4,889	5,772
1992	1.89E-04	0	132.1	0.143	0.443	0.084	769.4	4,915	5,817
1993	0.573	0.506	84.5	0.114	0.445	0.084	765.1	4,874	5,726
1994	0.003	0	106.5	0.123	0.438	0.084	765.4	4,887	5,760
1995	0.190	0.518	82.4	0.115	0.438	0.084	764.1	4,873	5,721
1996	0.082	0.899	58.5	0.113	0.415	0.084	763.8	4,869	5,693
1997	5.13E-05	0	114.8	0.123	0.428	0.084	764.1	4,888	5,768
1998	8.33E-05	0	115.0	0.132	0.437	0.084	765.4	4,891	5,772
1999	0.371	1.14	66.0	0.114	0.427	0.084	763.0	4,862	5,693
2000	2.09E-05	0	100.1	0.115	0.431	0.084	766.9	4,889	5,757
2001	0.049	0.234	89.8	0.115	0.436	0.084	764.5	4,873	5,728
2002	2.62E-04	0	152.6	0.150	0.449	0.084	768.3	4,912	5,833
2003	0.600	0.116	111.3	0.128	0.448	0.084	767.7	4,888	5,769
2004	0.021	0	146.2	0.147	0.459	0.084	768.9	4,914	5,830
2005	0.836	0.936	73.8	0.113	0.451	0.084	762.1	4,856	5,694
2006	0.065	0.348	66.0	0.113	0.428	0.084	759.9	4,844	5,671
2007	0	0	158.1	0.150	0.451	0.084	765.5	4,906	5,830
2008	1.02	1.37	62.7	0.113	0.438	0.084	762.5	4,864	5,692
2009	0	0	90.1	0.114	0.437	0.084	763.3	4,871	5,725
2010	7.43E-04	0	112.3	0.127	0.438	0.084	765.2	4,885	5,763
2011	0.358	1.64	51.9	0.113	0.417	0.084	762.2	4,850	5,666
2012	0.014	0	89.6	0.114	0.423	0.084	764.4	4,871	5,725
2013	0.006	0	98.0	0.114	0.427	0.083	766.6	4,848	5,713
2014	0.070	0.344	87.1	0.114	0.427	0.083	766.6	4,835	5,690
2015	0.011	0	143.9	0.147	0.440	0.083	771.5	4,860	5,776
2016	0.086	0.012	137.2	0.142	0.450	0.084	775.7	4,873	5,786
2017	0.387	0.076	112.0	0.127	0.446	0.083	773.8	4,840	5,726

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	87.8	0.430	0.040	0.172	4,889	773.5	5,751	1.94E-09	3.37E-11
1980	0	0	84.5	0.429	0.023	0.173	4,888	773.2	5,746	9.09E-12	1.58E-13
1981	0.371	0.199	89.0	0.430	0.290	0.172	4,892	793.1	5,776	-1.64E-10	-2.83E-12
1982	5.02E-04	0	73.4	0.428	0.021	0.172	4,871	770.5	5,715	-5.46E-12	-9.55E-14
1983	0.001	0.037	74.4	0.427	0.021	0.172	4,869	769.8	5,714	-2.34E-10	-4.09E-12
1984	8.00E-04	0	62.8	0.428	0.019	0.173	4,875	770.3	5,708	4.57E-10	8.00E-12
1985	0.302	1.01	88.6	0.429	0.196	0.172	4,887	784.6	5,762	1.82E-12	3.16E-14
1986	0.011	0	88.3	0.429	0.128	0.172	4,887	780.7	5,756	-7.82E-11	-1.36E-12
1987	0.025	0.003	88.4	0.429	0.143	0.172	4,888	782.2	5,759	6.96E-09	1.21E-10
1988	1.73E-04	0	44.3	0.427	0.016	0.173	4,866	769.5	5,680	1.99E-10	3.51E-12
1989	0.012	0.523	57.8	0.426	0.018	0.172	4,857	767.2	5,683	1.09E-11	1.92E-13
1990	0.093	1.16	87.7	0.428	0.029	0.172	4,875	770.2	5,735	2.73E-11	4.76E-13
1991	0.335	0.063	88.9	0.430	0.266	0.172	4,891	790.9	5,772	5.82E-11	1.01E-12
1992	0.255	0.048	90.1	0.432	0.453	0.173	4,917	808.5	5,817	8.39E-10	1.44E-11
1993	2.98E-04	0	77.4	0.428	0.021	0.172	4,876	771.7	5,726	0	0
1994	0.165	0.426	88.3	0.429	0.127	0.172	4,889	781.4	5,760	2.05E-10	3.55E-12
1995	3.90E-04	0	75.0	0.428	0.021	0.172	4,874	770.7	5,721	5.67E-10	9.90E-12
1996	2.62E-04	0	52.0	0.427	0.017	0.173	4,871	769.9	5,693	-7.68E-09	-1.35E-10
1997	0.354	1.44	88.7	0.429	0.223	0.172	4,890	786.6	5,768	1.46E-09	2.53E-11
1998	0.061	0.010	88.9	0.430	0.241	0.172	4,893	789.6	5,772	1.82E-12	3.15E-14
1999	1.91E-05	0	59.8	0.427	0.018	0.172	4,863	769.2	5,693	3.64E-12	6.39E-14
2000	0.104	1.09	88.0	0.429	0.041	0.173	4,890	776.2	5,757	6.51E-10	1.13E-11
2001	4.49E-05	0	81.8	0.428	0.022	0.172	4,874	771.2	5,728	-2.27E-11	-3.97E-13
2002	0.896	0.397	91.1	0.432	0.711	0.172	4,914	825.5	5,833	-7.28E-12	-1.25E-13
2003	0	0	88.8	0.430	0.195	0.172	4,890	788.7	5,769	3.13E-10	5.42E-12
2004	0.482	0.095	90.9	0.432	0.626	0.173	4,917	820.1	5,830	9.09E-12	1.56E-13
2005	0	0	67.3	0.426	0.019	0.172	4,857	768.8	5,694	2.46E-11	4.31E-13
2006	0.001	0	58.4	0.425	0.018	0.172	4,846	766.4	5,671	-2.64E-11	-4.65E-13
2007	1.05	1.31	91.3	0.431	0.770	0.172	4,908	826.9	5,830	7.28E-12	1.25E-13
2008	0	0	57.0	0.427	0.017	0.173	4,865	768.9	5,692	-7.28E-12	-1.28E-13
2009	0.097	0.927	80.9	0.427	0.022	0.172	4,872	770.2	5,725	7.61E-10	1.33E-11
2010	0.272	0.310	88.6	0.429	0.202	0.172	4,887	786.4	5,763	-1.29E-09	-2.23E-11
2011	0	0	46.5	0.426	0.016	0.172	4,851	768.1	5,666	-6.61E-10	-1.17E-11
2012	0.038	1.28	79.8	0.427	0.022	0.173	4,872	771.4	5,725	4.99E-10	8.72E-12
2013	0.049	0.314	87.6	0.427	0.033	0.172	4,849	775.1	5,713	-2.69E-10	-4.71E-12
2014	1.15E-04	0	78.8	0.426	0.022	0.172	4,837	773.8	5,690	3.43E-09	6.03E-11
2015	0.737	0.480	90.4	0.429	0.597	0.173	4,862	821.0	5,776	-9.90E-10	-1.71E-11
2016	0.019	0	90.4	0.430	0.516	0.173	4,876	819.4	5,786	6.51E-09	1.13E-10
2017	6.85E-04	0	88.6	0.427	0.200	0.173	4,842	795.1	5,726	-1.18E-11	-2.06E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	22,645	810.8	11,333	773.5	484.4	36,047
1980	0	22,953	818.8	11,449	773.2	482.1	36,476
1981	0	22,812	817.0	11,493	793.1	481.6	36,396
1982	3.62	22,901	816.4	11,347	770.5	481.5	36,320
1983	0.319	22,907	816.5	11,349	769.8	481.3	36,324
1984	1.36	23,001	818.6	11,327	770.3	482.6	36,401
1985	0	22,829	816.9	11,452	784.6	481.8	36,364
1986	0	22,823	816.7	11,427	780.7	482.0	36,329
1987	1.68E-04	22,815	816.6	11,422	782.2	482.2	36,317
1988	6.29	23,032	818.0	11,238	769.5	482.8	36,346
1989	0.029	22,957	816.1	11,286	767.2	481.1	36,308
1990	0.030	22,881	816.8	11,425	770.2	481.1	36,374
1991	0	22,812	817.0	11,478	790.9	481.6	36,379
1992	0	22,818	819.4	11,544	808.5	483.3	36,473
1993	4.74	22,866	816.2	11,342	771.7	481.9	36,283
1994	0.012	22,823	816.3	11,419	781.4	482.2	36,322
1995	2.44	22,880	815.9	11,339	770.7	482.0	36,290
1996	3.09	23,017	817.8	11,278	769.9	482.8	36,369
1997	0	22,816	816.4	11,467	786.6	481.9	36,367
1998	0	22,789	816.4	11,474	789.6	482.3	36,352
1999	5.14	22,914	815.6	11,291	769.2	481.9	36,277
2000	0.003	22,910	818.4	11,458	776.2	483.2	36,446
2001	0.572	22,861	816.1	11,392	771.2	481.9	36,323
2002	0	22,693	817.1	11,595	825.5	482.6	36,413
2003	3.98	22,791	816.1	11,456	788.7	482.8	36,339
2004	0.120	22,834	817.9	11,616	820.1	484.9	36,573
2005	8.24	22,971	814.3	11,360	768.8	483.1	36,405
2006	2.26	23,022	814.1	11,341	766.4	482.4	36,429
2007	0	22,737	816.0	11,630	826.9	483.5	36,494
2008	10.3	23,054	816.1	11,354	768.9	484.2	36,487
2009	0	22,872	815.6	11,395	770.2	482.2	36,335
2010	0.085	22,817	816.4	11,485	786.4	482.0	36,387
2011	6.31	22,979	815.9	11,270	768.1	481.0	36,320
2012	0.401	23,035	818.7	11,583	771.4	480.5	36,689
2013	0.850	23,023	817.8	11,706	775.1	476.4	36,800
2014	2.84	23,124	819.3	11,763	773.8	472.4	36,955
2015	0.714	23,078	822.6	12,035	821.0	467.8	37,225
2016	0.311	23,173	825.9	12,053	819.4	468.0	37,340
2017	3.44	23,222	824.5	11,918	795.1	464.3	37,227

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	3,459	12,327	856.3	14,327	4,877	201.3	36,047	5.91E-06	1.64E-08
1980	0	4.14	3,421	12,563	885.8	14,507	4,877	218.8	36,476	3.97E-08	1.09E-10
1981	3.19	4.41	3,471	12,506	850.8	14,464	4,881	215.6	36,396	-9.29E-07	-2.55E-09
1982	0	4.56	3,401	12,488	887.5	14,465	4,859	214.7	36,320	4.96E-09	1.37E-11
1983	0.002	4.54	3,395	12,492	892.0	14,465	4,857	217.7	36,324	-1.06E-06	-2.92E-09
1984	0.014	4.61	3,378	12,522	908.9	14,504	4,863	221.1	36,401	2.18E-06	5.99E-09
1985	4.41	4.53	3,452	12,485	862.2	14,460	4,875	220.1	36,364	6.77E-08	1.86E-10
1986	0.180	4.58	3,454	12,462	859.9	14,457	4,875	216.4	36,329	-3.66E-07	-1.01E-09
1987	0.276	4.66	3,457	12,453	857.1	14,455	4,877	214.1	36,317	3.92E-05	1.08E-07
1988	0	4.59	3,348	12,499	923.4	14,498	4,854	218.5	36,346	7.83E-07	2.15E-09
1989	0.461	4.74	3,350	12,504	918.1	14,461	4,845	224.5	36,308	4.37E-08	1.20E-10
1990	3.30	4.79	3,415	12,514	884.2	14,463	4,864	226.2	36,374	1.64E-07	4.51E-10
1991	2.89	4.81	3,467	12,489	853.5	14,461	4,879	221.6	36,379	3.21E-07	8.82E-10
1992	2.32	4.89	3,519	12,497	830.6	14,498	4,905	216.4	36,473	4.93E-06	1.35E-08
1993	0.028	8.83	3,417	12,448	877.4	14,455	4,865	212.7	36,283	1.24E-08	3.42E-11
1994	1.66	13.9	3,447	12,455	862.4	14,451	4,877	213.4	36,322	1.74E-06	4.80E-09
1995	0.003	11.7	3,401	12,462	887.3	14,450	4,863	214.5	36,290	3.14E-06	8.65E-09
1996	0	11.9	3,352	12,512	921.7	14,491	4,859	220.3	36,369	-3.73E-05	-1.02E-07
1997	5.58	11.7	3,450	12,489	863.8	14,448	4,878	220.9	36,367	7.11E-06	1.95E-08
1998	1.11	12.4	3,471	12,469	853.5	14,447	4,881	216.5	36,352	4.81E-07	1.32E-09
1999	0	13.5	3,372	12,468	906.2	14,448	4,852	216.9	36,277	1.03E-08	2.83E-11
2000	2.69	12.5	3,435	12,523	882.6	14,490	4,879	221.3	36,446	2.54E-06	6.97E-09
2001	0.006	10.8	3,414	12,481	885.1	14,449	4,863	219.9	36,323	7.76E-08	2.14E-10
2002	7.01	11.5	3,547	12,470	811.7	14,447	4,902	216.5	36,413	7.14E-09	1.96E-11
2003	0	25.9	3,469	12,454	855.0	14,447	4,879	209.3	36,339	1.31E-06	3.59E-09
2004	1.12	80.4	3,500	12,546	855.5	14,482	4,905	202.7	36,573	6.41E-08	1.75E-10
2005	0	94.6	3,334	12,544	939.8	14,445	4,846	201.4	36,405	6.07E-08	1.67E-10
2006	0	96.1	3,294	12,586	964.8	14,445	4,834	208.0	36,429	-1.04E-07	-2.86E-10
2007	11.4	58.3	3,508	12,531	843.7	14,437	4,897	207.5	36,494	-5.33E-08	-1.46E-10
2008	0	94.1	3,321	12,581	954.0	14,478	4,854	204.9	36,487	5.06E-09	1.39E-11
2009	4.61	13.4	3,401	12,501	894.7	14,444	4,861	216.2	36,335	8.35E-06	2.30E-08
2010	2.74	13.6	3,454	12,504	864.9	14,452	4,875	220.9	36,387	-7.95E-06	-2.18E-08
2011	0	13.6	3,336	12,515	926.8	14,463	4,840	226.2	36,320	-1.43E-05	-3.94E-08
2012	0.889	2.96	3,375	12,764	923.0	14,522	4,861	240.5	36,689	4.05E-06	1.10E-08
2013	0.212	78.5	3,366	12,832	917.1	14,515	4,838	252.7	36,800	-1.06E-07	-2.89E-10
2014	0.042	34.3	3,336	12,989	938.3	14,561	4,825	270.7	36,955	1.00E-04	2.72E-07
2015	4.82	22.2	3,439	13,112	885.9	14,619	4,851	291.6	37,225	-1.26E-05	-3.37E-08
2016	0.186	18.6	3,451	13,148	884.2	14,685	4,864	289.0	37,340	-2.46E-05	-6.58E-08
2017	0	15.3	3,383	13,113	916.2	14,675	4,830	294.9	37,227	-9.50E-08	-2.55E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Reklaw Formation (Layer 6)

Simulated Time Period	Inflows					Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers		Specific Storage	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)														%
Predevelopment	0	0.793	5.80	200.5	470.1	677.2	0	11.1	0.005	7.52	484.4	174.2	677.2	6.66E-08	9.84E-09
1980	0	0.668	5.88	218.0	468.9	693.5	0	11.7	0.054	7.72	482.1	191.9	693.5	1.36E-10	1.96E-11
1981	0	0.700	6.02	214.8	468.0	689.5	0.478	11.6	0.035	7.69	481.6	188.1	689.5	-4.80E-09	-6.97E-10
1982	0.382	0.684	5.82	213.9	468.3	689.0	0.002	11.6	0.047	7.69	481.5	188.2	689.0	3.30E-12	4.78E-13
1983	0.151	0.675	5.77	216.9	468.3	691.7	6.07E-04	11.6	0.057	7.69	481.3	191.0	691.7	-4.78E-09	-6.91E-10
1984	0.262	0.665	5.66	220.3	469.8	696.6	0.007	11.7	0.071	7.71	482.6	194.6	696.6	9.90E-09	1.42E-09
1985	0	0.691	5.88	219.2	468.3	694.1	0.526	11.6	0.051	7.68	481.8	192.5	694.1	8.22E-10	1.18E-10
1986	0	0.704	5.92	215.5	468.5	690.6	0.162	11.6	0.041	7.68	482.0	189.2	690.6	-1.67E-09	-2.42E-10
1987	0	0.713	5.94	213.3	468.5	688.5	0.116	11.5	0.033	7.67	482.2	187.0	688.5	1.87E-07	2.72E-08
1988	0.868	0.665	5.59	217.7	470.0	694.8	0	11.6	0.069	7.69	482.8	192.7	694.8	3.67E-09	5.28E-10
1989	0.198	0.642	5.57	223.6	468.5	698.4	0	11.7	0.084	7.68	481.1	197.9	698.4	-2.82E-11	-4.04E-12
1990	0.007	0.649	5.78	225.3	468.1	699.9	0.316	11.7	0.075	7.68	481.1	199.0	699.9	7.91E-10	1.13E-10
1991	0	0.681	5.97	220.7	468.1	695.4	0.507	11.7	0.050	7.69	481.6	193.9	695.4	1.50E-09	2.16E-10
1992	0	0.716	6.15	215.5	469.3	691.8	0.484	11.6	0.024	7.71	483.3	188.6	691.8	2.48E-08	3.58E-09
1993	0.431	0.702	5.86	211.8	468.5	687.3	0.006	11.5	0.037	7.68	481.9	186.2	687.3	3.90E-10	5.67E-11
1994	0	0.713	5.92	212.6	468.6	687.9	0.165	11.5	0.033	7.67	482.2	186.3	687.9	1.05E-07	1.52E-08
1995	0.323	0.695	5.78	213.7	468.7	689.2	0.001	11.5	0.046	7.67	482.0	188.0	689.2	1.61E-08	2.33E-09
1996	0.550	0.662	5.58	219.4	470.1	696.3	1.29E-05	11.6	0.073	7.69	482.8	194.1	696.3	-1.75E-07	-2.51E-08
1997	0	0.687	5.87	220.0	468.5	695.1	0.598	11.6	0.053	7.66	481.9	193.2	695.1	2.82E-08	4.05E-09
1998	0	0.707	5.97	215.6	468.6	691.0	0.297	11.5	0.036	7.66	482.3	189.1	691.0	4.03E-08	5.84E-09
1999	0.608	0.677	5.68	216.1	468.9	691.9	5.46E-05	11.5	0.059	7.66	481.9	190.8	691.9	1.96E-11	2.83E-12
2000	0.003	0.680	5.82	220.4	469.9	696.8	0.169	11.6	0.057	7.68	483.2	194.1	696.8	-1.29E-07	-1.86E-08
2001	0.037	0.678	5.78	219.0	468.7	694.2	0.002	11.6	0.058	7.66	481.9	193.0	694.2	-3.47E-11	-4.99E-12
2002	0	0.728	6.19	215.7	468.4	691.1	0.933	11.6	0.018	7.66	482.6	188.3	691.1	-8.64E-12	-1.25E-12
2003	0.185	0.727	6.05	208.6	468.9	684.4	0.003	11.5	0.017	7.66	482.8	182.5	684.4	5.76E-09	8.42E-10
2004	0	0.752	6.26	201.9	470.6	679.6	0.405	11.4	0	7.68	484.9	175.2	679.6	3.13E-10	4.60E-11
2005	0.913	0.703	5.83	200.6	469.9	677.9	0	11.4	0.032	7.65	483.1	175.8	677.9	7.04E-11	1.04E-11
2006	0.515	0.670	5.65	207.2	469.9	683.9	0	11.5	0.061	7.65	482.4	182.2	683.9	-4.81E-10	-7.03E-11
2007	0	0.747	6.18	206.7	469.4	683.1	1.33	11.5	0.011	7.64	483.5	179.2	683.1	-4.32E-09	-6.33E-10
2008	1.05	0.691	5.74	204.1	471.2	682.9	0	11.5	0.047	7.66	484.2	179.5	682.9	-1.19E-11	-1.75E-12
2009	0.006	0.687	5.76	215.3	469.1	690.9	0.068	11.5	0.052	7.65	482.2	189.3	690.9	1.47E-07	2.12E-08
2010	0.018	0.678	5.91	220.0	468.5	695.1	0.142	11.6	0.048	7.66	482.0	193.6	695.1	-3.25E-08	-4.68E-09
2011	0.929	0.619	5.58	225.3	468.5	700.9	0	11.7	0.087	7.67	481.0	200.5	700.9	-9.27E-07	-1.32E-07
2012	0.480	0.534	5.72	239.5	468.8	715.0	0	12.1	0.096	7.73	480.5	214.5	715.0	1.10E-07	1.54E-08
2013	0.590	0.439	6.03	251.7	465.6	724.4	0	12.6	0.116	7.78	476.4	227.5	724.4	1.57E-09	2.17E-10
2014	1.06	0.374	6.24	269.5	463.2	740.4	0	13.4	0.155	7.88	472.4	246.7	740.4	7.25E-07	9.79E-08
2015	0.467	0.338	6.93	290.4	459.5	757.7	0.073	14.2	0.163	8.01	467.8	267.4	757.7	-4.80E-08	-6.34E-09
2016	0.063	0.343	7.11	287.8	459.8	755.2	0.150	14.3	0.154	8.12	468.0	264.5	755.2	-3.89E-07	-5.15E-08
2017	0.692	0.343	6.99	293.7	457.0	758.7	0	14.5	0.171	8.18	464.3	271.6	758.7	-2.19E-10	-2.89E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	800.7	35.4	1,289	174.2	830.8	3,130
1980	0	869.1	32.1	1,325	191.9	842.4	3,261
1981	0	858.6	32.8	1,370	188.1	831.7	3,282
1982	2.93	857.8	32.4	1,304	188.2	840.0	3,226
1983	2.01	858.0	32.2	1,287	191.0	841.2	3,211
1984	2.91	858.0	32.2	1,252	194.6	843.9	3,183
1985	0	853.0	32.6	1,326	192.5	831.0	3,235
1986	0	850.6	32.8	1,336	189.2	830.8	3,239
1987	0	848.8	32.9	1,341	187.0	831.8	3,242
1988	8.25	854.9	32.0	1,228	192.7	849.2	3,165
1989	3.39	855.7	31.6	1,223	197.9	845.2	3,157
1990	0.156	858.5	31.6	1,296	199.0	837.3	3,223
1991	0	856.2	32.5	1,357	193.9	829.4	3,269
1992	0	856.0	33.1	1,411	188.6	829.3	3,318
1993	2.66	851.9	32.9	1,316	186.2	836.8	3,227
1994	0	848.1	33.1	1,331	186.3	833.8	3,232
1995	2.98	848.3	32.7	1,285	188.0	839.6	3,197
1996	5.92	852.2	32.1	1,222	194.1	848.1	3,154
1997	0	848.5	32.5	1,318	193.2	832.0	3,225
1998	0	845.2	32.9	1,349	189.1	829.3	3,246
1999	5.12	846.1	32.4	1,254	190.8	840.4	3,169
2000	0.121	850.2	32.4	1,299	194.1	839.2	3,215
2001	0.123	847.3	32.4	1,289	193.0	835.9	3,197
2002	0	844.6	33.2	1,418	188.3	824.0	3,308
2003	0.136	842.4	33.3	1,372	182.5	831.6	3,262
2004	0	840.1	34.1	1,436	175.2	829.3	3,315
2005	7.24	839.1	33.2	1,297	175.8	844.2	3,197
2006	5.93	841.1	32.7	1,240	182.2	847.4	3,149
2007	0	834.5	34.0	1,415	179.2	823.2	3,286
2008	8.01	840.1	33.1	1,270	179.5	846.2	3,177
2009	2.85	842.2	32.3	1,275	189.3	843.2	3,185
2010	0.851	848.7	31.9	1,325	193.6	841.8	3,242
2011	9.34	856.8	31.4	1,218	200.5	855.0	3,171
2012	8.55	884.0	30.9	1,229	214.5	874.7	3,242
2013	10.1	924.6	29.8	1,353	227.5	894.0	3,439
2014	15.8	999.3	28.9	1,453	246.7	928.5	3,672
2015	11.9	1,080	28.3	1,710	267.4	953.4	4,051
2016	1.09	1,096	29.3	1,768	264.5	934.7	4,093
2017	8.72	1,147	29.4	1,736	271.6	951.5	4,144

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	1,022	1,243	0	379.4	470.1	15.8	3,130	2.38E-06	7.62E-08
1980	0	4.62	891.4	1,491	0	395.8	468.9	8.98	3,261	-5.05E-10	-1.55E-11
1981	4.92	3.55	947.7	1,451	0	394.3	468.0	12.6	3,282	-8.72E-08	-2.66E-09
1982	0.059	3.49	902.7	1,448	0	394.0	468.3	9.64	3,226	4.67E-10	1.45E-11
1983	0.015	3.43	877.3	1,460	0	393.8	468.3	8.21	3,211	-1.93E-08	-6.02E-10
1984	0.155	2.88	840.1	1,469	0	394.5	469.8	6.30	3,183	4.60E-08	1.45E-09
1985	4.52	2.81	901.2	1,455	0	393.0	468.3	10.1	3,235	3.67E-08	1.14E-09
1986	2.32	2.71	927.4	1,434	0	392.6	468.5	11.6	3,239	-7.11E-09	-2.19E-10
1987	1.60	2.77	945.2	1,419	0	392.3	468.5	12.4	3,242	1.55E-06	4.78E-08
1988	0	2.85	836.1	1,456	0	393.5	470.0	5.89	3,165	7.81E-10	2.47E-11
1989	0	2.81	798.0	1,490	0	392.7	468.5	4.60	3,157	-1.14E-08	-3.60E-10
1990	2.05	2.92	835.2	1,515	0	393.3	468.1	6.38	3,223	8.83E-09	2.74E-10
1991	5.43	2.86	905.3	1,483	0	393.7	468.1	10.6	3,269	1.17E-08	3.59E-10
1992	5.54	3.02	977.5	1,453	0	394.8	469.3	14.6	3,318	2.66E-07	8.01E-09
1993	0.113	4.78	927.3	1,422	0	393.2	468.5	11.2	3,227	2.36E-08	7.32E-10
1994	1.36	1.18	943.2	1,413	0	392.5	468.6	12.0	3,232	6.17E-06	1.91E-07
1995	0.029	2.90	901.7	1,422	0	392.1	468.7	9.51	3,197	1.89E-07	5.92E-09
1996	0.006	2.87	826.6	1,456	0	392.9	470.1	5.56	3,154	-1.20E-06	-3.80E-08
1997	4.64	2.80	894.3	1,453	0	391.6	468.5	9.58	3,225	-1.05E-07	-3.25E-09
1998	3.62	2.45	938.5	1,429	0	391.3	468.6	12.2	3,246	2.53E-06	7.79E-08
1999	0.011	2.38	864.0	1,435	0	391.1	468.9	7.59	3,169	8.73E-11	2.76E-12
2000	0.447	3.08	879.3	1,461	0	392.4	469.9	8.42	3,215	-8.93E-06	-2.78E-07
2001	0.035	2.51	874.2	1,452	0	391.2	468.7	8.38	3,197	6.19E-08	1.94E-09
2002	8.57	3.13	992.6	1,428	0	391.3	468.4	15.6	3,308	-9.06E-10	-2.74E-11
2003	0.622	2.71	987.6	1,396	0	391.1	468.9	14.6	3,262	1.25E-08	3.83E-10
2004	5.61	2.39	1,061	1,365	0	391.8	470.6	18.8	3,315	5.85E-09	1.76E-10
2005	0.008	2.38	952.9	1,370	0	390.4	469.9	11.7	3,197	-9.45E-09	-2.95E-10
2006	5.13E-05	1.96	877.1	1,402	0	390.3	469.9	7.67	3,149	6.18E-10	1.96E-11
2007	11.2	1.47	1,031	1,366	0	389.7	469.4	17.4	3,286	-2.62E-07	-7.96E-09
2008	0	2.23	917.7	1,385	0	390.7	471.2	9.85	3,177	2.34E-10	7.36E-12
2009	0	3.18	888.6	1,426	0	390.0	469.1	8.44	3,185	7.20E-06	2.26E-07
2010	0.212	4.76	895.9	1,473	0	391.1	468.5	8.90	3,242	6.65E-08	2.05E-09
2011	0	4.76	776.9	1,525	0	392.2	468.5	3.58	3,171	-5.48E-05	-1.73E-06
2012	0	4.86	701.7	1,667	0	397.2	468.8	1.53	3,242	5.94E-06	1.83E-07
2013	0	5.28	642.6	1,916	5.34	403.8	465.6	0.415	3,439	1.69E-07	4.90E-09
2014	0	18.6	539.9	2,211	24.4	414.1	463.2	0	3,672	2.54E-05	6.92E-07
2015	0.021	36.5	512.5	2,580	33.7	428.5	459.5	0	4,051	-3.20E-07	-7.91E-09
2016	2.16	36.8	540.4	2,587	29.6	437.9	459.8	0	4,093	-1.47E-05	-3.58E-07
2017	0	57.6	472.7	2,676	36.4	444.9	457.0	0	4,144	5.67E-09	1.37E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Middle Wilcox (Layer 8)

Simulated Time Period	Inflows						Total Inflows	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers		Specific Storage	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)																%
Predevelopment	0	377.8	13.2	230.4	15.8	1,029	1,666	0	571.9	111.5	4.14	143.8	830.8	4.19	1,666	4.75E-07	2.85E-08
1980	0	390.4	6.40	233.5	8.98	1,032	1,672	0	544.5	134.2	0	148.4	842.4	2.23	1,672	-2.93E-10	-1.75E-11
1981	0	387.8	7.37	242.4	12.6	1,022	1,672	3.39	553.5	129.7	0.717	147.9	831.7	5.35	1,672	-1.39E-08	-8.34E-10
1982	1.76	388.0	6.76	230.0	9.64	1,031	1,667	0.071	546.4	130.2	0	147.8	840.0	2.49	1,667	-2.60E-10	-1.56E-11
1983	1.57	388.2	6.41	226.9	8.21	1,034	1,665	0.020	541.5	132.9	0	147.7	841.2	1.85	1,665	-2.97E-09	-1.79E-10
1984	2.38	389.5	6.43	221.4	6.30	1,040	1,666	0.069	535.4	137.4	0	148.0	843.9	1.34	1,666	6.25E-09	3.75E-10
1985	0	387.4	6.41	234.6	10.1	1,025	1,663	2.90	544.5	133.9	0	147.5	831.0	3.51	1,663	5.98E-09	3.60E-10
1986	0	386.8	6.71	236.3	11.6	1,023	1,665	1.92	549.8	130.2	0	147.4	830.8	4.58	1,665	-1.56E-09	-9.39E-11
1987	0	386.3	7.47	237.5	12.4	1,024	1,667	1.46	553.7	127.9	0.582	147.3	831.8	4.67	1,667	2.21E-07	1.33E-08
1988	5.64	388.9	6.43	216.9	5.89	1,045	1,669	0	535.9	134.9	0	147.7	849.2	1.24	1,669	-3.10E-10	-1.86E-11
1989	3.03	388.6	6.39	216.5	4.60	1,042	1,661	0	526.5	141.5	0	147.4	845.2	0.663	1,661	-2.05E-09	-1.24E-10
1990	0.170	388.7	6.38	229.4	6.38	1,031	1,662	1.12	532.0	142.5	0	147.5	837.3	1.31	1,662	1.69E-09	1.02E-10
1991	0.001	387.9	6.42	240.4	10.6	1,021	1,667	3.82	544.6	136.2	0	147.6	829.4	5.14	1,667	2.18E-09	1.31E-10
1992	0	387.9	7.82	251.2	14.6	1,021	1,682	4.44	559.6	129.9	2.13	148.1	829.3	8.62	1,682	3.88E-08	2.31E-09
1993	1.40	387.0	7.59	232.5	11.2	1,027	1,667	0.127	551.1	128.2	0	147.6	836.8	3.45	1,667	3.69E-09	2.21E-10
1994	0	386.3	7.79	235.3	12.0	1,026	1,667	0.956	553.8	127.2	0.558	147.4	833.8	3.77	1,667	9.38E-07	5.62E-08
1995	2.00	386.6	6.87	226.7	9.51	1,033	1,665	0.046	546.7	128.8	0	147.3	839.6	2.26	1,665	2.83E-08	1.70E-09
1996	4.48	388.6	6.45	216.1	5.56	1,046	1,667	0.007	533.9	136.3	0	147.6	848.1	0.999	1,667	-1.80E-07	-1.08E-08
1997	0	386.7	6.42	233.1	9.58	1,026	1,662	2.77	543.4	134.0	0	147.1	832.0	2.76	1,662	-1.84E-08	-1.11E-09
1998	0	385.8	7.04	238.8	12.2	1,022	1,666	2.76	551.9	129.7	0.145	147.0	829.3	5.21	1,666	4.34E-07	2.60E-08
1999	3.37	386.6	6.43	222.1	7.59	1,035	1,661	0.015	539.5	132.5	0	147.0	840.4	1.84	1,661	1.43E-09	8.60E-11
2000	0.228	387.8	6.44	229.8	8.42	1,034	1,666	0.238	542.5	134.9	0	147.4	839.2	1.90	1,666	-1.44E-06	-8.65E-08
2001	0.200	386.7	6.42	228.2	8.38	1,030	1,660	0.006	540.4	134.7	0	147.0	835.9	2.01	1,660	9.92E-09	5.98E-10
2002	0	385.2	8.07	253.1	15.6	1,017	1,679	6.19	561.4	128.0	2.92	147.0	824.0	9.26	1,679	-4.48E-11	-2.67E-12
2003	0.019	384.8	9.05	244.9	14.6	1,022	1,675	1.08	562.4	124.3	3.02	147.0	831.6	6.16	1,675	2.26E-09	1.35E-10
2004	0	384.5	12.7	258.5	18.8	1,021	1,695	4.38	577.2	120.6	6.63	147.3	829.3	9.80	1,695	7.21E-10	4.26E-11
2005	4.59	384.5	9.63	229.2	11.7	1,036	1,675	0.036	558.4	121.6	1.56	146.8	844.2	2.83	1,675	-2.05E-09	-1.22E-10
2006	4.68	385.5	6.86	217.7	7.67	1,044	1,666	0.002	543.8	127.0	0	146.8	847.4	1.42	1,666	-3.76E-10	-2.25E-11
2007	0	383.2	10.3	252.9	17.4	1,018	1,682	7.30	569.4	121.7	4.68	146.6	823.2	8.97	1,682	-4.16E-08	-2.47E-09
2008	4.98	385.6	8.02	223.6	9.85	1,040	1,672	6.22E-05	552.4	124.4	0	147.0	846.2	2.23	1,672	1.17E-10	7.00E-12
2009	2.42	385.4	6.44	224.6	8.44	1,038	1,665	0	544.9	129.0	0	146.7	843.2	1.59	1,665	1.14E-06	6.87E-08
2010	0.829	386.2	6.41	233.6	8.90	1,033	1,669	0.160	545.5	133.2	0	146.9	841.8	1.58	1,669	1.94E-08	1.16E-09
2011	6.93	388.6	6.39	215.4	3.58	1,050	1,671	0	524.0	144.4	0	147.2	855.0	0.400	1,671	-8.62E-06	-5.16E-07
2012	6.10	393.8	6.31	224.8	1.53	1,057	1,689	0	510.7	155.3	0	148.6	874.7	0.007	1,689	9.54E-07	5.65E-08
2013	6.99	399.2	6.14	243.7	0.415	1,058	1,715	0	497.8	173.0	0	150.0	894.0	0	1,715	3.20E-08	1.87E-09
2014	11.2	408.6	6.03	260.2	0	1,073	1,759	0	475.2	199.7	3.47	152.6	928.5	0	1,759	3.68E-06	2.09E-07
2015	8.51	420.0	6.24	301.0	0	1,070	1,806	0.099	467.5	225.9	2.73	156.3	953.4	0	1,806	-4.37E-08	-2.42E-09
2016	2.18	426.0	6.34	312.8	0	1,052	1,799	0.880	472.2	231.3	1.18	159.0	934.7	0.022	1,799	-1.89E-06	-1.05E-07
2017	6.48	431.8	6.45	311.2	0	1,057	1,813	0	455.6	241.4	3.47	160.8	951.5	0	1,813	1.69E-09	9.33E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-3.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Fayette County GCD - Lower Wilcox (Layer 9)

Simulated Time Period	Inflows					Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Gonzales County UWCD	Lost Pines GCD	Upper Layers		Specific Storage	Gonzales County UWCD	Lost Pines GCD	Lavaca	Upper Layers			
	(acre-feet)													%
Predevelopment	0	1,338	7.65	43.6	4.19	1,394	0	112.2	0.375	252.0	1,029	1,394	1.70E-07	1.22E-08
1980	0	1,361	6.88	45.2	2.23	1,415	0	124.5	1.26	257.0	1,032	1,415	4.42E-10	3.12E-11
1981	0	1,355	6.92	46.2	5.35	1,413	11.3	122.9	0.989	256.1	1,022	1,413	-2.59E-09	-1.83E-10
1982	2.30	1,355	6.88	44.8	2.49	1,411	0.745	122.8	1.10	256.1	1,031	1,411	1.08E-09	7.62E-11
1983	5.98	1,356	6.88	44.2	1.85	1,415	0.160	123.4	1.26	256.0	1,034	1,415	-2.17E-09	-1.54E-10
1984	10.4	1,361	6.89	43.5	1.34	1,423	0.164	124.8	1.52	256.6	1,040	1,423	1.58E-09	1.11E-10
1985	0	1,356	6.86	45.1	3.51	1,412	6.00	123.9	1.32	255.8	1,025	1,412	2.35E-09	1.67E-10
1986	0	1,355	6.87	45.6	4.58	1,412	8.68	122.8	1.12	255.7	1,023	1,412	-1.44E-09	-1.02E-10
1987	0	1,353	6.94	45.6	4.67	1,410	8.21	121.8	0.962	255.6	1,024	1,410	5.47E-08	3.88E-09
1988	16.0	1,359	6.90	43.1	1.24	1,427	0.003	123.7	1.42	256.3	1,045	1,427	3.05E-09	2.14E-10
1989	16.2	1,359	6.86	42.6	0.663	1,425	0	125.4	1.76	255.7	1,042	1,425	-2.75E-09	-1.93E-10
1990	3.51	1,359	6.84	44.3	1.31	1,415	0.705	126.3	1.70	255.8	1,031	1,415	4.23E-10	2.99E-11
1991	0.160	1,357	6.86	46.1	5.14	1,416	11.9	125.2	1.35	255.9	1,021	1,416	1.56E-09	1.11E-10
1992	8.14E-04	1,358	6.99	47.4	8.62	1,421	19.4	123.5	0.892	256.6	1,021	1,421	8.52E-09	6.00E-10
1993	0.700	1,354	6.99	45.3	3.45	1,410	3.54	122.3	0.941	255.8	1,027	1,410	1.13E-09	8.04E-11
1994	0	1,353	7.03	45.2	3.77	1,409	4.33	121.6	0.902	255.7	1,026	1,409	2.04E-07	1.45E-08
1995	5.35	1,353	6.91	44.1	2.26	1,412	0.400	121.8	1.08	255.6	1,033	1,412	8.21E-09	5.82E-10
1996	17.1	1,360	6.91	42.7	0.999	1,427	0.070	124.0	1.51	256.2	1,046	1,427	-4.57E-08	-3.20E-09
1997	0.446	1,355	6.88	44.7	2.76	1,410	3.48	123.6	1.35	255.4	1,026	1,410	-1.43E-09	-1.02E-10
1998	0	1,354	6.88	45.8	5.21	1,411	10.4	122.5	1.07	255.3	1,022	1,411	9.31E-08	6.59E-09
1999	7.64	1,355	6.88	43.8	1.84	1,415	0.103	123.0	1.31	255.3	1,035	1,415	-4.72E-10	-3.34E-11
2000	2.69	1,359	6.89	44.4	1.90	1,415	0	124.0	1.35	256.0	1,034	1,415	-3.14E-07	-2.22E-08
2001	1.74	1,355	6.87	44.4	2.01	1,410	2.53E-04	123.8	1.37	255.3	1,030	1,410	3.52E-09	2.50E-10
2002	0	1,352	7.00	47.1	9.26	1,415	20.3	122.0	0.825	255.3	1,017	1,415	1.23E-09	8.72E-11
2003	0	1,350	7.20	46.4	6.16	1,410	11.1	120.7	0.636	255.2	1,022	1,410	1.66E-09	1.18E-10
2004	0	1,350	7.56	47.4	9.80	1,415	19.1	119.1	0.245	255.8	1,021	1,415	4.09E-10	2.89E-11
2005	8.87	1,348	7.34	44.3	2.83	1,411	0.631	119.0	0.581	255.1	1,036	1,411	7.77E-10	5.50E-11
2006	18.9	1,351	6.97	42.6	1.42	1,421	0.050	120.5	1.08	255.0	1,044	1,421	-8.22E-10	-5.78E-11
2007	0	1,348	7.34	46.4	8.97	1,410	17.6	119.0	0.565	254.9	1,018	1,410	-8.84E-09	-6.27E-10
2008	10.3	1,353	7.14	43.8	2.23	1,417	0.077	119.9	0.881	255.6	1,040	1,417	3.88E-10	2.74E-11
2009	11.9	1,351	6.92	43.4	1.59	1,415	0	121.1	1.13	254.9	1,038	1,415	2.53E-07	1.79E-08
2010	6.62	1,353	6.89	44.5	1.58	1,412	0	122.8	1.16	255.1	1,033	1,412	3.98E-09	2.82E-10
2011	26.1	1,358	6.86	42.5	0.400	1,433	0	126.2	1.73	255.4	1,050	1,433	-1.87E-06	-1.30E-07
2012	29.6	1,368	6.79	42.7	0.007	1,447	0	131.4	2.05	257.0	1,057	1,447	2.09E-07	1.44E-08
2013	33.6	1,372	6.64	45.1	0	1,457	0	138.9	2.29	258.0	1,058	1,457	7.70E-09	5.29E-10
2014	49.7	1,384	6.47	46.8	0	1,487	0	150.4	2.78	260.5	1,073	1,487	8.07E-07	5.43E-08
2015	45.9	1,397	6.61	52.0	0	1,501	0	164.1	2.88	264.0	1,070	1,501	-6.92E-09	-4.61E-10
2016	24.0	1,409	6.90	55.3	0.022	1,495	0.926	172.0	2.78	267.3	1,052	1,495	-3.73E-07	-2.49E-08
2017	30.7	1,414	7.15	55.1	0	1,507	0	178.4	2.99	268.9	1,057	1,507	2.37E-10	1.57E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Evergreen UWCD	Guadalupe County GCD	Plum Creek CD	Caldwell	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	7.43E+05	3,583	1.59	59.0	50.6	57.3	8.86E+05	1.63E+06
1980	0	0	7.46E+05	3,381	1.08	48.5	49.2	55.3	8.85E+05	1.64E+06
1981	4.48E-05	0.017	7.44E+05	4,335	1.26	50.2	49.8	56.0	8.84E+05	1.63E+06
1982	0.470	206.0	7.45E+05	2,929	1.13	48.9	49.4	55.1	8.83E+05	1.63E+06
1983	0.344	136.2	7.45E+05	3,002	1.04	47.6	49.0	54.7	8.83E+05	1.63E+06
1984	0.594	246.3	7.47E+05	2,550	0.887	45.3	48.4	54.1	8.84E+05	1.63E+06
1985	2.58E-05	0.010	7.44E+05	4,087	1.04	46.5	48.9	55.1	8.84E+05	1.63E+06
1986	3.10E-05	0.110	7.44E+05	3,859	1.14	47.8	49.4	55.4	8.84E+05	1.63E+06
1987	4.61E-05	0.017	7.44E+05	3,905	1.22	49.0	49.8	55.6	8.84E+05	1.63E+06
1988	1.23	534.5	7.48E+05	1,806	0.893	45.7	48.6	53.9	8.83E+05	1.63E+06
1989	0.597	246.9	7.45E+05	2,400	0.739	43.2	47.6	53.4	8.81E+05	1.63E+06
1990	0.017	9.61	7.45E+05	3,569	0.834	43.3	47.9	54.1	8.82E+05	1.63E+06
1991	1.43E-06	6.56E-04	7.44E+05	4,259	1.04	45.8	48.7	55.2	8.84E+05	1.63E+06
1992	7.11E-07	6.16E-04	7.45E+05	4,806	1.33	49.4	50.2	56.4	8.88E+05	1.64E+06
1993	0.386	193.3	7.44E+05	3,074	1.19	49.0	49.8	55.4	8.83E+05	1.63E+06
1994	4.26E-04	0.147	7.44E+05	3,877	1.25	49.9	50.1	55.8	8.84E+05	1.63E+06
1995	0.450	195.4	7.45E+05	2,999	1.12	48.7	49.7	55.2	8.83E+05	1.63E+06
1996	0.967	413.2	7.48E+05	2,129	0.874	45.7	48.6	54.1	8.84E+05	1.63E+06
1997	0.003	1.64	7.44E+05	4,177	1.03	46.9	49.1	55.3	8.84E+05	1.63E+06
1998	1.45E-04	0.038	7.44E+05	4,186	1.18	48.6	49.8	55.9	8.84E+05	1.63E+06
1999	0.807	361.5	7.45E+05	2,400	0.969	46.4	49.0	54.5	8.82E+05	1.63E+06
2000	0.035	16.9	7.47E+05	3,641	1.05	46.3	49.2	55.1	8.85E+05	1.64E+06
2001	0.112	53.4	7.45E+05	3,267	1.05	45.7	49.0	54.8	8.82E+05	1.63E+06
2002	2.60E-05	0.009	7.43E+05	5,554	1.54	49.7	50.8	56.8	8.86E+05	1.63E+06
2003	0.059	41.7	7.44E+05	4,051	1.55	50.8	51.4	56.5	8.84E+05	1.63E+06
2004	0.006	1.73	7.45E+05	5,319	1.73	54.6	53.0	58.0	8.88E+05	1.64E+06
2005	1.16	493.3	7.45E+05	2,686	1.21	52.0	51.8	56.0	8.82E+05	1.63E+06
2006	1.07	435.0	7.46E+05	2,402	0.855	48.9	50.5	54.9	8.81E+05	1.63E+06
2007	0	0	7.43E+05	5,752	1.19	53.4	52.2	57.6	8.86E+05	1.63E+06
2008	1.21	533.6	7.47E+05	2,282	0.868	50.7	51.1	55.6	8.84E+05	1.63E+06
2009	0.354	126.7	7.45E+05	3,280	0.840	48.7	50.4	55.2	8.83E+05	1.63E+06
2010	0.071	27.1	7.44E+05	4,086	0.978	47.9	50.7	55.5	8.83E+05	1.63E+06
2011	1.39	593.6	7.46E+05	1,889	0.748	43.0	49.2	53.4	8.79E+05	1.63E+06
2012	0.357	133.1	7.49E+05	3,260	0.710	42.4	49.0	53.9	8.81E+05	1.63E+06
2013	0.358	121.9	7.47E+05	3,567	0.719	42.3	49.0	53.8	8.76E+05	1.63E+06
2014	0.748	279.3	7.49E+05	3,168	0.653	40.8	48.8	53.1	8.72E+05	1.62E+06
2015	0.247	83.6	7.49E+05	5,235	0.954	42.4	50.3	54.0	8.70E+05	1.62E+06
2016	0.071	27.2	7.51E+05	4,992	1.13	44.2	51.7	54.4	8.73E+05	1.63E+06
2017	0.408	177.8	7.50E+05	4,076	1.10	43.5	51.9	53.5	8.69E+05	1.62E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Evergreen UWCD	Guadalupe County GCD	Plum Creek CD	Gonzales	Caldwell	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	8.87E+05	22.0	6.02	15.5	29.3	0.472	174.7	7.46E+05	1.63E+06	1.03E-05	6.31E-10
1980	0	0	8.86E+05	19.8	6.06	12.1	26.4	0.473	166.8	7.49E+05	1.64E+06	-7.17E-08	-4.39E-12
1981	0.657	285.6	8.85E+05	20.8	6.03	12.4	27.8	0.472	169.8	7.47E+05	1.63E+06	-1.88E-07	-1.15E-11
1982	3.80E-05	0.019	8.83E+05	20.1	6.05	12.3	26.6	0.472	166.3	7.47E+05	1.63E+06	-4.69E-07	-2.88E-11
1983	2.39E-04	0.131	8.83E+05	19.6	6.05	12.1	26.0	0.472	164.8	7.47E+05	1.63E+06	-5.75E-07	-3.53E-11
1984	3.56E-05	0.020	8.85E+05	18.8	6.07	11.7	24.9	0.473	162.4	7.49E+05	1.63E+06	4.85E-07	2.97E-11
1985	0.599	273.5	8.84E+05	19.6	6.04	11.7	26.4	0.472	165.9	7.47E+05	1.63E+06	-4.08E-07	-2.50E-11
1986	0.380	149.8	8.85E+05	20.1	6.04	12.0	27.0	0.472	167.4	7.47E+05	1.63E+06	-4.78E-07	-2.93E-11
1987	0.326	127.9	8.85E+05	20.6	6.04	12.2	27.5	0.472	168.5	7.47E+05	1.63E+06	-6.79E-07	-4.16E-11
1988	3.89E-07	3.29E-04	8.84E+05	18.9	6.07	11.7	24.8	0.473	162.1	7.49E+05	1.63E+06	2.38E-07	1.46E-11
1989	0.002	1.55	8.82E+05	18.0	6.07	11.1	23.8	0.472	159.8	7.47E+05	1.63E+06	-5.59E-07	-3.43E-11
1990	0.284	148.5	8.83E+05	18.4	6.06	11.0	24.7	0.472	162.1	7.47E+05	1.63E+06	-1.86E-07	-1.14E-11
1991	0.778	335.5	8.84E+05	19.5	6.04	11.2	26.3	0.472	166.5	7.47E+05	1.63E+06	-3.61E-07	-2.21E-11
1992	1.03	423.2	8.88E+05	21.0	6.05	11.9	28.3	0.473	171.6	7.49E+05	1.64E+06	2.76E-07	1.69E-11
1993	0.007	1.74	8.84E+05	20.5	6.04	11.9	27.1	0.472	167.8	7.47E+05	1.63E+06	-2.73E-07	-1.68E-11
1994	0.230	94.0	8.85E+05	20.8	6.04	12.1	27.7	0.472	169.3	7.47E+05	1.63E+06	-2.94E-07	-1.80E-11
1995	1.46E-05	0.006	8.83E+05	20.3	6.05	11.9	26.8	0.472	166.7	7.47E+05	1.63E+06	-2.98E-07	-1.82E-11
1996	1.28E-06	9.69E-04	8.84E+05	19.0	6.07	11.4	24.9	0.473	162.6	7.50E+05	1.63E+06	3.09E-07	1.89E-11
1997	0.619	287.5	8.84E+05	19.8	6.04	11.4	26.5	0.472	166.8	7.47E+05	1.63E+06	-4.06E-07	-2.49E-11
1998	0.552	224.3	8.85E+05	20.6	6.04	11.6	27.6	0.472	169.4	7.47E+05	1.63E+06	-2.42E-07	-1.48E-11
1999	3.86E-05	0.012	8.82E+05	19.5	6.05	11.3	25.7	0.472	164.4	7.47E+05	1.63E+06	-6.78E-07	-4.16E-11
2000	0.148	80.6	8.86E+05	19.7	6.06	11.2	26.3	0.473	166.0	7.50E+05	1.64E+06	6.46E-07	3.95E-11
2001	4.68E-04	0.186	8.83E+05	19.6	6.05	11.0	26.0	0.472	165.1	7.47E+05	1.63E+06	-4.14E-07	-2.54E-11
2002	1.49	644.0	8.86E+05	21.8	6.03	11.5	29.3	0.472	173.1	7.47E+05	1.63E+06	-4.11E-07	-2.51E-11
2003	0.209	72.7	8.85E+05	22.2	6.04	11.8	29.2	0.472	172.2	7.47E+05	1.63E+06	-4.03E-07	-2.47E-11
2004	1.04	411.8	8.89E+05	24.0	6.05	12.5	31.6	0.473	177.7	7.49E+05	1.64E+06	2.72E-07	1.66E-11
2005	0	0	8.82E+05	22.4	6.05	12.3	28.9	0.472	170.1	7.48E+05	1.63E+06	-6.39E-07	-3.92E-11
2006	1.52E-07	3.03E-04	8.81E+05	20.8	6.08	11.9	26.9	0.472	165.6	7.48E+05	1.63E+06	-2.28E-07	-1.40E-11
2007	1.66	712.1	8.87E+05	23.2	6.02	12.4	30.7	0.472	175.9	7.47E+05	1.63E+06	-4.92E-07	-3.01E-11
2008	2.21E-08	1.30E-05	8.84E+05	21.6	6.14	12.2	27.8	0.473	168.3	7.50E+05	1.63E+06	2.39E-07	1.46E-11
2009	0.019	12.3	8.83E+05	21.0	6.12	11.8	27.3	0.472	166.7	7.47E+05	1.63E+06	-1.97E-07	-1.21E-11
2010	0.223	122.9	8.83E+05	21.4	6.07	11.6	27.9	0.472	167.5	7.48E+05	1.63E+06	-4.72E-07	-2.89E-11
2011	0.001	0.298	8.80E+05	19.3	6.12	11.1	24.9	0.472	160.0	7.48E+05	1.63E+06	-7.42E-07	-4.56E-11
2012	0.021	20.6	8.81E+05	19.0	6.19	10.1	24.9	0.473	161.2	7.51E+05	1.63E+06	5.25E-07	3.21E-11
2013	0.067	43.1	8.76E+05	18.7	6.23	9.54	24.8	0.472	160.9	7.50E+05	1.63E+06	-2.71E-07	-1.67E-11
2014	7.40E-07	5.89E-04	8.72E+05	18.1	6.29	8.79	23.7	0.471	157.6	7.52E+05	1.62E+06	5.19E-06	3.19E-10
2015	0.548	329.0	8.71E+05	19.4	6.28	8.31	25.5	0.471	160.8	7.53E+05	1.62E+06	-5.22E-07	-3.21E-11
2016	0.366	189.1	8.74E+05	20.5	6.24	8.14	26.4	0.473	162.5	7.55E+05	1.63E+06	-5.73E-07	-3.52E-11
2017	0.023	12.6	8.69E+05	20.5	6.18	7.80	25.5	0.471	159.4	7.53E+05	1.62E+06	-4.22E-07	-2.60E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - (Layer 2) - Inflows

Simulated Time Period	Inflows											Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Evergreen UWCD	Fayette County GCD	Pecan Valley GCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)											
Predevelopment	0	0	12,684	53.0	4.52E-04	2.35E-04	3.16E-04	8.42E-04	4.10E-04	1,956	19,320	34,013
1980	0	0	13,096	50.0	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,952	19,035	34,134
1981	9.49E-04	0.030	12,953	64.1	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,958	19,070	34,045
1982	0.072	6.05	13,026	43.3	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,950	19,027	34,051
1983	0.010	1.68	13,025	44.4	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,945	19,031	34,048
1984	0.047	3.45	13,098	37.7	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,943	19,063	34,146
1985	1.56E-05	2.53E-04	12,963	60.4	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,947	19,086	34,057
1986	1.38E-04	0.002	12,911	57.0	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,953	19,116	34,037
1987	0.004	0.093	12,895	57.7	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,958	19,131	34,042
1988	0.117	10.3	13,084	26.7	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,944	19,056	34,121
1989	0.054	3.45	13,098	35.5	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,933	18,972	34,041
1990	0.004	0.065	13,030	52.8	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,938	19,021	34,042
1991	0.004	0.132	12,908	62.9	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,949	19,111	34,032
1992	7.86E-04	0.012	12,852	71.0	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,972	19,251	34,147
1993	0.084	8.07	12,918	45.4	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,957	19,112	34,040
1994	0.002	0.077	12,891	57.3	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,960	19,132	34,041
1995	0.072	5.11	12,971	44.3	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,952	19,075	34,047
1996	0.146	7.96	13,122	31.5	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,943	19,045	34,150
1997	0.004	0.085	12,982	61.7	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,948	18,987	33,979
1998	7.79E-04	0.015	12,920	61.9	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,957	19,068	34,007
1999	0.081	8.03	13,039	35.5	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,944	18,977	34,004
2000	0.002	0.014	12,920	53.8	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,953	19,143	34,070
2001	0.042	1.42	12,913	48.3	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,946	19,068	33,977
2002	0.018	0.364	12,744	82.1	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,973	19,239	34,038
2003	0.154	7.67	12,832	59.9	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,974	19,145	34,018
2004	0.909	20.8	13,198	78.6	4.53E-04	2.35E-04	3.17E-04	8.44E-04	4.11E-04	1,994	19,011	34,304
2005	0.349	20.2	13,431	39.7	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,966	18,738	34,196
2006	0.041	6.28	13,495	35.5	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,948	18,679	34,163
2007	0	0	13,093	85.0	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,974	18,998	34,150
2008	0.615	25.9	13,532	33.7	4.53E-04	2.35E-04	3.17E-04	8.44E-04	4.11E-04	1,957	18,730	34,280
2009	0.003	0.396	13,055	48.5	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,948	18,984	34,036
2010	0.011	0.063	12,943	60.4	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,955	19,051	34,010
2011	0.098	9.02	13,080	27.9	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,938	18,934	33,989
2012	1.06	25.4	13,564	48.2	4.53E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,944	18,686	34,269
2013	0.160	2.73	13,540	52.7	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,942	18,624	34,161
2014	0.124	2.37	13,574	46.8	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,940	18,582	34,145
2015	0.104	0.953	13,440	77.4	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,962	18,674	34,155
2016	0.053	0.723	13,448	73.8	4.54E-04	2.36E-04	3.17E-04	8.44E-04	4.11E-04	1,982	18,761	34,265
2017	0.044	3.43	13,254	60.2	4.52E-04	2.35E-04	3.16E-04	8.41E-04	4.10E-04	1,975	18,786	34,078

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Evapo-transpiration	Evergreen UWCD	Fayette County GCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	20,860	0	1.37E-13	4.11E-05	3.37E-04	5.22E-04	1,905	11,249	34,013	-4.58E-10	-1.35E-12
1980	0	0	20,580	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,904	11,650	34,134	-1.51E-09	-4.43E-12
1981	0.080	6.53	20,608	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,906	11,523	34,045	9.75E-10	2.86E-12
1982	0.006	0.093	20,569	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,900	11,582	34,051	3.86E-10	1.13E-12
1983	0.041	0.817	20,572	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,898	11,577	34,048	2.69E-10	7.91E-13
1984	0.009	0.137	20,607	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,899	11,639	34,146	9.75E-10	2.86E-12
1985	0.067	6.12	20,623	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,901	11,526	34,057	7.79E-10	2.29E-12
1986	0.097	3.82	20,656	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,904	11,474	34,037	3.64E-11	1.07E-13
1987	0.011	1.34	20,671	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,907	11,462	34,042	1.37E-09	4.02E-12
1988	1.64E-04	0.003	20,602	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,899	11,620	34,121	1.31E-09	3.84E-12
1989	2.98E-05	0.003	20,511	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,891	11,638	34,041	8.51E-10	2.50E-12
1990	0.086	4.97	20,559	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,895	11,583	34,042	7.79E-10	2.29E-12
1991	0.112	7.85	20,647	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,903	11,473	34,032	1.57E-09	4.62E-12
1992	0.087	7.97	20,789	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,920	11,430	34,147	1.40E-09	4.09E-12
1993	0.003	0.091	20,655	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,905	11,481	34,040	1.07E-09	3.14E-12
1994	0.029	1.93	20,673	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,906	11,459	34,041	7.57E-10	2.22E-12
1995	1.35E-04	7.52E-04	20,618	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,900	11,528	34,047	8.51E-10	2.50E-12
1996	9.58E-04	0.016	20,591	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,898	11,661	34,150	1.09E-09	3.20E-12
1997	0.069	6.81	20,525	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,900	11,547	33,979	1.00E-09	2.96E-12
1998	0.042	4.43	20,607	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,906	11,489	34,007	1.70E-09	4.99E-12
1999	1.48E-04	0.002	20,519	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,897	11,588	34,004	-1.06E-09	-3.12E-12
2000	0.289	8.93	20,684	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,906	11,471	34,070	2.06E-09	6.04E-12
2001	4.99E-04	0.045	20,608	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,899	11,470	33,977	1.18E-09	3.47E-12
2002	0.108	14.9	20,769	1.58	1.37E-13	4.11E-05	3.37E-04	5.22E-04	1,919	11,335	34,038	-8.73E-11	-2.57E-13
2003	4.26E-04	0.175	20,687	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,915	11,416	34,018	2.18E-10	6.42E-13
2004	0.020	5.76	20,557	2.86	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,928	11,809	34,304	2.16E-09	6.30E-12
2005	1.34E-05	7.36E-04	20,285	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,904	12,007	34,196	-5.97E-10	-1.74E-12
2006	0.056	1.21	20,222	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,895	12,045	34,163	1.35E-09	3.96E-12
2007	0.565	26.7	20,527	0.482	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,917	11,679	34,150	1.07E-09	3.13E-12
2008	0	0	20,281	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,903	12,096	34,280	1.19E-09	3.48E-12
2009	1.00	24.2	20,517	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,900	11,594	34,036	1.67E-10	4.92E-13
2010	0.154	7.60	20,589	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,904	11,508	34,010	5.75E-10	1.69E-12
2011	0.001	0.033	20,476	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,893	11,620	33,989	5.89E-10	1.73E-12
2012	0.001	0.488	20,236	0	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,897	12,135	34,269	2.07E-09	6.05E-12
2013	0.006	1.61	20,163	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,895	12,102	34,161	-5.82E-11	-1.70E-13
2014	0.008	0.211	20,122	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,894	12,129	34,145	8.66E-10	2.54E-12
2015	0.051	11.1	20,208	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,909	12,027	34,155	7.06E-10	2.07E-12
2016	0.015	3.95	20,300	1.30	1.37E-13	4.13E-05	3.38E-04	5.23E-04	1,922	12,037	34,265	6.26E-10	1.83E-12
2017	0.428	10.2	20,326	0	1.37E-13	4.12E-05	3.37E-04	5.22E-04	1,914	11,827	34,078	2.04E-10	5.98E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows										Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Fayette County GCD	Pecan Valley GCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)										
Predevelopment	0	0	2,198	465.5	328.9	10.0	877.3	433.4	14,122	5,918	24,353
1980	0	0	2,074	467.1	329.2	10.1	879.6	434.6	14,493	5,886	24,573
1981	0.010	0	2,659	466.9	328.7	10.0	877.2	433.4	14,427	5,884	25,085
1982	5.25	193.8	1,797	465.7	328.1	10.0	877.2	433.4	14,411	5,871	24,392
1983	1.01	84.8	1,842	465.6	328.0	10.0	877.2	433.4	14,392	5,869	24,302
1984	2.49	176.5	1,564	466.4	328.6	10.1	879.6	434.6	14,418	5,882	24,163
1985	4.71E-04	0	2,507	466.5	328.4	10.0	877.2	433.4	14,388	5,884	24,894
1986	0.153	0.215	2,367	466.5	328.4	10.0	877.2	433.4	14,345	5,885	24,714
1987	0.018	0	2,396	466.7	328.5	10.0	877.2	433.4	14,350	5,887	24,749
1988	8.31	505.6	1,108	465.9	328.5	10.1	879.6	434.6	14,379	5,877	23,997
1989	1.65	129.6	1,472	464.7	327.5	10.0	877.2	433.4	14,383	5,858	23,958
1990	0.026	0.322	2,189	465.7	328.0	10.0	877.2	433.4	14,392	5,866	24,562
1991	0.030	0	2,612	466.7	328.6	10.0	877.2	433.4	14,349	5,879	24,956
1992	0.012	0	2,948	468.8	329.8	10.1	879.6	434.6	14,384	5,906	25,360
1993	6.86	223.5	1,885	466.0	328.2	10.0	877.2	433.4	14,339	5,876	24,446
1994	0.020	0.512	2,378	466.6	328.3	10.0	877.2	433.4	14,353	5,883	24,730
1995	3.81	164.9	1,840	465.8	328.0	10.0	877.2	433.4	14,365	5,874	24,362
1996	4.78	342.2	1,306	466.0	328.4	10.1	879.6	434.6	14,427	5,879	24,078
1997	0.134	0	2,562	466.4	328.3	10.0	877.2	433.4	14,414	5,883	24,975
1998	0.010	0	2,568	466.8	328.5	10.0	877.2	433.4	14,386	5,887	24,957
1999	6.96	331.8	1,472	465.2	327.8	10.0	877.2	433.4	14,379	5,868	24,172
2000	0.010	0.835	2,234	467.0	329.2	10.1	879.6	434.6	14,323	5,883	24,561
2001	0.896	23.8	2,004	465.5	328.2	10.0	877.2	433.4	14,298	5,867	24,308
2002	0.055	0	3,407	467.9	329.3	10.0	877.2	433.4	14,325	5,896	25,746
2003	5.22	74.7	2,485	467.0	328.7	10.0	877.2	433.4	14,358	5,883	24,922
2004	3.10	3.93	3,263	470.7	329.2	10.1	879.6	434.6	14,853	5,920	26,166
2005	12.6	430.1	1,648	467.3	327.0	10.0	877.2	433.4	14,888	5,872	24,966
2006	4.10	324.8	1,473	466.6	326.7	10.0	877.2	433.4	14,855	5,860	24,631
2007	0	0	3,528	469.0	328.5	10.0	877.2	433.4	14,686	5,907	26,240
2008	14.4	484.9	1,400	468.1	327.7	10.1	879.6	434.6	14,930	5,889	24,839
2009	0.347	31.7	2,012	466.0	327.9	10.0	877.2	433.4	14,431	5,872	24,461
2010	0.024	0	2,506	466.5	328.4	10.0	877.2	433.4	14,395	5,871	24,888
2011	8.01	464.3	1,159	464.5	327.5	10.0	877.2	433.4	14,371	5,842	23,957
2012	3.97	22.1	2,000	468.0	328.5	10.1	879.6	434.6	14,948	5,841	24,935
2013	0.438	2.23	2,188	467.5	328.6	10.0	877.2	433.4	14,927	5,781	25,015
2014	1.35	37.8	1,943	467.3	328.1	10.0	877.1	433.4	14,929	5,718	24,745
2015	0.258	0.003	3,211	469.2	329.0	10.0	877.1	433.3	14,963	5,674	25,967
2016	0.345	0.359	3,062	470.7	329.9	10.1	879.5	434.5	15,012	5,685	25,884
2017	3.45	85.5	2,501	467.8	328.6	10.0	877.0	433.3	14,751	5,631	25,088

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Fayette County GCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	0	666.6	8.54	103.3	44.8	557.4	22,649	323.3	24,353	1.59E-07	6.51E-10
1980	0	0	629.9	606.4	8.72	103.1	44.9	558.9	22,307	314.5	24,573	-1.89E-10	-7.70E-13
1981	4.99	210.8	584.9	770.7	8.87	105.7	44.8	557.4	22,428	369.2	25,085	-6.84E-09	-2.72E-11
1982	0.065	0	554.6	543.3	8.80	102.8	44.8	557.4	22,287	293.6	24,392	1.35E-10	5.52E-13
1983	0.185	0.016	496.4	529.4	8.75	102.7	44.8	557.4	22,268	295.1	24,302	-5.21E-09	-2.15E-11
1984	0.072	0	467.3	448.7	8.67	102.7	44.9	558.9	22,252	279.2	24,163	1.13E-08	4.66E-11
1985	5.60	290.6	462.8	688.1	8.79	104.1	44.8	557.4	22,384	348.0	24,894	1.40E-09	5.61E-12
1986	1.39	87.0	429.5	702.6	8.87	104.5	44.8	557.4	22,436	342.2	24,714	-2.04E-09	-8.27E-12
1987	0.896	58.4	439.7	716.4	8.94	104.8	44.8	557.4	22,472	345.8	24,749	8.31E-07	3.36E-09
1988	0.003	0	451.4	339.4	8.69	102.6	44.9	558.9	22,223	267.4	23,997	3.21E-09	1.34E-11
1989	0.212	14.1	463.3	387.0	8.56	102.2	44.8	557.4	22,110	270.1	23,958	-1.16E-10	-4.86E-13
1990	4.00	266.1	463.1	557.7	8.67	102.8	44.8	557.4	22,244	313.5	24,562	3.97E-09	1.62E-11
1991	5.44	275.2	426.3	735.3	8.82	105.5	44.8	557.4	22,434	363.3	24,956	4.12E-09	1.65E-11
1992	4.93	242.8	426.0	882.7	9.04	107.4	44.9	558.9	22,686	397.9	25,360	9.41E-08	3.71E-10
1993	0.023	0.292	422.7	590.1	8.96	102.9	44.8	557.4	22,417	301.8	24,446	6.18E-11	2.53E-13
1994	2.22	61.1	430.2	702.8	9.01	104.3	44.8	557.4	22,475	343.5	24,730	-8.56E-09	-3.46E-11
1995	1.23E-04	0	458.6	550.8	8.91	103.0	44.8	557.4	22,342	296.2	24,362	6.69E-08	2.74E-10
1996	0.017	0	496.8	382.2	8.73	102.7	44.9	558.9	22,213	270.4	24,078	-3.04E-07	-1.26E-09
1997	6.46	358.6	581.0	676.2	8.85	104.2	44.8	557.4	22,289	348.7	24,975	8.44E-08	3.38E-10
1998	2.76	157.7	544.8	753.5	8.97	105.6	44.8	557.4	22,420	361.4	24,957	4.07E-09	1.63E-11
1999	0.003	0	547.2	448.2	8.81	102.7	44.8	557.4	22,188	274.9	24,172	-1.46E-10	-6.02E-13
2000	3.90	146.3	320.8	619.8	8.71	103.3	44.9	558.9	22,430	324.9	24,561	2.67E-07	1.09E-09
2001	0.015	0.724	366.4	589.2	8.66	103.0	44.8	557.4	22,329	308.9	24,308	-5.68E-10	-2.33E-12
2002	11.8	461.7	392.7	991.2	8.98	108.3	44.8	557.4	22,727	442.0	25,746	-4.91E-10	-1.91E-12
2003	0.111	8.16	484.4	789.8	9.10	105.1	44.8	557.4	22,565	358.7	24,922	5.16E-09	2.07E-11
2004	5.81	194.9	1,270	996.9	9.90	108.4	44.9	558.9	22,546	430.7	26,166	2.24E-09	8.55E-12
2005	2.32E-04	0	1,406	516.5	9.94	103.1	44.8	557.4	22,042	286.9	24,966	-8.40E-09	-3.36E-11
2006	0.198	0	1,335	423.1	9.74	102.8	44.8	557.4	21,882	276.7	24,631	1.05E-09	4.25E-12
2007	15.5	605.3	1,005	968.4	9.75	108.5	44.8	557.4	22,480	445.5	26,240	1.36E-09	5.17E-12
2008	0	0	1,439	436.2	9.80	103.1	44.9	558.9	21,972	274.2	24,839	-1.20E-10	-4.83E-13
2009	4.94	65.5	578.6	550.3	9.14	102.9	44.8	557.4	22,242	304.7	24,461	9.95E-08	4.07E-10
2010	4.34	178.3	528.4	722.5	8.96	104.9	44.8	557.4	22,383	354.9	24,888	-2.72E-07	-1.09E-09
2011	0.004	0.117	528.1	352.9	8.68	102.5	44.8	557.4	22,093	269.3	23,957	-1.95E-07	-8.14E-10
2012	1.77	125.2	1,386	514.9	9.37	103.1	44.9	558.9	21,889	302.6	24,935	2.69E-08	1.08E-10
2013	1.94	124.3	1,400	595.1	9.63	102.9	44.8	557.4	21,848	330.8	25,015	8.77E-08	3.50E-10
2014	0.040	0.515	1,382	549.6	9.67	102.9	44.8	557.5	21,779	318.6	24,745	4.28E-07	1.73E-09
2015	9.92	425.7	1,396	908.5	9.91	108.0	44.8	557.5	22,062	444.4	25,967	-6.46E-08	-2.49E-10
2016	2.12	154.1	1,426	937.9	10.1	107.6	44.9	559.0	22,207	435.6	25,884	-4.77E-06	-1.84E-08
2017	1.57	7.13	1,021	782.5	9.75	105.2	44.8	557.5	22,171	387.7	25,088	-1.60E-09	-6.39E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows											Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Fayette County GCD	Lost Pines GCD	Pecan Valley GCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)											
Predevelopment	0	0	894.1	0.410	0.430	0	0.195	0.767	0.397	350.7	5,972	7,219
1980	0	0	843.9	0.412	0.429	0	0.197	0.771	0.398	341.6	5,940	7,128
1981	0	0	1,082	0.414	0.430	1.81E-04	0.197	0.769	0.397	398.7	5,938	7,420
1982	4.15	41.7	730.9	0.410	0.428	0	0.197	0.769	0.397	319.4	5,926	7,024
1983	0.264	17.5	749.3	0.410	0.427	0	0.197	0.769	0.397	320.9	5,923	7,014
1984	0.905	31.5	636.5	0.410	0.428	0	0.197	0.771	0.398	303.6	5,937	6,911
1985	0	0	1,020	0.414	0.429	1.06E-04	0.197	0.769	0.397	376.9	5,937	7,336
1986	0.351	1.04	963.2	0.413	0.429	6.68E-05	0.196	0.768	0.397	370.4	5,939	7,276
1987	2.05E-04	0	974.7	0.413	0.429	7.69E-05	0.196	0.768	0.397	374.2	5,941	7,292
1988	4.62	85.6	450.8	0.408	0.427	0	0.197	0.771	0.398	289.7	5,932	6,765
1989	0.335	27.2	599.0	0.408	0.426	0	0.197	0.769	0.397	294.0	5,913	6,836
1990	0.015	0.449	890.8	0.412	0.428	0	0.197	0.769	0.397	341.1	5,920	7,154
1991	5.71E-05	0	1,063	0.414	0.430	1.62E-04	0.197	0.769	0.397	392.4	5,933	7,390
1992	3.93E-06	0	1,199	0.417	0.432	3.21E-04	0.197	0.771	0.398	428.3	5,960	7,590
1993	5.31	52.6	767.1	0.411	0.428	0	0.196	0.769	0.397	328.2	5,930	7,086
1994	1.22E-05	0.002	967.6	0.413	0.429	5.85E-05	0.196	0.768	0.397	371.9	5,937	7,279
1995	2.68	31.6	748.6	0.410	0.428	0	0.196	0.769	0.397	322.1	5,928	7,035
1996	1.66	56.1	531.5	0.408	0.427	0	0.197	0.771	0.398	293.6	5,933	6,818
1997	0.006	0	1,043	0.413	0.429	1.24E-04	0.196	0.769	0.397	377.8	5,937	7,359
1998	7.15E-04	0	1,045	0.414	0.430	1.54E-04	0.196	0.769	0.397	390.4	5,941	7,378
1999	4.77	65.9	598.9	0.408	0.427	0	0.196	0.769	0.397	299.0	5,923	6,893
2000	0.016	0.285	908.7	0.412	0.429	0	0.197	0.771	0.398	352.8	5,937	7,201
2001	0.862	5.42	815.3	0.410	0.428	0	0.197	0.769	0.397	335.6	5,921	7,081
2002	2.89E-04	0	1,386	0.418	0.432	5.09E-04	0.196	0.768	0.397	473.4	5,951	7,812
2003	4.24	17.3	1,011	0.414	0.430	1.42E-04	0.196	0.769	0.397	387.7	5,937	7,359
2004	0.090	0	1,327	0.420	0.432	4.46E-04	0.197	0.771	0.398	462.2	5,973	7,765
2005	8.35	90.8	670.4	0.411	0.426	0	0.197	0.769	0.397	312.9	5,926	7,010
2006	1.00	50.5	599.5	0.410	0.425	0	0.197	0.769	0.397	301.2	5,914	6,868
2007	0	0	1,436	0.420	0.431	5.41E-04	0.196	0.768	0.397	477.2	5,962	7,877
2008	9.56	106.3	569.4	0.412	0.427	0	0.197	0.771	0.398	299.4	5,943	6,930
2009	0.085	7.36	818.5	0.411	0.427	0	0.196	0.769	0.397	331.6	5,926	7,086
2010	0.087	0.092	1,020	0.414	0.429	1.13E-04	0.197	0.769	0.397	383.8	5,925	7,330
2011	4.92	79.9	471.5	0.407	0.426	0	0.197	0.770	0.397	291.9	5,895	6,746
2012	0.573	3.39	813.5	0.413	0.427	0	0.198	0.774	0.398	329.6	5,894	7,043
2013	0.579	0.077	890.1	0.414	0.427	0	0.198	0.774	0.397	358.8	5,833	7,085
2014	1.91	8.96	790.5	0.414	0.426	0	0.199	0.776	0.397	345.6	5,769	6,918
2015	0.695	0	1,306	0.420	0.429	3.98E-04	0.201	0.779	0.397	476.4	5,724	7,510
2016	0.464	0.803	1,246	0.421	0.430	3.63E-04	0.201	0.782	0.398	467.3	5,736	7,452
2017	3.18	16.9	1,017	0.416	0.427	1.16E-04	0.201	0.781	0.397	417.4	5,680	7,137

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Evergreen UWCD	Fayette County GCD	Lost Pines GCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	220.1	0.205	0.117	7.52E-06	0.045	0.357	5,979	1,019	7,219	6.36E-09	8.81E-11
1980	0	0	208.9	0.205	0.115	4.30E-05	0.045	0.357	5,946	971.6	7,128	-9.09E-12	-1.28E-13
1981	3.29	46.9	253.0	0.206	0.133	0	0.045	0.357	5,945	1,172	7,420	-3.08E-10	-4.16E-12
1982	5.17E-05	0	187.4	0.204	0.114	3.80E-05	0.045	0.356	5,931	904.5	7,024	-9.09E-13	-1.29E-14
1983	0.019	0.130	188.9	0.204	0.114	4.85E-05	0.045	0.356	5,929	894.8	7,014	-2.31E-10	-3.29E-12
1984	0.001	0	158.0	0.204	0.113	5.68E-05	0.045	0.357	5,942	810.9	6,911	-1.55E-09	-2.25E-11
1985	4.02	52.9	234.1	0.206	0.123	0	0.045	0.357	5,945	1,100	7,336	4.82E-11	6.57E-13
1986	0.293	19.5	229.6	0.206	0.125	0	0.045	0.357	5,946	1,080	7,276	-1.06E-10	-1.46E-12
1987	0.300	12.4	235.4	0.206	0.127	0	0.045	0.357	5,948	1,095	7,292	3.28E-08	4.49E-10
1988	0	0	107.8	0.191	0.113	6.15E-05	0.045	0.357	5,937	719.6	6,765	1.83E-10	2.70E-12
1989	0.224	3.23	142.2	0.203	0.112	6.21E-05	0.045	0.356	5,918	771.7	6,836	1.46E-11	2.13E-13
1990	2.38	33.8	210.4	0.205	0.114	3.53E-05	0.045	0.356	5,926	980.7	7,154	1.52E-10	2.12E-12
1991	2.90	58.8	242.7	0.206	0.132	0	0.045	0.356	5,940	1,145	7,390	1.56E-10	2.12E-12
1992	2.44	54.9	280.8	0.207	0.143	0	0.045	0.358	5,968	1,284	7,590	2.45E-09	3.22E-11
1993	0.009	0	197.8	0.204	0.114	2.79E-05	0.045	0.356	5,936	950.6	7,086	1.82E-12	2.57E-14
1994	2.12	14.9	230.7	0.206	0.123	0	0.045	0.357	5,944	1,086	7,279	-2.87E-10	-3.95E-12
1995	5.22E-05	0	190.9	0.204	0.115	4.25E-05	0.045	0.356	5,934	909.8	7,035	2.66E-09	3.78E-11
1996	6.29E-06	0	127.5	0.203	0.113	6.37E-05	0.045	0.357	5,938	752.0	6,818	-1.91E-08	-2.80E-10
1997	4.48	61.1	234.9	0.206	0.123	0	0.045	0.356	5,944	1,114	7,359	3.52E-09	4.78E-11
1998	0.859	34.0	245.5	0.206	0.132	0	0.045	0.357	5,948	1,149	7,378	1.75E-10	2.37E-12
1999	0	0	151.2	0.204	0.114	4.75E-05	0.045	0.356	5,928	813.7	6,893	-1.46E-11	-2.11E-13
2000	2.39	20.6	215.7	0.206	0.115	1.54E-05	0.045	0.357	5,944	1,018	7,201	1.03E-08	1.44E-10
2001	0.002	0.045	204.6	0.205	0.115	4.15E-05	0.045	0.356	5,927	947.9	7,081	-6.28E-11	-8.86E-13
2002	7.73	101.0	327.8	0.208	0.150	0	0.045	0.357	5,958	1,417	7,812	-2.82E-11	-3.61E-13
2003	0.011	0.802	251.1	0.206	0.128	0	0.045	0.356	5,944	1,162	7,359	2.58E-10	3.51E-12
2004	3.91	31.5	341.2	0.208	0.147	0	0.045	0.357	5,982	1,406	7,765	1.04E-10	1.34E-12
2005	0	0	174.0	0.204	0.113	4.04E-05	0.045	0.356	5,932	903.8	7,010	-2.79E-10	-3.98E-12
2006	0.003	0	146.1	0.204	0.113	7.10E-05	0.045	0.356	5,919	802.6	6,868	8.19E-12	1.19E-13
2007	9.97	131.3	324.2	0.208	0.150	0	0.045	0.357	5,969	1,441	7,877	4.00E-11	5.08E-13
2008	0	0	146.2	0.204	0.113	4.28E-05	0.045	0.357	5,949	834.3	6,930	-9.09E-13	-1.31E-14
2009	1.48	6.51	200.7	0.205	0.114	4.54E-05	0.045	0.356	5,932	944.6	7,086	3.86E-09	5.45E-11
2010	2.79	38.7	236.1	0.206	0.127	0	0.045	0.356	5,932	1,120	7,330	-1.05E-08	-1.44E-10
2011	0	0	113.6	0.194	0.113	5.94E-05	0.045	0.356	5,901	730.9	6,746	-8.84E-09	-1.31E-10
2012	1.26	14.0	197.9	0.206	0.114	5.45E-05	0.045	0.356	5,900	929.0	7,043	1.12E-09	1.60E-11
2013	1.22	18.6	211.1	0.206	0.114	3.85E-05	0.044	0.355	5,840	1,012	7,085	3.29E-09	4.64E-11
2014	0	0	196.3	0.206	0.114	5.91E-05	0.044	0.354	5,776	944.8	6,918	1.75E-08	2.53E-10
2015	6.61	99.5	288.1	0.209	0.147	0	0.044	0.353	5,733	1,381	7,510	-2.66E-09	-3.55E-11
2016	0.416	21.6	307.6	0.209	0.142	0	0.044	0.354	5,744	1,377	7,452	-2.50E-07	-3.36E-09
2017	0.032	0.012	245.3	0.207	0.127	0	0.043	0.352	5,689	1,202	7,137	-1.06E-10	-1.48E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows												Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Fayette County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)												
Predevelopment	0	0	5,093	1.63E+05	12,327	373.7	0	6,429	4,085	1,122	7.47E+05	14,291	9.54E+05
1980	0	0	4,806	1.64E+05	12,563	360.6	0	6,499	4,472	1,144	7.50E+05	10,753	9.55E+05
1981	0	0	6,161	1.64E+05	12,506	386.6	0	6,410	4,480	1,140	7.48E+05	10,804	9.53E+05
1982	19.4	230.1	4,163	1.64E+05	12,488	352.2	0	6,492	4,438	1,140	7.48E+05	10,680	9.51E+05
1983	2.83	50.4	4,267	1.64E+05	12,492	349.8	0	6,503	4,424	1,140	7.48E+05	10,636	9.51E+05
1984	8.25	114.9	3,625	1.64E+05	12,522	338.1	0	6,555	4,414	1,143	7.50E+05	10,494	9.53E+05
1985	0	0	5,809	1.64E+05	12,485	376.8	0	6,436	4,438	1,139	7.48E+05	10,713	9.53E+05
1986	0.006	0.648	5,486	1.63E+05	12,462	376.1	0	6,430	4,439	1,139	7.48E+05	10,956	9.52E+05
1987	8.88E-04	0	5,551	1.64E+05	12,453	377.5	0	6,424	4,430	1,139	7.48E+05	10,983	9.53E+05
1988	42.7	444.0	2,568	1.64E+05	12,499	325.7	0	6,589	4,373	1,143	7.50E+05	10,323	9.52E+05
1989	4.21	28.0	3,412	1.64E+05	12,504	329.1	0	6,563	4,362	1,140	7.48E+05	10,006	9.50E+05
1990	1.08	0	5,073	1.64E+05	12,514	360.1	0	6,483	4,401	1,140	7.48E+05	9,698	9.51E+05
1991	0	0	6,053	1.64E+05	12,489	383.9	0	6,414	4,442	1,140	7.48E+05	10,192	9.53E+05
1992	0	0	6,831	1.64E+05	12,497	403.8	0	6,377	4,483	1,143	7.50E+05	10,549	9.56E+05
1993	20.5	292.6	4,369	1.63E+05	12,448	358.2	0	6,468	4,414	1,139	7.48E+05	10,868	9.52E+05
1994	0	0	5,511	1.63E+05	12,455	373.8	0	6,436	4,421	1,138	7.48E+05	10,989	9.53E+05
1995	15.0	169.8	4,263	1.63E+05	12,462	352.0	0	6,494	4,385	1,138	7.48E+05	10,814	9.51E+05
1996	23.2	244.3	3,027	1.64E+05	12,512	327.6	0	6,588	4,363	1,142	7.50E+05	10,313	9.53E+05
1997	0	0	5,938	1.64E+05	12,489	376.8	0	6,440	4,405	1,138	7.48E+05	10,411	9.53E+05
1998	0.109	0	5,950	1.64E+05	12,469	384.4	0	6,412	4,424	1,138	7.48E+05	10,400	9.53E+05
1999	28.7	342.5	3,411	1.64E+05	12,468	337.7	0	6,533	4,380	1,138	7.48E+05	10,291	9.50E+05
2000	1.31	0	5,176	1.64E+05	12,523	364.8	0	6,490	4,437	1,141	7.50E+05	9,905	9.54E+05
2001	1.82	30.4	4,643	1.64E+05	12,481	358.0	0	6,484	4,424	1,138	7.48E+05	9,981	9.51E+05
2002	0.035	0	7,894	1.64E+05	12,470	420.6	0	6,323	4,515	1,138	7.48E+05	10,094	9.54E+05
2003	17.9	192.4	5,758	1.64E+05	12,454	382.8	0	6,410	4,482	1,138	7.48E+05	10,327	9.53E+05
2004	0.082	8.25	7,560	1.64E+05	12,546	398.7	0	6,408	4,493	1,140	7.50E+05	10,916	9.58E+05
2005	47.9	535.1	3,818	1.64E+05	12,544	328.2	0	6,607	4,383	1,138	7.48E+05	10,723	9.52E+05
2006	16.3	223.7	3,414	1.64E+05	12,586	320.1	0	6,674	4,337	1,138	7.48E+05	10,629	9.51E+05
2007	0	0	8,176	1.64E+05	12,531	406.9	0	6,383	4,438	1,136	7.48E+05	11,465	9.56E+05
2008	59.5	595.3	3,243	1.64E+05	12,581	323.8	0	6,656	4,332	1,140	7.50E+05	11,057	9.54E+05
2009	0.778	0.476	4,662	1.64E+05	12,501	353.0	0	6,511	4,400	1,137	7.48E+05	10,144	9.51E+05
2010	9.36	1.26	5,807	1.64E+05	12,504	377.8	0	6,439	4,489	1,139	7.48E+05	9,021	9.52E+05
2011	47.5	422.8	2,685	1.64E+05	12,515	325.2	0	6,581	4,477	1,140	7.49E+05	8,146	9.49E+05
2012	43.6	20.7	4,633	1.64E+05	12,764	346.8	0	6,572	4,400	1,147	7.52E+05	6,191	9.52E+05
2013	61.3	47.0	5,070	1.65E+05	12,832	354.3	0	6,541	4,331	1,150	7.51E+05	3,633	9.49E+05
2014	86.8	194.2	4,502	1.65E+05	12,989	343.0	0.004	6,583	4,282	1,158	7.52E+05	2,063	9.49E+05
2015	74.5	21.2	7,441	1.66E+05	13,112	394.5	0.167	6,455	4,331	1,168	7.54E+05	1,160	9.54E+05
2016	9.71	0.930	7,096	1.66E+05	13,148	395.9	0.227	6,463	4,499	1,175	7.56E+05	1,212	9.56E+05
2017	40.1	193.8	5,794	1.66E+05	13,113	366.1	0.342	6,510	4,523	1,177	7.54E+05	1,030	9.52E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows													Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Fayette County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	0	0	34,239	810.8	1,834	1.21	2,025	5,705	2,756	9.06E+05	349.7	9.54E+05	0.001	1.06E-07
1980	0	0	721.0	0	34,298	818.8	1,906	0.849	2,029	6,152	2,790	9.05E+05	446.3	9.55E+05	-1.70E-06	-1.78E-10
1981	20.1	211.4	601.0	0	34,197	817.0	1,803	0.865	2,026	6,173	2,782	9.04E+05	484.6	9.53E+05	-4.51E-05	-4.74E-09
1982	0	0	479.9	0	34,190	816.4	1,921	0.850	2,022	6,119	2,782	9.03E+05	411.7	9.51E+05	5.05E-08	5.31E-12
1983	0.230	0.546	359.1	0	34,181	816.5	1,931	0.847	2,021	6,104	2,782	9.03E+05	416.6	9.51E+05	-2.93E-05	-3.08E-09
1984	0.040	0	240.6	0	34,272	818.6	1,980	0.848	2,025	6,092	2,790	9.04E+05	410.8	9.53E+05	2.37E-04	2.49E-08
1985	27.3	292.8	238.3	0	34,183	816.9	1,835	0.873	2,024	6,127	2,782	9.04E+05	486.2	9.53E+05	9.25E-06	9.71E-10
1986	5.46	43.9	246.2	0	34,193	816.7	1,833	0.887	2,024	6,127	2,781	9.04E+05	452.3	9.52E+05	-1.22E-05	-1.29E-09
1987	3.57	29.2	250.0	0	34,189	816.6	1,827	0.895	2,024	6,120	2,781	9.04E+05	453.8	9.53E+05	0.006	6.09E-07
1988	0	0	251.4	0	34,266	818.0	2,035	0.852	2,023	6,043	2,788	9.04E+05	380.2	9.52E+05	1.12E-05	1.18E-09
1989	0.348	10.0	247.1	0	34,168	816.1	2,006	0.840	2,018	6,027	2,781	9.01E+05	443.7	9.50E+05	8.38E-07	8.82E-11
1990	14.3	226.1	275.2	0	34,156	816.8	1,897	0.831	2,022	6,087	2,782	9.03E+05	545.6	9.51E+05	2.71E-05	2.84E-09
1991	21.8	224.4	257.1	0	34,173	817.0	1,809	0.857	2,025	6,137	2,782	9.04E+05	530.0	9.53E+05	2.85E-05	2.99E-09
1992	18.1	192.2	285.5	4.34	34,275	819.4	1,745	0.879	2,033	6,193	2,789	9.07E+05	519.0	9.56E+05	6.96E-04	7.27E-08
1993	0.807	0	275.8	0	34,197	816.2	1,894	0.886	2,022	6,093	2,780	9.03E+05	405.3	9.52E+05	-3.14E-07	-3.30E-11
1994	10.6	82.6	292.6	0	34,204	816.3	1,840	0.905	2,023	6,100	2,780	9.04E+05	450.9	9.53E+05	-1.46E-04	-1.53E-08
1995	0.004	0	322.8	0	34,202	815.9	1,917	0.897	2,020	6,050	2,780	9.03E+05	409.4	9.51E+05	4.79E-04	5.04E-08
1996	0	0	297.7	0	34,290	817.8	2,020	0.877	2,023	6,018	2,787	9.04E+05	413.5	9.53E+05	-5.28E-04	-5.54E-08
1997	31.7	358.6	281.7	0	34,198	816.4	1,834	0.902	2,023	6,076	2,779	9.04E+05	533.4	9.53E+05	5.70E-04	5.99E-08
1998	6.52	107.9	304.7	0	34,202	816.4	1,802	0.902	2,025	6,099	2,779	9.04E+05	522.5	9.53E+05	4.91E-06	5.15E-10
1999	0	0	315.9	0	34,204	815.6	1,967	0.883	2,018	6,035	2,779	9.02E+05	427.0	9.50E+05	-2.16E-07	-2.28E-11
2000	9.92	150.2	293.8	0	34,298	818.4	1,883	0.880	2,027	6,105	2,787	9.05E+05	565.3	9.54E+05	0.002	2.22E-07
2001	0.141	0	252.5	0	34,205	816.1	1,897	0.878	2,021	6,086	2,779	9.03E+05	520.8	9.51E+05	-7.98E-06	-8.39E-10
2002	39.5	477.0	272.4	9.44	34,215	817.1	1,674	0.902	2,030	6,206	2,780	9.05E+05	633.3	9.54E+05	-3.91E-06	-4.09E-10
2003	0	0	611.7	0	34,217	816.1	1,799	0.892	2,023	6,158	2,779	9.04E+05	525.0	9.53E+05	1.87E-05	1.96E-09
2004	8.04	131.3	1,895	5.03	34,302	817.9	1,742	0.903	2,022	6,172	2,786	9.07E+05	514.8	9.58E+05	1.88E-05	1.97E-09
2005	0	0	2,216	0	34,198	814.3	1,992	0.866	2,013	6,023	2,778	9.02E+05	392.6	9.52E+05	-6.49E-05	-6.82E-09
2006	0.059	0	2,244	0	34,185	814.1	2,067	0.856	2,013	5,966	2,778	9.01E+05	384.6	9.51E+05	4.36E-06	4.58E-10
2007	74.4	712.8	1,358	2.05	34,206	816.0	1,714	0.935	2,018	6,117	2,778	9.06E+05	493.6	9.56E+05	1.39E-05	1.45E-09
2008	0	0	2,199	0	34,289	816.1	2,039	0.890	2,018	5,967	2,784	9.04E+05	347.1	9.54E+05	-2.90E-07	-3.04E-11
2009	18.2	172.1	315.1	0	34,209	815.6	1,916	0.887	2,018	6,055	2,778	9.02E+05	514.2	9.51E+05	5.30E-04	5.57E-08
2010	9.59	188.8	320.9	0	34,213	816.4	1,828	0.848	2,023	6,153	2,780	9.03E+05	775.7	9.52E+05	-1.97E-03	-2.07E-07
2011	0	0	318.2	0	34,203	815.9	2,028	0.780	2,018	6,119	2,781	9.00E+05	842.4	9.49E+05	-1.40E-03	-1.47E-07
2012	1.10	66.5	1,962	0	34,147	818.7	1,979	0.648	2,028	6,050	2,790	9.01E+05	1,604	9.52E+05	9.56E-05	1.00E-08
2013	0.640	36.5	2,087	0	33,867	817.8	1,953	0.435	2,025	6,008	2,786	8.96E+05	3,824	9.49E+05	6.82E-04	7.18E-08
2014	0	0	2,383	0	33,665	819.3	2,004	0.172	2,025	5,991	2,791	8.92E+05	7,598	9.49E+05	0.001	1.37E-07
2015	10.9	299.0	1,917	0	33,428	822.6	1,833	0.019	2,032	6,125	2,797	8.90E+05	13,925	9.54E+05	-3.54E-04	-3.72E-08
2016	3.05	47.2	1,921	0	33,492	825.9	1,832	0.005	2,039	6,346	2,809	8.93E+05	13,086	9.56E+05	-1.66E-02	-1.74E-06
2017	0	0	1,494	0	33,339	824.5	1,931	0	2,029	6,387	2,805	8.89E+05	14,603	9.52E+05	-1.40E-05	-1.47E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows													Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)													
Predevelopment	0	0	1,507	17.5	11.1	27.7	2.55	0	24.9	4.43	1.97	479.3	14,611	16,687
1980	0	0	1,422	16.5	11.7	22.7	2.63	0	24.1	5.89	2.09	609.7	10,950	13,067
1981	0.079	0	1,823	17.0	11.6	24.8	2.75	0	26.3	5.94	2.08	639.6	11,009	13,562
1982	4.63	112.6	1,232	16.5	11.6	22.5	2.59	0	24.2	5.94	2.08	568.3	10,879	12,882
1983	1.90	48.0	1,263	16.3	11.6	21.5	2.55	0	23.6	5.93	2.08	583.6	10,825	12,804
1984	3.52	88.6	1,072	15.9	11.7	19.7	2.47	0	22.6	5.94	2.09	592.1	10,665	12,502
1985	0	0	1,719	16.5	11.6	22.4	2.66	0	24.5	5.90	2.08	660.1	10,896	13,360
1986	0	0	1,623	16.6	11.6	23.2	2.69	0	25.3	5.87	2.07	613.1	11,157	13,480
1987	0.212	0	1,642	16.7	11.5	23.8	2.71	0	25.9	5.86	2.07	608.3	11,192	13,531
1988	13.7	248.0	759.7	15.9	11.6	19.3	2.41	0	22.5	5.88	2.08	553.3	10,501	12,155
1989	3.94	58.8	1,009	15.7	11.7	18.1	2.40	0	21.6	5.79	2.08	639.3	10,154	11,943
1990	2.82	0	1,501	16.0	11.7	19.9	2.58	0	22.9	5.85	2.09	740.7	9,833	12,159
1991	0.004	0	1,791	16.3	11.7	22.2	2.73	0	25.3	5.81	2.09	706.0	10,362	12,945
1992	0.012	0	2,021	16.7	11.6	24.5	2.86	0	28.4	5.86	2.09	675.3	10,747	13,535
1993	3.82	125.9	1,293	16.2	11.5	21.4	2.64	0	25.3	5.72	2.08	564.7	11,082	13,154
1994	7.13E-04	0	1,630	16.3	11.5	22.0	2.69	0	25.8	5.70	2.07	613.6	11,201	13,531
1995	4.41	92.9	1,261	16.0	11.5	20.1	2.58	0	24.3	5.68	2.07	579.7	11,016	13,036
1996	8.96	163.5	895.6	15.4	11.6	17.2	2.42	0	22.3	5.68	2.08	606.0	10,486	12,236
1997	0.009	0	1,757	16.1	11.6	20.1	2.66	0	24.5	5.66	2.07	723.9	10,586	13,150
1998	1.11	0	1,761	16.3	11.5	21.3	2.74	0	26.2	5.74	2.07	696.3	10,586	13,129
1999	6.42	176.7	1,009	15.5	11.5	17.8	2.51	0	23.4	5.68	2.07	611.2	10,473	12,355
2000	3.08	0.128	1,531	15.7	11.6	18.2	2.63	0	24.1	5.79	2.08	763.4	10,064	12,441
2001	0.456	19.4	1,374	15.5	11.6	17.6	2.60	0	23.9	5.78	2.07	715.8	10,147	12,335
2002	0.492	0	2,336	16.4	11.6	22.2	2.92	0	29.5	5.89	2.07	808.6	10,271	13,506
2003	1.36	40.1	1,703	16.1	11.5	21.2	2.79	0	28.4	5.90	2.07	688.0	10,530	13,050
2004	0	0	2,237	16.8	11.4	24.7	2.92	0	31.5	5.90	2.07	660.9	11,140	14,132
2005	10.0	241.4	1,130	15.8	11.4	20.0	2.60	0	26.4	5.83	2.06	552.5	10,940	12,958
2006	5.69	153.2	1,010	15.4	11.5	17.8	2.47	0	23.9	5.75	2.06	566.1	10,825	12,639
2007	0	0	2,419	16.9	11.5	25.3	2.88	0	29.7	5.70	2.05	648.8	11,693	14,855
2008	13.3	264.7	959.5	15.8	11.5	19.6	2.52	0	24.7	5.66	2.06	511.7	11,273	13,104
2009	6.52	26.4	1,379	15.7	11.5	18.5	2.57	0	24.1	5.74	2.06	702.2	10,317	12,512
2010	10.1	4.40	1,718	15.5	11.6	17.9	2.72	0	25.5	5.98	2.08	979.2	9,157	11,950
2011	16.7	266.9	794.5	14.3	11.7	12.7	2.46	0	22.5	6.18	2.09	1,070	8,248	10,468
2012	26.8	10.0	1,371	16.2	12.1	15.2	2.61	0.032	23.1	7.32	2.17	1,838	6,252	9,577
2013	46.2	33.4	1,500	18.6	12.6	17.2	2.77	0.513	24.1	11.7	2.28	4,059	3,661	9,389
2014	55.8	130.9	1,332	20.4	13.4	17.1	2.85	1.26	24.3	17.2	2.41	7,844	2,091	11,553
2015	67.1	15.7	2,201	24.2	14.2	20.8	3.28	2.26	29.3	25.5	2.60	14,185	1,153	17,745
2016	3.95	3.53	2,099	23.2	14.3	22.0	3.35	2.57	31.3	23.3	2.64	13,324	1,217	16,770
2017	21.7	106.7	1,714	23.4	14.5	20.8	3.26	2.91	29.7	24.8	2.70	14,840	1,022	17,827

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows													Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	119.8	1.81	0.793	0.254	7.23	1.08	57.0	17.7	3.91	15,067	1,410	16,687	1.05E-05	6.30E-08
1980	0	0	80.9	2.08	0.668	0.247	6.26	0.490	53.1	18.4	3.92	11,398	1,504	13,067	-8.67E-09	-6.63E-11
1981	4.83	118.1	111.5	2.11	0.700	0.224	8.05	0.519	62.7	18.4	3.94	11,485	1,746	13,562	-1.91E-07	-1.41E-09
1982	0.005	0	75.0	2.09	0.684	0.266	6.12	0.517	52.2	18.3	3.94	11,321	1,402	12,882	1.15E-10	8.90E-13
1983	0.242	0	68.7	2.09	0.675	0.263	5.56	0.520	49.2	18.3	3.94	11,260	1,395	12,804	-1.01E-07	-7.86E-10
1984	0.127	0	49.7	2.09	0.665	0.284	4.48	0.569	43.5	18.1	3.96	11,086	1,293	12,502	3.83E-07	3.06E-09
1985	6.86	145.1	93.2	2.10	0.691	0.221	6.83	0.608	56.5	18.2	3.95	11,350	1,675	13,360	4.20E-08	3.14E-10
1986	3.46	47.5	98.3	2.10	0.704	0.232	7.33	0.642	58.9	18.3	3.95	11,615	1,624	13,480	-4.31E-08	-3.20E-10
1987	1.67	35.1	103.7	2.10	0.713	0.234	7.65	0.654	60.4	18.3	3.95	11,656	1,641	13,531	1.43E-05	1.06E-07
1988	0	0	36.7	2.05	0.665	0.307	3.96	0.604	40.5	17.8	3.96	10,914	1,135	12,155	3.40E-08	2.80E-10
1989	0.018	0.201	35.3	1.99	0.642	0.288	3.60	0.593	38.9	17.5	3.94	10,569	1,271	11,943	-1.54E-09	-1.29E-11
1990	2.74	98.3	65.9	1.98	0.649	0.234	5.46	0.497	49.4	17.5	3.94	10,283	1,629	12,159	8.76E-08	7.21E-10
1991	8.45	141.7	97.9	2.01	0.681	0.216	7.48	0.541	60.1	17.7	3.95	10,828	1,776	12,945	9.40E-08	7.26E-10
1992	7.20	143.5	126.1	2.05	0.716	0.214	9.35	0.549	69.9	18.0	3.97	11,240	1,913	13,535	2.20E-06	1.63E-08
1993	3.09	0	85.6	2.02	0.702	0.261	6.86	0.656	56.1	17.9	3.96	11,522	1,454	13,154	-3.95E-10	-3.00E-12
1994	2.92	41.0	103.6	2.02	0.713	0.238	7.50	0.717	59.5	17.8	3.96	11,658	1,633	13,531	-2.30E-08	-1.70E-10
1995	0.117	0	77.8	1.99	0.695	0.267	6.08	0.729	52.0	17.5	3.95	11,452	1,423	13,036	1.58E-06	1.21E-08
1996	0.019	0	41.8	1.96	0.662	0.300	3.97	0.725	40.7	17.2	3.95	10,897	1,228	12,236	-1.70E-06	-1.39E-08
1997	6.76	166.8	94.5	1.99	0.687	0.222	6.80	0.730	56.4	17.3	3.94	11,043	1,751	13,150	2.25E-06	1.71E-08
1998	3.04	82.6	108.1	2.00	0.707	0.227	7.92	0.715	62.2	17.1	3.95	11,058	1,783	13,129	4.02E-07	3.06E-09
1999	0.452	0	56.4	1.96	0.677	0.289	5.08	0.707	46.6	17.2	3.95	10,894	1,328	12,355	-8.02E-10	-6.49E-12
2000	1.35	51.7	81.0	1.97	0.680	0.245	6.27	0.666	53.5	17.0	3.95	10,517	1,706	12,441	6.85E-06	5.50E-08
2001	0.938	0	74.2	1.97	0.678	0.256	6.01	0.657	51.9	17.2	3.94	10,586	1,591	12,335	-1.18E-08	-9.60E-11
2002	9.95	268.8	141.0	2.03	0.728	0.200	10.2	0.631	75.0	17.3	3.95	10,782	2,194	13,506	-1.59E-08	-1.18E-10
2003	1.18	2.27	120.5	2.02	0.727	0.242	9.02	0.628	67.9	17.4	3.95	11,009	1,815	13,050	-1.09E-07	-8.32E-10
2004	8.56	149.5	155.7	2.07	0.752	0.219	11.2	0.651	79.5	17.8	3.97	11,660	2,043	14,132	7.94E-08	5.62E-10
2005	0.025	0	86.7	2.01	0.703	0.284	6.94	0.654	56.5	17.5	3.96	11,385	1,398	12,958	-1.67E-07	-1.29E-09
2006	0.576	0	59.3	1.97	0.670	0.293	4.93	0.667	45.5	17.4	3.95	11,242	1,262	12,639	2.14E-08	1.69E-10
2007	19.1	338.6	152.5	2.05	0.747	0.198	10.4	0.739	75.3	18.0	3.96	12,197	2,037	14,855	1.59E-09	1.07E-11
2008	0.008	0	69.3	1.98	0.691	0.295	5.82	0.736	50.5	17.5	3.96	11,701	1,252	13,104	-1.16E-09	-8.84E-12
2009	0.116	2.56	78.8	1.96	0.687	0.263	5.97	0.682	51.5	17.0	3.94	10,766	1,582	12,512	3.02E-06	2.42E-08
2010	1.37	52.8	96.8	1.97	0.678	0.241	7.43	0.553	59.8	16.3	3.93	9,639	2,069	11,950	-5.96E-06	-4.99E-08
2011	0	0	29.0	1.92	0.619	0.566	3.91	0.434	40.9	16.0	3.92	8,675	1,696	10,468	-1.23E-05	-1.17E-07
2012	0.496	24.5	37.8	1.88	0.534	0.250	5.04	0.124	47.4	14.1	3.88	6,701	2,740	9,577	1.15E-06	1.20E-08
2013	0.294	19.5	30.0	1.79	0.439	0.234	5.93	0	52.5	13.6	3.80	4,092	5,169	9,389	2.93E-06	3.12E-08
2014	0	0	12.4	1.73	0.374	0.245	5.46	0	50.4	14.1	3.73	2,438	9,026	11,553	2.88E-05	2.49E-07
2015	2.42	118.5	30.3	1.78	0.338	0.172	9.10	0	71.0	15.7	3.65	1,492	16,000	17,745	-1.13E-06	-6.34E-09
2016	7.83	53.3	32.4	1.84	0.343	0.181	10.1	0	75.7	15.7	3.75	1,566	15,003	16,770	-4.90E-05	-2.92E-07
2017	0	0	21.0	1.84	0.343	0.207	8.72	0	68.4	15.9	3.75	1,340	16,367	17,827	-4.14E-08	-2.32E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows														Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Caldwell	Upper Layers	Lower Layers	
	(acre-feet)														
Predevelopment	0	0	6,105	5,633	1,243	1,065	104.2	0	367.8	234.6	115.7	4.75	1,932	7,983	24,788
1980	0	0	5,762	4,985	1,491	961.9	108.1	0	334.3	448.9	125.3	4.89	2,014	7,482	23,717
1981	5.13	0	7,386	5,052	1,451	1,011	110.3	0	358.1	422.6	124.5	4.79	2,287	7,641	25,852
1982	65.7	570.3	4,991	5,052	1,448	960.9	105.4	0	338.1	428.8	124.4	4.87	1,905	7,551	23,545
1983	41.0	306.7	5,116	4,959	1,460	932.5	104.9	0	322.6	433.6	124.4	4.90	1,897	7,382	23,084
1984	72.5	522.6	4,346	4,835	1,469	882.4	103.9	0	299.3	447.3	124.4	4.97	1,779	7,136	22,022
1985	0	0	6,964	4,895	1,455	940.0	106.9	0	327.8	445.9	123.8	4.86	2,200	7,206	24,669
1986	0	0	6,576	4,916	1,434	964.0	106.7	0	341.7	442.4	123.5	4.83	2,146	7,313	24,369
1987	7.03	0	6,655	4,995	1,419	984.8	107.7	0	351.3	429.3	123.4	4.81	2,169	7,488	24,735
1988	258.3	1,320	3,078	4,955	1,456	882.0	101.9	0	300.1	396.2	124.1	4.99	1,605	7,429	21,912
1989	102.1	401.0	4,090	4,889	1,490	839.7	103.8	0	280.1	363.2	124.1	5.01	1,747	7,080	21,515
1990	85.6	0	6,082	4,768	1,515	881.1	109.5	0	301.3	329.9	124.9	4.94	2,135	7,245	23,581
1991	0.271	0	7,257	4,696	1,483	938.0	110.0	0	338.4	343.2	124.7	4.85	2,306	7,192	24,793
1992	0.553	0	8,189	4,645	1,453	1,000	113.7	0	374.0	348.5	125.0	4.77	2,471	7,487	26,211
1993	34.6	616.4	5,237	4,735	1,422	921.6	106.9	0	351.2	402.8	123.9	4.84	1,963	7,213	23,132
1994	0.154	0	6,606	4,710	1,413	928.4	107.5	0	353.4	406.8	123.4	4.81	2,164	7,280	24,098
1995	76.1	493.5	5,111	4,728	1,422	882.7	103.7	0	333.5	390.2	123.2	4.87	1,929	7,262	22,860
1996	186.1	919.5	3,629	4,578	1,456	806.8	101.4	0	293.7	381.4	123.6	4.99	1,706	7,079	21,265
1997	0.492	0	7,118	4,639	1,453	868.2	106.2	0	325.2	393.2	123.1	4.86	2,281	7,073	24,386
1998	29.8	0	7,133	4,619	1,429	905.8	108.3	0	349.5	368.9	123.0	4.80	2,320	7,344	24,735
1999	92.0	923.2	4,089	4,465	1,435	820.3	102.1	0	314.8	383.1	123.0	4.92	1,816	7,026	21,595
2000	97.9	1.96	6,205	4,344	1,461	821.7	106.0	0	321.7	386.8	123.8	4.90	2,228	7,130	23,234
2001	5.05	85.2	5,566	4,310	1,452	807.8	105.0	0	318.5	402.0	123.2	4.89	2,100	6,926	22,207
2002	24.4	0	9,464	4,308	1,428	918.0	113.8	0	375.8	410.1	123.3	4.72	2,779	7,354	27,303
2003	1.71	125.0	6,902	4,301	1,396	908.5	111.6	0	378.2	424.6	123.0	4.75	2,365	7,363	24,405
2004	0	0	9,063	4,426	1,365	991.4	117.2	0	411.8	435.5	122.9	4.66	2,633	7,575	27,144
2005	128.0	1,245	4,577	4,408	1,370	886.9	106.4	0	363.6	425.5	122.5	4.81	1,916	7,447	23,000
2006	103.5	924.1	4,093	4,443	1,402	820.9	100.1	0	320.5	416.5	122.4	4.91	1,760	7,107	21,617
2007	0	0	9,801	4,675	1,366	984.0	113.6	0	386.5	417.1	121.6	4.68	2,624	7,348	27,843
2008	198.1	1,335	3,888	4,631	1,385	872.5	103.3	0	342.0	391.3	122.3	4.88	1,748	7,414	22,437
2009	223.7	240.7	5,588	4,387	1,426	833.3	102.8	0	326.1	377.5	122.8	4.87	2,102	7,397	23,132
2010	301.9	11.4	6,962	3,981	1,473	814.4	108.7	0	335.2	383.4	124.2	4.83	2,618	7,564	24,682
2011	350.2	1,424	3,219	3,620	1,525	682.9	106.3	0	281.4	417.0	125.2	5.00	2,184	7,022	20,962
2012	708.9	72.7	5,554	5,227	1,667	785.2	115.4	0.718	304.1	473.1	131.3	5.00	3,263	8,412	26,721
2013	1,235	103.9	6,078	7,565	1,916	890.4	134.6	5.81	337.5	1,051	141.0	4.99	5,719	10,479	35,661
2014	1,454	580.6	5,397	9,743	2,211	951.4	157.1	12.8	348.1	1,680	152.5	5.08	9,599	11,928	44,220
2015	1,836	48.5	8,920	13,129	2,580	1,130	188.5	22.4	428.3	2,578	168.5	5.01	16,669	14,455	62,158
2016	107.3	0.207	8,506	11,894	2,587	1,177	190.0	25.2	457.9	2,290	170.6	5.00	15,653	11,798	54,862
2017	541.3	490.5	6,946	12,494	2,676	1,163	193.2	28.5	454.9	2,450	176.0	5.07	17,001	12,101	56,721

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows														Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Caldwell	Upper Layers	Lower Layers			
	(acre-feet)																%
Predevelopment	0	0	0	606.2	35.4	43.3	253.0	8.92	286.0	704.3	235.8	10.9	17,418	5,186	24,788	0.002	7.87E-06
1980	0	0	3,147	736.6	32.1	39.3	194.0	3.52	239.8	768.8	234.0	10.1	13,467	4,845	23,717	-1.31E-06	-5.52E-09
1981	75.9	650.8	3,390	743.6	32.8	40.5	223.1	3.81	268.2	725.4	237.1	10.5	13,636	5,815	25,852	-1.30E-05	-5.01E-08
1982	0.221	0	3,384	749.8	32.4	39.4	199.0	3.82	245.1	725.9	237.1	10.1	13,388	4,530	23,545	7.12E-09	3.02E-11
1983	7.62	0	3,088	767.6	32.2	38.6	185.1	3.86	230.5	726.6	237.0	9.92	13,282	4,476	23,084	-8.74E-06	-3.78E-08
1984	4.84	0	2,841	763.1	32.2	37.4	163.1	4.38	207.4	728.8	239.1	9.58	13,029	3,962	22,022	5.01E-05	2.27E-07
1985	113.0	751.7	2,704	762.6	32.6	38.9	193.8	4.73	236.9	733.6	238.6	10.1	13,405	5,444	24,669	3.18E-06	1.29E-08
1986	83.9	300.8	2,597	761.5	32.8	39.7	207.4	5.04	252.3	738.2	238.7	10.3	13,718	5,383	24,369	-4.61E-06	-1.89E-08
1987	36.4	218.0	2,943	743.6	32.9	40.4	218.6	5.13	263.2	726.6	238.7	10.4	13,791	5,467	24,735	0.001	4.73E-06
1988	0	0	3,639	721.0	32.0	37.5	162.6	4.70	208.3	668.9	238.5	9.54	12,851	3,338	21,912	1.96E-06	8.94E-09
1989	0.698	0	3,461	682.5	31.6	36.2	144.7	4.61	186.6	639.7	237.4	9.24	12,431	3,650	21,515	2.98E-07	1.38E-09
1990	26.6	498.5	4,111	646.8	31.6	37.0	164.0	3.62	206.0	597.4	237.3	9.61	12,200	4,812	23,581	7.08E-06	3.00E-08
1991	175.1	804.2	3,193	670.1	32.5	38.7	198.9	4.06	244.0	630.2	238.5	10.2	12,881	5,671	24,793	8.17E-06	3.30E-08
1992	139.9	846.9	3,222	675.2	33.1	40.9	236.7	4.09	284.7	643.6	239.6	10.8	13,427	6,406	26,211	1.67E-04	6.39E-07
1993	95.9	0	2,382	681.1	32.9	39.7	213.2	5.20	258.7	713.1	239.0	10.3	13,641	4,820	23,132	-2.58E-07	-1.12E-09
1994	53.9	180.4	2,388	681.6	33.1	40.2	219.5	5.77	264.0	709.4	239.2	10.5	13,810	5,462	24,098	-6.70E-05	-2.78E-07
1995	5.28	0	2,605	672.9	32.7	39.1	196.1	5.90	242.0	680.9	238.5	10.2	13,534	4,598	22,860	1.28E-04	5.60E-07
1996	0.856	0	2,868	641.1	32.1	37.1	156.0	5.91	201.7	654.1	238.7	9.55	12,843	3,578	21,265	-1.29E-03	-6.07E-06
1997	91.0	843.3	2,780	639.2	32.5	38.6	189.6	5.92	233.5	672.9	237.9	10.1	13,106	5,506	24,386	3.16E-04	1.30E-06
1998	56.9	515.9	3,198	636.3	32.9	39.8	214.5	5.78	259.4	629.3	238.9	10.5	13,188	5,709	24,735	1.12E-05	4.53E-08
1999	14.2	0	2,673	632.2	32.4	37.8	175.7	5.74	222.1	655.4	238.7	9.85	12,898	4,001	21,595	-7.15E-08	-3.31E-10
2000	4.85	219.9	3,458	603.3	32.4	38.1	183.6	5.33	229.5	634.7	238.7	10.1	12,538	5,037	23,234	5.08E-04	2.19E-06
2001	27.7	0	2,833	617.8	32.4	37.8	180.4	5.26	225.9	660.8	238.4	9.97	12,598	4,739	22,207	-1.20E-06	-5.38E-09
2002	144.6	1,464	3,515	609.6	33.2	41.0	244.5	4.96	291.1	657.0	238.7	11.0	12,995	7,053	27,303	-2.36E-06	-8.64E-09
2003	54.6	32.4	3,076	623.4	33.3	41.1	245.5	4.95	291.1	683.0	239.2	10.9	13,220	5,850	24,405	-1.91E-05	-7.81E-08
2004	187.9	840.7	2,692	651.1	34.1	43.2	286.6	5.16	330.3	713.1	240.7	11.5	14,005	7,103	27,144	3.44E-06	1.27E-08
2005	4.54	0	2,685	640.2	33.2	40.4	230.6	5.24	275.0	700.2	239.5	10.6	13,555	4,580	23,000	-7.23E-07	-3.14E-09
2006	20.9	0	2,234	647.6	32.7	38.2	184.3	5.39	230.8	699.3	239.0	9.95	13,289	3,986	21,617	1.48E-06	6.85E-09
2007	332.2	1,779	1,660	690.0	34.0	42.1	263.9	5.97	305.0	730.2	240.1	11.2	14,513	7,236	27,843	4.05E-06	1.46E-08
2008	0.691	0	2,417	654.0	33.1	39.6	206.2	6.00	251.2	683.9	239.6	10.3	13,823	4,072	22,437	-7.71E-08	-3.44E-10
2009	0.003	0.285	3,597	598.7	32.3	38.7	189.0	5.47	236.8	628.4	237.8	10.1	12,818	4,740	23,132	1.85E-04	8.00E-07
2010	3.99	231.2	5,368	523.3	31.9	38.9	196.1	4.26	247.0	569.2	236.5	10.4	11,680	5,542	24,682	-3.17E-04	-1.28E-06
2011	0	0	5,354	499.1	31.4	35.5	138.2	3.22	188.2	573.8	235.9	9.38	10,491	3,402	20,962	-1.57E-04	-7.49E-07
2012	2.69	128.2	12,194	323.4	30.9	34.3	166.3	0.677	199.4	470.9	230.8	9.45	8,478	4,452	26,721	4.35E-05	1.63E-07
2013	2.56	147.9	23,271	186.5	29.8	32.6	178.8	0	216.3	803.9	221.9	9.46	5,784	4,776	35,661	2.00E-04	5.62E-07
2014	0	0	33,763	181.8	28.9	30.6	166.1	0	210.4	1,200	214.6	9.06	4,000	4,416	44,220	0.002	5.37E-06
2015	18.9	815.4	49,070	214.2	28.3	29.9	218.9	0	267.3	1,766	205.0	9.57	3,040	6,474	62,158	-8.39E-05	-1.35E-07
2016	223.9	387.8	41,860	212.2	29.3	30.4	240.5	0	294.3	1,670	215.2	9.78	3,145	6,544	54,862	0.001	2.52E-06
2017	0	0	45,401	215.6	29.4	29.1	231.6	0	283.8	1,772	215.0	9.36	2,816	5,718	56,721	1.57E-06	2.76E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows														Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Caldwell	Upper Layers	Lower Layers	
	(acre-feet)														
Predevelopment	0	0	1,491	698.2	111.5	2,337	33.9	0	1,588	20.3	18.0	663.6	5,209	4,025	16,197
1980	0	0	1,408	663.5	134.2	2,146	34.2	0	1,238	26.0	19.4	757.0	4,871	3,783	15,080
1981	1.91	0	1,804	669.1	129.7	2,217	36.0	0	1,380	26.3	19.3	679.1	5,843	3,838	16,645
1982	72.1	388.3	1,219	665.2	130.2	2,134	33.8	0	1,275	26.4	19.3	749.9	4,555	3,852	15,120
1983	50.3	179.7	1,250	662.8	132.9	2,080	32.9	0	1,202	26.4	19.3	783.0	4,500	3,764	14,684
1984	87.2	323.5	1,062	657.0	137.4	1,972	31.5	0	1,097	26.3	19.3	838.8	3,986	3,666	13,904
1985	0	0	1,701	663.9	133.9	2,084	34.2	0	1,207	26.0	19.3	744.9	5,474	3,614	15,703
1986	0	0	1,607	664.7	130.2	2,128	34.8	0	1,283	25.9	19.2	715.5	5,411	3,664	15,682
1987	0.441	0	1,626	665.2	127.9	2,166	35.1	0	1,342	25.9	19.2	697.0	5,495	3,767	15,967
1988	237.5	843.8	752.0	655.0	134.9	2,004	30.8	0	1,126	26.5	19.3	852.5	3,358	3,880	13,920
1989	115.0	209.6	999.2	652.5	141.5	1,913	30.2	0	1,015	26.2	19.3	883.5	3,674	3,678	13,356
1990	52.6	0	1,486	648.3	142.5	1,983	32.7	0	1,061	26.8	19.4	813.5	4,841	3,721	14,828
1991	0.148	0	1,773	650.2	136.2	2,081	35.4	0	1,231	26.2	19.4	726.3	5,702	3,614	15,993
1992	0.167	0	2,001	648.2	129.9	2,188	37.6	0	1,414	26.3	19.5	639.7	6,435	3,737	17,276
1993	53.3	432.1	1,280	652.5	128.2	2,058	34.5	0	1,316	25.3	19.3	726.5	4,845	3,645	15,215
1994	0	0	1,614	651.1	127.2	2,073	34.9	0	1,325	25.2	19.2	710.2	5,489	3,669	15,738
1995	74.3	317.9	1,249	650.8	128.8	1,996	33.1	0	1,229	25.4	19.2	767.9	4,622	3,720	14,832
1996	179.8	573.5	886.5	636.1	136.3	1,871	30.5	0	1,047	25.6	19.2	870.3	3,599	3,706	13,581
1997	1.23	0	1,739	645.9	134.0	1,970	33.9	0	1,159	25.2	19.2	760.9	5,535	3,593	15,616
1998	13.7	0	1,743	645.5	129.7	2,038	35.4	0	1,280	25.8	19.2	703.7	5,737	3,743	16,115
1999	115.1	597.9	999.1	635.5	132.5	1,893	32.0	0	1,140	25.4	19.2	814.3	4,023	3,643	14,071
2000	58.6	0	1,516	628.7	134.9	1,879	33.3	0	1,134	26.0	19.3	787.9	5,065	3,704	14,986
2001	9.05	50.6	1,360	631.3	134.7	1,870	33.0	0	1,126	25.7	19.2	790.8	4,765	3,568	14,383
2002	9.09	0	2,312	632.3	128.0	2,055	37.8	0	1,384	26.2	19.2	625.5	7,081	3,727	18,037
2003	6.83	117.3	1,686	630.3	124.3	2,048	36.6	0	1,416	26.1	19.2	649.4	5,877	3,756	16,392
2004	0	0	2,214	641.4	120.6	2,195	38.9	0	1,624	26.1	19.1	589.3	7,126	3,794	18,389
2005	147.4	825.5	1,118	631.6	121.6	2,024	33.9	0	1,384	26.0	19.1	716.0	4,608	3,840	15,494
2006	131.5	539.0	999.9	636.0	127.0	1,918	31.4	0	1,194	25.6	19.1	813.6	4,012	3,680	14,126
2007	0	0	2,395	660.9	121.7	2,196	37.7	0	1,529	25.0	18.9	605.1	7,261	3,609	18,459
2008	186.1	904.8	949.8	645.1	124.4	2,001	32.8	0	1,301	25.4	19.0	764.5	4,098	3,834	14,886
2009	159.2	121.3	1,365	624.4	129.0	1,901	32.5	0	1,182	26.0	19.1	786.4	4,766	3,892	15,004
2010	190.3	0.093	1,701	595.5	133.2	1,842	34.1	0	1,142	27.5	19.3	755.6	5,570	4,065	16,076
2011	338.7	907.8	786.5	573.7	144.4	1,625	30.0	0	900.5	28.3	19.5	909.0	3,424	3,876	13,563
2012	432.1	0	1,357	642.8	155.3	1,927	32.3	0	1,023	33.7	20.3	905.5	4,480	4,733	15,742
2013	762.8	0.144	1,485	729.7	173.0	2,182	36.2	1.23	1,177	53.4	21.6	873.5	4,805	6,147	18,448
2014	991.1	239.1	1,319	808.3	199.7	2,369	38.5	4.30	1,175	84.1	23.3	916.7	4,446	7,215	19,830
2015	1,185	0	2,179	940.4	225.9	2,767	47.2	8.45	1,472	133.7	25.7	786.9	6,512	8,876	25,159
2016	194.6	0	2,078	932.1	231.3	2,892	50.3	10.6	1,662	126.7	26.5	729.8	6,582	6,947	22,462
2017	405.4	273.5	1,697	944.3	241.4	2,894	49.8	12.4	1,665	133.9	27.4	789.6	5,753	7,121	22,008

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows														Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Caldwell	Upper Layers	Lower Layers			
	(acre-feet)																%
Predevelopment	0	0	0	204.2	13.2	19.2	3,521	5.31	2,472	110.6	34.4	116.0	8,132	1,569	16,197	6.74E-05	4.16E-07
1980	0	0	193.8	209.9	6.40	16.0	3,010	2.81	2,291	115.0	34.2	103.8	7,600	1,497	15,080	-3.35E-08	-2.22E-10
1981	92.3	418.7	214.9	214.8	7.37	27.8	3,297	2.88	2,592	115.5	34.3	110.3	7,769	1,748	16,645	-7.24E-07	-4.35E-09
1982	0.190	0	220.0	209.9	6.76	19.2	3,042	2.89	2,258	115.5	34.4	103.1	7,666	1,442	15,120	3.87E-10	2.56E-12
1983	1.23	0	227.4	206.3	6.41	16.8	2,906	2.89	2,175	115.0	34.3	100.3	7,491	1,401	14,684	-2.17E-07	-1.48E-09
1984	1.33	0	240.4	201.7	6.43	17.9	2,687	3.04	1,981	114.3	34.4	94.4	7,235	1,287	13,904	1.70E-07	1.22E-09
1985	111.7	503.8	223.7	206.8	6.41	22.2	3,013	3.17	2,387	114.1	34.3	103.6	7,321	1,652	15,703	1.37E-07	8.71E-10
1986	78.2	164.3	233.6	208.9	6.71	24.3	3,137	3.32	2,465	114.6	34.4	106.6	7,433	1,672	15,682	-8.52E-08	-5.44E-10
1987	45.8	121.5	241.1	211.2	7.47	25.7	3,229	3.40	2,528	115.0	34.4	108.8	7,612	1,684	15,967	-1.85E-05	-1.16E-07
1988	5.76E-04	0	248.4	201.8	6.43	12.7	2,670	3.28	1,866	112.8	34.4	93.9	7,525	1,146	13,920	3.59E-08	2.58E-10
1989	0.220	0	231.6	196.1	6.39	11.2	2,506	3.21	1,815	110.4	34.2	89.9	7,170	1,183	13,356	-4.33E-08	-3.24E-10
1990	43.5	350.9	271.6	201.5	6.38	14.8	2,715	2.88	2,159	110.2	34.1	96.2	7,345	1,476	14,828	1.36E-07	9.14E-10
1991	145.4	503.9	268.6	206.5	6.42	23.9	3,080	2.95	2,464	111.0	34.2	104.1	7,310	1,732	15,993	1.55E-07	9.70E-10
1992	154.3	491.0	320.1	213.8	7.82	37.5	3,426	2.97	2,809	113.1	34.5	113.6	7,620	1,933	17,276	3.08E-06	1.78E-08
1993	54.4	0	270.4	205.0	7.59	19.5	3,143	3.31	2,378	112.8	34.4	105.9	7,335	1,545	15,215	1.06E-08	6.97E-11
1994	51.6	120.2	274.0	205.6	7.79	22.1	3,209	3.58	2,520	112.2	34.5	108.8	7,407	1,661	15,738	4.73E-06	3.00E-08
1995	5.05	0	274.4	200.8	6.87	17.1	2,988	3.69	2,260	110.7	34.4	103.5	7,380	1,448	14,832	2.24E-06	1.51E-08
1996	0.595	0	279.0	194.3	6.45	11.5	2,594	3.70	1,895	108.5	34.4	94.1	7,180	1,181	13,581	-1.86E-05	-1.37E-07
1997	98.2	582.5	265.8	200.7	6.42	19.5	2,961	3.69	2,394	108.1	34.2	104.3	7,192	1,646	15,616	5.03E-06	3.22E-08
1998	73.2	305.7	266.0	205.6	7.04	26.0	3,190	3.63	2,573	107.7	34.3	109.0	7,472	1,743	16,115	9.14E-06	5.67E-08
1999	6.24	0	282.3	196.8	6.43	15.0	2,795	3.59	2,070	108.0	34.3	98.3	7,135	1,320	14,071	-4.97E-10	-3.53E-12
2000	13.3	164.8	365.0	199.1	6.44	19.2	2,885	3.42	2,313	106.8	34.3	102.3	7,244	1,529	14,986	6.49E-06	4.33E-08
2001	7.06	0	298.5	197.2	6.42	16.0	2,850	3.33	2,238	107.1	34.2	100.6	7,038	1,487	14,383	5.89E-08	4.10E-10
2002	185.0	920.2	370.2	209.9	8.07	49.5	3,474	3.19	3,003	107.7	34.3	116.9	7,492	2,064	18,037	-3.76E-08	-2.08E-10
2003	44.5	2.17	323.5	209.0	9.05	34.4	3,427	3.15	2,779	109.3	34.4	114.4	7,498	1,804	16,392	-1.64E-06	-1.00E-08
2004	179.6	524.4	283.4	216.1	12.7	47.5	3,811	3.22	3,191	112.0	34.7	152.6	7,727	2,093	18,389	1.84E-07	1.00E-09
2005	4.96	0	282.6	204.8	9.63	23.6	3,243	3.27	2,431	111.4	34.6	109.5	7,575	1,461	15,494	-3.92E-08	-2.53E-10
2006	8.83	0	234.0	196.3	6.86	14.6	2,855	3.34	2,076	110.6	34.5	100.4	7,220	1,266	14,126	2.84E-08	2.01E-10
2007	311.4	1,171	174.8	210.9	10.3	39.8	3,653	3.59	3,022	113.0	34.6	128.7	7,498	2,088	18,459	-3.51E-07	-1.90E-09
2008	2.75	0	255.6	201.0	8.02	18.9	3,061	3.68	2,205	111.4	34.6	105.4	7,536	1,343	14,886	-1.26E-09	-8.44E-12
2009	0	0	379.2	199.4	6.44	19.3	2,926	3.50	2,285	107.6	34.3	103.6	7,513	1,427	15,004	1.51E-05	1.01E-07
2010	11.7	149.4	565.5	203.6	6.41	33.8	2,985	2.99	2,552	103.3	34.1	107.0	7,679	1,641	16,076	-7.41E-06	-4.61E-08
2011	0	0	565.5	192.7	6.39	17.7	2,371	2.43	1,923	100.7	33.9	90.6	7,109	1,151	13,563	-7.46E-05	-5.50E-07
2012	11.0	150.6	531.7	209.2	6.31	6.89	2,728	1.11	2,069	88.0	33.2	92.5	8,508	1,307	15,742	1.07E-05	6.78E-08
2013	11.8	175.9	804.3	230.9	6.14	3.43	2,925	0	2,148	77.0	31.9	92.1	10,577	1,365	18,448	9.77E-06	5.29E-08
2014	0	0	1,229	250.3	6.03	0.183	2,811	0	2,044	75.9	30.6	87.1	12,010	1,285	19,830	2.92E-04	1.47E-06
2015	59.2	705.4	1,547	287.6	6.24	0.426	3,425	0	2,597	83.5	29.0	93.2	14,550	1,775	25,159	-1.02E-06	-4.06E-09
2016	60.6	286.9	1,338	292.0	6.34	0.502	3,668	0	2,709	87.5	29.3	95.7	11,899	1,989	22,462	-2.57E-05	-1.15E-07
2017	0	0	1,464	294.8	6.45	0	3,575	0	2,478	90.5	28.9	90.3	12,190	1,792	22,008	-9.24E-08	-4.20E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows											Total Inflows
	Specific Storage	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Caldwell	Upper Layers	
	(acre-feet)											
Predevelopment	0	571.5	112.2	2,709	5.10	0	63.8	46.5	26.2	36.1	1,571	5,142
1980	0	524.9	124.5	2,529	5.09	0	59.7	61.3	28.6	40.9	1,499	4,873
1981	3.08	529.9	122.9	2,596	5.35	0	62.1	61.4	28.4	36.5	1,749	5,194
1982	156.5	525.5	122.8	2,513	5.10	0	60.0	61.6	28.4	39.7	1,443	4,955
1983	134.3	526.3	123.4	2,461	4.92	0	59.2	61.7	28.4	41.4	1,401	4,842
1984	230.8	521.5	124.8	2,345	4.71	0	57.9	61.8	28.5	43.9	1,287	4,706
1985	0	529.8	123.9	2,458	5.02	0	59.1	61.5	28.3	39.2	1,653	4,958
1986	0	530.5	122.8	2,499	5.18	0	59.4	61.2	28.3	36.9	1,673	5,016
1987	0	527.8	121.8	2,538	5.25	0	60.2	61.1	28.2	35.5	1,686	5,063
1988	560.3	514.6	123.7	2,380	4.68	0	58.3	61.3	28.3	44.0	1,146	4,922
1989	350.6	514.6	125.4	2,295	4.48	0	57.8	60.4	28.4	46.7	1,183	4,666
1990	160.8	509.7	126.3	2,367	4.77	0	57.6	60.4	28.6	43.2	1,477	4,835
1991	3.83	514.1	125.2	2,459	5.21	0	60.8	60.0	28.6	40.2	1,733	5,030
1992	0.358	509.5	123.5	2,565	5.59	0	62.7	60.2	28.7	34.7	1,934	5,325
1993	94.6	512.6	122.3	2,457	5.26	0	60.0	59.5	28.4	38.6	1,546	4,924
1994	0	511.2	121.6	2,478	5.23	0	59.9	59.2	28.3	37.6	1,662	4,963
1995	163.1	509.9	121.8	2,404	4.99	0	58.4	58.9	28.2	40.7	1,449	4,839
1996	452.8	493.3	124.0	2,283	4.59	0	56.4	58.8	28.3	46.0	1,182	4,729
1997	11.5	503.3	123.6	2,387	4.96	0	57.8	58.3	28.2	41.1	1,647	4,863
1998	29.3	501.9	122.5	2,454	5.25	0	59.2	58.5	28.2	38.1	1,744	5,042
1999	260.0	492.5	123.0	2,315	4.86	0	57.3	58.3	28.2	43.5	1,321	4,703
2000	165.6	480.5	124.0	2,318	4.92	0	57.6	58.9	28.4	41.8	1,530	4,810
2001	37.5	486.9	123.8	2,308	4.92	0	57.2	58.8	28.3	42.4	1,488	4,636
2002	18.2	483.5	122.0	2,483	5.54	0	60.7	59.3	28.3	33.2	2,065	5,359
2003	7.50	482.0	120.7	2,484	5.52	0	60.2	59.7	28.2	34.0	1,805	5,087
2004	0	494.6	119.1	2,623	5.82	0	64.4	60.1	28.2	29.6	2,094	5,518
2005	301.9	484.7	119.0	2,461	5.21	0	59.0	59.9	28.0	37.3	1,462	5,018
2006	325.3	493.5	120.5	2,356	4.74	0	57.5	59.5	28.0	43.6	1,267	4,756
2007	0	524.0	119.0	2,618	5.51	0	63.6	58.9	27.9	33.1	2,089	5,540
2008	371.0	502.1	119.9	2,430	5.01	0	58.8	58.9	28.0	40.5	1,344	4,958
2009	439.6	473.7	121.1	2,349	4.84	0	57.6	58.8	28.0	41.1	1,428	5,002
2010	556.5	432.7	122.8	2,309	5.00	0	56.8	59.8	28.3	38.0	1,642	5,251
2011	941.9	413.0	126.2	2,098	4.59	0	54.1	60.7	28.6	46.5	1,151	4,924
2012	1,185	450.6	131.4	2,403	4.78	0	62.2	63.5	29.6	52.8	1,308	5,691
2013	2,112	484.8	138.9	2,690	5.30	0.608	80.0	93.5	31.2	59.7	1,368	7,064
2014	2,850	520.1	150.4	2,928	6.00	8.38	113.6	155.1	33.6	72.9	1,289	8,128
2015	3,442	585.5	164.1	3,407	7.04	19.8	146.2	252.7	36.9	81.1	1,781	9,924
2016	1,049	634.4	172.0	3,571	7.56	27.8	157.0	275.9	38.8	81.5	1,995	8,010
2017	1,234	636.4	178.4	3,595	7.74	33.9	173.6	296.1	40.3	89.5	1,798	8,082

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-4.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales County UWCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows												Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	Evergreen UWCD	Fayette County GCD	Guadalupe County GCD	Lost Pines GCD	Pecan Valley GCD	Plum Creek CD	Gonzales	Lavaca	Caldwell	Upper Layers			
	(acre-feet)														%
Predevelopment	0	0	163.6	7.65	44.7	53.5	18.5	358.3	225.2	51.8	127.9	4,091	5,142	5.20E-05	1.01E-06
1980	0	42.8	185.1	6.88	36.1	44.9	11.2	322.7	219.6	50.9	113.1	3,839	4,873	-2.65E-08	-5.43E-10
1981	211.2	46.6	188.3	6.92	43.5	48.5	11.3	349.9	219.4	51.0	120.0	3,898	5,194	-4.28E-07	-8.24E-09
1982	2.01	48.3	185.3	6.88	37.9	45.7	11.3	326.1	219.1	51.1	113.2	3,908	4,955	1.96E-10	3.95E-12
1983	0.761	51.3	183.3	6.88	34.8	43.6	11.2	313.0	218.5	51.0	109.5	3,818	4,842	-1.30E-07	-2.69E-09
1984	1.01	56.2	180.1	6.89	30.8	40.5	11.5	292.5	217.2	51.0	100.8	3,718	4,706	1.20E-07	2.55E-09
1985	245.9	54.0	183.5	6.86	37.3	44.3	11.8	325.8	216.8	50.9	111.5	3,669	4,958	6.81E-08	1.37E-09
1986	218.5	58.4	184.8	6.87	41.7	46.3	12.2	340.3	218.3	51.0	116.9	3,721	5,016	-5.13E-08	-1.02E-09
1987	139.8	60.2	185.8	6.94	44.6	47.6	12.5	349.4	219.2	51.1	120.8	3,825	5,063	-1.17E-05	-2.30E-07
1988	0.128	61.0	178.8	6.90	30.8	40.7	12.3	288.6	214.7	51.1	105.1	3,932	4,922	2.15E-08	4.37E-10
1989	0.435	57.1	173.5	6.86	25.6	37.9	12.1	270.3	209.2	50.7	96.5	3,726	4,666	-2.01E-08	-4.31E-10
1990	77.0	65.5	176.0	6.84	30.6	40.0	11.4	297.5	205.6	50.5	102.0	3,772	4,835	8.04E-08	1.66E-09
1991	330.1	56.5	179.6	6.86	36.1	45.1	11.3	329.0	206.9	50.6	108.9	3,669	5,030	9.22E-08	1.83E-09
1992	406.5	69.9	184.7	6.99	45.9	49.9	11.4	369.2	210.9	51.0	120.8	3,797	5,325	1.79E-06	3.36E-08
1993	157.6	61.9	178.9	6.99	39.4	47.1	12.1	338.9	213.2	51.0	114.7	3,703	4,924	-2.74E-09	-5.57E-11
1994	152.6	64.4	179.0	7.03	41.6	47.6	12.8	346.9	214.0	51.1	117.9	3,728	4,963	1.03E-06	2.07E-08
1995	21.8	64.6	175.5	6.91	36.3	45.0	13.2	324.3	211.7	51.1	111.9	3,777	4,839	1.30E-06	2.68E-08
1996	2.47	66.2	170.4	6.91	27.6	39.5	13.3	285.3	206.9	51.0	101.7	3,758	4,729	-1.16E-05	-2.45E-07
1997	190.3	62.0	174.8	6.88	35.2	43.6	13.2	322.7	204.6	50.7	110.5	3,648	4,863	3.21E-06	6.59E-08
1998	175.8	62.3	178.2	6.88	40.8	47.0	13.0	346.6	202.2	50.7	116.3	3,802	5,042	2.39E-06	4.74E-08
1999	9.88	67.4	172.0	6.88	31.4	42.4	12.9	304.8	202.3	50.7	105.2	3,697	4,703	-4.47E-10	-9.51E-12
2000	16.8	87.2	173.7	6.89	34.9	42.7	12.4	318.3	199.3	50.7	108.7	3,758	4,810	8.36E-06	1.74E-07
2001	5.93	71.4	172.9	6.87	33.1	42.5	12.0	313.3	198.5	50.5	106.6	3,622	4,636	1.38E-08	2.97E-10
2002	425.5	88.4	182.4	7.00	49.9	50.1	11.6	382.2	198.5	50.7	125.0	3,788	5,359	-2.30E-08	-4.30E-10
2003	139.0	77.3	182.4	7.20	49.0	50.6	11.4	376.8	201.0	51.0	124.1	3,817	5,087	-1.02E-06	-2.00E-08
2004	463.7	67.6	187.7	7.56	57.4	55.7	11.6	415.0	206.8	51.5	134.3	3,860	5,518	1.08E-07	1.96E-09
2005	26.1	67.5	179.2	7.34	43.9	49.2	11.7	354.0	207.6	51.4	119.9	3,901	5,018	-1.35E-08	-2.68E-10
2006	21.0	55.9	172.5	6.97	32.3	43.7	12.0	309.5	207.6	51.3	107.9	3,735	4,756	1.69E-08	3.56E-10
2007	737.2	41.7	182.7	7.34	50.2	53.2	12.6	388.7	213.1	51.4	128.6	3,673	5,540	-1.02E-07	-1.85E-09
2008	16.0	60.9	175.1	7.14	37.9	46.7	13.0	329.7	212.2	51.5	114.7	3,893	4,958	-8.04E-10	-1.62E-11
2009	0	90.6	173.1	6.92	37.0	43.8	12.7	322.3	203.7	51.1	112.2	3,948	5,002	6.16E-06	1.23E-07
2010	14.4	134.2	177.7	6.89	43.5	43.6	11.3	340.9	190.2	50.7	116.7	4,121	5,251	-4.56E-06	-8.69E-08
2011	0	135.0	174.5	6.86	30.0	35.6	9.51	281.7	178.4	50.2	98.3	3,924	4,924	-2.51E-05	-5.10E-07
2012	14.8	68.0	181.5	6.79	21.5	44.1	6.10	272.7	147.9	49.3	97.6	4,781	5,691	3.52E-06	6.19E-08
2013	21.6	63.0	187.7	6.64	17.0	47.2	0.655	265.2	117.4	47.5	97.0	6,193	7,064	6.37E-06	9.02E-08
2014	0	111.0	194.5	6.47	12.9	45.8	0	251.5	106.6	45.2	98.9	7,255	8,128	1.88E-04	2.32E-06
2015	99.2	85.4	212.3	6.61	13.3	54.4	0	279.2	109.9	42.4	106.0	8,916	9,924	-5.20E-07	-5.24E-09
2016	89.3	78.6	216.6	6.90	14.4	57.5	0	291.1	115.7	41.2	110.3	6,988	8,010	-5.10E-06	-6.37E-08
2017	0	89.0	216.4	7.15	10.8	58.0	0	275.0	120.0	39.9	107.1	7,159	8,082	-4.53E-08	-5.60E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Quarternary Alluvium (Layer 1) Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Evergreen UWCD	Gonzales County UWCD	Bexar	Caldwell	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	29,347	1,785	45.1	15.5	15.9	247.6	35,615	67,071
1980	0	0	30,459	1,685	43.3	12.1	16.1	211.9	33,349	65,776
1981	5.73E-04	0.376	30,095	2,160	43.8	12.4	16.0	216.8	33,720	66,265
1982	0.516	201.8	30,518	1,459	42.9	12.3	16.1	210.7	33,026	65,488
1983	0.437	175.3	30,642	1,496	42.7	12.1	16.1	206.6	32,757	65,348
1984	0.941	408.7	31,265	1,271	41.9	11.7	16.2	198.1	31,923	65,137
1985	0	0	30,463	2,036	43.2	11.7	16.0	205.3	32,925	65,701
1986	1.62E-08	4.28E-05	30,325	1,923	43.5	12.0	16.0	208.7	33,246	65,775
1987	0	0	30,204	1,946	43.6	12.2	16.0	211.6	33,532	65,965
1988	1.03	418.0	31,038	900.0	42.1	11.7	16.1	199.4	32,406	65,032
1989	0.716	310.5	31,158	1,196	41.7	11.1	16.1	193.1	31,860	64,787
1990	0.019	12.4	30,843	1,778	42.4	11.0	16.1	195.4	32,257	65,157
1991	0	0	30,439	2,122	43.3	11.2	16.0	205.4	32,986	65,823
1992	0	0	30,186	2,394	44.1	11.9	16.0	215.3	33,785	66,652
1993	0.179	67.2	30,421	1,531	43.2	11.9	16.0	212.8	33,222	65,525
1994	1.67E-06	0.002	30,259	1,932	43.4	12.1	16.0	216.8	33,533	66,012
1995	0.385	144.3	30,551	1,494	42.8	11.9	16.0	212.9	33,038	65,511
1996	0.966	394.3	31,149	1,061	41.8	11.4	16.1	203.4	32,267	65,145
1997	3.48E-05	0.025	30,458	2,081	43.0	11.4	16.0	210.7	33,049	65,870
1998	0	0	30,269	2,086	43.5	11.6	16.0	216.7	33,454	66,096
1999	0.747	304.8	30,889	1,196	42.2	11.3	16.1	207.8	32,464	65,132
2000	0.132	51.8	30,870	1,814	42.5	11.2	16.1	208.7	32,647	65,661
2001	0.128	53.0	30,813	1,628	42.4	11.0	16.1	207.2	32,513	65,283
2002	0	0	30,061	2,767	43.9	11.5	15.9	221.6	33,841	66,963
2003	0.018	9.47	30,253	2,018	43.4	11.8	16.0	222.8	33,643	66,218
2004	0	0	29,806	2,650	44.6	12.5	15.9	236.2	34,815	67,579
2005	0.955	347.3	30,482	1,338	42.7	12.3	16.0	224.0	33,404	65,867
2006	0.992	382.3	30,778	1,197	42.1	11.9	16.1	215.0	32,781	65,424
2007	0	0	29,562	2,866	44.9	12.4	15.9	236.0	34,933	67,670
2008	1.17	440.0	30,647	1,137	42.8	12.2	16.1	221.7	33,300	65,818
2009	0.687	263.4	30,742	1,634	42.2	11.8	16.0	215.2	32,800	65,725
2010	0.427	164.8	30,908	2,036	41.9	11.6	16.0	212.0	32,516	65,907
2011	1.53	655.7	31,927	941.3	40.1	11.1	16.2	193.9	31,065	64,852
2012	0.096	47.2	31,182	1,624	41.8	10.1	16.1	198.2	32,166	65,285
2013	0.011	4.58	30,739	1,777	42.5	9.54	16.0	202.3	32,595	65,386
2014	0.082	42.4	30,787	1,578	42.4	8.79	16.0	198.3	32,482	65,155
2015	8.94E-05	0.135	30,006	2,608	44.0	8.31	15.9	210.8	33,782	66,675
2016	4.98E-09	6.65E-06	29,852	2,487	44.6	8.14	15.9	219.5	34,464	67,091
2017	0.065	29.2	30,018	2,031	43.8	7.80	15.9	217.6	33,987	66,350

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Evergreen UWCD	Gonzales County UWCD	Bexar	Caldwell	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	35,610	6.48	29.0	59.0	29.8	351.1	30,985	67,071	-2.28E-07	-3.41E-10
1980	0	0	33,589	4.02	27.3	48.5	29.5	285.2	31,793	65,776	8.73E-11	1.33E-13
1981	0.524	200.5	33,901	4.35	27.7	50.2	29.5	293.9	31,757	66,265	-2.32E-07	-3.51E-10
1982	0	0	33,319	3.98	27.2	48.9	29.4	283.6	31,776	65,488	-1.73E-07	-2.65E-10
1983	7.51E-10	1.00E-06	33,073	3.73	27.2	47.6	29.3	276.1	31,891	65,348	-1.92E-07	-2.94E-10
1984	0	0	32,343	3.20	27.3	45.3	29.2	260.6	32,429	65,137	1.31E-07	2.01E-10
1985	0.536	234.0	33,137	3.56	27.2	46.5	29.4	271.5	31,951	65,701	-8.70E-08	-1.32E-10
1986	0.466	198.2	33,424	3.81	27.3	47.8	29.5	278.6	31,765	65,775	-2.76E-07	-4.20E-10
1987	0.469	192.5	33,687	4.10	27.5	49.0	29.5	285.4	31,689	65,965	-3.08E-07	-4.66E-10
1988	0	0	32,750	3.44	27.3	45.7	29.3	265.9	31,910	65,032	1.26E-07	1.93E-10
1989	8.16E-08	1.09E-04	32,255	3.05	27.2	43.2	29.1	254.5	32,175	64,787	-2.82E-07	-4.36E-10
1990	0.114	47.3	32,589	3.14	27.2	43.3	29.3	256.7	32,160	65,157	-2.67E-07	-4.10E-10
1991	0.626	272.3	33,197	3.49	27.2	45.8	29.4	270.4	31,977	65,823	-1.59E-07	-2.42E-10
1992	0.949	391.4	33,904	4.08	27.8	49.4	29.6	287.2	31,958	66,652	6.92E-08	1.04E-10
1993	0.041	24.8	33,441	3.96	27.3	49.0	29.5	283.9	31,666	65,525	-2.29E-07	-3.49E-10
1994	0.314	138.0	33,713	4.22	27.3	49.9	29.5	291.5	31,759	66,012	-2.33E-07	-3.52E-10
1995	0.005	2.78	33,308	3.99	27.3	48.7	29.4	285.4	31,806	65,511	-2.24E-07	-3.43E-10
1996	0	0	32,638	3.44	27.4	45.7	29.3	268.5	32,133	65,145	1.19E-07	1.83E-10
1997	0.462	199.9	33,283	3.78	27.2	46.9	29.5	280.2	31,998	65,870	-1.80E-07	-2.74E-10
1998	0.542	226.8	33,626	4.10	27.3	48.6	29.5	290.9	31,842	66,096	-2.00E-07	-3.02E-10
1999	0	0	32,799	3.62	27.3	46.4	29.3	275.6	31,951	65,132	-1.14E-07	-1.75E-10
2000	0.025	14.3	32,976	3.64	27.3	46.3	29.4	276.3	32,288	65,661	3.36E-07	5.12E-10
2001	7.33E-04	0.551	32,823	3.56	27.3	45.7	29.3	273.8	32,080	65,283	-2.61E-07	-4.00E-10
2002	1.25	525.6	33,938	4.38	27.6	49.7	29.6	299.5	32,087	66,963	-1.52E-07	-2.26E-10
2003	0.341	129.6	33,809	4.50	27.3	50.8	29.6	303.0	31,864	66,218	-2.11E-07	-3.19E-10
2004	1.34	492.2	34,800	5.41	28.2	54.6	29.8	326.7	31,841	67,579	2.44E-07	3.61E-10
2005	0	0	33,654	4.65	27.3	52.0	29.4	307.0	31,793	65,867	-1.55E-07	-2.35E-10
2006	7.60E-09	1.01E-05	33,095	4.08	27.3	48.9	29.3	290.3	31,929	65,424	-1.00E-07	-1.53E-10
2007	1.84	700.4	34,839	5.31	28.7	53.4	29.8	325.6	31,685	67,670	-2.70E-07	-4.00E-10
2008	0	0	33,576	4.43	27.4	50.7	29.5	302.2	31,828	65,818	1.24E-07	1.88E-10
2009	2.67E-05	0.022	33,141	4.11	27.3	48.7	29.3	290.5	32,184	65,725	-2.11E-07	-3.21E-10
2010	0.021	11.5	32,895	3.93	27.3	47.9	29.3	284.5	32,607	65,907	-1.89E-07	-2.86E-10
2011	0	0	31,526	2.84	27.4	43.0	29.0	255.0	32,969	64,852	-2.31E-07	-3.57E-10
2012	0.247	103.0	32,448	3.06	27.4	42.4	29.3	259.8	32,372	65,285	8.61E-08	1.32E-10
2013	0.425	172.4	32,825	3.37	27.3	42.3	29.4	265.8	32,020	65,386	-2.68E-07	-4.09E-10
2014	0.142	45.4	32,787	3.35	27.3	40.8	29.4	261.1	31,961	65,155	1.61E-06	2.48E-09
2015	1.18	501.1	33,915	4.08	27.5	42.4	29.7	282.4	31,872	66,675	-3.73E-07	-5.59E-10
2016	1.11	427.1	34,554	4.69	27.9	44.2	29.8	299.1	31,703	67,091	7.64E-08	1.14E-10
2017	0.180	66.6	34,228	4.69	27.4	43.5	29.7	296.9	31,654	66,350	-3.10E-07	-4.67E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Guadalupe County GCD does not exist in model in the Layer2.			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Guadalupe County GCD does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Guadalupe County GCD does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Queen City Aquifer (Layer 5)

Simulated Time Period	Inflows	Total Inflows	Outflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	Recharge		Lower Layers			
	(acre-feet)					%
Predevelopment	68.0	68.0	68.0	68.0	2.56E-13	3.76E-13
1980	64.2	64.2	64.2	64.2	-1.42E-13	-2.21E-13
1981	82.2	82.2	82.2	82.2	8.53E-14	1.04E-13
1982	55.6	55.6	55.6	55.6	-1.35E-13	-2.43E-13
1983	57.0	57.0	57.0	57.0	1.35E-13	2.37E-13
1984	48.4	48.4	48.4	48.4	-1.14E-13	-2.35E-13
1985	77.5	77.5	77.5	77.5	-9.95E-14	-1.28E-13
1986	73.2	73.2	73.2	73.2	8.53E-14	1.16E-13
1987	74.1	74.1	74.1	74.1	-9.95E-14	-1.34E-13
1988	34.3	34.3	34.3	34.3	-4.26E-14	-1.24E-13
1989	45.5	45.5	45.5	45.5	1.71E-13	3.74E-13
1990	67.7	67.7	67.7	67.7	5.68E-14	8.39E-14
1991	80.8	80.8	80.8	80.8	7.11E-14	8.79E-14
1992	91.2	91.2	91.2	91.2	1.56E-13	1.71E-13
1993	58.3	58.3	58.3	58.3	-2.84E-14	-4.87E-14
1994	73.6	73.6	73.6	73.6	4.26E-14	5.80E-14
1995	56.9	56.9	56.9	56.9	-9.24E-14	-1.62E-13
1996	40.4	40.4	40.4	40.4	-3.55E-14	-8.79E-14
1997	79.3	79.3	79.3	79.3	8.53E-14	1.08E-13
1998	79.4	79.4	79.4	79.4	-8.53E-14	-1.07E-13
1999	45.5	45.5	45.5	45.5	1.42E-13	3.12E-13
2000	69.1	69.1	69.1	69.1	4.26E-14	6.17E-14
2001	62.0	62.0	62.0	62.0	-1.85E-13	-2.98E-13
2002	105.4	105.4	105.4	105.4	1.71E-13	1.62E-13
2003	76.9	76.9	76.9	76.9	4.26E-14	5.55E-14
2004	100.9	100.9	100.9	100.9	-1.71E-13	-1.69E-13
2005	51.0	51.0	51.0	51.0	-4.26E-14	-8.36E-14
2006	45.6	45.6	45.6	45.6	-2.20E-13	-4.83E-13
2007	109.1	109.1	109.1	109.1	3.41E-13	3.12E-13
2008	43.3	43.3	43.3	43.3	1.85E-13	4.27E-13
2009	62.2	62.2	62.2	62.2	0	0
2010	77.5	77.5	77.5	77.5	2.84E-14	3.67E-14
2011	35.8	35.8	35.8	35.8	-1.99E-13	-5.55E-13
2012	61.8	61.8	61.8	61.8	1.71E-13	2.76E-13
2013	67.7	67.7	67.7	67.7	1.42E-13	2.10E-13
2014	60.1	60.1	60.1	60.1	-1.14E-13	-1.89E-13
2015	99.3	99.3	99.3	99.3	7.11E-14	7.15E-14
2016	94.7	94.7	94.7	94.7	-1.56E-13	-1.65E-13
2017	77.3	77.3	77.3	77.3	1.99E-13	2.57E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Gonzales County UWCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	326.5	0.314	0.254	250.4	52.9	630.5
1980	0	0	308.2	0.315	0.247	278.4	41.0	628.2
1981	0	0	395.1	0.307	0.224	309.9	45.4	750.8
1982	0.200	15.9	266.9	0.314	0.266	257.4	40.7	581.7
1983	0.078	7.21	273.6	0.320	0.263	266.5	38.4	586.4
1984	0.165	14.8	232.4	0.327	0.284	258.6	34.0	540.5
1985	0	0	372.5	0.318	0.221	313.5	40.2	726.7
1986	0	0	351.7	0.312	0.232	298.0	42.5	692.8
1987	0	0	355.9	0.308	0.234	295.8	44.2	696.4
1988	0.408	35.0	164.6	0.324	0.307	226.4	34.9	461.9
1989	0.096	10.2	218.8	0.330	0.288	262.6	31.2	523.6
1990	0	0	325.3	0.321	0.234	307.7	35.0	668.6
1991	0	0	388.1	0.317	0.216	325.3	40.7	754.6
1992	0	0	438.0	0.321	0.214	336.8	46.7	822.0
1993	0.248	20.7	280.1	0.322	0.261	272.9	41.4	616.0
1994	0	0	353.3	0.323	0.238	306.7	42.8	703.4
1995	0.163	14.4	273.4	0.331	0.267	277.7	39.0	605.2
1996	0.269	25.3	194.1	0.339	0.300	259.0	32.5	511.8
1997	0	0	380.7	0.335	0.222	335.8	38.5	755.6
1998	0	0	381.5	0.328	0.227	328.5	41.9	752.5
1999	0.307	27.4	218.7	0.335	0.289	268.0	34.8	549.9
2000	0.014	1.52	331.9	0.338	0.245	326.2	35.8	696.0
2001	0.043	4.13	297.7	0.337	0.256	311.9	35.1	649.5
2002	0	0	506.2	0.360	0.200	390.1	45.5	942.3
2003	0.075	5.29	369.2	0.330	0.242	324.8	44.1	744.0
2004	0	0	484.7	0.351	0.219	362.7	50.9	898.9
2005	0.376	31.7	244.8	0.331	0.284	266.4	41.1	585.1
2006	0.193	18.3	218.9	0.339	0.293	267.2	35.4	540.7
2007	0	0	524.2	0.369	0.198	378.6	49.8	953.2
2008	0.448	37.8	208.0	0.339	0.295	249.7	39.3	535.8
2009	0.098	11.1	298.9	0.337	0.263	305.2	36.5	652.3
2010	0.077	9.12	372.4	0.337	0.241	352.7	36.5	771.4
2011	0.480	47.4	172.2	0.332	0.566	292.3	26.3	539.5
2012	1.07E-05	0	297.1	0.323	0.250	339.7	27.8	665.2
2013	3.88E-05	0	325.1	0.316	0.234	344.9	28.0	698.6
2014	0.101	9.29	288.7	0.313	0.245	333.4	24.1	656.1
2015	0	0	477.1	0.311	0.172	411.3	28.1	916.9
2016	0	0	455.0	0.300	0.181	389.3	31.3	876.0
2017	0.138	12.4	371.5	0.299	0.207	356.7	27.1	768.4

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Reklaw Formation (Layer 6) - Outflows, Net Flows Iin-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Evergreen UWCD	Gonzales County UWCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	4.56	0.488	27.7	62.2	535.4	630.5	7.84E-09	1.24E-09
1980	0	0	2.07	0.358	22.7	47.1	556.0	628.2	-1.25E-11	-1.99E-12
1981	0.190	15.8	3.46	0.405	24.8	53.1	653.1	750.8	-4.27E-10	-5.69E-11
1982	0	0	1.98	0.355	22.5	46.3	510.6	581.7	2.96E-12	5.08E-13
1983	0	0	1.32	0.334	21.5	43.9	519.3	586.4	-1.09E-10	-1.86E-11
1984	0	0	0	0.296	19.7	39.1	481.5	540.5	-4.47E-10	-8.27E-11
1985	0.240	20.0	1.82	0.355	22.4	46.6	635.4	726.7	7.71E-11	1.06E-11
1986	0.069	6.52	2.46	0.375	23.2	49.1	611.1	692.8	-2.08E-11	-3.00E-12
1987	0.057	4.98	2.99	0.389	23.8	51.2	613.0	696.4	-3.98E-08	-5.71E-09
1988	0	0	0	0.282	19.3	39.1	403.3	461.9	1.02E-12	2.22E-13
1989	0	0	0	0.261	18.1	36.4	468.8	523.6	-2.79E-11	-5.32E-12
1990	0.144	12.0	0.130	0.307	19.9	40.6	595.5	668.6	3.22E-11	4.81E-12
1991	0.203	18.2	1.98	0.352	22.2	47.0	664.8	754.6	4.00E-11	5.30E-12
1992	0.201	17.6	3.87	0.403	24.5	54.5	721.0	822.0	4.97E-10	6.05E-11
1993	0	0	2.38	0.350	21.4	46.7	545.2	616.0	-1.82E-11	-2.95E-12
1994	0.057	4.14	2.98	0.365	22.0	49.0	624.9	703.4	-7.74E-10	-1.10E-10
1995	0	0	1.81	0.325	20.1	44.1	538.9	605.2	1.05E-10	1.74E-11
1996	0	0	0	0.258	17.2	37.2	457.1	511.8	3.16E-09	6.18E-10
1997	0.256	21.9	1.78	0.321	20.1	44.4	666.9	755.6	1.07E-09	1.42E-10
1998	0.107	10.1	2.80	0.350	21.3	48.1	669.8	752.5	2.15E-11	2.86E-12
1999	0	0	0.529	0.280	17.8	39.5	491.8	549.9	-5.34E-12	-9.72E-13
2000	0.043	2.32	1.06	0.298	18.2	41.2	632.9	696.0	1.33E-08	1.92E-09
2001	0	0	0.821	0.288	17.6	40.3	590.4	649.5	-1.01E-11	-1.56E-12
2002	0.383	34.1	4.16	0.370	22.2	52.9	828.2	942.3	-6.93E-12	-7.36E-13
2003	2.38E-04	0.036	3.76	0.359	21.2	50.3	668.4	744.0	-2.68E-09	-3.60E-10
2004	0.277	24.4	4.57	0.418	24.7	59.4	785.2	898.9	1.23E-10	1.36E-11
2005	0	0	2.79	0.328	20.0	45.9	516.1	585.1	6.82E-12	1.17E-12
2006	0	0	1.01	0.273	17.8	40.0	481.6	540.7	2.27E-12	4.21E-13
2007	0.606	53.8	4.56	0.408	25.3	58.9	809.7	953.2	-2.91E-11	-3.05E-12
2008	0	0	1.95	0.312	19.6	43.7	470.2	535.8	-1.82E-12	-3.39E-13
2009	2.01E-04	0	1.50	0.302	18.5	41.8	590.2	652.3	1.70E-09	2.60E-10
2010	0.007	0.209	1.75	0.302	17.9	42.1	709.2	771.4	-2.83E-09	-3.67E-10
2011	0	0	0	0.198	12.7	31.3	495.3	539.5	-1.19E-09	-2.20E-10
2012	0.160	14.3	0	0.226	15.2	33.7	601.6	665.2	4.25E-10	6.39E-11
2013	0.084	9.03	0	0.252	17.2	34.1	637.9	698.6	3.49E-09	4.99E-10
2014	0	0	0	0.237	17.1	30.3	608.5	656.1	8.47E-07	1.29E-07
2015	0.224	20.7	0.124	0.309	20.8	35.1	839.7	916.9	-7.00E-10	-7.63E-11
2016	0.113	12.0	0.919	0.338	22.0	38.2	802.5	876.0	-7.27E-09	-8.30E-10
2017	0	0	0	0.307	20.8	33.6	713.7	768.4	-8.32E-11	-1.08E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Gonzales County UWCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	6,927	541.5	43.3	2,286	778.3	10,577
1980	0	0	6,538	618.5	39.3	2,209	632.1	10,037
1981	0	0	8,381	585.3	40.5	2,347	655.2	12,009
1982	11.4	621.7	5,663	618.9	39.4	2,159	623.0	9,736
1983	7.00	343.9	5,805	634.1	38.6	2,159	600.5	9,588
1984	12.7	627.0	4,931	665.7	37.4	2,100	543.6	8,918
1985	0	0	7,902	623.3	38.9	2,286	605.3	11,456
1986	0	0	7,462	611.0	39.7	2,266	632.2	11,011
1987	0	0	7,551	600.6	40.4	2,283	650.1	11,125
1988	26.3	1,364	3,493	671.9	37.5	2,001	583.0	8,177
1989	10.8	497.2	4,641	689.3	36.2	2,060	533.4	8,468
1990	7.18E-05	0	6,901	660.3	37.0	2,210	559.1	10,367
1991	0	0	8,234	624.8	38.7	2,314	607.4	11,819
1992	0.801	58.7	9,292	587.8	40.9	2,421	696.0	13,098
1993	15.7	867.8	5,943	627.6	39.7	2,193	790.1	10,477
1994	0.154	5.65	7,496	617.2	40.2	2,301	787.1	11,247
1995	10.7	543.4	5,799	646.2	39.1	2,184	751.0	9,973
1996	20.1	1,014	4,118	694.6	37.1	2,060	711.3	8,655
1997	0	0	8,077	647.3	38.6	2,321	748.0	11,831
1998	0.057	5.92	8,094	625.6	39.8	2,338	798.6	11,902
1999	19.8	1,057	4,640	678.9	37.8	2,099	806.1	9,339
2000	3.69	132.5	7,040	672.6	38.1	2,275	882.0	11,044
2001	2.64	137.8	6,316	678.2	37.8	2,210	873.4	10,256
2002	0	0	10,739	606.6	41.0	2,547	981.7	14,915
2003	1.63	146.7	7,832	619.4	41.1	2,357	963.6	11,962
2004	0	0	10,284	574.5	43.2	2,549	979.2	14,430
2005	22.3	1,242	5,194	640.0	40.4	2,185	897.7	10,221
2006	15.4	809.1	4,644	678.3	38.2	2,114	820.9	9,121
2007	0	0	11,122	574.1	42.1	2,565	878.9	15,182
2008	25.7	1,436	4,412	652.8	39.6	2,116	835.3	9,517
2009	12.6	549.0	6,341	665.0	38.7	2,248	891.3	10,746
2010	10.5	415.7	7,900	668.8	38.9	2,391	1,031	12,456
2011	33.7	1,698	3,653	757.5	35.5	2,098	936.0	9,212
2012	0.019	0.511	6,303	721.2	34.3	2,203	784.0	10,046
2013	0.002	0.069	6,896	691.4	32.6	2,239	699.2	10,559
2014	3.92	79.1	6,125	693.0	30.6	2,198	634.6	9,764
2015	0	0	10,122	629.8	29.9	2,511	661.6	13,954
2016	0	0	9,652	603.6	30.4	2,495	676.0	13,457
2017	7.49	370.2	7,882	621.0	29.1	2,384	659.9	11,954

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Gonzales County UWCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	8.47	333.7	1,065	2,613	6,557	10,577	-9.34E-07	-8.83E-09
1980	0	0	168.1	8.15	292.0	961.9	2,351	6,255	10,037	-4.07E-10	-4.06E-12
1981	12.5	657.2	195.7	8.47	305.6	1,011	2,429	7,390	12,009	-2.24E-08	-1.87E-10
1982	0	0	196.4	7.68	292.2	960.9	2,336	5,943	9,736	-1.60E-10	-1.64E-12
1983	0	0	207.2	7.24	282.0	932.5	2,299	5,860	9,588	-5.65E-09	-5.89E-11
1984	0	0	228.8	5.76	266.6	882.4	2,206	5,328	8,918	-7.55E-09	-8.46E-11
1985	13.8	741.3	221.9	8.25	279.8	940.0	2,321	6,930	11,456	4.29E-09	3.75E-11
1986	6.70	316.0	232.0	8.47	288.2	964.0	2,361	6,835	11,011	-8.95E-10	-8.13E-12
1987	5.08	244.7	238.1	8.47	295.5	984.8	2,398	6,950	11,125	-1.64E-06	-1.47E-08
1988	0	0	237.6	5.35	268.2	882.0	2,225	4,559	8,177	-1.27E-10	-1.56E-12
1989	0	0	267.0	4.85	251.7	839.7	2,161	4,943	8,468	-1.30E-09	-1.53E-11
1990	7.44	463.3	268.8	6.70	264.2	881.1	2,224	6,252	10,367	1.69E-09	1.63E-11
1991	14.5	753.1	295.2	8.43	280.1	938.0	2,328	7,201	11,819	1.71E-09	1.45E-11
1992	14.9	776.5	582.2	8.50	303.8	1,000	2,452	7,960	13,098	1.87E-08	1.43E-10
1993	1.92E-05	0	808.0	7.89	286.6	921.6	2,351	6,102	10,477	-4.78E-10	-4.57E-12
1994	2.24	145.8	661.6	8.47	288.7	928.4	2,391	6,821	11,247	-3.00E-08	-2.66E-10
1995	0	0	659.5	7.37	275.8	882.7	2,318	5,830	9,973	3.34E-09	3.35E-11
1996	0	0	681.0	5.03	255.4	806.8	2,200	4,707	8,655	1.23E-07	1.42E-09
1997	13.8	796.4	676.8	7.92	269.3	868.2	2,308	6,891	11,831	4.12E-08	3.49E-10
1998	8.89	455.8	751.6	8.47	283.2	905.8	2,367	7,121	11,902	6.75E-10	5.67E-12
1999	0	0	881.5	5.87	262.4	820.3	2,230	5,139	9,339	-2.80E-10	-3.00E-12
2000	1.02	83.4	1,141	6.95	263.1	821.7	2,261	6,467	11,044	5.38E-07	4.87E-09
2001	0.084	13.8	932.4	6.58	258.6	807.8	2,238	5,999	10,256	-8.73E-10	-8.51E-12
2002	24.4	1,337	1,183	8.47	290.3	918.0	2,441	8,713	14,915	-2.18E-10	-1.46E-12
2003	1.21	45.5	1,029	8.47	291.4	908.5	2,413	7,265	11,962	-1.96E-07	-1.64E-09
2004	19.9	1,021	919.6	8.50	314.5	991.4	2,567	8,588	14,430	4.42E-09	3.06E-11
2005	0	0	895.4	7.47	286.8	886.9	2,371	5,774	10,221	2.69E-10	2.63E-12
2006	0.056	7.25	730.7	5.93	263.8	820.9	2,267	5,025	9,121	-1.82E-12	-1.99E-14
2007	39.3	2,089	571.3	8.47	304.6	984.0	2,548	8,637	15,182	-8.29E-10	-5.46E-12
2008	0	0	805.0	6.65	279.6	872.5	2,330	5,223	9,517	1.82E-11	1.91E-13
2009	0.024	0.742	1,189	6.93	269.0	833.3	2,290	6,156	10,746	4.85E-08	4.51E-10
2010	0.431	37.4	1,735	7.74	267.5	814.4	2,292	7,302	12,456	-1.16E-07	-9.30E-10
2011	0	0	1,447	3.28	232.3	682.9	2,093	4,754	9,212	1.42E-08	1.55E-10
2012	11.3	713.8	448.6	4.88	251.4	785.2	2,152	5,679	10,046	1.44E-08	1.43E-10
2013	9.76	637.8	415.0	5.84	276.9	890.4	2,177	6,146	10,559	1.75E-07	1.66E-09
2014	0.679	56.3	435.0	5.17	293.1	951.4	2,140	5,883	9,764	2.98E-05	3.06E-07
2015	17.4	1,190	526.8	8.30	338.4	1,130	2,278	8,465	13,954	-1.30E-07	-9.29E-10
2016	12.9	656.5	448.5	8.50	358.9	1,177	2,350	8,444	13,457	-2.19E-07	-1.63E-09
2017	3.22E-04	0	563.5	7.91	357.5	1,163	2,288	7,574	11,954	-2.76E-10	-2.31E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Gonzales County UWCD	Caldwell	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	2,206	328.8	19.2	0.060	6,747	1,036	10,337
1980	0	0	2,082	383.4	16.0	0	6,475	1,037	9,993
1981	0	0	2,669	373.2	27.8	0	7,628	962.2	11,660
1982	33.7	660.4	1,803	381.1	19.2	0	6,153	1,030	10,081
1983	20.1	393.2	1,849	391.4	16.8	0	6,077	1,055	9,802
1984	39.4	809.3	1,570	409.3	17.9	0	5,549	1,088	9,483
1985	0	0	2,516	398.4	22.2	0	7,176	1,001	11,114
1986	0	0	2,376	389.6	24.3	0	7,068	993.8	10,852
1987	0	0	2,405	382.3	25.7	0	7,179	992.5	10,984
1988	75.5	1,438	1,112	405.9	12.7	0	4,751	1,166	8,961
1989	31.0	629.5	1,478	424.5	11.2	0	5,163	1,162	8,899
1990	0	0	2,198	421.1	14.8	0	6,497	1,066	10,197
1991	0	0	2,622	406.0	23.9	0	7,451	997.7	11,501
1992	0	0	2,959	389.0	37.5	0	8,211	946.8	12,544
1993	38.2	647.9	1,893	403.1	19.5	0	6,311	1,054	10,367
1994	0	0	2,387	403.8	22.1	0	7,050	1,041	10,904
1995	31.0	592.7	1,847	416.9	17.1	0	6,044	1,102	10,050
1996	57.3	1,119	1,311	438.6	11.5	0	4,912	1,203	9,052
1997	0	0	2,572	431.9	19.5	0	7,141	1,069	11,234
1998	0	0	2,578	421.5	26.0	0	7,364	1,037	11,425
1999	56.5	1,090	1,478	439.1	15.0	0	5,346	1,156	9,580
2000	6.22	74.8	2,242	453.2	19.2	0	6,710	1,102	10,608
2001	4.84	103.6	2,011	453.0	16.0	0	6,232	1,123	9,943
2002	0	0	3,420	434.4	49.5	0	8,991	982.5	13,878
2003	3.15	65.7	2,494	424.8	34.4	0	7,499	1,031	11,552
2004	0	0	3,275	402.5	47.5	0	8,842	986.3	13,553
2005	65.7	1,298	1,654	416.4	23.6	0	5,975	1,117	10,549
2006	44.2	917.5	1,479	433.7	14.6	0	5,230	1,201	9,320
2007	0	0	3,542	398.4	39.8	0	8,904	1,002	13,885
2008	77.1	1,498	1,405	418.7	18.9	0	5,418	1,146	9,981
2009	35.1	628.3	2,019	442.2	19.3	0	6,385	1,126	10,656
2010	27.6	433.1	2,516	468.3	33.8	0	7,562	1,077	12,117
2011	99.6	2,066	1,163	514.0	17.7	0	4,980	1,295	10,136
2012	0	0	2,007	474.3	6.89	0	5,928	1,212	9,628
2013	0	0	2,196	458.5	3.43	0	6,396	1,123	10,177
2014	7.29	83.6	1,950	460.1	0.183	0	6,124	1,108	9,734
2015	0	0	3,223	453.2	0.426	0	8,749	962.7	13,388
2016	0	0	3,074	431.2	0.502	0	8,708	945.1	13,158
2017	20.8	339.5	2,510	433.8	0	0	7,818	985.1	12,107

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Gonzales County UWCD	Caldwell	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	3.02	2,699	2,337	47.9	1,143	4,106	10,337	-1.23E-05	-1.19E-07
1980	0	0	948.5	1.81	2,354	2,146	43.4	901.9	3,597	9,993	-3.39E-09	-3.39E-11
1981	33.4	632.6	1,162	2.23	2,476	2,217	43.9	943.6	4,149	11,660	-1.41E-07	-1.21E-09
1982	0	0	1,174	1.69	2,331	2,134	42.7	885.4	3,511	10,081	8.55E-11	8.48E-13
1983	0	0	1,216	1.52	2,245	2,080	42.0	849.9	3,367	9,802	-3.79E-08	-3.87E-10
1984	0	0	1,602	1.01	2,086	1,972	39.5	758.2	3,024	9,483	-3.81E-08	-4.02E-10
1985	43.6	859.7	1,209	1.80	2,257	2,084	42.4	860.9	3,755	11,114	3.04E-08	2.73E-10
1986	18.9	377.5	1,217	1.96	2,328	2,128	43.2	900.1	3,838	10,852	-6.38E-09	-5.88E-11
1987	14.1	290.8	1,208	2.08	2,389	2,166	43.9	928.2	3,942	10,984	-1.07E-05	-9.76E-08
1988	0	0	1,208	1.06	2,105	2,004	41.4	810.0	2,792	8,961	-1.22E-10	-1.36E-12
1989	0	0	1,495	0.840	1,975	1,913	39.6	739.2	2,736	8,899	-8.55E-09	-9.61E-11
1990	24.1	483.1	1,461	1.31	2,119	1,983	40.3	781.7	3,303	10,197	1.25E-08	1.22E-10
1991	41.8	826.9	1,480	1.85	2,276	2,081	42.4	870.4	3,881	11,501	1.25E-08	1.09E-10
1992	44.0	904.1	1,505	2.31	2,481	2,188	44.2	993.2	4,382	12,544	1.25E-07	9.96E-10
1993	0	0	1,372	1.79	2,309	2,058	43.6	1,066	3,515	10,367	-2.11E-09	-2.04E-11
1994	8.19	189.2	1,407	1.97	2,348	2,073	44.2	1,074	3,758	10,904	-1.84E-07	-1.68E-09
1995	0	0	1,489	1.58	2,221	1,996	43.2	1,018	3,282	10,050	2.54E-08	2.53E-10
1996	0	0	1,549	0.928	2,023	1,871	41.3	940.3	2,627	9,052	7.62E-07	8.42E-09
1997	43.1	864.4	1,556	1.70	2,204	1,970	42.9	1,012	3,540	11,234	2.71E-07	2.41E-09
1998	26.2	541.5	1,585	1.97	2,324	2,038	43.8	1,082	3,783	11,425	4.82E-09	4.22E-11
1999	0	0	1,652	1.17	2,097	1,893	41.8	1,049	2,845	9,580	7.28E-11	7.60E-13
2000	1.70	49.5	2,135	1.31	2,123	1,879	41.9	1,129	3,248	10,608	3.54E-06	3.34E-08
2001	8.83E-04	0	1,749	1.27	2,093	1,870	41.9	1,118	3,070	9,943	-4.72E-09	-4.74E-11
2002	71.8	1,477	2,174	2.26	2,410	2,055	44.5	1,283	4,359	13,878	-1.29E-09	-9.29E-12
2003	1.32	25.9	1,903	1.99	2,389	2,048	44.5	1,260	3,878	11,552	-1.52E-06	-1.31E-08
2004	55.7	1,085	1,676	2.66	2,606	2,195	46.8	1,320	4,566	13,553	2.89E-08	2.13E-10
2005	0	0	1,662	1.60	2,312	2,024	44.2	1,184	3,321	10,549	1.91E-09	1.81E-11
2006	0	0	1,371	1.18	2,116	1,918	42.8	1,078	2,794	9,320	5.62E-10	6.03E-12
2007	113.9	2,201	1,033	2.80	2,556	2,196	46.8	1,221	4,515	13,885	-4.60E-09	-3.31E-11
2008	0	0	1,497	1.51	2,246	2,001	43.7	1,112	3,080	9,981	-1.66E-10	-1.66E-12
2009	0	0	2,224	1.29	2,155	1,901	42.4	1,148	3,185	10,656	3.32E-07	3.11E-09
2010	0.553	18.6	3,304	1.16	2,142	1,842	41.4	1,278	3,489	12,117	-7.64E-07	-6.31E-09
2011	0	0	3,283	0	1,774	1,625	38.0	1,123	2,293	10,136	1.18E-07	1.17E-09
2012	46.9	974.7	852.7	0.733	2,045	1,927	41.9	1,004	2,735	9,628	1.06E-07	1.10E-09
2013	33.0	777.1	778.7	1.16	2,265	2,182	42.5	931.0	3,166	10,177	1.02E-06	1.00E-08
2014	1.61	98.1	814.8	1.09	2,374	2,369	42.0	848.6	3,184	9,734	2.31E-04	2.37E-06
2015	59.3	1,377	967.1	2.09	2,781	2,767	43.8	916.1	4,475	13,388	-1.16E-06	-8.66E-09
2016	37.5	762.4	819.9	2.39	2,969	2,892	44.7	950.9	4,680	13,158	-1.65E-06	-1.26E-08
2017	0	0	1,037	2.00	2,925	2,894	43.5	915.2	4,290	12,107	9.97E-09	8.24E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Gonzales County UWCD	Bexar	Caldwell	Upper Layers	
	(acre-feet)								
Predevelopment	0	0	6,903	2,526	44.7	3,218	367.3	30,590	43,648
1980	0	0	6,515	2,641	36.1	3,261	340.3	30,842	43,635
1981	0.402	11.1	8,352	2,620	43.5	3,246	342.4	31,326	45,941
1982	93.0	1,241	5,643	2,646	37.9	3,257	339.9	30,762	44,020
1983	60.4	843.8	5,784	2,659	34.8	3,262	340.8	30,718	43,703
1984	130.5	2,175	4,914	2,721	30.8	3,286	356.8	30,882	44,496
1985	0	0	7,874	2,651	37.3	3,258	342.6	31,130	45,293
1986	3.25E-06	0.018	7,436	2,633	41.7	3,251	334.1	31,052	44,747
1987	0	0	7,525	2,619	44.6	3,246	328.3	31,076	44,838
1988	204.5	2,513	3,481	2,676	30.8	3,276	330.7	30,194	42,706
1989	101.4	1,520	4,624	2,706	25.6	3,277	344.6	30,361	42,959
1990	0.405	11.8	6,877	2,682	30.6	3,267	343.7	30,879	44,091
1991	0	0	8,205	2,647	36.1	3,254	346.0	31,270	45,758
1992	0.038	0.965	9,259	2,623	45.9	3,250	343.4	31,717	47,240
1993	80.9	615.0	5,922	2,628	39.4	3,248	334.1	30,646	43,513
1994	1.12E-05	0	7,470	2,619	41.6	3,239	333.6	30,924	44,627
1995	80.1	875.4	5,779	2,642	36.3	3,247	331.6	30,526	43,518
1996	163.0	2,117	4,103	2,687	27.6	3,271	334.0	30,192	42,895
1997	0	0	8,048	2,647	35.2	3,247	335.0	30,915	45,228
1998	0	0	8,066	2,627	40.8	3,240	336.9	31,018	45,329
1999	151.7	1,893	4,624	2,669	31.4	3,257	333.6	30,246	43,206
2000	16.3	107.6	7,016	2,679	34.9	3,263	330.2	30,886	44,332
2001	13.6	210.6	6,294	2,674	33.1	3,256	331.9	30,550	43,363
2002	0	0	10,701	2,621	49.9	3,232	332.4	31,738	48,675
2003	4.26	58.6	7,804	2,623	49.0	3,236	330.7	31,116	45,221
2004	0	0	10,247	2,589	57.4	3,230	343.0	31,717	48,184
2005	176.2	2,180	5,175	2,632	43.9	3,243	331.0	30,538	44,319
2006	133.9	1,902	4,628	2,663	32.3	3,256	333.4	30,153	43,102
2007	0	0	11,082	2,579	50.2	3,223	353.0	31,534	48,821
2008	209.8	2,667	4,396	2,646	37.9	3,256	335.8	30,363	43,912
2009	100.6	1,156	6,319	2,664	37.0	3,252	326.1	30,728	44,583
2010	71.7	640.8	7,872	2,684	43.5	3,252	314.8	31,353	46,232
2011	287.9	3,780	3,640	2,756	30.0	3,279	323.8	30,554	44,651
2012	0.101	3.42	6,280	2,710	21.5	3,278	332.0	30,446	43,072
2013	0.032	0	6,872	2,676	17.0	3,259	340.3	30,565	43,728
2014	22.6	35.8	6,103	2,677	12.9	3,258	334.8	30,531	42,974
2015	0.011	0	10,086	2,633	13.3	3,235	347.6	31,651	47,966
2016	2.98E-07	0	9,618	2,610	14.4	3,233	356.5	31,707	47,538
2017	44.1	148.0	7,854	2,617	10.8	3,229	357.1	31,293	45,553

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-5.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Guadalupe County GCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Gonzales County UWCD	Bexar	Caldwell	Upper Layers			
	(acre-feet)											%
Predevelopment	0	0	0	99.4	8,341	2,709	1,220	712.2	30,566	43,648	-3.40E-05	-7.79E-08
1980	0	0	2,475	59.5	7,984	2,529	1,210	642.1	28,735	43,635	-2.96E-09	-6.79E-12
1981	90.3	1,116	3,291	62.8	8,013	2,596	1,207	655.6	28,910	45,941	-1.02E-07	-2.22E-10
1982	0	0	3,233	58.4	7,923	2,513	1,205	643.3	28,444	44,020	5.82E-11	1.32E-13
1983	1.86E-08	0	3,238	52.8	7,852	2,461	1,203	635.6	28,260	43,703	-3.06E-08	-7.01E-11
1984	0	0	5,045	33.4	7,660	2,345	1,202	600.4	27,609	44,496	-2.17E-08	-4.87E-11
1985	124.0	1,735	2,922	50.6	7,848	2,458	1,202	630.6	28,323	45,293	2.77E-08	6.11E-11
1986	61.6	969.7	2,795	55.5	7,936	2,499	1,206	648.3	28,578	44,747	-4.71E-09	-1.05E-11
1987	49.0	860.5	2,645	60.2	8,004	2,538	1,208	665.3	28,809	44,838	-8.11E-06	-1.81E-08
1988	0.049	1.22	2,446	35.3	7,848	2,380	1,208	640.0	28,147	42,706	-2.91E-10	-6.81E-13
1989	5.75E-05	0.537	3,482	26.1	7,656	2,295	1,198	606.5	27,694	42,959	-7.28E-09	-1.70E-11
1990	57.1	588.2	3,584	37.1	7,763	2,367	1,200	608.2	27,888	44,091	1.06E-08	2.41E-11
1991	120.1	1,617	3,429	50.7	7,907	2,459	1,203	605.9	28,366	45,758	9.98E-09	2.18E-11
1992	136.3	1,961	3,661	61.3	8,089	2,565	1,210	637.8	28,918	47,240	1.00E-07	2.12E-10
1993	1.48	45.1	2,451	57.9	8,024	2,457	1,209	636.1	28,631	43,513	-2.18E-10	-5.02E-13
1994	32.6	711.0	2,542	62.1	8,067	2,478	1,214	650.2	28,870	44,627	-1.28E-07	-2.86E-10
1995	0.117	2.83	2,670	57.9	7,978	2,404	1,212	637.5	28,556	43,518	2.10E-08	4.83E-11
1996	0	0	2,812	35.5	7,854	2,283	1,212	618.2	28,080	42,895	6.76E-07	1.58E-09
1997	116.7	1,538	2,818	55.4	7,941	2,387	1,209	627.3	28,535	45,228	2.08E-07	4.60E-10
1998	81.0	1,178	2,842	61.9	8,046	2,454	1,212	642.5	28,811	45,329	5.68E-09	1.25E-11
1999	0	0	2,953	46.5	7,890	2,315	1,209	618.5	28,174	43,206	1.13E-09	2.61E-12
2000	5.08	130.0	3,824	51.3	7,913	2,318	1,212	626.7	28,252	44,332	2.66E-06	6.01E-09
2001	0.106	2.34	3,135	49.6	7,871	2,308	1,208	618.3	28,171	43,363	-2.92E-09	-6.75E-12
2002	210.2	2,996	3,903	64.2	8,103	2,483	1,213	667.8	29,035	48,675	-1.19E-09	-2.45E-12
2003	12.2	315.9	3,407	63.8	8,115	2,484	1,214	672.6	28,937	45,221	-1.18E-06	-2.60E-09
2004	165.4	2,299	2,997	73.3	8,289	2,623	1,220	708.6	29,808	48,184	2.47E-08	5.13E-11
2005	0	0	2,966	62.7	8,078	2,461	1,214	677.6	28,860	44,319	1.35E-09	3.05E-12
2006	5.65E-06	0	2,448	56.8	7,909	2,356	1,209	645.4	28,477	43,102	1.16E-09	2.68E-12
2007	312.4	3,911	1,852	72.2	8,200	2,618	1,215	691.9	29,949	48,821	-3.29E-09	-6.74E-12
2008	0	0	2,672	61.3	8,036	2,430	1,216	663.4	28,833	43,912	7.28E-10	1.66E-12
2009	0.013	1.74	3,973	58.7	7,939	2,349	1,210	654.8	28,398	44,583	2.66E-07	5.97E-10
2010	1.60	73.7	5,887	56.1	7,937	2,309	1,209	666.7	28,091	46,232	-5.86E-07	-1.27E-09
2011	0	0	5,841	23.5	7,666	2,098	1,204	626.6	27,191	44,651	-7.88E-08	-1.77E-10
2012	118.5	1,250	1,549	36.5	7,855	2,403	1,204	616.1	28,040	43,072	9.88E-08	2.29E-10
2013	90.4	1,344	1,415	47.8	7,996	2,690	1,204	615.8	28,325	43,728	5.93E-07	1.35E-09
2014	9.76	308.0	1,483	49.5	8,087	2,928	1,205	638.6	28,265	42,974	1.69E-04	3.92E-07
2015	180.2	3,171	1,748	63.8	8,352	3,407	1,209	659.7	29,173	47,966	-8.17E-07	-1.70E-09
2016	123.3	2,125	1,479	71.8	8,547	3,571	1,217	681.9	29,722	47,538	-1.28E-06	-2.70E-09
2017	3.78	199.1	1,864	72.6	8,518	3,595	1,214	683.2	29,404	45,553	4.09E-08	8.98E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	River Package	Bee GCD	Evergreen UWCD	McMullen GCD	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	1.49E-11	0.522	0.641	1.35	244.1	246.6
1980	0	0	1.50E-11	0.523	0.639	1.35	244.5	247.0
1981	0	0	1.49E-11	0.521	0.638	1.35	243.8	246.3
1982	1.30E-12	7.94E-08	1.49E-11	0.521	0.638	1.35	243.8	246.3
1983	1.29E-06	4.69E-05	1.49E-11	0.521	0.638	1.35	243.8	246.3
1984	6.34E-06	7.70E-04	1.50E-11	0.523	0.639	1.35	244.5	247.0
1985	7.08E-10	8.96E-06	1.49E-11	0.521	0.638	1.35	243.8	246.3
1986	0	0	1.49E-11	0.521	0.638	1.35	243.8	246.3
1987	0	0	1.49E-11	0.521	0.638	1.35	243.8	246.3
1988	2.42E-06	6.64E-05	1.50E-11	0.523	0.639	1.35	244.5	247.0
1989	2.07E-05	0.003	1.49E-11	0.521	0.637	1.35	243.8	246.3
1990	3.83E-05	0.008	1.49E-11	0.521	0.637	1.35	243.8	246.3
1991	7.03E-05	0.016	1.49E-11	0.521	0.637	1.35	243.8	246.3
1992	2.93E-05	0.006	1.50E-11	0.523	0.639	1.35	244.5	247.0
1993	6.49E-05	0.013	1.49E-11	0.521	0.637	1.35	243.8	246.3
1994	9.66E-05	0.018	1.49E-11	0.521	0.637	1.35	243.8	246.3
1995	1.81E-04	0.032	1.49E-11	0.521	0.637	1.35	243.8	246.3
1996	3.15E-04	0.055	1.50E-11	0.523	0.639	1.35	244.4	247.0
1997	2.78E-04	0.048	1.49E-11	0.521	0.637	1.35	243.8	246.3
1998	4.14E-04	0.071	1.49E-11	0.521	0.637	1.35	243.8	246.3
1999	2.20E-04	0.037	1.49E-11	0.521	0.637	1.35	243.8	246.3
2000	1.30E-04	0.022	1.50E-11	0.523	0.639	1.35	244.4	247.0
2001	4.03E-05	0.006	1.49E-11	0.521	0.637	1.35	243.8	246.3
2002	1.26E-05	0.002	1.49E-11	0.521	0.637	1.35	243.8	246.3
2003	2.63E-05	0.004	1.49E-11	0.521	0.637	1.35	243.8	246.3
2004	2.71E-05	0.004	1.50E-11	0.523	0.639	1.35	244.5	247.0
2005	1.21E-04	0.018	1.49E-11	0.521	0.637	1.35	243.8	246.3
2006	1.41E-04	0.022	1.49E-11	0.521	0.637	1.35	243.8	246.3
2007	1.67E-05	0.003	1.49E-11	0.521	0.637	1.35	243.8	246.3
2008	3.91E-05	0.005	1.50E-11	0.523	0.639	1.35	244.5	247.0
2009	1.05E-04	0.016	1.49E-11	0.521	0.637	1.35	243.8	246.3
2010	6.71E-04	0.122	1.49E-11	0.521	0.637	1.35	243.7	246.4
2011	0.001	0.242	1.49E-11	0.521	0.637	1.35	243.7	246.4
2012	0.001	0.237	1.50E-11	0.523	0.639	1.35	244.3	247.1
2013	0.001	0.235	1.49E-11	0.521	0.637	1.35	243.7	246.4
2014	0.001	0.250	1.49E-11	0.521	0.637	1.35	243.6	246.4
2015	0.001	0.259	1.49E-11	0.521	0.637	1.35	243.6	246.4
2016	0.001	0.241	1.50E-11	0.523	0.639	1.35	244.3	247.1
2017	0.001	0.248	1.49E-11	0.521	0.637	1.35	243.6	246.4

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evergreen UWCD	McMullen GCD	Lower Layers			
	(acre-feet)								%
Predevelopment	0	0	8.01E-10	0.028	2.20	244.4	246.6	3.61E-09	1.47E-09
1980	0	0	8.03E-10	0.028	2.21	244.7	247.0	3.21E-11	1.30E-11
1981	2.93E-04	0.053	8.01E-10	0.028	2.20	244.0	246.3	-1.43E-09	-5.80E-10
1982	2.77E-04	0.051	8.01E-10	0.028	2.20	244.0	246.3	1.23E-11	4.98E-12
1983	2.42E-04	0.045	8.01E-10	0.028	2.20	244.0	246.3	-1.89E-10	-7.69E-11
1984	2.10E-04	0.039	8.03E-10	0.028	2.21	244.7	247.0	3.07E-10	1.24E-10
1985	2.67E-04	0.048	8.01E-10	0.028	2.20	244.0	246.3	-1.05E-12	-4.27E-13
1986	2.96E-04	0.053	8.01E-10	0.028	2.20	244.0	246.3	-7.18E-11	-2.91E-11
1987	4.36E-04	0.078	8.01E-10	0.028	2.20	244.0	246.3	4.42E-09	1.80E-09
1988	3.34E-04	0.060	8.03E-10	0.028	2.21	244.7	247.0	1.29E-10	5.21E-11
1989	1.57E-04	0.026	8.01E-10	0.028	2.20	244.1	246.3	1.57E-11	6.37E-12
1990	7.02E-05	0.011	8.01E-10	0.028	2.20	244.1	246.3	1.28E-10	5.18E-11
1991	2.06E-05	0.004	8.01E-10	0.028	2.20	244.1	246.3	5.44E-11	2.21E-11
1992	6.19E-05	0.010	8.03E-10	0.028	2.21	244.7	247.0	9.03E-10	3.65E-10
1993	2.56E-05	0.005	8.01E-10	0.028	2.20	244.1	246.3	4.77E-11	1.94E-11
1994	1.25E-05	0.004	8.01E-10	0.028	2.20	244.1	246.3	2.38E-10	9.68E-11
1995	5.60E-06	0.002	8.01E-10	0.028	2.20	244.1	246.3	5.50E-10	2.23E-10
1996	1.10E-06	3.94E-04	8.03E-10	0.028	2.21	244.8	247.0	-5.87E-09	-2.38E-09
1997	2.38E-06	0.001	8.01E-10	0.028	2.20	244.1	246.3	1.23E-09	4.99E-10
1998	1.54E-07	9.00E-05	8.01E-10	0.028	2.20	244.1	246.3	-2.72E-11	-1.10E-11
1999	1.90E-06	3.50E-04	8.01E-10	0.028	2.20	244.1	246.3	2.83E-11	1.15E-11
2000	1.27E-05	0.002	8.03E-10	0.028	2.21	244.8	247.0	1.56E-10	6.32E-11
2001	4.93E-05	0.010	8.01E-10	0.028	2.20	244.1	246.3	6.39E-12	2.60E-12
2002	4.62E-05	0.009	8.01E-10	0.028	2.20	244.1	246.3	4.55E-12	1.85E-12
2003	2.56E-05	0.005	8.01E-10	0.028	2.20	244.1	246.3	2.46E-10	9.97E-11
2004	2.38E-05	0.005	8.03E-10	0.028	2.21	244.7	247.0	-5.53E-11	-2.24E-11
2005	3.23E-06	7.58E-04	8.01E-10	0.028	2.20	244.1	246.3	4.80E-11	1.95E-11
2006	1.51E-05	0.004	8.01E-10	0.028	2.20	244.1	246.3	-2.93E-11	-1.19E-11
2007	2.49E-04	0.050	8.01E-10	0.028	2.20	244.1	246.3	2.64E-11	1.07E-11
2008	1.87E-04	0.037	8.03E-10	0.028	2.21	244.7	247.0	-3.02E-11	-1.22E-11
2009	3.25E-05	0.006	8.01E-10	0.028	2.20	244.1	246.3	2.42E-10	9.83E-11
2010	0	0	8.01E-10	0.028	2.20	244.1	246.4	-6.53E-10	-2.65E-10
2011	0	0	8.01E-10	0.028	2.20	244.2	246.4	2.41E-10	9.77E-11
2012	1.33E-10	1.25E-06	8.03E-10	0.028	2.21	244.9	247.1	3.99E-10	1.62E-10
2013	1.89E-09	2.01E-05	8.01E-10	0.028	2.20	244.2	246.4	-4.29E-10	-1.74E-10
2014	8.94E-11	8.38E-07	8.01E-10	0.028	2.20	244.2	246.4	-2.55E-09	-1.04E-09
2015	3.59E-10	3.81E-06	8.01E-10	0.028	2.20	244.2	246.4	-9.18E-10	-3.72E-10
2016	2.03E-08	2.76E-05	8.03E-10	0.028	2.21	244.8	247.1	1.61E-08	6.53E-09
2017	0	0	8.01E-10	0.028	2.20	244.2	246.4	-9.04E-11	-3.67E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - (Layer 2) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	584.6	9.29E-04	6.05E-04	6.51E-04	244.4	30,113	30,942
1980	0	0	611.4	9.31E-04	6.08E-04	6.53E-04	244.8	29,993	30,850
1981	0	0	609.0	9.29E-04	6.06E-04	6.51E-04	244.1	29,918	30,771
1982	0.004	0.013	608.7	9.29E-04	6.06E-04	6.51E-04	244.1	29,918	30,771
1983	0.013	0.041	608.4	9.29E-04	6.06E-04	6.51E-04	244.1	29,919	30,772
1984	0.012	0.037	609.8	9.31E-04	6.08E-04	6.53E-04	244.8	30,001	30,856
1985	5.52E-04	0.002	607.9	9.29E-04	6.06E-04	6.51E-04	244.1	29,921	30,773
1986	2.21E-04	9.27E-04	607.7	9.29E-04	6.06E-04	6.51E-04	244.1	29,922	30,774
1987	0	0	607.1	9.29E-04	6.06E-04	6.51E-04	244.1	29,926	30,777
1988	0.012	0.032	608.8	9.31E-04	6.08E-04	6.53E-04	244.8	30,007	30,860
1989	0.087	0.263	607.5	9.29E-04	6.06E-04	6.51E-04	244.1	29,921	30,773
1990	0.063	0.195	607.8	9.29E-04	6.06E-04	6.51E-04	244.1	29,919	30,771
1991	0.043	0.133	608.0	9.29E-04	6.06E-04	6.51E-04	244.1	29,917	30,770
1992	0	0	609.3	9.31E-04	6.08E-04	6.53E-04	244.8	30,001	30,855
1993	0.015	0.042	607.6	9.29E-04	6.06E-04	6.51E-04	244.1	29,919	30,770
1994	0.015	0.043	607.6	9.29E-04	6.06E-04	6.51E-04	244.1	29,918	30,770
1995	0.037	0.106	607.7	9.29E-04	6.06E-04	6.51E-04	244.1	29,916	30,768
1996	0.067	0.195	609.6	9.31E-04	6.08E-04	6.53E-04	244.8	29,996	30,850
1997	0.008	0.025	607.7	9.29E-04	6.06E-04	6.51E-04	244.2	29,915	30,766
1998	0.074	0.225	607.9	9.29E-04	6.06E-04	6.51E-04	244.2	29,911	30,764
1999	0.003	0.010	607.9	9.29E-04	6.06E-04	6.51E-04	244.1	29,914	30,766
2000	0.025	0.084	609.9	9.31E-04	6.08E-04	6.53E-04	244.8	29,997	30,851
2001	0	0	608.0	9.29E-04	6.06E-04	6.51E-04	244.1	29,917	30,769
2002	0.010	0.036	608.1	9.29E-04	6.06E-04	6.51E-04	244.1	29,917	30,769
2003	0.008	0.021	608.1	9.29E-04	6.06E-04	6.51E-04	244.1	29,916	30,769
2004	0.007	0.024	609.6	9.31E-04	6.08E-04	6.53E-04	244.8	29,999	30,853
2005	0.030	0.080	607.9	9.29E-04	6.06E-04	6.51E-04	244.1	29,915	30,768
2006	0.013	0.033	607.7	9.29E-04	6.06E-04	6.51E-04	244.1	29,916	30,768
2007	0	0	606.6	9.29E-04	6.06E-04	6.51E-04	244.1	29,924	30,774
2008	0.009	0.025	608.3	9.31E-04	6.08E-04	6.53E-04	244.8	30,004	30,858
2009	0.118	0.358	607.3	9.29E-04	6.06E-04	6.51E-04	244.1	29,918	30,770
2010	0.354	1.08	609.2	9.29E-04	6.06E-04	6.51E-04	244.2	29,904	30,759
2011	0.405	1.21	611.1	9.29E-04	6.07E-04	6.51E-04	244.2	29,889	30,746
2012	0.084	0.231	613.0	9.31E-04	6.08E-04	6.52E-04	244.9	29,970	30,829
2013	0.104	0.304	612.0	9.29E-04	6.07E-04	6.51E-04	244.2	29,885	30,742
2014	0.180	0.540	613.3	9.29E-04	6.07E-04	6.51E-04	244.2	29,880	30,738
2015	0.210	0.639	615.0	9.29E-04	6.07E-04	6.51E-04	244.2	29,874	30,734
2016	0.106	0.325	617.6	9.31E-04	6.08E-04	6.52E-04	244.9	29,954	30,817
2017	0.153	0.465	617.1	9.28E-04	6.07E-04	6.51E-04	244.2	29,867	30,729

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	30,116	4.98E-04	2.70E-04	5.37E-04	244.0	581.8	30,942	-6.55E-11	-2.12E-13
1980	0	0	29,997	4.98E-04	2.70E-04	5.38E-04	244.4	608.6	30,850	-2.18E-11	-7.08E-14
1981	0.156	0.472	29,920	4.97E-04	2.70E-04	5.36E-04	243.7	606.0	30,771	-1.60E-10	-5.20E-13
1982	0.045	0.142	29,922	4.97E-04	2.70E-04	5.36E-04	243.7	605.8	30,771	2.91E-11	9.46E-14
1983	0.043	0.140	29,922	4.97E-04	2.70E-04	5.36E-04	243.7	605.5	30,772	-8.73E-11	-2.84E-13
1984	0.033	0.106	30,005	4.98E-04	2.70E-04	5.38E-04	244.4	606.9	30,856	-1.13E-10	-3.65E-13
1985	0.038	0.109	29,924	4.97E-04	2.70E-04	5.36E-04	243.7	605.1	30,773	-3.64E-12	-1.18E-14
1986	0.036	0.106	29,925	4.97E-04	2.70E-04	5.36E-04	243.7	604.9	30,774	-2.91E-11	-9.46E-14
1987	0.106	0.322	29,929	4.97E-04	2.70E-04	5.36E-04	243.7	604.2	30,777	1.24E-10	4.02E-13
1988	0.004	0.014	30,010	4.98E-04	2.70E-04	5.38E-04	244.4	605.9	30,860	-7.64E-11	-2.48E-13
1989	0	0	29,925	4.97E-04	2.70E-04	5.36E-04	243.7	604.8	30,773	-6.91E-11	-2.25E-13
1990	2.61E-05	9.86E-06	29,923	4.97E-04	2.70E-04	5.36E-04	243.7	605.0	30,771	-1.13E-10	-3.67E-13
1991	2.02E-04	2.81E-04	29,921	4.97E-04	2.70E-04	5.36E-04	243.7	605.2	30,770	2.91E-11	9.46E-14
1992	0.043	0.132	30,004	4.98E-04	2.70E-04	5.38E-04	244.4	606.5	30,855	-1.20E-10	-3.89E-13
1993	0.006	0.020	29,922	4.97E-04	2.70E-04	5.36E-04	243.7	604.8	30,770	-4.00E-11	-1.30E-13
1994	0.006	0.019	29,921	4.97E-04	2.70E-04	5.36E-04	243.7	604.7	30,770	-5.46E-11	-1.77E-13
1995	0	0	29,920	4.97E-04	2.70E-04	5.36E-04	243.7	604.8	30,768	5.46E-11	1.77E-13
1996	0	0	29,999	4.98E-04	2.70E-04	5.38E-04	244.3	606.8	30,850	-2.98E-10	-9.67E-13
1997	0.026	0.084	29,918	4.97E-04	2.70E-04	5.36E-04	243.7	604.8	30,766	6.91E-11	2.25E-13
1998	6.78E-08	1.64E-07	29,915	4.97E-04	2.70E-04	5.36E-04	243.7	605.2	30,764	0	0
1999	0.045	0.138	29,917	4.97E-04	2.70E-04	5.36E-04	243.7	605.1	30,766	-4.37E-11	-1.42E-13
2000	0.030	0.094	30,000	4.98E-04	2.70E-04	5.38E-04	244.3	607.1	30,851	-6.91E-11	-2.24E-13
2001	0.054	0.164	29,920	4.97E-04	2.70E-04	5.36E-04	243.7	605.2	30,769	-5.46E-11	-1.77E-13
2002	0.011	0.029	29,920	4.97E-04	2.70E-04	5.36E-04	243.7	605.3	30,769	2.18E-11	7.09E-14
2003	1.83E-04	7.03E-04	29,920	4.97E-04	2.70E-04	5.36E-04	243.7	605.3	30,769	3.27E-11	1.06E-13
2004	0.024	0.077	30,002	4.98E-04	2.70E-04	5.38E-04	244.4	606.7	30,853	-6.91E-11	-2.24E-13
2005	0.001	0.004	29,919	4.97E-04	2.70E-04	5.36E-04	243.7	605.1	30,768	2.91E-11	9.46E-14
2006	0.032	0.107	29,919	4.97E-04	2.70E-04	5.36E-04	243.7	604.8	30,768	-9.09E-11	-2.96E-13
2007	0.191	0.577	29,926	4.97E-04	2.70E-04	5.36E-04	243.7	603.7	30,774	-4.00E-11	-1.30E-13
2008	0.005	0.013	30,008	4.98E-04	2.70E-04	5.38E-04	244.4	605.5	30,858	-5.46E-11	-1.77E-13
2009	0	0	29,921	4.97E-04	2.70E-04	5.36E-04	243.7	604.6	30,770	0	0
2010	0	0	29,909	4.97E-04	2.69E-04	5.36E-04	243.6	606.6	30,759	-7.28E-11	-2.37E-13
2011	0	0	29,894	4.97E-04	2.69E-04	5.36E-04	243.6	608.5	30,746	-1.49E-10	-4.85E-13
2012	0.009	0.033	29,974	4.98E-04	2.70E-04	5.38E-04	244.2	610.1	30,829	-1.02E-10	-3.30E-13
2013	9.10E-04	0.003	29,889	4.97E-04	2.69E-04	5.36E-04	243.6	609.3	30,742	-8.00E-11	-2.60E-13
2014	1.46E-05	6.38E-05	29,884	4.97E-04	2.69E-04	5.36E-04	243.6	610.7	30,738	-1.35E-10	-4.38E-13
2015	0.002	0.006	29,878	4.97E-04	2.69E-04	5.36E-04	243.5	612.4	30,734	-7.28E-11	-2.37E-13
2016	0.008	0.024	29,958	4.98E-04	2.70E-04	5.38E-04	244.2	614.9	30,817	5.53E-10	1.79E-12
2017	2.40E-05	1.05E-04	29,871	4.96E-04	2.69E-04	5.36E-04	243.5	614.4	30,729	-8.00E-11	-2.60E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	5,777	103.7	149.5	135.2	575.9	23,915	30,656
1980	0	5,800	104.0	149.8	135.5	601.2	23,763	30,554
1981	0	5,784	103.7	149.4	135.1	598.7	23,706	30,476
1982	0.006	5,784	103.7	149.4	135.1	598.5	23,706	30,476
1983	0.014	5,784	103.7	149.4	135.1	598.2	23,707	30,477
1984	0.013	5,800	104.0	149.8	135.5	599.6	23,772	30,561
1985	0.001	5,784	103.7	149.4	135.1	597.8	23,709	30,478
1986	3.49E-04	5,784	103.7	149.4	135.1	597.6	23,710	30,479
1987	0	5,783	103.7	149.4	135.1	597.0	23,714	30,483
1988	0.020	5,799	104.0	149.8	135.5	598.7	23,778	30,565
1989	0.088	5,784	103.7	149.4	135.1	597.5	23,709	30,479
1990	0.057	5,784	103.7	149.4	135.1	597.8	23,707	30,477
1991	0.040	5,784	103.7	149.4	135.1	597.9	23,705	30,475
1992	0	5,799	104.0	149.8	135.5	599.2	23,772	30,560
1993	0.021	5,784	103.7	149.4	135.1	597.5	23,707	30,476
1994	0.017	5,784	103.7	149.4	135.1	597.4	23,706	30,475
1995	0.040	5,784	103.7	149.4	135.1	597.6	23,704	30,474
1996	0.069	5,800	104.0	149.8	135.4	599.4	23,766	30,555
1997	0.006	5,784	103.7	149.4	135.1	597.5	23,702	30,472
1998	0.078	5,784	103.7	149.4	135.1	597.8	23,699	30,469
1999	0.002	5,784	103.7	149.4	135.1	597.8	23,702	30,472
2000	0.021	5,800	104.0	149.8	135.5	599.7	23,767	30,556
2001	0	5,784	103.7	149.4	135.1	597.8	23,705	30,475
2002	0.010	5,784	103.7	149.4	135.1	598.0	23,705	30,474
2003	0.010	5,784	103.7	149.4	135.1	598.0	23,704	30,474
2004	0.008	5,800	104.0	149.8	135.5	599.4	23,770	30,558
2005	0.037	5,784	103.7	149.4	135.1	597.8	23,703	30,473
2006	0.014	5,784	103.7	149.4	135.1	597.5	23,704	30,474
2007	0	5,784	103.7	149.4	135.1	596.5	23,712	30,481
2008	0.021	5,800	104.0	149.8	135.5	598.3	23,776	30,563
2009	0.117	5,784	103.7	149.4	135.1	597.3	23,705	30,475
2010	0.342	5,784	103.7	149.4	135.1	599.2	23,691	30,463
2011	0.384	5,785	103.7	149.4	135.1	601.0	23,675	30,449
2012	0.065	5,801	104.0	149.8	135.4	602.6	23,739	30,531
2013	0.094	5,785	103.7	149.4	135.1	601.7	23,670	30,445
2014	0.162	5,785	103.7	149.4	135.1	603.1	23,664	30,441
2015	0.179	5,785	103.7	149.4	135.1	604.8	23,657	30,436
2016	0.080	5,801	104.0	149.8	135.4	607.2	23,720	30,518
2017	0.135	5,786	103.7	149.4	135.1	606.6	23,650	30,430

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	41.4	103.9	41.9	136.8	30,047	285.2	30,656	5.62E-08	1.83E-10
1980	0	40.9	103.8	42.0	137.1	29,928	301.4	30,554	4.87E-10	1.60E-12
1981	0.156	40.8	103.5	41.8	136.7	29,853	300.0	30,476	-6.34E-08	-2.08E-10
1982	0.031	40.8	103.5	41.8	136.7	29,854	299.9	30,476	-5.09E-11	-1.67E-13
1983	0.034	40.8	103.5	41.8	136.7	29,854	299.7	30,477	-1.57E-08	-5.14E-11
1984	0.025	40.9	103.8	42.0	137.1	29,936	300.3	30,561	2.60E-08	8.52E-11
1985	0.039	40.8	103.6	41.8	136.7	29,856	299.4	30,478	6.55E-11	2.15E-13
1986	0.033	40.8	103.6	41.8	136.7	29,857	299.3	30,479	-5.38E-09	-1.76E-11
1987	0.100	40.8	103.6	41.8	136.7	29,861	298.8	30,483	3.51E-07	1.15E-09
1988	2.68E-04	40.9	103.9	42.0	137.1	29,942	299.7	30,565	1.38E-08	4.51E-11
1989	0	40.8	103.6	41.8	136.7	29,857	299.2	30,479	1.10E-09	3.60E-12
1990	3.87E-05	40.8	103.6	41.8	136.7	29,854	299.4	30,477	5.12E-09	1.68E-11
1991	2.11E-04	40.8	103.6	41.8	136.7	29,853	299.4	30,475	3.68E-09	1.21E-11
1992	0.046	40.9	103.8	42.0	137.1	29,936	300.0	30,560	7.72E-08	2.53E-10
1993	0.004	40.8	103.6	41.8	136.7	29,854	299.2	30,476	1.72E-09	5.65E-12
1994	0.005	40.8	103.6	41.8	136.7	29,853	299.1	30,475	1.75E-08	5.73E-11
1995	0	40.8	103.6	41.8	136.7	29,852	299.2	30,474	3.42E-08	1.12E-10
1996	0	40.9	103.8	42.0	137.1	29,931	300.2	30,555	-4.71E-07	-1.54E-09
1997	0.025	40.8	103.6	41.8	136.7	29,850	299.1	30,472	9.28E-08	3.05E-10
1998	0	40.8	103.6	41.8	136.7	29,846	299.4	30,469	-1.31E-10	-4.30E-13
1999	0.057	40.8	103.6	41.8	136.7	29,849	299.4	30,472	1.06E-10	3.46E-13
2000	0.033	40.9	103.8	42.0	137.1	29,932	300.4	30,556	1.52E-08	4.97E-11
2001	0.056	40.8	103.6	41.8	136.7	29,852	299.4	30,475	-5.09E-11	-1.67E-13
2002	0.011	40.8	103.6	41.8	136.7	29,852	299.5	30,474	9.46E-11	3.10E-13
2003	3.85E-04	40.8	103.6	41.8	136.7	29,852	299.5	30,474	2.02E-08	6.62E-11
2004	0.020	40.9	103.8	42.0	137.1	29,934	300.2	30,558	9.46E-11	3.10E-13
2005	4.05E-04	40.8	103.6	41.8	136.7	29,851	299.4	30,473	3.46E-09	1.13E-11
2006	0.029	40.8	103.6	41.8	136.7	29,851	299.2	30,474	-1.79E-09	-5.89E-12
2007	0.190	40.8	103.6	41.8	136.7	29,859	298.5	30,481	1.26E-09	4.13E-12
2008	2.18E-04	40.9	103.9	42.0	137.1	29,940	299.4	30,563	5.82E-10	1.90E-12
2009	0	40.8	103.6	41.8	136.7	29,853	299.1	30,475	1.05E-08	3.45E-11
2010	0	40.7	103.5	41.8	136.7	29,839	300.3	30,463	-5.26E-08	-1.73E-10
2011	0	40.7	103.5	41.8	136.7	29,825	301.4	30,449	1.76E-08	5.79E-11
2012	0.014	40.8	103.8	41.9	137.1	29,906	302.2	30,531	3.07E-08	1.01E-10
2013	0.002	40.7	103.5	41.8	136.7	29,821	301.9	30,445	-3.30E-08	-1.08E-10
2014	2.51E-05	40.6	103.5	41.8	136.7	29,815	302.7	30,441	-2.02E-07	-6.63E-10
2015	0.003	40.6	103.5	41.8	136.7	29,809	303.8	30,436	-5.03E-08	-1.65E-10
2016	0.009	40.7	103.7	41.9	137.1	29,889	305.1	30,518	1.25E-06	4.11E-09
2017	5.53E-06	40.6	103.4	41.8	136.7	29,803	305.1	30,430	-4.26E-09	-1.40E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	1.99	2.78	2.79	285.2	24,019	24,312
1980	0	1.99	2.78	2.79	301.4	23,867	24,175
1981	0	1.99	2.77	2.78	300.0	23,808	24,116
1982	0.002	1.99	2.77	2.78	299.9	23,809	24,116
1983	0.003	1.99	2.77	2.78	299.7	23,810	24,117
1984	0.003	1.99	2.78	2.79	300.3	23,875	24,183
1985	2.34E-04	1.99	2.77	2.78	299.4	23,811	24,118
1986	8.77E-05	1.99	2.77	2.78	299.3	23,813	24,120
1987	0	1.99	2.77	2.78	298.8	23,817	24,123
1988	0.006	1.99	2.78	2.79	299.7	23,881	24,188
1989	0.021	1.99	2.77	2.78	299.2	23,812	24,119
1990	0.013	1.99	2.77	2.78	299.4	23,810	24,117
1991	0.009	1.99	2.77	2.78	299.4	23,808	24,115
1992	0	1.99	2.78	2.79	300.0	23,875	24,183
1993	0.005	1.99	2.77	2.78	299.2	23,809	24,116
1994	0.004	1.99	2.77	2.78	299.1	23,809	24,115
1995	0.009	1.99	2.77	2.78	299.2	23,807	24,114
1996	0.016	1.99	2.78	2.79	300.2	23,869	24,177
1997	0.001	1.99	2.77	2.78	299.1	23,805	24,112
1998	0.018	1.99	2.77	2.78	299.4	23,801	24,108
1999	2.85E-04	1.99	2.77	2.78	299.4	23,804	24,111
2000	0.005	1.99	2.78	2.79	300.4	23,870	24,178
2001	0	1.99	2.77	2.78	299.4	23,807	24,114
2002	0.003	1.99	2.77	2.78	299.5	23,807	24,114
2003	0.002	1.99	2.77	2.78	299.5	23,807	24,114
2004	0.002	1.99	2.78	2.79	300.2	23,873	24,180
2005	0.009	1.99	2.77	2.78	299.4	23,806	24,113
2006	0.003	1.99	2.77	2.78	299.2	23,806	24,113
2007	0	1.99	2.77	2.78	298.5	23,815	24,121
2008	0.007	1.99	2.78	2.79	299.4	23,879	24,186
2009	0.028	1.99	2.77	2.78	299.1	23,808	24,115
2010	0.080	1.99	2.77	2.78	300.3	23,793	24,101
2011	0.089	1.99	2.77	2.78	301.4	23,777	24,086
2012	0.012	1.99	2.78	2.79	302.2	23,842	24,151
2013	0.022	1.99	2.77	2.78	301.9	23,773	24,083
2014	0.038	1.99	2.77	2.78	302.7	23,767	24,077
2015	0.042	1.99	2.77	2.78	303.8	23,760	24,072
2016	0.018	1.99	2.78	2.79	305.1	23,823	24,136
2017	0.032	1.99	2.77	2.78	305.1	23,753	24,065

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	2.42	0.705	2.00	24,030	276.0	24,312	1.65E-08	6.80E-11
1980	0	2.41	0.710	2.01	23,878	292.1	24,175	1.20E-10	4.97E-13
1981	0.037	2.41	0.707	2.00	23,820	290.7	24,116	-1.09E-08	-4.51E-11
1982	0.006	2.41	0.707	2.00	23,821	290.6	24,116	-7.28E-12	-3.02E-14
1983	0.008	2.41	0.707	2.00	23,821	290.4	24,117	-3.27E-09	-1.35E-11
1984	0.006	2.41	0.709	2.01	23,887	291.0	24,183	5.35E-09	2.21E-11
1985	0.009	2.41	0.708	2.00	23,823	290.1	24,118	4.00E-11	1.66E-13
1986	0.008	2.41	0.708	2.00	23,824	289.9	24,120	-1.05E-09	-4.36E-12
1987	0.024	2.41	0.707	2.00	23,829	289.5	24,123	7.30E-08	3.03E-10
1988	0	2.41	0.709	2.01	23,893	290.3	24,188	2.94E-09	1.21E-11
1989	0	2.41	0.708	2.00	23,824	289.9	24,119	2.18E-10	9.05E-13
1990	4.56E-05	2.41	0.708	2.00	23,821	290.0	24,117	8.99E-10	3.73E-12
1991	1.11E-04	2.41	0.708	2.00	23,820	290.1	24,115	7.60E-10	3.15E-12
1992	0.011	2.41	0.710	2.01	23,887	290.7	24,183	1.60E-08	6.62E-11
1993	7.50E-04	2.41	0.708	2.00	23,821	289.9	24,116	2.87E-10	1.19E-12
1994	0.001	2.41	0.708	2.00	23,820	289.8	24,115	3.69E-09	1.53E-11
1995	0	2.41	0.708	2.00	23,819	289.9	24,114	6.78E-09	2.81E-11
1996	0	2.41	0.710	2.01	23,881	290.8	24,177	-9.87E-08	-4.08E-10
1997	0.006	2.41	0.708	2.00	23,817	289.8	24,112	1.91E-08	7.91E-11
1998	0	2.41	0.708	2.00	23,813	290.0	24,108	7.28E-11	3.02E-13
1999	0.013	2.41	0.708	2.00	23,816	290.0	24,111	0	0
2000	0.007	2.41	0.710	2.01	23,882	291.0	24,178	3.11E-09	1.29E-11
2001	0.013	2.41	0.708	2.00	23,819	290.1	24,114	0	0
2002	0.002	2.41	0.708	2.00	23,819	290.2	24,114	6.18E-11	2.56E-13
2003	1.06E-04	2.41	0.708	2.00	23,819	290.2	24,114	4.17E-09	1.73E-11
2004	0.005	2.41	0.710	2.01	23,884	290.8	24,180	3.64E-11	1.50E-13
2005	4.17E-05	2.41	0.708	2.00	23,817	290.0	24,113	7.09E-10	2.94E-12
2006	0.007	2.41	0.708	2.00	23,818	289.8	24,113	-3.75E-10	-1.55E-12
2007	0.045	2.41	0.707	2.00	23,827	289.1	24,121	2.47E-10	1.03E-12
2008	0	2.41	0.709	2.01	23,890	290.0	24,186	1.35E-10	5.57E-13
2009	0	2.41	0.708	2.00	23,820	289.7	24,115	1.83E-09	7.59E-12
2010	0	2.41	0.709	2.00	23,805	291.0	24,101	-1.09E-08	-4.51E-11
2011	0	2.41	0.709	2.00	23,789	292.2	24,086	3.67E-09	1.53E-11
2012	0.004	2.41	0.710	2.01	23,853	292.9	24,151	6.13E-09	2.54E-11
2013	3.66E-04	2.41	0.708	2.00	23,785	292.7	24,083	-6.84E-09	-2.84E-11
2014	6.19E-06	2.41	0.708	2.00	23,778	293.6	24,077	-4.20E-08	-1.74E-10
2015	9.53E-04	2.40	0.707	2.00	23,772	294.8	24,072	-9.50E-09	-3.94E-11
2016	0.002	2.41	0.709	2.01	23,835	296.1	24,136	2.61E-07	1.08E-09
2017	0	2.40	0.707	2.00	23,764	296.0	24,065	-7.89E-10	-3.28E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	7,601	4,433	6,085	12,747	276.0	186.8	31,329
1980	0	7,836	4,504	6,189	12,777	292.1	0	31,597
1981	0	7,808	4,489	6,166	12,743	290.7	0	31,497
1982	0.201	7,808	4,487	6,161	12,740	290.6	0	31,487
1983	0.334	7,809	4,487	6,159	12,737	290.4	0	31,481
1984	0.293	7,830	4,500	6,175	12,769	291.0	0	31,566
1985	0.019	7,806	4,489	6,162	12,739	290.1	0	31,486
1986	0.009	7,805	4,490	6,164	12,740	289.9	0	31,487
1987	0	7,801	4,488	6,161	12,740	289.5	0	31,479
1988	0.578	7,825	4,501	6,176	12,769	290.3	0	31,562
1989	1.59	7,807	4,490	6,163	12,733	289.9	0	31,484
1990	0.905	7,808	4,491	6,164	12,736	290.0	0	31,490
1991	0.676	7,809	4,493	6,168	12,738	290.1	0	31,499
1992	0	7,828	4,506	6,185	12,775	290.7	0	31,585
1993	0.530	7,809	4,495	6,171	12,736	289.9	0	31,502
1994	0.370	7,810	4,497	6,174	12,735	289.8	0	31,506
1995	0.821	7,812	4,499	6,176	12,732	289.9	0	31,510
1996	1.34	7,838	4,513	6,195	12,763	290.8	0	31,600
1997	0.104	7,815	4,502	6,179	12,729	289.8	0	31,515
1998	1.45	7,818	4,504	6,183	12,731	290.0	0	31,528
1999	0.017	7,817	4,502	6,181	12,729	290.0	0	31,519
2000	0.282	7,837	4,513	6,199	12,765	291.0	0	31,606
2001	0	7,814	4,500	6,180	12,729	290.1	0	31,512
2002	0.166	7,812	4,500	6,182	12,734	290.2	0	31,518
2003	0.240	7,813	4,500	6,181	12,732	290.2	0	31,517
2004	0.166	7,834	4,513	6,197	12,767	290.8	0	31,602
2005	0.912	7,817	4,500	6,179	12,724	290.0	0	31,512
2006	0.388	7,819	4,500	6,177	12,717	289.8	0	31,503
2007	0	7,811	4,500	6,175	12,721	289.1	0	31,496
2008	0.635	7,834	4,512	6,191	12,751	290.0	0	31,579
2009	2.06	7,818	4,502	6,179	12,716	289.7	0	31,506
2010	5.92	7,829	4,507	6,190	12,719	291.0	0	31,542
2011	6.77	7,845	4,513	6,198	12,715	292.2	0	31,569
2012	1.06	7,871	4,520	6,201	12,746	292.9	0	31,632
2013	1.48	7,853	4,499	6,168	12,712	292.7	0	31,526
2014	2.53	7,859	4,488	6,147	12,713	293.6	0	31,504
2015	2.57	7,864	4,474	6,121	12,721	294.8	0	31,477
2016	1.02	7,886	4,479	6,125	12,761	296.1	0	31,547
2017	2.08	7,869	4,460	6,096	12,727	296.0	0	31,450

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	107.9	923.8	2,768	3,510	24,019	0	31,329	1.36E-05	4.35E-08
1980	0	95.3	906.6	2,840	3,637	23,867	252.1	31,597	1.21E-07	3.84E-10
1981	2.82	95.5	905.0	2,826	3,624	23,808	235.9	31,497	-1.25E-05	-3.98E-08
1982	0.379	95.3	905.0	2,824	3,627	23,809	226.3	31,487	4.70E-09	1.49E-11
1983	0.458	95.1	905.6	2,823	3,630	23,810	217.5	31,481	-3.99E-06	-1.27E-08
1984	0.333	95.1	908.5	2,830	3,643	23,875	213.5	31,566	6.54E-06	2.07E-08
1985	0.780	95.3	906.4	2,824	3,631	23,811	216.5	31,486	2.18E-08	6.92E-11
1986	0.558	95.5	906.7	2,825	3,632	23,813	215.9	31,487	-1.35E-06	-4.28E-09
1987	1.70	95.7	907.6	2,821	3,631	23,817	205.0	31,479	8.93E-05	2.84E-07
1988	0	95.4	909.8	2,830	3,642	23,881	203.0	31,562	3.54E-06	1.12E-08
1989	0	94.9	906.8	2,826	3,634	23,812	210.4	31,484	2.65E-07	8.40E-10
1990	0.006	95.0	906.5	2,828	3,636	23,810	215.5	31,490	1.04E-06	3.31E-09
1991	0.014	95.1	906.8	2,830	3,638	23,808	221.4	31,499	9.43E-07	2.99E-09
1992	0.842	95.7	909.9	2,836	3,648	23,875	219.0	31,585	1.94E-05	6.16E-08
1993	0.037	95.0	907.8	2,829	3,640	23,809	221.0	31,502	3.09E-07	9.80E-10
1994	0.059	94.8	908.3	2,830	3,641	23,809	223.7	31,506	4.43E-06	1.41E-08
1995	0	94.5	908.4	2,831	3,642	23,807	227.5	31,510	8.06E-06	2.56E-08
1996	0	94.2	910.9	2,840	3,654	23,869	232.5	31,600	-1.21E-04	-3.82E-07
1997	0.407	94.0	909.2	2,831	3,646	23,805	229.7	31,515	2.33E-05	7.39E-08
1998	0	94.0	909.1	2,835	3,650	23,801	238.9	31,528	1.05E-07	3.34E-10
1999	1.25	93.9	908.7	2,831	3,640	23,804	239.5	31,519	2.53E-08	8.03E-11
2000	0.694	94.3	910.3	2,840	3,645	23,870	246.0	31,606	3.83E-06	1.21E-08
2001	1.03	94.1	907.9	2,829	3,632	23,807	241.0	31,512	-2.25E-08	-7.14E-11
2002	0.269	94.5	907.7	2,831	3,631	23,807	245.6	31,518	5.12E-08	1.63E-10
2003	0.008	94.3	907.8	2,831	3,632	23,807	244.5	31,517	5.15E-06	1.63E-08
2004	0.296	94.6	910.8	2,839	3,645	23,873	239.7	31,602	3.78E-08	1.20E-10
2005	0.002	93.6	908.4	2,831	3,637	23,806	235.3	31,512	9.02E-07	2.86E-09
2006	0.443	93.0	908.9	2,829	3,638	23,806	227.5	31,503	-4.62E-07	-1.47E-09
2007	3.41	93.7	910.6	2,824	3,635	23,815	214.4	31,496	3.23E-07	1.03E-09
2008	0	93.5	912.4	2,834	3,646	23,879	214.4	31,579	1.17E-07	3.70E-10
2009	0	92.9	908.9	2,830	3,637	23,808	229.6	31,506	2.18E-06	6.91E-09
2010	0	92.5	906.8	2,841	3,643	23,793	265.7	31,542	-1.33E-05	-4.22E-08
2011	0	91.3	905.6	2,848	3,651	23,777	295.8	31,569	4.49E-06	1.42E-08
2012	0.272	91.1	908.6	2,845	3,664	23,842	281.1	31,632	7.46E-06	2.36E-08
2013	0.031	90.7	904.0	2,832	3,655	23,773	271.1	31,526	-8.34E-06	-2.64E-08
2014	6.29E-04	90.6	900.6	2,828	3,654	23,767	264.3	31,504	-5.14E-05	-1.63E-07
2015	0.115	91.0	896.1	2,821	3,653	23,760	255.7	31,477	-1.12E-05	-3.55E-08
2016	0.252	91.6	896.4	2,826	3,661	23,823	249.6	31,547	3.18E-04	1.01E-06
2017	0	91.3	891.2	2,817	3,650	23,753	248.2	31,450	-8.74E-07	-2.78E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0.539	0.667	7.37	0	190.2	198.8
1980	0	3.61	3.85	3.92	252.1	0	263.5
1981	0	3.41	3.64	3.87	235.9	0	246.8
1982	0.033	3.30	3.53	3.83	226.3	0	237.0
1983	0.100	3.19	3.43	3.78	217.5	0	228.0
1984	0.150	3.15	3.41	3.75	213.5	0	224.0
1985	0.723	3.18	3.48	3.76	216.5	0	227.6
1986	0.098	3.19	3.48	3.74	215.9	0	226.4
1987	0.051	3.06	3.35	3.70	205.0	0	215.2
1988	0.057	3.04	3.35	3.69	203.0	0	213.1
1989	1.56	3.14	3.46	3.70	210.4	0	222.3
1990	1.11	3.20	3.52	3.71	215.5	0	227.0
1991	1.32	3.25	3.58	3.71	221.4	0	233.3
1992	0.229	3.21	3.54	3.70	219.0	0	229.7
1993	0.711	3.23	3.56	3.68	221.0	0	232.2
1994	0.780	3.25	3.59	3.66	223.7	0	235.0
1995	1.08	3.29	3.63	3.66	227.5	0	239.2
1996	1.27	3.34	3.69	3.66	232.5	0	244.5
1997	0.546	3.28	3.63	3.63	229.7	0	240.8
1998	2.27	3.38	3.74	3.63	238.9	0	251.9
1999	0.588	3.40	3.74	3.64	239.5	0	250.9
2000	1.36	3.49	3.83	3.67	246.0	0	258.3
2001	0.172	3.43	3.75	3.66	241.0	0	252.0
2002	1.00	3.48	3.81	3.66	245.6	0	257.6
2003	0.260	3.46	3.78	3.65	244.5	0	255.7
2004	0.257	3.40	3.71	3.64	239.7	0	250.7
2005	0.288	3.35	3.66	3.60	235.3	0	246.2
2006	0.276	3.26	3.56	3.57	227.5	0	238.1
2007	0.220	3.12	3.41	3.53	214.4	0	224.7
2008	0.325	3.14	3.44	3.54	214.4	0	224.9
2009	3.27	3.32	3.65	3.56	229.6	0	243.4
2010	7.65	3.71	4.08	3.64	265.7	0	284.7
2011	7.06	4.00	4.38	3.71	295.8	0	315.0
2012	1.39	3.75	4.08	3.67	281.1	0	294.0
2013	1.01	3.61	3.91	3.63	271.1	0	283.2
2014	0.821	3.52	3.80	3.60	264.3	0	276.1
2015	0.636	3.42	3.67	3.58	255.7	0	267.0
2016	0.472	3.35	3.59	3.58	249.6	0	260.6
2017	0.388	3.34	3.57	3.57	248.2	0	259.0

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	0.779	8.42	2.80	186.8	0	198.8	2.01E-07	1.01E-07
1980	0	0.173	4.92	1.71	0	256.7	263.5	-5.25E-09	-1.99E-09
1981	3.10	0.162	4.97	1.69	0	236.8	246.8	-1.63E-08	-6.60E-09
1982	1.96	0.158	5.06	1.73	0	228.1	237.0	9.29E-12	3.92E-12
1983	1.79	0.154	5.12	1.79	0	219.2	228.0	-5.76E-09	-2.52E-09
1984	1.01	0.154	5.18	1.84	0	215.8	224.0	9.62E-09	4.30E-09
1985	0.077	0.158	5.23	1.84	0	220.3	227.6	7.68E-11	3.37E-11
1986	0.169	0.160	5.17	1.85	0	219.0	226.4	-1.90E-09	-8.40E-10
1987	2.14	0.154	5.21	1.86	0	205.8	215.2	1.28E-07	5.94E-08
1988	0.564	0.155	5.26	1.89	0	205.3	213.1	5.14E-09	2.41E-09
1989	0.006	0.162	5.22	1.89	0	215.0	222.3	5.66E-10	2.55E-10
1990	0	0.165	5.19	1.90	0	219.8	227.0	1.38E-09	6.07E-10
1991	0	0.168	5.15	1.93	0	226.0	233.3	1.41E-09	6.06E-10
1992	0.604	0.166	5.17	1.95	0	221.8	229.7	2.75E-08	1.20E-08
1993	0	0.167	5.14	1.98	0	224.9	232.2	5.92E-10	2.55E-10
1994	0	0.169	5.13	2.02	0	227.7	235.0	6.56E-09	2.79E-09
1995	0	0.171	5.10	2.08	0	231.8	239.2	1.16E-08	4.83E-09
1996	0	0.173	5.09	2.15	0	237.1	244.5	-1.75E-07	-7.17E-08
1997	0.535	0.170	5.08	2.22	0	232.7	240.8	3.37E-08	1.40E-08
1998	0	0.175	5.04	2.31	0	244.4	251.9	5.43E-10	2.15E-10
1999	0.204	0.175	5.00	2.28	0	243.2	250.9	4.99E-11	1.99E-11
2000	0.105	0.180	4.98	2.26	0	250.8	258.3	6.55E-09	2.53E-09
2001	0.877	0.175	4.97	2.26	0	243.7	252.0	-3.89E-11	-1.54E-11
2002	0.010	0.177	4.96	2.30	0	250.1	257.6	1.08E-10	4.20E-11
2003	0.232	0.175	4.96	2.36	0	247.9	255.7	6.88E-09	2.69E-09
2004	1.04	0.172	5.01	2.43	0	242.1	250.7	1.35E-10	5.38E-11
2005	0.723	0.169	5.02	2.49	0	237.8	246.2	1.31E-09	5.33E-10
2006	1.54	0.165	5.07	2.55	0	228.8	238.1	-6.70E-10	-2.81E-10
2007	2.70	0.158	5.13	2.61	0	214.1	224.7	4.81E-10	2.14E-10
2008	0.351	0.162	5.18	2.68	0	216.5	224.9	1.49E-10	6.63E-11
2009	0	0.173	5.10	2.76	0	235.3	243.4	2.83E-09	1.16E-09
2010	0	0.195	4.91	2.88	0	276.8	284.7	-1.94E-08	-6.83E-09
2011	0	0.206	4.70	3.05	0	307.0	315.0	6.54E-09	2.08E-09
2012	3.03	0.186	4.70	3.22	0	282.9	294.0	1.09E-08	3.70E-09
2013	1.78	0.176	4.74	3.36	0	273.2	283.2	-1.20E-08	-4.25E-09
2014	1.24	0.170	4.79	3.48	0	266.4	276.1	-7.34E-08	-2.66E-08
2015	1.54	0.163	4.83	3.58	0	256.9	267.0	-1.56E-08	-5.83E-09
2016	1.30	0.160	4.88	3.66	0	250.6	260.6	4.64E-07	1.78E-07
2017	0.161	0.159	4.89	3.70	0	250.1	259.0	-1.12E-09	-4.34E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	10.1	21.6	642.9	0	67.6	742.2
1980	0	69.3	137.7	466.2	79.5	256.7	164.0	1,173
1981	0	68.6	91.1	427.1	68.8	236.8	128.7	1,021
1982	10.1	68.4	84.0	367.1	30.7	228.1	115.2	903.7
1983	20.6	68.3	74.5	319.0	11.9	219.2	102.3	815.8
1984	24.7	68.5	77.7	303.9	3.57	215.8	99.4	793.6
1985	75.4	68.1	98.1	294.7	4.28	220.3	112.0	872.8
1986	11.7	68.1	102.6	317.4	2.48	219.0	113.1	834.5
1987	6.14	68.0	74.2	298.8	0.199	205.8	91.5	744.6
1988	7.42	68.0	85.2	304.7	0	205.3	93.9	764.5
1989	131.8	67.8	115.7	337.0	0	215.0	116.2	983.5
1990	92.2	68.1	119.9	335.4	0.163	219.8	126.3	961.8
1991	128.6	68.9	128.7	347.7	0.220	226.0	137.8	1,038
1992	35.7	69.8	109.5	326.5	0.628	221.8	128.7	892.7
1993	87.6	70.6	114.3	345.0	1.58	224.9	135.0	979.0
1994	91.0	71.8	120.1	351.7	2.45	227.7	139.5	1,004
1995	118.1	73.2	125.5	363.8	3.32	231.8	146.2	1,062
1996	135.0	75.0	130.4	372.1	4.16	237.1	153.5	1,107
1997	78.6	76.4	113.3	356.0	4.98	232.7	144.1	1,006
1998	240.5	78.4	139.6	393.4	5.81	244.4	163.8	1,266
1999	52.4	79.0	132.6	399.6	3.91	243.2	159.9	1,071
2000	113.3	79.9	142.2	436.5	4.23	250.8	171.4	1,198
2001	20.2	80.4	122.9	420.8	5.15	243.7	156.6	1,050
2002	101.3	81.3	133.7	441.9	6.38	250.1	166.6	1,181
2003	39.9	82.5	124.5	428.5	7.60	247.9	160.1	1,091
2004	38.5	83.7	112.3	419.3	8.57	242.1	146.8	1,051
2005	39.6	84.4	109.8	415.4	9.74	237.8	139.4	1,036
2006	34.9	85.1	98.6	401.3	11.5	228.8	123.3	983.5
2007	26.5	85.4	81.4	392.2	15.8	214.1	98.0	913.4
2008	43.3	86.0	99.2	399.7	16.3	216.5	105.1	966.0
2009	300.9	87.0	137.5	435.9	14.5	235.3	142.3	1,353
2010	693.6	90.0	197.4	573.6	14.1	276.8	215.5	2,061
2011	656.7	94.4	214.9	598.8	16.4	307.0	261.3	2,150
2012	188.7	98.7	121.5	434.4	17.8	282.9	203.7	1,348
2013	138.0	101.5	106.5	441.0	18.3	273.2	180.1	1,259
2014	106.4	103.9	99.4	426.2	19.1	266.4	163.8	1,185
2015	76.9	105.5	85.5	414.0	22.7	256.9	144.1	1,106
2016	51.7	106.7	81.0	414.5	26.5	250.6	130.5	1,062
2017	39.6	107.0	91.9	404.8	29.0	250.1	130.1	1,053

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	48.1	33.4	436.1	32.0	190.2	2.31	742.2	5.55E-05	7.47E-06
1980	0	190.0	0	26.9	938.8	17.7	0	0	1,173	-1.39E-06	-1.19E-07
1981	271.9	121.1	0	22.2	593.4	12.6	0	0	1,021	-3.92E-08	-3.83E-09
1982	153.7	118.3	0	20.0	567.6	44.0	0	0	903.7	1.29E-09	1.42E-10
1983	143.7	94.5	0	18.7	463.1	95.9	0	0	815.8	-2.11E-08	-2.59E-09
1984	78.9	94.2	0	18.7	468.5	133.3	0	0	793.6	1.15E-07	1.45E-08
1985	8.05	84.6	0	20.4	651.9	107.9	0	0	872.8	1.56E-08	1.78E-09
1986	19.9	116.2	0	20.8	552.1	125.6	0	0	834.5	4.65E-09	5.57E-10
1987	182.6	71.9	0	18.4	324.8	147.0	0	0	744.6	3.75E-08	5.04E-09
1988	41.1	95.0	0	19.0	441.4	168.0	0	0	764.5	2.66E-08	3.48E-09
1989	0.687	137.3	0	21.8	667.5	156.2	0	0	983.5	4.90E-08	4.98E-09
1990	0	128.9	0	22.7	650.6	159.6	0	0	961.8	1.44E-08	1.50E-09
1991	0	134.9	0	23.8	697.2	182.0	0	0	1,038	1.82E-08	1.75E-09
1992	52.0	101.2	0	22.5	518.9	198.1	0	0	892.7	1.90E-07	2.13E-08
1993	0	121.3	0	23.3	614.4	220.0	0	0	979.0	4.12E-08	4.21E-09
1994	0	121.7	0	23.7	619.2	239.6	0	0	1,004	5.65E-08	5.63E-09
1995	0	129.2	0	24.4	652.4	255.9	0	0	1,062	3.18E-08	3.00E-09
1996	0	133.5	0	25.2	674.4	274.4	0	0	1,107	-6.74E-07	-6.09E-08
1997	43.2	100.8	0	23.9	523.3	314.9	0	0	1,006	2.09E-07	2.08E-08
1998	0	142.4	0	26.2	746.5	350.8	0	0	1,266	6.46E-08	5.10E-09
1999	33.9	140.9	0	26.0	629.6	240.2	0	0	1,071	3.64E-09	3.40E-10
2000	14.2	182.3	0	27.6	796.9	177.4	0	0	1,198	4.00E-07	3.34E-08
2001	85.6	149.3	0	25.7	624.0	165.2	0	0	1,050	-2.06E-09	-1.97E-10
2002	0.263	184.8	0	27.0	799.4	169.8	0	0	1,181	8.96E-09	7.59E-10
2003	23.4	161.7	0	26.0	687.9	192.0	0	0	1,091	-1.79E-07	-1.64E-08
2004	85.5	141.6	0	24.4	579.7	220.1	0	0	1,051	2.39E-08	2.28E-09
2005	56.7	141.2	0	23.8	571.2	243.3	0	0	1,036	3.69E-09	3.57E-10
2006	128.9	116.8	0	22.0	449.2	266.6	0	0	983.5	-1.98E-09	-2.02E-10
2007	222.1	87.3	0	19.5	293.5	291.1	0	0	913.4	7.35E-09	8.04E-10
2008	31.0	127.3	0	21.1	482.7	303.9	0	0	966.0	2.07E-09	2.14E-10
2009	0	189.5	0	25.9	821.3	316.8	0	0	1,353	3.15E-08	2.33E-09
2010	0	282.4	0	34.1	1,406	338.2	0	0	2,061	-1.92E-07	-9.31E-09
2011	0	282.4	0	37.8	1,443	386.6	0	0	2,150	3.56E-08	1.65E-09
2012	268.4	159.2	0	29.0	423.2	467.7	0	0	1,348	1.43E-07	1.06E-08
2013	125.8	164.1	0	26.0	431.4	511.2	0	0	1,259	-2.66E-08	-2.11E-09
2014	95.9	160.1	0	23.9	369.8	535.5	0	0	1,185	-2.32E-08	-1.96E-09
2015	131.6	150.7	0	21.4	249.5	552.4	0	0	1,106	-8.51E-08	-7.69E-09
2016	108.8	149.5	0	20.4	224.4	558.7	0	0	1,062	2.78E-06	2.62E-07
2017	17.2	155.8	0	20.6	305.7	553.2	0	0	1,053	2.30E-08	2.19E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	1.65	0.667	105.8	2.31	35.7	146.1
1980	0	52.4	8.47	11.5	3.05	0	119.6	195.0
1981	0	52.2	7.95	11.1	2.94	0	106.1	180.3
1982	0.063	52.2	7.49	10.9	2.74	0	97.1	170.4
1983	0.302	52.2	7.00	10.8	2.39	0	89.3	162.0
1984	0.861	52.3	6.56	10.9	1.96	0	85.8	158.4
1985	1.52	52.1	6.53	11.0	1.64	0	89.0	161.8
1986	1.65	52.1	6.67	11.3	1.32	0	90.5	163.4
1987	1.47	52.0	6.46	11.2	0.994	0	82.7	154.9
1988	1.61	52.1	6.29	11.4	0.735	0	81.5	153.6
1989	2.55	51.9	6.32	11.6	0.542	0	89.2	162.2
1990	4.22	51.9	6.45	11.8	0.389	0	95.2	169.9
1991	8.14	51.9	7.29	11.9	0.264	0	101.0	180.5
1992	4.93	52.0	7.43	11.8	0.136	0	99.2	175.5
1993	7.54	51.9	6.98	11.8	0.044	0	100.6	178.9
1994	10.2	52.0	7.30	11.9	0	0	102.7	184.1
1995	14.4	52.1	7.44	12.0	0	0	106.0	192.0
1996	19.1	52.5	7.61	12.2	0	0	109.9	201.3
1997	16.0	52.6	7.62	12.1	0	0	107.3	195.6
1998	30.1	52.9	7.82	12.4	0	0	114.1	217.2
1999	27.0	53.2	7.95	12.5	0	0	114.8	215.4
2000	34.4	53.8	7.43	12.8	0	0	119.9	228.4
2001	23.5	54.0	7.77	12.7	0	0	116.2	214.1
2002	30.9	54.5	7.41	12.8	0	0	119.4	225.0
2003	25.9	54.9	7.67	12.7	0	0	118.3	219.5
2004	20.7	55.6	8.13	12.4	0	0	113.5	210.3
2005	20.3	55.9	8.23	12.3	0	0	109.3	206.0
2006	19.4	56.5	8.69	12.1	0.053	0	102.4	199.2
2007	18.2	57.0	9.27	11.9	0.115	0	91.2	187.7
2008	18.3	57.6	8.65	12.2	0.175	0	91.0	187.9
2009	31.4	58.0	7.51	12.8	0.244	0	104.8	214.8
2010	76.7	58.6	6.86	13.9	0.337	0	136.2	292.6
2011	99.5	59.3	6.96	14.6	0.460	0	162.4	343.3
2012	60.4	60.3	7.48	13.7	0.605	0	148.3	290.9
2013	56.4	61.1	7.65	13.0	0.751	0	134.9	273.9
2014	56.1	62.1	7.68	12.7	0.889	0	125.1	264.5
2015	54.5	63.1	7.61	12.4	1.01	0	115.0	253.7
2016	53.7	64.3	7.58	12.4	1.10	0	107.4	246.6
2017	54.5	65.2	7.57	12.4	1.15	0	105.1	245.9

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	39.9	8.15	9.63	1.60	67.6	19.2	146.1	4.51E-06	3.09E-06
1980	0	0.008	0	2.61	1.05	16.0	164.0	11.3	195.0	-2.69E-07	-1.38E-07
1981	20.8	0.008	0	2.66	0.950	15.9	128.7	11.3	180.3	-1.71E-10	-9.47E-11
1982	24.2	0.017	0	2.69	0.985	16.0	115.2	11.4	170.4	2.56E-11	1.50E-11
1983	27.8	0.017	0	2.72	1.22	16.6	102.3	11.3	162.0	4.30E-11	2.65E-11
1984	25.7	0.017	0	2.80	1.55	17.6	99.4	11.3	158.4	1.10E-09	6.94E-10
1985	15.7	0.017	0	2.70	1.86	18.3	112.0	11.2	161.8	1.80E-10	1.11E-10
1986	15.6	0.017	0	2.58	2.05	19.1	113.1	11.1	163.4	1.92E-10	1.17E-10
1987	27.8	0.017	0	2.53	2.26	19.8	91.5	11.0	154.9	-2.11E-10	-1.36E-10
1988	23.1	0.017	0	2.52	2.45	20.6	93.9	10.9	153.6	1.90E-10	1.24E-10
1989	8.79	0.017	0	2.53	2.59	21.3	116.2	10.8	162.2	8.21E-10	5.06E-10
1990	5.64	0.017	0	2.52	2.79	22.0	126.3	10.6	169.9	1.46E-10	8.62E-11
1991	3.78	0	0	2.38	3.09	22.9	137.8	10.5	180.5	1.77E-10	9.83E-11
1992	6.58	0	0	2.39	3.42	24.0	128.7	10.4	175.5	1.16E-09	6.59E-10
1993	2.25	0	0	2.48	3.67	25.2	135.0	10.3	178.9	6.81E-10	3.81E-10
1994	1.42	0	0	2.42	3.91	26.7	139.5	10.2	184.1	8.02E-10	4.36E-10
1995	0.586	0	0	2.44	4.11	28.5	146.2	10.1	192.0	8.46E-11	4.41E-11
1996	0.159	0	0	2.46	4.31	30.7	153.5	10.1	201.3	-3.52E-09	-1.75E-09
1997	1.31	0	0	2.47	4.55	33.1	144.1	10.0	195.6	1.32E-09	6.75E-10
1998	0	0	0	2.49	4.86	36.0	163.8	10.00	217.2	8.89E-10	4.09E-10
1999	0	0	0	2.51	4.76	38.2	159.9	10.1	215.4	6.56E-11	3.05E-11
2000	0.003	0	0	2.71	4.33	39.7	171.4	10.2	228.4	3.70E-09	1.62E-09
2001	0.270	0	0	2.59	3.69	40.7	156.6	10.3	214.1	-2.44E-11	-1.14E-11
2002	0.299	0	0	2.78	3.10	41.8	166.6	10.4	225.0	1.48E-10	6.57E-11
2003	0.342	0	0	2.70	2.60	43.3	160.1	10.4	219.5	-1.26E-09	-5.75E-10
2004	2.94	0	0	2.61	2.21	45.2	146.8	10.5	210.3	3.19E-10	1.52E-10
2005	4.25	0	0	2.58	1.93	47.3	139.4	10.6	206.0	1.85E-11	8.97E-12
2006	11.2	0	0	2.53	1.74	49.8	123.3	10.6	199.2	-3.10E-12	-1.56E-12
2007	22.7	0	0	2.44	1.59	52.4	98.0	10.7	187.7	9.72E-11	5.18E-11
2008	13.1	0	0	2.46	1.39	55.1	105.1	10.8	187.9	3.03E-11	1.61E-11
2009	7.00E-04	0	0	2.73	1.21	57.7	142.3	10.7	214.8	3.40E-10	1.58E-10
2010	0	0	0	4.13	1.21	61.0	215.5	10.7	292.6	-1.06E-09	-3.61E-10
2011	0	0	0	4.48	1.66	65.1	261.3	10.7	343.3	4.88E-10	1.42E-10
2012	0.512	0	0	3.36	2.21	70.4	203.7	10.8	290.9	1.41E-09	4.84E-10
2013	1.38	0	0	3.10	2.63	75.7	180.1	10.9	273.9	-2.31E-10	-8.44E-11
2014	2.36	0	0	3.03	2.74	81.3	163.8	11.2	264.5	1.54E-09	5.83E-10
2015	5.71	0	0	3.06	2.66	86.7	144.1	11.5	253.7	-5.04E-10	-1.99E-10
2016	6.74	0	0	3.15	2.46	91.8	130.5	11.8	246.6	1.85E-08	7.48E-09
2017	2.55	0	0	3.18	2.17	95.8	130.1	12.1	245.9	1.30E-11	5.30E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-6.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Live Oak UWCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows						Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers		Specific Storage	General Head Boundaries	Bee GCD	Evergreen UWCD	McMullen GCD	Upper Layers			
	(acre-feet)															%
Predevelopment	0	0	9.63	4.41	134.0	19.2	167.3	0	40.1	33.2	55.7	2.64	35.7	167.3	6.30E-06	3.76E-06
1980	0	53.1	35.4	56.4	4.41	11.3	160.6	0	0	8.70	12.8	19.6	119.6	160.6	-2.87E-07	-1.79E-07
1981	0	52.9	34.1	55.7	4.30	11.3	158.4	13.6	0	8.67	10.7	19.3	106.1	158.4	-1.26E-10	-7.96E-11
1982	0.078	52.9	32.7	55.3	3.98	11.4	156.3	22.4	0	8.60	8.76	19.5	97.1	156.3	6.82E-13	4.36E-13
1983	0.395	52.9	31.0	55.5	3.42	11.3	154.5	28.7	0	8.51	7.59	20.4	89.3	154.5	-1.69E-11	-1.09E-11
1984	1.14	53.0	29.3	56.3	2.71	11.3	153.7	30.3	0	8.44	7.33	21.8	85.8	153.7	6.63E-10	4.31E-10
1985	1.83	52.8	28.7	56.8	2.14	11.2	153.5	25.2	0	8.30	8.12	22.9	89.0	153.5	9.08E-11	5.92E-11
1986	2.20	52.8	28.8	57.7	1.72	11.1	154.2	22.9	0	8.19	8.65	24.0	90.5	154.2	8.64E-11	5.60E-11
1987	2.07	52.7	28.1	59.2	1.29	11.0	154.4	29.5	0	8.12	8.94	25.1	82.7	154.4	-6.36E-10	-4.12E-10
1988	2.18	52.8	27.5	60.5	0.924	10.9	154.8	29.6	0	8.11	9.32	26.3	81.5	154.8	1.00E-10	6.47E-11
1989	2.59	52.6	27.3	60.4	0.650	10.8	154.4	19.8	0	8.11	9.94	27.4	89.2	154.4	4.16E-10	2.70E-10
1990	3.46	52.6	27.7	60.1	0.440	10.6	154.9	12.2	0	8.16	10.9	28.4	95.2	154.9	8.32E-11	5.37E-11
1991	6.29	52.6	29.2	59.8	0.258	10.5	158.7	7.18	0	8.19	12.5	29.7	101.0	158.7	9.83E-11	6.19E-11
1992	6.52	52.7	29.8	60.2	0.137	10.4	159.7	7.07	0	8.24	14.0	31.3	99.2	159.7	7.54E-10	4.72E-10
1993	8.46	52.6	28.8	60.6	0.037	10.3	160.8	3.72	0	8.39	15.1	32.9	100.6	160.8	3.37E-10	2.10E-10
1994	11.1	52.7	29.9	61.1	0	10.2	165.0	2.60	0	8.40	16.3	35.0	102.7	165.0	3.86E-10	2.34E-10
1995	15.1	52.8	30.5	61.7	0	10.1	170.3	1.09	0	8.48	17.4	37.4	106.0	170.3	1.34E-10	7.88E-11
1996	20.5	53.2	31.2	62.5	0	10.1	177.5	0.292	0	8.59	18.6	40.1	109.9	177.5	-2.31E-09	-1.30E-09
1997	21.0	53.3	31.6	63.0	0	10.0	178.8	0.397	0	8.64	19.3	43.2	107.3	178.8	8.62E-10	4.82E-10
1998	31.1	53.6	32.3	63.7	0	10.00	190.6	0.004	0	8.74	20.8	47.0	114.1	190.6	4.66E-10	2.44E-10
1999	33.1	53.9	33.0	64.3	0	10.1	194.3	0	0	8.84	21.1	49.6	114.8	194.3	4.38E-11	2.26E-11
2000	39.4	54.5	31.8	65.1	0	10.2	201.0	0	0	9.16	20.8	51.1	119.9	201.0	2.40E-09	1.19E-09
2001	33.5	54.7	33.3	65.0	0	10.3	196.8	0.254	0	9.13	19.4	51.7	116.2	196.8	-2.06E-11	-1.05E-11
2002	37.0	55.2	32.4	65.3	0	10.4	200.2	0.411	0	9.34	18.4	52.6	119.4	200.2	7.12E-11	3.56E-11
2003	34.5	55.6	33.5	65.2	0	10.4	199.3	0.409	0	9.33	17.3	54.0	118.3	199.3	-1.02E-09	-5.14E-10
2004	28.3	56.3	34.9	65.0	0	10.5	195.0	0.502	0	9.26	15.7	56.0	113.5	195.0	1.71E-10	8.77E-11
2005	26.0	56.6	35.1	64.5	0	10.6	192.9	1.94	0	9.18	14.1	58.3	109.3	192.9	2.88E-11	1.49E-11
2006	24.9	57.2	36.2	64.2	0.021	10.6	193.1	8.28	0	9.00	12.3	61.2	102.4	193.1	-1.21E-11	-6.27E-12
2007	23.5	57.7	37.4	64.1	0.102	10.7	193.5	19.4	0	8.73	9.93	64.2	91.2	193.5	4.81E-11	2.48E-11
2008	23.4	58.3	35.5	64.7	0.180	10.8	192.9	17.4	0	8.80	8.22	67.5	91.0	192.9	9.55E-12	4.95E-12
2009	26.7	58.7	32.1	65.3	0.266	10.7	193.8	0.887	0	9.11	8.29	70.7	104.8	193.8	2.05E-10	1.06E-10
2010	67.8	59.3	27.8	66.7	0.380	10.7	232.6	0	0	9.82	11.8	74.8	136.2	232.6	-7.82E-10	-3.36E-10
2011	102.9	60.0	28.4	68.9	0.532	10.7	271.4	0	0	10.3	18.7	80.0	162.4	271.4	2.69E-10	9.90E-11
2012	91.6	61.0	33.6	68.7	0.714	10.8	266.4	0	0	10.1	21.3	86.7	148.3	266.4	7.90E-10	2.96E-10
2013	83.0	61.8	34.9	67.6	0.900	10.9	259.1	0	0	10.0	20.8	93.4	134.9	259.1	-1.38E-10	-5.31E-11
2014	77.5	62.8	35.2	66.4	1.08	11.2	254.1	0.010	0	9.94	18.7	100.4	125.1	254.1	9.18E-10	3.61E-10
2015	72.3	63.8	34.9	65.3	1.23	11.5	249.1	1.45	0	9.85	15.7	107.0	115.0	249.1	-3.11E-10	-1.25E-10
2016	69.5	65.1	34.5	65.0	1.35	11.8	247.2	3.60	0	9.75	13.1	113.3	107.4	247.2	1.38E-08	5.58E-09
2017	68.8	66.0	34.0	64.1	1.43	12.1	246.3	2.59	0	9.60	10.8	118.2	105.1	246.3	-2.47E-12	-1.00E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Quarternary Alluvium (Layer 1)

Simulated Time Period	Inflows						Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Recharge	Caldwell	Lower Layers		Specific Storage	Specific Yield	River Package	Evapo-transpiration	Fayette County GCD	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	46,990	549.1	3.65	72,366	1.20E+05	0	0	72,633	55.0	17.3	47,203	1.20E+05	6.75E-08	5.63E-11
1980	0	0	47,206	518.3	3.08	71,933	1.20E+05	0	0	72,220	52.8	15.3	47,373	1.20E+05	4.49E-08	3.76E-11
1981	0	0	46,981	664.4	3.57	72,449	1.20E+05	0.624	201.5	72,595	54.5	17.0	47,230	1.20E+05	-2.91E-07	-2.42E-10
1982	0.481	149.5	47,077	448.9	3.09	71,690	1.19E+05	0	0	72,052	53.0	16.2	47,248	1.19E+05	-2.92E-07	-2.44E-10
1983	0.316	105.4	47,116	460.2	2.90	71,473	1.19E+05	0	0	71,819	52.2	15.1	47,271	1.19E+05	-2.51E-07	-2.11E-10
1984	0.489	165.1	47,329	390.9	2.57	71,230	1.19E+05	0	0	71,617	51.0	13.5	47,436	1.19E+05	2.80E-07	2.35E-10
1985	0	0	47,057	626.4	3.16	71,937	1.20E+05	0.615	202.6	72,092	52.6	14.9	47,261	1.20E+05	-3.15E-07	-2.63E-10
1986	1.45E-10	1.93E-07	47,027	591.5	3.33	72,095	1.20E+05	0.331	109.3	72,308	53.5	16.1	47,231	1.20E+05	-2.43E-07	-2.03E-10
1987	0	0	47,005	598.6	3.45	72,227	1.20E+05	0.240	78.9	72,458	54.2	17.1	47,226	1.20E+05	-2.35E-07	-1.96E-10
1988	1.19	387.3	47,359	276.9	2.47	71,031	1.19E+05	0	0	71,510	50.9	14.1	47,484	1.19E+05	3.02E-07	2.54E-10
1989	0.448	160.9	47,278	367.9	2.28	70,673	1.18E+05	3.14E-04	0.042	71,070	49.5	11.9	47,351	1.18E+05	-5.19E-07	-4.38E-10
1990	6.62E-04	0.204	47,160	547.0	2.72	71,340	1.19E+05	0.399	135.1	71,554	50.7	12.7	47,297	1.19E+05	-3.65E-07	-3.06E-10
1991	0	0	47,036	652.7	3.28	72,107	1.20E+05	0.759	253.7	72,223	52.8	15.0	47,254	1.20E+05	-3.08E-07	-2.57E-10
1992	0	0	47,061	736.6	3.85	73,022	1.21E+05	0.902	288.9	73,105	55.6	20.2	47,353	1.21E+05	5.42E-08	4.48E-11
1993	0.540	163.5	47,045	471.1	3.25	71,880	1.20E+05	0.001	0.515	72,249	53.8	17.5	47,243	1.20E+05	-2.95E-07	-2.46E-10
1994	0	0	47,014	594.2	3.38	72,138	1.20E+05	0.113	35.6	72,401	54.2	17.8	47,240	1.20E+05	-1.58E-07	-1.32E-10
1995	0.473	149.4	47,092	459.7	3.00	71,588	1.19E+05	0	0	71,954	52.8	16.7	47,269	1.19E+05	-3.96E-07	-3.32E-10
1996	0.868	292.5	47,376	326.4	2.39	70,970	1.19E+05	0	0	71,417	50.5	13.9	47,487	1.19E+05	3.58E-07	3.01E-10
1997	0	0	47,071	640.2	3.08	71,852	1.20E+05	0.661	218.3	72,000	52.3	15.2	47,280	1.20E+05	-3.81E-07	-3.19E-10
1998	0	0	47,008	641.6	3.42	72,249	1.20E+05	0.544	178.3	72,414	53.9	16.9	47,239	1.20E+05	-1.19E-07	-9.89E-11
1999	0.792	255.9	47,167	367.8	2.71	71,165	1.19E+05	0	0	71,586	51.6	15.1	47,307	1.19E+05	-2.11E-07	-1.78E-10
2000	8.77E-04	0.389	47,237	558.1	2.93	71,748	1.20E+05	0.142	43.9	72,022	52.1	15.3	47,413	1.20E+05	-1.28E-07	-1.07E-10
2001	0.052	17.3	47,121	500.7	2.87	71,464	1.19E+05	2.80E-05	0.015	71,767	51.8	15.1	47,273	1.19E+05	-3.66E-07	-3.07E-10
2002	0	0	46,902	851.2	3.97	73,088	1.21E+05	1.40	451.6	73,057	56.0	23.5	47,256	1.21E+05	-2.93E-07	-2.42E-10
2003	0.067	17.1	46,944	620.8	3.78	72,615	1.20E+05	0.123	39.2	72,870	56.2	24.9	47,211	1.20E+05	-2.81E-07	-2.34E-10
2004	0	0	46,962	815.2	4.42	73,711	1.21E+05	0.902	276.6	73,793	59.1	31.9	47,331	1.21E+05	2.09E-07	1.72E-10
2005	1.22	361.5	47,027	411.7	3.34	71,937	1.20E+05	0	0	72,389	55.2	23.1	47,275	1.20E+05	-2.51E-07	-2.10E-10
2006	0.988	321.5	47,152	368.2	2.73	71,213	1.19E+05	0	0	71,656	52.3	16.8	47,333	1.19E+05	-3.31E-07	-2.78E-10
2007	0	0	46,868	881.6	4.17	73,370	1.21E+05	1.61	507.4	73,287	57.2	25.9	47,245	1.21E+05	-4.15E-07	-3.43E-10
2008	1.20	370.6	47,223	349.7	3.05	71,737	1.20E+05	0	0	72,191	53.6	17.8	47,422	1.20E+05	1.47E-07	1.23E-10
2009	0.309	106.0	47,106	502.7	2.92	71,509	1.19E+05	0.002	0.363	71,861	52.7	16.5	47,296	1.19E+05	3.51E-07	2.94E-10
2010	0.001	0.511	47,051	626.2	3.15	71,877	1.20E+05	0.231	75.3	72,129	53.4	17.3	47,282	1.20E+05	-1.72E-07	-1.44E-10
2011	1.18	397.7	47,297	289.6	2.16	70,516	1.19E+05	0	0	71,008	50.0	14.3	47,431	1.19E+05	-1.53E-06	-1.29E-09
2012	0.657	211.0	47,515	499.6	2.23	70,315	1.19E+05	0.001	0.266	70,798	48.5	13.7	47,683	1.19E+05	6.02E-07	5.08E-10
2013	0.164	53.9	47,370	546.7	2.40	70,238	1.18E+05	0.034	17.8	70,629	48.1	14.3	47,502	1.18E+05	-2.15E-07	-1.82E-10
2014	0.416	138.2	47,471	485.5	2.17	69,819	1.18E+05	0	0	70,267	47.0	14.1	47,589	1.18E+05	2.84E-07	2.41E-10
2015	0.002	1.41	47,262	802.3	3.01	70,812	1.19E+05	0.695	253.4	71,030	49.2	19.8	47,527	1.19E+05	-3.56E-07	-3.00E-10
2016	0	0	47,308	765.1	3.38	71,430	1.20E+05	0.575	195.4	71,661	51.3	27.2	47,572	1.20E+05	7.59E-08	6.35E-11
2017	0.455	145.2	47,302	624.8	2.99	70,461	1.19E+05	8.56E-04	0.345	70,915	49.9	27.4	47,543	1.19E+05	-2.99E-07	-2.52E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - (Layer 2)

Simulated Time Period	Inflows					Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Fayette County GCD	Upper Layers	Lower Layers		Specific Storage	Specific Yield	General Head Boundaries	Fayette County GCD	Upper Layers	Lower Layers			
	(acre-feet)														%
Predevelopment	0	0	2.40E-06	1.62E-11	2,161	2,161	0	0	2,161	1.86E-06	4.70E-12	0	2,161	3.91E-10	1.81E-11
1980	0	0	2.44E-06	4.19E-12	2,129	2,129	0	0	2,129	1.82E-06	3.67E-12	1.79E-11	2,129	4.55E-12	2.14E-13
1981	0	0	2.43E-06	3.65E-12	2,148	2,148	0.004	0.325	2,148	1.83E-06	6.27E-12	8.74E-12	2,148	2.77E-11	1.29E-12
1982	0.003	0.317	2.43E-06	4.18E-12	2,121	2,122	5.31E-05	0.002	2,122	1.82E-06	3.13E-12	2.68E-11	2,122	-1.96E-11	-9.22E-13
1983	6.48E-04	0.054	2.43E-06	5.22E-12	2,117	2,117	2.19E-04	0.009	2,117	1.81E-06	5.75E-12	0	2,117	-2.73E-12	-1.29E-13
1984	0.001	0.126	2.44E-06	3.66E-12	2,111	2,111	1.32E-04	0.005	2,111	1.80E-06	9.43E-12	8.76E-12	2,111	-7.09E-11	-3.36E-12
1985	0	0	2.42E-06	5.22E-12	2,139	2,139	0.005	0.417	2,139	1.82E-06	3.66E-12	8.92E-12	2,139	-4.55E-12	-2.13E-13
1986	0	0	2.42E-06	1.41E-11	2,147	2,147	0.002	0.123	2,147	1.83E-06	5.22E-13	8.74E-12	2,147	1.36E-11	6.36E-13
1987	6.66E-05	0.003	2.42E-06	8.35E-12	2,150	2,150	4.61E-04	0.039	2,150	1.84E-06	3.66E-12	0	2,150	3.96E-11	1.84E-12
1988	0.006	0.531	2.43E-06	0	2,109	2,110	0	0	2,110	1.81E-06	1.83E-11	2.65E-11	2,110	-1.66E-10	-7.87E-12
1989	0.002	0.137	2.43E-06	1.31E-11	2,096	2,097	2.64E-06	9.17E-04	2,097	1.79E-06	3.66E-12	0	2,097	2.27E-12	1.08E-13
1990	0	0	2.43E-06	3.66E-12	2,117	2,117	0.002	0.204	2,116	1.79E-06	7.83E-12	8.92E-12	2,117	5.32E-11	2.51E-12
1991	0	0	2.43E-06	6.79E-12	2,144	2,144	0.004	0.350	2,144	1.81E-06	4.18E-12	0	2,144	1.41E-11	6.57E-13
1992	0	0	2.43E-06	6.81E-12	2,172	2,172	0.003	0.273	2,171	1.84E-06	5.76E-12	0	2,172	-1.13E-10	-5.21E-12
1993	0.004	0.399	2.43E-06	7.83E-12	2,133	2,134	7.53E-05	0.003	2,134	1.83E-06	2.61E-12	1.77E-11	2,134	-1.18E-11	-5.54E-13
1994	0	0	2.42E-06	4.18E-12	2,147	2,147	0.002	0.188	2,147	1.84E-06	9.40E-12	0	2,147	-5.00E-12	-2.33E-13
1995	0.002	0.215	2.42E-06	3.13E-12	2,129	2,129	0	0	2,129	1.83E-06	1.20E-11	8.74E-12	2,129	4.77E-11	2.24E-12
1996	0.004	0.323	2.43E-06	1.20E-11	2,108	2,108	0	0	2,108	1.80E-06	4.19E-12	8.94E-12	2,108	1.91E-11	9.06E-13
1997	0	0	2.42E-06	4.18E-12	2,141	2,141	0.005	0.471	2,141	1.82E-06	4.70E-12	0	2,141	5.82E-11	2.72E-12
1998	0	0	2.40E-06	2.61E-12	2,166	2,166	0.006	0.415	2,166	1.85E-06	4.18E-12	0	2,166	2.73E-12	1.26E-13
1999	0.004	0.407	2.40E-06	1.25E-11	2,130	2,131	0	0	2,131	1.84E-06	0	0	2,131	3.18E-11	1.49E-12
2000	0	0	2.41E-06	2.62E-12	2,154	2,154	0.002	0.204	2,154	1.85E-06	6.28E-12	8.94E-12	2,154	-8.37E-11	-3.88E-12
2001	3.29E-04	0.031	2.40E-06	7.31E-12	2,145	2,145	0	0	2,145	1.84E-06	8.88E-12	1.78E-11	2,145	2.41E-11	1.12E-12
2002	0	0	2.39E-06	4.18E-12	2,202	2,202	0.008	0.721	2,201	1.88E-06	2.61E-12	8.74E-12	2,202	1.64E-11	7.43E-13
2003	0.003	0.304	2.40E-06	5.22E-12	2,179	2,179	1.21E-04	0.009	2,179	1.88E-06	2.61E-12	0	2,179	2.46E-11	1.13E-12
2004	3.12E-04	0.015	2.40E-06	7.33E-12	2,206	2,206	0.002	0.234	2,206	1.89E-06	2.62E-12	0	2,206	-5.28E-11	-2.39E-12
2005	0.008	0.726	2.41E-06	1.57E-12	2,143	2,144	0	0	2,144	1.86E-06	4.70E-12	0	2,144	-5.00E-11	-2.33E-12
2006	0.003	0.235	2.41E-06	5.74E-12	2,123	2,123	0	0	2,123	1.83E-06	1.57E-12	8.74E-12	2,123	1.36E-11	6.43E-13
2007	0	0	2.40E-06	7.83E-12	2,195	2,195	0.010	0.884	2,194	1.87E-06	1.04E-12	0	2,195	7.73E-12	3.52E-13
2008	0.009	0.813	2.41E-06	4.19E-12	2,135	2,136	0	0	2,136	1.85E-06	2.10E-12	0	2,136	-2.32E-11	-1.09E-12
2009	0	0	2.40E-06	5.74E-12	2,141	2,141	0.002	0.168	2,141	1.84E-06	2.61E-12	0	2,141	7.28E-12	3.40E-13
2010	0	0	2.40E-06	4.18E-12	2,163	2,163	0.003	0.293	2,163	1.85E-06	8.88E-12	0	2,163	-3.82E-11	-1.77E-12
2011	0.005	0.501	2.40E-06	6.27E-12	2,119	2,120	0	0	2,120	1.83E-06	1.04E-12	3.53E-11	2,120	-3.09E-11	-1.46E-12
2012	0.007	0.467	2.45E-06	8.38E-12	2,111	2,111	6.88E-05	0.024	2,111	1.78E-06	4.71E-12	3.54E-11	2,111	3.18E-12	1.51E-13
2013	0	0	2.44E-06	8.88E-12	2,117	2,117	0.002	0.140	2,117	1.78E-06	7.31E-12	1.75E-11	2,117	-1.32E-11	-6.23E-13
2014	5.51E-04	0.058	2.44E-06	3.13E-12	2,112	2,112	0	0	2,112	1.78E-06	3.13E-12	8.74E-12	2,112	-5.00E-12	-2.37E-13
2015	0	0	2.44E-06	8.88E-12	2,157	2,157	0.005	0.514	2,156	1.80E-06	4.70E-12	8.74E-12	2,157	2.32E-11	1.08E-12
2016	2.33E-05	0.008	2.44E-06	2.10E-12	2,172	2,172	0.002	0.139	2,172	1.83E-06	4.71E-12	0	2,172	-1.18E-11	-5.44E-13
2017	0.007	0.549	2.46E-06	3.13E-12	2,132	2,133	0	0	2,133	1.79E-06	7.31E-12	0	2,133	3.18E-11	1.49E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Fayette County GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	1,810	534.3	23.6	80.8	155.6	2,604
1980	0	0	1,826	504.3	24.9	76.1	160.0	2,591
1981	0	0	1,816	646.5	23.9	80.6	158.6	2,726
1982	0.471	46.9	1,821	436.8	24.6	77.8	158.2	2,565
1983	0.142	19.6	1,820	447.7	24.9	75.9	159.6	2,548
1984	0.252	40.0	1,825	380.3	25.9	71.7	161.8	2,505
1985	0	0	1,813	609.5	24.5	75.8	160.7	2,684
1986	2.61E-05	0.022	1,812	575.6	24.3	77.6	158.5	2,648
1987	2.70E-04	0	1,812	582.4	23.9	80.1	157.4	2,656
1988	0.820	114.8	1,824	269.4	25.9	72.6	159.8	2,467
1989	0.199	24.6	1,821	358.0	26.4	68.6	162.8	2,461
1990	0	0	1,818	532.3	25.6	71.0	162.8	2,610
1991	0	0	1,814	635.1	24.7	75.4	160.5	2,709
1992	0	0	1,816	716.7	23.7	80.8	158.1	2,795
1993	0.599	50.9	1,817	458.4	24.0	80.6	156.4	2,588
1994	0	0	1,812	578.2	23.5	82.4	157.0	2,653
1995	0.362	38.4	1,815	447.3	24.1	79.4	157.6	2,563
1996	0.485	76.7	1,823	317.6	25.7	72.8	161.0	2,477
1997	0	0	1,812	623.0	24.2	77.0	160.5	2,697
1998	0	0	1,808	624.3	23.8	79.9	157.1	2,693
1999	0.626	75.8	1,814	357.9	25.0	75.1	157.0	2,506
2000	0	0	1,816	543.0	24.4	76.8	158.0	2,619
2001	0.045	4.76	1,812	487.2	24.6	75.5	157.2	2,561
2002	0	0	1,802	828.3	22.9	81.1	155.4	2,890
2003	0.388	17.9	1,808	604.1	23.0	82.8	152.0	2,689
2004	0.001	0	1,810	793.2	23.2	86.3	151.5	2,864
2005	1.03	94.4	1,815	400.6	22.6	86.2	150.6	2,570
2006	0.472	68.0	1,816	358.2	23.8	81.2	154.4	2,502
2007	0	0	1,804	857.8	22.6	83.1	155.1	2,922
2008	1.11	109.3	1,821	340.3	23.6	82.9	153.5	2,532
2009	0.044	4.57	1,813	489.1	23.8	80.1	156.7	2,567
2010	0	0	1,809	609.3	23.4	81.6	156.3	2,679
2011	0.777	105.0	1,816	281.8	25.4	73.4	157.4	2,459
2012	0.129	7.21	1,823	486.1	25.4	73.7	161.5	2,577
2013	0.005	0.468	1,816	531.9	25.1	74.1	160.4	2,608
2014	0.087	8.51	1,817	472.4	25.4	73.4	159.6	2,557
2015	0	0	1,810	780.7	23.6	80.9	157.9	2,853
2016	0.035	0	1,815	744.5	23.4	83.1	154.9	2,821
2017	0.383	24.1	1,817	607.9	23.3	84.2	154.4	2,711

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Fayette County GCD	Upper Layers	Lower Layers			
										%
Predevelopment	0	0	0	83.6	163.1	2,204	153.6	2,604	-7.74E-10	-2.97E-11
1980	0	0	47.1	76.2	156.3	2,167	144.6	2,591	-3.73E-11	-1.44E-12
1981	0.478	46.3	44.9	104.6	163.4	2,194	171.5	2,726	-6.00E-11	-2.20E-12
1982	1.10E-04	0	42.9	66.8	157.3	2,160	138.4	2,565	2.86E-11	1.12E-12
1983	6.22E-04	0	40.9	64.1	153.3	2,153	136.3	2,548	-2.18E-11	-8.57E-13
1984	2.92E-04	0	39.1	49.2	147.6	2,142	127.4	2,505	4.27E-11	1.71E-12
1985	0.530	69.6	29.9	89.4	156.4	2,180	158.2	2,684	4.91E-11	1.83E-12
1986	0.172	20.1	25.9	91.8	160.9	2,189	159.6	2,648	4.59E-11	1.73E-12
1987	0.108	12.8	27.9	94.4	163.7	2,195	162.2	2,656	2.23E-09	8.39E-11
1988	0	0	30.0	30.6	148.4	2,139	119.2	2,467	2.73E-12	1.11E-13
1989	0.003	2.12	35.9	37.3	142.0	2,123	120.7	2,461	2.41E-11	9.79E-13
1990	0.312	60.0	35.9	75.1	148.4	2,151	139.1	2,610	-3.64E-11	-1.39E-12
1991	0.585	59.8	37.0	98.8	158.8	2,187	167.3	2,709	2.32E-11	8.56E-13
1992	0.504	52.5	38.0	124.1	167.6	2,223	189.6	2,795	2.19E-10	7.84E-12
1993	1.62E-04	0	34.9	73.3	161.8	2,175	142.9	2,588	-1.96E-11	-7.56E-13
1994	0.197	14.9	30.9	90.5	163.8	2,192	160.8	2,653	2.02E-10	7.63E-12
1995	0	0	28.9	68.1	158.1	2,168	139.5	2,563	1.98E-10	7.74E-12
1996	0	0	34.0	37.2	147.0	2,137	121.9	2,477	-7.51E-10	-3.03E-11
1997	0.589	83.5	24.9	89.7	156.6	2,182	158.8	2,697	2.10E-10	7.79E-12
1998	0.386	38.1	6.65	102.4	164.2	2,212	169.4	2,693	1.36E-10	5.07E-12
1999	0	0	6.69	50.7	154.1	2,165	129.7	2,506	-6.64E-11	-2.65E-12
2000	0.236	35.9	3.95	79.1	157.7	2,193	148.5	2,619	-3.51E-10	-1.34E-11
2001	0.001	0.114	4.48	74.2	156.8	2,183	142.9	2,561	-3.00E-11	-1.17E-12
2002	1.14	102.2	4.79	138.4	170.6	2,258	214.9	2,890	5.46E-12	1.89E-13
2003	0.032	3.04	5.92	109.4	170.1	2,229	171.4	2,689	2.55E-09	9.50E-11
2004	0.486	37.1	15.6	156.7	175.6	2,266	212.2	2,864	3.05E-11	1.06E-12
2005	0	0	17.2	62.3	163.8	2,186	140.9	2,570	-9.09E-13	-3.54E-14
2006	0	0	16.3	44.8	153.8	2,158	129.8	2,502	-1.91E-11	-7.63E-13
2007	1.29	136.1	12.3	136.5	169.6	2,251	215.8	2,922	-1.32E-11	-4.51E-13
2008	0	0	17.6	49.3	158.9	2,173	132.5	2,532	-3.18E-11	-1.26E-12
2009	0.054	12.9	7.07	69.9	157.0	2,180	140.8	2,567	1.57E-09	6.12E-11
2010	0.419	41.1	6.48	94.5	163.2	2,208	165.4	2,679	-5.48E-10	-2.05E-11
2011	0	0	6.48	33.9	149.3	2,149	120.4	2,459	-2.80E-09	-1.14E-10
2012	0.123	30.2	51.8	64.9	149.1	2,145	136.5	2,577	4.70E-10	1.82E-11
2013	0.200	27.9	47.8	78.5	152.5	2,154	146.8	2,608	4.15E-10	1.59E-11
2014	0	0	46.5	71.2	151.8	2,148	139.5	2,557	3.44E-08	1.34E-09
2015	0.970	92.0	56.3	128.3	165.1	2,209	201.6	2,853	-3.51E-09	-1.23E-10
2016	0.273	32.5	52.5	137.3	170.5	2,227	200.5	2,821	-1.14E-08	-4.04E-10
2017	2.22E-05	0	80.5	109.4	166.8	2,182	172.2	2,711	1.56E-09	5.74E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Fayette County GCD	Gonzales County UWCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	173.2	0.040	7.52E-06	153.6	141.0	467.8
1980	0	0	163.4	0.023	4.30E-05	144.6	145.2	453.2
1981	0	0	209.5	0.290	0	171.5	144.1	525.4
1982	0.164	5.97	141.6	0.021	3.80E-05	138.4	143.3	429.5
1983	0.020	1.36	145.1	0.021	4.85E-05	136.3	144.6	427.4
1984	0.044	3.16	123.3	0.019	5.68E-05	127.4	146.2	400.1
1985	0	0	197.5	0.196	0	158.2	146.0	501.9
1986	1.01E-04	0.012	186.5	0.128	0	159.6	144.0	490.3
1987	0	0	188.8	0.143	0	162.2	142.9	494.0
1988	0.205	10.9	87.3	0.016	6.15E-05	119.2	144.0	361.7
1989	0.022	0.651	116.0	0.018	6.21E-05	120.7	146.9	384.3
1990	0	0	172.5	0.029	3.53E-05	139.1	147.7	459.4
1991	0	0	205.8	0.266	0	167.3	145.9	519.3
1992	0	0	232.3	0.453	0	189.6	143.6	565.9
1993	0.225	8.75	148.6	0.021	2.79E-05	142.9	141.8	442.2
1994	0	0	187.4	0.127	0	160.8	142.5	490.8
1995	0.109	3.56	145.0	0.021	4.25E-05	139.5	142.7	430.8
1996	0.085	6.41	102.9	0.017	6.37E-05	121.9	145.2	376.6
1997	0	0	201.9	0.223	0	158.8	145.7	506.7
1998	0	0	202.3	0.241	0	169.4	142.6	514.6
1999	0.194	8.65	116.0	0.018	4.75E-05	129.7	141.7	396.3
2000	0	0	176.0	0.041	1.54E-05	148.5	143.2	467.7
2001	0.016	0.663	157.9	0.022	4.15E-05	142.9	142.4	443.9
2002	0	0	268.4	0.711	0	215.1	140.9	625.1
2003	0.185	6.91	195.8	0.195	0	171.5	137.7	512.3
2004	0	0	257.1	0.626	0	212.7	137.1	607.5
2005	0.341	14.8	129.8	0.019	4.04E-05	140.9	136.1	422.1
2006	0.074	5.52	116.1	0.018	7.10E-05	129.8	139.3	390.8
2007	0	0	278.0	0.770	0	216.0	140.6	635.4
2008	0.374	17.1	110.3	0.017	4.28E-05	132.5	138.7	398.9
2009	0.001	0.184	158.5	0.022	4.54E-05	140.8	141.8	441.4
2010	0	0	197.5	0.202	0	165.4	141.7	504.8
2011	0.209	10.4	91.3	0.016	5.94E-05	120.4	141.8	364.2
2012	0.005	0.126	157.6	0.022	5.45E-05	136.5	146.4	440.6
2013	1.24E-04	0	172.4	0.033	3.85E-05	146.8	145.7	465.0
2014	0.035	1.31	153.1	0.022	5.91E-05	139.5	144.9	438.8
2015	0	0	253.0	0.597	0	201.7	143.6	599.0
2016	0.018	0.012	241.3	0.516	0	200.9	140.7	583.4
2017	0.135	6.00	197.0	0.200	0	172.4	140.1	515.9

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Fayette County GCD	Gonzales County UWCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	4.01	0.441	0	143.9	319.4	467.8	3.04E-10	6.49E-11
1980	0	0	3.62	0.436	0	148.5	300.7	453.2	4.55E-13	1.00E-13
1981	0.147	5.33	5.21	0.437	1.81E-04	146.6	367.7	525.4	-4.77E-12	-9.09E-13
1982	0	0	3.03	0.436	0	146.7	279.3	429.5	9.09E-13	2.12E-13
1983	3.66E-07	4.45E-05	3.03	0.429	0	148.3	275.6	427.4	-9.66E-13	-2.26E-13
1984	0	0	2.34	0.417	0	150.6	246.7	400.1	2.39E-12	5.97E-13
1985	0.145	7.06	4.73	0.427	1.06E-04	149.0	340.6	501.9	-1.14E-12	-2.27E-13
1986	0.026	0.952	4.48	0.433	6.68E-05	146.7	337.7	490.3	1.02E-12	2.09E-13
1987	0.017	0.617	4.55	0.436	7.69E-05	145.6	342.9	494.0	8.30E-11	1.68E-11
1988	0	0	1.30	0.415	0	148.8	211.2	361.7	-3.18E-12	-8.80E-13
1989	0.001	0.145	2.03	0.405	0	151.9	229.9	384.3	-1.82E-12	-4.73E-13
1990	0.072	6.45	3.83	0.420	0	151.4	297.2	459.4	9.09E-13	1.98E-13
1991	0.167	5.68	5.10	0.429	1.62E-04	148.6	359.3	519.3	1.14E-12	2.19E-13
1992	0.118	5.82	6.08	0.443	3.21E-04	145.8	407.7	565.9	6.14E-11	1.08E-11
1993	0	0	3.30	0.445	0	144.7	293.7	442.2	-1.71E-12	-3.86E-13
1994	0.083	1.71	4.44	0.438	5.85E-05	145.1	339.0	490.8	9.21E-12	1.88E-12
1995	0	0	3.10	0.438	0	146.1	281.2	430.8	3.52E-12	8.18E-13
1996	0	0	1.71	0.415	0	150.0	224.5	376.6	-3.30E-11	-8.77E-12
1997	0.161	8.94	4.84	0.428	1.24E-04	148.8	343.6	506.7	5.68E-12	1.12E-12
1998	0.083	3.04	5.03	0.437	1.54E-04	145.2	360.9	514.6	5.12E-12	9.94E-13
1999	0	0	2.22	0.427	0	145.7	247.9	396.3	-3.41E-13	-8.61E-14
2000	0.068	4.01	3.97	0.431	0	146.4	312.8	467.7	-1.55E-11	-3.31E-12
2001	0	0	3.48	0.436	0	145.8	294.3	443.9	-2.07E-10	-4.67E-11
2002	0.356	14.8	7.26	0.449	5.09E-04	142.9	459.4	625.1	-2.27E-13	-3.64E-14
2003	0.001	0.178	4.92	0.448	1.42E-04	139.8	367.0	512.3	5.80E-11	1.13E-11
2004	0.169	7.24	6.87	0.459	4.46E-04	139.0	453.8	607.5	2.16E-12	3.56E-13
2005	0	0	2.66	0.451	0	139.0	280.0	422.1	-3.18E-12	-7.54E-13
2006	0	0	2.01	0.428	0	143.3	245.0	390.8	-5.68E-13	-1.45E-13
2007	0.405	19.6	7.45	0.451	5.41E-04	142.7	464.9	635.4	-2.61E-12	-4.11E-13
2008	0	0	2.08	0.438	0	142.2	254.2	398.9	-2.56E-12	-6.41E-13
2009	0.025	2.11	3.39	0.437	0	145.3	290.1	441.4	6.99E-11	1.58E-11
2010	0.136	4.45	4.78	0.438	1.13E-04	144.4	350.6	504.8	-2.36E-11	-4.67E-12
2011	0	0	1.43	0.417	0	146.5	215.9	364.2	-1.11E-10	-3.05E-11
2012	0.032	4.00	3.28	0.423	0	150.2	282.6	440.6	2.21E-11	5.01E-12
2013	0.053	2.86	3.82	0.427	0	148.9	308.9	465.0	1.88E-11	4.05E-12
2014	0	0	3.22	0.427	0	148.3	286.9	438.8	1.52E-09	3.47E-10
2015	0.305	12.4	6.58	0.440	3.98E-04	145.7	433.5	599.0	-1.48E-10	-2.48E-11
2016	0.031	1.95	6.34	0.450	3.63E-04	142.6	432.0	583.4	-5.73E-10	-9.81E-11
2017	3.55E-04	0.045	4.79	0.446	1.16E-04	142.2	368.4	515.9	3.12E-11	6.04E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	6,748	2,593	856.3	1,834	43.1	319.4	2.71	12,398
1980	0	0	7,011	2,448	885.8	1,906	38.2	300.7	1.70	12,590
1981	0	0	6,598	3,138	850.8	1,803	48.3	367.7	1.89	12,807
1982	2.68	96.4	7,092	2,120	887.5	1,921	34.8	279.3	2.24	12,436
1983	0.192	6.41	7,124	2,173	892.0	1,931	33.5	275.6	1.79	12,437
1984	0.990	35.8	7,324	1,846	908.9	1,980	28.1	246.7	1.41	12,373
1985	0	0	6,727	2,958	862.2	1,835	43.7	340.6	1.07	12,768
1986	0.022	2.25	6,734	2,794	859.9	1,833	43.4	337.7	1.74	12,605
1987	0	0	6,710	2,827	857.1	1,827	44.0	342.9	2.13	12,610
1988	4.45	159.1	7,546	1,308	923.4	2,035	21.5	211.2	2.06	12,210
1989	0	0	7,418	1,737	918.1	2,006	24.6	229.9	0.936	12,335
1990	0	0	6,972	2,584	884.2	1,897	37.5	297.2	0.482	12,672
1991	0	0	6,627	3,083	853.5	1,809	47.2	359.3	1.08	12,780
1992	0	0	6,373	3,479	830.6	1,745	54.8	407.7	2.13	12,892
1993	3.47	122.9	6,992	2,225	877.4	1,894	37.4	293.7	2.65	12,449
1994	0	0	6,760	2,806	862.4	1,840	41.3	339.0	2.31	12,652
1995	1.75	62.1	7,081	2,171	887.3	1,917	32.3	281.2	2.23	12,436
1996	2.13	75.1	7,489	1,541	921.7	2,020	22.2	224.5	1.68	12,298
1997	0	0	6,723	3,024	863.8	1,834	41.2	343.6	0.985	12,830
1998	0	0	6,603	3,030	853.5	1,802	44.4	360.9	1.77	12,696
1999	3.70	131.9	7,282	1,737	906.2	1,967	26.3	247.9	2.04	12,304
2000	0	0	6,918	2,636	882.6	1,883	36.0	312.8	1.36	12,669
2001	0.467	17.5	6,988	2,365	885.1	1,897	34.2	294.3	1.49	12,482
2002	0	0	6,084	4,020	811.7	1,674	56.8	459.4	1.93	13,109
2003	2.87	99.4	6,608	2,932	855.0	1,799	38.9	367.0	3.12	12,705
2004	0	0	6,373	3,850	855.5	1,742	31.3	453.8	4.26	13,310
2005	5.67	193.8	7,393	1,944	939.8	1,992	18.4	280.0	4.32	12,772
2006	1.40	46.3	7,643	1,739	964.8	2,067	15.8	245.0	2.92	12,724
2007	0	0	6,244	4,164	843.7	1,714	36.5	464.9	2.52	13,469
2008	7.09	243.3	7,565	1,652	954.0	2,039	16.7	254.2	3.37	12,734
2009	0	0	7,060	2,374	894.7	1,916	31.5	290.1	1.93	12,568
2010	0	0	6,701	2,957	864.9	1,828	40.5	350.6	1.57	12,744
2011	4.41	157.6	7,512	1,368	926.8	2,028	20.7	215.9	1.56	12,235
2012	0	0	7,245	2,360	923.0	1,979	33.2	282.6	0.339	12,822
2013	0	0	7,128	2,582	917.1	1,953	38.0	308.9	0.195	12,927
2014	1.08	33.4	7,324	2,293	938.3	2,004	34.5	286.9	0.187	12,916
2015	0	0	6,593	3,789	885.9	1,833	55.8	433.5	0	13,590
2016	0.005	1.31	6,607	3,613	884.2	1,832	56.6	432.0	0.726	13,427
2017	2.18	74.1	6,985	2,951	916.2	1,931	46.9	368.4	0.948	13,275

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Queen City Aquifer (Layer 5) - Outflows, Net Flow In-Out, Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	216.2	11,333	373.7	24.4	145.3	304.6	12,398	7.98E-07	6.43E-09
1980	0	0	100.9	185.3	11,449	360.6	21.9	149.5	322.9	12,590	-2.99E-09	-2.37E-11
1981	2.15	75.0	98.5	260.3	11,493	386.6	30.6	148.4	313.1	12,807	-2.07E-07	-1.62E-09
1982	0	0	94.1	159.9	11,347	352.2	18.6	147.6	316.8	12,436	3.24E-10	2.60E-12
1983	1.61E-06	0.060	91.0	156.6	11,349	349.8	18.3	148.9	324.0	12,437	-1.92E-08	-1.54E-10
1984	0	0	88.1	121.0	11,327	338.1	14.0	150.6	333.5	12,373	8.94E-08	7.23E-10
1985	3.14	112.2	84.1	235.7	11,452	376.8	27.6	150.3	325.7	12,768	2.54E-08	1.99E-10
1986	0.008	0.144	80.9	229.7	11,427	376.1	26.6	148.3	317.2	12,605	-7.96E-09	-6.31E-11
1987	0.133	4.35	86.3	233.8	11,422	377.5	27.1	147.2	312.2	12,610	5.18E-06	4.11E-08
1988	0	0	89.1	72.0	11,238	325.7	7.96	148.4	329.4	12,210	-1.89E-07	-1.55E-09
1989	0.544	22.5	91.3	101.1	11,286	329.1	11.8	151.4	341.4	12,335	-9.68E-09	-7.85E-11
1990	2.44	88.5	92.4	191.3	11,425	360.1	22.5	152.2	337.8	12,672	1.91E-08	1.51E-10
1991	1.91	65.5	92.8	254.2	11,478	383.9	29.6	150.3	323.6	12,780	2.39E-08	1.87E-10
1992	1.51	51.2	96.5	304.0	11,544	403.8	35.3	147.9	308.0	12,892	6.45E-07	5.00E-09
1993	0	0	95.2	176.4	11,342	358.2	20.3	146.0	310.2	12,449	4.41E-09	3.54E-11
1994	1.23	44.9	101.3	226.3	11,419	373.8	26.4	146.7	311.6	12,652	5.67E-07	4.48E-09
1995	0	0	98.7	162.5	11,339	352.0	18.8	147.0	317.8	12,436	4.02E-07	3.23E-09
1996	0	0	110.4	88.3	11,278	327.6	10.2	149.6	333.8	12,298	-2.14E-06	-1.74E-08
1997	4.05	144.9	93.0	238.7	11,467	376.8	27.9	150.1	327.4	12,830	3.82E-07	2.98E-09
1998	0.661	20.7	69.9	254.9	11,474	384.4	29.3	146.9	315.5	12,696	3.43E-07	2.70E-09
1999	0	0	71.4	119.9	11,291	337.7	13.5	146.1	324.1	12,304	-3.09E-10	-2.51E-12
2000	2.06	75.4	68.0	201.8	11,458	364.8	23.4	147.5	327.6	12,669	-7.80E-07	-6.15E-09
2001	0	0	58.0	180.8	11,392	358.0	20.7	146.7	326.1	12,482	5.51E-08	4.42E-10
2002	4.94	172.5	65.9	356.5	11,595	420.6	41.0	145.2	307.1	13,109	-5.30E-09	-4.04E-11
2003	0	0	143.4	253.0	11,456	382.8	28.8	141.9	298.7	12,705	-4.22E-08	-3.32E-10
2004	1.23	52.2	454.2	325.1	11,616	398.7	35.8	141.2	286.1	13,310	1.50E-08	1.12E-10
2005	0	0	505.4	124.7	11,360	328.2	16.0	140.2	297.9	12,772	-5.30E-08	-4.15E-10
2006	0	0	507.3	83.0	11,341	320.1	12.2	143.4	317.3	12,724	6.24E-09	4.91E-11
2007	7.67	260.6	332.4	347.2	11,630	406.9	38.9	144.8	300.6	13,469	-9.37E-08	-6.96E-10
2008	0	0	497.8	94.2	11,354	323.8	12.6	142.8	309.2	12,734	-4.15E-09	-3.26E-11
2009	2.75	84.4	72.3	171.7	11,395	353.0	20.3	146.1	322.4	12,568	3.98E-06	3.16E-08
2010	1.97	69.2	75.2	239.7	11,485	377.8	27.8	146.0	321.4	12,744	-1.31E-06	-1.03E-08
2011	0	0	71.6	76.5	11,270	325.2	8.62	146.2	336.9	12,235	-8.18E-06	-6.69E-08
2012	1.50	65.9	147.4	154.7	11,583	346.8	19.5	150.7	353.1	12,822	1.39E-06	1.08E-08
2013	0.529	24.6	134.5	179.0	11,706	354.3	22.9	150.0	354.6	12,927	8.19E-07	6.33E-09
2014	0	0	130.3	145.9	11,763	343.0	19.6	149.1	364.1	12,916	7.53E-05	5.83E-07
2015	3.97	144.7	169.4	296.7	12,035	394.5	38.0	147.8	359.9	13,590	-7.55E-06	-5.56E-08
2016	0.066	2.14	154.7	292.5	12,053	395.9	37.4	144.8	345.7	13,427	-2.73E-05	-2.03E-07
2017	0	0	248.3	218.5	11,918	366.1	29.3	144.2	350.7	13,275	-2.83E-08	-2.13E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Upper Layers	
	(acre-feet)							
Predevelopment	0	0	731.1	0.005	7.23	10.4	306.2	1,055
1980	0	0	690.0	0.054	6.26	9.72	324.8	1,031
1981	0	0	884.5	0.035	8.05	10.7	314.8	1,218
1982	1.23	65.4	597.7	0.047	6.12	9.76	318.6	998.8
1983	0.543	28.3	612.6	0.057	5.56	9.41	325.9	982.5
1984	0.905	47.9	520.4	0.071	4.48	8.81	335.4	918.0
1985	0	0	834.0	0.051	6.83	9.68	327.5	1,178
1986	1.07E-06	0.007	787.5	0.041	7.33	10.2	318.9	1,124
1987	0	0	796.9	0.033	7.65	10.6	313.9	1,129
1988	2.67	140.4	368.6	0.069	3.96	8.76	331.4	855.9
1989	0.609	31.8	489.8	0.084	3.60	8.17	343.4	877.5
1990	0	0	728.3	0.075	5.46	8.86	339.8	1,083
1991	0	0	869.0	0.050	7.48	10.00	325.4	1,212
1992	0	0	980.6	0.024	9.35	11.6	309.7	1,311
1993	1.47	80.3	627.2	0.037	6.86	10.1	312.0	1,038
1994	0	0	791.1	0.033	7.50	10.5	313.3	1,122
1995	1.04	54.4	612.1	0.046	6.08	9.74	319.6	1,003
1996	1.72	90.4	434.5	0.073	3.97	8.67	335.8	875.2
1997	0	0	852.4	0.053	6.80	9.63	329.3	1,198
1998	0	0	854.2	0.036	7.92	10.5	317.2	1,190
1999	1.91	100.5	489.7	0.059	5.08	9.27	326.0	932.6
2000	0	0	743.0	0.057	6.27	9.59	329.5	1,088
2001	0.138	7.55	666.6	0.058	6.01	9.53	328.0	1,018
2002	0	0	1,133	0.018	10.2	11.9	308.8	1,464
2003	0.498	26.5	826.6	0.017	9.02	11.4	300.4	1,174
2004	0	0	1,085	0	11.2	12.7	287.6	1,397
2005	2.84	146.4	548.1	0.032	6.94	10.2	299.5	1,014
2006	1.78	93.0	490.2	0.061	4.93	9.21	319.1	918.3
2007	0	0	1,174	0.011	10.4	11.8	302.2	1,498
2008	2.96	151.1	465.6	0.047	5.82	9.61	310.9	946.1
2009	0.153	9.17	669.2	0.052	5.97	9.54	324.2	1,018
2010	0	0	833.7	0.048	7.43	10.2	323.2	1,175
2011	2.54	131.1	385.5	0.087	3.91	8.74	339.0	870.8
2012	0.252	3.41	665.2	0.096	5.04	8.94	355.3	1,038
2013	0.057	0	727.8	0.116	5.93	9.37	356.8	1,100
2014	0.698	17.8	646.4	0.155	5.46	9.30	366.5	1,046
2015	0	0	1,068	0.163	9.10	11.0	362.3	1,451
2016	0	0	1,019	0.154	10.1	12.2	348.0	1,389
2017	0.982	41.5	831.8	0.171	8.72	11.4	353.1	1,248

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	5.80	2.55	6.67	2.71	1,037	1,055	1.82E-08	1.73E-09
1980	0	0	0	5.88	2.63	6.49	1.70	1,014	1,031	-2.11E-11	-2.05E-12
1981	1.34	70.4	2.35	6.02	2.75	6.40	1.89	1,127	1,218	-1.66E-09	-1.36E-10
1982	0	0	0	5.82	2.59	6.73	2.24	981.4	998.8	1.71E-12	1.71E-13
1983	0	0	0	5.77	2.55	6.55	1.79	965.8	982.5	-1.38E-10	-1.40E-11
1984	0	0	0	5.66	2.47	6.43	1.41	902.1	918.0	5.28E-10	5.75E-11
1985	1.57	85.0	0	5.88	2.66	6.30	1.07	1,076	1,178	4.51E-10	3.83E-11
1986	0.557	28.6	0	5.92	2.69	6.43	1.74	1,078	1,124	-6.09E-11	-5.42E-12
1987	0.370	18.3	0.992	5.94	2.71	6.51	2.13	1,092	1,129	3.05E-08	2.70E-09
1988	0	0	0	5.59	2.41	6.71	2.06	839.1	855.9	-9.78E-10	-1.14E-10
1989	0	0	0	5.57	2.40	6.33	0.936	862.3	877.5	-1.91E-10	-2.18E-11
1990	1.14	63.9	0	5.78	2.58	6.15	0.482	1,002	1,083	1.39E-10	1.28E-11
1991	1.61	86.3	0.292	5.97	2.73	6.26	1.08	1,108	1,212	1.51E-10	1.24E-11
1992	1.59	81.3	10.3	6.15	2.86	6.28	2.13	1,201	1,311	4.51E-09	3.44E-10
1993	0	0	0	5.86	2.64	7.00	2.65	1,020	1,038	2.59E-10	2.49E-11
1994	0.358	17.8	0	5.92	2.69	6.69	2.31	1,087	1,122	5.34E-08	4.76E-09
1995	0	0	0	5.78	2.58	6.77	2.23	985.6	1,003	2.94E-09	2.93E-10
1996	0	0	0	5.58	2.42	6.56	1.68	859.0	875.2	-1.41E-08	-1.62E-09
1997	1.81	98.2	0	5.87	2.66	6.32	0.985	1,082	1,198	-4.54E-10	-3.79E-11
1998	1.02	52.8	1.65	5.97	2.74	6.38	1.77	1,118	1,190	4.13E-08	3.47E-09
1999	0	0	0	5.68	2.51	6.65	2.04	915.7	932.6	-2.50E-12	-2.68E-13
2000	0.608	33.1	0	5.82	2.63	6.47	1.36	1,038	1,088	-9.66E-08	-8.87E-09
2001	0	0	0	5.78	2.60	6.44	1.49	1,002	1,018	2.55E-10	2.51E-11
2002	3.01	158.5	14.6	6.19	2.92	6.19	1.93	1,271	1,464	-2.57E-11	-1.75E-12
2003	0.045	2.16	5.78	6.05	2.79	6.94	3.12	1,147	1,174	-2.57E-10	-2.19E-11
2004	1.47	76.5	17.8	6.26	2.92	6.94	4.26	1,281	1,397	1.20E-10	8.56E-12
2005	0	0	0	5.83	2.60	7.71	4.32	993.6	1,014	-3.27E-10	-3.22E-11
2006	0	0	0	5.65	2.47	7.03	2.92	900.2	918.3	4.01E-11	4.37E-12
2007	3.72	190.4	13.1	6.18	2.88	6.40	2.52	1,273	1,498	-2.90E-09	-1.94E-10
2008	0	0	0	5.74	2.52	7.24	3.37	927.2	946.1	2.05E-12	2.16E-13
2009	0.081	1.65	0	5.76	2.57	6.71	1.93	999.7	1,018	8.54E-08	8.38E-09
2010	0.862	51.8	0	5.91	2.72	6.56	1.57	1,105	1,175	-2.90E-09	-2.47E-10
2011	0	0	0	5.58	2.46	6.57	1.56	854.7	870.8	-5.53E-07	-6.35E-08
2012	0.181	20.3	0	5.72	2.61	6.31	0.339	1,003	1,038	6.73E-08	6.48E-09
2013	0.329	29.0	0	6.03	2.77	6.26	0.195	1,056	1,100	6.57E-09	5.98E-10
2014	0	0	0	6.24	2.85	6.34	0.187	1,031	1,046	5.55E-07	5.31E-08
2015	2.04	131.9	5.91	6.93	3.28	6.45	0	1,294	1,451	-3.96E-08	-2.73E-09
2016	0.986	49.8	11.2	7.11	3.35	6.61	0.726	1,309	1,389	-2.06E-07	-1.48E-08
2017	0	0	2.02	6.99	3.26	7.17	0.948	1,227	1,248	-1.12E-10	-9.00E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	239.1	3,049	0	253.0	97.7	45,584	2,928	52,150
1980	0	0	240.7	2,878	0	194.0	73.7	45,683	3,038	52,108
1981	0	0	238.5	3,689	0	223.1	83.0	45,675	2,927	52,835
1982	9.86	153.4	240.3	2,492	0	199.0	76.2	45,530	3,045	51,746
1983	4.29	48.4	240.7	2,555	0	185.1	70.3	45,513	3,073	51,689
1984	7.35	94.4	242.2	2,170	0	163.1	61.5	45,571	3,147	51,457
1985	0	0	239.3	3,478	0	193.8	71.6	45,623	2,985	52,591
1986	0.001	0	239.2	3,284	0	207.4	77.2	45,626	2,965	52,399
1987	0	0	239.0	3,324	0	218.6	81.1	45,640	2,952	52,454
1988	21.5	302.3	242.9	1,537	0	162.6	62.4	45,510	3,216	51,055
1989	4.68	38.5	242.2	2,043	0	144.7	54.2	45,410	3,199	51,135
1990	0	0	240.4	3,037	0	164.0	58.8	45,550	3,073	52,124
1991	0	0	238.9	3,624	0	198.9	74.7	45,656	2,961	52,753
1992	0	0	238.3	4,090	0	236.7	87.0	45,872	2,871	53,394
1993	11.7	190.7	240.0	2,616	0	213.2	81.7	45,569	3,012	51,934
1994	0	0	239.3	3,299	0	219.5	82.9	45,634	2,965	52,440
1995	8.11	114.6	240.5	2,552	0	196.1	75.6	45,534	3,051	51,772
1996	13.9	181.0	242.9	1,812	0	156.0	60.8	45,529	3,203	51,199
1997	0	0	239.4	3,555	0	189.6	71.2	45,630	2,992	52,677
1998	0	0	238.8	3,563	0	214.5	80.7	45,666	2,938	52,701
1999	15.4	227.3	241.4	2,042	0	175.7	68.5	45,464	3,123	51,358
2000	0	0	240.9	3,099	0	183.6	68.4	45,708	3,048	52,348
2001	0.913	19.1	240.4	2,780	0	180.4	68.5	45,549	3,051	51,890
2002	0	0	237.1	4,726	0	244.5	88.5	45,821	2,815	53,932
2003	3.66	93.1	238.4	3,447	0	245.5	91.4	45,697	2,899	52,715
2004	0	0	237.3	4,526	0	286.6	104.9	45,953	2,780	53,888
2005	22.0	322.2	240.3	2,286	0	230.6	88.0	45,544	3,033	51,766
2006	13.2	161.6	241.6	2,044	0	184.3	72.5	45,447	3,135	51,300
2007	0	0	236.7	4,895	0	263.9	97.1	45,824	2,779	54,095
2008	23.9	366.3	241.6	1,942	0	206.2	80.1	45,600	3,103	51,562
2009	2.95	18.7	240.6	2,791	0	189.0	71.4	45,547	3,066	51,927
2010	0	0	239.6	3,477	0	196.1	70.3	45,653	3,009	52,645
2011	21.8	302.5	242.8	1,608	0	138.2	50.0	45,405	3,260	51,028
2012	6.57	27.8	244.1	2,774	0	166.3	57.5	45,680	3,423	52,379
2013	1.41	0	243.0	3,035	5.34	178.8	60.4	45,610	3,458	52,592
2014	10.5	87.0	244.1	2,696	24.4	166.1	50.4	45,588	3,623	52,489
2015	0.143	0	241.7	4,455	33.7	218.9	66.5	45,852	3,561	54,428
2016	0	0	241.8	4,248	29.6	240.5	76.5	45,987	3,506	54,330
2017	11.6	146.9	243.1	3,469	36.4	231.6	72.2	45,787	3,701	53,699

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Upper Layers	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	0	1,644	69.3	1,289	104.2	62.2	47,146	1,836	52,150	1.12E-06	2.14E-09
1980	0	0	74.7	1,487	69.5	1,325	108.1	61.1	47,265	1,717	52,108	-1.97E-09	-3.78E-12
1981	10.6	146.2	80.8	1,644	69.3	1,370	110.3	65.4	47,153	2,185	52,835	-6.39E-08	-1.21E-10
1982	0	0	84.3	1,466	69.3	1,304	105.4	61.1	47,132	1,523	51,746	-2.70E-09	-5.22E-12
1983	0	0	89.0	1,422	69.3	1,287	104.9	58.9	47,130	1,529	51,689	-4.69E-09	-9.07E-12
1984	0	0	96.6	1,326	69.5	1,252	103.9	55.6	47,250	1,303	51,457	8.26E-09	1.60E-11
1985	12.9	190.3	96.9	1,542	69.3	1,326	106.9	61.0	47,145	2,041	52,591	2.80E-08	5.32E-11
1986	3.92	38.9	100.4	1,573	69.3	1,336	106.7	63.1	47,145	1,963	52,399	-3.46E-09	-6.61E-12
1987	2.64	27.7	103.7	1,599	69.3	1,341	107.7	64.2	47,146	1,993	52,454	4.96E-07	9.45E-10
1988	0	0	108.9	1,262	69.5	1,228	101.9	55.0	47,242	987.4	51,055	-1.60E-09	-3.14E-12
1989	0.093	4.78	117.0	1,241	69.3	1,223	103.8	52.5	47,115	1,208	51,135	-1.40E-08	-2.75E-11
1990	9.20	147.5	123.3	1,407	69.3	1,296	109.5	57.6	47,134	1,771	52,124	2.69E-10	5.16E-13
1991	12.7	162.7	114.7	1,577	69.3	1,357	110.0	62.8	47,149	2,138	52,753	2.27E-09	4.30E-12
1992	12.0	150.8	117.3	1,733	69.5	1,411	113.7	69.0	47,291	2,427	53,394	1.10E-07	2.06E-10
1993	0	0	118.1	1,511	69.3	1,316	106.9	62.8	47,135	1,614	51,934	1.87E-08	3.60E-11
1994	2.96	50.0	124.9	1,578	69.3	1,331	107.5	63.4	47,144	1,969	52,440	4.50E-06	8.59E-09
1995	0	0	127.4	1,449	69.3	1,285	103.7	59.8	47,131	1,547	51,772	8.73E-08	1.69E-10
1996	0	0	136.2	1,259	69.5	1,222	101.4	53.7	47,243	1,114	51,199	-3.33E-07	-6.50E-10
1997	15.1	230.9	130.0	1,527	69.3	1,318	106.2	60.1	47,145	2,076	52,677	-2.10E-07	-4.00E-10
1998	7.54	88.7	133.7	1,609	69.3	1,349	108.3	63.9	47,149	2,122	52,701	3.53E-06	6.71E-09
1999	0	0	137.6	1,349	69.3	1,254	102.1	57.2	47,121	1,267	51,358	-2.31E-09	-4.49E-12
2000	4.35	85.7	178.0	1,458	69.5	1,299	106.0	59.4	47,264	1,824	52,348	-8.48E-06	-1.62E-08
2001	0	0	145.9	1,432	69.3	1,289	105.0	58.7	47,132	1,658	51,890	5.28E-08	1.02E-10
2002	23.3	334.2	181.6	1,791	69.3	1,418	113.8	69.4	47,172	2,760	53,932	-2.50E-09	-4.63E-12
2003	0.009	0	158.1	1,676	69.3	1,372	111.6	68.0	47,152	2,108	52,715	-5.20E-09	-9.85E-12
2004	12.9	172.0	138.9	1,874	69.5	1,436	117.2	73.3	47,303	2,691	53,888	1.49E-09	2.77E-12
2005	0	0	137.7	1,503	69.3	1,297	106.4	63.4	47,132	1,457	51,766	-6.72E-09	-1.30E-11
2006	0	0	114.0	1,347	69.3	1,240	100.1	56.7	47,120	1,252	51,300	2.91E-10	5.67E-13
2007	30.4	443.6	85.7	1,851	69.3	1,415	113.6	69.3	47,179	2,839	54,095	-2.24E-07	-4.14E-10
2008	0	0	124.3	1,422	69.5	1,270	103.3	60.2	47,254	1,259	51,562	-2.18E-09	-4.22E-12
2009	0.322	17.2	185.0	1,431	69.3	1,275	102.8	59.0	47,130	1,657	51,927	6.01E-06	1.16E-08
2010	4.27	85.4	275.7	1,516	69.3	1,325	108.7	62.5	47,141	2,057	52,645	3.27E-07	6.21E-10
2011	0	0	275.7	1,174	69.3	1,218	106.3	53.6	47,109	1,023	51,028	-4.71E-05	-9.24E-08
2012	0.047	8.46	1,025	1,067	69.5	1,229	115.4	54.4	47,231	1,580	52,379	5.59E-06	1.07E-08
2013	1.05	37.9	1,032	1,072	69.3	1,353	134.6	60.2	47,105	1,726	52,592	2.36E-07	4.49E-10
2014	0	0	1,193	919.7	69.3	1,453	157.1	63.3	47,096	1,538	52,489	1.84E-05	3.51E-08
2015	11.0	235.6	1,410	1,110	69.3	1,710	188.5	77.4	47,117	2,499	54,428	-2.39E-07	-4.39E-10
2016	7.43	83.2	1,256	1,197	69.5	1,768	190.0	82.7	47,251	2,425	54,330	-6.96E-06	-1.28E-08
2017	0	0	1,551	976.2	69.3	1,736	193.2	80.8	47,102	1,991	53,699	-5.89E-10	-1.10E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows										Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Caldwell	Upper Layers	Lower Layers	
	(acre-feet)										
Predevelopment	0	0	6,961	2,853	4.14	3,521	60.8	1,325	2,455	14,665	31,845
1980	0	0	7,291	2,693	0	3,010	39.1	1,320	2,374	14,633	31,360
1981	0	0	6,924	3,452	0.717	3,297	46.8	1,321	2,811	14,634	32,486
1982	30.7	316.2	7,314	2,333	0	3,042	41.8	1,315	2,194	14,617	31,203
1983	11.6	106.2	7,433	2,391	0	2,906	36.9	1,315	2,213	14,582	30,994
1984	21.3	204.7	7,719	2,031	0	2,687	29.6	1,316	2,026	14,594	30,629
1985	0	0	7,154	3,255	0	3,013	37.2	1,319	2,691	14,575	32,045
1986	6.52E-05	0.020	7,083	3,074	0	3,137	42.2	1,318	2,600	14,608	31,862
1987	0	0	7,026	3,110	0.582	3,229	45.7	1,318	2,625	14,628	31,983
1988	64.0	636.7	7,879	1,439	0	2,670	30.9	1,314	1,768	14,623	30,424
1989	10.6	81.9	7,930	1,912	0	2,506	23.2	1,314	1,964	14,517	30,258
1990	0	0	7,485	2,843	0	2,715	26.8	1,316	2,456	14,524	31,366
1991	0	0	7,074	3,392	0	3,080	38.5	1,319	2,781	14,575	32,258
1992	0	0	6,770	3,827	2.13	3,426	49.9	1,324	3,044	14,686	33,129
1993	36.9	386.5	7,210	2,448	0	3,143	45.9	1,314	2,280	14,626	31,490
1994	0	0	7,073	3,088	0.558	3,209	46.7	1,317	2,611	14,615	31,960
1995	24.3	242.8	7,376	2,389	0	2,988	41.0	1,314	2,228	14,590	31,194
1996	40.1	387.5	7,907	1,696	0	2,594	28.7	1,314	1,885	14,583	30,436
1997	0	0	7,203	3,327	0	2,961	36.3	1,318	2,736	14,549	32,131
1998	0	0	7,016	3,334	0.145	3,190	44.3	1,318	2,755	14,599	32,257
1999	46.9	474.6	7,630	1,911	0	2,795	35.0	1,311	1,993	14,566	30,762
2000	0	0	7,397	2,900	0	2,885	34.4	1,318	2,500	14,579	31,614
2001	3.56	39.5	7,426	2,602	0	2,850	34.4	1,313	2,335	14,547	31,151
2002	0	0	6,643	4,423	2.92	3,474	50.6	1,323	3,382	14,635	33,933
2003	13.8	165.0	6,862	3,226	3.02	3,427	53.8	1,318	2,728	14,662	32,459
2004	0	0	6,484	4,236	6.63	3,811	65.0	1,329	3,284	14,764	33,980
2005	65.7	663.6	7,228	2,139	1.56	3,243	52.3	1,315	2,153	14,673	31,534
2006	37.2	349.4	7,633	1,913	0	2,855	39.2	1,313	1,991	14,591	30,722
2007	0	0	6,526	4,581	4.68	3,653	58.2	1,329	3,453	14,680	34,285
2008	72.5	742.0	7,466	1,817	0	3,061	45.5	1,318	1,973	14,675	31,171
2009	4.51	19.7	7,432	2,612	0	2,926	37.9	1,314	2,346	14,563	31,256
2010	9.44E-05	0.008	7,219	3,254	0	2,985	36.5	1,314	2,718	14,558	32,084
2011	64.8	641.0	8,099	1,505	0	2,371	19.6	1,305	1,852	14,518	30,375
2012	8.11	49.0	8,462	2,596	0	2,728	24.0	1,332	2,433	14,346	31,978
2013	0.588	0.265	8,350	2,841	0	2,925	24.9	1,335	2,522	14,284	32,282
2014	21.1	169.5	8,678	2,523	3.47	2,811	15.4	1,334	2,402	14,234	32,191
2015	1.84E-04	0.017	8,072	4,169	2.73	3,425	25.1	1,348	3,256	14,220	34,519
2016	0	0	7,815	3,976	1.18	3,668	32.7	1,350	3,136	14,324	34,304
2017	29.8	287.4	8,351	3,247	3.47	3,575	29.3	1,348	2,784	14,214	33,868

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Caldwell	Upper Layers	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	0	6,599	230.4	33.9	58.6	92.3	24,137	693.2	31,845	2.31E-06	7.26E-09
1980	0	0	126.3	6,341	233.5	34.2	58.7	89.8	23,816	660.8	31,360	-1.93E-09	-6.15E-12
1981	31.0	304.5	140.0	6,581	242.4	36.0	64.3	93.3	24,204	790.4	32,486	-1.04E-07	-3.20E-10
1982	0	0	147.8	6,313	230.0	33.8	57.5	89.2	23,720	611.7	31,203	2.07E-09	6.62E-12
1983	1.44E-06	5.38E-04	158.2	6,240	226.9	32.9	55.8	88.2	23,579	612.7	30,994	-3.99E-09	-1.29E-11
1984	0	0	173.2	6,125	221.4	31.5	52.4	86.1	23,374	565.1	30,629	1.84E-08	6.00E-11
1985	39.3	397.7	178.6	6,379	234.6	34.2	60.5	91.0	23,874	756.7	32,045	1.96E-07	6.11E-10
1986	10.0	86.8	187.6	6,448	236.3	34.8	61.6	91.5	23,972	733.8	31,862	-2.22E-09	-6.98E-12
1987	7.02	62.1	192.8	6,501	237.5	35.1	62.3	92.2	24,053	739.6	31,983	4.92E-07	1.54E-09
1988	0	0	202.6	6,064	216.9	30.8	50.1	84.6	23,284	492.0	30,424	-2.35E-09	-7.71E-12
1989	1.23E-04	0.042	223.7	6,002	216.5	30.2	49.6	84.2	23,098	553.6	30,258	-1.26E-07	-4.17E-10
1990	29.3	305.6	236.9	6,182	229.4	32.7	56.9	88.0	23,508	697.1	31,366	1.11E-09	3.54E-12
1991	36.1	347.2	219.6	6,440	240.4	35.4	62.6	91.7	23,997	787.7	32,258	6.52E-09	2.02E-11
1992	33.5	315.7	219.9	6,738	251.2	37.6	68.2	95.5	24,506	863.2	33,129	1.16E-07	3.50E-10
1993	0	0	225.0	6,373	232.5	34.5	58.8	90.1	23,837	639.5	31,490	9.02E-08	2.86E-10
1994	9.56	101.8	239.2	6,465	235.3	34.9	60.9	91.9	23,988	734.7	31,960	8.57E-06	2.68E-08
1995	0	0	246.5	6,276	226.7	33.1	56.2	88.9	23,642	624.5	31,194	2.12E-07	6.81E-10
1996	0	0	259.9	6,045	216.1	30.5	49.4	84.6	23,223	526.7	30,436	2.92E-08	9.59E-11
1997	46.7	480.1	257.1	6,343	233.1	33.9	59.6	90.8	23,814	772.9	32,131	-9.55E-07	-2.97E-09
1998	20.7	191.4	264.5	6,500	238.8	35.4	62.7	92.4	24,066	784.2	32,257	7.76E-06	2.40E-08
1999	0	0	272.4	6,141	222.1	32.0	52.9	86.4	23,396	559.1	30,762	-9.79E-10	-3.18E-12
2000	15.6	173.5	352.2	6,268	229.8	33.3	57.8	89.5	23,686	708.5	31,614	-2.87E-05	-9.08E-08
2001	4.89E-05	0.003	288.7	6,230	228.2	33.0	56.5	88.4	23,565	660.0	31,151	9.79E-08	3.14E-10
2002	69.0	685.3	357.2	6,799	253.1	37.8	70.1	97.0	24,594	970.7	33,933	-9.02E-10	-2.66E-12
2003	0.030	0	312.5	6,645	244.9	36.6	65.0	94.3	24,287	774.6	32,459	8.86E-09	2.73E-11
2004	36.8	358.7	273.4	6,995	258.5	38.9	71.4	99.0	24,910	938.1	33,980	7.20E-10	2.12E-12
2005	0	0	272.7	6,380	229.2	33.9	57.4	90.7	23,866	603.6	31,534	-5.02E-09	-1.59E-11
2006	0	0	225.9	6,149	217.7	31.4	51.5	87.0	23,410	549.9	30,722	7.02E-10	2.29E-12
2007	90.5	909.2	168.6	6,913	252.9	37.7	69.7	98.4	24,759	985.5	34,285	-1.05E-06	-3.05E-09
2008	0	0	245.9	6,274	223.6	32.8	54.6	88.8	23,697	554.1	31,171	-3.29E-09	-1.06E-11
2009	0.289	4.77	366.2	6,234	224.6	32.5	56.1	89.2	23,588	660.7	31,256	3.64E-05	1.16E-07
2010	15.6	172.2	545.9	6,327	233.6	34.1	61.4	91.6	23,823	779.3	32,084	4.44E-06	1.38E-08
2011	0	0	545.9	5,915	215.4	30.0	49.3	83.6	23,012	523.0	30,375	-1.24E-04	-4.09E-07
2012	0.529	13.5	2,041	5,696	224.8	32.3	53.5	84.5	23,000	831.4	31,978	1.91E-05	5.96E-08
2013	7.21	92.7	2,057	5,697	243.7	36.2	60.0	84.7	23,118	885.1	32,282	2.85E-07	8.84E-10
2014	0	0	2,376	5,520	260.2	38.5	62.8	82.7	22,984	867.6	32,191	6.03E-05	1.87E-07
2015	46.2	519.5	2,803	5,726	301.0	47.2	79.8	88.8	23,739	1,168	34,519	2.41E-07	6.97E-10
2016	20.4	193.2	2,495	5,879	312.8	50.3	83.9	90.1	24,067	1,112	34,304	-1.35E-05	-3.92E-08
2017	0	0	3,089	5,595	311.2	49.8	80.3	86.6	23,605	1,051	33,868	-3.58E-08	-1.06E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Caldwell	Upper Layers	
	(acre-feet)									
Predevelopment	0	0	15,138	1,937	0.375	53.5	4.04	338.4	2,590	20,061
1980	0	0	15,250	1,828	1.26	44.9	2.62	316.9	2,570	20,013
1981	0	0	15,133	2,343	0.989	48.5	3.05	325.8	2,706	20,561
1982	47.2	275.7	15,222	1,583	1.10	45.7	2.77	319.2	2,502	19,999
1983	24.1	159.0	15,243	1,623	1.26	43.6	2.46	314.3	2,516	19,927
1984	40.1	285.6	15,335	1,379	1.52	40.5	2.01	307.0	2,475	19,865
1985	0	0	15,188	2,209	1.32	44.3	2.42	315.9	2,683	20,445
1986	5.17E-04	0.012	15,178	2,086	1.12	46.3	2.71	320.7	2,643	20,278
1987	0	0	15,166	2,111	0.962	47.6	2.92	324.1	2,645	20,298
1988	108.2	683.3	15,377	976.5	1.42	40.7	2.07	306.2	2,389	19,884
1989	29.8	253.0	15,341	1,297	1.76	37.9	1.61	297.5	2,471	19,731
1990	0.012	1.24	15,259	1,929	1.70	40.0	1.81	303.2	2,629	20,165
1991	3.06E-06	0	15,177	2,302	1.35	45.1	2.53	317.4	2,716	20,561
1992	0	0	15,146	2,598	0.892	49.9	3.26	331.3	2,789	20,919
1993	55.2	298.1	15,214	1,661	0.941	47.1	3.03	324.0	2,528	20,131
1994	0	0	15,180	2,096	0.902	47.6	3.05	326.9	2,644	20,298
1995	41.0	255.7	15,245	1,621	1.08	45.0	2.72	321.2	2,524	20,057
1996	73.7	502.2	15,383	1,151	1.51	39.5	1.99	308.7	2,438	19,901
1997	0	0	15,206	2,258	1.35	43.6	2.41	318.9	2,708	20,539
1998	0	0	15,171	2,263	1.07	47.0	2.90	327.7	2,702	20,515
1999	75.7	467.2	15,300	1,297	1.31	42.4	2.37	315.1	2,456	19,957
2000	0.253	1.02	15,294	1,968	1.35	42.7	2.27	318.1	2,638	20,266
2001	4.93	42.8	15,258	1,766	1.37	42.5	2.29	316.4	2,572	20,007
2002	0	0	15,091	3,002	0.825	50.1	3.19	336.9	2,915	21,400
2003	14.8	28.8	15,146	2,190	0.636	50.6	3.44	337.5	2,674	20,446
2004	0	0	15,088	2,875	0.245	55.7	4.12	346.2	2,859	21,229
2005	105.7	613.7	15,225	1,452	0.581	49.2	3.42	335.2	2,487	20,272
2006	73.7	497.9	15,292	1,298	1.08	43.7	2.64	323.2	2,455	19,988
2007	0	0	15,044	3,109	0.565	53.2	3.74	343.1	2,926	21,479
2008	112.1	684.8	15,306	1,233	0.881	46.7	3.03	331.6	2,446	20,165
2009	18.0	126.9	15,264	1,773	1.13	43.8	2.48	325.4	2,580	20,135
2010	0.227	0.015	15,240	2,209	1.16	43.6	2.29	329.4	2,711	20,536
2011	110.8	707.4	15,415	1,021	1.73	35.6	1.29	309.9	2,440	20,043
2012	35.6	408.8	15,682	1,762	2.05	44.1	1.59	329.9	2,849	21,116
2013	6.81	163.1	15,646	1,928	2.29	47.2	1.76	340.8	2,902	21,038
2014	42.2	356.4	15,749	1,712	2.78	45.8	1.20	338.8	2,901	21,150
2015	0.516	0.181	15,678	2,830	2.88	54.4	1.87	371.1	3,241	22,180
2016	0	0	15,648	2,698	2.78	57.5	2.42	383.2	3,154	21,946
2017	51.0	311.7	15,781	2,204	2.99	58.0	2.23	386.0	3,099	21,895

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-7.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lost Pines GCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows										Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Fayette County GCD	Gonzales County UWCD	Plum Creek CD	Caldwell	Upper Layers			
	(acre-feet)												%
Predevelopment	0	0	0	1,487	29.5	43.6	5.10	2.39	36.8	18,457	20,061	3.92E-07	1.95E-09
1980	0	0	103.2	1,479	29.6	45.2	5.09	2.38	36.3	18,312	20,013	5.75E-10	2.87E-12
1981	53.5	347.6	115.3	1,493	29.5	46.2	5.35	2.68	35.3	18,432	20,561	-1.56E-08	-7.61E-11
1982	0	0	122.2	1,471	29.5	44.8	5.10	2.30	36.7	18,288	19,999	7.79E-10	3.89E-12
1983	7.68E-06	2.23E-04	131.1	1,467	29.5	44.2	4.92	2.21	37.1	18,211	19,927	-6.69E-10	-3.36E-12
1984	0	0	143.8	1,460	29.6	43.5	4.71	2.05	37.6	18,144	19,865	4.81E-09	2.42E-11
1985	62.7	369.2	149.0	1,481	29.5	45.1	5.02	2.52	35.7	18,265	20,445	3.99E-08	1.95E-10
1986	23.0	160.7	156.8	1,482	29.5	45.6	5.18	2.56	35.6	18,336	20,278	-3.60E-10	-1.78E-12
1987	15.6	128.5	161.0	1,485	29.5	45.6	5.25	2.57	35.7	18,389	20,298	6.54E-08	3.22E-10
1988	0	0	169.4	1,454	29.6	43.1	4.68	1.90	38.1	18,143	19,884	3.75E-10	1.88E-12
1989	0.002	0.050	187.8	1,450	29.5	42.6	4.48	1.92	37.6	17,977	19,731	-2.77E-08	-1.40E-10
1990	45.1	248.1	199.1	1,466	29.5	44.3	4.77	2.33	35.9	18,090	20,165	6.00E-10	2.98E-12
1991	65.8	411.4	201.4	1,483	29.5	46.1	5.21	2.64	34.7	18,281	20,561	-7.24E-10	-3.52E-12
1992	65.7	473.4	201.3	1,504	29.6	47.4	5.59	2.88	34.3	18,555	20,919	1.89E-08	9.02E-11
1993	0.013	1.31	206.7	1,473	29.5	45.3	5.26	2.35	36.3	18,332	20,131	1.73E-08	8.59E-11
1994	12.7	96.3	219.4	1,482	29.5	45.2	5.23	2.45	36.3	18,369	20,298	1.24E-06	6.13E-09
1995	0	0	226.9	1,467	29.5	44.1	4.99	2.21	37.3	18,245	20,057	3.72E-08	1.85E-10
1996	0	0	238.9	1,454	29.6	42.7	4.59	1.86	38.4	18,091	19,901	3.35E-08	1.69E-10
1997	71.7	411.0	238.2	1,478	29.5	44.7	4.96	2.45	36.1	18,222	20,539	-1.75E-07	-8.51E-10
1998	41.6	272.2	245.7	1,485	29.5	45.8	5.25	2.62	35.6	18,352	20,515	1.20E-06	5.83E-09
1999	0	0	253.1	1,455	29.5	43.8	4.86	2.06	37.5	18,131	19,957	-9.82E-11	-4.92E-13
2000	19.5	115.7	327.0	1,472	29.6	44.4	4.92	2.30	36.8	18,214	20,266	-5.16E-06	-2.55E-08
2001	0.003	0.042	268.3	1,465	29.5	44.4	4.92	2.27	36.7	18,156	20,007	1.56E-08	7.77E-11
2002	118.4	783.2	331.7	1,506	29.5	47.1	5.54	2.97	34.5	18,541	21,400	-5.78E-10	-2.70E-12
2003	4.14	28.2	290.1	1,490	29.5	46.4	5.52	2.67	35.9	18,513	20,446	3.25E-09	1.59E-11
2004	65.7	464.0	253.8	1,518	29.6	47.4	5.82	2.98	37.1	18,805	21,229	1.16E-09	5.47E-12
2005	0	0	253.1	1,470	29.5	44.3	5.21	2.20	37.5	18,430	20,272	-2.58E-10	-1.27E-12
2006	0	0	210.0	1,457	29.5	42.6	4.74	1.93	38.1	18,204	19,988	1.86E-09	9.32E-12
2007	147.4	879.5	157.0	1,516	29.5	46.4	5.51	2.97	36.2	18,659	21,479	-2.02E-07	-9.39E-10
2008	0	0	228.5	1,464	29.6	43.8	5.01	2.11	37.5	18,354	20,165	8.37E-10	4.15E-12
2009	0.060	0.436	340.2	1,465	29.5	43.4	4.84	2.15	37.9	18,212	20,135	7.25E-06	3.60E-08
2010	22.2	150.6	506.8	1,473	29.5	44.5	5.00	2.41	37.3	18,265	20,536	9.26E-07	4.51E-09
2011	0	0	506.8	1,442	29.5	42.5	4.59	1.79	39.3	17,976	20,043	-2.07E-05	-1.03E-07
2012	0.088	0.349	1,923	1,427	29.6	42.7	4.78	2.03	39.2	17,648	21,116	3.45E-06	1.63E-08
2013	9.80	2.76	1,938	1,421	29.5	45.1	5.30	2.32	38.5	17,546	21,038	3.29E-08	1.56E-10
2014	0	0	2,236	1,408	22.0	46.8	6.00	2.33	38.8	17,390	21,150	1.06E-05	5.01E-08
2015	69.2	410.1	2,641	1,421	29.5	52.0	7.04	3.15	37.4	17,509	22,180	7.33E-08	3.30E-10
2016	41.3	280.8	2,351	1,431	29.6	55.3	7.56	3.39	37.4	17,709	21,946	-2.22E-06	-1.01E-08
2017	0.010	1.02	2,911	1,408	27.4	55.1	7.74	3.10	39.0	17,443	21,895	-6.29E-09	-2.87E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	River Package	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	3.35E-11	3.86	2.20	42.7	884.9	933.7
1980	0	0	3.36E-11	3.87	2.21	42.8	887.1	936.0
1981	0	0	3.35E-11	3.86	2.20	42.7	884.7	933.5
1982	1.61E-04	5.25E-04	3.35E-11	3.86	2.20	42.7	884.7	933.5
1983	5.27E-04	0.012	3.35E-11	3.86	2.20	42.7	884.7	933.5
1984	9.43E-04	0.030	3.36E-11	3.87	2.21	42.8	887.1	936.0
1985	3.30E-06	0.001	3.35E-11	3.86	2.20	42.7	884.7	933.5
1986	1.35E-05	0.002	3.35E-11	3.86	2.20	42.7	884.7	933.5
1987	1.16E-06	5.50E-04	3.35E-11	3.86	2.20	42.7	884.7	933.5
1988	0.001	0.014	3.36E-11	3.87	2.21	42.8	887.1	936.0
1989	0.001	0.038	3.35E-11	3.86	2.20	42.7	884.7	933.5
1990	1.99E-04	0.021	3.35E-11	3.86	2.20	42.7	884.7	933.5
1991	1.11E-04	0.019	3.35E-11	3.86	2.20	42.7	884.7	933.5
1992	5.01E-05	0.012	3.36E-11	3.87	2.21	42.8	887.1	936.1
1993	8.35E-04	0.020	3.35E-11	3.86	2.20	42.7	884.7	933.5
1994	7.71E-04	0.029	3.35E-11	3.86	2.20	42.7	884.7	933.5
1995	0.002	0.056	3.35E-11	3.86	2.20	42.7	884.7	933.5
1996	0.003	0.096	3.36E-11	3.87	2.21	42.8	887.1	936.1
1997	7.81E-04	0.065	3.35E-11	3.86	2.20	42.7	884.7	933.5
1998	5.39E-04	0.056	3.35E-11	3.86	2.20	42.7	884.7	933.5
1999	0.001	0.052	3.35E-11	3.86	2.20	42.7	884.7	933.5
2000	5.18E-04	0.040	3.36E-11	3.87	2.21	42.8	887.1	936.0
2001	5.43E-04	0.040	3.35E-11	3.86	2.20	42.7	884.7	933.5
2002	2.81E-05	0.005	3.35E-11	3.86	2.20	42.7	884.7	933.5
2003	1.14E-04	0.011	3.35E-11	3.86	2.20	42.7	884.7	933.5
2004	9.54E-05	0.019	3.36E-11	3.87	2.21	42.8	887.1	936.0
2005	0.002	0.083	3.35E-11	3.86	2.20	42.7	884.6	933.5
2006	0.003	0.126	3.35E-11	3.86	2.20	42.7	884.6	933.5
2007	2.23E-04	0.031	3.35E-11	3.86	2.20	42.7	884.7	933.5
2008	0.002	0.073	3.36E-11	3.87	2.21	42.8	887.1	936.0
2009	0.002	0.086	3.35E-11	3.86	2.20	42.7	884.6	933.5
2010	0.002	0.110	3.35E-11	3.86	2.20	42.7	884.6	933.5
2011	0.005	0.204	3.35E-11	3.86	2.20	42.7	884.6	933.5
2012	0.004	0.200	3.36E-11	3.87	2.21	42.8	887.0	936.1
2013	0.003	0.167	3.35E-11	3.86	2.20	42.7	884.6	933.5
2014	0.002	0.144	3.35E-11	3.86	2.20	42.7	884.6	933.5
2015	5.48E-04	0.072	3.35E-11	3.86	2.20	42.7	884.6	933.5
2016	2.44E-04	0.033	3.36E-11	3.87	2.21	42.8	887.1	936.0
2017	2.48E-04	0.029	3.35E-11	3.86	2.20	42.7	884.6	933.4

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	1.80E-09	0.001	1.35	3.25	929.1	933.7	1.18E-09	1.27E-10
1980	0	0	1.81E-09	0.001	1.35	3.26	931.4	936.0	1.32E-10	1.41E-11
1981	0.001	0.043	1.80E-09	0.001	1.35	3.25	928.8	933.5	-1.24E-08	-1.33E-09
1982	1.17E-04	0.017	1.80E-09	0.001	1.35	3.25	928.9	933.5	-4.21E-12	-4.51E-13
1983	2.04E-05	0.006	1.80E-09	0.001	1.35	3.25	928.9	933.5	-5.95E-11	-6.37E-12
1984	1.85E-05	0.006	1.81E-09	0.001	1.35	3.26	931.4	936.0	5.82E-10	6.21E-11
1985	9.36E-04	0.023	1.80E-09	0.001	1.35	3.25	928.9	933.5	3.23E-11	3.46E-12
1986	0.001	0.037	1.80E-09	0.001	1.35	3.25	928.9	933.5	1.33E-11	1.42E-12
1987	0.001	0.046	1.80E-09	0.001	1.35	3.25	928.8	933.5	1.23E-09	1.32E-10
1988	1.20E-05	0.004	1.81E-09	0.001	1.35	3.26	931.4	936.0	-5.13E-11	-5.48E-12
1989	2.47E-07	2.73E-04	1.80E-09	0.001	1.35	3.25	928.9	933.5	9.69E-11	1.04E-11
1990	9.35E-05	1.35E-04	1.80E-09	0.001	1.35	3.25	928.9	933.5	1.09E-09	1.16E-10
1991	6.41E-04	0.015	1.80E-09	0.001	1.35	3.25	928.9	933.5	-3.21E-11	-3.43E-12
1992	0.001	0.035	1.81E-09	0.001	1.35	3.26	931.4	936.1	2.42E-10	2.59E-11
1993	1.86E-05	0.003	1.80E-09	0.001	1.35	3.25	928.9	933.5	3.01E-10	3.22E-11
1994	3.82E-07	1.20E-04	1.80E-09	0.001	1.35	3.25	928.9	933.5	4.79E-11	5.13E-12
1995	0	0	1.80E-09	0.001	1.35	3.25	928.9	933.5	5.79E-11	6.20E-12
1996	0	0	1.81E-09	0.001	1.35	3.26	931.5	936.1	2.48E-09	2.65E-10
1997	6.56E-05	3.72E-05	1.80E-09	0.001	1.35	3.25	928.9	933.5	1.84E-09	1.97E-10
1998	7.25E-05	3.91E-04	1.80E-09	0.001	1.35	3.25	928.9	933.5	-7.57E-10	-8.10E-11
1999	1.05E-04	0.006	1.80E-09	0.001	1.35	3.25	928.9	933.5	6.66E-11	7.14E-12
2000	1.59E-04	0.016	1.81E-09	0.001	1.35	3.26	931.4	936.0	6.32E-10	6.76E-11
2001	1.33E-04	0.018	1.80E-09	0.001	1.35	3.25	928.9	933.5	-4.32E-12	-4.63E-13
2002	0.001	0.021	1.80E-09	0.001	1.35	3.25	928.9	933.5	3.34E-11	3.58E-12
2003	8.77E-05	0.008	1.80E-09	0.001	1.35	3.25	928.9	933.5	-4.04E-11	-4.32E-12
2004	2.63E-04	0.006	1.81E-09	0.001	1.35	3.26	931.4	936.0	-1.02E-10	-1.09E-11
2005	3.50E-12	3.89E-07	1.80E-09	0.001	1.35	3.25	928.9	933.5	-6.84E-11	-7.33E-12
2006	0	0	1.80E-09	0.001	1.35	3.25	928.9	933.5	4.64E-11	4.97E-12
2007	0.001	0.004	1.80E-09	0.001	1.35	3.25	928.9	933.5	2.67E-11	2.86E-12
2008	1.28E-07	9.26E-05	1.81E-09	0.001	1.35	3.26	931.4	936.0	1.15E-10	1.22E-11
2009	1.12E-05	0.002	1.80E-09	0.001	1.35	3.25	928.9	933.5	2.38E-09	2.55E-10
2010	2.82E-12	1.92E-07	1.80E-09	0.001	1.35	3.25	928.9	933.5	-6.94E-10	-7.44E-11
2011	0	0	1.80E-09	0.001	1.35	3.25	928.9	933.5	7.50E-11	8.04E-12
2012	1.76E-06	1.74E-04	1.81E-09	0.001	1.35	3.26	931.5	936.1	1.59E-09	1.69E-10
2013	1.38E-05	1.28E-04	1.80E-09	0.001	1.35	3.25	928.9	933.5	-1.89E-10	-2.02E-11
2014	8.12E-07	1.29E-04	1.80E-09	0.001	1.35	3.25	928.9	933.5	-5.42E-10	-5.81E-11
2015	8.08E-04	0.004	1.80E-09	0.001	1.35	3.25	928.9	933.5	-5.10E-09	-5.47E-10
2016	0.001	0.012	1.81E-09	0.001	1.35	3.26	931.4	936.0	5.91E-09	6.31E-10
2017	2.53E-04	0.010	1.80E-09	0.001	1.35	3.25	928.8	933.4	-5.93E-10	-6.36E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - (Layer 2) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	3,803	1.78E-04	5.37E-04	6.83E-04	3.82E-05	933.6	22,652	27,388
1980	0	0	3,961	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.0	22,354	27,252
1981	0	0	3,946	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,304	27,183
1982	0.064	0.315	3,947	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,300	27,181
1983	0.075	0.354	3,948	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,296	27,178
1984	0.057	0.243	3,959	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.0	22,355	27,251
1985	0	0	3,944	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,304	27,181
1986	0.017	0.099	3,944	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,304	27,181
1987	4.04E-04	0.002	3,942	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,307	27,183
1988	0.073	0.259	3,954	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.0	22,364	27,255
1989	0.063	0.254	3,946	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,297	27,177
1990	0.027	0.150	3,948	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,294	27,175
1991	0.041	0.234	3,950	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,289	27,173
1992	0.001	0.013	3,961	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.0	22,351	27,248
1993	0.062	0.242	3,953	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,284	27,171
1994	0.041	0.182	3,955	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,280	27,169
1995	0.060	0.231	3,957	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.5	22,275	27,165
1996	0.086	0.323	3,971	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.0	22,329	27,236
1997	0.037	0.204	3,962	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.5	22,264	27,160
1998	0.068	0.375	3,967	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,256	27,156
1999	0.024	0.065	3,957	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,271	27,162
2000	0.003	0.017	3,963	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.0	22,342	27,241
2001	0.005	0.023	3,950	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,284	27,168
2002	0.003	0.029	3,951	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,285	27,169
2003	0.030	0.160	3,953	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,280	27,167
2004	0.058	0.365	3,972	1.79E-04	5.38E-04	6.85E-04	3.82E-05	936.0	22,331	27,239
2005	0.122	0.500	3,967	1.78E-04	5.36E-04	6.83E-04	3.81E-05	933.5	22,257	27,158
2006	0.091	0.330	3,970	1.78E-04	5.36E-04	6.83E-04	3.81E-05	933.5	22,250	27,154
2007	0	0	3,964	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,261	27,159
2008	0.063	0.238	3,978	1.79E-04	5.38E-04	6.85E-04	3.82E-05	936.0	22,316	27,231
2009	0.044	0.133	3,965	1.78E-04	5.36E-04	6.83E-04	3.81E-05	933.4	22,256	27,154
2010	0.132	0.652	3,971	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.5	22,240	27,146
2011	0.251	1.10	3,983	1.78E-04	5.36E-04	6.83E-04	3.81E-05	933.5	22,215	27,132
2012	0.099	0.434	3,999	1.79E-04	5.38E-04	6.85E-04	3.83E-05	936.1	22,267	27,202
2013	0.026	0.123	3,989	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.5	22,204	27,126
2014	0.013	0.047	3,988	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.5	22,204	27,126
2015	0	0	3,985	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,210	27,129
2016	8.30E-05	0.001	3,992	1.79E-04	5.38E-04	6.85E-04	3.83E-05	935.9	22,279	27,207
2017	0.002	0.002	3,980	1.78E-04	5.36E-04	6.83E-04	3.82E-05	933.4	22,220	27,134

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	23,045	6.18E-04	6.51E-04	4.25E-04	879.7	3,464	27,388	2.55E-11	9.30E-14
1980	0	0	22,753	6.19E-04	6.53E-04	4.27E-04	881.9	3,617	27,252	2.91E-11	1.07E-13
1981	0.098	0.445	22,701	6.18E-04	6.51E-04	4.25E-04	879.5	3,602	27,183	-1.47E-09	-5.42E-12
1982	0.005	0.045	22,697	6.18E-04	6.51E-04	4.25E-04	879.5	3,604	27,181	-6.55E-11	-2.41E-13
1983	0.005	0.046	22,693	6.18E-04	6.51E-04	4.25E-04	879.5	3,605	27,178	-1.93E-10	-7.09E-13
1984	0.005	0.047	22,754	6.19E-04	6.53E-04	4.26E-04	881.9	3,615	27,251	1.46E-10	5.34E-13
1985	0.085	0.391	22,701	6.18E-04	6.51E-04	4.25E-04	879.5	3,600	27,181	1.46E-11	5.35E-14
1986	0.031	0.108	22,701	6.18E-04	6.51E-04	4.25E-04	879.5	3,601	27,181	-1.46E-11	-5.35E-14
1987	0.030	0.118	22,704	6.18E-04	6.51E-04	4.25E-04	879.5	3,599	27,183	4.00E-11	1.47E-13
1988	0.001	0.012	22,762	6.19E-04	6.53E-04	4.26E-04	881.9	3,611	27,255	4.00E-11	1.47E-13
1989	2.72E-06	3.03E-05	22,694	6.18E-04	6.51E-04	4.25E-04	879.5	3,603	27,177	3.60E-10	1.33E-12
1990	0.012	0.026	22,691	6.18E-04	6.51E-04	4.25E-04	879.5	3,605	27,175	1.16E-10	4.28E-13
1991	0.021	0.053	22,686	6.18E-04	6.51E-04	4.25E-04	879.5	3,607	27,173	-1.96E-10	-7.23E-13
1992	0.032	0.096	22,749	6.19E-04	6.53E-04	4.26E-04	881.9	3,617	27,248	-3.64E-12	-1.34E-14
1993	2.03E-05	3.13E-04	22,682	6.18E-04	6.51E-04	4.25E-04	879.5	3,609	27,171	-3.64E-12	-1.34E-14
1994	0	0	22,678	6.18E-04	6.51E-04	4.25E-04	879.5	3,612	27,169	-2.51E-10	-9.24E-13
1995	3.07E-05	4.73E-04	22,672	6.18E-04	6.51E-04	4.25E-04	879.5	3,614	27,165	-2.44E-10	-8.97E-13
1996	0	0	22,728	6.19E-04	6.53E-04	4.27E-04	881.8	3,627	27,236	1.42E-10	5.21E-13
1997	0.014	0.031	22,662	6.18E-04	6.51E-04	4.25E-04	879.4	3,619	27,160	3.27E-11	1.21E-13
1998	0.010	0.024	22,653	6.18E-04	6.51E-04	4.25E-04	879.4	3,624	27,156	-3.20E-10	-1.18E-12
1999	0.160	0.886	22,668	6.17E-04	6.51E-04	4.25E-04	879.4	3,613	27,162	6.15E-10	2.26E-12
2000	0.100	0.525	22,740	6.19E-04	6.53E-04	4.26E-04	881.9	3,618	27,241	1.46E-11	5.34E-14
2001	0.047	0.242	22,681	6.17E-04	6.51E-04	4.25E-04	879.5	3,607	27,168	-4.22E-10	-1.55E-12
2002	0.049	0.139	22,682	6.17E-04	6.51E-04	4.25E-04	879.5	3,607	27,169	-3.31E-10	-1.22E-12
2003	1.22E-04	3.97E-04	22,678	6.17E-04	6.51E-04	4.25E-04	879.5	3,610	27,167	-3.35E-10	-1.23E-12
2004	0.006	0.013	22,730	6.19E-04	6.53E-04	4.27E-04	881.9	3,627	27,239	-1.67E-10	-6.14E-13
2005	0	0	22,655	6.17E-04	6.51E-04	4.26E-04	879.4	3,623	27,158	-9.46E-10	-3.48E-12
2006	4.12E-04	0.002	22,648	6.17E-04	6.51E-04	4.26E-04	879.4	3,626	27,154	-3.97E-10	-1.46E-12
2007	0.118	0.475	22,659	6.17E-04	6.51E-04	4.25E-04	879.5	3,620	27,159	-5.82E-11	-2.14E-13
2008	0	0	22,715	6.19E-04	6.53E-04	4.27E-04	881.8	3,634	27,231	1.96E-10	7.21E-13
2009	0.008	0.071	22,653	6.17E-04	6.51E-04	4.25E-04	879.4	3,621	27,154	-3.64E-12	-1.34E-14
2010	0.001	0.005	22,638	6.17E-04	6.51E-04	4.25E-04	879.4	3,628	27,146	-4.33E-10	-1.59E-12
2011	0	0	22,614	6.17E-04	6.51E-04	4.25E-04	879.4	3,639	27,132	-2.04E-10	-7.51E-13
2012	0.002	0.010	22,667	6.19E-04	6.52E-04	4.27E-04	881.8	3,654	27,202	1.78E-10	6.55E-13
2013	0.003	0.009	22,602	6.17E-04	6.51E-04	4.25E-04	879.4	3,645	27,126	-1.35E-10	-4.96E-13
2014	0.007	0.047	22,602	6.17E-04	6.51E-04	4.25E-04	879.4	3,644	27,126	-3.53E-10	-1.30E-12
2015	0.078	0.302	22,608	6.17E-04	6.51E-04	4.25E-04	879.4	3,641	27,129	-7.24E-10	-2.67E-12
2016	0.077	0.321	22,677	6.19E-04	6.52E-04	4.26E-04	881.8	3,647	27,207	6.33E-10	2.33E-12
2017	0.017	0.104	22,618	6.17E-04	6.51E-04	4.25E-04	879.4	3,636	27,134	-1.46E-10	-5.36E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	2,500	54.0	136.8	508.1	10.2	3,453	17,407	24,069
1980	0	2,509	53.3	137.1	509.2	10.2	3,606	17,038	23,863
1981	0	2,502	53.2	136.7	507.9	10.2	3,591	17,004	23,805
1982	0.127	2,502	53.2	136.7	507.9	10.2	3,593	17,000	23,803
1983	0.131	2,502	53.2	136.7	507.9	10.2	3,594	16,997	23,801
1984	0.090	2,509	53.3	137.1	509.4	10.2	3,604	17,042	23,865
1985	0	2,502	53.2	136.7	508.0	10.2	3,589	17,007	23,806
1986	0.038	2,502	53.2	136.7	508.0	10.2	3,590	17,007	23,807
1987	2.85E-04	2,502	53.2	136.7	508.0	10.2	3,588	17,011	23,809
1988	0.116	2,509	53.3	137.1	509.4	10.2	3,599	17,052	23,871
1989	0.114	2,502	53.1	136.7	508.0	10.2	3,592	16,999	23,801
1990	0.068	2,502	53.1	136.7	508.0	10.2	3,594	16,996	23,800
1991	0.105	2,502	53.1	136.7	508.0	10.2	3,596	16,991	23,797
1992	0.009	2,509	53.3	137.1	509.4	10.2	3,606	17,039	23,863
1993	0.119	2,502	53.1	136.7	508.0	10.2	3,598	16,985	23,794
1994	0.086	2,502	53.1	136.7	507.9	10.2	3,601	16,980	23,791
1995	0.112	2,502	53.1	136.7	507.9	10.2	3,603	16,974	23,786
1996	0.155	2,509	53.2	137.1	509.3	10.2	3,615	17,012	23,846
1997	0.087	2,502	53.1	136.7	507.9	10.2	3,608	16,961	23,779
1998	0.169	2,502	53.0	136.7	507.9	10.2	3,613	16,952	23,774
1999	0.038	2,502	53.2	136.7	507.9	10.2	3,602	16,968	23,780
2000	0.009	2,509	53.3	137.1	509.4	10.1	3,607	17,025	23,850
2001	0.018	2,502	53.2	136.7	508.0	10.1	3,596	16,982	23,788
2002	0.021	2,502	53.2	136.7	507.9	10.1	3,596	16,983	23,789
2003	0.093	2,502	53.2	136.7	507.9	10.1	3,599	16,977	23,786
2004	0.203	2,509	53.4	137.1	509.0	10.0	3,616	17,012	23,847
2005	0.258	2,502	53.2	136.7	507.6	9.95	3,612	16,952	23,774
2006	0.162	2,502	53.3	136.7	507.6	10.0	3,615	16,943	23,768
2007	0	2,502	53.3	136.7	507.7	10.1	3,609	16,957	23,776
2008	0.136	2,509	53.4	137.1	509.0	10.0	3,623	16,996	23,837
2009	0.055	2,502	53.2	136.7	507.9	9.91	3,610	16,949	23,769
2010	0.297	2,502	53.2	136.7	507.9	10.1	3,617	16,931	23,758
2011	0.512	2,502	53.1	136.7	507.9	9.97	3,628	16,902	23,740
2012	0.195	2,509	53.0	137.1	509.2	10.1	3,643	16,937	23,798
2013	0.057	2,502	52.8	136.7	507.8	10.1	3,634	16,887	23,731
2014	0.019	2,502	52.8	136.7	507.9	10.1	3,633	16,887	23,730
2015	0	2,502	52.9	136.7	508.0	10.1	3,630	16,895	23,735
2016	0.001	2,509	53.0	137.1	509.3	10.2	3,636	16,950	23,805
2017	0.004	2,502	52.9	136.7	507.9	10.1	3,625	16,907	23,741

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	431.8	147.0	135.2	311.4	22,780	263.5	24,069	1.13E-08	4.70E-11
1980	0	2.06	432.2	147.9	135.5	313.2	22,480	351.8	23,863	8.73E-11	3.66E-13
1981	0.212	1.74	431.1	147.4	135.1	312.2	22,429	347.5	23,805	-1.95E-07	-8.18E-10
1982	0.036	1.45	431.1	147.4	135.1	312.1	22,426	350.5	23,803	4.37E-11	1.83E-13
1983	0.036	1.18	431.1	147.4	135.1	311.9	22,422	352.7	23,801	-1.05E-09	-4.40E-12
1984	0.036	0.876	432.2	147.8	135.5	312.6	22,481	354.5	23,865	1.28E-08	5.35E-11
1985	0.196	0.882	431.1	147.4	135.1	311.5	22,430	350.0	23,806	1.13E-10	4.74E-13
1986	0.050	0.882	431.1	147.4	135.1	311.5	22,430	350.9	23,807	2.55E-11	1.07E-13
1987	0.063	0.842	431.1	147.4	135.1	311.5	22,433	350.2	23,809	2.41E-08	1.01E-10
1988	0.008	0.872	432.2	147.8	135.5	312.3	22,490	352.3	23,871	8.22E-10	3.44E-12
1989	1.64E-05	0.955	431.0	147.4	135.1	311.5	22,423	352.5	23,801	4.11E-10	1.73E-12
1990	0.017	0.991	431.1	147.4	135.1	311.6	22,419	353.9	23,800	1.77E-08	7.45E-11
1991	0.026	0.909	431.1	147.4	135.1	311.6	22,414	356.4	23,797	-4.37E-10	-1.83E-12
1992	0.043	0.901	432.3	147.8	135.5	312.5	22,477	357.1	23,863	5.45E-09	2.29E-11
1993	2.53E-04	0.909	431.1	147.4	135.1	311.6	22,410	357.6	23,794	3.25E-09	1.37E-11
1994	0	0.876	431.1	147.4	135.1	312.1	22,406	358.6	23,791	4.11E-10	1.73E-12
1995	4.20E-04	0.892	431.0	147.5	135.1	312.0	22,400	359.6	23,786	4.78E-09	2.01E-11
1996	0	0.889	432.1	147.9	135.4	313.1	22,454	362.0	23,846	3.91E-08	1.64E-10
1997	0.023	0.920	431.0	147.5	135.1	312.0	22,389	363.1	23,779	3.14E-08	1.32E-10
1998	0.012	0.920	431.0	147.5	135.1	312.2	22,381	366.9	23,774	-1.19E-08	-4.99E-11
1999	0.355	0.930	431.0	147.4	135.1	312.3	22,397	356.6	23,780	-3.64E-12	-1.53E-14
2000	0.201	1.05	432.2	147.8	135.5	312.8	22,467	353.5	23,850	1.35E-08	5.65E-11
2001	0.089	2.10	431.0	147.4	135.1	312.0	22,410	350.8	23,788	-8.37E-11	-3.52E-13
2002	0.062	1.65	431.0	147.4	135.1	312.0	22,411	351.4	23,789	-6.18E-11	-2.60E-13
2003	7.47E-05	1.76	431.0	147.4	135.1	312.2	22,406	353.1	23,786	5.28E-10	2.22E-12
2004	0.008	3.16	432.2	147.8	135.5	314.4	22,456	357.7	23,847	-7.28E-12	-3.05E-14
2005	0	4.36	430.9	147.4	135.1	313.7	22,382	359.7	23,774	-9.50E-10	-3.99E-12
2006	9.50E-04	5.69	430.9	147.4	135.1	313.6	22,375	360.9	23,768	-3.27E-11	-1.38E-13
2007	0.245	4.65	431.0	147.4	135.1	313.1	22,387	357.8	23,776	2.22E-10	9.33E-13
2008	0	5.34	432.1	147.8	135.5	314.7	22,442	360.1	23,837	2.63E-09	1.10E-11
2009	0.057	3.92	430.9	147.4	135.1	312.4	22,381	358.4	23,769	4.09E-08	1.72E-10
2010	0.002	3.83	430.9	147.4	135.1	312.3	22,365	363.9	23,758	-1.22E-08	-5.14E-11
2011	0	3.83	430.8	147.5	135.1	312.2	22,339	371.9	23,740	1.13E-09	4.77E-12
2012	0.009	1.84	431.9	147.9	135.4	313.4	22,392	375.6	23,798	2.89E-08	1.21E-10
2013	0.006	1.54	430.7	147.5	135.1	312.5	22,328	375.4	23,731	-2.85E-09	-1.20E-11
2014	0.022	1.50	430.7	147.5	135.1	312.2	22,328	374.9	23,730	-1.17E-08	-4.93E-11
2015	0.152	1.44	430.8	147.5	135.1	311.9	22,335	372.9	23,735	-7.82E-08	-3.29E-10
2016	0.151	1.47	432.0	147.9	135.4	312.9	22,404	371.6	23,805	1.11E-07	4.65E-10
2017	0.052	1.16	430.8	147.5	135.1	312.1	22,345	369.5	23,741	-5.58E-09	-2.35E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	1.85	2.00	6.45	0.092	263.5	17,392	17,666
1980	0	1.47	2.01	6.41	0.093	351.8	17,024	17,386
1981	0	1.48	2.00	6.39	0.092	347.5	16,990	17,347
1982	0.062	1.48	2.00	6.39	0.092	350.5	16,986	17,347
1983	0.055	1.48	2.00	6.40	0.092	352.7	16,982	17,345
1984	0.046	1.49	2.01	6.42	0.093	354.5	17,027	17,392
1985	0	1.50	2.00	6.41	0.092	350.0	16,992	17,352
1986	0.014	1.50	2.00	6.41	0.092	350.9	16,993	17,354
1987	2.37E-05	1.50	2.00	6.41	0.092	350.2	16,997	17,357
1988	0.096	1.50	2.01	6.43	0.093	352.3	17,038	17,400
1989	0.079	1.49	2.00	6.41	0.092	352.5	16,985	17,347
1990	0.042	1.49	2.00	6.41	0.092	353.9	16,982	17,346
1991	0.063	1.48	2.00	6.41	0.092	356.4	16,976	17,343
1992	0.014	1.48	2.01	6.43	0.093	357.1	17,024	17,391
1993	0.109	1.47	2.00	6.41	0.092	357.6	16,971	17,338
1994	0.068	1.47	2.00	6.41	0.092	358.6	16,966	17,335
1995	0.107	1.47	2.00	6.41	0.092	359.6	16,959	17,329
1996	0.147	1.47	2.01	6.42	0.093	362.0	16,997	17,369
1997	0.054	1.46	2.00	6.41	0.092	363.1	16,947	17,320
1998	0.097	1.45	2.00	6.40	0.092	366.9	16,938	17,315
1999	0.069	1.47	2.00	6.40	0.092	356.6	16,954	17,321
2000	0.025	1.48	2.01	6.42	0.092	353.5	17,010	17,374
2001	0.030	1.48	2.00	6.40	0.092	350.8	16,968	17,329
2002	0.033	1.47	2.00	6.40	0.092	351.4	16,969	17,330
2003	0.094	1.46	2.00	6.40	0.092	353.1	16,963	17,326
2004	0.166	1.45	2.01	6.40	0.092	357.7	16,998	17,366
2005	0.267	1.44	2.00	6.38	0.091	359.7	16,937	17,307
2006	0.186	1.44	2.00	6.38	0.091	360.9	16,929	17,300
2007	0	1.46	2.00	6.38	0.092	357.8	16,942	17,310
2008	0.130	1.45	2.01	6.39	0.092	360.1	16,981	17,352
2009	0.045	1.45	2.00	6.39	0.091	358.4	16,934	17,303
2010	0.179	1.43	2.00	6.39	0.092	363.9	16,916	17,290
2011	0.399	1.40	2.00	6.38	0.091	371.9	16,887	17,269
2012	0.201	1.39	2.01	6.40	0.092	375.6	16,922	17,307
2013	0.077	1.39	2.00	6.38	0.092	375.4	16,872	17,258
2014	0.020	1.39	2.00	6.38	0.092	374.9	16,873	17,257
2015	0	1.40	2.00	6.38	0.092	372.9	16,881	17,264
2016	0	1.42	2.01	6.40	0.092	371.6	16,936	17,317
2017	0.007	1.42	2.00	6.38	0.092	369.5	16,892	17,272

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	4.45	2.79	2.56	17,402	254.6	17,666	3.60E-09	2.04E-11
1980	0	4.75	2.79	2.51	17,034	341.4	17,386	-3.64E-11	-2.09E-13
1981	0.154	4.73	2.78	2.50	17,000	337.1	17,347	-6.25E-08	-3.61E-10
1982	0.059	4.72	2.78	2.50	16,996	340.1	17,347	-7.28E-12	-4.19E-14
1983	0.064	4.71	2.78	2.50	16,993	342.4	17,345	-2.11E-10	-1.22E-12
1984	0.064	4.71	2.79	2.50	17,038	344.1	17,392	4.42E-09	2.54E-11
1985	0.181	4.69	2.78	2.49	17,002	339.7	17,352	3.64E-12	2.10E-14
1986	0.079	4.69	2.78	2.49	17,003	340.6	17,354	0	0
1987	0.077	4.69	2.78	2.49	17,007	340.0	17,357	6.03E-09	3.47E-11
1988	0.018	4.70	2.79	2.50	17,048	342.0	17,400	1.49E-10	8.57E-13
1989	2.03E-04	4.69	2.78	2.49	16,995	342.3	17,347	1.24E-10	7.13E-13
1990	0.029	4.70	2.78	2.50	16,992	343.6	17,346	5.90E-09	3.40E-11
1991	0.036	4.71	2.78	2.49	16,987	346.1	17,343	-2.00E-10	-1.15E-12
1992	0.042	4.72	2.79	2.50	17,035	346.7	17,391	1.30E-09	7.47E-12
1993	0	4.71	2.78	2.49	16,981	347.3	17,338	8.91E-10	5.14E-12
1994	0	4.71	2.78	2.50	16,976	348.2	17,335	3.64E-11	2.10E-13
1995	0	4.72	2.78	2.50	16,970	349.3	17,329	1.26E-09	7.24E-12
1996	0	4.74	2.79	2.51	17,008	351.5	17,369	1.60E-08	9.23E-11
1997	0.036	4.73	2.78	2.50	16,957	352.7	17,320	1.00E-08	5.79E-11
1998	0.020	4.74	2.78	2.50	16,948	356.5	17,315	-3.92E-09	-2.26E-11
1999	0.134	4.72	2.78	2.50	16,964	346.1	17,321	7.28E-12	4.20E-14
2000	0.074	4.73	2.79	2.50	17,021	343.0	17,374	4.74E-09	2.73E-11
2001	0.033	4.72	2.78	2.49	16,978	340.4	17,329	-1.46E-11	-8.40E-14
2002	0.069	4.73	2.78	2.49	16,979	341.0	17,330	-3.64E-12	-2.10E-14
2003	0	4.74	2.78	2.49	16,973	342.6	17,326	3.64E-11	2.10E-13
2004	0.014	4.77	2.79	2.53	17,008	347.2	17,366	1.82E-11	1.05E-13
2005	0	4.77	2.78	2.52	16,948	349.1	17,307	-3.24E-10	-1.87E-12
2006	1.89E-05	4.77	2.78	2.52	16,939	350.2	17,300	-7.28E-12	-4.21E-14
2007	0.198	4.75	2.78	2.51	16,953	347.2	17,310	9.09E-11	5.25E-13
2008	0	4.77	2.79	2.53	16,992	349.5	17,352	9.09E-10	5.24E-12
2009	0.035	4.75	2.78	2.50	16,945	347.9	17,303	1.39E-08	8.01E-11
2010	3.16E-04	4.77	2.78	2.49	16,927	353.3	17,290	-3.82E-09	-2.21E-11
2011	0	4.80	2.78	2.49	16,898	360.8	17,269	2.87E-10	1.66E-12
2012	2.63E-05	4.82	2.79	2.50	16,933	364.4	17,307	9.49E-09	5.48E-11
2013	0.009	4.81	2.78	2.49	16,883	364.2	17,258	-7.79E-10	-4.51E-12
2014	0.010	4.80	2.78	2.48	16,884	363.7	17,257	-2.83E-09	-1.64E-11
2015	0.149	4.79	2.78	2.48	16,892	361.8	17,264	-2.47E-08	-1.43E-10
2016	0.140	4.79	2.79	2.49	16,946	360.5	17,317	2.63E-08	1.52E-10
2017	0.064	4.77	2.78	2.48	16,903	358.5	17,272	-1.70E-09	-9.84E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the

Appendix J Table J-8.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	643.4	3,510	40,896	3,511	254.6	231.8	49,047
1980	0	294.4	3,637	41,087	3,531	341.4	0	48,891
1981	0	307.8	3,624	40,993	3,523	337.1	0	48,785
1982	8.29	319.2	3,627	40,970	3,521	340.1	0	48,785
1983	7.18	331.5	3,630	40,963	3,520	342.4	0	48,795
1984	6.10	343.1	3,643	41,061	3,529	344.1	0	48,926
1985	0	352.9	3,631	40,977	3,522	339.7	0	48,822
1986	1.75	353.1	3,632	40,985	3,522	340.6	0	48,834
1987	0.002	359.7	3,631	40,988	3,522	340.0	0	48,841
1988	13.2	361.4	3,642	41,055	3,528	342.0	0	48,942
1989	10.7	353.0	3,634	40,938	3,518	342.3	0	48,797
1990	5.80	348.7	3,636	40,965	3,520	343.6	0	48,819
1991	8.72	342.9	3,638	40,988	3,522	346.1	0	48,846
1992	2.05	344.2	3,648	41,118	3,533	346.7	0	48,993
1993	15.0	339.4	3,640	40,974	3,521	347.3	0	48,836
1994	9.12	335.8	3,641	40,977	3,522	348.2	0	48,833
1995	14.7	330.7	3,642	40,960	3,521	349.3	0	48,817
1996	20.0	325.8	3,654	41,046	3,528	351.5	0	48,926
1997	7.41	323.9	3,646	40,972	3,522	352.7	0	48,825
1998	13.3	317.2	3,650	40,989	3,523	356.5	0	48,849
1999	9.60	317.5	3,640	40,950	3,520	346.1	0	48,784
2000	3.54	313.1	3,645	41,065	3,531	343.0	0	48,900
2001	4.18	310.8	3,632	40,945	3,521	340.4	0	48,753
2002	4.81	303.9	3,631	40,986	3,524	341.0	0	48,792
2003	13.4	295.0	3,632	40,974	3,523	342.6	0	48,780
2004	22.9	276.7	3,645	41,109	3,535	347.2	0	48,936
2005	36.5	264.9	3,637	40,951	3,522	349.1	0	48,760
2006	24.8	263.2	3,638	40,928	3,520	350.2	0	48,725
2007	0	279.5	3,635	40,994	3,526	347.2	0	48,782
2008	18.0	271.7	3,646	41,052	3,531	349.5	0	48,869
2009	5.85	279.6	3,637	40,931	3,521	347.9	0	48,723
2010	24.4	258.8	3,643	40,944	3,523	353.3	0	48,747
2011	54.9	234.7	3,651	40,902	3,520	360.8	0	48,724
2012	26.9	228.4	3,664	41,030	3,532	364.4	0	48,846
2013	10.5	226.6	3,655	40,938	3,524	364.2	0	48,717
2014	2.74	230.9	3,654	40,940	3,523	363.7	0	48,715
2015	0	240.0	3,653	40,988	3,527	361.8	0	48,770
2016	0	249.8	3,661	41,114	3,537	360.5	0	48,923
2017	1.11	252.7	3,650	40,989	3,526	358.5	0	48,777

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	17,294	1,614	12,747	0	17,392	0	49,047	6.10E-06	1.24E-08
1980	0	7.46	17,122	1,803	12,777	4.42	17,024	154.2	48,891	1.12E-06	2.30E-09
1981	21.2	6.13	17,089	1,783	12,743	4.24	16,990	148.4	48,785	-3.36E-04	-6.90E-07
1982	8.49	4.83	17,079	1,805	12,740	3.78	16,986	158.1	48,785	2.08E-08	4.26E-11
1983	9.30	3.50	17,074	1,818	12,737	3.21	16,982	167.3	48,795	-4.54E-07	-9.31E-10
1984	9.28	2.19	17,112	1,830	12,769	2.58	17,027	174.5	48,926	2.39E-05	4.88E-08
1985	24.9	2.14	17,082	1,811	12,739	1.83	16,992	169.9	48,822	1.29E-07	2.64E-10
1986	10.6	2.31	17,091	1,822	12,740	1.31	16,993	173.5	48,834	3.39E-07	6.94E-10
1987	10.5	1.73	17,096	1,821	12,740	1.05	16,997	173.7	48,841	1.26E-05	2.58E-08
1988	2.62	1.97	17,119	1,834	12,769	0.813	17,038	177.3	48,942	2.20E-07	4.49E-10
1989	0.026	2.45	17,063	1,834	12,733	0.740	16,985	179.0	48,797	3.66E-07	7.51E-10
1990	4.16	2.29	17,074	1,839	12,736	0.776	16,982	182.3	48,819	3.30E-05	6.76E-08
1991	4.91	2.35	17,086	1,848	12,738	0.861	16,976	189.1	48,846	-1.29E-06	-2.65E-09
1992	5.60	2.12	17,145	1,848	12,775	0.973	17,024	192.0	48,993	2.42E-06	4.94E-09
1993	0	2.37	17,080	1,848	12,736	1.02	16,971	197.5	48,836	3.65E-06	7.47E-09
1994	0	2.40	17,077	1,849	12,735	1.21	16,966	202.7	48,833	-1.25E-06	-2.56E-09
1995	0	2.38	17,064	1,850	12,732	1.34	16,959	208.3	48,817	3.94E-06	8.08E-09
1996	0	2.33	17,090	1,857	12,763	1.58	16,997	215.2	48,926	1.21E-04	2.47E-07
1997	5.26	1.99	17,057	1,859	12,729	1.77	16,947	223.4	48,825	5.12E-05	1.05E-07
1998	2.65	2.26	17,065	1,873	12,731	2.00	16,938	235.8	48,849	-2.19E-05	-4.48E-08
1999	17.4	2.28	17,047	1,815	12,729	2.17	16,954	216.3	48,784	3.87E-08	7.93E-11
2000	9.69	2.85	17,095	1,805	12,765	2.35	17,010	209.7	48,900	2.61E-05	5.33E-08
2001	4.27	3.56	17,045	1,793	12,729	2.60	16,968	207.0	48,753	-3.01E-07	-6.18E-10
2002	9.51	3.19	17,067	1,795	12,734	2.94	16,969	210.8	48,792	-2.39E-07	-4.90E-10
2003	0	5.55	17,062	1,799	12,732	3.46	16,963	215.5	48,780	-5.35E-07	-1.10E-09
2004	2.12	14.9	17,115	1,813	12,767	5.50	16,998	220.0	48,936	-3.75E-08	-7.67E-11
2005	0	19.0	17,038	1,811	12,724	7.45	16,937	223.5	48,760	-1.94E-06	-3.98E-09
2006	0.002	21.4	17,015	1,807	12,717	8.97	16,929	226.1	48,725	3.59E-08	7.37E-11
2007	27.5	13.8	17,049	1,793	12,721	8.05	16,942	226.9	48,782	3.31E-07	6.79E-10
2008	0	20.3	17,070	1,805	12,751	9.11	16,981	230.9	48,869	4.94E-06	1.01E-08
2009	5.01	7.37	17,013	1,798	12,716	8.20	16,934	241.9	48,723	7.85E-05	1.61E-07
2010	0.056	8.03	17,011	1,821	12,719	8.84	16,916	262.3	48,747	-1.85E-05	-3.79E-08
2011	0	8.33	16,974	1,844	12,715	9.51	16,887	285.7	48,724	2.64E-07	5.42E-10
2012	0	9.56	17,015	1,843	12,746	12.1	16,922	298.1	48,846	5.46E-05	1.12E-07
2013	1.30	8.79	16,972	1,833	12,712	12.6	16,872	305.0	48,717	-1.94E-06	-3.97E-09
2014	1.31	7.89	16,971	1,827	12,713	12.0	16,873	310.2	48,715	-4.64E-06	-9.52E-09
2015	20.4	7.67	16,997	1,818	12,721	11.7	16,881	312.3	48,770	-1.27E-04	-2.61E-07
2016	19.1	7.78	17,058	1,816	12,761	11.5	16,936	313.5	48,923	4.81E-05	9.83E-08
2017	8.67	6.42	17,008	1,811	12,727	10.1	16,892	313.4	48,777	-1.26E-05	-2.57E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	4.13	2.80	2.92	0.078	0	239.1	249.0
1980	0	1.06	1.71	1.41	0.043	154.2	0	158.4
1981	0	1.29	1.69	1.40	0.043	148.4	0	152.8
1982	2.69	1.54	1.73	1.38	0.043	158.1	0	165.5
1983	3.92	1.79	1.79	1.37	0.043	167.3	0	176.2
1984	4.12	1.95	1.84	1.37	0.043	174.5	0	183.8
1985	1.28	2.03	1.84	1.36	0.043	169.9	0	176.4
1986	1.92	2.01	1.85	1.36	0.043	173.5	0	180.6
1987	1.14	2.16	1.86	1.36	0.043	173.7	0	180.3
1988	1.88	2.18	1.89	1.37	0.043	177.3	0	184.6
1989	2.34	2.00	1.89	1.38	0.043	179.0	0	186.6
1990	2.78	1.97	1.90	1.41	0.043	182.3	0	190.4
1991	5.99	1.92	1.93	1.42	0.043	189.1	0	200.4
1992	6.56	1.97	1.95	1.44	0.044	192.0	0	204.0
1993	10.0	1.92	1.98	1.45	0.045	197.5	0	212.9
1994	12.2	1.88	2.02	1.46	0.046	202.7	0	220.3
1995	14.3	1.82	2.08	1.47	0.048	208.3	0	228.0
1996	16.6	1.77	2.15	1.49	0.050	215.2	0	237.3
1997	17.3	1.88	2.22	1.50	0.051	223.4	0	246.3
1998	20.9	1.83	2.31	1.52	0.052	235.8	0	262.4
1999	13.0	1.62	2.28	1.52	0.054	216.3	0	234.8
2000	13.4	1.35	2.26	1.52	0.055	209.7	0	228.3
2001	13.9	1.31	2.26	1.50	0.057	207.0	0	226.0
2002	17.4	1.18	2.30	1.48	0.058	210.8	0	233.2
2003	19.5	1.18	2.36	1.46	0.060	215.5	0	240.1
2004	20.0	1.20	2.43	1.45	0.061	220.0	0	245.2
2005	20.3	1.20	2.49	1.42	0.062	223.5	0	249.0
2006	18.5	1.28	2.55	1.39	0.063	226.1	0	249.9
2007	16.2	1.46	2.61	1.35	0.063	226.9	0	248.6
2008	18.0	1.41	2.68	1.31	0.063	230.9	0	254.4
2009	25.1	1.32	2.76	1.27	0.063	241.9	0	272.4
2010	35.8	1.20	2.88	1.26	0.064	262.3	0	303.6
2011	43.8	1.21	3.05	1.28	0.066	285.7	0	335.1
2012	39.2	1.57	3.22	1.29	0.068	298.1	0	343.5
2013	35.5	1.76	3.36	1.27	0.069	305.0	0	347.0
2014	31.5	1.89	3.48	1.24	0.069	310.2	0	348.3
2015	26.5	2.05	3.58	1.19	0.069	312.3	0	345.8
2016	22.2	2.16	3.66	1.14	0.068	313.5	0	342.7
2017	18.8	2.16	3.70	1.07	0.067	313.4	0	339.3

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	9.82	7.37	0.002	231.8	0	249.0	8.33E-08	3.35E-08
1980	0	7.23	3.92	0.018	0	147.3	158.4	-1.86E-08	-1.18E-08
1981	3.39	6.90	3.87	0.018	0	138.6	152.8	-1.75E-08	-1.15E-08
1982	1.10	8.27	3.83	0.018	0	152.3	165.5	2.01E-10	1.22E-10
1983	1.01	8.94	3.78	0.018	0	162.5	176.2	1.88E-09	1.07E-09
1984	0.540	9.24	3.75	0.017	0	170.2	183.8	8.58E-09	4.67E-09
1985	2.36	8.54	3.76	0.017	0	161.7	176.4	1.21E-09	6.87E-10
1986	0.925	9.11	3.74	0.016	0	166.8	180.6	2.15E-09	1.19E-09
1987	1.56	9.14	3.70	0.015	0	165.8	180.3	1.02E-08	5.68E-09
1988	0.913	9.50	3.69	0.014	0	170.5	184.6	8.25E-10	4.47E-10
1989	0.365	9.43	3.70	0.013	0	173.1	186.6	7.16E-09	3.84E-09
1990	0.210	9.54	3.71	0.012	0	176.9	190.4	2.57E-09	1.35E-09
1991	0	9.80	3.71	0.011	0	186.9	200.4	9.01E-10	4.49E-10
1992	0.040	9.51	3.70	0.009	0	190.7	204.0	2.07E-09	1.01E-09
1993	0	9.62	3.68	0.007	0	199.6	212.9	6.24E-09	2.93E-09
1994	0	9.49	3.66	0.004	0	207.1	220.3	6.17E-09	2.80E-09
1995	0	9.38	3.66	0.001	0	215.0	228.0	-8.33E-10	-3.65E-10
1996	0	9.30	3.66	4.85E-04	0	224.3	237.3	-1.67E-09	-7.06E-10
1997	0	9.55	3.63	6.93E-04	0	233.2	246.3	5.47E-09	2.22E-09
1998	0	9.86	3.63	9.95E-04	0	248.9	262.4	5.73E-09	2.19E-09
1999	3.74	6.98	3.64	0.002	0	220.4	234.8	5.96E-10	2.54E-10
2000	1.77	6.56	3.67	0.005	0	216.3	228.3	1.61E-08	7.03E-09
2001	0.792	6.38	3.66	0.008	0	215.2	226.0	-9.88E-11	-4.37E-11
2002	0.048	6.37	3.66	0.014	0	223.1	233.2	1.34E-09	5.73E-10
2003	2.57E-04	6.33	3.65	0.019	0	230.0	240.1	4.49E-10	1.87E-10
2004	0.003	6.30	3.64	0.024	0	235.2	245.2	2.31E-09	9.43E-10
2005	0.001	6.25	3.60	0.028	0	239.1	249.0	-3.50E-11	-1.41E-11
2006	0.017	6.13	3.57	0.032	0	240.2	249.9	1.73E-10	6.91E-11
2007	0.562	5.93	3.53	0.034	0	238.5	248.6	7.16E-10	2.88E-10
2008	0.005	6.00	3.54	0.041	0	244.8	254.4	4.63E-10	1.82E-10
2009	0	6.16	3.56	0.057	0	262.6	272.4	5.49E-09	2.01E-09
2010	0	6.73	3.64	0.079	0	293.1	303.6	-1.69E-10	-5.55E-11
2011	0	7.10	3.71	0.105	0	324.2	335.1	4.41E-09	1.32E-09
2012	0.002	6.60	3.67	0.123	0	333.1	343.5	1.01E-08	2.95E-09
2013	0.009	6.30	3.63	0.134	0	336.9	347.0	-2.07E-09	-5.96E-10
2014	0.070	6.08	3.60	0.139	0	338.4	348.3	1.35E-08	3.86E-09
2015	0.604	5.85	3.58	0.138	0	335.6	345.8	-8.69E-09	-2.51E-09
2016	1.03	5.71	3.58	0.134	0	332.3	342.7	3.74E-08	1.09E-08
2017	0.606	5.66	3.57	0.128	0	329.3	339.3	1.99E-11	5.86E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the

Appendix J Table J-8.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	111.7	32.0	4,144	69.2	0	360.3	4,718
1980	0	78.4	99.4	17.7	313.5	0	147.3	238.9	895.1
1981	0	77.5	511.7	12.6	331.1	0	138.6	152.8	1,224
1982	558.8	79.6	768.0	44.0	385.7	0	152.3	296.1	2,284
1983	543.6	81.5	1,151	95.9	668.1	4.39	162.5	392.1	3,099
1984	512.3	83.7	1,388	133.3	482.1	0	170.2	515.1	3,285
1985	12.3	82.3	1,398	107.9	848.0	8.50	161.7	341.8	2,960
1986	177.5	82.1	1,307	125.6	993.2	9.88	166.8	399.7	3,262
1987	47.1	81.6	1,573	147.0	1,121	12.0	165.8	381.9	3,529
1988	186.4	82.1	1,560	168.0	1,066	8.50	170.5	463.7	3,705
1989	263.0	82.2	1,272	156.2	794.1	2.01	173.1	545.1	3,287
1990	288.1	82.9	1,291	159.6	815.5	3.23	176.9	567.6	3,385
1991	1,134	87.5	1,365	182.0	54.1	0	186.9	1,013	4,023
1992	1,100	93.8	1,654	198.1	4.14	0	190.7	1,202	4,443
1993	1,494	101.7	1,712	220.0	0	0	199.6	1,432	5,159
1994	1,551	110.7	1,768	239.6	0	0	207.1	1,575	5,451
1995	1,573	119.8	1,807	255.9	0	0	215.0	1,635	5,605
1996	1,606	129.0	1,902	274.4	0	0	224.3	1,677	5,812
1997	1,222	135.7	2,203	314.9	0	0	233.2	1,411	5,520
1998	1,895	144.5	2,229	350.8	0	0	248.9	1,803	6,671
1999	596.3	147.4	2,012	240.2	0	0	220.4	1,391	4,607
2000	1,124	154.7	1,882	177.4	0	0	216.3	1,598	5,151
2001	1,060	161.7	2,102	165.2	0	0	215.2	1,490	5,193
2002	1,656	171.2	2,097	169.8	0	0	223.1	1,752	6,069
2003	1,567	180.7	2,307	192.0	0	0	230.0	1,733	6,210
2004	1,244	189.3	2,545	220.1	0	0	235.2	1,584	6,018
2005	1,112	195.7	2,674	243.3	0	0	239.1	1,506	5,970
2006	652.5	200.4	2,898	266.6	0	0	240.2	1,285	5,543
2007	467.1	204.1	3,257	291.1	0	0	238.5	1,193	5,651
2008	1,195	211.1	3,258	303.9	0	0	244.8	1,547	6,760
2009	2,827	224.1	3,151	316.8	0	0	262.6	2,435	9,216
2010	4,014	242.8	2,736	338.2	0	0	293.1	3,106	10,730
2011	4,418	264.3	2,818	386.6	0	0	324.2	3,517	11,728
2012	2,366	280.4	4,027	467.7	0	0	333.1	2,738	10,212
2013	1,580	290.5	4,454	511.2	0	0	336.9	2,371	9,544
2014	937.4	297.3	4,734	535.5	0	0	338.4	2,034	8,877
2015	465.9	299.9	4,998	552.4	0.502	0	335.6	1,628	8,281
2016	188.3	301.0	5,156	558.7	1.86	0	332.3	1,418	7,956
2017	91.3	299.5	5,107	553.2	2.30	0	329.3	1,314	7,696

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	211.1	2,880	642.9	9.41	0	239.1	734.7	4,718	1.11E-04	2.36E-06
1980	0	459.4	0	233.7	79.5	93.7	4.36	0	24.5	895.1	-3.26E-05	-3.64E-06
1981	451.2	410.3	0	111.8	68.8	79.3	3.10	0	99.8	1,224	7.54E-06	6.16E-07
1982	61.0	1,176	0	893.0	30.7	72.7	2.06	0	48.5	2,284	1.33E-06	5.84E-08
1983	117.3	1,498	0	1,372	11.9	6.30	0	0	93.4	3,099	1.57E-05	5.06E-07
1984	0	1,570	0	1,580	3.57	106.0	1.94	0	23.4	3,285	2.37E-05	7.22E-07
1985	463.3	1,175	0	1,171	4.28	4.11	0	0	142.4	2,960	7.69E-06	2.60E-07
1986	114.3	1,501	0	1,514	2.48	2.09	0	0	127.4	3,262	1.47E-05	4.50E-07
1987	198.9	1,614	0	1,564	0.199	1.38	0	0	151.1	3,529	5.62E-06	1.59E-07
1988	27.3	1,805	0	1,772	0	1.98	0	0	97.6	3,705	3.15E-06	8.50E-08
1989	4.85	1,545	0	1,693	0	8.69	0	0	35.9	3,287	4.73E-05	1.44E-06
1990	0	1,580	0	1,744	0.163	11.8	0	0	48.9	3,385	5.08E-06	1.50E-07
1991	0	1,718	0	1,888	0.220	393.5	24.0	0	0	4,023	4.90E-06	1.22E-07
1992	7.11	1,571	0	1,708	0.628	1,119	37.8	0	0	4,443	1.47E-07	3.31E-09
1993	0	1,661	0	1,793	1.58	1,654	49.0	0	0	5,159	3.88E-05	7.52E-07
1994	0	1,599	0	1,716	2.45	2,076	58.2	0	0	5,451	4.41E-05	8.09E-07
1995	0	1,554	0	1,644	3.32	2,343	61.1	0	0	5,605	-1.87E-05	-3.34E-07
1996	0	1,552	0	1,579	4.16	2,615	61.2	0	0	5,812	3.38E-05	5.82E-07
1997	0	1,740	0	1,775	4.98	1,958	42.2	0	0	5,520	5.21E-06	9.44E-08
1998	0	1,841	0	1,955	5.81	2,808	61.1	0	0	6,671	4.53E-05	6.79E-07
1999	793.6	154.1	0	261.4	3.91	3,324	70.5	0	0	4,607	3.95E-06	8.56E-08
2000	199.9	200.6	0	118.6	4.23	4,531	94.6	0	2.28	5,151	9.73E-05	1.89E-06
2001	86.3	162.0	0	105.3	5.15	4,715	92.8	0	27.0	5,193	-1.09E-06	-2.11E-08
2002	3.05	202.8	0	141.2	6.38	5,582	108.7	0	24.8	6,069	8.62E-06	1.42E-07
2003	0.244	173.6	0	136.4	7.60	5,738	107.5	0	46.4	6,210	1.66E-06	2.67E-08
2004	2.27	154.7	0	121.0	8.57	5,555	98.5	0	78.1	6,018	1.51E-05	2.51E-07
2005	1.04	154.3	0	115.9	9.74	5,498	94.6	0	96.0	5,970	-2.53E-07	-4.23E-09
2006	8.56	128.7	0	97.3	11.5	5,073	82.6	0	141.0	5,543	1.29E-06	2.32E-08
2007	68.8	96.1	0	95.8	15.8	5,112	82.0	0	180.2	5,651	4.44E-06	7.86E-08
2008	0.598	141.3	0	127.9	16.3	6,239	108.7	0	125.4	6,760	1.41E-06	2.09E-08
2009	0	193.7	0	209.9	14.5	8,578	163.5	0	56.4	9,216	1.26E-05	1.37E-07
2010	0	308.7	0	272.3	14.1	9,919	191.9	0	24.4	10,730	1.33E-05	1.24E-07
2011	0	308.7	0	321.3	16.4	10,848	207.6	0	26.4	11,728	2.64E-05	2.25E-07
2012	5.65	344.5	0	198.6	17.8	9,346	160.2	0	138.9	10,212	4.74E-05	4.65E-07
2013	3.31	341.4	0	168.7	18.3	8,670	139.9	0	202.6	9,544	8.29E-07	8.68E-09
2014	35.5	299.3	0	146.2	19.1	7,984	123.0	0	270.0	8,877	1.24E-04	1.40E-06
2015	323.9	377.5	0	117.3	22.7	6,972	100.9	0	366.8	8,281	8.67E-07	1.05E-08
2016	372.3	321.6	0	104.7	26.5	6,618	93.5	0	419.7	7,956	7.03E-07	8.83E-09
2017	256.7	377.0	0	98.8	29.0	6,417	91.2	0	426.7	7,696	-1.72E-06	-2.23E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	8.56	1.60	614.8	2.06	734.7	60.6	1,422
1980	0	73.9	5.02	16.0	60.3	0	24.5	100.2	279.9
1981	0	73.3	60.8	15.9	51.1	0	99.8	71.9	372.7
1982	44.9	73.9	76.6	16.0	50.7	0	48.5	134.1	444.8
1983	76.5	74.6	107.9	16.6	73.6	0.111	93.4	173.8	616.5
1984	113.2	76.1	124.9	17.6	58.5	0	23.4	210.6	624.3
1985	30.5	75.6	151.2	18.3	85.7	0.229	142.4	138.9	642.8
1986	39.7	75.2	127.2	19.1	109.3	0.272	127.4	146.6	644.7
1987	26.6	74.7	156.3	19.8	123.3	0.335	151.1	139.2	691.3
1988	38.0	75.0	148.9	20.6	125.1	0.233	97.6	159.2	664.7
1989	106.0	75.2	115.2	21.3	109.6	0.044	35.9	210.2	673.5
1990	105.9	75.8	115.0	22.0	104.5	0.078	48.9	223.3	695.5
1991	424.8	79.4	102.2	22.9	33.5	0	0	489.6	1,152
1992	541.8	84.8	135.8	24.0	1.81	0	0	605.4	1,394
1993	694.3	91.3	139.5	25.2	0.231	0	0	754.7	1,705
1994	786.7	98.9	147.2	26.7	0	0	0	854.6	1,914
1995	824.2	106.6	153.4	28.5	0	0	0	909.0	2,022
1996	845.1	114.6	164.5	30.7	0	0	0	950.0	2,105
1997	651.0	120.0	206.6	33.1	0.119	0	0	806.1	1,817
1998	894.9	127.3	190.3	36.0	0	0	0	1,028	2,276
1999	688.8	132.9	220.2	38.2	0	0	0	820.5	1,901
2000	852.3	140.4	216.0	39.7	0	0	2.28	950.7	2,201
2001	775.3	147.0	254.4	40.7	0	0	27.0	896.6	2,141
2002	949.2	155.4	252.0	41.8	0	0	24.8	1,066	2,490
2003	917.6	163.7	279.1	43.3	0	0	46.4	1,064	2,514
2004	788.9	171.3	312.0	45.2	0	0	78.1	973.4	2,369
2005	717.2	177.0	329.0	47.3	0	0	96.0	921.8	2,288
2006	530.9	181.5	363.2	49.8	0	0	141.0	773.6	2,040
2007	444.2	185.2	416.8	52.4	0	0	180.2	697.0	1,976
2008	700.6	191.8	404.2	55.1	0	0	125.4	908.7	2,386
2009	1,343	203.0	377.5	57.7	0	0	56.4	1,474	3,512
2010	1,828	218.7	351.7	61.0	0	0	24.4	1,943	4,427
2011	2,091	236.6	377.5	65.1	0	0	26.4	2,229	5,025
2012	1,445	250.4	503.3	70.4	0	0	138.9	1,730	4,137
2013	1,124	259.4	554.9	75.7	0	0	202.6	1,472	3,689
2014	842.6	266.1	593.8	81.3	0	0	270.0	1,240	3,294
2015	590.3	269.4	640.1	86.7	0	0	366.8	975.0	2,928
2016	432.5	271.6	667.6	91.8	0	0	419.7	823.7	2,707
2017	332.8	271.4	662.0	95.8	0.961	0	426.7	741.2	2,531

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	Lower Layers			
												%
Predevelopment	0	0	196.0	379.7	105.8	0	0	360.3	380.6	1,422	3.94E-05	2.77E-06
1980	0	0.311	0	23.1	3.05	6.74	0.142	238.9	7.63	279.9	-1.08E-05	-3.84E-06
1981	120.4	0.235	0	2.86	2.94	3.71	0.106	152.8	89.6	372.7	2.34E-06	6.28E-07
1982	56.9	0.226	0	35.2	2.74	1.75	0.076	296.1	51.9	444.8	4.20E-07	9.45E-08
1983	83.1	0.117	0	65.3	2.39	0.285	0	392.1	73.2	616.5	4.97E-06	8.06E-07
1984	12.9	0.244	0	82.3	1.96	0.450	0.071	515.1	11.3	624.3	8.46E-06	1.35E-06
1985	124.6	0.117	0	67.2	1.64	0.245	0	341.8	107.2	642.8	2.43E-06	3.78E-07
1986	84.9	0.117	0	83.8	1.32	0.222	0	399.7	74.6	644.7	4.64E-06	7.19E-07
1987	117.3	0.117	0	84.8	0.994	0.194	0	381.9	106.0	691.3	1.82E-06	2.63E-07
1988	45.9	0.160	0	100.5	0.735	0.218	0	463.7	53.5	664.7	9.88E-07	1.49E-07
1989	5.57	0.159	0	112.2	0.542	0.294	0	545.1	9.65	673.5	1.49E-05	2.21E-06
1990	0.307	0.117	0	114.5	0.389	0.269	0	567.6	12.3	695.5	1.65E-06	2.37E-07
1991	0	0.159	0	114.9	0.264	22.6	0.709	1,013	0.593	1,152	1.56E-06	1.36E-07
1992	0	0.059	0	98.8	0.136	90.7	1.11	1,202	0.546	1,394	4.46E-08	3.20E-09
1993	0	0.059	0	100.1	0.044	171.2	1.44	1,432	0.475	1,705	1.22E-05	7.16E-07
1994	0	0.117	0	96.2	0	240.5	1.71	1,575	0.443	1,914	1.35E-05	7.03E-07
1995	0	0.117	0	91.7	0	292.7	1.80	1,635	0.431	2,022	-5.97E-06	-2.95E-07
1996	0	0.244	0	87.2	0	338.6	1.81	1,677	0.431	2,105	1.06E-05	5.05E-07
1997	0	0.168	0	94.3	0	309.3	1.26	1,411	0.443	1,817	1.64E-06	9.04E-08
1998	0	0.168	0	104.4	0	366.9	1.80	1,803	0.469	2,276	1.43E-05	6.26E-07
1999	33.7	0.159	0	28.7	0	433.8	2.08	1,391	11.2	1,901	1.24E-06	6.54E-08
2000	26.9	0.218	0	14.5	0	554.0	2.78	1,598	5.55	2,201	3.06E-05	1.39E-06
2001	21.0	0.159	0	9.39	0	615.4	2.73	1,490	2.49	2,141	-3.21E-07	-1.50E-08
2002	8.52	0.218	0	16.0	0	708.6	3.20	1,752	0.889	2,490	2.73E-06	1.10E-07
2003	3.42	0.159	0	13.9	0	759.7	3.17	1,733	0.951	2,514	5.16E-07	2.05E-08
2004	1.33	0.160	0	7.93	0	771.2	2.91	1,584	1.02	2,369	4.76E-06	2.01E-07
2005	0.399	0.159	0	5.02	0	773.4	2.79	1,506	1.11	2,288	-6.93E-08	-3.03E-09
2006	0.386	0.117	0	0.233	0.053	745.7	2.45	1,285	5.98	2,040	3.96E-07	1.94E-08
2007	14.9	0.101	0	0.013	0.115	744.6	2.43	1,193	20.5	1,976	1.40E-06	7.09E-08
2008	0.268	0.160	0	0.585	0.175	832.6	3.20	1,547	1.48	2,386	4.50E-07	1.89E-08
2009	0	0.218	0	26.4	0.244	1,044	4.79	2,435	1.58	3,512	3.97E-06	1.13E-07
2010	0	0.318	0	90.4	0.337	1,222	5.63	3,106	1.65	4,427	4.18E-06	9.44E-08
2011	0	0.318	0	131.7	0.460	1,368	6.10	3,517	1.71	5,025	8.31E-06	1.65E-07
2012	0.236	0.361	0	59.3	0.605	1,332	4.73	2,738	1.83	4,137	1.49E-05	3.61E-07
2013	0.144	0.360	0	29.8	0.751	1,276	4.14	2,371	5.86	3,689	1.20E-07	3.24E-09
2014	10.9	0.318	0	14.1	0.889	1,208	3.65	2,034	21.9	3,294	3.91E-05	1.19E-06
2015	114.0	0.377	0	7.33	1.01	1,107	3.00	1,628	67.0	2,928	2.93E-07	1.00E-08
2016	144.4	0.319	0	3.01	1.10	1,044	2.78	1,418	93.5	2,707	1.93E-07	7.12E-09
2017	120.3	0.377	0	1.11	1.15	998.4	2.71	1,314	93.2	2,531	2.16E-08	8.54E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers	
	(acre-feet)							
Predevelopment	0	0	2.38	2.64	89.3	1.30	380.6	476.2
1980	0	73.7	0.851	19.6	8.89	0	7.63	110.6
1981	0	73.2	6.69	19.3	8.64	0	89.6	197.4
1982	46.3	73.7	6.95	19.5	9.04	0	51.9	207.4
1983	85.4	74.3	11.0	20.4	13.6	0.068	73.2	278.0
1984	124.4	75.8	14.5	21.8	10.4	0	11.3	258.2
1985	42.1	75.3	17.5	22.9	16.4	0.142	107.2	281.6
1986	48.4	75.0	16.4	24.0	19.6	0.170	74.6	258.3
1987	35.0	74.5	19.7	25.1	22.3	0.210	106.0	282.9
1988	46.0	74.7	20.2	26.3	21.5	0.147	53.5	242.4
1989	107.7	75.0	18.1	27.4	17.3	0.029	9.65	255.2
1990	112.2	75.6	18.7	28.4	16.7	0.049	12.3	264.0
1991	407.9	79.1	18.7	29.7	3.61	0	0.593	539.6
1992	528.5	84.4	21.9	31.3	0.190	0	0.546	666.9
1993	684.6	90.8	22.6	32.9	0.038	0	0.475	831.4
1994	785.8	98.3	23.6	35.0	0	0	0.443	943.2
1995	836.6	106.1	24.5	37.4	0	0	0.431	1,005
1996	871.0	113.9	25.6	40.1	0	0	0.431	1,051
1997	708.4	119.3	29.6	43.2	0.006	0	0.443	900.9
1998	935.5	126.6	29.7	47.0	0	0	0.469	1,139
1999	723.2	132.3	30.9	49.6	0	0	11.2	947.2
2000	858.4	139.8	29.3	51.1	0	0	5.55	1,084
2001	795.0	146.4	31.6	51.7	0	0	2.49	1,027
2002	960.1	154.7	30.3	52.6	0	0	0.889	1,199
2003	946.2	163.0	32.0	54.0	0	0	0.951	1,196
2004	837.6	170.5	35.0	56.0	0	0	1.02	1,100
2005	772.9	176.2	36.9	58.3	0	0	1.11	1,045
2006	600.3	180.7	40.6	61.2	0	0	5.98	888.7
2007	507.8	184.5	46.7	64.2	0	0	20.5	823.6
2008	732.8	191.0	47.0	67.5	0	0	1.48	1,040
2009	1,331	202.1	44.3	70.7	0	0	1.58	1,650
2010	1,824	217.6	45.0	74.8	0	0	1.65	2,163
2011	2,118	235.3	50.0	80.0	0	0	1.71	2,485
2012	1,564	249.1	60.8	86.7	0	0	1.83	1,962
2013	1,262	258.1	66.2	93.4	0	0	5.86	1,685
2014	985.9	264.9	70.4	100.4	0	0	21.9	1,443
2015	723.9	268.3	75.1	107.0	0	0	67.0	1,241
2016	548.5	270.5	78.5	113.3	0	0	93.5	1,104
2017	431.2	270.4	79.2	118.2	0.058	0	93.2	992.3

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-8.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
McMullen GCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Evergreen UWCD	Live Oak UWCD	Wintergarden GCD	Webb	Upper Layers			
	(acre-feet)										%
Predevelopment	0	0	195.5	86.0	134.0	0	0	60.6	476.2	1.15E-05	2.42E-06
1980	0	0.067	0	4.54	4.41	1.36	0.090	100.2	110.6	-2.62E-06	-2.37E-06
1981	118.3	0.050	0	1.97	4.30	0.915	0.067	71.9	197.4	2.61E-07	1.32E-07
1982	56.6	0.050	0	12.1	3.98	0.598	0.048	134.1	207.4	4.65E-08	2.24E-08
1983	77.1	0.025	0	23.4	3.42	0.261	0	173.8	278.0	5.49E-07	1.98E-07
1984	13.5	0.050	0	30.9	2.71	0.360	0.044	210.6	258.2	1.23E-06	4.76E-07
1985	113.8	0.025	0	26.5	2.14	0.233	0	138.9	281.6	2.72E-07	9.66E-08
1986	79.0	0.025	0	30.8	1.72	0.215	0	146.6	258.3	5.17E-07	2.00E-07
1987	109.9	0.025	0	32.3	1.29	0.194	0	139.2	282.9	2.08E-07	7.36E-08
1988	45.6	0.034	0	36.4	0.924	0.208	0	159.2	242.4	1.09E-07	4.49E-08
1989	6.13	0.034	0	37.9	0.650	0.258	0	210.2	255.2	1.65E-06	6.46E-07
1990	0.373	0.025	0	39.6	0.440	0.244	0	223.3	264.0	1.96E-07	7.43E-08
1991	0	0.034	0	43.0	0.258	6.19	0.440	489.6	539.6	1.82E-07	3.37E-08
1992	0	0.008	0	41.3	0.137	19.3	0.697	605.4	666.9	5.22E-09	7.82E-10
1993	0	0.008	0	42.5	0.037	33.2	0.905	754.7	831.4	1.35E-06	1.62E-07
1994	0	0.025	0	42.2	0	45.2	1.07	854.6	943.2	1.40E-06	1.49E-07
1995	0	0.025	0	41.6	0	53.2	1.13	909.0	1,005	-6.57E-07	-6.54E-08
1996	0	0.050	0	41.0	0	59.0	1.14	950.0	1,051	1.17E-06	1.11E-07
1997	0	0.034	0	44.0	0	50.0	0.798	806.1	900.9	1.87E-07	2.07E-08
1998	0	0.034	0	49.0	0	61.4	1.13	1,028	1,139	1.58E-06	1.38E-07
1999	31.2	0.034	0	22.1	0	72.1	1.31	820.5	947.2	1.38E-07	1.45E-08
2000	28.3	0.042	0	9.78	0	93.5	1.74	950.7	1,084	3.39E-06	3.13E-07
2001	23.4	0.034	0	4.54	0	101.0	1.72	896.6	1,027	-2.87E-08	-2.79E-09
2002	10.6	0.042	0	2.87	0	116.9	2.01	1,066	1,199	3.05E-07	2.55E-08
2003	4.61	0.034	0	1.93	0	123.1	1.99	1,064	1,196	4.53E-08	3.79E-09
2004	1.84	0.034	0	1.33	0	121.7	1.83	973.4	1,100	5.30E-07	4.82E-08
2005	0.554	0.034	0	1.05	0	120.2	1.76	921.8	1,045	-5.32E-09	-5.09E-10
2006	0.409	0.025	0	0.391	0.021	112.7	1.55	773.6	888.7	4.40E-08	4.95E-09
2007	13.9	0.025	0	0.063	0.102	111.0	1.53	697.0	823.6	1.55E-07	1.89E-08
2008	0.378	0.034	0	0.027	0.180	128.5	2.01	908.7	1,040	5.05E-08	4.86E-09
2009	0	0.042	0	2.14	0.266	170.4	3.01	1,474	1,650	4.39E-07	2.66E-08
2010	0	0.059	0	13.3	0.380	203.3	3.54	1,943	2,163	4.62E-07	2.14E-08
2011	0	0.067	0	23.4	0.532	228.0	3.83	2,229	2,485	9.18E-07	3.70E-08
2012	0.123	0.076	0	17.9	0.714	210.3	2.99	1,730	1,962	1.65E-06	8.41E-08
2013	0.134	0.075	0	14.0	0.900	195.6	2.61	1,472	1,685	-6.96E-08	-4.13E-09
2014	8.74	0.067	0	10.3	1.08	180.4	2.30	1,240	1,443	4.32E-06	2.99E-07
2015	96.3	0.075	0	6.79	1.23	160.0	1.90	975.0	1,241	2.33E-08	1.88E-09
2016	125.9	0.067	0	3.67	1.35	147.9	1.76	823.7	1,104	2.47E-08	2.23E-09
2017	105.9	0.075	0	1.68	1.43	140.2	1.72	741.2	992.3	9.34E-09	9.41E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Evergreen UWCD	Uvalde County UWCD	Wintergarden GCD	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	23,825	3,533	92.7	8.06	0.338	23,657	51,116
1980	0	0	26,424	3,334	24.1	6.91	0	21,725	51,514
1981	0	0	25,681	4,274	23.9	6.75	0	22,021	52,007
1982	0.185	118.6	25,883	2,888	24.0	6.88	0	21,929	50,849
1983	0.128	69.2	25,834	2,960	24.0	6.89	0	21,935	50,829
1984	0.880	550.4	27,255	2,515	24.4	7.06	0	21,338	51,690
1985	0	0	25,663	4,030	23.9	6.80	0	22,031	51,755
1986	2.43E-06	0.032	25,333	3,806	23.8	6.76	0	22,240	51,409
1987	0	0	25,107	3,851	23.8	6.69	0	22,391	51,380
1988	0.769	456.4	25,669	1,781	24.1	6.96	0	22,163	50,102
1989	0.364	192.1	25,565	2,367	24.2	6.96	0	22,077	50,233
1990	0	0	25,216	3,519	23.9	6.84	0	22,277	51,044
1991	0	0	24,961	4,199	23.9	6.76	0	22,473	51,664
1992	0	0	24,787	4,739	24.0	6.70	0	22,759	52,316
1993	0.247	192.6	25,093	3,031	24.2	6.87	0	22,485	50,833
1994	0.097	93.4	25,335	3,823	24.2	6.86	0	22,222	51,505
1995	0.722	473.5	25,800	2,958	24.5	7.00	0	21,966	51,229
1996	1.29	774.1	26,411	2,100	25.3	7.19	0	21,765	51,085
1997	0.012	11.7	25,687	4,119	24.5	6.96	0	22,024	51,873
1998	0.002	2.55	25,589	4,128	24.6	6.94	0	22,107	51,858
1999	0.826	468.2	26,154	2,366	25.7	7.15	0	21,858	50,880
2000	0.112	71.8	26,165	3,590	25.7	7.12	0	21,921	51,781
2001	0.245	132.3	26,181	3,221	25.7	7.15	0	21,854	51,422
2002	9.11E-05	0.091	25,622	5,476	24.8	6.92	0	22,129	53,259
2003	0.031	64.9	25,876	3,994	25.3	7.05	0	22,053	52,020
2004	3.88E-05	0.047	25,508	5,245	24.8	6.93	0	22,364	53,149
2005	0.883	529.6	26,130	2,649	26.2	7.18	0	21,975	51,318
2006	0.923	478.6	26,336	2,369	26.2	7.28	0	21,862	51,080
2007	5.18E-05	0.055	25,253	5,672	24.7	6.89	0	22,414	53,371
2008	1.03	640.3	26,290	2,250	26.4	7.27	0	22,001	51,215
2009	0.451	243.7	26,423	3,234	26.5	7.27	0	21,804	51,739
2010	0.169	109.0	26,693	4,029	26.5	7.28	0	21,687	52,551
2011	1.38	734.9	27,766	1,863	28.5	7.61	0	21,366	51,767
2012	0.261	123.5	26,971	3,214	27.7	7.49	0	21,760	52,104
2013	0.085	38.1	26,573	3,517	27.3	7.41	0	21,827	51,990
2014	0.187	85.2	26,595	3,123	27.7	7.43	0	21,812	51,650
2015	4.23E-05	0.217	25,679	5,162	26.1	7.13	0	22,255	53,130
2016	4.35E-06	0.013	25,520	4,922	25.9	7.07	0	22,463	52,939
2017	0.009	18.9	25,553	4,020	26.1	7.10	0	22,359	51,983

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Evergreen UWCD	Uvalde County UWCD	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	24,447	686.4	85.6	0.305	25,897	51,116	1.25E-07	2.44E-10
1980	0	0	21,817	179.8	37.3	0.008	29,480	51,514	-1.65E-07	-3.20E-10
1981	0.724	456.7	22,121	200.8	37.4	0.067	29,191	52,007	-1.08E-06	-2.07E-09
1982	0.065	54.8	21,986	193.4	38.5	0.083	28,577	50,849	-1.03E-06	-2.03E-09
1983	0.070	59.1	21,997	189.6	37.7	0.039	28,546	50,829	-9.42E-07	-1.85E-09
1984	0	0	21,431	165.0	37.9	0.002	30,056	51,690	7.95E-07	1.54E-09
1985	0.651	417.2	22,097	186.4	36.1	0.010	29,017	51,755	-9.03E-07	-1.74E-09
1986	0.614	415.6	22,295	203.1	37.1	0.045	28,457	51,409	-1.40E-06	-2.72E-09
1987	0.692	471.8	22,461	219.6	38.2	0.088	28,188	51,380	-4.61E-07	-8.97E-10
1988	0.053	48.2	22,170	192.8	38.7	0.106	27,651	50,102	8.84E-07	1.76E-09
1989	0.077	68.8	22,106	183.0	37.0	0	27,838	50,233	-6.20E-07	-1.24E-09
1990	0.490	347.5	22,341	197.4	35.6	0	28,122	51,044	-8.26E-07	-1.62E-09
1991	0.939	625.9	22,575	223.3	37.1	0.073	28,201	51,664	-6.47E-07	-1.25E-09
1992	1.36	852.8	22,894	259.2	39.5	0.149	28,269	52,316	5.16E-07	9.85E-10
1993	0.209	123.0	22,556	248.9	41.3	0.310	27,864	50,833	-9.86E-07	-1.94E-09
1994	0.207	97.6	22,399	248.8	41.1	0.127	28,718	51,505	-1.13E-06	-2.18E-09
1995	0.006	2.44	22,094	226.2	42.1	0.120	28,864	51,229	-9.58E-07	-1.87E-09
1996	0	0	21,840	190.2	41.1	0	29,014	51,085	1.08E-06	2.12E-09
1997	0.396	217.4	22,140	205.3	37.3	0	29,273	51,873	-6.51E-07	-1.26E-09
1998	0.404	213.6	22,224	218.5	38.1	0.028	29,163	51,858	-8.47E-07	-1.63E-09
1999	0.003	1.15	21,905	193.4	39.9	0.020	28,741	50,880	-7.93E-07	-1.56E-09
2000	0.055	30.0	22,006	195.3	38.5	3.48E-04	29,512	51,781	7.75E-07	1.50E-09
2001	0.012	6.09	21,913	189.6	38.4	1.49E-04	29,275	51,422	-9.89E-07	-1.92E-09
2002	1.14	668.9	22,276	225.5	37.0	0.102	30,050	53,259	-5.77E-07	-1.08E-09
2003	0.194	88.6	22,144	227.5	39.6	0.143	29,521	52,020	-6.61E-07	-1.27E-09
2004	1.04	570.0	22,493	257.6	38.5	0.137	29,789	53,149	7.02E-07	1.32E-09
2005	0.004	1.40	22,011	224.2	41.3	0.163	29,040	51,318	-9.74E-07	-1.90E-09
2006	9.07E-04	0.307	21,873	196.7	39.5	0	28,971	51,080	-7.16E-07	-1.40E-09
2007	1.37	841.7	22,521	241.0	34.9	0.103	29,732	53,371	-9.47E-07	-1.77E-09
2008	6.17E-04	0.553	22,014	207.1	39.8	0.035	28,954	51,215	7.09E-07	1.38E-09
2009	4.54E-04	0.026	21,851	195.7	39.4	0	29,653	51,739	-1.11E-06	-2.15E-09
2010	0.055	29.0	21,759	196.7	39.5	0	30,528	52,551	-6.50E-07	-1.24E-09
2011	0	0	21,348	162.6	43.8	0	30,212	51,767	-7.57E-07	-1.46E-09
2012	0.054	40.0	21,737	164.7	39.5	0	30,122	52,104	7.13E-07	1.37E-09
2013	0.124	94.5	21,813	170.0	37.8	0	29,875	51,990	-6.85E-07	-1.32E-09
2014	0.038	29.4	21,790	168.6	37.1	0	29,626	51,650	-5.38E-07	-1.04E-09
2015	1.03	649.8	22,276	199.0	32.8	0.004	29,971	53,130	-8.11E-07	-1.53E-09
2016	0.948	551.0	22,487	224.0	32.7	0.056	29,643	52,939	7.38E-07	1.39E-09
2017	0.387	201.9	22,364	229.8	33.5	0.054	29,154	51,983	-9.58E-07	-1.84E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Medina County GCD does not exist in the model in Layer 2.			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Medina County GCD does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Medina County GCD does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Queen City Aquifer (Layer 5)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Medina County GCD does not exist in model in the Queen City Aquifer (Layer 5).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Reklaw Formation (Layer 6)

Simulated Time Period	Inflows	Total Inflows	Outflows			Total Outflows	Net Flows In-Out	Percent Discrepancy
	Recharge		Evapo-transpiration	Evergreen UWCD	Lower Layers			
	(acre-feet)							%
Predevelopment	88.9	88.9	30.0	0.347	58.5	88.9	-1.80E-11	-2.03E-11
1980	83.9	83.9	0	0	83.9	83.9	-2.84E-14	-3.39E-14
1981	107.5	107.5	0	0	107.5	107.5	0	0
1982	72.6	72.6	0	0	72.6	72.6	1.28E-13	1.76E-13
1983	74.5	74.5	0	0	74.5	74.5	1.14E-13	1.53E-13
1984	63.2	63.2	0	0	63.2	63.2	1.63E-13	2.58E-13
1985	101.4	101.4	0	0	101.4	101.4	-7.11E-14	-7.01E-14
1986	95.7	95.7	0	0	95.7	95.7	8.53E-14	8.91E-14
1987	96.9	96.9	0	0	96.9	96.9	0	0
1988	44.8	44.8	0	0	44.8	44.8	2.84E-14	6.34E-14
1989	59.5	59.5	0	0	59.5	59.5	9.24E-14	1.55E-13
1990	88.5	88.5	0	0	88.5	88.5	7.11E-14	8.03E-14
1991	105.6	105.6	0	0	105.6	105.6	8.53E-14	8.07E-14
1992	119.2	119.2	0	0	119.2	119.2	8.53E-14	7.15E-14
1993	76.2	76.2	0	0	76.2	76.2	4.26E-14	5.59E-14
1994	96.2	96.2	0	0	96.2	96.2	0	0
1995	74.4	74.4	0	0	74.4	74.4	1.14E-13	1.53E-13
1996	52.8	52.8	0	0	52.8	52.8	-7.11E-15	-1.35E-14
1997	103.6	103.6	0	0	103.6	103.6	-1.71E-13	-1.65E-13
1998	103.8	103.8	0	0	103.8	103.8	0	0
1999	59.5	59.5	0	0	59.5	59.5	2.42E-13	4.06E-13
2000	90.3	90.3	0	0	90.3	90.3	9.95E-14	1.10E-13
2001	81.0	81.0	0	0	81.0	81.0	0	0
2002	137.7	137.7	0	0	137.7	137.7	0	0
2003	100.5	100.5	0	0	100.5	100.5	0	0
2004	131.9	131.9	0	0	131.9	131.9	-1.14E-13	-8.62E-14
2005	66.6	66.6	0	0	66.6	66.6	7.11E-14	1.07E-13
2006	59.6	59.6	0	0	59.6	59.6	6.39E-14	1.07E-13
2007	142.7	142.7	0	0	142.7	142.7	-8.53E-14	-5.98E-14
2008	56.6	56.6	0	0	56.6	56.6	-1.07E-13	-1.88E-13
2009	81.3	81.3	0	0	81.3	81.3	-1.71E-13	-2.10E-13
2010	101.3	101.3	0	0	101.3	101.3	8.53E-14	8.41E-14
2011	46.9	46.9	0	0	46.9	46.9	-9.24E-14	-1.97E-13
2012	80.8	80.8	0	0	80.8	80.8	0	0
2013	88.5	88.5	0	0	88.5	88.5	0	0
2014	78.6	78.6	0	0	78.6	78.6	1.42E-14	1.81E-14
2015	129.8	129.8	0	0	129.8	129.8	1.71E-13	1.31E-13
2016	123.8	123.8	0	0	123.8	123.8	0	0
2017	101.1	101.1	0	0	101.1	101.1	-5.70E-12	-5.64E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Uvalde County UWCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	6,050	243.3	3.51	1,095	767.0	8,158
1980	0	0	5,710	304.4	4.14	2,800	1,277	10,095
1981	0	0	7,320	307.2	4.43	3,025	1,145	11,801
1982	2.17	281.3	4,946	291.9	4.02	2,535	1,176	9,237
1983	0.445	69.0	5,070	281.9	4.02	2,539	1,178	9,142
1984	52.0	3,216	4,307	309.0	3.97	2,581	1,433	11,901
1985	0	0	6,901	298.0	4.29	2,958	1,222	11,384
1986	0.002	0.398	6,517	287.2	4.29	2,746	1,089	10,645
1987	0	0	6,595	282.5	4.32	2,645	1,006	10,532
1988	20.4	1,530	3,051	261.3	3.69	2,042	1,111	8,020
1989	10.9	677.1	4,053	256.4	3.77	2,252	1,092	8,346
1990	0.008	0.745	6,027	263.3	4.14	2,609	1,011	9,915
1991	5.90	246.3	7,191	292.3	4.51	2,772	934.0	11,447
1992	2.12	92.9	8,115	320.4	4.72	2,856	904.2	12,296
1993	28.0	1,765	5,190	319.7	4.20	2,503	984.1	10,795
1994	31.4	1,681	6,547	347.2	4.46	2,880	1,008	12,499
1995	37.9	2,472	5,065	353.7	4.27	2,780	1,143	11,856
1996	38.8	2,855	3,596	345.1	4.05	2,639	1,333	10,811
1997	0.022	2.29	7,054	347.1	4.56	3,231	1,262	11,901
1998	2.70	134.1	7,069	357.9	4.62	3,210	1,190	11,969
1999	28.5	2,163	4,053	347.2	4.17	2,688	1,310	10,593
2000	18.9	1,114	6,149	365.6	4.49	3,198	1,253	12,102
2001	13.5	980.3	5,516	367.1	4.42	3,087	1,325	11,293
2002	1.55	75.1	9,378	402.4	5.14	3,846	1,151	14,859
2003	8.85	670.5	6,840	403.6	4.68	3,389	1,222	12,538
2004	0.002	0.142	8,981	416.3	5.08	3,716	1,176	14,294
2005	22.7	2,058	4,536	387.9	4.35	2,950	1,330	11,289
2006	13.8	1,388	4,056	362.2	4.25	2,842	1,463	10,129
2007	0	0	9,713	389.2	5.21	3,874	1,247	15,228
2008	32.6	2,706	3,853	375.3	4.22	2,843	1,371	11,185
2009	33.5	2,347	5,538	395.5	4.48	3,267	1,289	12,876
2010	29.3	2,027	6,899	423.1	4.75	3,696	1,231	14,310
2011	46.6	4,342	3,190	408.1	4.21	3,009	1,434	12,435
2012	1.19	128.6	5,504	401.3	4.43	3,512	1,566	11,118
2013	0.034	4.47	6,023	392.8	4.53	3,568	1,552	11,545
2014	0.333	49.5	5,349	381.4	4.45	3,370	1,583	10,737
2015	0	0	8,840	395.8	4.97	4,033	1,428	14,702
2016	1.14E-04	0.039	8,430	403.2	4.97	3,805	1,349	13,992
2017	0.213	44.5	6,884	393.7	4.72	3,424	1,341	12,092

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Uvalde County UWCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	1,137	5,124	1.05	491.0	1,406	8,158	7.79E-07	9.55E-09
1980	0	0	2,209	413.0	5,204	1.23	179.6	2,088	10,095	1.91E-07	1.90E-09
1981	29.4	1,954	1,211	600.3	5,665	1.28	198.7	2,142	11,801	3.24E-07	2.75E-09
1982	2.93	125.9	1,209	368.5	5,573	1.28	184.6	1,772	9,237	5.84E-09	6.32E-11
1983	6.20	282.3	1,175	359.9	5,391	1.21	182.6	1,743	9,142	-2.15E-06	-2.36E-08
1984	0	0	4,781	276.6	4,492	1.02	161.3	2,190	11,901	-6.03E-06	-5.07E-08
1985	50.4	3,076	374.9	514.2	5,164	1.30	190.9	2,012	11,384	9.63E-07	8.46E-09
1986	31.2	1,895	494.7	534.8	5,646	1.25	201.1	1,841	10,645	-8.11E-06	-7.62E-08
1987	25.4	1,509	524.4	567.8	5,887	1.21	212.2	1,806	10,532	5.15E-06	4.89E-08
1988	0	0	542.8	218.9	5,782	1.01	180.3	1,295	8,020	1.18E-08	1.47E-10
1989	0.039	4.72	608.6	251.0	5,889	0.893	175.0	1,416	8,346	1.06E-05	1.27E-07
1990	13.2	976.8	546.8	410.2	6,068	1.15	191.9	1,707	9,915	5.72E-07	5.77E-09
1991	8.04	794.0	602.7	578.8	7,338	1.27	205.2	1,919	11,447	1.87E-06	1.63E-08
1992	9.26	837.9	590.2	740.4	7,834	1.31	219.1	2,063	12,296	6.02E-10	4.90E-12
1993	0	0	581.7	403.0	7,830	1.37	194.5	1,785	10,795	-5.99E-06	-5.55E-08
1994	0.065	12.7	1,876	495.7	7,764	1.30	189.6	2,160	12,499	-1.33E-06	-1.07E-08
1995	0	0	2,016	337.5	7,281	1.32	170.4	2,049	11,856	-1.62E-08	-1.37E-10
1996	0	0	2,010	195.2	6,613	1.01	147.0	1,844	10,811	4.05E-06	3.75E-08
1997	18.4	1,320	1,284	464.7	6,396	1.31	169.5	2,247	11,901	7.58E-08	6.37E-10
1998	4.58	442.7	1,382	511.2	7,177	1.31	172.4	2,277	11,969	1.15E-07	9.62E-10
1999	0	0	1,386	230.0	6,961	1.11	146.1	1,869	10,593	8.51E-09	8.03E-11
2000	0.210	51.7	1,794	356.8	7,455	1.22	150.4	2,293	12,102	1.56E-07	1.29E-09
2001	0	0	1,470	312.4	7,165	1.21	143.5	2,202	11,293	6.29E-07	5.57E-09
2002	11.5	1,344	1,830	693.9	7,958	1.37	171.4	2,848	14,859	5.13E-07	3.45E-09
2003	0.010	1.19	1,596	488.7	7,765	1.42	157.9	2,528	12,538	2.82E-06	2.25E-08
2004	15.5	1,305	1,404	700.4	7,923	1.38	175.0	2,770	14,294	-5.78E-08	-4.04E-10
2005	0	0	1,390	263.4	7,314	1.39	142.5	2,178	11,289	4.03E-09	3.57E-11
2006	0.053	2.43	1,147	177.4	6,691	1.03	127.9	1,983	10,129	-1.72E-07	-1.70E-09
2007	36.7	3,157	868.3	698.3	7,555	1.36	173.6	2,738	15,228	2.97E-08	1.95E-10
2008	0	0	1,252	191.9	7,574	1.22	132.9	2,032	11,185	4.28E-09	3.83E-11
2009	0.044	7.87	1,861	257.3	8,192	1.14	127.9	2,428	12,876	1.97E-08	1.53E-10
2010	0.221	55.2	2,773	361.4	8,046	1.37	128.5	2,945	14,310	1.47E-08	1.03E-10
2011	0	0	2,732	103.5	7,096	0.680	98.8	2,404	12,435	1.47E-08	1.18E-10
2012	7.76	695.9	798.6	191.8	6,731	0.983	107.2	2,585	11,118	4.03E-08	3.62E-10
2013	11.3	1,028	755.3	248.4	6,773	1.12	112.3	2,616	11,545	1.73E-09	1.50E-11
2014	7.04	511.9	847.3	210.9	6,597	1.03	109.4	2,453	10,737	2.35E-06	2.19E-08
2015	37.8	3,476	496.9	527.0	7,130	1.48	146.2	2,886	14,702	-6.61E-07	-4.49E-09
2016	29.1	2,349	588.4	582.7	7,532	1.44	154.9	2,754	13,992	1.29E-06	9.19E-09
2017	12.6	805.6	626.0	445.7	7,562	1.45	148.4	2,491	12,092	-1.51E-06	-1.25E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Uvalde County UWCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	1,567	102.1	20.2	12.1	1,185	1,829	4,715
1980	0	0	1,479	462.7	34.2	0	2,238	3,335	7,549
1981	0	0	1,896	440.1	34.4	0	2,180	3,235	7,785
1982	3.42	78.2	1,281	428.3	33.8	0	1,838	3,236	6,898
1983	1.37	35.7	1,313	416.6	33.5	0	1,809	3,196	6,805
1984	94.7	1,461	1,115	465.7	34.6	0	2,538	3,322	9,030
1985	0	0	1,787	419.4	33.7	0	2,076	3,275	7,591
1986	5.99E-04	0.066	1,688	388.2	33.6	0	1,830	3,122	7,061
1987	0	0	1,708	365.4	33.3	0	1,752	3,009	6,868
1988	30.6	296.5	790.0	370.0	32.5	0	1,344	3,121	5,985
1989	19.5	82.8	1,050	380.9	32.5	0	1,458	3,167	6,190
1990	0	0	1,561	375.9	32.8	0	1,681	3,119	6,769
1991	7.51	0.050	1,862	397.7	34.2	0	1,829	3,167	7,298
1992	2.12	0.004	2,102	407.8	35.4	0	1,911	3,179	7,637
1993	37.6	157.9	1,344	431.3	35.1	0	1,715	3,337	7,059
1994	50.1	302.0	1,695	472.8	36.4	0	2,142	3,375	8,075
1995	56.5	504.8	1,312	510.3	36.5	0	2,121	3,564	8,105
1996	63.3	707.2	931.2	545.8	36.6	0	2,008	3,774	8,066
1997	0	0	1,827	529.6	36.9	0	2,273	3,681	8,347
1998	4.75	0.004	1,831	538.4	37.7	0	2,273	3,719	8,404
1999	47.5	396.9	1,049	565.1	37.3	0	1,962	3,890	7,948
2000	37.7	107.0	1,592	609.3	38.4	0	2,360	4,039	8,784
2001	20.8	89.5	1,428	626.3	38.4	0	2,276	4,118	8,597
2002	4.00	0.468	2,429	644.2	40.6	0	2,803	4,106	10,027
2003	11.1	47.1	1,771	653.5	40.5	0	2,528	4,172	9,224
2004	0	0	2,326	643.5	41.7	0	2,683	4,102	9,796
2005	37.3	439.1	1,175	648.9	40.3	0	2,233	4,211	8,785
2006	25.2	366.0	1,050	650.1	39.7	0	2,082	4,266	8,479
2007	0	0	2,515	626.4	40.8	0	2,639	4,082	9,903
2008	60.1	553.5	997.8	659.9	39.9	0	2,118	4,300	8,729
2009	74.0	333.7	1,434	735.6	40.8	0	2,523	4,566	9,707
2010	69.4	354.4	1,787	812.4	42.3	0	3,058	4,813	10,936
2011	106.7	1,099	826.1	893.0	42.7	0	2,670	5,186	10,824
2012	1.80	1.27	1,425	877.2	42.3	0	2,719	5,131	10,198
2013	0.039	0	1,560	846.8	42.0	0	2,705	5,022	10,176
2014	0.936	13.6	1,385	821.3	41.8	0	2,553	4,938	9,753
2015	0	0	2,289	765.8	41.8	0	2,841	4,690	10,628
2016	0.002	0.049	2,183	720.9	42.1	0	2,678	4,504	10,127
2017	0.966	25.5	1,783	689.1	41.5	0	2,443	4,396	9,379

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Uvalde County UWCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	840.9	1,153	7.93	0	1,084	1,629	4,715	1.91E-07	4.04E-09
1980	0	0	806.2	297.6	2,067	13.1	22.9	1,413	2,929	7,549	8.21E-08	1.09E-09
1981	48.8	628.3	483.5	527.7	2,074	12.3	21.9	1,331	2,658	7,785	1.38E-07	1.78E-09
1982	5.42	103.8	487.0	379.5	2,056	13.1	22.3	1,357	2,474	6,898	1.87E-09	2.71E-11
1983	8.89	94.5	488.1	367.2	2,004	13.1	22.7	1,359	2,448	6,805	-1.26E-06	-1.85E-08
1984	0	0	1,641	152.4	1,889	12.9	23.2	1,538	3,773	9,030	-3.35E-06	-3.71E-08
1985	90.2	1,183	238.4	375.1	1,921	12.7	23.6	1,402	2,344	7,591	3.98E-07	5.24E-09
1986	46.9	588.8	271.0	554.6	1,954	12.4	21.3	1,321	2,292	7,061	-3.41E-06	-4.83E-08
1987	35.3	439.0	281.6	638.8	1,938	12.0	19.1	1,259	2,245	6,868	3.42E-06	4.99E-08
1988	0.153	45.5	278.7	318.9	1,973	12.3	20.8	1,333	2,002	5,985	4.24E-09	7.09E-11
1989	0.542	67.3	324.2	343.0	2,026	12.1	22.5	1,310	2,085	6,190	5.09E-06	8.22E-08
1990	19.6	356.9	319.8	532.7	2,037	12.4	22.3	1,255	2,214	6,769	3.04E-07	4.49E-09
1991	12.5	402.2	316.7	695.3	2,214	12.2	22.5	1,204	2,420	7,298	1.06E-06	1.45E-08
1992	14.7	379.5	316.4	845.4	2,298	11.8	21.9	1,198	2,551	7,637	-1.06E-10	-1.38E-12
1993	0.093	13.4	329.4	588.9	2,386	12.8	22.7	1,260	2,445	7,059	-2.88E-06	-4.08E-08
1994	0.376	20.5	742.8	523.6	2,450	12.5	23.0	1,231	3,070	8,075	-7.52E-07	-9.31E-09
1995	0	0	807.1	344.5	2,484	13.2	24.4	1,344	3,088	8,105	-2.75E-10	-3.39E-12
1996	0	0	821.6	180.3	2,500	12.9	26.5	1,507	3,019	8,066	2.54E-06	3.15E-08
1997	33.2	374.3	602.7	485.7	2,421	12.8	26.1	1,472	2,920	8,347	4.78E-08	5.73E-10
1998	7.11	220.7	612.3	578.0	2,553	12.7	25.3	1,417	2,978	8,404	5.70E-08	6.79E-10
1999	0	0	625.4	303.8	2,632	13.0	26.5	1,511	2,836	7,948	3.61E-09	4.54E-11
2000	1.23	49.5	808.6	415.6	2,814	13.2	27.4	1,458	3,196	8,784	7.01E-08	7.98E-10
2001	0.189	3.83	662.6	396.5	2,858	13.3	28.0	1,532	3,103	8,597	2.67E-07	3.11E-09
2002	17.9	476.9	820.0	749.8	2,993	12.2	27.1	1,394	3,536	10,027	1.36E-06	1.36E-08
2003	0.357	23.7	717.5	593.2	3,030	13.0	27.6	1,460	3,358	9,224	2.98E-07	3.23E-09
2004	29.4	378.4	628.1	815.9	3,024	12.2	26.7	1,442	3,439	9,796	-3.03E-07	-3.09E-09
2005	0	0	626.4	408.8	2,996	13.5	28.0	1,559	3,153	8,785	3.00E-09	3.41E-11
2006	0.014	0.026	517.8	301.9	2,939	13.0	29.1	1,674	3,004	8,479	-1.24E-07	-1.47E-09
2007	64.3	796.3	387.2	861.0	2,945	12.0	26.7	1,520	3,290	9,903	1.66E-08	1.68E-10
2008	0	0	564.7	343.2	3,073	13.2	28.4	1,596	3,110	8,729	3.05E-09	3.49E-11
2009	0.233	5.95	838.0	359.8	3,396	13.2	30.8	1,507	3,556	9,707	1.47E-08	1.52E-10
2010	1.17	57.0	1,249	408.2	3,659	13.9	32.8	1,444	4,071	10,936	1.26E-08	1.15E-10
2011	0	0	1,205	126.4	3,892	13.2	36.5	1,612	3,938	10,824	1.54E-08	1.42E-10
2012	32.3	366.4	353.6	296.6	3,813	12.9	37.3	1,773	3,514	10,198	3.72E-08	3.64E-10
2013	29.4	364.3	335.3	429.1	3,721	13.1	36.2	1,773	3,475	10,176	2.37E-09	2.33E-11
2014	17.4	115.7	381.6	399.1	3,601	13.0	35.5	1,799	3,391	9,753	5.51E-06	5.65E-08
2015	82.5	837.1	216.8	786.7	3,469	13.1	32.8	1,697	3,493	10,628	-6.85E-07	-6.45E-09
2016	57.6	491.3	258.1	850.5	3,355	12.8	30.5	1,632	3,439	10,127	1.87E-06	1.85E-08
2017	24.2	145.2	275.7	714.2	3,262	13.2	29.7	1,615	3,300	9,379	-9.39E-07	-1.00E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Uvalde County UWCD	Wintergarden GCD	Bexar	Upper Layers	
	(acre-feet)								
Predevelopment	0	0	3,127	44.2	42.8	14.3	0.785	26,655	29,884
1980	0	0	2,951	608.8	55.0	0	78.2	29,401	33,094
1981	0	0	3,783	529.9	55.6	0	2.82	28,744	33,115
1982	4.71	107.8	2,556	523.4	54.9	0	2.20	28,378	31,627
1983	1.65	26.7	2,620	509.8	54.4	0	2.21	28,323	31,537
1984	203.6	2,870	2,226	836.6	54.6	0	215.2	30,834	37,240
1985	0	0	3,567	506.2	54.5	0	2.30	28,298	32,427
1986	0.002	0.555	3,368	433.5	54.7	0	1.93	27,965	31,824
1987	0	0	3,408	384.5	54.7	0	1.87	27,794	31,644
1988	44.4	401.9	1,577	421.6	53.0	0	1.39	27,468	29,967
1989	24.9	64.0	2,095	447.1	52.3	0	1.61	27,544	30,229
1990	0	0	3,115	418.2	53.0	0	1.75	27,692	31,280
1991	8.67	0	3,717	418.2	54.6	0	1.85	27,877	32,077
1992	2.39	0	4,194	407.8	56.6	0	1.66	28,057	32,720
1993	52.9	234.9	2,682	448.5	56.3	0	1.46	27,771	31,247
1994	86.1	584.6	3,384	511.8	57.6	0	2.74	28,830	33,457
1995	102.1	870.9	2,618	596.7	57.5	0	18.3	28,981	33,245
1996	115.4	1,110	1,858	701.9	56.6	0	35.7	29,088	32,965
1997	0.006	0	3,646	648.3	57.7	0	2.86	28,840	33,194
1998	5.41	0	3,653	638.6	58.6	0	2.93	28,830	33,189
1999	76.7	586.2	2,094	712.8	57.6	0	2.03	28,647	32,177
2000	54.3	127.5	3,178	773.6	58.9	0	2.60	29,305	33,500
2001	28.2	73.3	2,851	808.0	58.8	0	2.47	29,066	32,888
2002	4.74	0	4,847	775.8	61.8	0	3.49	29,672	35,364
2003	15.2	80.0	3,535	796.0	62.3	0	2.91	29,341	33,833
2004	0	0	4,642	751.2	62.9	0	3.40	29,476	34,935
2005	65.6	674.4	2,344	815.0	61.6	0	2.23	29,009	32,972
2006	41.8	407.1	2,096	864.6	60.3	0	1.98	28,852	32,324
2007	0	0	5,020	737.3	62.8	0	3.29	29,134	34,957
2008	102.4	909.5	1,991	841.0	61.1	0	2.03	28,942	32,849
2009	115.2	488.8	2,862	972.2	61.6	0	2.40	29,650	34,153
2010	115.9	595.7	3,566	1,124	63.4	0	26.8	30,592	36,083
2011	182.2	1,550	1,649	1,384	61.9	0	59.0	30,621	35,506
2012	1.94	7.57	2,845	1,257	62.1	0	2.56	29,766	33,942
2013	0.018	0	3,113	1,179	62.1	0	2.70	29,480	33,836
2014	0.961	21.9	2,764	1,147	61.7	0	2.52	29,336	33,334
2015	0	0	4,569	966.2	63.3	0	2.83	29,312	34,913
2016	0.010	1.41	4,356	872.5	63.9	0	2.76	29,193	34,490
2017	1.88	79.2	3,558	829.4	63.6	0	2.62	28,904	33,438

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-9.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Medina County GCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	Uvalde County UWCD	Wintergarden GCD	Bexar	Upper Layers			
	(acre-feet)											%
Predevelopment	0	0	0	1,524	2,679	27.6	0	1,002	24,650	29,884	1.14E-07	3.81E-10
1980	0	0	4,478	629.4	2,289	38.2	27.9	751.9	24,879	33,094	3.03E-08	9.17E-11
1981	99.8	1,364	2,325	927.0	2,510	35.7	26.7	826.1	25,000	33,115	5.29E-08	1.60E-10
1982	17.0	362.6	2,313	649.8	2,469	37.7	27.1	816.5	24,934	31,627	3.81E-09	1.20E-11
1983	21.2	338.0	2,318	647.9	2,435	38.3	27.6	810.1	24,901	31,537	-4.79E-07	-1.52E-09
1984	0	0	9,796	379.3	1,971	39.5	28.1	494.7	24,531	37,240	-1.34E-06	-3.61E-09
1985	179.4	2,396	542.1	805.7	2,489	37.3	28.7	887.3	25,062	32,427	1.34E-07	4.14E-10
1986	100.0	1,363	711.6	916.2	2,650	36.3	25.8	967.6	25,053	31,824	-1.72E-06	-5.42E-09
1987	77.9	1,054	775.4	990.0	2,666	35.3	23.1	969.8	25,053	31,644	1.49E-06	4.69E-09
1988	5.08	190.1	712.1	502.8	2,554	38.2	25.1	922.8	25,017	29,967	2.02E-09	6.73E-12
1989	7.20	270.9	795.9	600.7	2,574	38.7	27.2	922.5	24,992	30,229	1.88E-06	6.22E-09
1990	45.4	753.5	717.5	948.0	2,662	38.3	27.0	993.1	25,095	31,280	1.26E-07	4.02E-10
1991	39.3	809.8	833.7	1,252	2,770	36.3	27.4	998.1	25,311	32,077	4.36E-07	1.36E-09
1992	43.4	810.2	822.5	1,530	2,860	34.1	26.8	1,021	25,573	32,720	1.86E-09	5.68E-12
1993	2.31	74.8	736.5	1,091	2,762	36.5	27.7	998.9	25,518	31,247	-1.11E-06	-3.54E-09
1994	0.856	37.3	3,631	1,034	2,570	35.8	27.9	764.2	25,356	33,457	-2.53E-07	-7.56E-10
1995	0	0	3,951	734.7	2,452	37.6	29.5	699.0	25,341	33,245	1.47E-09	4.42E-12
1996	0	0	3,964	469.5	2,372	39.4	31.9	677.6	25,410	32,965	1.01E-06	3.08E-09
1997	58.5	676.4	2,577	978.6	2,550	37.4	31.5	783.6	25,501	33,194	2.11E-08	6.37E-11
1998	18.5	349.1	2,533	1,117	2,674	36.2	30.5	818.7	25,612	33,189	2.10E-08	6.32E-11
1999	0	0	2,519	635.3	2,581	38.7	31.8	769.4	25,601	32,177	-5.13E-10	-1.59E-12
2000	1.72	60.2	3,262	875.0	2,646	38.4	33.0	766.3	25,817	33,500	1.96E-08	5.85E-11
2001	0.817	24.3	2,678	826.8	2,676	38.7	33.7	770.9	25,839	32,888	1.34E-07	4.08E-10
2002	40.9	760.8	3,356	1,466	2,826	34.2	32.8	811.9	26,037	35,364	6.35E-07	1.79E-09
2003	1.82	58.3	2,918	1,143	2,793	35.2	33.2	795.6	26,054	33,833	-4.03E-08	-1.19E-10
2004	58.9	690.1	2,588	1,539	2,909	32.9	32.2	843.7	26,242	34,935	-1.28E-07	-3.66E-10
2005	0	0	2,533	791.8	2,752	36.9	33.6	780.5	26,045	32,972	3.31E-09	1.00E-11
2006	0.048	0.434	2,092	644.3	2,725	38.4	34.7	771.7	26,017	32,324	-5.37E-08	-1.66E-10
2007	123.7	1,377	1,609	1,647	2,982	33.3	32.0	891.7	26,262	34,957	4.57E-09	1.31E-11
2008	0	0	2,287	712.3	2,803	37.7	34.0	793.2	26,182	32,849	3.80E-09	1.16E-11
2009	0.236	13.4	3,381	810.8	2,831	38.2	37.0	749.9	26,292	34,153	7.23E-09	2.12E-11
2010	1.75	48.0	5,005	934.6	2,850	38.1	39.7	722.0	26,444	36,083	4.40E-09	1.22E-11
2011	0	0	4,921	414.0	2,822	40.6	43.9	675.5	26,588	35,506	8.00E-09	2.25E-11
2012	71.2	906.1	1,464	735.2	3,054	39.9	44.8	749.0	26,878	33,942	1.25E-08	3.69E-11
2013	59.4	616.5	1,379	934.0	3,149	39.3	43.4	808.5	26,807	33,836	-1.01E-09	-2.99E-12
2014	30.5	181.4	1,565	873.2	3,095	39.5	42.5	800.4	26,706	33,334	3.63E-06	1.09E-08
2015	149.3	1,309	903.1	1,553	3,223	36.2	39.4	908.0	26,791	34,913	-2.76E-07	-7.90E-10
2016	99.8	731.8	1,076	1,604	3,214	34.7	36.7	915.8	26,777	34,490	1.08E-06	3.14E-09
2017	39.9	234.1	1,140	1,362	3,123	35.3	35.7	889.4	26,578	33,438	-4.27E-07	-1.28E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	River Package	Gonzales	Lavaca	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	2.21E-11	0.469	1.86	408.9	411.2
1980	0	0	2.22E-11	0.470	1.86	410.0	412.3
1981	0	0	2.21E-11	0.469	1.86	408.9	411.2
1982	9.08E-08	8.13E-06	2.21E-11	0.469	1.86	408.9	411.2
1983	8.72E-10	1.01E-06	2.21E-11	0.469	1.86	408.9	411.2
1984	0	0	2.22E-11	0.470	1.86	410.0	412.3
1985	0	0	2.21E-11	0.469	1.86	408.9	411.2
1986	0	0	2.21E-11	0.469	1.86	408.9	411.2
1987	0	0	2.21E-11	0.469	1.86	408.9	411.2
1988	2.34E-07	3.27E-05	2.22E-11	0.470	1.86	410.0	412.3
1989	2.26E-07	6.53E-05	2.21E-11	0.469	1.86	408.9	411.2
1990	7.49E-07	2.23E-04	2.21E-11	0.469	1.86	408.9	411.2
1991	0	0	2.21E-11	0.469	1.86	408.9	411.2
1992	0	0	2.22E-11	0.470	1.86	410.0	412.3
1993	0	0	2.21E-11	0.469	1.86	408.9	411.2
1994	0	0	2.21E-11	0.469	1.86	408.9	411.2
1995	0	0	2.21E-11	0.469	1.86	408.9	411.2
1996	7.09E-08	1.10E-05	2.22E-11	0.470	1.86	410.0	412.3
1997	0	0	2.21E-11	0.469	1.86	408.9	411.2
1998	0	0	2.21E-11	0.469	1.86	408.9	411.2
1999	5.29E-08	7.46E-06	2.21E-11	0.469	1.86	408.9	411.2
2000	8.98E-08	2.23E-05	2.22E-11	0.470	1.86	410.0	412.3
2001	1.06E-12	8.59E-09	2.21E-11	0.469	1.86	408.9	411.2
2002	0	0	2.21E-11	0.469	1.86	408.9	411.2
2003	1.50E-08	9.89E-07	2.21E-11	0.469	1.86	408.9	411.2
2004	0	0	2.22E-11	0.470	1.86	410.0	412.3
2005	3.87E-07	9.47E-05	2.21E-11	0.469	1.86	408.9	411.2
2006	1.77E-07	7.15E-05	2.21E-11	0.469	1.86	408.9	411.2
2007	0	0	2.21E-11	0.469	1.86	408.9	411.2
2008	8.90E-08	7.82E-06	2.22E-11	0.470	1.86	410.0	412.3
2009	1.01E-07	2.09E-05	2.21E-11	0.469	1.86	408.9	411.2
2010	5.12E-06	0.001	2.21E-11	0.469	1.86	408.9	411.2
2011	4.12E-05	0.009	2.21E-11	0.469	1.86	408.9	411.2
2012	9.35E-05	0.019	2.22E-11	0.470	1.86	410.0	412.3
2013	1.79E-04	0.036	2.21E-11	0.469	1.86	408.9	411.2
2014	2.92E-04	0.058	2.21E-11	0.469	1.86	408.8	411.2
2015	4.28E-04	0.085	2.21E-11	0.469	1.86	408.8	411.2
2016	4.70E-04	0.093	2.22E-11	0.470	1.86	409.9	412.4
2017	5.18E-04	0.102	2.21E-11	0.469	1.86	408.8	411.2

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Gonzales	Lavaca	Lower Layers			
									%
Predevelopment	0	0	6.13E-10	8.93	2.25	400.0	411.2	2.78E-09	6.76E-10
1980	0	0	6.15E-10	8.96	2.26	401.1	412.3	3.60E-11	8.74E-12
1981	1.08E-05	0.002	6.13E-10	8.93	2.25	400.0	411.2	-1.40E-10	-3.41E-11
1982	4.86E-06	9.59E-04	6.13E-10	8.93	2.25	400.0	411.2	-5.87E-11	-1.43E-11
1983	4.61E-06	8.92E-04	6.13E-10	8.93	2.25	400.0	411.2	-1.44E-10	-3.50E-11
1984	7.44E-06	0.001	6.15E-10	8.96	2.26	401.1	412.3	2.35E-10	5.70E-11
1985	2.00E-05	0.004	6.13E-10	8.93	2.25	400.0	411.2	-5.55E-11	-1.35E-11
1986	2.82E-05	0.006	6.13E-10	8.93	2.25	400.0	411.2	-1.14E-10	-2.78E-11
1987	3.58E-05	0.007	6.13E-10	8.93	2.25	400.0	411.2	3.44E-09	8.36E-10
1988	2.15E-05	0.004	6.15E-10	8.96	2.26	401.1	412.3	1.00E-10	2.42E-11
1989	1.40E-05	0.003	6.13E-10	8.93	2.25	400.0	411.2	6.20E-12	1.51E-12
1990	6.55E-06	0.001	6.13E-10	8.93	2.25	400.0	411.2	1.42E-11	3.46E-12
1991	1.33E-05	0.002	6.13E-10	8.93	2.25	400.0	411.2	3.13E-11	7.62E-12
1992	2.24E-05	0.004	6.15E-10	8.96	2.26	401.1	412.3	4.22E-10	1.02E-10
1993	2.95E-05	0.006	6.13E-10	8.93	2.25	400.0	411.2	-2.96E-12	-7.19E-13
1994	3.89E-05	0.008	6.13E-10	8.93	2.25	400.0	411.2	1.14E-10	2.76E-11
1995	3.73E-05	0.007	6.13E-10	8.93	2.25	400.0	411.2	2.32E-10	5.65E-11
1996	2.96E-05	0.006	6.15E-10	8.96	2.26	401.1	412.3	-4.34E-09	-1.05E-09
1997	3.99E-05	0.008	6.13E-10	8.93	2.25	400.0	411.2	7.92E-10	1.92E-10
1998	3.88E-05	0.007	6.13E-10	8.93	2.25	400.0	411.2	-4.71E-11	-1.14E-11
1999	3.20E-05	0.006	6.13E-10	8.93	2.25	400.0	411.2	9.44E-12	2.29E-12
2000	2.65E-05	0.005	6.15E-10	8.96	2.26	401.1	412.3	2.97E-10	7.20E-11
2001	2.64E-05	0.005	6.13E-10	8.93	2.25	400.0	411.2	-4.05E-11	-9.84E-12
2002	3.14E-05	0.006	6.13E-10	8.93	2.25	400.0	411.2	4.66E-12	1.13E-12
2003	2.70E-05	0.005	6.13E-10	8.93	2.25	400.0	411.2	1.55E-10	3.77E-11
2004	2.94E-05	0.005	6.15E-10	8.96	2.26	401.1	412.3	-6.29E-11	-1.52E-11
2005	1.80E-05	0.003	6.13E-10	8.93	2.25	400.0	411.2	8.41E-12	2.05E-12
2006	1.56E-05	0.003	6.13E-10	8.93	2.25	400.0	411.2	-9.09E-11	-2.21E-11
2007	4.78E-05	0.009	6.13E-10	8.93	2.25	400.0	411.2	-4.66E-12	-1.13E-12
2008	3.35E-05	0.006	6.15E-10	8.96	2.26	401.1	412.3	-4.09E-11	-9.93E-12
2009	2.66E-05	0.005	6.13E-10	8.93	2.25	400.0	411.2	7.60E-11	1.85E-11
2010	2.89E-06	5.35E-04	6.13E-10	8.93	2.25	400.0	411.2	-5.84E-10	-1.42E-10
2011	0	0	6.13E-10	8.93	2.25	400.0	411.2	1.19E-10	2.90E-11
2012	0	0	6.15E-10	8.96	2.26	401.1	412.3	1.67E-10	4.05E-11
2013	0	0	6.13E-10	8.93	2.25	400.0	411.2	-2.54E-10	-6.18E-11
2014	0	0	6.13E-10	8.93	2.25	400.0	411.2	-1.79E-09	-4.36E-10
2015	0	0	6.13E-10	8.93	2.25	400.1	411.2	-2.58E-10	-6.27E-11
2016	0	0	6.15E-10	8.96	2.26	401.2	412.4	8.91E-09	2.16E-09
2017	0	0	6.13E-10	8.93	2.25	400.1	411.2	-3.62E-11	-8.80E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - (Layer 2) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	9,034	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,188	22,623
1980	0	0	9,076	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,209	22,686
1981	0	0	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1982	0.007	0.016	9,051	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1983	4.91E-04	0.001	9,051	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1984	0	0	9,075	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,209	22,686
1985	0	0	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1986	0	0	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1987	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
1988	0.019	0.039	9,074	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,209	22,686
1989	0.019	0.040	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1990	0.021	0.044	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1991	0	0	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
1992	0	0	9,074	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,210	22,686
1993	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
1994	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
1995	4.90E-08	1.62E-07	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
1996	0.011	0.023	9,074	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,210	22,686
1997	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
1998	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
1999	0.007	0.016	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2000	0.011	0.025	9,074	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,210	22,686
2001	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2002	0	0	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2003	0.002	0.005	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2004	0	0	9,073	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,211	22,686
2005	0.019	0.041	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2006	0.004	0.008	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2007	0	0	9,048	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,175	22,624
2008	0.008	0.016	9,073	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,211	22,686
2009	0.016	0.035	9,048	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,175	22,624
2010	0.079	0.169	9,049	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,174	22,624
2011	0.120	0.256	9,050	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,173	22,624
2012	0.152	0.323	9,076	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.0	13,207	22,686
2013	0.247	0.526	9,054	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,169	22,624
2014	0.347	0.738	9,057	5.92E-04	3.37E-04	7.43E-04	9.01E-04	400.9	13,166	22,625
2015	0.443	0.943	9,061	5.92E-04	3.37E-04	7.43E-04	9.00E-04	401.0	13,161	22,625
2016	0.265	0.563	9,088	5.93E-04	3.38E-04	7.45E-04	9.03E-04	402.1	13,195	22,687
2017	0.255	0.542	9,066	5.92E-04	3.37E-04	7.43E-04	9.00E-04	401.0	13,157	22,625

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	13,439	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,775	22,623	4.33E-10	1.91E-12
1980	0	0	13,460	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,815	22,686	5.46E-11	2.41E-13
1981	0.030	0.065	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,791	22,624	-9.09E-11	-4.02E-13
1982	0	0	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,791	22,624	-3.64E-12	-1.61E-14
1983	0.001	0.002	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,791	22,624	-2.18E-11	-9.65E-14
1984	0.010	0.022	13,461	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,815	22,686	-5.09E-11	-2.25E-13
1985	0.035	0.076	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,791	22,624	7.28E-12	3.22E-14
1986	0.032	0.069	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	-4.37E-11	-1.93E-13
1987	0.035	0.074	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	6.91E-11	3.06E-13
1988	0	0	13,461	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,814	22,686	-9.09E-11	-4.01E-13
1989	0	0	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	-9.46E-11	-4.18E-13
1990	0	0	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,791	22,624	-1.27E-10	-5.63E-13
1991	0.013	0.029	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	-5.46E-11	-2.41E-13
1992	0.029	0.061	13,461	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,814	22,686	-5.09E-11	-2.25E-13
1993	0.027	0.058	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	-1.06E-10	-4.66E-13
1994	0.033	0.071	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	-1.02E-10	-4.50E-13
1995	0.010	0.021	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-6.55E-11	-2.89E-13
1996	0	0	13,462	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,814	22,686	-2.55E-10	-1.12E-12
1997	0.029	0.062	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-6.55E-11	-2.89E-13
1998	0.009	0.018	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-6.55E-11	-2.89E-13
1999	0	0	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-2.18E-11	-9.65E-14
2000	0	0	13,462	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,814	22,686	-6.55E-11	-2.89E-13
2001	0.003	0.007	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-9.46E-11	-4.18E-13
2002	0.015	0.032	13,426	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-6.18E-11	-2.73E-13
2003	0	0	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-6.55E-11	-2.89E-13
2004	0.011	0.024	13,462	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,813	22,686	-1.38E-10	-6.09E-13
2005	0	0	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-1.20E-10	-5.31E-13
2006	2.51E-04	5.66E-04	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-4.73E-11	-2.09E-13
2007	0.083	0.178	13,426	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,788	22,624	-8.37E-11	-3.70E-13
2008	1.38E-08	3.01E-08	13,463	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,813	22,686	-2.04E-10	-8.98E-13
2009	0	0	13,426	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,789	22,624	-4.73E-11	-2.09E-13
2010	0	0	13,425	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,790	22,624	-8.37E-11	-3.70E-13
2011	0	0	13,424	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,791	22,624	0	0
2012	0	0	13,459	3.96E-04	3.17E-04	0.001	1.93E-04	410.4	8,816	22,686	-4.73E-11	-2.08E-13
2013	0	0	13,420	3.95E-04	3.16E-04	0.001	1.93E-04	409.3	8,795	22,624	-9.82E-11	-4.34E-13
2014	0	0	13,417	3.95E-04	3.16E-04	0.001	1.93E-04	409.2	8,798	22,625	-1.13E-10	-4.98E-13
2015	0	0	13,413	3.95E-04	3.16E-04	0.001	1.93E-04	409.2	8,802	22,625	-8.00E-11	-3.54E-13
2016	0	0	13,448	3.96E-04	3.17E-04	0.001	1.93E-04	410.3	8,829	22,687	2.04E-10	8.98E-13
2017	0	0	13,409	3.95E-04	3.16E-04	0.001	1.93E-04	409.2	8,807	22,625	-7.28E-11	-3.22E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	3,155	208.4	44.8	104.2	245.0	8,746	3,591	16,094
1980	0	3,165	209.0	44.9	104.5	245.6	8,786	3,577	16,131
1981	0	3,156	208.4	44.8	104.2	244.9	8,762	3,567	16,087
1982	0.007	3,156	208.4	44.8	104.2	244.9	8,762	3,567	16,087
1983	8.59E-05	3,156	208.4	44.8	104.2	244.9	8,762	3,567	16,087
1984	0	3,165	209.0	44.9	104.5	245.6	8,786	3,577	16,131
1985	0	3,156	208.4	44.8	104.2	244.9	8,761	3,568	16,087
1986	0	3,156	208.4	44.8	104.2	244.9	8,761	3,568	16,088
1987	0	3,156	208.4	44.8	104.2	244.9	8,761	3,569	16,088
1988	0.014	3,165	209.0	44.9	104.5	245.6	8,785	3,578	16,132
1989	0.010	3,156	208.4	44.8	104.2	244.9	8,761	3,568	16,087
1990	0.011	3,156	208.4	44.8	104.2	244.9	8,761	3,568	16,087
1991	0	3,156	208.4	44.8	104.2	244.9	8,761	3,568	16,087
1992	0	3,165	209.0	44.9	104.5	245.6	8,785	3,578	16,132
1993	0	3,156	208.4	44.8	104.2	244.9	8,761	3,569	16,088
1994	0	3,156	208.4	44.8	104.2	244.9	8,760	3,569	16,088
1995	2.82E-07	3,156	208.4	44.8	104.2	244.9	8,760	3,569	16,088
1996	0.007	3,165	209.0	44.9	104.5	245.6	8,784	3,579	16,132
1997	0	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
1998	0	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
1999	0.005	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2000	0.006	3,165	209.0	44.9	104.5	245.6	8,784	3,579	16,132
2001	0	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2002	0	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2003	0.002	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2004	0	3,165	209.0	44.9	104.5	245.6	8,784	3,580	16,132
2005	0.013	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2006	0.001	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2007	0	3,156	208.4	44.8	104.2	244.9	8,759	3,571	16,088
2008	0.011	3,165	209.0	44.9	104.5	245.6	8,783	3,580	16,132
2009	0.009	3,156	208.4	44.8	104.2	244.9	8,760	3,570	16,088
2010	0.046	3,156	208.4	44.8	104.2	244.9	8,760	3,569	16,088
2011	0.067	3,156	208.4	44.8	104.2	244.9	8,762	3,567	16,087
2012	0.084	3,165	209.0	44.9	104.5	245.5	8,787	3,575	16,131
2013	0.141	3,157	208.4	44.8	104.2	244.9	8,766	3,561	16,085
2014	0.194	3,157	208.4	44.8	104.2	244.8	8,769	3,555	16,083
2015	0.246	3,157	208.4	44.8	104.2	244.8	8,773	3,548	16,081
2016	0.130	3,166	209.0	44.9	104.5	245.4	8,799	3,554	16,124
2017	0.136	3,158	208.4	44.8	104.2	244.8	8,777	3,541	16,079

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	1,461	173.9	10.0	364.1	70.0	13,311	704.1	16,094	9.79E-08	6.09E-10
1980	0	1,463	174.5	10.1	365.1	70.2	13,332	716.7	16,131	1.09E-09	6.75E-12
1981	0.018	1,459	174.0	10.0	364.1	70.0	13,296	714.5	16,087	-1.96E-08	-1.22E-10
1982	0	1,459	174.0	10.0	364.1	70.0	13,296	714.6	16,087	2.00E-11	1.24E-13
1983	8.51E-04	1,459	174.0	10.0	364.1	70.0	13,296	714.6	16,087	-2.77E-08	-1.72E-10
1984	0.006	1,463	174.5	10.1	365.1	70.2	13,332	716.5	16,131	4.93E-08	3.06E-10
1985	0.021	1,459	174.0	10.0	364.1	70.0	13,296	714.3	16,087	2.58E-10	1.61E-12
1986	0.017	1,459	174.0	10.0	364.1	70.0	13,296	714.1	16,088	-9.50E-09	-5.90E-11
1987	0.019	1,459	174.0	10.0	364.1	70.0	13,297	713.9	16,088	6.94E-07	4.32E-09
1988	0	1,463	174.5	10.1	365.1	70.2	13,333	716.0	16,132	2.46E-08	1.52E-10
1989	0	1,459	174.0	10.0	364.1	70.0	13,296	714.1	16,087	1.58E-09	9.84E-12
1990	0	1,459	174.0	10.0	364.1	70.0	13,296	714.3	16,087	2.85E-09	1.77E-11
1991	0.010	1,459	174.0	10.0	364.1	70.0	13,296	714.1	16,087	7.00E-09	4.35E-11
1992	0.016	1,463	174.5	10.1	365.1	70.2	13,333	715.9	16,132	1.05E-07	6.51E-10
1993	0.015	1,459	174.0	10.0	364.1	70.0	13,297	713.8	16,088	-1.27E-10	-7.91E-13
1994	0.018	1,459	174.0	10.0	364.1	70.0	13,297	713.6	16,088	2.46E-08	1.53E-10
1995	0.004	1,459	174.0	10.0	364.1	70.0	13,297	713.6	16,088	6.04E-08	3.76E-10
1996	0	1,463	174.5	10.1	365.1	70.2	13,333	715.7	16,132	-8.74E-07	-5.42E-09
1997	0.018	1,459	174.0	10.0	364.1	70.0	13,297	713.5	16,088	1.63E-07	1.01E-09
1998	0.003	1,459	174.0	10.0	364.1	70.0	13,297	713.5	16,088	-1.78E-09	-1.11E-11
1999	0	1,459	174.0	10.0	364.1	70.0	13,297	713.5	16,088	1.27E-10	7.91E-13
2000	0	1,463	174.5	10.1	365.1	70.2	13,334	715.6	16,132	5.75E-08	3.57E-10
2001	0.003	1,459	174.0	10.0	364.1	70.0	13,297	713.6	16,088	-2.82E-10	-1.75E-12
2002	0.009	1,459	174.0	10.0	364.1	70.0	13,297	713.5	16,088	3.29E-10	2.05E-12
2003	0	1,459	174.0	10.0	364.1	70.0	13,297	713.5	16,088	3.66E-08	2.27E-10
2004	0.007	1,463	174.5	10.1	365.1	70.2	13,334	715.4	16,132	4.00E-10	2.48E-12
2005	0	1,459	174.0	10.0	364.1	70.0	13,297	713.6	16,088	5.49E-09	3.41E-11
2006	4.38E-04	1,459	174.0	10.0	364.1	70.0	13,297	713.6	16,088	-3.18E-09	-1.98E-11
2007	0.051	1,459	174.0	10.0	364.1	70.0	13,298	713.0	16,088	2.44E-09	1.52E-11
2008	0	1,463	174.5	10.1	365.1	70.2	13,334	715.1	16,132	6.37E-11	3.95E-13
2009	0	1,459	174.0	10.0	364.1	70.0	13,298	713.3	16,088	1.83E-08	1.14E-10
2010	0	1,459	174.0	10.0	364.1	70.0	13,297	713.8	16,088	-1.15E-07	-7.16E-10
2011	0	1,459	174.0	10.0	364.1	70.0	13,296	714.6	16,087	3.04E-08	1.89E-10
2012	0	1,463	174.5	10.1	365.1	70.2	13,331	717.4	16,131	4.38E-08	2.71E-10
2013	0	1,458	174.0	10.0	364.1	70.0	13,292	716.9	16,085	-4.61E-08	-2.87E-10
2014	0	1,458	174.1	10.0	364.1	70.0	13,289	718.8	16,083	-3.55E-07	-2.20E-09
2015	0	1,457	174.1	10.0	364.1	70.0	13,284	721.3	16,081	-4.78E-08	-2.97E-10
2016	0	1,461	174.5	10.1	365.1	70.2	13,319	724.4	16,124	1.88E-06	1.16E-08
2017	0	1,457	174.1	10.0	364.1	70.0	13,280	723.8	16,079	-3.25E-09	-2.02E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0.377	0.045	0.239	0.155	704.1	3,572	4,277
1980	0	0.378	0.045	0.238	0.155	716.7	3,557	4,274
1981	0	0.377	0.045	0.238	0.155	714.5	3,548	4,263
1982	0.009	0.377	0.045	0.238	0.155	714.6	3,547	4,263
1983	5.27E-06	0.377	0.045	0.238	0.155	714.6	3,547	4,263
1984	0	0.378	0.045	0.238	0.155	716.5	3,557	4,274
1985	0	0.377	0.045	0.238	0.155	714.3	3,548	4,263
1986	0	0.377	0.045	0.238	0.155	714.1	3,549	4,263
1987	0	0.377	0.045	0.238	0.155	713.9	3,549	4,264
1988	0.018	0.378	0.045	0.238	0.155	716.0	3,558	4,275
1989	0.010	0.377	0.045	0.238	0.155	714.1	3,548	4,263
1990	0.011	0.377	0.045	0.238	0.155	714.3	3,548	4,263
1991	0	0.377	0.045	0.238	0.155	714.1	3,548	4,263
1992	0	0.378	0.045	0.238	0.155	715.9	3,558	4,275
1993	0	0.377	0.045	0.238	0.155	713.8	3,549	4,264
1994	0	0.377	0.045	0.238	0.155	713.6	3,550	4,264
1995	0	0.377	0.045	0.238	0.155	713.6	3,550	4,264
1996	0.008	0.378	0.045	0.238	0.155	715.7	3,559	4,276
1997	0	0.377	0.045	0.238	0.155	713.5	3,550	4,264
1998	2.21E-06	0.377	0.045	0.238	0.155	713.5	3,550	4,264
1999	0.006	0.377	0.045	0.238	0.155	713.5	3,550	4,264
2000	0.006	0.378	0.045	0.238	0.155	715.6	3,559	4,276
2001	0	0.377	0.045	0.238	0.155	713.6	3,550	4,264
2002	0	0.377	0.045	0.238	0.155	713.5	3,550	4,264
2003	0.004	0.377	0.045	0.238	0.155	713.5	3,550	4,264
2004	0	0.378	0.045	0.239	0.155	715.4	3,560	4,276
2005	0.015	0.377	0.045	0.238	0.155	713.6	3,550	4,264
2006	9.76E-04	0.377	0.045	0.238	0.155	713.6	3,550	4,264
2007	0	0.377	0.045	0.238	0.155	713.0	3,551	4,265
2008	0.017	0.378	0.045	0.238	0.155	715.1	3,561	4,277
2009	0.009	0.377	0.045	0.238	0.155	713.3	3,551	4,265
2010	0.047	0.377	0.045	0.238	0.155	713.8	3,549	4,264
2011	0.066	0.377	0.045	0.237	0.155	714.6	3,547	4,263
2012	0.087	0.378	0.045	0.237	0.155	717.4	3,555	4,273
2013	0.147	0.377	0.044	0.236	0.155	716.9	3,541	4,259
2014	0.200	0.377	0.044	0.235	0.155	718.8	3,535	4,255
2015	0.251	0.377	0.044	0.233	0.155	721.3	3,528	4,250
2016	0.117	0.378	0.044	0.234	0.155	724.4	3,535	4,260
2017	0.134	0.377	0.043	0.232	0.155	723.8	3,521	4,246

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0.381	0.195	0.257	0.073	3,573	702.4	4,277	5.78E-09	1.35E-10
1980	0	0.382	0.197	0.258	0.074	3,558	714.9	4,274	7.09E-11	1.66E-12
1981	0.019	0.381	0.197	0.257	0.073	3,549	712.7	4,263	-1.18E-09	-2.76E-11
1982	0	0.381	0.197	0.257	0.073	3,549	712.8	4,263	9.09E-13	2.13E-14
1983	8.50E-04	0.381	0.197	0.257	0.073	3,549	712.8	4,263	-1.65E-09	-3.88E-11
1984	0.006	0.382	0.197	0.258	0.074	3,559	714.7	4,274	2.93E-09	6.86E-11
1985	0.022	0.381	0.197	0.257	0.073	3,550	712.5	4,263	1.73E-11	4.05E-13
1986	0.016	0.381	0.196	0.257	0.073	3,550	712.3	4,263	-5.63E-10	-1.32E-11
1987	0.017	0.381	0.196	0.257	0.073	3,551	712.1	4,264	4.14E-08	9.70E-10
1988	0	0.382	0.197	0.258	0.074	3,560	714.2	4,275	1.47E-09	3.43E-11
1989	0	0.381	0.197	0.257	0.073	3,550	712.3	4,263	9.37E-11	2.20E-12
1990	0	0.381	0.197	0.257	0.073	3,550	712.4	4,263	1.66E-10	3.90E-12
1991	0.012	0.381	0.197	0.257	0.073	3,550	712.3	4,263	4.17E-10	9.79E-12
1992	0.017	0.382	0.197	0.258	0.074	3,560	714.1	4,275	6.42E-09	1.50E-10
1993	0.014	0.381	0.196	0.257	0.073	3,551	712.0	4,264	-6.37E-12	-1.49E-13
1994	0.019	0.381	0.196	0.257	0.073	3,551	711.8	4,264	1.48E-09	3.47E-11
1995	0.002	0.381	0.196	0.257	0.073	3,551	711.8	4,264	3.95E-09	9.26E-11
1996	0	0.382	0.197	0.258	0.074	3,561	713.8	4,276	-5.22E-08	-1.22E-09
1997	0.021	0.381	0.196	0.257	0.073	3,552	711.7	4,264	9.71E-09	2.28E-10
1998	0.002	0.381	0.196	0.257	0.073	3,552	711.7	4,264	-8.91E-11	-2.09E-12
1999	0	0.381	0.196	0.257	0.073	3,552	711.7	4,264	9.09E-12	2.13E-13
2000	0	0.382	0.197	0.258	0.074	3,561	713.8	4,276	3.40E-09	7.95E-11
2001	0.003	0.381	0.197	0.257	0.073	3,552	711.8	4,264	-1.46E-11	-3.41E-13
2002	0.010	0.381	0.196	0.257	0.073	3,552	711.7	4,264	1.73E-11	4.05E-13
2003	0	0.381	0.196	0.257	0.073	3,552	711.7	4,264	2.17E-09	5.10E-11
2004	0.007	0.382	0.197	0.258	0.074	3,562	713.6	4,276	1.73E-11	4.04E-13
2005	0	0.381	0.197	0.257	0.073	3,552	711.8	4,264	3.26E-10	7.64E-12
2006	3.86E-04	0.381	0.197	0.257	0.073	3,552	711.8	4,264	-1.94E-10	-4.54E-12
2007	0.055	0.381	0.196	0.257	0.073	3,553	711.1	4,265	1.42E-10	3.33E-12
2008	0	0.382	0.197	0.258	0.074	3,562	713.3	4,277	0	0
2009	0	0.381	0.196	0.257	0.073	3,552	711.5	4,265	1.07E-09	2.51E-11
2010	0	0.381	0.197	0.257	0.073	3,551	712.0	4,264	-6.85E-09	-1.61E-10
2011	0	0.381	0.197	0.257	0.073	3,549	712.8	4,263	1.84E-09	4.32E-11
2012	0	0.383	0.198	0.258	0.074	3,557	715.6	4,273	2.62E-09	6.14E-11
2013	0	0.382	0.198	0.257	0.073	3,543	715.1	4,259	-2.77E-09	-6.49E-11
2014	0	0.382	0.199	0.257	0.073	3,537	717.0	4,255	-2.12E-08	-4.97E-10
2015	0	0.382	0.201	0.258	0.073	3,530	719.5	4,250	-2.86E-09	-6.72E-11
2016	0	0.383	0.201	0.258	0.073	3,536	722.6	4,260	1.12E-07	2.64E-09
2017	0	0.382	0.201	0.258	0.073	3,523	722.0	4,246	-2.05E-10	-4.82E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	600.8	1.21	2,292	7,305	702.4	740.8	11,642
1980	0	471.7	0.849	2,234	7,663	714.9	388.0	11,472
1981	0	475.9	0.865	2,234	7,635	712.7	385.7	11,445
1982	0.755	470.7	0.850	2,228	7,640	712.8	384.4	11,438
1983	6.75E-05	469.7	0.847	2,227	7,640	712.8	382.6	11,433
1984	0	470.8	0.848	2,231	7,660	714.7	384.3	11,462
1985	0	478.3	0.873	2,237	7,631	712.5	384.6	11,444
1986	0	482.8	0.887	2,242	7,625	712.3	387.4	11,450
1987	0	485.8	0.895	2,243	7,619	712.1	389.9	11,450
1988	1.54	474.2	0.852	2,227	7,646	714.2	392.3	11,457
1989	0.781	470.2	0.840	2,217	7,628	712.3	393.3	11,423
1990	0.921	467.6	0.831	2,214	7,630	712.4	390.8	11,416
1991	0	475.2	0.857	2,226	7,625	712.3	393.0	11,432
1992	0	482.7	0.879	2,240	7,639	714.1	395.5	11,472
1993	0	484.6	0.886	2,236	7,615	712.0	402.8	11,451
1994	0	490.6	0.905	2,244	7,609	711.8	410.5	11,466
1995	2.19E-05	488.5	0.897	2,238	7,609	711.8	417.6	11,467
1996	0.701	483.5	0.877	2,234	7,634	713.8	425.3	11,492
1997	0	490.2	0.902	2,240	7,605	711.7	429.5	11,478
1998	0.001	490.5	0.902	2,240	7,605	711.7	433.8	11,483
1999	0.528	485.1	0.883	2,231	7,609	711.7	438.4	11,476
2000	0.483	484.3	0.880	2,236	7,632	713.8	441.9	11,509
2001	0	483.2	0.878	2,230	7,610	711.8	442.8	11,478
2002	0	489.8	0.902	2,242	7,605	711.7	443.0	11,493
2003	0.311	486.8	0.892	2,237	7,607	711.7	444.1	11,489
2004	0	491.0	0.903	2,247	7,625	713.6	446.6	11,524
2005	1.26	479.7	0.866	2,224	7,610	711.8	447.5	11,475
2006	0.070	477.2	0.856	2,218	7,610	711.8	449.3	11,467
2007	0	500.6	0.935	2,253	7,589	711.1	451.2	11,505
2008	1.50	488.6	0.890	2,235	7,617	713.3	456.4	11,512
2009	0.678	486.6	0.887	2,231	7,600	711.5	456.1	11,487
2010	3.89	473.9	0.848	2,219	7,618	712.0	453.9	11,482
2011	5.44	452.7	0.780	2,193	7,644	712.8	449.8	11,458
2012	7.16	414.1	0.648	2,141	7,690	715.6	437.1	11,405
2013	12.2	349.7	0.435	2,045	7,710	715.1	408.4	11,240
2014	16.5	270.7	0.172	1,932	7,767	717.0	367.5	11,071
2015	20.7	176.8	0.019	1,802	7,834	719.5	309.2	10,863
2016	9.42	153.3	0.005	1,784	7,882	722.6	259.5	10,811
2017	11.1	116.0	0	1,733	7,896	722.0	210.6	10,689

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	6,570	1,099	0	400.9	3,572	0	11,642	6.79E-04	5.83E-06
1980	0	6,263	1,234	0	413.4	3,557	5.55	11,472	7.77E-06	6.77E-08
1981	1.56	6,253	1,226	0	412.3	3,548	5.57	11,445	-1.47E-04	-1.29E-06
1982	0	6,249	1,222	0	412.2	3,547	6.76	11,438	1.58E-07	1.38E-09
1983	0.079	6,250	1,216	0	412.0	3,547	7.80	11,433	-2.11E-04	-1.85E-06
1984	0.482	6,269	1,214	0	413.0	3,557	8.18	11,462	3.77E-04	3.29E-06
1985	1.80	6,260	1,214	0	412.3	3,548	7.72	11,444	2.17E-06	1.90E-08
1986	1.32	6,266	1,216	0	412.4	3,549	6.86	11,450	-7.23E-05	-6.32E-07
1987	1.41	6,272	1,210	0	412.1	3,549	5.99	11,450	0.005	4.63E-05
1988	0	6,282	1,199	0	412.1	3,558	5.21	11,457	1.87E-04	1.64E-06
1989	0	6,262	1,198	0	410.8	3,548	4.45	11,423	1.20E-05	1.05E-07
1990	0	6,258	1,196	0	410.5	3,548	3.93	11,416	2.16E-05	1.89E-07
1991	1.04	6,262	1,206	0	411.1	3,548	3.46	11,432	5.36E-05	4.69E-07
1992	1.38	6,285	1,211	0	412.4	3,558	2.94	11,472	7.68E-04	6.69E-06
1993	1.17	6,273	1,213	0	411.5	3,549	2.35	11,451	-9.09E-07	-7.94E-09
1994	1.53	6,280	1,221	0	411.8	3,550	1.86	11,466	1.85E-04	1.61E-06
1995	0.154	6,281	1,223	0	411.6	3,550	1.43	11,467	4.01E-04	3.49E-06
1996	0	6,295	1,225	0	412.3	3,559	1.09	11,492	-6.67E-03	-5.80E-05
1997	1.73	6,285	1,228	0	411.6	3,550	0.852	11,478	0.001	1.08E-05
1998	0.177	6,286	1,234	0	411.7	3,550	0.661	11,483	-1.59E-05	-1.39E-07
1999	0	6,284	1,231	0	411.2	3,550	0.525	11,476	1.17E-06	1.02E-08
2000	0	6,299	1,238	0	412.4	3,559	0.463	11,509	4.45E-04	3.87E-06
2001	0.294	6,283	1,233	0	411.2	3,550	0.424	11,478	-2.50E-06	-2.18E-08
2002	0.871	6,287	1,243	0	411.9	3,550	0.436	11,493	2.36E-06	2.06E-08
2003	0	6,285	1,241	0	411.7	3,550	0.448	11,489	2.79E-04	2.43E-06
2004	0.620	6,305	1,244	0	412.9	3,560	0.449	11,524	2.68E-06	2.32E-08
2005	0	6,283	1,231	0	410.9	3,550	0.415	11,475	4.12E-05	3.59E-07
2006	0.035	6,283	1,224	0	410.5	3,550	0.367	11,467	-2.42E-05	-2.11E-07
2007	4.60	6,303	1,235	0	411.8	3,551	0.294	11,505	1.84E-05	1.60E-07
2008	0	6,314	1,226	0	411.7	3,561	0.205	11,512	-9.60E-08	-8.34E-10
2009	0	6,293	1,232	0	411.0	3,551	0.176	11,487	1.43E-04	1.24E-06
2010	0	6,276	1,245	0	411.1	3,549	0.214	11,482	-8.83E-04	-7.69E-06
2011	0	6,252	1,247	0	410.6	3,547	0.363	11,458	2.29E-04	2.00E-06
2012	0	6,238	1,202	0	408.8	3,555	0.757	11,405	3.32E-04	2.91E-06
2013	0	6,168	1,126	0	403.1	3,541	1.51	11,240	-3.53E-04	-3.14E-06
2014	0	6,097	1,038	0.004	397.7	3,535	3.44	11,071	-2.70E-03	-2.44E-05
2015	0	6,006	927.7	0.167	391.4	3,528	8.98	10,863	-3.63E-04	-3.34E-06
2016	0	5,981	885.5	0.227	391.5	3,535	18.3	10,811	0.014	1.32E-04
2017	0	5,916	831.2	0.342	388.4	3,521	31.5	10,689	-2.44E-05	-2.29E-07

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0.735	1.08	2.42	5.74	0	731.0	741.0
1980	0	0.323	0.490	0.821	6.78	5.55	381.0	394.9
1981	0.033	0.328	0.519	0.798	6.78	5.57	378.6	392.6
1982	0.281	0.304	0.517	0.802	6.79	6.76	377.2	392.7
1983	0.251	0.302	0.520	0.813	6.80	7.80	375.5	391.9
1984	0.075	0.319	0.569	0.925	6.80	8.18	377.1	394.0
1985	0	0.349	0.608	1.00	6.77	7.72	377.5	393.9
1986	0	0.374	0.642	1.07	6.76	6.86	380.2	395.9
1987	0	0.385	0.654	1.07	6.76	5.99	382.7	397.5
1988	0.078	0.360	0.604	0.918	6.79	5.21	384.9	398.9
1989	0.014	0.371	0.593	0.904	6.77	4.45	386.1	399.2
1990	0.251	0.351	0.497	0.609	6.81	3.93	383.6	396.0
1991	3.30E-04	0.363	0.541	0.808	6.78	3.46	386.0	397.9
1992	0	0.371	0.549	0.816	6.80	2.94	388.3	399.8
1993	0	0.403	0.656	1.19	6.71	2.35	395.7	407.0
1994	0	0.425	0.717	1.32	6.67	1.86	403.1	414.1
1995	0	0.429	0.729	1.33	6.65	1.43	410.1	420.7
1996	0	0.423	0.725	1.31	6.65	1.09	417.7	427.9
1997	0	0.424	0.730	1.34	6.61	0.852	422.0	431.9
1998	0.002	0.417	0.715	1.28	6.61	0.661	426.2	435.9
1999	0	0.410	0.707	1.28	6.59	0.525	430.7	440.3
2000	0.006	0.386	0.666	1.19	6.61	0.463	434.2	443.5
2001	0	0.380	0.657	1.20	6.58	0.424	435.2	444.4
2002	0.009	0.365	0.631	1.15	6.58	0.436	435.4	444.6
2003	0.006	0.362	0.628	1.15	6.58	0.448	436.5	445.7
2004	0	0.375	0.651	1.21	6.59	0.449	438.9	448.2
2005	0	0.377	0.654	1.20	6.57	0.415	439.8	449.0
2006	0	0.387	0.667	1.22	6.56	0.367	441.7	450.9
2007	0	0.429	0.739	1.38	6.55	0.294	443.6	453.0
2008	1.10E-04	0.428	0.736	1.35	6.56	0.205	448.5	457.8
2009	0.029	0.397	0.682	1.23	6.55	0.176	448.3	457.3
2010	0.456	0.321	0.553	0.977	6.57	0.214	446.1	455.2
2011	0.748	0.247	0.434	0.793	6.59	0.363	442.2	451.3
2012	1.60	0.119	0.124	0.217	6.69	0.757	429.8	439.3
2013	2.98	0.030	0	0	6.83	1.51	401.9	413.3
2014	4.39	0.007	0	0	7.08	3.44	362.3	377.2
2015	6.24	0.012	0	0	7.48	8.98	305.9	328.6
2016	5.20	0.017	0	0	7.67	18.3	257.6	288.8
2017	5.45	0.021	0	0	7.87	31.5	208.9	253.8

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0.029	0	0.132	0	740.8	0	741.0	2.68E-06	3.62E-07
1980	0	1.00	0	0.250	0	388.0	5.63	394.9	1.86E-09	4.70E-10
1981	0.065	0.998	0	0.227	0	385.7	5.64	392.6	-6.19E-08	-1.58E-08
1982	0	1.08	0	0.229	0	384.4	6.92	392.7	6.45E-11	1.64E-11
1983	0.003	1.11	0	0.231	0	382.6	7.95	391.9	-8.86E-08	-2.26E-08
1984	0.091	1.10	0	0.221	0	384.3	8.29	394.0	1.65E-07	4.20E-08
1985	0.269	1.06	0	0.210	0	384.6	7.78	393.9	1.27E-09	3.22E-10
1986	0.389	1.01	0	0.204	0	387.4	6.91	395.9	-3.05E-08	-7.71E-09
1987	0.395	0.982	0	0.198	0	389.9	6.02	397.5	2.44E-06	6.13E-07
1988	0.166	0.955	0	0.204	0	392.3	5.26	398.9	7.79E-08	1.95E-08
1989	0.205	0.936	0	0.206	0	393.3	4.50	399.2	5.00E-09	1.25E-09
1990	0.103	0.921	0	0.230	0	390.8	3.98	396.0	9.84E-09	2.49E-09
1991	0.300	0.908	0	0.217	0	393.0	3.48	397.9	2.33E-08	5.85E-09
1992	0.281	0.890	0	0.211	0	395.5	2.96	399.8	3.37E-07	8.42E-08
1993	0.746	0.874	0	0.195	0	402.8	2.37	407.0	-4.04E-10	-9.94E-11
1994	0.737	0.865	0	0.189	0	410.5	1.85	414.1	6.35E-08	1.53E-08
1995	0.594	0.858	0	0.187	0	417.6	1.44	420.7	1.85E-07	4.41E-08
1996	0.481	0.855	0	0.187	0	425.3	1.11	427.9	-2.93E-06	-6.85E-07
1997	0.565	0.848	0	0.186	0	429.5	0.849	431.9	5.55E-07	1.28E-07
1998	0.380	0.841	0	0.184	0	433.8	0.663	435.9	-6.96E-09	-1.60E-09
1999	0.323	0.840	0	0.184	0	438.4	0.529	440.3	4.58E-10	1.04E-10
2000	0.158	0.845	0	0.188	0	441.9	0.471	443.5	2.35E-07	5.31E-08
2001	0.185	0.845	0	0.188	0	442.8	0.432	444.4	-1.24E-09	-2.80E-10
2002	0.096	0.851	0	0.191	0	443.0	0.447	444.6	6.88E-10	1.55E-10
2003	0.057	0.856	0	0.193	0	444.1	0.460	445.7	1.16E-07	2.60E-08
2004	0.136	0.861	0	0.189	0	446.6	0.458	448.2	1.37E-09	3.06E-10
2005	0.062	0.857	0	0.189	0	447.5	0.426	449.0	1.66E-08	3.70E-09
2006	0.142	0.853	0	0.188	0	449.3	0.373	450.9	-9.82E-09	-2.18E-09
2007	0.503	0.845	0	0.179	0	451.2	0.298	453.0	8.30E-09	1.83E-09
2008	0.202	0.837	0	0.180	0	456.4	0.208	457.8	-4.49E-11	-9.81E-12
2009	0.067	0.832	0	0.183	0	456.1	0.181	457.3	8.79E-08	1.92E-08
2010	0	0.844	0	0.206	0	453.9	0.226	455.2	-4.07E-07	-8.95E-08
2011	0	0.867	0	0.251	0	449.8	0.396	451.3	1.02E-07	2.26E-08
2012	0	0.879	0.032	0.521	0	437.1	0.800	439.3	1.41E-07	3.20E-08
2013	0	0.998	0.513	1.77	0	408.4	1.61	413.3	-1.26E-07	-3.05E-08
2014	0	1.25	1.26	3.51	0.043	367.5	3.68	377.2	-1.05E-06	-2.79E-07
2015	0	1.62	2.26	5.87	0.151	309.2	9.44	328.6	-1.62E-07	-4.94E-08
2016	0	1.75	2.57	6.34	0.177	259.5	18.4	288.8	5.95E-06	2.06E-06
2017	0	1.87	2.91	7.09	0.214	210.6	31.0	253.8	-9.83E-09	-3.88E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	31.8	115.7	8.92	94.6	143.9	0	359.9	754.8
1980	0	42.6	42.2	3.52	51.7	175.8	5.63	248.0	569.5
1981	1.58	42.5	43.3	3.81	44.5	176.3	5.64	250.1	567.7
1982	9.79	42.5	39.0	3.82	45.8	176.5	6.92	255.5	579.8
1983	9.28	42.6	39.0	3.86	47.4	176.6	7.95	256.4	583.1
1984	3.00	42.8	42.5	4.38	55.6	176.7	8.29	248.2	581.4
1985	0.040	42.6	46.9	4.73	60.3	175.8	7.78	239.4	577.7
1986	0	42.6	50.6	5.04	63.6	175.4	6.91	234.4	578.6
1987	0	42.5	52.6	5.13	61.2	175.4	6.02	234.6	577.3
1988	1.81	42.5	49.6	4.70	50.0	176.5	5.26	243.5	573.8
1989	0.210	42.3	51.1	4.61	50.1	175.9	4.50	242.5	571.3
1990	6.98	42.3	46.9	3.62	36.1	177.4	3.98	256.5	573.8
1991	0.143	42.2	49.0	4.06	46.5	176.3	3.48	243.8	565.5
1992	0.040	42.2	50.0	4.09	45.1	176.6	2.96	243.5	564.6
1993	0	42.0	56.2	5.20	76.8	173.7	2.37	222.5	578.7
1994	0	41.8	60.4	5.77	82.5	172.5	1.85	219.2	584.0
1995	0	41.7	61.5	5.90	81.7	171.8	1.44	222.6	586.6
1996	0	41.6	61.3	5.91	80.6	171.8	1.11	227.7	590.0
1997	0	41.3	61.3	5.92	83.5	170.5	0.849	228.8	592.1
1998	0.084	41.2	60.3	5.78	76.3	170.5	0.663	235.3	590.1
1999	0	41.1	59.5	5.74	77.6	170.1	0.529	238.0	592.5
2000	0.156	41.1	55.2	5.33	72.7	170.5	0.471	245.6	591.1
2001	0	40.9	54.4	5.26	74.4	169.8	0.432	246.4	591.5
2002	0.571	40.9	51.1	4.96	70.6	169.8	0.447	251.0	589.3
2003	0.198	40.8	50.9	4.95	72.2	169.7	0.460	251.7	590.8
2004	0	40.9	52.7	5.16	75.1	169.9	0.458	251.0	595.3
2005	0	40.8	53.7	5.24	75.5	169.3	0.426	250.7	595.6
2006	0	40.7	55.7	5.39	76.5	169.1	0.373	250.3	598.0
2007	0	40.7	61.5	5.97	82.9	168.6	0.298	244.6	604.6
2008	0	40.7	61.9	6.00	80.3	169.0	0.208	248.0	606.1
2009	0.724	40.5	56.6	5.47	72.7	168.7	0.181	254.8	599.6
2010	10.4	40.5	44.7	4.26	59.8	169.3	0.226	269.0	598.1
2011	18.2	40.6	35.8	3.22	54.6	169.8	0.396	277.9	600.6
2012	43.3	41.0	21.1	0.677	31.5	173.3	0.800	307.5	619.1
2013	81.6	41.3	7.20	0	16.4	180.1	1.61	353.8	681.9
2014	122.0	42.0	1.52	0	10.0	189.2	3.68	402.1	770.6
2015	176.9	43.1	1.18	0	4.14	202.4	9.44	463.4	900.6
2016	157.6	44.5	1.50	0	3.87	207.5	18.4	435.8	869.2
2017	164.4	45.7	1.78	0	2.52	214.2	31.0	419.4	879.1

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0.192	0	23.5	0.113	731.0	0	754.8	7.48E-05	9.91E-06
1980	0	8.65	140.8	0	38.0	0.300	381.0	0.810	569.5	-3.48E-08	-6.11E-09
1981	0.774	8.14	140.3	0	38.6	0.302	378.6	0.931	567.7	-2.20E-07	-3.88E-08
1982	0.002	7.78	156.1	0	38.3	0.303	377.2	0.161	579.8	5.44E-10	9.38E-11
1983	0.099	7.47	161.6	0	38.1	0.303	375.5	0.119	583.1	-3.03E-07	-5.20E-08
1984	2.51	5.40	159.2	0	36.4	0.299	377.1	0.506	581.4	7.31E-07	1.26E-07
1985	6.95	4.82	150.4	0	35.9	0.291	377.5	1.86	577.7	1.32E-08	2.29E-09
1986	11.7	4.52	142.6	0	35.6	0.283	380.2	3.67	578.6	-1.11E-07	-1.91E-08
1987	11.9	4.99	137.3	0	35.7	0.278	382.7	4.49	577.3	1.38E-05	2.39E-06
1988	7.40	6.55	133.5	0	37.3	0.281	384.9	3.83	573.8	2.50E-07	4.35E-08
1989	8.42	6.23	130.2	0	36.6	0.284	386.1	3.45	571.3	1.76E-08	3.08E-09
1990	4.35	7.83	127.8	0	47.9	0.299	383.6	2.05	573.8	5.47E-08	9.54E-09
1991	9.42	5.48	125.4	0	37.1	0.304	386.0	1.86	565.5	1.01E-07	1.78E-08
1992	8.23	5.96	122.1	0	37.7	0.305	388.3	1.93	564.6	1.61E-06	2.86E-07
1993	23.2	2.50	119.5	0	34.9	0.289	395.7	2.64	578.7	-1.66E-09	-2.87E-10
1994	22.4	2.06	118.1	0	35.2	0.270	403.1	2.85	584.0	-1.27E-07	-2.18E-08
1995	19.5	2.34	116.9	0	35.1	0.257	410.1	2.36	586.6	1.00E-06	1.71E-07
1996	16.9	2.18	116.4	0	34.9	0.249	417.7	1.65	590.0	-1.38E-05	-2.33E-06
1997	16.7	1.86	115.1	0	35.0	0.242	422.0	1.29	592.1	2.80E-06	4.73E-07
1998	12.5	2.04	114.0	0	34.2	0.240	426.2	0.923	590.1	-1.74E-08	-2.95E-09
1999	11.5	1.76	113.7	0	34.1	0.240	430.7	0.639	592.5	1.22E-09	2.06E-10
2000	5.83	2.27	114.4	0	33.9	0.242	434.2	0.252	591.1	1.92E-06	3.25E-07
2001	5.78	1.85	114.4	0	33.9	0.243	435.2	0.185	591.5	-8.63E-09	-1.46E-09
2002	2.21	2.28	115.3	0	33.8	0.245	435.4	0.079	589.3	-5.82E-09	-9.88E-10
2003	2.11	2.02	116.1	0	33.9	0.246	436.5	0.074	590.8	3.75E-07	6.35E-08
2004	3.63	1.76	116.6	0	34.0	0.246	438.9	0.119	595.3	1.04E-08	1.75E-09
2005	3.55	1.76	116.2	0	33.9	0.244	439.8	0.140	595.6	4.89E-08	8.21E-09
2006	4.85	1.53	115.5	0	34.0	0.242	441.7	0.194	598.0	-2.42E-08	-4.05E-09
2007	11.1	1.10	114.1	0	34.0	0.237	443.6	0.488	604.6	4.38E-08	7.25E-09
2008	8.52	1.60	112.9	0	33.9	0.234	448.5	0.384	606.1	-2.65E-10	-4.37E-11
2009	3.00	2.35	112.3	0	33.4	0.234	448.3	0.094	599.6	9.46E-07	1.58E-07
2010	2.21E-04	3.52	115.1	0	33.2	0.244	446.1	0	598.1	-2.24E-06	-3.75E-07
2011	0	3.52	120.7	0	33.9	0.257	442.2	0	600.6	4.82E-07	8.03E-08
2012	0	3.51	128.2	0.718	56.6	0.291	429.8	0	619.1	5.21E-07	8.42E-08
2013	0	4.94	148.6	5.81	118.6	2.10	401.9	0	681.9	1.15E-07	1.68E-08
2014	0	6.27	189.7	12.8	194.8	4.61	362.3	0	770.6	-1.46E-06	-1.90E-07
2015	0	8.25	250.5	22.4	305.5	8.08	305.9	0	900.6	-8.21E-07	-9.12E-08
2016	0	7.33	272.7	25.2	297.3	8.86	257.6	0.207	869.2	2.26E-05	2.60E-06
2017	0	7.78	294.9	28.5	327.9	10.0	208.9	0.976	879.1	-3.20E-08	-3.63E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	30.7	15.0	5.31	13.0	72.9	0	235.7	372.7
1980	0	41.8	7.33	2.81	6.47	86.2	0.810	146.9	292.4
1981	0.607	41.7	7.36	2.88	6.39	86.3	0.931	148.3	294.5
1982	4.02	41.7	6.56	2.89	6.41	86.4	0.161	152.0	300.2
1983	4.68	41.8	6.38	2.89	6.44	86.5	0.119	153.2	301.9
1984	2.36	42.0	6.75	3.04	6.81	86.5	0.506	147.4	295.4
1985	0.190	41.9	7.50	3.17	7.10	86.1	1.86	140.8	288.6
1986	0	41.8	8.19	3.32	7.40	85.9	3.67	136.3	286.6
1987	0	41.7	8.58	3.40	7.49	85.9	4.49	136.0	287.5
1988	0.595	41.8	8.31	3.28	7.08	86.4	3.83	142.2	293.5
1989	0.194	41.6	8.58	3.21	6.89	86.2	3.45	141.9	292.0
1990	2.93	41.5	8.39	2.88	5.83	86.8	2.05	151.9	302.3
1991	0.114	41.4	8.49	2.95	6.18	86.4	1.86	143.6	291.1
1992	0.034	41.5	8.62	2.97	6.23	86.6	1.93	142.8	290.6
1993	0	41.2	9.10	3.31	7.45	85.3	2.64	128.0	277.1
1994	0	41.1	9.50	3.58	8.10	84.7	2.85	124.8	274.6
1995	0	40.9	9.65	3.69	8.34	84.4	2.36	127.0	276.4
1996	0	40.8	9.61	3.70	8.37	84.4	1.65	130.8	279.4
1997	0	40.6	9.52	3.69	8.43	83.9	1.29	131.9	279.2
1998	0	40.4	9.36	3.63	8.21	83.8	0.923	136.6	282.9
1999	0	40.3	9.21	3.59	8.18	83.7	0.639	138.8	284.4
2000	0.029	40.3	8.72	3.42	7.88	83.9	0.252	144.1	288.6
2001	0	40.1	8.47	3.33	7.77	83.6	0.185	145.1	288.5
2002	0.147	40.0	8.07	3.19	7.53	83.6	0.079	148.4	291.1
2003	0.088	40.0	7.93	3.15	7.51	83.6	0.074	149.1	291.4
2004	0	40.1	8.10	3.22	7.70	83.7	0.119	148.7	291.6
2005	0	39.9	8.23	3.27	7.80	83.4	0.140	148.5	291.3
2006	0	39.9	8.49	3.34	7.92	83.4	0.194	148.2	291.4
2007	0	39.8	9.15	3.59	8.43	83.1	0.488	144.3	288.9
2008	0	39.9	9.38	3.68	8.56	83.3	0.384	146.3	291.5
2009	0.199	39.7	8.87	3.50	8.14	83.2	0.094	151.3	294.9
2010	3.97	39.7	7.45	2.99	7.13	83.4	0	161.4	306.1
2011	8.54	39.8	5.93	2.43	6.15	83.7	0	168.4	314.9
2012	20.3	40.1	3.76	1.11	3.38	85.1	0	189.7	343.5
2013	39.0	40.3	0.936	0	0.362	87.4	0	223.8	392.0
2014	60.1	41.0	0.355	0	0	91.6	0	261.0	454.1
2015	88.0	42.0	0.417	0	0	97.5	0	308.6	536.6
2016	85.6	43.4	0.478	0	0	100.6	0.207	290.8	521.0
2017	88.3	44.6	0.531	0	0	103.6	0.976	277.3	515.3

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	0	0.291	0	359.9	12.5	372.7	2.63E-05	7.06E-06
1980	0	0	20.9	0	0.578	4.31E-04	248.0	22.8	292.4	-1.34E-08	-4.59E-09
1981	0.289	0.008	20.9	0	0.536	8.50E-04	250.1	22.6	294.5	-5.66E-08	-1.92E-08
1982	0	0.008	22.3	0	0.535	0.001	255.5	21.9	300.2	1.38E-10	4.58E-11
1983	0.027	0.008	23.0	0	0.541	0.001	256.4	21.9	301.9	-7.80E-08	-2.58E-08
1984	0.977	0.008	23.1	0	0.531	2.96E-04	248.2	22.6	295.4	1.88E-07	6.35E-08
1985	2.47	0.008	22.4	0	0.519	0	239.4	23.7	288.6	3.43E-09	1.19E-09
1986	5.16	0.008	21.7	0	0.513	0	234.4	24.9	286.6	-2.84E-08	-9.93E-09
1987	6.02	0.008	21.0	0	0.503	0	234.6	25.4	287.5	3.53E-06	1.23E-06
1988	4.27	0.008	20.4	0	0.495	0	243.5	24.8	293.5	6.41E-08	2.18E-08
1989	4.62	0.008	19.9	0	0.493	0	242.5	24.5	292.0	4.48E-09	1.54E-09
1990	2.91	0.008	19.5	0	0.515	0	256.5	22.8	302.3	1.40E-08	4.64E-09
1991	4.18	0.008	19.2	0	0.515	9.36E-04	243.8	23.4	291.1	2.57E-08	8.84E-09
1992	4.31	0.008	18.8	0	0.510	0.001	243.5	23.5	290.6	4.12E-07	1.42E-07
1993	10.7	0.008	18.4	0	0.501	0	222.5	25.0	277.1	-4.06E-10	-1.46E-10
1994	11.6	0.008	18.2	0	0.492	0	219.2	25.2	274.6	-3.51E-08	-1.28E-08
1995	10.7	0.008	18.0	0	0.484	0	222.6	24.6	276.4	2.57E-07	9.29E-08
1996	9.47	0.008	17.8	0	0.481	0	227.7	23.8	279.4	-3.52E-06	-1.26E-06
1997	9.06	0.008	17.6	0	0.480	0	228.8	23.3	279.2	7.18E-07	2.57E-07
1998	7.15	0.008	17.5	0	0.472	0	235.3	22.5	282.9	-4.74E-09	-1.67E-09
1999	6.39	0.008	17.4	0	0.471	0	238.0	22.1	284.4	2.55E-10	8.96E-11
2000	3.79	0.008	17.4	0	0.478	0	245.6	21.4	288.6	4.95E-07	1.71E-07
2001	3.24	0.008	17.4	0	0.481	0	246.4	21.1	288.5	-2.24E-09	-7.78E-10
2002	1.49	0.008	17.5	0	0.487	0	251.0	20.6	291.1	-1.48E-09	-5.08E-10
2003	1.18	0.008	17.5	0	0.490	0	251.7	20.5	291.4	9.44E-08	3.24E-08
2004	1.75	0.008	17.6	0	0.488	0	251.0	20.7	291.6	2.70E-09	9.25E-10
2005	1.86	0.008	17.6	0	0.484	0	250.7	20.6	291.3	1.23E-08	4.23E-09
2006	2.44	0.008	17.6	0	0.480	0	250.3	20.6	291.4	-6.27E-09	-2.15E-09
2007	5.19	0.008	17.4	0	0.469	0	244.6	21.2	288.9	1.10E-08	3.80E-09
2008	4.70	0.008	17.3	0	0.467	0	248.0	21.0	291.5	-9.04E-11	-3.10E-11
2009	2.19	0.008	17.2	0	0.460	0	254.8	20.3	294.9	2.50E-07	8.47E-08
2010	0.031	0.017	17.3	0	0.486	0	269.0	19.3	306.1	-5.75E-07	-1.88E-07
2011	0	0.017	17.7	0	0.562	0	277.9	18.8	314.9	1.27E-07	4.02E-08
2012	0	0.042	17.9	0	0.916	0	307.5	17.2	343.5	1.35E-07	3.92E-08
2013	0	0.075	18.4	1.23	3.66	0.304	353.8	14.5	392.0	1.76E-09	4.48E-10
2014	0	0.117	22.5	4.30	10.8	1.61	402.1	12.8	454.1	-3.57E-07	-7.87E-08
2015	0	0.168	28.6	8.45	21.0	3.40	463.4	11.5	536.6	-2.11E-07	-3.92E-08
2016	0	0.143	31.9	10.6	25.8	4.32	435.8	12.5	521.0	5.78E-06	1.11E-06
2017	0	0.151	34.4	12.4	30.1	5.12	419.4	13.7	515.3	-7.60E-09	-1.48E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers	
	(acre-feet)							
Predevelopment	0	30.5	46.4	18.5	46.3	83.9	12.5	238.1
1980	0	41.9	22.4	11.2	23.8	98.6	22.8	220.7
1981	2.05	41.8	22.4	11.3	23.8	98.6	22.6	222.5
1982	10.3	41.8	21.0	11.3	23.8	98.7	21.9	228.7
1983	14.3	41.9	20.5	11.2	23.7	98.7	21.9	232.3
1984	9.47	42.1	21.0	11.5	24.5	98.9	22.6	230.1
1985	1.79	42.0	22.6	11.8	25.3	98.5	23.7	225.6
1986	0	41.9	24.2	12.2	26.3	98.4	24.9	227.9
1987	0	41.9	25.3	12.5	26.9	98.3	25.4	230.4
1988	1.18	41.9	24.8	12.3	26.3	98.7	24.8	230.1
1989	0.699	41.7	25.4	12.1	25.5	98.4	24.5	228.3
1990	9.12	41.6	25.1	11.4	23.1	98.8	22.8	232.0
1991	0.805	41.5	25.2	11.3	22.9	98.6	23.4	223.8
1992	0.189	41.6	25.5	11.4	23.0	98.8	23.5	224.0
1993	0	41.4	26.5	12.1	25.4	97.9	25.0	228.2
1994	0	41.2	27.5	12.8	27.7	97.4	25.2	231.8
1995	0	41.0	28.0	13.2	28.9	97.0	24.6	232.8
1996	0	41.0	28.0	13.3	29.3	97.0	23.8	232.4
1997	0	40.7	27.7	13.2	29.3	96.4	23.3	230.7
1998	0	40.5	27.3	13.0	28.9	96.3	22.5	228.5
1999	0	40.4	26.8	12.9	28.6	96.1	22.1	226.8
2000	0.004	40.4	25.7	12.4	27.6	96.3	21.4	223.8
2001	0	40.2	24.8	12.0	26.9	95.9	21.1	221.0
2002	0.156	40.1	23.8	11.6	26.1	95.9	20.6	218.3
2003	0.188	40.1	23.3	11.4	25.8	95.8	20.5	217.1
2004	0	40.1	23.6	11.6	26.2	96.0	20.7	218.2
2005	0	40.0	24.0	11.7	26.6	95.7	20.6	218.6
2006	0	40.0	24.6	12.0	27.1	95.6	20.6	219.9
2007	0	39.9	26.2	12.6	28.7	95.5	21.2	224.0
2008	0	39.9	27.1	13.0	29.6	95.6	21.0	226.3
2009	0.233	39.8	26.1	12.7	28.7	95.4	20.3	223.1
2010	9.54	39.8	22.8	11.3	25.5	95.5	19.3	223.8
2011	26.9	39.8	18.7	9.51	21.6	95.7	18.8	231.0
2012	67.2	40.1	13.1	6.10	13.2	96.8	17.2	253.6
2013	133.7	40.4	4.18	0.655	1.93	98.1	14.5	293.4
2014	213.4	41.0	0.928	0	0	100.4	12.8	368.5
2015	317.1	42.0	1.16	0	0	103.9	11.5	475.6
2016	334.7	43.3	1.41	0	0	107.0	12.5	499.0
2017	346.6	44.6	1.62	0	0	109.6	13.7	516.1

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-10.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Pecan Valley GCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Evergreen UWCD	Gonzales County UWCD	Gonzales	Lavaca	Upper Layers			
	(acre-feet)								%
Predevelopment	0	0	0	1.97	0.343	235.7	238.1	2.87E-05	1.20E-05
1980	0	69.8	0	3.35	0.627	146.9	220.7	-1.68E-08	-7.61E-09
1981	0.633	69.6	0	3.27	0.628	148.3	222.5	-4.16E-08	-1.87E-08
1982	0	72.8	0	3.26	0.629	152.0	228.7	1.61E-10	7.03E-11
1983	0.003	75.2	0	3.27	0.630	153.2	232.3	-5.69E-08	-2.45E-08
1984	2.77	75.9	0	3.34	0.628	147.4	230.1	1.43E-07	6.21E-08
1985	6.52	74.3	0	3.38	0.621	140.8	225.6	2.81E-09	1.24E-09
1986	15.4	72.2	0	3.41	0.614	136.3	227.9	-2.10E-08	-9.21E-09
1987	20.3	70.2	0	3.40	0.608	136.0	230.4	2.78E-06	1.21E-06
1988	15.5	68.4	0	3.34	0.610	142.2	230.1	4.61E-08	2.01E-08
1989	15.9	66.7	0	3.29	0.611	141.9	228.3	3.34E-09	1.46E-09
1990	11.0	65.3	0	3.15	0.622	151.9	232.0	1.10E-08	4.76E-09
1991	12.2	64.2	0	3.18	0.627	143.6	223.8	1.95E-08	8.73E-09
1992	14.2	63.1	0	3.18	0.631	142.8	224.0	3.18E-07	1.42E-07
1993	34.5	61.8	0	3.32	0.618	128.0	228.2	-4.06E-10	-1.78E-10
1994	42.1	60.9	0	3.40	0.601	124.8	231.8	-3.70E-08	-1.60E-08
1995	41.6	60.2	0	3.41	0.586	127.0	232.8	2.00E-07	8.58E-08
1996	37.8	59.8	0	3.41	0.577	130.8	232.4	-2.72E-06	-1.17E-06
1997	35.8	59.1	0	3.40	0.567	131.9	230.7	5.59E-07	2.42E-07
1998	29.4	58.6	0	3.36	0.563	136.6	228.5	-3.21E-09	-1.41E-09
1999	25.9	58.3	0	3.34	0.560	138.8	226.8	2.04E-10	8.99E-11
2000	17.5	58.3	0	3.32	0.560	144.1	223.8	4.02E-07	1.80E-07
2001	13.9	58.2	0	3.30	0.558	145.1	221.0	-1.85E-09	-8.37E-10
2002	7.75	58.3	0	3.29	0.559	148.4	218.3	-1.42E-09	-6.52E-10
2003	5.54	58.6	0	3.29	0.559	149.1	217.1	6.81E-08	3.14E-08
2004	6.74	59.0	0	3.31	0.560	148.7	218.2	2.17E-09	9.92E-10
2005	7.33	58.9	0	3.30	0.556	148.5	218.6	8.89E-09	4.07E-09
2006	9.03	58.8	0	3.30	0.554	148.2	219.9	-4.11E-09	-1.87E-09
2007	17.4	58.5	0	3.32	0.549	144.3	224.0	8.73E-09	3.90E-09
2008	17.9	58.2	0	3.31	0.547	146.3	226.3	-1.33E-10	-5.88E-11
2009	10.3	57.7	0	3.26	0.545	151.3	223.1	2.00E-07	8.96E-08
2010	0.585	58.0	0	3.21	0.550	161.4	223.8	-4.50E-07	-2.01E-07
2011	0	58.9	0	3.19	0.560	168.4	231.0	9.37E-08	4.06E-08
2012	0	59.7	0	3.63	0.588	189.7	253.6	9.90E-08	3.90E-08
2013	0	59.3	0.608	9.05	0.644	223.8	293.4	9.05E-09	3.08E-09
2014	0	67.9	8.38	30.5	0.735	261.0	368.5	-1.73E-07	-4.68E-08
2015	0	83.6	19.8	62.4	1.12	308.6	475.6	-1.64E-07	-3.44E-08
2016	0	94.1	27.8	84.7	1.62	290.8	499.0	4.36E-06	8.74E-07
2017	0	101.2	33.9	101.7	2.03	277.3	516.1	-5.72E-09	-1.11E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Gonzales County UWCD	Caldwell	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	16,838	1,465	29.3	56.1	14,186	32,574
1980	0	0	17,437	1,383	26.4	38.9	12,421	31,307
1981	0	0	17,085	1,773	27.8	42.4	13,130	32,058
1982	0.497	214.6	17,423	1,198	26.6	40.3	12,376	31,279
1983	0.484	195.3	17,496	1,228	26.0	38.0	12,137	31,121
1984	0.808	337.5	17,739	1,043	24.9	34.1	11,700	30,880
1985	0	0	17,305	1,672	26.4	36.6	12,438	31,478
1986	4.32E-05	0.029	17,281	1,579	27.0	38.7	12,577	31,502
1987	0	0	17,216	1,597	27.5	40.7	12,780	31,662
1988	1.27	531.8	17,803	738.9	24.8	34.1	11,641	30,775
1989	0.800	344.3	17,800	981.7	23.8	29.9	11,380	30,560
1990	0.080	48.5	17,608	1,460	24.7	30.5	11,698	30,870
1991	0	0	17,263	1,742	26.3	35.3	12,545	31,611
1992	9.33E-05	0.110	17,125	1,966	28.3	41.8	13,127	32,287
1993	0.231	125.6	17,410	1,257	27.1	41.2	12,447	31,308
1994	0.012	6.13	17,308	1,586	27.7	42.8	12,632	31,602
1995	0.464	197.1	17,519	1,227	26.8	40.8	12,184	31,195
1996	1.21	533.1	17,952	871.0	24.9	35.2	11,396	30,814
1997	6.49E-06	0.048	17,409	1,709	26.5	37.8	12,248	31,430
1998	0	0	17,295	1,712	27.6	41.4	12,606	31,682
1999	0.734	322.8	17,715	981.6	25.7	37.5	11,762	30,846
2000	0.151	93.9	17,674	1,489	26.3	37.6	11,876	31,197
2001	0.111	44.8	17,618	1,336	26.0	36.9	11,862	30,924
2002	0	0	17,107	2,272	29.3	44.9	13,012	32,465
2003	0.004	9.93	17,278	1,657	29.2	47.3	12,860	31,881
2004	0	0	17,097	2,175	31.6	54.5	13,814	33,173
2005	0.921	388.2	17,611	1,099	28.9	49.5	12,534	31,712
2006	1.12	432.2	17,813	982.5	26.9	43.3	11,970	31,269
2007	0	0	16,920	2,353	30.7	52.1	13,959	33,314
2008	1.26	520.5	17,730	933.2	27.8	46.3	12,350	31,609
2009	0.922	390.9	17,654	1,341	27.3	43.0	11,942	31,399
2010	0.529	306.8	17,790	1,671	27.9	42.3	11,737	31,575
2011	1.66	742.4	18,568	772.7	24.9	33.4	10,559	30,702
2012	0.246	97.4	17,951	1,333	24.9	31.9	11,296	30,734
2013	0.033	8.97	17,664	1,459	24.8	32.4	11,715	30,904
2014	0.469	245.6	18,036	1,296	23.7	30.2	11,050	30,682
2015	0	0	17,361	2,141	25.5	35.7	12,300	31,863
2016	0	0	17,249	2,042	26.4	41.1	12,837	32,196
2017	0.096	50.5	17,408	1,667	25.5	41.7	12,354	31,548

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Gonzales County UWCD	Caldwell	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	14,872	42.7	50.6	30.0	17,579	32,574	-1.39E-09	-4.26E-12
1980	0	0	13,170	30.1	49.2	28.4	18,029	31,307	-3.34E-08	-1.07E-10
1981	0.883	367.5	13,735	32.5	49.8	29.1	17,843	32,058	-4.51E-07	-1.41E-09
1982	0	0	13,183	31.1	49.4	28.4	17,987	31,279	-4.58E-07	-1.46E-09
1983	0	0	12,966	29.8	49.0	28.1	18,048	31,121	-4.06E-07	-1.30E-09
1984	0	0	12,574	27.6	48.4	27.6	18,202	30,880	4.05E-07	1.31E-09
1985	0.519	240.5	13,127	29.0	48.9	28.2	18,004	31,478	-4.18E-07	-1.33E-09
1986	0.407	166.6	13,274	30.1	49.4	28.6	17,953	31,502	-3.46E-07	-1.10E-09
1987	0.454	181.7	13,466	31.4	49.8	28.8	17,903	31,662	-4.72E-07	-1.49E-09
1988	0	0	12,535	27.8	48.6	27.6	18,136	30,775	3.48E-07	1.13E-09
1989	9.13E-05	0.044	12,251	25.5	47.6	27.1	18,210	30,560	-5.08E-07	-1.66E-09
1990	0.108	58.4	12,486	25.5	47.9	27.4	18,225	30,870	-3.03E-07	-9.80E-10
1991	0.867	402.5	13,137	27.9	48.7	28.3	17,967	31,611	-4.50E-07	-1.42E-09
1992	1.19	481.5	13,722	31.2	50.2	29.5	17,972	32,287	4.03E-07	1.25E-09
1993	0.018	7.34	13,212	30.3	49.8	28.7	17,980	31,308	-3.78E-07	-1.21E-09
1994	0.234	86.4	13,382	31.0	50.1	29.0	18,023	31,602	-3.95E-07	-1.25E-09
1995	0	0	13,009	29.6	49.7	28.5	18,078	31,195	-2.96E-07	-9.48E-10
1996	0	0	12,308	26.2	48.6	27.7	18,403	30,814	1.80E-07	5.85E-10
1997	0.495	240.9	12,960	27.5	49.1	28.3	18,124	31,430	-4.13E-07	-1.31E-09
1998	0.646	272.2	13,278	29.3	49.8	29.0	18,023	31,682	-3.29E-07	-1.04E-09
1999	0	0	12,602	27.2	49.0	28.0	18,140	30,846	-3.71E-07	-1.20E-09
2000	0.023	15.6	12,703	26.8	49.2	28.2	18,374	31,197	1.70E-07	5.44E-10
2001	0.008	8.90	12,647	26.5	49.0	28.1	18,165	30,924	-3.79E-07	-1.23E-09
2002	1.41	608.1	13,640	30.5	50.8	29.9	18,105	32,465	-4.32E-07	-1.33E-09
2003	0.487	187.1	13,562	31.8	51.4	29.7	18,019	31,881	-3.68E-07	-1.15E-09
2004	1.53	604.5	14,386	36.1	53.0	31.0	18,061	33,173	3.54E-07	1.07E-09
2005	0	0	13,391	33.6	51.8	29.3	18,205	31,712	-4.71E-07	-1.49E-09
2006	1.33E-04	0.074	12,871	30.6	50.5	28.4	18,289	31,269	-3.39E-07	-1.08E-09
2007	1.96	808.6	14,438	36.2	52.2	30.6	17,947	33,314	-3.52E-07	-1.06E-09
2008	0	0	13,233	32.8	51.1	28.9	18,263	31,609	3.74E-07	1.18E-09
2009	6.83E-04	0.333	12,871	30.2	50.4	28.5	18,418	31,399	-3.52E-07	-1.12E-09
2010	0.030	20.7	12,671	28.4	50.7	28.7	18,776	31,575	-3.85E-07	-1.22E-09
2011	0	0	11,568	23.4	49.2	27.5	19,034	30,702	-1.17E-06	-3.80E-09
2012	0.129	108.5	12,076	23.3	49.0	27.2	18,450	30,734	4.98E-07	1.62E-09
2013	0.291	201.8	12,399	24.2	49.0	27.1	18,202	30,904	-4.56E-07	-1.47E-09
2014	0	0	11,952	22.8	48.8	26.6	18,632	30,682	1.36E-07	4.45E-10
2015	1.01	548.3	12,952	25.9	50.3	27.2	18,259	31,863	-4.93E-07	-1.55E-09
2016	1.04	507.6	13,471	29.3	51.7	27.7	18,107	32,196	-4.23E-08	-1.31E-10
2017	0.180	76.2	13,183	29.6	51.9	27.1	18,180	31,548	-4.84E-07	-1.53E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Plum Creek CD does not exist in the model in Layer 2.			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Plum Creek CD does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Plum Creek CD does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	212.0	2,025	24.4	8,887	3.50	11,151
1980	0	0	200.1	2,029	21.9	8,967	1.36	11,219
1981	0	0	256.5	2,026	30.6	8,856	3.17	11,173
1982	0.126	9.26	173.3	2,022	18.6	8,962	1.61	11,187
1983	0.014	0.980	177.7	2,021	18.3	8,975	0.794	11,194
1984	0.051	3.69	150.9	2,025	14.0	9,042	0.046	11,236
1985	0	0	241.9	2,024	27.6	8,892	1.53	11,187
1986	1.24E-04	0.062	228.4	2,024	26.6	8,888	2.37	11,170
1987	0	0	231.1	2,024	27.1	8,882	2.94	11,168
1988	0.214	15.5	106.9	2,023	7.96	9,088	0.017	11,242
1989	0	0	142.0	2,018	11.8	9,047	0	11,219
1990	0	0	211.2	2,022	22.5	8,947	0.190	11,204
1991	0	0	252.0	2,025	29.6	8,866	2.05	11,175
1992	0	0	284.4	2,033	35.3	8,825	4.36	11,183
1993	0.163	11.9	181.9	2,022	20.3	8,938	2.52	11,177
1994	0	0	229.4	2,023	26.4	8,898	2.98	11,180
1995	0.086	6.20	177.5	2,020	18.8	8,970	1.62	11,195
1996	0.106	7.34	126.0	2,023	10.2	9,085	0	11,252
1997	0	0	247.2	2,023	27.9	8,899	1.48	11,199
1998	0	0	247.8	2,025	29.3	8,867	2.95	11,172
1999	0.179	12.8	142.0	2,018	13.5	9,019	0.535	11,206
2000	0	0	215.5	2,027	23.4	8,965	1.12	11,232
2001	0.018	1.29	193.3	2,021	20.7	8,955	0.957	11,193
2002	0	0	328.7	2,030	41.0	8,757	5.14	11,161
2003	0.146	11.3	239.7	2,023	28.8	8,878	5.07	11,185
2004	0.016	2.23	314.8	2,022	35.8	8,907	9.21	11,290
2005	0.291	16.8	159.0	2,013	16.0	9,127	4.13	11,336
2006	0.080	4.24	142.2	2,013	12.2	9,196	1.63	11,370
2007	0	0	340.4	2,018	38.9	8,859	6.70	11,263
2008	0.360	21.8	135.0	2,018	12.6	9,186	2.68	11,377
2009	0	0	194.1	2,018	20.3	8,989	1.37	11,223
2010	0	0	241.8	2,023	27.8	8,899	2.22	11,194
2011	0.206	14.5	111.8	2,018	8.62	9,073	0	11,226
2012	0	0	192.9	2,028	19.5	9,034	0	11,275
2013	0	0	211.1	2,025	22.9	8,983	0.124	11,242
2014	0.045	2.88	187.5	2,025	19.6	9,025	0	11,261
2015	0	0	309.8	2,032	38.0	8,860	1.14	11,241
2016	0	0	295.4	2,039	37.4	8,875	2.64	11,249
2017	0.092	6.74	241.3	2,029	29.3	8,930	1.44	11,238

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	0	6,429	43.1	4,670	9.45	11,151	5.06E-07	4.54E-09
1980	0	0	10.5	6,499	38.2	4,660	11.8	11,219	-4.29E-10	-3.83E-12
1981	0.101	7.24	12.2	6,410	48.3	4,685	10.3	11,173	-2.04E-08	-1.83E-10
1982	0	0	11.1	6,492	34.8	4,637	11.3	11,187	5.48E-10	4.89E-12
1983	0	0	11.6	6,503	33.5	4,633	12.1	11,194	-1.59E-09	-1.42E-11
1984	0	0	11.6	6,555	28.1	4,628	13.8	11,236	8.96E-09	7.97E-11
1985	0.149	10.8	13.9	6,436	43.7	4,671	11.9	11,187	2.84E-09	2.54E-11
1986	0.003	0.092	15.1	6,430	43.4	4,671	10.9	11,170	1.15E-09	1.03E-11
1987	0.007	0.462	15.6	6,424	44.0	4,673	10.3	11,168	4.71E-07	4.22E-09
1988	0	0	11.9	6,589	21.5	4,606	13.7	11,242	8.49E-08	7.56E-10
1989	0.022	1.83	11.0	6,563	24.6	4,603	15.9	11,219	5.49E-10	4.90E-12
1990	0.118	8.64	13.5	6,483	37.5	4,647	13.9	11,204	3.25E-09	2.90E-11
1991	0.093	6.70	14.4	6,414	47.2	4,681	11.5	11,175	2.88E-09	2.58E-11
1992	0.076	5.41	14.3	6,377	54.8	4,721	9.24	11,183	7.86E-08	7.03E-10
1993	0	0	13.6	6,468	37.4	4,647	10.6	11,177	1.95E-09	1.75E-11
1994	0.048	3.28	21.3	6,436	41.3	4,667	10.2	11,180	3.83E-08	3.43E-10
1995	0	0	21.1	6,494	32.3	4,635	11.3	11,195	4.07E-08	3.63E-10
1996	0	0	17.6	6,588	22.2	4,610	14.1	11,252	-2.16E-07	-1.92E-09
1997	0.191	13.6	22.9	6,440	41.2	4,669	11.9	11,199	3.82E-08	3.41E-10
1998	0.036	2.45	22.3	6,412	44.4	4,681	10.4	11,172	2.75E-07	2.46E-09
1999	0	0	20.8	6,533	26.3	4,614	12.2	11,206	1.64E-09	1.46E-11
2000	0.095	6.81	23.4	6,490	36.0	4,663	12.1	11,232	-8.10E-08	-7.21E-10
2001	0	0	19.5	6,484	34.2	4,643	12.1	11,193	6.35E-09	5.67E-11
2002	0.233	16.6	25.4	6,323	56.8	4,730	8.78	11,161	9.90E-10	8.87E-12
2003	0	0	51.7	6,410	38.9	4,676	8.75	11,185	-1.01E-09	-9.01E-12
2004	0.002	0.071	146.3	6,408	31.3	4,696	7.62	11,290	2.10E-09	1.86E-11
2005	0	0	123.1	6,607	18.4	4,579	9.45	11,336	-3.65E-09	-3.22E-11
2006	0	0	116.6	6,674	15.8	4,552	11.6	11,370	1.27E-09	1.12E-11
2007	0.401	23.8	115.4	6,383	36.5	4,696	8.25	11,263	-7.87E-09	-6.99E-11
2008	0	0	116.9	6,656	16.7	4,577	10.7	11,377	2.86E-10	2.51E-12
2009	0.216	13.3	23.1	6,511	31.5	4,632	11.7	11,223	3.69E-07	3.29E-09
2010	0.108	7.23	27.5	6,439	40.5	4,669	11.2	11,194	-1.38E-07	-1.23E-09
2011	0	0	18.5	6,581	20.7	4,591	15.0	11,226	-5.69E-07	-5.07E-09
2012	0.091	7.32	12.6	6,572	33.2	4,634	15.5	11,275	1.61E-07	1.43E-09
2013	0.036	2.94	13.2	6,541	38.0	4,632	15.2	11,242	1.01E-07	8.95E-10
2014	0	0	12.2	6,583	34.5	4,614	17.3	11,261	5.38E-06	4.77E-08
2015	0.200	14.5	14.7	6,455	55.8	4,686	14.3	11,241	-5.35E-07	-4.76E-09
2016	0.010	0.615	14.7	6,463	56.6	4,701	12.6	11,249	-5.55E-06	-4.93E-08
2017	0	0	15.4	6,510	46.9	4,652	13.8	11,238	1.81E-09	1.61E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Lost Pines GCD	Upper Layers	
	(acre-feet)						
Predevelopment	0	0	37.7	57.0	6.67	30.0	131.4
1980	0	0	35.6	53.1	6.49	34.8	130.0
1981	0	0	45.7	62.7	6.40	31.8	146.5
1982	0.150	5.42	30.8	52.2	6.73	33.7	129.1
1983	0.073	2.56	31.6	49.2	6.55	35.3	125.3
1984	0.123	4.17	26.9	43.5	6.43	38.3	119.4
1985	0	0	43.0	56.5	6.30	35.0	140.8
1986	0	0	40.6	58.9	6.43	33.1	139.1
1987	0	0	41.1	60.4	6.51	31.8	139.8
1988	0.338	11.5	19.0	40.5	6.71	38.0	116.1
1989	0.098	3.97	25.3	38.9	6.33	41.5	116.1
1990	0	0	37.6	49.4	6.15	38.7	131.9
1991	0	0	44.9	60.1	6.26	34.4	145.6
1992	0	0	50.6	69.9	6.28	29.8	156.6
1993	0.188	5.91	32.4	56.1	7.00	32.0	133.7
1994	0	0	40.8	59.5	6.69	31.5	138.5
1995	0.134	5.08	31.6	52.0	6.77	33.6	129.2
1996	0.228	7.64	22.4	40.7	6.56	38.8	116.4
1997	0	0	44.0	56.4	6.32	35.2	141.9
1998	0	0	44.1	62.2	6.38	32.2	144.8
1999	0.231	8.40	25.3	46.6	6.65	35.6	122.7
2000	2.19E-04	0.016	38.3	53.5	6.47	35.4	133.7
2001	0.015	0.567	34.4	51.9	6.44	35.4	128.7
2002	0	0	58.5	75.0	6.19	28.9	168.6
2003	0.056	1.38	42.7	67.9	6.94	28.3	147.2
2004	0	0	56.0	79.5	6.94	25.3	167.8
2005	0.384	12.3	28.3	56.5	7.71	29.4	134.6
2006	0.237	9.82	25.3	45.5	7.03	34.1	122.0
2007	0	0	60.6	75.3	6.40	27.6	169.9
2008	0.376	13.4	24.0	50.5	7.24	32.3	127.9
2009	0.030	1.83	34.5	51.5	6.71	34.4	129.0
2010	0	0	43.0	59.8	6.56	33.5	142.9
2011	0.318	11.1	19.9	40.9	6.57	40.0	118.8
2012	0.008	0.422	34.3	47.4	6.31	41.0	129.5
2013	0.003	0	37.6	52.5	6.26	40.5	136.8
2014	0.070	1.45	33.4	50.4	6.34	43.3	135.0
2015	0	0	55.1	71.0	6.45	38.3	170.9
2016	0	0	52.6	75.7	6.61	34.8	169.7
2017	0.109	2.67	42.9	68.4	7.17	36.4	157.7

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	0	24.9	10.4	3.50	92.7	131.4	5.54E-09	4.22E-09
1980	0	0	24.1	9.72	1.36	94.8	130.0	-3.69E-12	-2.84E-12
1981	0.175	6.70	26.3	10.7	3.17	99.5	146.5	-1.58E-10	-1.08E-10
1982	0	0	24.2	9.76	1.61	93.4	129.1	6.82E-13	5.29E-13
1983	0	0	23.6	9.41	0.794	91.5	125.3	-1.59E-11	-1.27E-11
1984	0	0	22.6	8.81	0.046	87.9	119.4	4.85E-11	4.06E-11
1985	0.184	6.59	24.5	9.68	1.53	98.3	140.8	6.78E-11	4.82E-11
1986	0.082	3.10	25.3	10.2	2.37	98.0	139.1	-6.93E-12	-4.99E-12
1987	0.061	1.93	25.9	10.6	2.94	98.5	139.8	2.72E-09	1.94E-09
1988	0	0	22.5	8.76	0.017	84.8	116.1	2.34E-10	2.01E-10
1989	0	0	21.6	8.17	0	86.3	116.1	-3.03E-11	-2.61E-11
1990	0.129	3.65	22.9	8.86	0.190	96.1	131.9	1.25E-11	9.50E-12
1991	0.209	8.58	25.3	10.00	2.05	99.5	145.6	1.55E-11	1.06E-11
1992	0.242	8.36	28.4	11.6	4.36	103.7	156.6	5.84E-10	3.73E-10
1993	0	0	25.3	10.1	2.52	95.7	133.7	-1.21E-11	-9.04E-12
1994	0.047	1.10	25.8	10.5	2.98	98.1	138.5	2.84E-09	2.05E-09
1995	0	0	24.3	9.74	1.62	93.6	129.2	3.25E-10	2.51E-10
1996	0	0	22.3	8.67	0	85.4	116.4	-1.51E-09	-1.30E-09
1997	0.207	7.25	24.5	9.63	1.48	98.8	141.9	-1.45E-10	-1.03E-10
1998	0.145	5.27	26.2	10.5	2.95	99.8	144.8	2.60E-08	1.79E-08
1999	0	0	23.4	9.27	0.535	89.4	122.7	3.41E-13	2.78E-13
2000	0.061	1.52	24.1	9.59	1.12	97.3	133.7	-1.72E-08	-1.28E-08
2001	0	0	23.9	9.53	0.957	94.4	128.7	8.24E-11	6.40E-11
2002	0.406	14.9	29.5	11.9	5.14	106.7	168.6	-3.67E-12	-2.18E-12
2003	0.014	0.951	28.4	11.4	5.07	101.4	147.2	-1.71E-11	-1.16E-11
2004	0.217	7.91	31.5	12.7	9.40	106.0	167.8	1.12E-11	6.68E-12
2005	0	0	26.4	10.2	4.13	93.9	134.6	-3.09E-11	-2.29E-11
2006	0	0	23.9	9.21	1.63	87.3	122.0	1.15E-12	9.43E-13
2007	0.468	16.4	29.7	11.8	6.70	104.7	169.9	-5.18E-10	-3.05E-10
2008	0	0	24.7	9.61	2.68	90.9	127.9	-1.65E-12	-1.29E-12
2009	0.004	0	24.1	9.54	1.37	94.0	129.0	1.29E-08	9.99E-09
2010	0.100	4.24	25.5	10.2	2.22	100.6	142.9	4.05E-10	2.84E-10
2011	0	0	22.5	8.74	0	87.6	118.8	-7.91E-08	-6.66E-08
2012	0.024	0.399	23.1	8.94	0	97.0	129.5	1.31E-08	1.01E-08
2013	0.051	1.82	24.1	9.37	0.124	101.3	136.8	7.52E-10	5.50E-10
2014	0	0	24.3	9.30	0	101.4	135.0	5.38E-08	3.99E-08
2015	0.280	13.0	29.3	11.0	1.14	116.2	170.9	-2.38E-09	-1.39E-09
2016	0.164	5.60	31.3	12.2	2.64	117.8	169.7	-2.98E-08	-1.75E-08
2017	2.92E-05	0.002	29.7	11.4	1.44	115.1	157.7	3.13E-12	1.98E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Gonzales County UWCD	Lost Pines GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	286.0	62.2	106.0	86.1	540.3
1980	0	0	239.8	61.1	109.6	82.4	492.9
1981	0	0	268.2	65.4	113.2	89.8	536.6
1982	1.30	5.56	245.1	61.1	108.8	81.6	503.5
1983	0.900	4.51	230.5	58.9	106.3	79.2	480.4
1984	1.38	6.67	207.4	55.6	102.7	74.3	448.0
1985	0	0	236.9	61.0	112.7	83.6	494.3
1986	0	0	252.3	63.1	112.5	85.6	513.5
1987	0	0	263.2	64.2	112.8	87.3	527.5
1988	3.34	15.3	208.3	55.0	100.3	72.2	454.4
1989	1.24	6.33	186.6	52.5	101.2	69.8	417.7
1990	0	0	206.0	57.6	111.6	79.0	454.2
1991	0	0	244.0	62.8	113.7	84.9	505.4
1992	0	0	284.7	69.0	117.3	94.5	565.4
1993	1.31	5.96	258.7	62.8	111.0	82.4	522.2
1994	0	0	264.0	63.4	112.3	85.0	524.8
1995	1.26	5.75	242.0	59.8	108.9	79.3	497.0
1996	2.47	11.9	201.7	53.7	100.1	70.0	439.9
1997	0	0	233.5	60.1	113.2	81.7	488.5
1998	0	0	259.4	63.9	113.9	86.1	523.3
1999	2.21	9.84	222.1	57.2	105.1	74.5	470.9
2000	0	0	229.5	59.4	112.3	80.1	481.3
2001	0.077	0.624	225.9	58.7	109.5	77.8	472.7
2002	0	0	291.1	69.4	119.3	97.8	577.6
2003	0.014	0	291.1	68.0	115.5	90.3	564.9
2004	0	0	330.3	73.3	118.4	99.5	621.6
2005	3.09	13.5	275.0	63.4	108.9	83.7	547.7
2006	2.56	12.8	230.8	56.7	102.1	75.1	480.0
2007	0	0	305.0	69.3	116.3	99.7	590.3
2008	3.18	13.0	251.2	60.2	106.6	79.5	513.6
2009	1.00	4.80	236.8	59.0	109.0	80.1	490.7
2010	0	0	247.0	62.5	115.1	86.1	510.7
2011	3.52	16.0	188.2	53.6	103.3	69.3	434.0
2012	0.320	0.284	199.4	54.4	112.8	74.6	441.9
2013	0.186	0	216.3	60.2	117.6	82.9	477.2
2014	1.79	4.38	210.4	63.3	118.3	86.3	484.5
2015	0	0	267.3	77.4	132.2	109.8	586.7
2016	0	0	294.3	82.7	134.3	110.0	621.3
2017	1.27	3.73	283.8	80.8	132.7	106.0	608.4

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Gonzales County UWCD	Lost Pines GCD	Caldwell	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	367.8	97.7	3.42	65.6	5.79	540.3	1.04E-07	1.92E-08
1980	0	0	16.6	334.3	73.7	3.21	60.7	4.29	492.9	-7.57E-11	-1.54E-11
1981	1.70	7.68	17.9	358.1	83.0	3.38	63.7	1.13	536.6	-3.01E-09	-5.62E-10
1982	0	0	18.4	338.1	76.2	3.18	60.3	7.29	503.5	-2.90E-11	-5.77E-12
1983	0	0	19.4	322.6	70.3	3.13	59.2	5.82	480.4	-2.38E-10	-4.96E-11
1984	0	0	21.2	299.3	61.5	3.02	57.1	5.96	448.0	5.68E-10	1.27E-10
1985	1.86	8.41	19.8	327.8	71.6	3.25	61.1	0.482	494.3	1.81E-09	3.66E-10
1986	0.888	4.45	21.5	341.7	77.2	3.29	62.0	2.47	513.5	-1.05E-10	-2.04E-11
1987	0.598	2.91	22.2	351.3	81.1	3.32	62.8	3.35	527.5	3.03E-08	5.74E-09
1988	0	0	22.4	300.1	62.4	2.96	56.2	10.3	454.4	7.21E-11	1.59E-11
1989	0	0	19.9	280.1	54.2	2.92	55.0	5.52	417.7	-8.52E-10	-2.04E-10
1990	1.12	5.71	25.0	301.3	58.8	3.10	58.0	1.15	454.2	1.48E-10	3.25E-11
1991	2.34	10.5	14.1	338.4	74.7	3.29	61.7	0.305	505.4	2.17E-10	4.28E-11
1992	2.18	10.7	22.0	374.0	87.0	3.48	65.5	0.607	565.4	6.03E-09	1.07E-09
1993	0	0	15.9	351.2	81.7	3.24	61.5	8.69	522.2	9.32E-10	1.79E-10
1994	0.295	0.831	16.0	353.4	82.9	3.32	62.8	5.16	524.8	1.03E-07	1.95E-08
1995	0	0	16.3	333.5	75.6	3.18	60.4	8.01	497.0	5.55E-09	1.12E-09
1996	0	0	16.7	293.7	60.8	2.97	56.5	9.15	439.9	-2.20E-08	-5.00E-09
1997	2.01	9.02	15.5	325.2	71.2	3.25	61.2	0.953	488.5	-1.09E-08	-2.23E-09
1998	1.50	7.27	15.6	349.5	80.7	3.36	63.3	2.12	523.3	5.51E-07	1.05E-07
1999	0	0	17.0	314.8	68.5	3.07	58.3	9.29	470.9	7.84E-12	1.67E-12
2000	0.287	1.39	22.0	321.7	68.4	3.19	60.2	4.22	481.3	-5.46E-07	-1.13E-07
2001	0	0	18.0	318.5	68.5	3.15	59.6	4.92	472.7	2.91E-09	6.15E-10
2002	3.63	16.8	22.3	375.8	88.5	3.56	66.9	0.253	577.6	-6.61E-11	-1.14E-11
2003	0.111	1.06	19.5	378.2	91.4	3.44	65.2	6.01	564.9	-2.01E-10	-3.56E-11
2004	2.16	9.60	17.1	411.8	104.9	3.68	69.6	2.80	621.6	1.51E-10	2.43E-11
2005	0	0	17.0	363.6	88.0	3.26	62.4	13.4	547.7	-3.76E-10	-6.86E-11
2006	0	0	14.1	320.5	72.5	3.08	58.8	11.1	480.0	8.28E-11	1.72E-11
2007	4.42	19.3	10.5	386.5	97.1	3.64	68.5	0.264	590.3	-1.35E-08	-2.28E-09
2008	0	0	15.3	342.0	80.1	3.18	60.7	12.3	513.6	-1.56E-11	-3.03E-12
2009	0	0	22.9	326.1	71.4	3.18	60.2	7.00	490.7	3.71E-07	7.56E-08
2010	0.295	2.10	34.1	335.2	70.3	3.27	61.6	3.80	510.7	2.53E-08	4.96E-09
2011	0	0	34.1	281.4	50.0	2.89	54.6	11.0	434.0	-2.19E-06	-5.05E-07
2012	1.18E-04	0	17.1	304.1	57.5	2.98	55.7	4.46	441.9	3.87E-07	8.75E-08
2013	0.178	2.80	15.7	337.5	60.4	2.96	55.1	2.58	477.2	2.13E-08	4.46E-09
2014	0	0	27.9	348.1	50.4	2.77	51.2	4.10	484.5	1.07E-06	2.20E-07
2015	1.82	12.4	21.0	428.3	66.5	2.95	53.8	0	586.7	-1.65E-08	-2.80E-09
2016	1.49	7.89	19.4	457.9	76.5	2.99	54.8	0.218	621.3	-4.52E-07	-7.28E-08
2017	0	0	22.0	454.9	72.2	2.81	51.4	4.99	608.4	1.61E-10	2.65E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Lost Pines GCD	Caldwell	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	3,139	2,472	58.6	121.6	2,157	2,676	10,624
1980	0	0	2,962	2,291	58.7	141.9	2,489	1,979	9,922
1981	0	0	3,797	2,592	64.3	131.1	2,393	2,112	11,090
1982	11.1	512.9	2,566	2,258	57.5	136.1	2,494	1,968	10,003
1983	6.32	267.4	2,630	2,175	55.8	142.5	2,526	1,906	9,710
1984	10.6	460.0	2,234	1,981	52.4	150.1	2,606	1,798	9,292
1985	0	0	3,580	2,387	60.5	142.3	2,506	1,944	10,619
1986	0.003	0.982	3,381	2,465	61.6	135.7	2,490	1,981	10,516
1987	0	0	3,421	2,528	62.3	131.6	2,449	2,029	10,621
1988	24.9	1,055	1,583	1,866	50.1	147.2	2,542	1,810	9,077
1989	8.55	356.7	2,103	1,815	49.6	156.3	2,621	1,723	8,833
1990	0.045	9.09	3,127	2,159	56.9	150.9	2,674	1,746	9,923
1991	0	0	3,731	2,464	62.6	140.8	2,496	1,977	10,871
1992	2.23E-05	0.086	4,210	2,809	68.2	124.9	2,504	2,039	11,755
1993	11.3	494.3	2,693	2,378	58.8	132.5	2,505	1,987	10,260
1994	0.015	2.98	3,396	2,520	60.9	134.5	2,538	2,006	10,659
1995	9.50	404.7	2,628	2,260	56.2	140.5	2,560	1,931	9,989
1996	18.7	831.1	1,865	1,895	49.4	155.0	2,767	1,754	9,335
1997	0	0	3,659	2,394	59.6	147.6	2,595	1,909	10,764
1998	0	0	3,667	2,573	62.7	137.7	2,558	1,990	10,988
1999	16.8	722.1	2,102	2,070	52.9	146.5	2,601	1,844	9,557
2000	0.278	41.4	3,190	2,313	57.8	148.0	2,782	1,817	10,349
2001	1.05	39.1	2,862	2,238	56.5	147.9	2,637	1,840	9,821
2002	0.002	0.641	4,865	3,003	70.1	130.1	2,678	2,014	12,761
2003	0.909	58.1	3,548	2,779	65.0	125.8	2,558	2,044	11,180
2004	0	0	4,659	3,191	71.4	113.9	2,493	2,226	12,755
2005	23.6	978.7	2,353	2,431	57.4	128.9	2,520	2,031	10,524
2006	17.6	690.3	2,104	2,076	51.5	145.6	2,529	1,915	9,529
2007	0	0	5,039	3,022	69.7	124.2	2,411	2,281	12,946
2008	25.9	1,128	1,999	2,205	54.6	135.9	2,519	2,001	10,069
2009	7.45	391.4	2,873	2,285	56.1	145.0	2,824	1,842	10,424
2010	1.45	173.6	3,579	2,552	61.4	145.1	3,206	1,747	11,465
2011	28.1	1,258	1,655	1,923	49.3	161.2	3,362	1,511	9,946
2012	0.321	0	2,856	2,069	53.5	165.8	2,776	1,691	9,611
2013	0.099	0	3,125	2,148	60.0	159.7	2,616	1,782	9,889
2014	9.45	442.8	2,775	2,044	62.8	162.7	2,998	1,603	10,098
2015	0	0	4,586	2,597	79.8	151.2	2,717	1,826	11,957
2016	0	0	4,373	2,709	83.9	139.0	2,582	1,955	11,842
2017	7.28	296.9	3,571	2,478	80.3	141.9	2,642	1,869	11,086

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Gonzales County UWCD	Lost Pines GCD	Caldwell	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	76.1	1,588	60.8	181.2	7,314	1,403	10,624	1.24E-06	1.17E-08
1980	0	0	487.6	39.9	1,238	39.1	129.4	5,846	2,142	9,922	-6.66E-10	-6.71E-12
1981	13.5	596.9	435.0	57.6	1,380	46.8	152.4	6,365	2,042	11,090	-2.47E-08	-2.23E-10
1982	0	0	527.8	44.4	1,275	41.8	133.8	5,834	2,147	10,003	1.35E-10	1.35E-12
1983	0	0	530.8	33.5	1,202	36.9	122.4	5,661	2,123	9,710	-8.13E-10	-8.37E-12
1984	0	0	575.1	13.4	1,097	29.6	106.8	5,348	2,122	9,292	2.45E-09	2.64E-11
1985	14.2	630.5	513.1	38.4	1,207	37.2	125.4	5,832	2,221	10,619	1.09E-08	1.03E-10
1986	5.85	228.1	557.2	46.3	1,283	42.2	138.0	5,926	2,290	10,516	-5.78E-10	-5.50E-12
1987	4.61	196.9	538.8	55.5	1,342	45.7	146.7	6,084	2,206	10,621	-2.24E-08	-2.11E-10
1988	0	0	543.2	17.3	1,126	30.9	108.8	5,344	1,908	9,077	-3.15E-10	-3.47E-12
1989	1.41E-04	0.012	533.1	8.21	1,015	23.2	93.7	5,140	2,020	8,833	-6.60E-09	-7.47E-11
1990	8.63	348.9	635.5	9.40	1,061	26.8	102.6	5,302	2,427	9,923	5.24E-10	5.28E-12
1991	16.5	742.5	513.2	40.6	1,231	38.5	130.5	5,918	2,240	10,871	6.75E-10	6.21E-12
1992	16.4	645.0	622.8	57.0	1,414	49.9	161.3	6,319	2,470	11,755	2.60E-08	2.21E-10
1993	0	0	573.5	47.1	1,316	45.9	142.0	5,886	2,250	10,260	7.91E-09	7.71E-11
1994	2.74	113.6	593.2	48.9	1,325	46.7	146.3	5,981	2,401	10,659	9.48E-07	8.89E-09
1995	0	0	585.8	34.1	1,229	41.0	129.7	5,694	2,276	9,989	2.43E-08	2.43E-10
1996	0	0	659.3	7.01	1,047	28.7	102.6	5,131	2,359	9,335	-8.27E-08	-8.86E-10
1997	15.9	724.7	574.9	25.4	1,159	36.3	121.4	5,685	2,421	10,764	-7.97E-08	-7.40E-10
1998	10.4	426.1	598.3	41.9	1,280	44.3	142.6	5,928	2,516	10,988	2.43E-06	2.21E-08
1999	0	0	609.2	15.8	1,140	35.0	116.8	5,403	2,236	9,557	8.91E-11	9.33E-13
2000	2.75	106.7	771.9	10.4	1,134	34.4	117.3	5,393	2,779	10,349	-4.05E-06	-3.91E-08
2001	0.151	25.4	640.8	13.2	1,126	34.4	116.1	5,423	2,441	9,821	1.06E-08	1.08E-10
2002	27.0	1,107	798.9	50.1	1,384	50.6	163.4	6,121	3,059	12,761	-1.20E-10	-9.41E-13
2003	0.595	37.4	699.1	54.0	1,416	53.8	164.6	6,090	2,665	11,180	-3.27E-09	-2.92E-11
2004	17.6	741.7	612.1	59.1	1,624	65.0	198.0	6,781	2,657	12,755	8.79E-10	6.89E-12
2005	0	0	610.3	51.5	1,384	52.3	153.5	5,969	2,304	10,524	-8.29E-10	-7.88E-12
2006	0.004	1.61	505.0	29.9	1,194	39.2	123.2	5,612	2,024	9,529	5.86E-10	6.15E-12
2007	34.8	1,513	377.3	59.2	1,529	58.2	183.7	6,954	2,237	12,946	-8.45E-08	-6.52E-10
2008	0	0	550.0	45.1	1,301	45.5	139.3	5,872	2,116	10,069	-1.98E-10	-1.97E-12
2009	0.001	0.159	805.0	17.2	1,182	37.9	124.3	5,462	2,796	10,424	2.09E-06	2.01E-08
2010	2.08	64.3	1,148	4.73	1,142	36.5	124.8	5,185	3,758	11,465	1.92E-07	1.68E-09
2011	0	0	1,076	0	900.5	19.6	84.7	4,421	3,445	9,946	-2.19E-05	-2.20E-07
2012	5.35	461.5	578.9	2.13	1,023	24.0	95.0	4,992	2,429	9,611	2.79E-06	2.90E-08
2013	6.21	407.2	546.4	7.66	1,177	24.9	110.7	5,323	2,287	9,889	5.98E-08	6.05E-10
2014	0	0	921.2	1.84	1,175	15.4	104.9	4,770	3,110	10,098	7.27E-06	7.20E-08
2015	21.0	1,066	712.5	20.5	1,472	25.1	145.8	5,594	2,901	11,957	-6.34E-08	-5.30E-10
2016	11.3	533.2	670.6	48.5	1,662	32.7	174.6	5,968	2,741	11,842	-3.17E-06	-2.68E-08
2017	0	0	760.5	37.2	1,665	29.3	167.8	5,625	2,801	11,086	-4.60E-10	-4.15E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Lost Pines GCD	Caldwell	Upper Layers	
	(acre-feet)							
Predevelopment	0	0	1,523	358.3	2.39	896.0	2,651	5,431
1980	0	0	1,438	322.7	2.38	780.7	3,398	5,941
1981	0	0	1,843	349.9	2.68	805.0	3,349	6,349
1982	44.3	268.3	1,245	326.1	2.30	793.8	3,375	6,055
1983	23.2	144.1	1,276	313.0	2.21	776.1	3,364	5,899
1984	40.1	259.6	1,084	292.5	2.05	748.3	3,346	5,773
1985	0	0	1,738	325.8	2.52	761.8	3,531	6,359
1986	0.299	0.106	1,641	340.3	2.56	776.1	3,571	6,331
1987	0	0	1,660	349.4	2.57	790.2	3,488	6,290
1988	89.9	595.2	768.0	288.6	1.90	747.5	3,080	5,571
1989	31.2	172.3	1,020	270.3	1.92	718.3	3,240	5,455
1990	1.46	1.76	1,517	297.5	2.33	720.1	3,724	6,265
1991	0	0	1,811	329.0	2.64	749.4	3,552	6,444
1992	0.184	1.58	2,043	369.2	2.88	797.0	3,820	7,034
1993	40.2	249.9	1,307	338.9	2.35	788.9	3,491	6,218
1994	0.414	0	1,648	346.9	2.45	795.4	3,699	6,492
1995	33.7	210.3	1,275	324.3	2.21	778.5	3,523	6,147
1996	71.3	442.8	905.4	285.3	1.86	757.6	3,577	6,042
1997	0	0	1,776	322.7	2.45	761.6	3,755	6,618
1998	0.119	0	1,780	346.6	2.62	788.8	3,825	6,743
1999	60.9	420.6	1,020	304.8	2.06	757.0	3,445	6,011
2000	5.10	24.4	1,548	318.3	2.30	744.7	4,091	6,734
2001	3.08	32.3	1,389	313.3	2.27	746.7	3,711	6,197
2002	0.557	0	2,361	382.2	2.97	798.6	4,462	8,008
2003	4.62	50.6	1,722	376.8	2.67	820.6	3,965	6,943
2004	0	0	2,261	415.0	2.98	872.2	4,025	7,577
2005	83.0	516.3	1,142	354.0	2.20	839.9	3,548	6,486
2006	59.1	367.1	1,021	309.5	1.93	801.4	3,258	5,818
2007	0	0	2,445	388.7	2.97	861.8	3,637	7,336
2008	97.6	604.6	970.1	329.7	2.11	823.3	3,336	6,163
2009	37.0	175.3	1,394	322.3	2.15	780.2	4,097	6,809
2010	19.0	135.3	1,737	340.9	2.41	764.4	5,138	8,137
2011	107.4	773.4	803.2	281.7	1.79	711.9	4,724	7,403
2012	1.53	6.97	1,386	272.7	2.03	726.0	3,739	6,134
2013	0.389	0.866	1,516	265.2	2.32	741.0	3,577	6,103
2014	43.4	194.6	1,347	251.5	2.33	720.4	4,397	6,956
2015	0	0	2,226	279.2	3.15	787.6	4,289	7,584
2016	0.002	0	2,122	291.1	3.39	845.0	4,087	7,348
2017	25.7	95.8	1,733	275.0	3.10	850.3	4,106	7,089

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-11.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Plum Creek CD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Gonzales County UWCD	Lost Pines GCD	Caldwell	Upper Layers			
	(acre-feet)										%
Predevelopment	0	0	0	144.8	63.8	4.04	342.7	4,876	5,431	6.85E-07	1.26E-08
1980	0	0	1,560	121.7	59.7	2.62	298.7	3,898	5,941	-4.22E-10	-7.10E-12
1981	50.9	281.8	1,306	136.3	62.1	3.05	310.5	4,198	6,349	-1.11E-08	-1.76E-10
1982	0	0	1,698	118.7	60.0	2.77	300.2	3,875	6,055	1.23E-10	2.03E-12
1983	2.40E-04	0	1,679	114.4	59.2	2.46	293.6	3,751	5,899	-4.20E-10	-7.12E-12
1984	0	0	1,801	104.1	57.9	2.01	285.4	3,522	5,773	1.34E-09	2.32E-11
1985	53.3	348.2	1,594	125.3	59.1	2.42	293.2	3,883	6,359	5.00E-09	7.86E-11
1986	19.8	118.2	1,739	127.7	59.4	2.71	297.9	3,967	6,331	-3.55E-11	-5.60E-13
1987	17.3	91.3	1,631	130.2	60.2	2.92	301.1	4,057	6,290	-3.20E-08	-5.09E-10
1988	0	0	1,632	97.8	58.3	2.07	280.2	3,500	5,571	3.27E-11	5.88E-13
1989	0.015	0.648	1,666	95.6	57.8	1.61	273.8	3,359	5,455	-2.96E-09	-5.42E-11
1990	28.2	182.6	2,104	110.6	57.6	1.81	281.0	3,499	6,265	4.20E-10	6.71E-12
1991	64.7	386.5	1,580	129.3	60.8	2.53	292.0	3,928	6,444	4.79E-10	7.44E-12
1992	54.6	285.2	2,040	141.6	62.7	3.26	312.5	4,135	7,034	1.21E-08	1.72E-10
1993	0.013	0.889	1,831	122.2	60.0	3.03	297.5	3,902	6,218	3.59E-09	5.78E-11
1994	10.1	100.2	1,896	130.1	59.9	3.05	299.7	3,993	6,492	1.22E-06	1.88E-08
1995	0	0	1,889	118.2	58.4	2.72	292.6	3,786	6,147	1.13E-08	1.84E-10
1996	0	0	2,201	99.8	56.4	1.99	277.6	3,405	6,042	-4.21E-08	-6.97E-10
1997	61.2	415.7	1,860	126.0	57.8	2.41	289.3	3,805	6,618	-3.26E-08	-4.92E-10
1998	36.7	231.1	1,986	134.2	59.2	2.90	302.1	3,991	6,743	1.16E-06	1.73E-08
1999	0	0	1,970	108.4	57.3	2.37	285.6	3,587	6,011	1.69E-10	2.81E-12
2000	8.20	79.7	2,547	117.6	57.6	2.27	283.0	3,638	6,734	-1.84E-06	-2.73E-08
2001	3.19	11.4	2,088	115.6	57.2	2.29	283.4	3,636	6,197	4.90E-09	7.91E-11
2002	92.8	620.4	2,583	150.2	60.7	3.19	310.7	4,187	8,008	3.55E-11	4.43E-13
2003	5.78	20.6	2,260	139.4	60.2	3.44	310.4	4,143	6,943	-1.85E-09	-2.67E-11
2004	65.7	391.0	1,979	168.6	64.4	4.12	333.4	4,571	7,577	5.73E-10	7.56E-12
2005	0	0	1,973	123.3	59.0	3.42	308.7	4,018	6,486	-3.11E-10	-4.80E-12
2006	0.497	0.010	1,633	111.5	57.5	2.64	295.2	3,718	5,818	3.11E-10	5.35E-12
2007	130.6	823.1	1,220	162.3	63.6	3.74	333.3	4,600	7,336	-3.73E-08	-5.09E-10
2008	0	0	1,779	117.6	58.8	3.03	304.5	3,901	6,163	2.73E-11	4.43E-13
2009	0.314	1.92	2,649	118.0	57.6	2.48	289.1	3,691	6,809	9.56E-07	1.40E-08
2010	5.50	76.5	3,947	123.8	56.8	2.29	289.0	3,636	8,137	8.64E-08	1.06E-09
2011	0	0	3,933	90.7	54.1	1.29	267.9	3,057	7,403	-9.64E-06	-1.30E-07
2012	43.9	320.1	1,963	108.7	62.2	1.59	270.0	3,364	6,134	1.26E-06	2.06E-08
2013	32.5	258.5	1,775	118.0	80.0	1.76	282.6	3,555	6,103	2.95E-08	4.83E-10
2014	0	0	3,167	107.9	113.6	1.20	274.1	3,292	6,956	3.52E-06	5.06E-08
2015	89.2	676.4	2,336	142.4	146.2	1.87	301.4	3,891	7,584	-3.08E-08	-4.07E-10
2016	46.3	335.9	2,168	151.1	157.0	2.42	320.9	4,167	7,348	-1.54E-06	-2.10E-08
2017	0.175	8.96	2,461	139.5	173.6	2.23	314.3	3,989	7,089	-1.16E-10	-1.64E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Medina County GCD	Wintergarden GCD	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	6,896	1,309	0.305	17.9	6,494	14,717
1980	0	0	13,140	1,235	0.008	5.12	4,840	19,221
1981	0	0	11,853	1,583	0.067	4.91	4,964	18,406
1982	0.019	12.6	11,803	1,070	0.083	4.89	4,883	17,774
1983	0.011	6.99	11,653	1,097	0.039	4.84	4,880	17,642
1984	0.026	17.2	11,417	931.5	0.002	4.86	4,876	17,246
1985	0	0	10,832	1,493	0.010	4.72	5,009	17,338
1986	1.00E-07	1.84E-04	10,570	1,410	0.045	4.47	5,070	17,054
1987	0	0	10,306	1,427	0.088	4.25	5,133	16,869
1988	0.086	54.7	10,839	659.9	0.106	4.41	4,956	16,514
1989	0.034	22.3	10,837	876.7	0	4.46	4,927	16,668
1990	0	0	10,535	1,304	0	4.39	5,031	16,874
1991	3.61E-08	0.003	10,291	1,556	0.073	4.37	5,126	16,977
1992	0	0	10,079	1,755	0.149	4.35	5,239	17,077
1993	0.036	23.5	10,440	1,123	0.310	4.46	5,094	16,686
1994	2.43E-05	0.078	10,342	1,416	0.127	4.47	5,137	16,900
1995	0.044	28.2	10,621	1,096	0.120	4.59	5,048	16,798
1996	0.097	60.4	11,053	777.9	0	4.76	4,931	16,828
1997	0	0	10,591	1,526	0	4.63	5,069	17,191
1998	0	0	10,474	1,529	0.028	4.58	5,108	17,115
1999	0.081	51.4	10,922	876.6	0.020	4.69	4,951	16,805
2000	0.001	1.07	10,765	1,330	3.48E-04	4.69	5,029	17,130
2001	0.014	8.25	10,810	1,193	1.49E-04	4.69	4,988	17,004
2002	0	0	10,204	2,029	0.102	4.55	5,204	17,441
2003	0.010	4.49	10,419	1,480	0.143	4.60	5,123	17,031
2004	0	0	10,083	1,943	0.137	4.47	5,265	17,296
2005	0.116	69.8	10,667	981.2	0.163	4.62	5,034	16,757
2006	0.105	68.4	10,914	877.4	0	4.64	4,945	16,809
2007	0	0	10,037	2,101	0.103	4.33	5,245	17,387
2008	0.130	81.9	10,830	833.4	0.035	4.59	4,991	16,740
2009	0.036	25.4	10,851	1,198	0	4.74	4,973	17,052
2010	0.004	3.26	10,846	1,492	0	4.96	4,999	17,346
2011	0.129	84.5	11,632	690.1	0	5.36	4,761	17,173
2012	0.021	15.0	11,513	1,191	0	5.32	4,827	17,551
2013	0.004	2.74	11,403	1,303	0	5.29	4,844	17,557
2014	0.019	11.3	11,505	1,157	0	5.31	4,810	17,488
2015	0	0	10,883	1,912	0.004	5.08	5,017	17,818
2016	2.95E-07	4.86E-04	10,724	1,823	0.056	4.96	5,085	17,638
2017	0.008	4.73	10,797	1,489	0.054	4.92	5,025	17,320

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Medina County GCD	Wintergarden GCD	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	6,859	73.8	8.06	19.7	7,756	14,717	-2.21E-07	-1.50E-09
1980	0	0	5,146	9.87	6.91	40.3	14,017	19,221	-3.28E-07	-1.70E-09
1981	0.069	46.6	5,276	11.6	6.75	39.0	13,026	18,406	-4.38E-07	-2.38E-09
1982	0.006	5.58	5,185	10.9	6.88	39.1	12,526	17,774	-8.13E-07	-4.57E-09
1983	0.008	6.14	5,186	10.4	6.89	38.7	12,393	17,642	-3.11E-07	-1.76E-09
1984	0.011	12.2	5,178	9.40	7.06	38.9	12,001	17,246	4.91E-07	2.85E-09
1985	0.070	54.3	5,324	11.0	6.80	37.9	11,905	17,338	-6.13E-07	-3.54E-09
1986	0.055	46.2	5,386	12.0	6.76	36.8	11,566	17,054	-2.72E-07	-1.60E-09
1987	0.060	47.9	5,454	13.0	6.69	35.5	11,313	16,869	-5.21E-07	-3.09E-09
1988	0.001	0.778	5,255	10.4	6.96	36.4	11,205	16,514	9.94E-08	6.02E-10
1989	0.003	1.11	5,233	9.21	6.96	36.6	11,381	16,668	-5.23E-07	-3.14E-09
1990	0.040	27.8	5,349	10.2	6.84	36.1	11,445	16,874	-3.46E-07	-2.05E-09
1991	0.076	56.2	5,451	12.0	6.76	36.0	11,414	16,977	-7.33E-07	-4.32E-09
1992	0.110	76.2	5,570	14.3	6.70	35.9	11,373	17,077	1.96E-07	1.15E-09
1993	0.003	3.14	5,408	13.3	6.87	36.7	11,218	16,686	-2.00E-07	-1.20E-09
1994	0.033	19.0	5,460	13.9	6.86	36.7	11,363	16,900	-4.77E-07	-2.82E-09
1995	9.01E-04	0.919	5,359	12.8	7.00	37.5	11,381	16,798	-3.17E-07	-1.89E-09
1996	0	0	5,232	10.6	7.19	38.6	11,539	16,828	2.47E-07	1.47E-09
1997	0.058	35.2	5,392	12.1	6.96	37.7	11,706	17,191	-3.38E-07	-1.96E-09
1998	0.049	34.5	5,432	13.2	6.94	37.4	11,591	17,115	-4.16E-07	-2.43E-09
1999	0	0	5,253	11.3	7.15	38.2	11,495	16,805	-7.30E-07	-4.34E-09
2000	0.016	8.08	5,346	11.7	7.12	38.0	11,719	17,130	4.41E-07	2.57E-09
2001	6.55E-05	0.081	5,299	11.4	7.15	38.1	11,648	17,004	-6.12E-07	-3.60E-09
2002	0.146	98.9	5,540	14.9	6.92	37.0	11,744	17,441	-4.77E-07	-2.74E-09
2003	0.027	15.3	5,444	15.3	7.05	37.4	11,511	17,031	-3.37E-07	-1.98E-09
2004	0.123	72.4	5,602	18.1	6.93	36.6	11,560	17,296	5.19E-07	3.00E-09
2005	0	0	5,337	15.3	7.18	37.7	11,359	16,757	-4.97E-07	-2.97E-09
2006	0	0	5,246	12.9	7.28	37.9	11,506	16,809	-8.52E-07	-5.07E-09
2007	0.162	103.8	5,583	16.7	6.89	35.9	11,640	17,387	-3.96E-07	-2.28E-09
2008	0	0	5,290	13.7	7.27	37.6	11,392	16,740	2.33E-07	1.39E-09
2009	0.003	0.081	5,283	12.9	7.27	38.3	11,711	17,052	-5.02E-07	-2.95E-09
2010	0.020	12.1	5,315	13.5	7.28	39.2	11,958	17,346	-3.77E-07	-2.18E-09
2011	0	0	5,052	10.7	7.61	41.7	12,062	17,173	-5.56E-07	-3.24E-09
2012	0.007	1.64	5,135	10.5	7.49	41.9	12,354	17,551	4.90E-07	2.79E-09
2013	0.007	4.82	5,155	10.7	7.41	41.7	12,338	17,557	-6.83E-07	-3.89E-09
2014	0	0	5,118	10.4	7.43	42.0	12,310	17,488	-4.34E-07	-2.48E-09
2015	0.105	73.3	5,344	12.8	7.13	40.5	12,339	17,818	-8.39E-07	-4.71E-09
2016	0.083	58.3	5,412	14.9	7.07	39.8	12,105	17,638	3.36E-07	1.90E-09
2017	0.022	11.8	5,342	15.2	7.10	39.6	11,905	17,320	-3.67E-07	-2.12E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Uvalde County UWCD does not exist in the model in Layer 2.			
1980				
1981				
1982				
1983				
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2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Uvalde County UWCD does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
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2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Uvalde County UWCD does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
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1986				
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2006				
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2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Queen City Aquifer (Layer 5)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Uvalde County UWCD does not exist in model in the Queen City Aquifer (Layer 5).			
1980				
1981				
1982				
1983				
1984				
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2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Reklaw Formation (Layer 6)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Uvalde County UWCD does not exist in model in the Reklaw Formation (Layer 6).			
1980				
1981				
1982				
1983				
1984				
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2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Medina County GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	624.5	3.34	1.05	28.3	2,032	755.0	3,444
1980	0	0	589.4	0	1.23	14.6	3,126	237.2	3,968
1981	0	0	755.6	0	1.28	14.1	3,115	250.8	4,137
1982	0.349	27.5	510.5	0	1.28	13.9	3,033	244.7	3,831
1983	0.084	11.4	523.3	0	1.21	13.9	3,047	242.8	3,840
1984	0.289	30.8	444.5	0	1.02	13.8	3,054	239.0	3,784
1985	0	0	712.4	0	1.30	13.6	3,109	246.9	4,083
1986	0	0	672.7	0	1.25	13.4	3,021	256.9	3,965
1987	0	0	680.8	0	1.21	13.0	2,962	266.2	3,923
1988	0.821	77.5	314.9	0	1.01	13.1	2,900	252.6	3,560
1989	0.191	26.0	418.4	0	0.893	13.1	2,981	243.7	3,683
1990	0	0	622.2	0	1.15	12.9	3,029	249.1	3,915
1991	1.40E-05	0.008	742.3	0	1.27	12.5	3,039	258.0	4,053
1992	0	0	837.7	0	1.31	12.3	3,037	269.8	4,158
1993	0.540	49.4	535.8	0	1.37	12.5	2,946	256.9	3,803
1994	0.003	0.859	675.8	0	1.30	12.6	3,006	257.7	3,954
1995	0.450	50.0	522.8	0	1.32	12.9	2,990	249.1	3,826
1996	0.648	80.0	371.2	0	1.01	13.5	3,012	238.4	3,717
1997	0	0	728.1	0	1.31	13.5	3,107	246.1	4,097
1998	0	0	729.7	0	1.31	13.4	3,077	250.7	4,072
1999	0.655	67.1	418.3	0	1.11	13.7	3,010	239.8	3,750
2000	0.006	1.11	634.7	0	1.22	13.7	3,113	239.6	4,004
2001	0.135	13.5	569.4	0	1.21	13.8	3,090	236.2	3,924
2002	0	0	968.1	0	1.37	13.4	3,183	253.5	4,419
2003	0.275	15.4	706.1	0	1.42	13.3	3,085	248.8	4,070
2004	0	0	927.1	0	1.38	13.1	3,132	260.7	4,335
2005	0.897	91.2	468.2	0	1.39	13.4	3,012	242.7	3,830
2006	0.428	60.3	418.7	0	1.03	13.9	3,045	232.9	3,772
2007	0	0	1,003	0	1.36	13.4	3,168	257.7	4,443
2008	1.03	97.8	397.7	0	1.22	13.6	3,014	239.1	3,765
2009	0.199	34.3	571.7	0	1.14	13.7	3,136	229.0	3,986
2010	0.117	17.2	712.2	0	1.37	13.8	3,232	228.2	4,204
2011	1.02	112.0	329.3	0	0.680	14.6	3,204	211.7	3,873
2012	0.046	9.19	568.2	0	0.983	14.9	3,309	217.6	4,120
2013	0.015	3.17	621.7	0	1.12	15.1	3,302	219.3	4,162
2014	0.116	15.7	552.1	0	1.03	15.3	3,280	218.0	4,082
2015	0	0	912.5	0	1.48	15.2	3,331	231.8	4,492
2016	0	0	870.1	0	1.44	15.0	3,258	239.0	4,384
2017	0.115	6.11	710.6	0	1.45	14.8	3,183	235.6	4,152

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evergreen UWCD	Medina County GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	0	3.51	17.3	2,454	969.7	3,444	4.27E-10	1.24E-11
1980	0	0	9.44	2.38	4.14	81.6	1,805	2,066	3,968	-3.78E-09	-9.51E-11
1981	0.504	55.4	9.96	1.79	4.43	80.5	1,850	2,134	4,137	-2.02E-10	-4.88E-12
1982	5.28E-04	0.323	10.2	2.31	4.02	80.1	1,814	1,920	3,831	-4.59E-11	-1.20E-12
1983	0.002	0.772	10.6	2.37	4.02	80.9	1,810	1,931	3,840	-1.77E-11	-4.62E-13
1984	3.72E-06	0	11.3	2.97	3.97	82.8	1,791	1,892	3,784	-1.99E-10	-5.26E-12
1985	0.485	48.3	10.6	2.06	4.29	83.9	1,836	2,097	4,083	-4.87E-11	-1.19E-12
1986	0.376	49.5	9.20	1.80	4.29	79.4	1,865	1,956	3,965	1.36E-10	3.43E-12
1987	0.411	51.9	10.1	1.46	4.32	75.2	1,894	1,886	3,923	-1.51E-10	-3.85E-12
1988	0	0	9.55	2.45	3.69	76.7	1,821	1,647	3,560	-1.58E-10	-4.43E-12
1989	0.002	0	11.0	2.59	3.77	80.3	1,805	1,780	3,683	-3.68E-11	-1.00E-12
1990	0.395	41.6	11.3	2.15	4.14	81.3	1,844	1,930	3,915	-1.65E-10	-4.22E-12
1991	0.409	51.6	0.058	1.87	4.51	82.6	1,877	2,035	4,053	-1.21E-10	-3.00E-12
1992	0.462	56.8	0.062	1.56	4.72	82.4	1,917	2,095	4,158	-9.46E-11	-2.27E-12
1993	0	0	0.062	2.31	4.20	82.3	1,859	1,854	3,803	3.37E-10	8.85E-12
1994	0.101	3.30	0.062	2.32	4.46	83.9	1,873	1,987	3,954	1.68E-11	4.26E-13
1995	0	0	0.065	2.91	4.27	85.5	1,835	1,899	3,826	-8.46E-11	-2.21E-12
1996	0	0	0.070	3.66	4.05	88.2	1,787	1,834	3,717	-1.41E-10	-3.78E-12
1997	0.536	44.1	0.065	2.86	4.56	89.2	1,841	2,114	4,097	-1.82E-12	-4.44E-14
1998	0.199	25.7	0.057	2.75	4.62	88.1	1,856	2,095	4,072	2.27E-12	5.58E-14
1999	0	0	0.057	3.60	4.17	88.0	1,794	1,860	3,750	-2.42E-10	-6.45E-12
2000	0.141	6.59	0.073	3.47	4.49	91.3	1,818	2,079	4,004	-2.45E-10	-6.11E-12
2001	5.78E-05	0.084	0.060	3.68	4.42	91.7	1,801	2,023	3,924	-1.06E-10	-2.69E-12
2002	0.820	89.1	0.073	2.83	5.14	93.3	1,879	2,349	4,419	-1.17E-10	-2.65E-12
2003	0	0	0.065	3.29	4.68	92.5	1,846	2,124	4,070	6.00E-11	1.47E-12
2004	0.522	57.2	0.057	2.75	5.08	92.6	1,899	2,277	4,335	-2.85E-10	-6.57E-12
2005	0	0	0.057	3.82	4.35	91.6	1,809	1,921	3,830	-1.27E-11	-3.32E-13
2006	0	0	0.049	4.21	4.25	92.5	1,777	1,894	3,772	-1.53E-10	-4.05E-12
2007	1.22	126.8	0.036	2.71	5.21	92.2	1,895	2,319	4,443	3.19E-10	7.19E-12
2008	0	0	0.052	4.07	4.22	91.6	1,794	1,871	3,765	3.13E-10	8.31E-12
2009	0.017	0.019	0.075	4.27	4.48	96.4	1,781	2,100	3,986	-7.19E-11	-1.80E-12
2010	0.055	2.50	0.104	4.42	4.75	100.9	1,780	2,312	4,204	1.64E-11	3.89E-13
2011	0	0	0.093	5.69	4.21	103.4	1,682	2,078	3,873	-2.49E-10	-6.43E-12
2012	0.139	7.13	0.040	5.38	4.43	104.3	1,711	2,287	4,120	-2.06E-10	-5.01E-12
2013	0.129	10.1	0.036	5.08	4.53	103.1	1,721	2,318	4,162	-2.73E-12	-6.56E-14
2014	0.008	1.01	0.038	5.11	4.45	101.9	1,712	2,258	4,082	-4.91E-11	-1.20E-12
2015	0.777	71.8	0.030	3.88	4.97	100.2	1,793	2,516	4,492	-1.65E-10	-3.67E-12
2016	0.331	35.6	0.033	3.49	4.97	97.2	1,823	2,419	4,384	-1.71E-10	-3.90E-12
2017	0.002	0.374	0.036	3.62	4.72	94.9	1,802	2,246	4,152	-6.37E-11	-1.53E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Medina County GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	626.8	7.93	112.2	1,917	940.5	3,604
1980	0	0	591.5	13.1	68.3	4,310	654.1	5,637
1981	0	0	758.3	12.3	64.3	4,303	705.7	5,843
1982	1.61	45.6	512.4	13.1	62.5	3,987	713.0	5,335
1983	0.485	17.8	525.2	13.1	61.9	3,984	715.7	5,318
1984	1.75	64.1	446.1	12.9	62.1	3,903	750.0	5,240
1985	0	0	715.0	12.7	59.3	4,129	747.2	5,663
1986	5.34E-05	0	675.1	12.4	59.7	3,902	755.6	5,404
1987	0	0	683.2	12.0	56.6	3,766	751.1	5,269
1988	5.51	211.1	316.0	12.3	53.9	3,469	741.5	4,809
1989	2.17	117.1	419.9	12.1	54.9	3,654	736.4	4,997
1990	0	0	624.4	12.4	53.1	3,836	741.1	5,267
1991	0.071	3.87	745.0	12.2	48.5	3,947	724.8	5,481
1992	8.87E-05	0.014	840.7	11.8	46.6	4,004	717.9	5,621
1993	4.04	189.9	537.7	12.8	48.9	3,708	719.5	5,221
1994	0.321	25.5	678.2	12.5	48.8	3,887	716.8	5,369
1995	4.08	212.3	524.7	13.2	50.9	3,792	722.8	5,320
1996	6.57	370.5	372.5	12.9	54.8	3,752	728.1	5,298
1997	0	0	730.8	12.8	53.3	4,105	730.5	5,633
1998	0	0	732.3	12.7	52.2	4,057	732.5	5,587
1999	5.05	243.9	419.8	13.0	54.8	3,774	736.2	5,247
2000	0.302	19.0	637.0	13.2	54.3	4,065	737.5	5,527
2001	0.950	46.4	571.5	13.3	55.1	3,989	740.2	5,416
2002	0	0	971.6	12.2	50.9	4,369	736.8	6,140
2003	1.06	22.6	708.6	13.0	51.6	4,071	738.0	5,606
2004	0	0	930.4	12.2	49.3	4,249	735.3	5,976
2005	6.51	295.9	469.9	13.5	52.3	3,814	741.2	5,394
2006	4.21	234.6	420.2	13.0	56.4	3,815	741.9	5,286
2007	0	0	1,006	12.0	48.7	4,312	737.9	6,116
2008	7.92	369.6	399.2	13.2	51.4	3,757	738.5	5,337
2009	4.06	270.1	573.7	13.2	51.7	4,086	731.1	5,730
2010	3.21	243.5	714.7	13.9	54.5	4,378	741.7	6,150
2011	11.6	749.2	330.5	13.2	63.8	4,139	754.1	6,061
2012	1.42	138.7	570.2	12.9	64.1	4,447	761.0	5,995
2013	0.539	46.4	624.0	13.1	65.5	4,482	762.3	5,994
2014	1.69	109.0	554.1	13.0	67.3	4,408	762.7	5,916
2015	0	0	915.8	13.1	65.6	4,715	771.5	6,481
2016	2.63E-05	0	873.3	12.8	62.1	4,550	767.8	6,266
2017	0.432	9.13	713.1	13.2	60.4	4,314	761.5	5,871

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Medina County GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	0	20.2	417.4	1,771	1,396	3,604	7.93E-09	2.20E-10
1980	0	0	280.2	34.2	1,241	882.6	3,199	5,637	-1.04E-07	-1.85E-09
1981	6.22	431.6	192.1	34.4	1,261	925.7	2,993	5,843	-3.48E-09	-5.95E-11
1982	0.822	113.1	197.6	33.8	1,281	901.3	2,807	5,335	-1.82E-10	-3.41E-12
1983	0.729	90.9	198.8	33.5	1,299	899.1	2,796	5,318	6.34E-10	1.19E-11
1984	0.506	73.1	189.9	34.6	1,347	887.7	2,707	5,240	3.66E-09	6.99E-11
1985	4.69	294.3	193.6	33.7	1,371	924.8	2,841	5,663	1.91E-08	3.37E-10
1986	5.62	359.0	98.1	33.6	1,311	945.4	2,652	5,404	1.46E-09	2.71E-11
1987	5.78	375.7	92.4	33.3	1,264	966.8	2,531	5,269	-2.52E-10	-4.78E-12
1988	0.002	0.595	158.1	32.5	1,297	912.8	2,408	4,809	2.31E-08	4.81E-10
1989	0.007	0	192.2	32.5	1,333	899.7	2,540	4,997	2.43E-09	4.87E-11
1990	3.47	168.4	170.5	32.8	1,330	927.3	2,635	5,267	6.46E-09	1.23E-10
1991	3.21	155.3	167.3	34.2	1,376	955.5	2,789	5,481	-1.12E-08	-2.05E-10
1992	3.90	195.4	146.7	35.4	1,392	989.3	2,858	5,621	3.33E-10	5.92E-12
1993	0	0	135.2	35.1	1,396	946.6	2,708	5,221	1.89E-07	3.61E-09
1994	0.347	10.4	140.9	36.4	1,414	957.3	2,810	5,369	-1.42E-09	-2.64E-11
1995	0	0	144.9	36.5	1,433	930.3	2,776	5,320	9.65E-08	1.81E-09
1996	0	0	146.4	36.6	1,459	893.8	2,762	5,298	-4.37E-09	-8.24E-11
1997	3.51	146.5	134.8	36.9	1,454	933.3	2,924	5,633	2.34E-09	4.15E-11
1998	2.18	130.1	130.6	37.7	1,446	945.0	2,895	5,587	2.21E-10	3.96E-12
1999	0	0	128.5	37.3	1,445	900.4	2,736	5,247	6.55E-09	1.25E-10
2000	0.594	16.2	166.1	38.4	1,477	916.2	2,912	5,527	3.08E-09	5.57E-11
2001	0.033	0.595	136.1	38.4	1,471	904.2	2,866	5,416	1.58E-09	2.92E-11
2002	6.87	361.1	168.9	40.6	1,493	966.9	3,103	6,140	1.39E-09	2.26E-11
2003	0.079	12.2	147.8	40.5	1,496	944.5	2,965	5,606	1.31E-08	2.34E-10
2004	4.96	270.2	129.6	41.7	1,493	984.9	3,052	5,976	-7.67E-09	-1.28E-10
2005	0	0	129.0	40.3	1,487	919.8	2,817	5,394	1.09E-08	2.03E-10
2006	0	0	106.6	39.7	1,476	891.2	2,772	5,286	-2.62E-09	-4.95E-11
2007	10.4	530.4	80.0	40.8	1,456	979.3	3,020	6,116	2.67E-08	4.36E-10
2008	0	0	116.3	39.9	1,486	905.5	2,789	5,337	6.15E-09	1.15E-10
2009	0.032	0.040	172.6	40.8	1,561	894.0	3,062	5,730	3.90E-09	6.80E-11
2010	0.289	14.4	256.6	42.3	1,634	899.3	3,302	6,150	4.04E-09	6.57E-11
2011	0	0	255.2	42.7	1,680	829.7	3,253	6,061	1.11E-09	1.83E-11
2012	0.787	21.4	44.4	42.3	1,684	852.3	3,350	5,995	-3.49E-10	-5.83E-12
2013	0.637	23.5	41.0	42.0	1,674	859.0	3,354	5,994	2.04E-09	3.40E-11
2014	0.006	0	41.7	41.8	1,672	849.5	3,311	5,916	3.77E-09	6.38E-11
2015	7.11	425.8	30.9	41.8	1,644	910.0	3,422	6,481	-2.56E-08	-3.95E-10
2016	4.28	313.2	31.5	42.1	1,627	928.5	3,319	6,266	-4.37E-11	-6.97E-13
2017	0.663	76.9	35.3	41.5	1,612	912.8	3,192	5,871	6.28E-09	1.07E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Medina County GCD	Wintergarden GCD	Upper Layers	
	(acre-feet)						
Predevelopment	0	0	1,300	27.6	187.2	5,810	7,325
1980	0	0	1,226	38.2	111.7	11,263	12,639
1981	0	0	1,572	35.7	100.3	10,153	11,861
1982	4.13	48.8	1,062	37.7	96.1	9,641	10,890
1983	1.21	15.0	1,089	38.3	91.2	9,493	10,728
1984	3.98	35.9	925.0	39.5	86.8	9,030	10,122
1985	0	0	1,482	37.3	68.6	9,005	10,594
1986	0.007	0.086	1,400	36.3	72.2	8,657	10,166
1987	0	0	1,417	35.3	71.2	8,419	9,942
1988	18.0	352.2	655.2	38.2	67.3	8,292	9,423
1989	7.66	129.4	870.6	38.7	61.6	8,461	9,569
1990	0	0	1,295	38.3	59.9	8,546	9,939
1991	1.37	12.5	1,545	36.3	48.1	8,659	10,301
1992	0.081	0.674	1,743	34.1	47.6	8,697	10,523
1993	15.1	308.9	1,115	36.5	49.0	8,529	10,053
1994	1.67	29.0	1,406	35.8	48.3	8,672	10,193
1995	15.3	292.7	1,088	37.6	49.4	8,667	10,150
1996	25.5	516.6	772.4	39.4	63.2	8,747	10,164
1997	0	0	1,515	37.4	59.0	8,923	10,534
1998	0	0	1,518	36.2	54.6	8,841	10,450
1999	18.5	389.0	870.5	38.7	67.6	8,687	10,071
2000	1.15	5.03	1,321	38.4	59.2	8,911	10,335
2001	2.92	40.7	1,185	38.7	64.2	8,834	10,165
2002	0	0	2,014	34.2	46.2	9,035	11,130
2003	3.00	40.3	1,469	35.2	48.6	8,828	10,424
2004	0	0	1,929	32.9	46.5	8,900	10,909
2005	24.0	516.6	974.3	36.9	54.6	8,648	10,254
2006	16.6	400.9	871.2	38.4	67.0	8,681	10,075
2007	0	0	2,086	33.3	55.0	8,896	11,070
2008	29.6	595.3	827.6	37.7	55.8	8,649	10,195
2009	17.2	272.3	1,190	38.2	49.4	9,014	10,581
2010	13.7	180.7	1,482	38.1	53.1	9,319	11,087
2011	46.9	906.9	685.3	40.6	71.2	9,370	11,121
2012	7.01	169.1	1,182	39.9	86.9	9,566	11,051
2013	1.93	27.7	1,294	39.3	92.8	9,564	11,019
2014	6.31	109.2	1,149	39.5	97.8	9,525	10,926
2015	0	0	1,899	36.2	88.4	9,597	11,620
2016	0.006	0.093	1,811	34.7	78.0	9,403	11,326
2017	1.80	40.4	1,479	35.3	75.1	9,210	10,841

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-12.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Uvalde County UWCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Medina County GCD	Wintergarden GCD	Upper Layers			
	(acre-feet)									%
Predevelopment	0	0	0	22.7	42.8	3,305	3,955	7,325	1.43E-08	1.95E-10
1980	0	0	4,001	6.92	55.0	5,393	3,183	12,639	-2.20E-07	-1.74E-09
1981	44.1	1,392	1,473	15.7	55.6	5,604	3,276	11,861	-1.66E-08	-1.40E-10
1982	12.1	479.1	1,352	8.54	54.9	5,720	3,263	10,890	3.30E-09	3.03E-11
1983	8.64	336.9	1,240	8.73	54.4	5,810	3,269	10,728	2.84E-09	2.65E-11
1984	11.4	501.1	179.4	7.71	54.6	6,036	3,332	10,122	1.64E-08	1.62E-10
1985	24.4	728.9	184.1	16.9	54.5	6,204	3,381	10,594	1.17E-07	1.10E-09
1986	25.2	558.1	114.2	17.1	54.7	5,992	3,404	10,166	7.69E-09	7.57E-11
1987	25.1	512.1	115.0	17.8	54.7	5,805	3,413	9,942	-3.93E-10	-3.95E-12
1988	1.41E-06	0	145.3	5.88	53.0	5,866	3,353	9,423	1.58E-08	1.68E-10
1989	0.050	2.74	169.8	7.75	52.3	5,994	3,342	9,569	1.14E-08	1.19E-10
1990	13.1	284.1	164.7	14.6	53.0	6,024	3,385	9,939	4.36E-08	4.38E-10
1991	12.2	310.6	156.3	20.0	54.6	6,342	3,406	10,301	-4.81E-08	-4.67E-10
1992	14.3	338.9	155.9	24.7	56.6	6,490	3,443	10,523	1.13E-09	1.07E-11
1993	6.83E-04	0	140.9	14.2	56.3	6,448	3,394	10,053	1.16E-06	1.15E-08
1994	1.61	48.2	146.1	18.3	57.6	6,511	3,410	10,193	-9.76E-09	-9.57E-11
1995	2.30E-04	0	144.8	13.2	57.5	6,544	3,390	10,150	9.55E-07	9.41E-09
1996	0	0	149.0	7.35	56.6	6,588	3,364	10,164	-2.36E-08	-2.33E-10
1997	13.2	301.4	142.1	18.9	57.7	6,589	3,412	10,534	1.14E-08	1.08E-10
1998	9.44	226.9	141.7	20.4	58.6	6,566	3,426	10,450	-3.51E-10	-3.36E-12
1999	0	0	131.9	9.55	57.6	6,494	3,378	10,071	2.02E-08	2.01E-10
2000	3.06	106.7	98.6	16.0	58.9	6,635	3,417	10,335	1.44E-08	1.40E-10
2001	0.095	5.06	80.1	14.3	58.8	6,601	3,406	10,165	5.42E-09	5.33E-11
2002	27.5	654.9	99.9	30.4	61.8	6,771	3,484	11,130	8.47E-09	7.61E-11
2003	0.579	21.9	87.2	22.5	62.3	6,771	3,458	10,424	6.11E-08	5.86E-10
2004	19.6	407.5	76.2	44.1	62.9	6,789	3,509	10,909	-2.30E-08	-2.11E-10
2005	0	0	75.9	12.7	61.6	6,671	3,433	10,254	6.33E-08	6.17E-10
2006	0	0	62.8	9.14	60.3	6,538	3,404	10,075	-8.93E-09	-8.87E-11
2007	39.6	822.2	47.2	34.3	62.8	6,564	3,501	11,070	1.00E-07	9.05E-10
2008	0	0	68.2	9.96	61.1	6,639	3,416	10,195	-1.00E-08	-9.84E-11
2009	0.151	4.22	102.9	14.0	61.6	6,986	3,411	10,581	1.92E-08	1.82E-10
2010	2.01	76.3	152.1	19.2	63.4	7,329	3,445	11,087	2.19E-08	1.98E-10
2011	0	0	152.0	6.57	61.9	7,510	3,390	11,121	2.16E-08	1.94E-10
2012	1.64	29.3	6.20	13.1	62.1	7,521	3,418	11,051	-7.77E-09	-7.03E-11
2013	1.89	49.6	5.86	15.9	62.1	7,466	3,418	11,019	6.49E-09	5.89E-11
2014	0.012	0	5.91	13.7	61.7	7,442	3,403	10,926	1.83E-08	1.68E-10
2015	29.8	669.6	4.90	26.9	63.3	7,347	3,479	11,620	-1.61E-07	-1.39E-09
2016	19.5	429.6	4.91	33.2	63.9	7,281	3,494	11,326	-1.38E-09	-1.22E-11
2017	4.37	81.4	7.87	25.1	63.6	7,198	3,461	10,841	6.14E-08	5.66E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows										Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Evergreen UWCD	McMullen GCD	Uvalde County UWCD	Maverick	Webb	Lower Layers	
	(acre-feet)										
Predevelopment	0	0	4.53E+05	10,849	13.5	3.25	19.7	43.8	1.84	4.80E+05	9.45E+05
1980	0	0	4.84E+05	10,240	11.6	3.26	40.3	6.44	2.49	4.68E+05	9.62E+05
1981	4.33E-09	5.77E-06	4.79E+05	13,126	12.0	3.25	39.0	6.43	2.45	4.69E+05	9.61E+05
1982	4.26	700.8	4.82E+05	8,869	11.8	3.25	39.1	6.64	2.48	4.67E+05	9.58E+05
1983	1.57	379.8	4.82E+05	9,091	11.6	3.25	38.7	6.71	2.49	4.67E+05	9.58E+05
1984	3.50	758.5	4.86E+05	7,723	11.2	3.26	38.9	6.57	2.53	4.67E+05	9.61E+05
1985	0.002	1.36	4.81E+05	12,376	11.6	3.25	37.9	6.61	2.49	4.68E+05	9.61E+05
1986	5.92E-04	0.561	4.78E+05	11,687	11.8	3.25	36.8	5.61	2.48	4.69E+05	9.59E+05
1987	6.48E-11	9.86E-05	4.76E+05	11,826	12.0	3.25	35.5	5.21	2.47	4.69E+05	9.57E+05
1988	9.49	1,795	4.84E+05	5,470	11.2	3.26	36.4	7.87	2.55	4.66E+05	9.57E+05
1989	2.42	694.7	4.83E+05	7,268	10.8	3.25	36.6	6.52	2.57	4.65E+05	9.56E+05
1990	0.041	14.5	4.80E+05	10,808	11.0	3.25	36.1	8.07	2.55	4.67E+05	9.58E+05
1991	0.010	11.7	4.80E+05	12,896	11.4	3.25	36.0	8.42	2.49	4.69E+05	9.61E+05
1992	0.002	3.51	4.79E+05	14,553	12.2	3.26	35.9	8.53	2.44	4.72E+05	9.66E+05
1993	5.14	750.9	4.82E+05	9,308	11.9	3.25	36.7	6.36	2.45	4.67E+05	9.59E+05
1994	0.004	1.04	4.81E+05	11,740	12.1	3.25	36.7	5.72	2.43	4.68E+05	9.61E+05
1995	3.51	596.6	4.84E+05	9,083	11.9	3.25	37.5	6.11	2.45	4.67E+05	9.60E+05
1996	6.30	1,295	4.88E+05	6,449	11.3	3.26	38.6	6.45	2.50	4.66E+05	9.62E+05
1997	0.002	1.18	4.82E+05	12,649	11.7	3.25	37.7	5.58	2.45	4.68E+05	9.63E+05
1998	3.42E-06	0.002	4.81E+05	12,677	12.0	3.25	37.4	6.26	2.43	4.69E+05	9.62E+05
1999	7.01	1,241	4.85E+05	7,267	11.5	3.25	38.2	6.75	2.49	4.65E+05	9.59E+05
2000	0.926	326.2	4.85E+05	11,026	11.2	3.26	38.0	5.74	2.47	4.68E+05	9.65E+05
2001	2.00	531.0	4.85E+05	9,892	11.4	3.25	38.1	5.41	2.47	4.66E+05	9.61E+05
2002	1.24	705.8	4.81E+05	16,818	12.8	3.25	37.0	5.07	2.38	4.70E+05	9.68E+05
2003	2.70	498.4	4.82E+05	12,266	11.8	3.25	37.4	5.24	2.37	4.68E+05	9.64E+05
2004	0.062	74.4	4.80E+05	16,106	12.3	3.26	36.6	5.19	2.32	4.72E+05	9.68E+05
2005	9.15	1,559	4.85E+05	8,134	11.8	3.25	37.7	5.52	2.37	4.66E+05	9.61E+05
2006	5.62	1,244	4.87E+05	7,274	11.4	3.25	37.9	5.60	2.39	4.64E+05	9.60E+05
2007	9.68E-04	0.807	4.78E+05	17,418	12.1	3.25	35.9	5.22	2.29	4.71E+05	9.66E+05
2008	10.8	1,796	4.87E+05	6,909	11.6	3.26	37.6	5.59	2.37	4.66E+05	9.62E+05
2009	1.14	316.3	4.88E+05	9,931	11.5	3.25	38.3	5.55	2.36	4.65E+05	9.64E+05
2010	0.050	27.3	4.88E+05	12,372	11.6	3.25	39.2	5.48	2.33	4.67E+05	9.67E+05
2011	10.1	1,848	4.96E+05	5,721	11.0	3.25	41.7	5.67	2.40	4.62E+05	9.66E+05
2012	0.733	227.7	4.95E+05	9,871	10.9	3.26	41.9	5.32	2.39	4.65E+05	9.70E+05
2013	0.146	55.5	4.92E+05	10,801	10.8	3.25	41.7	5.32	2.37	4.65E+05	9.68E+05
2014	1.19	274.2	4.92E+05	9,592	10.7	3.25	42.0	5.42	2.38	4.64E+05	9.67E+05
2015	0.001	0.775	4.85E+05	15,852	11.2	3.25	40.5	5.11	2.31	4.69E+05	9.70E+05
2016	2.91E-04	0.381	4.85E+05	15,116	11.7	3.26	39.8	5.06	2.28	4.71E+05	9.71E+05
2017	2.02	275.1	4.85E+05	12,344	11.8	3.25	39.6	5.09	2.28	4.68E+05	9.66E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows											Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Medina County GCD	Uvalde County UWCD	Maverick	Webb	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0	4.79E+05	2,818	21.4	42.7	0.338	17.9	22.1	0.983	4.62E+05	9.45E+05	4.60E-07	4.87E-11
1980	0	0	4.67E+05	2,190	19.2	42.8	0	5.12	6.92	1.19	4.93E+05	9.62E+05	-5.27E-07	-5.47E-11
1981	4.96	987.8	4.68E+05	2,212	20.1	42.7	0	4.91	6.87	1.11	4.90E+05	9.61E+05	-6.30E-06	-6.55E-10
1982	0.003	1.81	4.65E+05	2,191	19.7	42.7	0	4.89	7.21	1.21	4.91E+05	9.58E+05	-4.36E-06	-4.55E-10
1983	3.92E-04	0.320	4.65E+05	2,180	19.2	42.7	0	4.84	7.26	1.22	4.91E+05	9.58E+05	-3.86E-06	-4.02E-10
1984	3.05E-05	0.062	4.65E+05	2,166	18.3	42.8	0	4.86	7.05	1.26	4.94E+05	9.61E+05	3.15E-06	3.28E-10
1985	5.58	959.1	4.67E+05	2,188	19.0	42.7	0	4.72	7.04	1.14	4.92E+05	9.61E+05	-3.61E-06	-3.75E-10
1986	1.78	456.1	4.67E+05	2,200	19.5	42.7	0	4.47	5.63	1.16	4.89E+05	9.59E+05	-3.70E-06	-3.86E-10
1987	1.73	432.4	4.68E+05	2,211	20.1	42.7	0	4.25	5.12	1.15	4.86E+05	9.57E+05	-3.82E-06	-3.99E-10
1988	2.83E-05	0.043	4.64E+05	2,165	18.5	42.8	0	4.41	9.05	1.32	4.91E+05	9.57E+05	3.24E-06	3.38E-10
1989	0.163	9.39	4.63E+05	2,143	17.4	42.7	0	4.46	6.67	1.29	4.91E+05	9.56E+05	-2.88E-06	-3.01E-10
1990	3.79	590.2	4.66E+05	2,162	17.6	42.7	0	4.39	8.93	1.21	4.90E+05	9.58E+05	-3.47E-06	-3.62E-10
1991	4.85	1,031	4.67E+05	2,191	18.7	42.7	0	4.37	9.47	1.14	4.91E+05	9.61E+05	-4.77E-06	-4.96E-10
1992	5.64	1,322	4.70E+05	2,231	20.3	42.8	0	4.35	9.73	1.09	4.91E+05	9.66E+05	2.20E-06	2.28E-10
1993	0.052	19.0	4.66E+05	2,201	20.1	42.7	0	4.46	6.52	1.20	4.91E+05	9.59E+05	-4.12E-06	-4.30E-10
1994	1.93	393.7	4.67E+05	2,210	20.4	42.7	0	4.47	5.83	1.13	4.91E+05	9.61E+05	-5.23E-06	-5.45E-10
1995	0.007	4.35	4.65E+05	2,192	19.9	42.7	0	4.59	6.56	1.20	4.93E+05	9.60E+05	-4.02E-06	-4.19E-10
1996	3.07E-04	0.298	4.64E+05	2,162	18.5	42.8	0	4.76	7.07	1.28	4.96E+05	9.62E+05	2.45E-06	2.55E-10
1997	6.63	1,112	4.66E+05	2,189	19.1	42.7	0	4.63	5.72	1.12	4.93E+05	9.63E+05	-3.33E-06	-3.46E-10
1998	3.19	761.3	4.67E+05	2,210	20.0	42.7	0	4.58	6.81	1.11	4.92E+05	9.62E+05	-3.87E-06	-4.03E-10
1999	2.93E-04	0.468	4.64E+05	2,174	19.0	42.7	0	4.69	7.52	1.25	4.93E+05	9.59E+05	-2.99E-06	-3.12E-10
2000	2.16	346.2	4.66E+05	2,187	16.8	42.8	0	4.69	6.01	1.17	4.95E+05	9.65E+05	2.60E-06	2.69E-10
2001	0.014	6.63	4.65E+05	2,175	14.4	42.7	0	4.69	5.77	1.19	4.94E+05	9.61E+05	-3.96E-06	-4.12E-10
2002	10.3	2,058	4.69E+05	2,233	12.7	42.7	0	4.55	5.14	1.05	4.95E+05	9.68E+05	-4.19E-06	-4.33E-10
2003	1.17	349.8	4.67E+05	2,232	12.6	42.7	0	4.60	5.40	1.12	4.94E+05	9.64E+05	-4.04E-06	-4.20E-10
2004	6.81	1,445	4.71E+05	2,277	13.4	42.8	0	4.47	5.12	1.06	4.94E+05	9.68E+05	1.96E-06	2.03E-10
2005	0.023	15.2	4.64E+05	2,224	13.3	42.7	0	4.62	5.69	1.19	4.94E+05	9.61E+05	-3.35E-06	-3.49E-10
2006	0.005	5.52	4.63E+05	2,187	13.1	42.7	0	4.64	5.83	1.21	4.95E+05	9.60E+05	-5.88E-06	-6.13E-10
2007	13.4	2,433	4.69E+05	2,258	13.5	42.7	0	4.33	5.01	1.03	4.92E+05	9.66E+05	-1.02E-05	-1.05E-09
2008	0.006	5.39	4.65E+05	2,211	13.0	42.8	0	4.59	5.76	1.21	4.95E+05	9.62E+05	2.62E-06	2.72E-10
2009	0.372	42.2	4.64E+05	2,197	12.9	42.7	0	4.74	5.71	1.17	4.98E+05	9.64E+05	-2.81E-06	-2.91E-10
2010	2.67	542.7	4.65E+05	2,212	13.1	42.7	0	4.96	5.68	1.12	4.99E+05	9.67E+05	-4.67E-06	-4.83E-10
2011	3.48E-04	0.592	4.61E+05	2,159	13.1	42.7	0	5.36	6.45	1.26	5.03E+05	9.66E+05	-3.99E-06	-4.13E-10
2012	2.10	228.0	4.64E+05	2,167	13.0	42.8	0	5.32	6.40	1.17	5.04E+05	9.70E+05	2.26E-06	2.33E-10
2013	1.77	274.1	4.63E+05	2,169	12.9	42.7	0	5.29	6.41	1.16	5.02E+05	9.68E+05	-3.73E-06	-3.86E-10
2014	0.001	0.369	4.63E+05	2,163	12.9	42.7	0	5.31	6.60	1.18	5.02E+05	9.67E+05	-3.90E-06	-4.03E-10
2015	9.77	1,833	4.67E+05	2,216	12.9	42.7	0	5.08	6.08	1.07	4.99E+05	9.70E+05	-5.50E-06	-5.67E-10
2016	4.46	1,091	4.69E+05	2,253	13.3	42.8	0	4.96	6.07	1.08	4.98E+05	9.71E+05	1.77E-06	1.83E-10
2017	0.973	272.4	4.67E+05	2,244	13.5	42.7	0	4.92	6.25	1.12	4.97E+05	9.66E+05	-3.82E-06	-3.95E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - (Layer 2) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	20,501	6.30E-05	4.25E-04	6.15E-04	426.9	24,332	45,260
1980	0	0	23,520	6.33E-05	4.27E-04	6.17E-04	428.1	24,194	48,142
1981	0	0	22,999	6.31E-05	4.25E-04	6.15E-04	426.9	24,150	47,576
1982	0.015	0.381	22,566	6.31E-05	4.25E-04	6.15E-04	426.9	24,164	47,158
1983	0.002	0.016	22,121	6.31E-05	4.25E-04	6.15E-04	426.9	24,183	46,732
1984	0.014	0.367	21,751	6.32E-05	4.26E-04	6.17E-04	428.1	24,267	46,447
1985	4.95E-06	0.002	20,719	6.30E-05	4.25E-04	6.15E-04	426.9	24,256	45,403
1986	0.001	0.045	20,689	6.30E-05	4.25E-04	6.15E-04	426.9	24,261	45,377
1987	0	0	20,679	6.30E-05	4.25E-04	6.15E-04	426.9	24,264	45,370
1988	0.020	0.418	20,750	6.32E-05	4.26E-04	6.17E-04	428.1	24,326	45,504
1989	0.088	1.34	20,806	6.30E-05	4.25E-04	6.15E-04	426.9	24,246	45,480
1990	0.019	0.338	20,803	6.30E-05	4.25E-04	6.15E-04	426.9	24,236	45,466
1991	0.002	0.037	20,800	6.30E-05	4.25E-04	6.15E-04	426.9	24,236	45,463
1992	0.032	0.494	20,898	6.32E-05	4.26E-04	6.17E-04	428.1	24,299	45,626
1993	0.016	0.344	20,818	6.30E-05	4.25E-04	6.15E-04	426.9	24,233	45,478
1994	0.380	5.86	21,412	6.31E-05	4.25E-04	6.15E-04	426.9	24,178	46,023
1995	0.010	0.198	21,342	6.31E-05	4.25E-04	6.15E-04	426.9	24,183	45,952
1996	0.208	3.09	21,708	6.33E-05	4.27E-04	6.17E-04	428.1	24,222	46,362
1997	9.09E-06	0.003	21,296	6.31E-05	4.25E-04	6.15E-04	426.9	24,191	45,914
1998	0.168	2.78	21,557	6.31E-05	4.25E-04	6.15E-04	426.9	24,166	46,152
1999	0.075	1.17	21,664	6.31E-05	4.25E-04	6.15E-04	426.9	24,154	46,246
2000	0.033	0.331	21,284	6.34E-05	4.26E-04	6.16E-04	428.1	24,258	45,970
2001	0.055	0.929	21,308	6.32E-05	4.25E-04	6.14E-04	426.9	24,181	45,917
2002	0.039	0.637	21,357	6.32E-05	4.25E-04	6.14E-04	426.9	24,177	45,962
2003	0.123	2.08	21,544	6.32E-05	4.25E-04	6.14E-04	426.9	24,158	46,131
2004	1.08	18.0	23,262	6.34E-05	4.27E-04	6.15E-04	428.1	24,070	47,779
2005	0.248	3.94	23,545	6.33E-05	4.26E-04	6.13E-04	426.9	23,974	47,951
2006	0.006	0.063	23,402	6.33E-05	4.26E-04	6.14E-04	426.9	23,985	47,814
2007	5.82E-08	4.07E-05	22,683	6.32E-05	4.25E-04	6.14E-04	426.9	24,045	47,155
2008	0.596	9.82	23,662	6.35E-05	4.27E-04	6.15E-04	428.1	24,036	48,137
2009	0.033	0.232	21,816	6.32E-05	4.25E-04	6.13E-04	426.9	24,115	46,359
2010	2.12E-04	0.006	21,672	6.32E-05	4.25E-04	6.14E-04	426.9	24,135	46,234
2011	0.042	0.351	21,688	6.32E-05	4.25E-04	6.13E-04	426.9	24,126	46,241
2012	0.249	4.28	22,153	6.36E-05	4.27E-04	6.16E-04	428.1	24,155	46,741
2013	0.001	0.036	22,025	6.35E-05	4.25E-04	6.15E-04	426.9	24,097	46,549
2014	5.00E-05	0.013	21,730	6.34E-05	4.25E-04	6.15E-04	426.9	24,128	46,285
2015	4.69E-06	0.003	21,238	6.33E-05	4.25E-04	6.15E-04	426.9	24,183	45,848
2016	0.107	1.81	21,463	6.35E-05	4.26E-04	6.16E-04	428.1	24,233	46,126
2017	0.068	1.14	21,507	6.34E-05	4.25E-04	6.15E-04	426.9	24,157	46,093

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	24,665	1.77E-05	6.83E-04	2.32E-04	458.5	20,137	45,260	-4.00E-10	-8.84E-13
1980	0	0	24,528	1.78E-05	6.85E-04	2.33E-04	459.8	23,155	48,142	-2.38E-09	-4.94E-12
1981	0.329	5.12	24,482	1.77E-05	6.83E-04	2.32E-04	458.5	22,630	47,576	-9.75E-10	-2.05E-12
1982	0.319	4.74	24,497	1.77E-05	6.83E-04	2.32E-04	458.5	22,197	47,158	-8.80E-10	-1.87E-12
1983	0.320	4.74	24,516	1.77E-05	6.83E-04	2.32E-04	458.5	21,752	46,732	1.67E-10	3.58E-13
1984	0.321	4.74	24,601	1.78E-05	6.85E-04	2.33E-04	459.8	21,381	46,447	2.53E-09	5.45E-12
1985	0.718	10.5	24,588	1.77E-05	6.83E-04	2.32E-04	458.5	20,345	45,403	-4.66E-10	-1.03E-12
1986	0.030	0.418	24,594	1.77E-05	6.83E-04	2.32E-04	458.5	20,324	45,377	1.55E-09	3.42E-12
1987	0.009	0.149	24,596	1.77E-05	6.83E-04	2.32E-04	458.5	20,315	45,370	2.91E-10	6.41E-13
1988	0.001	0.016	24,659	1.78E-05	6.85E-04	2.33E-04	459.8	20,385	45,504	3.20E-10	7.04E-13
1989	0	0	24,579	1.77E-05	6.83E-04	2.32E-04	458.5	20,443	45,480	2.67E-09	5.87E-12
1990	0.042	0.558	24,568	1.77E-05	6.83E-04	2.32E-04	458.5	20,438	45,466	1.31E-09	2.88E-12
1991	0.009	0.168	24,569	1.77E-05	6.83E-04	2.32E-04	458.5	20,436	45,463	-9.97E-10	-2.19E-12
1992	0.012	0.266	24,632	1.78E-05	6.85E-04	2.33E-04	459.8	20,533	45,626	4.23E-09	9.28E-12
1993	0.022	0.349	24,566	1.77E-05	6.83E-04	2.32E-04	458.5	20,453	45,478	-2.55E-09	-5.62E-12
1994	7.72E-05	0.013	24,511	1.77E-05	6.83E-04	2.32E-04	458.5	21,054	46,023	-1.96E-09	-4.27E-12
1995	0.047	0.718	24,515	1.77E-05	6.83E-04	2.32E-04	458.5	20,977	45,952	-1.29E-09	-2.80E-12
1996	0.011	0.342	24,556	1.78E-05	6.85E-04	2.33E-04	459.8	21,346	46,362	2.66E-09	5.74E-12
1997	0.229	3.61	24,524	1.77E-05	6.83E-04	2.32E-04	458.5	20,928	45,914	3.49E-10	7.61E-13
1998	0.004	0.030	24,498	1.77E-05	6.83E-04	2.32E-04	458.5	21,195	46,152	-1.36E-09	-2.95E-12
1999	2.45E-06	6.93E-04	24,487	1.77E-05	6.83E-04	2.32E-04	458.5	21,301	46,246	3.83E-09	8.28E-12
2000	0.295	4.99	24,591	1.78E-05	6.85E-04	2.33E-04	459.8	20,914	45,970	2.06E-09	4.48E-12
2001	8.67E-04	0.017	24,514	1.77E-05	6.83E-04	2.32E-04	458.5	20,944	45,917	-4.51E-10	-9.82E-13
2002	0.008	0.087	24,510	1.77E-05	6.83E-04	2.32E-04	458.5	20,993	45,962	-5.38E-10	-1.17E-12
2003	0.006	0.062	24,490	1.77E-05	6.83E-04	2.32E-04	458.5	21,182	46,131	-1.61E-09	-3.49E-12
2004	0.002	0.051	24,404	1.77E-05	6.85E-04	2.33E-04	459.8	22,915	47,779	2.55E-09	5.33E-12
2005	4.33E-05	0.018	24,307	1.77E-05	6.83E-04	2.32E-04	458.5	23,185	47,951	-2.98E-10	-6.22E-13
2006	0.106	1.61	24,317	1.77E-05	6.83E-04	2.32E-04	458.5	23,036	47,814	-2.40E-10	-5.02E-13
2007	0.474	7.77	24,377	1.77E-05	6.83E-04	2.32E-04	458.5	22,311	47,155	-1.53E-10	-3.24E-13
2008	9.10E-06	0.008	24,370	1.77E-05	6.85E-04	2.32E-04	459.8	23,307	48,137	4.04E-09	8.39E-12
2009	1.12	19.0	24,447	1.77E-05	6.83E-04	2.33E-04	458.5	21,433	46,359	-1.56E-09	-3.36E-12
2010	0.142	1.90	24,467	1.77E-05	6.83E-04	2.32E-04	458.5	21,306	46,234	-1.99E-09	-4.30E-12
2011	4.52E-04	0.008	24,459	1.77E-05	6.83E-04	2.32E-04	458.5	21,324	46,241	-1.48E-09	-3.21E-12
2012	0.047	0.286	24,489	1.78E-05	6.85E-04	2.33E-04	459.8	21,792	46,741	3.85E-09	8.23E-12
2013	0.053	0.828	24,430	1.77E-05	6.83E-04	2.32E-04	458.5	21,660	46,549	-1.94E-09	-4.17E-12
2014	0.193	3.25	24,460	1.77E-05	6.83E-04	2.32E-04	458.5	21,362	46,285	-1.43E-09	-3.10E-12
2015	0.323	5.41	24,515	1.77E-05	6.83E-04	2.32E-04	458.5	20,869	45,848	-1.81E-09	-3.95E-12
2016	0.006	0.075	24,567	1.78E-05	6.85E-04	2.33E-04	459.8	21,100	46,126	3.66E-09	7.93E-12
2017	4.17E-04	0.039	24,490	1.77E-05	6.83E-04	2.32E-04	458.5	21,144	46,093	-1.01E-09	-2.19E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	8,614	445.1	311.4	1,454	22,163	3,273	36,260
1980	0	0	8,130	435.1	313.2	1,458	25,151	3,264	38,750
1981	0	0	10,421	435.8	312.2	1,455	24,644	3,253	40,522
1982	17.9	980.7	7,041	435.1	312.1	1,454	24,177	3,250	37,669
1983	7.83	520.6	7,218	434.2	311.9	1,454	23,744	3,248	36,938
1984	16.3	1,017	6,131	433.7	312.6	1,457	23,372	3,254	35,994
1985	0.066	3.26	9,826	432.3	311.5	1,454	22,359	3,242	37,628
1986	0.047	0.496	9,279	433.3	311.5	1,455	22,321	3,243	37,043
1987	1.40E-07	0.042	9,389	434.5	311.5	1,456	22,314	3,244	37,150
1988	40.3	2,462	4,343	433.4	312.3	1,458	22,357	3,251	34,656
1989	15.0	892.4	5,771	430.0	311.5	1,453	22,433	3,242	34,548
1990	0.929	18.9	8,581	430.0	311.6	1,454	22,439	3,243	36,479
1991	0.184	5.00	10,239	430.5	311.6	1,455	22,436	3,244	38,121
1992	0.762	0.871	11,554	437.4	312.5	1,461	22,552	3,253	39,572
1993	20.6	1,041	7,390	433.8	311.6	1,456	22,425	3,241	36,319
1994	8.47	0.058	9,321	436.2	312.1	1,457	23,062	3,244	37,841
1995	14.7	845.5	7,211	436.2	312.0	1,457	22,969	3,242	36,486
1996	32.3	1,769	5,120	435.8	313.1	1,458	23,339	3,250	35,717
1997	0.069	3.22	10,043	434.8	312.0	1,455	22,956	3,241	38,444
1998	3.78	0	10,065	436.9	312.2	1,457	23,208	3,243	38,725
1999	29.8	1,668	5,770	435.7	312.3	1,455	23,276	3,241	36,188
2000	18.8	965.1	8,754	450.7	312.8	1,454	23,192	3,246	38,393
2001	20.4	1,245	7,854	454.9	312.0	1,449	23,316	3,236	37,887
2002	41.1	3,123	13,352	589.5	312.0	1,451	24,152	3,237	46,259
2003	14.1	703.2	9,738	528.6	312.2	1,453	23,747	3,237	39,733
2004	27.8	417.5	12,787	536.2	314.4	1,460	25,516	3,255	44,315
2005	51.5	3,206	6,458	550.2	313.7	1,451	25,730	3,244	41,004
2006	32.3	2,560	5,775	551.8	313.6	1,451	25,604	3,241	39,528
2007	0.016	0.732	13,829	530.5	313.1	1,454	24,941	3,240	44,309
2008	50.4	2,359	5,486	511.0	314.7	1,455	25,703	3,251	39,130
2009	10.6	909.6	7,885	521.9	312.4	1,436	23,962	3,229	38,266
2010	1.29	193.5	9,823	525.9	312.3	1,445	23,871	3,227	39,398
2011	45.6	3,786	4,542	566.0	312.2	1,437	23,941	3,222	37,853
2012	12.2	728.8	7,837	574.5	313.4	1,451	24,491	3,232	38,640
2013	1.86	276.9	8,575	566.8	312.5	1,449	24,331	3,223	38,737
2014	6.68	612.2	7,615	565.7	312.2	1,449	24,011	3,222	37,794
2015	0.071	3.54	12,585	536.8	311.9	1,451	23,511	3,223	41,622
2016	2.48	0.400	12,001	530.7	312.9	1,458	23,666	3,235	41,206
2017	6.08	249.3	9,800	531.5	312.1	1,455	23,665	3,227	39,246

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	4,565	413.1	508.1	759.5	28,160	1,855	36,260	2.74E-09	7.54E-12
1980	0	0	3,143	4,178	396.2	509.2	753.9	27,887	1,884	38,750	-1.53E-09	-3.94E-12
1981	27.8	1,246	2,641	5,039	411.5	507.9	753.5	27,996	1,900	40,522	-1.36E-07	-3.35E-10
1982	6.21	5.27	2,194	4,069	396.9	507.9	753.1	27,857	1,880	37,669	5.97E-10	1.58E-12
1983	6.15	1.55	1,725	3,855	393.2	507.9	752.3	27,825	1,872	36,938	3.20E-10	8.67E-13
1984	6.11	0.166	1,279	3,391	383.8	509.4	752.3	27,810	1,862	35,994	1.04E-08	2.89E-11
1985	36.0	1,366	229.1	4,479	400.4	508.0	750.2	27,978	1,882	37,628	2.40E-10	6.38E-13
1986	8.92	559.1	219.9	4,670	405.7	508.0	751.1	28,032	1,887	37,043	8.66E-10	2.34E-12
1987	7.86	464.4	209.9	4,823	411.4	508.0	751.7	28,081	1,892	37,150	3.19E-09	8.60E-12
1988	0.026	0.194	227.8	3,088	383.6	509.4	751.9	27,842	1,854	34,656	1.03E-09	2.98E-12
1989	0.183	8.27	354.1	3,025	375.7	508.0	747.2	27,690	1,839	34,548	1.12E-09	3.24E-12
1990	15.1	943.0	358.9	3,852	384.3	508.0	747.5	27,810	1,859	36,479	2.76E-08	7.57E-11
1991	24.1	1,491	356.5	4,722	401.0	508.0	748.9	27,986	1,884	38,121	-5.89E-10	-1.55E-12
1992	29.5	1,681	405.2	5,605	417.1	509.4	752.8	28,254	1,917	39,572	4.07E-10	1.03E-12
1993	0.887	18.9	378.0	4,372	404.9	508.0	751.6	27,991	1,894	36,319	-1.74E-08	-4.80E-11
1994	8.66	438.5	1,051	4,766	412.2	507.9	750.2	28,002	1,905	37,841	-5.91E-09	-1.56E-11
1995	1.32	8.19	957.8	4,083	398.9	507.9	750.0	27,889	1,890	36,486	1.65E-09	4.53E-12
1996	0.241	1.73	1,301	3,157	382.0	509.3	751.4	27,745	1,870	35,717	1.26E-07	3.52E-10
1997	30.7	1,557	889.6	4,491	399.8	507.9	749.8	27,924	1,895	38,444	6.76E-08	1.76E-10
1998	15.4	954.6	1,199	4,980	410.3	507.9	749.5	28,001	1,908	38,725	-5.50E-09	-1.42E-11
1999	0.017	0.899	1,312	3,594	387.4	507.9	749.8	27,758	1,878	36,188	3.42E-10	9.45E-13
2000	13.0	434.9	2,819	3,890	336.5	509.4	756.4	27,745	1,888	38,393	8.53E-08	2.22E-10
2001	0.023	0.035	3,226	3,639	303.3	508.0	754.2	27,586	1,870	37,887	-3.64E-11	-9.60E-14
2002	37.0	2,284	7,324	5,333	288.2	507.9	754.2	27,844	1,886	46,259	1.23E-09	2.66E-12
2003	4.60	277.6	3,562	4,703	282.0	507.9	755.0	27,771	1,871	39,733	-3.64E-11	-9.16E-14
2004	24.5	1,374	5,954	5,653	285.3	509.0	750.2	27,869	1,896	44,315	-3.27E-10	-7.39E-13
2005	0.450	22.4	6,362	3,747	276.3	507.6	750.2	27,497	1,842	41,004	-2.91E-11	-7.10E-14
2006	2.24	8.62	5,838	2,990	269.1	507.6	747.3	27,359	1,807	39,528	-2.40E-10	-6.07E-13
2007	59.4	3,269	4,521	5,292	278.7	507.7	748.6	27,773	1,860	44,309	1.18E-09	2.66E-12
2008	0.722	45.7	4,970	3,278	275.0	509.0	749.9	27,478	1,824	39,130	2.52E-09	6.45E-12
2009	26.3	58.2	3,842	3,439	269.7	507.9	760.2	27,545	1,819	38,266	1.23E-07	3.23E-10
2010	11.5	660.9	3,635	4,066	271.3	507.9	756.5	27,653	1,836	39,398	-1.26E-08	-3.21E-11
2011	0.012	0.555	4,558	2,569	266.0	507.9	758.6	27,405	1,787	37,853	3.64E-11	9.61E-14
2012	2.77	241.5	4,500	3,085	266.9	509.2	752.6	27,490	1,792	38,640	3.38E-08	8.74E-11
2013	6.11	384.7	4,151	3,412	266.4	507.8	750.0	27,469	1,789	38,737	-1.53E-10	-3.94E-13
2014	4.25	1.37	3,791	3,226	265.4	507.9	751.2	27,470	1,778	37,794	1.05E-09	2.77E-12
2015	48.6	3,064	2,618	4,746	272.6	508.0	754.0	27,790	1,821	41,622	-4.32E-08	-1.04E-10
2016	24.0	1,766	2,911	5,159	281.7	509.3	756.3	27,953	1,846	41,206	4.46E-09	1.08E-11
2017	3.27	228.0	3,202	4,617	283.3	507.9	754.7	27,815	1,835	39,246	8.96E-09	2.28E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	1,169	4.21	2.56	11.2	1,886	3,248	6,322
1980	0	0	1,104	4.10	2.51	11.2	1,917	3,239	6,278
1981	0	0	1,415	4.11	2.50	11.2	1,933	3,229	6,595
1982	1.40	41.3	956.0	4.09	2.50	11.2	1,913	3,226	6,155
1983	0.616	18.4	980.0	4.09	2.50	11.2	1,905	3,223	6,146
1984	1.32	45.0	832.4	4.09	2.50	11.2	1,894	3,230	6,020
1985	0	0	1,334	4.08	2.49	11.2	1,916	3,218	6,486
1986	0.012	1.44	1,260	4.09	2.49	11.2	1,921	3,219	6,419
1987	0	0	1,275	4.09	2.49	11.2	1,926	3,220	6,438
1988	3.42	124.1	589.7	4.09	2.50	11.2	1,886	3,226	5,847
1989	1.21	38.8	783.5	4.07	2.49	11.2	1,872	3,217	5,931
1990	0.042	1.49	1,165	4.07	2.50	11.2	1,893	3,219	6,296
1991	0.019	0	1,390	4.07	2.49	11.2	1,918	3,219	6,545
1992	0.041	0	1,569	4.11	2.50	11.2	1,951	3,229	6,766
1993	1.83	46.0	1,003	4.07	2.49	11.2	1,928	3,216	6,213
1994	0.359	0.268	1,265	4.10	2.50	11.2	1,938	3,219	6,442
1995	1.29	35.4	979.0	4.09	2.50	11.2	1,923	3,217	6,174
1996	2.61	88.0	695.1	4.09	2.51	11.2	1,903	3,225	5,932
1997	0.004	0.027	1,363	4.09	2.50	11.2	1,930	3,217	6,527
1998	0.136	0	1,366	4.10	2.50	11.2	1,942	3,218	6,545
1999	2.52	78.4	783.4	4.08	2.50	11.2	1,911	3,216	6,009
2000	1.13	3.02	1,189	4.08	2.50	11.2	1,923	3,221	6,355
2001	1.42	12.8	1,066	4.07	2.49	11.1	1,905	3,212	6,214
2002	2.58	3.96	1,813	4.62	2.49	11.2	1,923	3,213	6,974
2003	1.25	22.8	1,322	4.46	2.49	11.2	1,908	3,212	6,484
2004	1.20	1.35	1,736	4.59	2.53	11.2	1,933	3,230	6,920
2005	4.35	98.9	876.8	4.73	2.52	11.2	1,879	3,219	6,096
2006	2.90	80.1	784.0	4.84	2.52	11.2	1,843	3,216	5,944
2007	0.019	1.42	1,878	4.75	2.51	11.2	1,897	3,216	7,010
2008	3.95	127.2	744.8	4.68	2.53	11.2	1,861	3,226	5,981
2009	1.28	19.8	1,071	4.73	2.50	11.1	1,856	3,205	6,171
2010	0.314	3.89	1,334	4.76	2.49	11.1	1,874	3,203	6,433
2011	4.58	134.2	616.7	5.04	2.49	11.1	1,824	3,197	5,796
2012	0.989	13.8	1,064	5.21	2.50	11.2	1,830	3,208	6,135
2013	0.311	6.86	1,164	5.23	2.49	11.1	1,827	3,199	6,216
2014	0.576	16.8	1,034	5.28	2.48	11.1	1,815	3,198	6,083
2015	0.019	1.48	1,709	5.12	2.48	11.2	1,860	3,199	6,787
2016	0.074	1.78	1,629	5.06	2.49	11.2	1,884	3,210	6,744
2017	0.492	14.2	1,331	5.04	2.48	11.2	1,873	3,202	6,438

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	479.0	2.99	6.45	5.43	3,279	2,549	6,322	1.21E-09	1.91E-11
1980	0	0	425.8	2.95	6.41	5.43	3,270	2,568	6,278	-4.27E-10	-6.79E-12
1981	1.96	49.8	624.2	3.03	6.39	5.42	3,259	2,645	6,595	-6.72E-08	-1.02E-09
1982	0.259	0.074	346.5	2.93	6.39	5.41	3,256	2,537	6,155	6.37E-11	1.03E-12
1983	0.272	0.076	346.7	2.91	6.40	5.41	3,254	2,530	6,146	7.00E-11	1.14E-12
1984	0.270	0	262.5	2.85	6.42	5.42	3,260	2,483	6,020	1.04E-08	1.73E-10
1985	2.49	61.0	551.7	2.96	6.41	5.41	3,248	2,609	6,486	9.73E-11	1.50E-12
1986	0.854	21.7	530.4	2.98	6.41	5.41	3,249	2,602	6,419	3.02E-10	4.70E-12
1987	0.702	18.9	542.0	3.01	6.41	5.41	3,250	2,611	6,438	1.45E-09	2.26E-11
1988	0.016	0	151.5	2.83	6.43	5.42	3,257	2,424	5,847	7.28E-11	1.24E-12
1989	0.058	7.29	223.5	2.79	6.41	5.39	3,248	2,437	5,931	4.21E-10	7.10E-12
1990	1.37	54.9	431.6	2.87	6.41	5.40	3,249	2,545	6,296	1.48E-08	2.36E-10
1991	1.85	65.5	593.8	2.97	6.41	5.40	3,250	2,620	6,545	-3.77E-10	-5.77E-12
1992	2.13	67.9	728.9	3.06	6.43	5.43	3,259	2,693	6,766	2.73E-11	4.03E-13
1993	0.032	1.20	380.5	2.96	6.41	5.41	3,247	2,569	6,213	-9.91E-09	-1.60E-10
1994	0.551	21.2	526.2	3.01	6.41	5.40	3,250	2,629	6,442	-3.17E-09	-4.92E-11
1995	0.021	0.112	354.9	2.93	6.41	5.40	3,247	2,556	6,174	9.34E-10	1.51E-11
1996	0.002	0	192.4	2.83	6.42	5.41	3,256	2,468	5,932	6.81E-08	1.15E-09
1997	2.41	79.1	553.9	2.96	6.41	5.41	3,247	2,631	6,527	3.51E-08	5.38E-10
1998	1.21	35.3	596.7	3.02	6.40	5.40	3,249	2,648	6,545	-3.00E-09	-4.58E-11
1999	0	0	248.0	2.87	6.40	5.40	3,247	2,500	6,009	6.82E-11	1.14E-12
2000	0.614	31.7	457.0	2.45	6.42	5.44	3,252	2,599	6,355	4.38E-08	6.90E-10
2001	8.51E-04	0.130	400.8	2.21	6.40	5.42	3,242	2,557	6,214	-4.55E-12	-7.32E-14
2002	2.88	113.8	866.0	1.76	6.40	5.43	3,243	2,734	6,974	4.63E-10	6.64E-12
2003	0.376	9.24	585.6	1.79	6.40	5.43	3,243	2,632	6,484	-5.82E-11	-8.98E-13
2004	2.07	68.8	841.8	1.82	6.40	5.42	3,261	2,732	6,920	-1.37E-10	-1.98E-12
2005	0.011	0.610	307.3	1.78	6.38	5.41	3,250	2,524	6,096	-1.08E-10	-1.78E-12
2006	0.040	0	234.2	1.75	6.38	5.41	3,246	2,450	5,944	-4.18E-11	-7.04E-13
2007	4.90	152.6	882.2	1.81	6.38	5.42	3,246	2,711	7,010	4.89E-10	6.98E-12
2008	0.012	0.087	238.3	1.83	6.39	5.42	3,257	2,471	5,981	1.34E-09	2.24E-11
2009	0.927	16.6	384.4	1.79	6.39	5.47	3,235	2,520	6,171	6.51E-08	1.05E-09
2010	0.741	34.3	557.9	1.79	6.39	5.46	3,233	2,593	6,433	-6.96E-09	-1.08E-10
2011	0	0	160.7	1.73	6.38	5.46	3,228	2,394	5,796	-1.63E-10	-2.81E-12
2012	0.368	29.5	364.5	1.73	6.40	5.45	3,238	2,489	6,135	1.64E-08	2.68E-10
2013	0.607	25.1	443.0	1.73	6.38	5.43	3,229	2,505	6,216	-2.53E-10	-4.07E-12
2014	0.166	0.574	375.6	1.73	6.38	5.43	3,228	2,466	6,083	3.18E-10	5.23E-12
2015	3.99	108.6	793.9	1.78	6.38	5.45	3,229	2,639	6,787	-2.18E-08	-3.21E-10
2016	2.10	54.0	777.1	1.83	6.40	5.46	3,241	2,657	6,744	2.15E-09	3.19E-11
2017	0.294	8.53	586.9	1.85	6.38	5.44	3,233	2,596	6,438	6.87E-09	1.07E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	15,817	29,383	0	97,761	4.42E+05	997.2	5.86E+05
1980	0	0	14,928	28,106	4.42	97,799	4.46E+05	0.306	5.87E+05
1981	0	0	19,137	28,090	4.24	97,678	4.44E+05	0.303	5.89E+05
1982	106.2	1,381	12,930	28,039	3.78	97,516	4.45E+05	0.308	5.85E+05
1983	30.4	454.9	13,254	28,036	3.21	97,468	4.45E+05	0.311	5.85E+05
1984	69.9	920.1	11,259	28,044	2.58	97,646	4.47E+05	0.313	5.85E+05
1985	0	0	18,043	28,057	1.83	97,577	4.45E+05	0.306	5.88E+05
1986	0.022	0.933	17,038	28,103	1.31	97,611	4.44E+05	0.314	5.87E+05
1987	0	0	17,242	28,158	1.05	97,632	4.44E+05	0.331	5.87E+05
1988	221.7	2,842	7,975	28,108	0.813	97,586	4.48E+05	0.347	5.84E+05
1989	38.1	456.2	10,596	27,976	0.740	97,300	4.47E+05	0.344	5.83E+05
1990	0.588	0	15,757	28,032	0.776	97,468	4.45E+05	0.340	5.87E+05
1991	3.07	0	18,801	27,957	0.861	97,640	4.44E+05	0.318	5.89E+05
1992	2.74	0	21,216	27,975	0.973	98,059	4.45E+05	0.299	5.92E+05
1993	169.6	1,760	13,570	27,728	1.02	97,592	4.45E+05	0.294	5.86E+05
1994	13.8	9.76	17,116	27,629	1.21	97,649	4.45E+05	0.287	5.87E+05
1995	107.6	1,111	13,242	27,513	1.34	97,537	4.46E+05	0.282	5.85E+05
1996	152.2	1,778	9,401	27,481	1.58	97,628	4.48E+05	0.279	5.85E+05
1997	1.40	0	18,442	27,564	1.77	97,605	4.45E+05	0.269	5.89E+05
1998	2.88	0	18,482	27,558	2.00	97,696	4.44E+05	0.263	5.88E+05
1999	185.1	2,142	10,595	27,417	2.17	97,455	4.46E+05	0.267	5.84E+05
2000	64.0	697.6	16,075	27,390	2.35	97,832	4.47E+05	0.271	5.89E+05
2001	74.6	950.8	14,422	27,249	2.60	97,546	4.47E+05	0.274	5.87E+05
2002	78.6	1,180	24,519	27,243	2.94	97,897	4.46E+05	0.282	5.97E+05
2003	65.6	753.7	17,883	27,189	3.46	97,794	4.46E+05	0.271	5.89E+05
2004	11.6	0.214	23,481	27,371	5.50	98,222	4.46E+05	0.263	5.95E+05
2005	256.9	3,173	11,859	27,222	7.45	97,618	4.47E+05	0.271	5.87E+05
2006	125.2	1,664	10,604	27,216	8.97	97,448	4.48E+05	0.278	5.85E+05
2007	0.001	0	25,394	27,410	8.05	97,889	4.45E+05	0.266	5.95E+05
2008	255.3	2,961	10,073	27,280	9.11	97,787	4.48E+05	0.267	5.87E+05
2009	85.0	427.1	14,479	26,902	8.20	97,549	4.47E+05	0.255	5.87E+05
2010	31.2	28.7	18,037	26,688	8.84	97,691	4.47E+05	0.236	5.89E+05
2011	312.2	3,347	8,341	26,372	9.51	97,410	4.49E+05	0.227	5.85E+05
2012	21.1	114.0	14,391	26,577	12.1	97,777	4.50E+05	0.216	5.89E+05
2013	7.43	12.3	15,746	26,646	12.6	97,582	4.48E+05	0.208	5.88E+05
2014	15.2	307.4	13,984	26,735	12.0	97,536	4.48E+05	0.204	5.87E+05
2015	0	0	23,111	26,979	11.7	97,825	4.46E+05	0.197	5.94E+05
2016	0.009	0.494	22,038	27,192	11.5	98,155	4.46E+05	0.196	5.94E+05
2017	53.7	742.8	17,997	27,145	10.1	97,771	4.46E+05	0.201	5.89E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Webb	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	1,253	47,277	40,896	41,023	4.56E+05	127.3	5.86E+05	1.02E-05	1.74E-09
1980	0	0	1.24	1,244	46,936	41,087	40,858	4.54E+05	2,538	5.87E+05	-3.97E-06	-6.76E-10
1981	113.3	1,396	1.23	1,251	46,939	40,993	40,803	4.55E+05	2,506	5.89E+05	-5.74E-04	-9.75E-08
1982	5.07	0	1.27	1,239	46,814	40,970	40,746	4.53E+05	2,478	5.85E+05	7.88E-07	1.35E-10
1983	7.15	0.004	1.28	1,237	46,756	40,963	40,728	4.53E+05	2,455	5.85E+05	1.43E-06	2.44E-10
1984	6.90	0	1.33	1,235	46,795	41,061	40,804	4.53E+05	2,483	5.85E+05	1.69E-04	2.89E-08
1985	159.5	1,780	1.29	1,246	46,782	40,977	40,771	4.54E+05	2,516	5.88E+05	9.17E-07	1.56E-10
1986	51.3	454.7	1.19	1,247	46,861	40,985	40,794	4.54E+05	2,407	5.87E+05	3.58E-06	6.10E-10
1987	41.1	356.8	1.22	1,248	46,929	40,988	40,807	4.54E+05	2,267	5.87E+05	1.49E-05	2.54E-09
1988	2.20	0	1.04	1,231	46,813	41,055	40,801	4.52E+05	2,238	5.84E+05	6.22E-07	1.07E-10
1989	1.80	35.9	1.31	1,228	46,651	40,938	40,672	4.51E+05	2,258	5.83E+05	3.95E-06	6.77E-10
1990	113.7	1,391	1.32	1,240	46,785	40,965	40,736	4.53E+05	2,249	5.87E+05	1.82E-04	3.10E-08
1991	93.3	1,499	1.61	1,249	46,938	40,988	40,792	4.55E+05	2,385	5.89E+05	-3.45E-06	-5.86E-10
1992	84.9	1,446	1.66	1,261	47,196	41,118	40,952	4.57E+05	2,469	5.92E+05	8.64E-07	1.46E-10
1993	0	0	1.68	1,241	46,925	40,974	40,753	4.53E+05	2,501	5.86E+05	-1.51E-04	-2.57E-08
1994	19.9	440.8	1.57	1,246	46,943	40,977	40,758	4.54E+05	2,553	5.87E+05	-3.93E-05	-6.70E-09
1995	0	0	1.70	1,238	46,843	40,960	40,707	4.53E+05	2,606	5.85E+05	9.68E-06	1.65E-09
1996	0	0	1.73	1,230	46,803	41,046	40,743	4.52E+05	2,658	5.85E+05	8.58E-04	1.47E-07
1997	176.6	2,140	1.84	1,245	46,853	40,972	40,725	4.54E+05	2,647	5.89E+05	4.45E-04	7.55E-08
1998	59.3	880.4	1.84	1,249	46,985	40,989	40,759	4.55E+05	2,643	5.88E+05	-2.10E-05	-3.57E-09
1999	0	0	1.81	1,232	46,830	40,950	40,664	4.52E+05	2,622	5.84E+05	6.50E-07	1.11E-10
2000	31.5	597.6	2,015	1,243	46,872	41,065	40,791	4.54E+05	2,698	5.89E+05	5.79E-04	9.82E-08
2001	0	0	2,319	1,238	46,650	40,945	40,663	4.52E+05	2,703	5.87E+05	2.98E-08	5.08E-12
2002	147.2	2,018	6,354	1,260	46,498	40,986	40,772	4.56E+05	2,780	5.97E+05	4.29E-06	7.18E-10
2003	35.1	309.0	2,383	1,250	46,715	40,974	40,736	4.54E+05	2,806	5.89E+05	1.44E-06	2.44E-10
2004	110.3	1,463	2,899	1,265	46,983	41,109	40,903	4.57E+05	2,805	5.95E+05	-5.98E-07	-1.01E-10
2005	0	0	2,973	1,237	46,598	40,951	40,664	4.52E+05	2,769	5.87E+05	8.58E-07	1.46E-10
2006	0	0	2,623	1,228	46,472	40,928	40,597	4.51E+05	2,714	5.85E+05	1.92E-07	3.28E-11
2007	339.7	4,200	2,105	1,260	46,895	40,994	40,767	4.56E+05	2,706	5.95E+05	5.48E-06	9.20E-10
2008	0.159	1.20	1,507	1,235	46,857	41,052	40,742	4.53E+05	2,779	5.87E+05	1.44E-05	2.46E-09
2009	9.74	158.8	2,426	1,235	46,678	40,931	40,606	4.52E+05	3,009	5.87E+05	8.40E-04	1.43E-07
2010	41.8	894.3	2,345	1,243	46,775	40,944	40,628	4.53E+05	3,242	5.89E+05	-8.39E-05	-1.42E-08
2011	0	0	3,273	1,222	46,425	40,902	40,494	4.49E+05	3,427	5.85E+05	-1.92E-06	-3.28E-10
2012	60.1	730.1	2,795	1,234	46,601	41,030	40,633	4.52E+05	3,504	5.89E+05	1.43E-04	2.43E-08
2013	71.4	720.5	2,551	1,236	46,551	40,938	40,558	4.52E+05	3,515	5.88E+05	-2.88E-06	-4.89E-10
2014	9.69	10.9	2,585	1,233	46,504	40,940	40,553	4.51E+05	3,528	5.87E+05	3.18E-06	5.42E-10
2015	274.0	3,222	1,853	1,254	46,817	40,988	40,679	4.55E+05	3,486	5.94E+05	-1.97E-04	-3.31E-08
2016	103.3	1,148	1,925	1,260	47,043	41,114	40,833	4.57E+05	3,446	5.94E+05	2.09E-05	3.52E-09
2017	9.02	66.7	2,098	1,248	46,832	40,989	40,688	4.54E+05	3,398	5.89E+05	1.30E-04	2.20E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Maverick	Webb	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	1,379	1.17	0.002	0.024	1.04	181.9	993.8	2,557
1980	0	0	1,301	3.97	0.018	0.032	2.17	2,616	0	3,924
1981	0	0	1,668	4.01	0.018	0.032	2.16	2,592	0	4,266
1982	5.07	45.7	1,127	3.93	0.018	0.032	2.16	2,552	0	3,736
1983	0.125	7.38	1,155	3.95	0.018	0.032	2.16	2,529	0	3,698
1984	6.31	24.6	981.4	3.85	0.017	0.032	2.17	2,552	0	3,571
1985	7.57	0.099	1,573	4.15	0.017	0.032	2.15	2,601	0	4,187
1986	0.015	2.00	1,485	3.95	0.016	0.032	2.15	2,489	0	3,982
1987	0	0	1,503	3.72	0.015	0.032	2.14	2,350	0	3,858
1988	4.22	90.4	695.2	3.49	0.014	0.031	2.14	2,300	0	3,096
1989	8.93	11.2	923.6	3.39	0.013	0.031	2.13	2,325	0	3,274
1990	0.217	0.387	1,373	3.37	0.012	0.032	2.13	2,329	0	3,709
1991	33.5	0.391	1,639	3.45	0.011	0.032	2.15	2,471	0	4,149
1992	26.5	0.455	1,849	3.60	0.009	0.032	2.18	2,558	0	4,440
1993	40.2	53.4	1,183	3.42	0.007	0.032	2.18	2,577	0	3,859
1994	28.2	1.31	1,492	3.35	0.004	0.032	2.21	2,635	0	4,162
1995	36.0	33.9	1,154	3.23	0.001	0.032	2.23	2,680	0	3,910
1996	35.2	51.5	819.5	3.01	4.85E-04	0.032	2.29	2,723	0	3,635
1997	20.0	2.36	1,607	2.94	6.93E-04	0.032	2.32	2,732	0	4,367
1998	21.9	1.91	1,611	2.83	9.95E-04	0.032	2.39	2,728	0	4,368
1999	29.2	70.0	923.5	2.52	0.002	0.031	2.48	2,692	0	3,719
2000	42.7	3.20	1,401	2.37	0.005	0.032	2.61	2,779	0	4,231
2001	34.0	12.4	1,257	2.15	0.008	0.032	2.73	2,780	0	4,088
2002	49.7	2.87	2,137	2.29	0.014	0.032	2.87	2,874	0	5,069
2003	57.8	36.0	1,559	2.22	0.019	0.032	3.00	2,889	0	4,547
2004	35.5	2.27	2,047	2.26	0.024	0.032	3.11	2,895	0	4,985
2005	66.7	85.3	1,034	2.03	0.028	0.032	3.19	2,843	0	4,034
2006	35.4	38.3	924.3	1.72	0.032	0.031	3.20	2,785	0	3,788
2007	29.0	1.66	2,213	1.79	0.034	0.032	3.26	2,798	0	5,048
2008	84.5	108.2	878.0	1.67	0.041	0.032	3.36	2,850	0	3,926
2009	98.4	8.04	1,262	1.76	0.057	0.032	3.53	3,086	0	4,460
2010	107.5	7.08	1,572	1.84	0.079	0.032	3.77	3,325	0	5,017
2011	114.0	99.7	727.0	1.71	0.105	0.031	4.04	3,493	0	4,440
2012	74.3	13.7	1,254	1.55	0.123	0.032	4.20	3,582	0	4,931
2013	61.3	10.9	1,373	1.43	0.134	0.032	4.28	3,596	0	5,046
2014	54.3	24.2	1,219	1.39	0.139	0.032	4.31	3,605	0	4,908
2015	43.7	7.38	2,014	1.40	0.138	0.032	4.29	3,579	0	5,650
2016	37.8	7.33	1,921	1.46	0.134	0.032	4.26	3,536	0	5,508
2017	46.4	30.0	1,569	1.52	0.128	0.032	4.20	3,482	0	5,133

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Maverick	Webb	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	1,220	6.92	2.92	0.001	0.621	998.1	328.5	2,557	2.96E-08	1.16E-09
1980	0	0	1,066	6.24	1.41	0.006	0.464	0.362	2,850	3,924	-1.28E-08	-3.27E-10
1981	13.7	40.5	1,374	6.21	1.40	0.006	0.466	0.371	2,829	4,266	-1.51E-08	-3.53E-10
1982	5.71	0.741	947.8	6.19	1.38	0.005	0.469	0.368	2,773	3,736	5.01E-09	1.34E-10
1983	6.71	0.760	934.3	6.12	1.37	0.005	0.478	0.368	2,748	3,698	5.41E-09	1.46E-10
1984	1.19	0.453	784.7	6.18	1.37	0.005	0.478	0.366	2,776	3,571	5.87E-09	1.64E-10
1985	4.73	57.4	1,271	6.05	1.36	0.006	0.487	0.362	2,846	4,187	3.52E-09	8.39E-11
1986	31.1	8.13	1,239	6.04	1.36	0.006	0.499	0.371	2,695	3,982	5.93E-09	1.49E-10
1987	41.7	9.51	1,255	6.00	1.36	0.006	0.512	0.391	2,544	3,858	1.67E-09	4.32E-11
1988	12.1	2.42	578.9	6.06	1.37	0.005	0.524	0.400	2,494	3,096	5.82E-09	1.88E-10
1989	6.33	13.5	709.2	6.12	1.38	0.005	0.523	0.395	2,537	3,274	1.80E-08	5.50E-10
1990	8.03	50.0	1,094	6.12	1.41	0.005	0.527	0.395	2,548	3,709	5.41E-09	1.46E-10
1991	4.80	42.8	1,350	6.41	1.42	0.006	0.508	0.378	2,742	4,149	-7.59E-09	-1.83E-10
1992	13.5	36.0	1,542	6.78	1.44	0.006	0.476	0.434	2,839	4,440	1.94E-10	4.36E-12
1993	0.066	3.81	1,017	7.14	1.45	0.005	0.434	0.378	2,829	3,859	7.68E-09	1.99E-10
1994	0.758	24.6	1,227	7.51	1.46	0.006	0.388	0.353	2,899	4,162	1.49E-08	3.57E-10
1995	0.025	2.89	957.5	7.68	1.47	0.005	0.345	0.339	2,940	3,910	-4.64E-09	-1.19E-10
1996	0.015	2.35	652.6	7.75	1.49	0.005	0.322	0.329	2,970	3,635	1.93E-08	5.30E-10
1997	6.75	76.4	1,287	7.55	1.50	0.006	0.318	0.321	2,987	4,367	1.39E-08	3.18E-10
1998	6.56	19.8	1,344	7.75	1.52	0.006	0.320	0.317	2,987	4,368	1.56E-08	3.56E-10
1999	3.46	3.09	774.0	7.94	1.52	0.005	0.338	0.317	2,929	3,719	5.90E-09	1.59E-10
2000	0.395	38.1	1,128	8.29	1.52	0.006	0.371	0.322	3,054	4,231	5.12E-08	1.21E-09
2001	0.156	3.36	1,033	8.46	1.50	0.005	0.413	0.324	3,041	4,088	2.05E-09	5.00E-11
2002	31.0	92.7	1,739	8.69	1.48	0.006	0.458	0.488	3,195	5,069	3.41E-09	6.72E-11
2003	0.249	8.67	1,348	8.82	1.46	0.006	0.500	0.444	3,179	4,547	5.81E-09	1.28E-10
2004	25.4	51.7	1,698	8.87	1.45	0.006	0.531	0.538	3,199	4,985	-7.00E-09	-1.40E-10
2005	3.34	4.86	917.7	8.87	1.42	0.005	0.551	0.410	3,097	4,034	-3.02E-09	-7.49E-11
2006	11.5	4.25	744.3	8.80	1.39	0.005	0.568	0.360	3,017	3,788	-2.20E-09	-5.81E-11
2007	44.3	128.0	1,777	8.75	1.35	0.006	0.567	0.521	3,087	5,048	2.05E-08	4.05E-10
2008	0.045	4.45	793.8	8.89	1.31	0.005	0.578	0.395	3,117	3,926	1.61E-08	4.10E-10
2009	0.175	21.5	1,015	9.26	1.27	0.005	0.620	0.332	3,412	4,460	2.60E-08	5.83E-10
2010	2.45	35.9	1,291	10.3	1.26	0.006	0.704	0.293	3,675	5,017	8.32E-09	1.66E-10
2011	0.016	2.57	602.6	11.1	1.28	0.005	0.806	0.271	3,821	4,440	7.84E-09	1.77E-10
2012	1.11	38.9	983.4	11.0	1.29	0.006	0.851	0.259	3,894	4,931	2.40E-08	4.87E-10
2013	4.33	18.4	1,114	10.6	1.27	0.006	0.855	0.250	3,896	5,046	6.17E-09	1.22E-10
2014	3.20	1.44	995.9	10.1	1.24	0.006	0.839	0.246	3,895	4,908	4.73E-08	9.63E-10
2015	39.1	81.0	1,636	9.53	1.19	0.006	0.815	0.352	3,882	5,650	-7.64E-09	-1.35E-10
2016	25.6	17.3	1,617	9.03	1.14	0.006	0.780	0.441	3,837	5,508	3.35E-10	6.08E-12
2017	10.6	4.77	1,344	8.61	1.07	0.006	0.740	0.391	3,763	5,133	-3.55E-09	-6.92E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows										Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Uvalde County UWCD	Maverick	Webb	Upper Layers	Lower Layers	
	(acre-feet)										
Predevelopment	0	0	8,696	6,221	9.41	17.3	151.0	766.4	6,945	8,211	31,017
1980	0	0	8,208	8,657	93.7	81.6	177.9	3,366	23,964	39,116	83,664
1981	0.004	0.189	10,522	8,469	79.3	80.5	176.0	3,112	23,865	37,491	83,795
1982	11.0	862.5	7,109	8,484	72.7	80.1	173.1	3,031	23,351	37,861	81,035
1983	13.7	465.1	7,287	9,351	6.30	80.9	171.9	2,105	23,358	37,635	80,475
1984	2,170	3,058	6,190	8,133	106.0	82.8	177.2	3,618	23,500	40,996	88,030
1985	1,283	2,020	9,920	10,571	4.11	83.9	175.3	1,723	24,041	40,910	90,731
1986	0.014	1.87	9,368	9,021	2.09	79.4	210.9	1,955	22,735	32,874	76,247
1987	0.039	2.31	9,480	8,621	1.38	75.2	225.8	1,805	21,778	31,085	73,073
1988	1,252	3,506	4,385	7,330	1.98	76.7	142.9	2,653	21,729	35,678	76,754
1989	3,026	4,064	5,826	6,837	8.69	80.3	177.2	3,665	22,263	39,075	85,021
1990	207.5	309.6	8,663	7,668	11.8	81.3	147.1	3,243	22,648	35,787	78,766
1991	11,807	9,312	10,337	4,670	393.5	82.6	150.7	7,938	23,953	55,894	1.25E+05
1992	7,779	4,503	11,665	4,894	1,119	82.4	153.8	9,126	24,306	52,824	1.16E+05
1993	7,584	4,057	7,461	4,199	1,654	82.3	197.1	10,084	23,566	52,086	1.11E+05
1994	7,778	3,139	9,410	3,676	2,076	83.9	217.7	10,779	23,986	53,215	1.14E+05
1995	7,387	5,345	7,280	4,007	2,343	85.5	195.4	10,471	24,050	53,333	1.14E+05
1996	6,350	6,837	5,169	4,970	2,615	88.2	186.6	9,956	24,251	52,763	1.13E+05
1997	540.0	706.4	10,139	7,714	1,958	89.2	225.8	6,395	24,614	45,107	97,488
1998	6,091	261.1	10,161	5,090	2,808	88.1	182.8	10,207	24,449	50,907	1.10E+05
1999	5,381	2,181	5,825	4,578	3,324	88.0	175.0	10,871	23,906	49,592	1.06E+05
2000	11,492	4,571	8,838	3,687	4,531	91.3	203.0	14,088	24,733	58,609	1.31E+05
2001	5,385	1,019	7,929	4,454	4,715	91.7	217.9	12,217	24,395	51,157	1.12E+05
2002	10,567	3,941	13,481	4,035	5,582	93.3	228.2	14,329	25,299	58,937	1.36E+05
2003	5,858	1,602	9,832	4,770	5,738	92.5	230.5	12,950	24,726	53,705	1.20E+05
2004	2,906	97.4	12,910	5,964	5,555	92.6	237.2	10,891	24,838	49,116	1.13E+05
2005	2,604	2,361	6,520	6,316	5,498	91.6	226.6	10,232	23,975	48,199	1.06E+05
2006	267.1	1,698	5,830	7,676	5,073	92.5	220.4	8,012	23,701	42,843	95,413
2007	988.0	0	13,962	7,471	5,112	92.2	233.2	8,344	24,357	45,336	1.06E+05
2008	10,197	8,369	5,538	5,268	6,239	91.6	225.5	12,923	24,037	58,476	1.31E+05
2009	24,349	20,212	7,961	4,230	8,578	96.4	225.1	21,044	25,831	81,270	1.94E+05
2010	22,068	20,632	9,917	4,449	9,919	100.9	224.4	23,205	27,108	81,941	2.00E+05
2011	20,003	24,038	4,586	4,755	10,848	103.4	219.5	23,768	27,492	82,119	1.98E+05
2012	3,300	9,738	7,912	8,186	9,346	104.3	237.6	14,081	27,903	60,933	1.42E+05
2013	1,800	5,100	8,657	9,127	8,670	103.1	237.8	11,903	27,817	57,923	1.31E+05
2014	985.8	4,147	7,689	10,526	7,984	101.9	237.0	9,799	27,736	56,545	1.26E+05
2015	469.2	966.7	12,706	12,026	6,972	100.2	237.2	6,840	27,699	51,359	1.19E+05
2016	229.0	484.7	12,117	12,242	6,618	97.2	237.5	6,638	27,206	50,899	1.17E+05
2017	89.2	434.3	9,895	12,033	6,417	94.9	236.3	6,907	26,678	50,929	1.14E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows											Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Uvalde County UWCD	Maverick	Webb	Upper Layers	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0	0	1,991	5,889	4,144	28.3	102.1	2,130	9,699	7,034	31,017	0.008	2.68E-05
1980	0	0	51,596	34.8	6,133	313.5	14.6	226.8	326.5	4,581	20,438	83,664	-3.65E-03	-4.36E-06
1981	1,866	4,596	44,729	51.5	6,223	331.1	14.1	247.3	329.4	4,626	20,781	83,795	0.003	3.90E-06
1982	939.4	1,518	46,915	34.2	6,139	385.7	13.9	256.5	328.1	4,579	19,928	81,035	8.25E-04	1.02E-06
1983	2,083	1,326	45,568	29.5	4,486	668.1	13.9	259.8	324.5	4,570	21,146	80,475	0.007	8.79E-06
1984	44.7	167.9	55,024	19.9	7,474	482.1	13.8	219.6	324.8	4,553	19,707	88,030	0.012	1.36E-05
1985	2,097	1,367	54,704	39.8	3,358	848.0	13.6	253.1	318.4	4,598	23,134	90,731	0.003	3.82E-06
1986	6,671	10,487	27,357	44.9	5,031	993.2	13.4	126.8	318.4	4,626	20,578	76,247	0.007	8.63E-06
1987	6,717	12,204	22,830	48.8	5,039	1,121	13.0	98.0	321.2	4,660	20,021	73,073	0.003	3.49E-06
1988	796.7	2,391	42,505	15.8	7,137	1,066	13.1	435.3	331.7	4,585	17,478	76,754	0.002	2.42E-06
1989	436.4	1,346	50,397	12.5	8,556	794.1	13.1	201.7	342.1	4,560	18,362	85,021	0.021	2.49E-05
1990	1,126	2,929	42,565	27.3	7,069	815.5	12.9	441.8	356.2	4,606	18,818	78,766	0.002	3.05E-06
1991	66.2	2,070	77,778	45.7	18,728	54.1	12.5	457.5	465.0	4,642	20,219	1.25E+05	0.001	1.13E-06
1992	75.2	2,434	68,324	66.7	19,264	4.14	12.3	476.3	541.4	4,702	20,552	1.16E+05	7.89E-05	6.78E-08
1993	90.4	462.8	63,410	42.0	22,446	0	12.5	183.5	608.9	4,619	19,094	1.11E+05	0.017	1.54E-05
1994	25.9	820.1	62,888	49.3	25,529	0	12.6	135.0	669.1	4,636	19,597	1.14E+05	0.019	1.66E-05
1995	3.26	71.7	64,965	36.6	24,426	0	12.9	177.3	695.5	4,591	19,518	1.14E+05	-8.34E-03	-7.29E-06
1996	1.34	27.2	66,867	18.2	21,545	0	13.5	198.6	699.8	4,543	19,272	1.13E+05	0.015	1.30E-05
1997	1,523	2,883	54,957	43.0	12,304	0	13.5	121.6	623.9	4,602	20,416	97,488	0.002	2.44E-06
1998	754.5	3,035	57,512	54.7	23,657	0	13.4	216.2	717.4	4,629	19,657	1.10E+05	0.020	1.82E-05
1999	695.6	1,695	54,101	28.8	25,099	0	13.7	252.4	772.4	4,558	18,706	1.06E+05	0.002	1.87E-06
2000	25.0	781.1	69,618	39.8	34,391	0	13.7	135.7	894.3	4,599	20,347	1.31E+05	0.043	3.30E-05
2001	461.4	940.4	57,163	37.9	27,776	0	13.8	113.6	904.1	4,578	19,591	1.12E+05	-3.11E-04	-2.78E-07
2002	62.3	3,466	70,543	85.2	34,755	0	13.4	101.1	999.0	4,700	21,768	1.36E+05	0.004	2.83E-06
2003	169.2	862.2	61,772	72.8	29,990	0	13.3	102.9	1,011	4,664	20,847	1.20E+05	5.25E-04	4.39E-07
2004	1,123	5,164	54,275	104.1	24,966	0	13.1	100.4	995.8	4,759	21,105	1.13E+05	0.006	5.10E-06
2005	634.4	1,701	54,111	48.0	24,191	0	13.4	107.6	985.5	4,630	19,602	1.06E+05	-1.87E-04	-1.76E-07
2006	2,360	4,200	44,887	31.0	19,098	0	13.9	109.8	944.6	4,587	19,182	95,413	3.98E-04	4.17E-07
2007	1,020	8,046	50,354	93.0	20,836	0	13.4	99.7	951.0	4,753	19,731	1.06E+05	0.003	2.48E-06
2008	2.96	63.4	73,008	39.5	33,272	0	13.6	106.8	1,070	4,624	19,164	1.31E+05	6.53E-04	4.97E-07
2009	0.047	7.02	1.08E+05	43.3	56,404	0	13.7	107.9	1,314	4,598	23,775	1.94E+05	0.006	3.04E-06
2010	5.87	487.2	1.06E+05	61.4	59,130	0	13.8	110.7	1,455	4,612	27,849	2.00E+05	0.006	3.16E-06
2011	0	0	1.05E+05	25.8	59,174	0	14.6	121.9	1,541	4,497	27,909	1.98E+05	0.012	5.92E-06
2012	1,918	1,945	78,584	35.8	28,405	0	14.9	125.1	1,322	4,527	24,864	1.42E+05	0.021	1.50E-05
2013	1,014	2,359	72,186	44.5	26,715	0	15.1	125.7	1,231	4,526	23,123	1.31E+05	8.11E-04	6.17E-07
2014	1,716	987.1	71,089	41.1	22,557	0	15.3	128.3	1,144	4,506	23,566	1.26E+05	0.055	4.41E-05
2015	6,919	10,162	52,767	83.6	17,171	0.502	15.2	123.3	1,047	4,612	26,475	1.19E+05	3.40E-04	2.85E-07
2016	4,939	8,494	54,975	98.1	17,573	1.86	15.0	121.3	996.3	4,656	24,898	1.17E+05	2.41E-04	2.06E-07
2017	3,131	4,603	58,524	81.9	18,381	2.30	14.8	121.7	967.1	4,621	23,266	1.14E+05	3.35E-04	2.95E-07

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows											Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Medina County GCD	Uvalde County UWCD	Maverick	Webb	Upper Layers	Lower Layers	
	(acre-feet)											
Predevelopment	0	0	1,974	93.7	0	0	417.4	321.5	29.8	7,253	5,919	16,008
1980	0	0	1,863	281.7	6.74	22.9	1,241	2,919	222.2	21,483	29,467	57,506
1981	0	0	2,388	273.0	3.71	21.9	1,261	2,908	220.9	21,864	28,387	57,327
1982	13.5	317.6	1,614	273.4	1.75	22.3	1,281	2,838	219.2	20,919	28,690	56,189
1983	15.9	235.6	1,654	285.4	0.285	22.7	1,299	2,812	214.6	22,148	28,689	57,377
1984	1,229	754.3	1,405	287.6	0.450	23.2	1,347	2,849	216.1	20,695	30,746	59,552
1985	752.0	65.9	2,252	325.3	0.245	23.6	1,371	2,933	211.4	24,226	30,737	62,896
1986	0	0	2,126	266.2	0.222	21.3	1,311	2,827	208.6	21,610	25,723	54,094
1987	0	0	2,152	237.3	0.194	19.1	1,264	2,646	204.4	21,011	24,134	51,668
1988	694.4	1,104	995.3	242.2	0.218	20.8	1,297	2,434	201.9	18,342	27,187	52,519
1989	1,691	826.4	1,322	253.2	0.294	22.5	1,333	2,610	201.4	19,303	29,334	56,897
1990	118.8	40.4	1,966	255.0	0.269	22.3	1,330	2,533	200.3	19,834	27,352	53,652
1991	6,628	207.6	2,346	261.2	22.6	22.5	1,376	2,806	214.5	21,266	37,459	72,609
1992	4,494	83.7	2,648	270.2	90.7	21.9	1,392	2,933	229.7	21,613	35,660	69,436
1993	4,418	417.6	1,693	258.2	171.2	22.7	1,396	3,039	243.3	20,047	35,269	66,976
1994	4,517	145.6	2,136	256.5	240.5	23.0	1,414	3,120	257.4	20,597	35,804	68,511
1995	4,322	549.2	1,652	267.6	292.7	24.4	1,433	3,110	268.2	20,473	35,967	68,360
1996	3,753	1,209	1,173	288.2	338.6	26.5	1,459	3,098	276.5	20,201	35,818	67,640
1997	418.6	40.2	2,301	313.6	309.3	26.1	1,454	3,181	272.7	21,478	31,810	61,604
1998	3,447	1.33	2,306	296.2	366.9	25.3	1,446	3,129	283.0	20,691	34,730	66,722
1999	3,158	663.4	1,322	293.6	433.8	26.5	1,445	3,008	291.2	19,630	34,117	64,389
2000	6,560	147.9	2,006	327.9	554.0	27.4	1,477	3,143	308.8	21,353	38,931	74,836
2001	3,178	95.1	1,800	335.5	615.4	28.0	1,471	3,135	315.5	20,571	34,909	66,454
2002	6,053	37.5	3,060	370.6	708.6	27.1	1,493	3,311	330.2	22,866	38,970	77,226
2003	3,460	91.4	2,232	381.1	759.7	27.6	1,496	3,302	337.8	21,844	36,161	70,092
2004	1,756	0	2,930	387.3	771.2	26.7	1,493	3,329	340.3	22,154	33,694	66,882
2005	1,564	676.2	1,480	390.9	773.4	28.0	1,487	3,185	339.0	20,493	33,219	63,636
2006	242.6	594.2	1,323	391.7	745.7	29.1	1,476	3,048	332.0	20,057	30,410	58,650
2007	597.3	0	3,169	408.7	744.6	26.7	1,456	3,131	329.9	20,777	31,077	61,718
2008	5,784	1,110	1,257	438.0	832.6	28.4	1,486	3,138	342.0	20,018	38,067	72,500
2009	13,937	1,112	1,807	517.3	1,044	30.8	1,561	3,379	374.4	24,719	49,873	98,354
2010	12,905	1,254	2,251	557.7	1,222	32.8	1,634	3,609	406.9	28,868	50,851	1.04E+05
2011	11,864	2,942	1,041	588.0	1,368	36.5	1,680	3,660	435.1	28,843	51,134	1.04E+05
2012	2,285	856.9	1,796	594.8	1,332	37.3	1,684	3,744	432.8	25,921	40,221	78,904
2013	1,278	460.8	1,965	603.3	1,276	36.2	1,674	3,756	427.1	24,193	38,895	74,564
2014	756.0	610.1	1,745	614.7	1,208	35.5	1,672	3,746	419.0	24,610	38,326	73,744
2015	368.4	76.4	2,884	605.7	1,107	32.8	1,644	3,782	405.7	27,615	35,734	74,255
2016	205.8	20.5	2,750	605.5	1,044	30.5	1,627	3,765	396.8	25,991	35,262	71,699
2017	111.5	42.0	2,246	600.3	998.4	29.7	1,612	3,684	388.0	24,285	35,110	69,106

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows												Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Medina County GCD	Uvalde County UWCD	Maverick	Webb	Upper Layers	Lower Layers			
	(acre-feet)														%
Predevelopment	0	0	0	733.0	434.6	614.8	12.1	112.2	474.6	634.1	8,469	4,523	16,008	9.13E-04	5.70E-06
1980	0	0	9,444	26.6	294.6	60.3	0	68.3	164.4	484.5	39,151	7,812	57,506	-4.54E-04	-7.89E-07
1981	1,122	1,031	8,300	34.0	293.6	51.1	0	64.3	173.5	483.6	37,526	8,248	57,327	3.26E-04	5.69E-07
1982	584.2	88.0	8,770	26.7	288.2	50.7	0	62.5	175.5	485.2	37,894	7,764	56,189	1.64E-04	2.92E-07
1983	1,214	85.7	9,010	24.2	263.0	73.6	0	61.9	174.6	484.1	37,666	8,319	57,377	7.64E-04	1.33E-06
1984	45.4	1.78	10,182	19.7	286.8	58.5	0	62.1	165.7	483.9	41,032	7,214	59,552	0.002	2.71E-06
1985	1,171	556.7	10,481	28.7	228.5	85.7	0	59.3	173.2	480.7	40,947	8,684	62,896	4.56E-04	7.25E-07
1986	3,887	1,278	5,436	32.0	286.5	109.3	0	59.7	161.8	482.1	32,894	9,467	54,094	7.31E-04	1.35E-06
1987	4,040	1,411	4,550	34.7	313.2	123.3	0	56.6	167.7	483.9	31,103	9,384	51,668	2.71E-04	5.25E-07
1988	532.5	115.1	8,154	19.0	326.1	125.1	0	53.9	211.6	486.1	35,707	6,789	52,519	2.90E-04	5.53E-07
1989	286.5	68.1	9,459	17.6	337.1	109.6	0	54.9	175.4	482.3	39,113	6,793	56,897	0.002	4.04E-06
1990	707.9	539.0	8,055	24.9	328.6	104.5	0	53.1	218.0	481.4	35,824	7,316	53,652	3.19E-04	5.95E-07
1991	122.7	899.3	7,271	32.9	363.4	33.5	0	48.5	186.5	487.0	55,967	7,197	72,609	-1.04E-04	-1.43E-07
1992	120.3	1,177	6,392	40.0	399.3	1.81	0	46.6	196.7	496.3	52,899	7,668	69,436	2.05E-05	2.96E-08
1993	67.6	187.8	5,926	30.3	461.1	0.231	0	48.9	144.3	502.1	52,154	7,454	66,976	0.002	2.77E-06
1994	41.7	489.1	5,817	32.4	522.9	0	0	48.8	139.3	505.3	53,291	7,623	68,511	0.002	2.84E-06
1995	5.96	84.6	6,018	26.2	546.5	0	0	50.9	147.7	507.9	53,411	7,561	68,360	-8.65E-04	-1.27E-06
1996	0.015	0.365	6,030	17.1	542.7	0	0	54.8	146.8	509.0	52,839	7,500	67,640	0.001	2.16E-06
1997	887.3	861.5	5,067	27.6	474.5	0.119	0	53.3	140.3	505.3	45,174	8,413	61,604	3.03E-04	4.91E-07
1998	481.9	817.5	4,975	32.8	584.6	0	0	52.2	162.3	509.3	50,980	8,126	66,722	0.002	3.20E-06
1999	411.9	41.0	5,039	21.0	638.8	0	0	54.8	166.0	513.4	49,663	7,841	64,389	2.28E-04	3.54E-07
2000	25.2	289.0	6,512	25.8	748.9	0	0	54.3	153.4	518.1	58,700	7,809	74,836	0.005	6.24E-06
2001	241.2	124.1	5,337	24.8	738.2	0	0	55.1	153.1	520.9	51,239	8,021	66,454	1.94E-05	2.92E-08
2002	97.4	1,570	6,603	43.2	803.1	0	0	50.9	157.2	527.1	59,039	8,335	77,226	4.34E-04	5.62E-07
2003	114.2	426.0	5,777	39.8	790.4	0	0	51.6	163.4	535.2	53,800	8,395	70,092	5.98E-05	8.53E-08
2004	710.8	1,451	5,058	51.5	766.4	0	0	49.3	169.5	543.6	49,205	8,877	66,882	3.69E-04	5.51E-07
2005	383.0	59.1	5,044	32.5	762.9	0	0	52.3	173.8	548.0	48,279	8,300	63,636	-2.47E-05	-3.89E-08
2006	1,358	81.1	4,174	22.5	734.9	0	0	56.4	173.6	550.2	42,910	8,589	58,650	-1.27E-05	-2.16E-08
2007	733.4	2,266	3,118	49.7	725.9	0	0	48.7	169.1	554.0	45,414	8,638	61,718	5.44E-04	8.81E-07
2008	5.11	22.0	4,547	28.3	795.6	0	0	51.4	170.0	562.7	58,571	7,748	72,500	6.72E-05	9.26E-08
2009	0.590	25.7	6,770	28.2	930.8	0	0	51.7	165.7	566.3	81,411	8,405	98,354	7.31E-04	7.44E-07
2010	9.04	262.5	10,091	34.3	1,027	0	0	54.5	175.3	571.4	82,088	9,278	1.04E+05	8.09E-04	7.81E-07
2011	0	0	10,089	16.1	1,074	0	0	63.8	177.0	574.9	82,226	9,370	1.04E+05	0.001	1.28E-06
2012	994.4	90.6	5,012	19.4	806.0	0	0	64.1	164.1	568.7	61,047	10,138	78,904	0.002	2.94E-06
2013	550.4	189.0	4,567	22.9	753.8	0	0	65.5	157.6	563.3	58,027	9,668	74,564	1.35E-04	1.81E-07
2014	939.2	42.6	4,613	20.7	699.8	0	0	67.3	154.0	560.7	56,646	10,001	73,744	0.006	8.19E-06
2015	3,929	1,694	3,443	37.3	671.2	0	0	65.6	157.0	559.7	51,441	12,257	74,255	3.17E-05	4.27E-08
2016	2,932	1,375	3,492	45.5	672.2	0	0	62.1	164.4	564.9	50,978	11,414	71,699	2.57E-05	3.58E-08
2017	1,880	523.4	3,719	45.2	669.1	0.961	0	60.4	166.8	567.8	51,009	10,465	69,106	1.53E-04	2.22E-07

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows										Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	McMullen GCD	Medina County GCD	Uvalde County UWCD	Maverick	Webb	Upper Layers	
	(acre-feet)										
Predevelopment	0	0	910.8	41.1	0	0	3,305	2,239	57.4	18,328	24,881
1980	0	0	859.7	240.8	1.36	27.9	5,393	2,657	356.9	33,166	42,703
1981	0	0	1,102	228.4	0.915	26.7	5,604	2,624	354.5	33,155	43,096
1982	13.0	93.9	744.6	225.0	0.598	27.1	5,720	2,634	351.6	32,668	42,478
1983	15.9	49.0	763.3	230.8	0.261	27.6	5,810	2,637	343.5	33,220	43,097
1984	1,392	225.9	648.3	235.8	0.360	28.1	6,036	2,650	346.0	32,499	44,062
1985	853.9	34.4	1,039	267.1	0.233	28.7	6,204	2,630	337.9	33,993	45,388
1986	0.008	0.464	981.1	203.5	0.215	25.8	5,992	2,590	332.3	33,476	43,601
1987	0.037	0.978	992.9	168.2	0.194	23.1	5,805	2,554	324.7	32,277	42,146
1988	885.4	400.9	459.3	180.8	0.208	25.1	5,866	2,635	320.7	30,277	41,050
1989	2,023	332.4	610.2	198.8	0.258	27.2	5,994	2,613	320.6	30,871	42,991
1990	126.4	10.8	907.4	194.9	0.244	27.0	6,024	2,628	319.4	31,257	41,496
1991	7,526	358.3	1,083	230.4	6.19	27.4	6,342	2,701	344.9	32,123	50,741
1992	4,859	103.1	1,222	222.0	19.3	26.8	6,490	2,718	373.6	32,903	48,936
1993	4,677	129.9	781.4	199.5	33.2	27.7	6,448	2,690	399.7	32,765	48,152
1994	4,878	41.5	985.6	191.5	45.2	27.9	6,511	2,672	426.4	33,066	48,844
1995	4,671	171.1	762.5	190.7	53.2	29.5	6,544	2,688	447.1	33,315	48,873
1996	4,047	291.2	541.4	192.6	59.0	31.9	6,588	2,719	463.1	33,703	48,636
1997	474.9	0	1,062	192.3	50.0	31.5	6,589	2,674	457.2	34,288	45,820
1998	3,674	0	1,064	177.2	61.4	30.5	6,566	2,670	474.2	33,725	48,443
1999	3,372	143.7	610.1	161.8	72.1	31.8	6,494	2,693	489.8	33,423	47,491
2000	7,177	82.2	925.7	174.5	93.5	33.0	6,635	2,683	521.9	33,647	51,973
2001	3,400	7.69	830.5	161.3	101.0	33.7	6,601	2,679	536.0	33,718	48,068
2002	6,601	34.9	1,412	177.3	116.9	32.8	6,771	2,654	562.6	34,112	52,474
2003	3,693	57.9	1,030	170.4	123.1	33.2	6,771	2,658	577.8	34,219	49,334
2004	1,881	0	1,352	163.2	121.7	32.2	6,789	2,649	582.9	34,412	47,984
2005	1,673	174.1	682.9	156.9	120.2	33.6	6,671	2,665	580.9	33,807	46,565
2006	275.4	116.8	610.7	146.2	112.7	34.7	6,538	2,680	569.0	33,826	44,909
2007	642.6	0	1,462	153.4	111.0	32.0	6,564	2,642	564.1	33,298	45,470
2008	6,421	496.8	580.1	171.2	128.5	34.0	6,639	2,684	584.8	33,247	50,986
2009	15,402	563.0	833.8	224.4	170.4	37.0	6,986	2,693	642.7	35,295	62,848
2010	14,109	433.6	1,039	248.3	203.3	39.7	7,329	2,699	703.4	37,311	64,115
2011	12,855	703.4	480.3	256.3	228.0	43.9	7,510	2,738	756.6	38,529	64,101
2012	2,326	35.8	828.7	238.8	210.3	44.8	7,521	2,768	755.4	39,415	54,143
2013	1,288	5.28	906.8	233.2	195.6	43.4	7,466	2,771	743.6	38,643	52,295
2014	736.4	33.5	805.3	238.9	180.4	42.5	7,442	2,786	727.1	38,901	51,893
2015	361.7	0	1,331	226.5	160.0	39.4	7,347	2,764	700.9	40,380	53,310
2016	200.7	0.062	1,269	224.2	147.9	36.7	7,281	2,759	681.6	39,033	51,634
2017	106.4	16.8	1,036	224.9	140.2	35.7	7,198	2,756	663.7	37,797	49,976

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-13.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Wintergarden GCD - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows											Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Evergreen UWCD	McMullen GCD	Medina County GCD	Uvalde County UWCD	Maverick	Webb	Upper Layers			
	(acre-feet)													%
Predevelopment	0	0	0	328.5	329.2	89.3	14.3	187.2	2,081	1,185	20,666	24,881	8.87E-06	3.56E-08
1980	0	0	1,236	102.1	306.8	8.89	0	111.7	2,081	950.4	37,906	42,703	-2.17E-05	-5.08E-08
1981	1,243	276.9	1,087	139.2	318.2	8.64	0	100.3	2,054	947.9	36,921	43,096	-2.08E-06	-4.82E-09
1982	614.8	7.79	1,140	94.4	317.7	9.04	0	96.1	2,112	946.2	37,141	42,478	1.21E-05	2.85E-08
1983	1,270	7.19	1,144	88.7	289.2	13.6	0	91.2	2,120	943.5	37,130	43,097	5.48E-06	1.27E-08
1984	46.4	0	1,308	72.6	319.8	10.4	0	86.8	2,142	942.2	39,135	44,062	2.52E-05	5.72E-08
1985	1,238	127.5	1,361	117.8	249.5	16.4	0	68.6	2,090	939.3	39,180	45,388	3.00E-05	6.61E-08
1986	4,521	511.5	671.5	124.2	313.7	19.6	0	72.2	2,070	940.0	34,357	43,601	8.79E-06	2.02E-08
1987	4,528	481.7	585.1	128.0	351.3	22.3	0	71.2	2,066	940.9	32,972	42,146	4.97E-07	1.18E-09
1988	527.8	0	1,062	58.3	364.0	21.5	0	67.3	2,209	941.6	35,799	41,050	6.09E-06	1.48E-08
1989	264.2	3.04	1,247	61.5	369.9	17.3	0	61.6	2,192	932.7	37,841	42,991	1.94E-05	4.51E-08
1990	739.3	124.4	1,013	95.6	359.6	16.7	0	59.9	2,215	931.6	35,940	41,496	1.40E-05	3.38E-08
1991	115.2	191.2	834.2	126.8	416.3	3.61	0	48.1	2,063	970.0	45,973	50,741	-4.32E-05	-8.52E-08
1992	93.8	231.4	695.8	163.6	461.0	0.190	0	47.6	2,045	991.1	44,207	48,936	3.03E-06	6.19E-09
1993	70.5	26.7	638.8	108.4	531.6	0.038	0	49.0	2,051	996.8	43,679	48,152	4.93E-05	1.02E-07
1994	29.2	99.8	669.4	129.0	599.2	0	0	48.3	2,027	1,002	44,240	48,844	5.41E-06	1.11E-08
1995	3.87	13.7	696.4	99.4	622.4	0	0	49.4	2,078	1,004	44,306	48,873	3.98E-05	8.14E-08
1996	0.070	1.97	690.3	66.6	618.0	0	0	63.2	2,132	1,005	44,059	48,636	-1.13E-05	-2.32E-08
1997	995.4	278.0	586.4	124.5	538.2	0.006	0	59.0	2,052	1,001	40,185	45,820	1.11E-05	2.42E-08
1998	550.7	225.5	552.2	145.9	670.5	0	0	54.6	2,077	1,006	43,159	48,443	1.03E-05	2.13E-08
1999	463.7	13.3	527.3	83.4	732.6	0	0	67.6	2,160	1,009	42,434	47,491	-8.15E-06	-1.72E-08
2000	15.2	80.2	436.1	112.0	835.7	0	0	59.2	2,091	1,023	47,320	51,973	3.42E-05	6.59E-08
2001	303.3	38.4	357.4	107.9	829.2	0	0	64.2	2,066	1,030	43,271	48,068	6.58E-06	1.37E-08
2002	71.5	305.9	442.2	221.1	888.0	0	0	46.2	1,971	1,047	47,481	52,474	7.62E-06	1.45E-08
2003	119.3	65.4	387.0	180.4	879.2	0	0	48.6	2,003	1,059	44,592	49,334	2.13E-05	4.33E-08
2004	831.0	344.3	338.9	244.5	864.4	0	0	46.5	1,962	1,075	42,277	47,984	-2.64E-05	-5.50E-08
2005	447.7	5.12	338.0	128.8	864.9	0	0	54.6	2,038	1,080	41,608	46,565	6.36E-06	1.37E-08
2006	1,605	102.1	279.9	94.2	841.6	0	0	67.0	2,051	1,084	38,784	44,909	-1.07E-05	-2.38E-08
2007	803.4	545.3	209.2	247.1	837.1	0	0	55.0	1,926	1,096	39,751	45,470	5.56E-05	1.22E-07
2008	4.85	0	304.7	113.2	898.2	0	0	55.8	2,039	1,107	46,464	50,986	-1.36E-06	-2.66E-09
2009	0.091	6.09	453.2	128.1	1,002	0	0	49.4	2,009	1,116	58,084	62,848	2.13E-05	3.39E-08
2010	5.01	56.0	675.8	165.2	1,083	0	0	53.1	1,989	1,127	58,960	64,115	2.66E-05	4.14E-08
2011	0	0	676.0	73.2	1,122	0	0	71.2	2,068	1,132	58,958	64,101	2.92E-05	4.56E-08
2012	1,245	38.6	545.6	104.3	879.6	0	0	86.9	2,013	1,128	48,102	54,143	1.10E-05	2.02E-08
2013	716.7	122.9	493.8	126.7	837.8	0	0	92.8	1,979	1,119	46,805	52,295	1.42E-05	2.72E-08
2014	1,043	31.4	495.6	115.6	788.7	0	0	97.8	1,983	1,115	46,224	51,893	5.00E-05	9.64E-08
2015	4,444	540.6	373.9	215.0	764.4	0	0	88.4	1,908	1,115	43,861	53,310	3.22E-06	6.04E-09
2016	3,277	360.8	377.0	235.7	770.7	0	0	78.0	1,913	1,121	43,501	51,634	9.80E-08	1.90E-10
2017	2,054	114.3	396.9	201.8	770.7	0.058	0	75.1	1,938	1,123	43,302	49,976	3.91E-05	7.83E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Evergreen UWCD	Guadalupe County GCD	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	3.04E+05	3,011	25.3	29.8	2.90E+05	5.98E+05
1980	0	0	3.13E+05	2,842	21.0	29.5	2.84E+05	5.99E+05
1981	0	0	3.10E+05	3,643	21.8	29.5	2.84E+05	5.98E+05
1982	0.161	65.8	3.12E+05	2,461	21.2	29.4	2.83E+05	5.97E+05
1983	0.036	15.3	3.13E+05	2,523	21.1	29.3	2.82E+05	5.98E+05
1984	0.153	62.0	3.15E+05	2,143	20.7	29.2	2.82E+05	5.99E+05
1985	0	0	3.11E+05	3,435	21.8	29.4	2.84E+05	5.98E+05
1986	5.61E-04	0.195	3.11E+05	3,243	22.0	29.5	2.84E+05	5.98E+05
1987	0.002	0.649	3.11E+05	3,282	22.1	29.5	2.84E+05	5.98E+05
1988	0.310	127.1	3.15E+05	1,518	20.7	29.3	2.82E+05	5.99E+05
1989	0.019	7.72	3.14E+05	2,017	20.4	29.1	2.82E+05	5.98E+05
1990	0	0	3.13E+05	3,000	20.9	29.3	2.83E+05	5.98E+05
1991	0.003	1.49	3.11E+05	3,579	21.2	29.4	2.83E+05	5.98E+05
1992	0	0	3.11E+05	4,039	21.7	29.6	2.85E+05	6.00E+05
1993	0.229	90.7	3.12E+05	2,583	20.7	29.5	2.83E+05	5.98E+05
1994	0.035	10.2	3.12E+05	3,258	21.1	29.5	2.83E+05	5.98E+05
1995	0.155	63.8	3.13E+05	2,521	20.5	29.4	2.82E+05	5.98E+05
1996	0.195	82.6	3.16E+05	1,790	19.5	29.3	2.81E+05	5.99E+05
1997	0	0	3.12E+05	3,511	20.7	29.5	2.82E+05	5.98E+05
1998	9.78E-04	1.02	3.12E+05	3,518	20.9	29.5	2.83E+05	5.98E+05
1999	0.263	108.8	3.15E+05	2,017	19.7	29.3	2.81E+05	5.97E+05
2000	0.051	22.3	3.16E+05	3,060	19.6	29.4	2.81E+05	6.00E+05
2001	0.003	1.40	3.14E+05	2,745	19.6	29.3	2.81E+05	5.98E+05
2002	0	0	3.12E+05	4,667	20.6	29.6	2.82E+05	5.99E+05
2003	0.083	33.2	3.13E+05	3,404	20.2	29.6	2.82E+05	5.98E+05
2004	0	0	3.11E+05	4,470	21.3	29.8	2.84E+05	6.00E+05
2005	0.313	129.3	3.14E+05	2,257	19.9	29.4	2.81E+05	5.97E+05
2006	0.046	21.6	3.14E+05	2,019	19.7	29.3	2.81E+05	5.97E+05
2007	0	0	3.08E+05	4,834	22.5	29.8	2.86E+05	5.99E+05
2008	0.490	196.2	3.14E+05	1,917	20.4	29.5	2.82E+05	5.99E+05
2009	0.187	78.9	3.15E+05	2,756	19.4	29.3	2.80E+05	5.98E+05
2010	0.239	103.7	3.18E+05	3,434	18.0	29.3	2.77E+05	5.99E+05
2011	0.343	160.7	3.23E+05	1,588	16.1	29.0	2.74E+05	5.99E+05
2012	0	0	3.14E+05	2,739	18.8	29.3	2.83E+05	5.99E+05
2013	0	0	3.11E+05	2,997	20.0	29.4	2.84E+05	5.98E+05
2014	0.022	9.28	3.11E+05	2,662	20.2	29.4	2.83E+05	5.97E+05
2015	0	0	3.07E+05	4,399	22.0	29.7	2.87E+05	5.98E+05
2016	2.07E-05	0.008	3.07E+05	4,195	22.6	29.8	2.88E+05	6.00E+05
2017	0.110	44.4	3.07E+05	3,426	21.9	29.7	2.87E+05	5.98E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Evergreen UWCD	Guadalupe County GCD	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	2.91E+05	92.8	15.9	15.9	3.07E+05	5.98E+05	4.59E-06	7.68E-10
1980	0	0	2.84E+05	90.5	12.2	16.1	3.15E+05	5.99E+05	1.84E-07	3.07E-11
1981	0.154	60.1	2.85E+05	90.7	12.8	16.0	3.13E+05	5.98E+05	-2.73E-07	-4.56E-11
1982	0	0	2.83E+05	90.1	12.3	16.1	3.14E+05	5.97E+05	-2.59E-07	-4.34E-11
1983	6.51E-04	0.724	2.83E+05	90.1	12.2	16.1	3.15E+05	5.98E+05	-4.85E-07	-8.12E-11
1984	0	0	2.82E+05	89.9	11.8	16.2	3.17E+05	5.99E+05	5.48E-07	9.14E-11
1985	0.276	111.9	2.84E+05	90.5	12.7	16.0	3.14E+05	5.98E+05	-2.25E-07	-3.77E-11
1986	0.038	14.6	2.84E+05	90.5	12.9	16.0	3.14E+05	5.98E+05	-1.46E-07	-2.45E-11
1987	0.026	10.7	2.85E+05	90.5	13.0	16.0	3.13E+05	5.98E+05	-2.26E-07	-3.79E-11
1988	0	0	2.83E+05	89.8	11.7	16.1	3.16E+05	5.99E+05	-2.95E-07	-4.92E-11
1989	0.017	6.59	2.82E+05	89.7	11.5	16.1	3.16E+05	5.98E+05	-2.89E-07	-4.83E-11
1990	0.134	55.7	2.83E+05	90.1	12.0	16.1	3.15E+05	5.98E+05	-6.85E-07	-1.15E-10
1991	0.125	54.7	2.84E+05	90.5	12.3	16.0	3.14E+05	5.98E+05	-2.19E-07	-3.66E-11
1992	0.143	59.1	2.86E+05	91.2	12.7	16.0	3.14E+05	6.00E+05	-5.04E-08	-8.40E-12
1993	0	0	2.83E+05	90.2	11.9	16.0	3.14E+05	5.98E+05	-3.48E-07	-5.82E-11
1994	0.056	24.1	2.84E+05	90.3	12.2	16.0	3.14E+05	5.98E+05	-4.63E-07	-7.75E-11
1995	0	0	2.82E+05	89.9	11.6	16.0	3.15E+05	5.98E+05	-2.54E-07	-4.25E-11
1996	0	0	2.81E+05	89.6	10.7	16.1	3.18E+05	5.99E+05	3.31E-07	5.52E-11
1997	0.268	112.2	2.83E+05	90.2	11.8	16.0	3.15E+05	5.98E+05	-2.39E-07	-4.00E-11
1998	0.087	34.5	2.83E+05	90.3	12.1	16.0	3.14E+05	5.98E+05	-2.78E-07	-4.65E-11
1999	0	0	2.81E+05	89.6	11.0	16.1	3.16E+05	5.97E+05	-4.24E-07	-7.10E-11
2000	0.016	7.20	2.82E+05	89.9	10.8	16.1	3.18E+05	6.00E+05	1.43E-07	2.38E-11
2001	0.031	13.1	2.81E+05	89.7	10.9	16.1	3.17E+05	5.98E+05	-5.52E-07	-9.23E-11
2002	0.215	90.6	2.83E+05	90.4	11.7	15.9	3.16E+05	5.99E+05	-2.72E-07	-4.55E-11
2003	4.76E-04	0.223	2.82E+05	90.0	11.4	16.0	3.16E+05	5.98E+05	-5.11E-07	-8.55E-11
2004	0.240	98.1	2.85E+05	91.0	12.4	15.9	3.15E+05	6.00E+05	-2.65E-07	-4.42E-11
2005	0	0	2.82E+05	89.7	11.1	16.0	3.16E+05	5.97E+05	-2.51E-07	-4.20E-11
2006	0.002	0.763	2.81E+05	89.6	11.0	16.1	3.16E+05	5.97E+05	-2.57E-07	-4.31E-11
2007	0.596	241.9	2.87E+05	91.5	13.4	15.9	3.12E+05	5.99E+05	-4.98E-07	-8.33E-11
2008	0	0	2.83E+05	90.1	11.6	16.1	3.16E+05	5.99E+05	9.08E-08	1.52E-11
2009	1.92E-04	0.079	2.80E+05	89.5	10.7	16.0	3.18E+05	5.98E+05	-2.25E-07	-3.77E-11
2010	1.02E-04	0.039	2.78E+05	89.0	9.46	16.0	3.21E+05	5.99E+05	-2.72E-07	-4.54E-11
2011	0	0	2.75E+05	88.1	7.59	16.2	3.24E+05	5.99E+05	-5.59E-09	-9.33E-13
2012	0.687	302.5	2.83E+05	90.2	10.2	16.1	3.16E+05	5.99E+05	7.56E-08	1.26E-11
2013	0.239	101.8	2.84E+05	90.5	11.3	16.0	3.13E+05	5.98E+05	-3.68E-07	-6.16E-11
2014	0.036	14.9	2.84E+05	90.4	11.5	16.0	3.13E+05	5.97E+05	-3.53E-07	-5.91E-11
2015	0.412	162.0	2.87E+05	91.6	13.1	15.9	3.11E+05	5.98E+05	-5.66E-07	-9.45E-11
2016	0.152	55.1	2.89E+05	92.2	13.7	15.9	3.10E+05	6.00E+05	-4.98E-07	-8.31E-11
2017	0.012	3.43	2.87E+05	91.4	13.1	15.9	3.10E+05	5.98E+05	-2.20E-07	-3.68E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Bexar does not exist in the model in Layer 2.			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
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2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Bexar does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
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1988				
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1990				
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2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Bexar does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
1985				
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2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Queen City Aquifer (Layer 5)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Bexar does not exist in model in the Queen City Aquifer (Layer 5).			
1980				
1981				
1982				
1983				
1984				
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2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Reklaw Formation (Layer 6)

Simulated Time Period	Inflows					Total Inflows	Outflows				Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Lower Layers		Specific Storage	Specific Yield	Evergreen UWCD	Lower Layers			
	(acre-feet)												%
Predevelopment	0	0	102.4	2.75	0	105.2	0	0	2.18	103.0	105.2	-1.81E-10	-1.72E-10
1980	0	0	96.7	2.62	0	99.3	0	0	1.17	98.1	99.3	-2.56E-13	-2.58E-13
1981	0	0	123.9	1.79	0	125.7	0.046	8.68	0.957	116.1	125.7	-7.53E-13	-5.99E-13
1982	0	0	83.7	1.46	0	85.2	0.018	2.84	0.941	81.4	85.2	-5.68E-13	-6.67E-13
1983	0	0	85.8	1.40	0	87.2	0.021	3.14	0.742	83.3	87.2	9.95E-13	1.14E-12
1984	0	0	72.9	1.22	0	74.1	0.009	1.32	0.688	72.1	74.1	2.34E-12	3.16E-12
1985	0	0	116.9	0.775	0	117.6	0.038	5.04	0.502	112.1	117.6	-2.27E-13	-1.93E-13
1986	0	0	110.4	0.395	0	110.7	0.004	0.529	0.710	109.5	110.7	-1.02E-12	-9.24E-13
1987	0	0	111.7	0.391	0	112.1	0.030	3.60	0.456	108.0	112.1	-9.19E-12	-8.20E-12
1988	0.028	3.33	51.7	0.204	0	55.2	0	0	0.697	54.5	55.2	1.74E-12	3.15E-12
1989	0.033	4.36	68.6	0.055	0	73.1	0	0	0.924	72.2	73.1	-1.71E-13	-2.33E-13
1990	0.013	1.87	102.1	0.550	0	104.5	0	0	0.760	103.7	104.5	-1.71E-13	-1.63E-13
1991	0	0	121.8	0.214	0	122.0	0.005	0.702	0.769	120.5	122.0	4.26E-14	3.49E-14
1992	0	0	137.4	0.392	0	137.8	0.022	2.95	0.521	134.3	137.8	4.55E-13	3.30E-13
1993	0.025	3.36	87.9	0.909	0	92.2	0	0	0.654	91.5	92.2	-1.09E-12	-1.19E-12
1994	0	0	110.9	0.368	0	111.2	0.007	0.932	0.658	109.6	111.2	-8.53E-14	-7.67E-14
1995	0.008	1.15	85.8	0.158	0	87.1	0	0	0.801	86.3	87.1	-5.68E-14	-6.53E-14
1996	0.023	3.35	60.9	0.066	0	64.3	0	0	0.861	63.5	64.3	2.83E-12	4.40E-12
1997	0	0	119.4	0.265	0	119.7	0.025	3.69	0.581	115.4	119.7	-2.13E-13	-1.78E-13
1998	6.70E-04	0.095	119.7	0.040	0	119.8	0	0	0.818	119.0	119.8	-5.26E-13	-4.39E-13
1999	0.019	2.74	68.6	0.015	0	71.4	0	0	0.974	70.4	71.4	6.25E-13	8.76E-13
2000	0.025	3.99	104.1	0	0	108.1	0	0	1.04	107.1	108.1	-2.56E-13	-2.37E-13
2001	0	0	93.4	0	0	93.4	0.002	0.409	0.979	92.0	93.4	2.84E-14	3.04E-14
2002	2.23E-04	0.037	158.8	0	0	158.8	0	0	0.969	157.9	158.8	1.42E-13	8.95E-14
2003	2.14E-05	0.004	115.8	0	0	115.8	0	0	0.990	114.8	115.8	-6.39E-12	-5.52E-12
2004	0	0	152.1	0.027	0	152.1	0.024	3.74	0.923	147.4	152.1	-3.69E-13	-2.43E-13
2005	0.013	1.95	76.8	8.63E-04	0	78.8	0	0	1.09	77.7	78.8	-2.19E-12	-2.78E-12
2006	0	0	68.7	0.007	0	68.7	0.006	0.925	1.06	66.7	68.7	-3.41E-13	-4.97E-13
2007	0	0	164.5	0.074	0	164.5	0.064	8.91	0.716	154.9	164.5	6.82E-13	4.15E-13
2008	0.035	4.60	65.2	0.044	0	69.9	0	0	1.06	68.9	69.9	3.41E-13	4.88E-13
2009	0.047	7.06	93.8	0	0	100.9	0	0	1.14	99.7	100.9	-7.96E-13	-7.89E-13
2010	0.063	12.4	116.8	0.263	0	129.5	0	0	1.13	128.4	129.5	-1.05E-12	-8.12E-13
2011	0.035	10.4	54.0	0.695	0	65.2	0	0	0.878	64.3	65.2	2.27E-13	3.49E-13
2012	0	0	93.2	0	3.18	96.4	0.050	13.8	0.954	81.5	96.4	2.09E-12	2.17E-12
2013	0	0	102.0	0	0	102.0	0.040	7.66	1.10	93.2	102.0	8.10E-13	7.94E-13
2014	0	0	90.6	0	0	90.6	0.025	3.96	1.11	85.5	90.6	1.85E-11	2.04E-11
2015	0	0	149.7	0.034	0	149.7	0.055	7.81	0.860	141.0	149.7	-1.17E-12	-7.78E-13
2016	0	0	142.7	0.026	0	142.8	0.038	9.23	0.898	132.6	142.8	5.14E-12	3.60E-12
2017	5.43E-04	0.065	116.6	0.018	0	116.6	0.002	2.08	1.17	113.4	116.6	-9.24E-13	-7.92E-13

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Carrizo-Upper Wilcox (Layer 7)

Simulated Time Period	Inflows						Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Upper Layers	Lower Layers		Specific Storage	Specific Yield	Wells	Evergreen UWCD	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	4,438	171.8	6,983	4,402	15,994	0	0	0	2,983	8,293	4,718	15,994	-4.82E-06	-3.01E-08
1980	0	0	4,189	312.0	7,422	4,523	16,446	0	0	1,986	3,032	7,652	3,775	16,446	-1.30E-09	-7.92E-12
1981	0	0	5,369	246.8	7,394	4,428	17,438	34.0	799.3	1,687	2,948	7,751	4,219	17,438	-5.56E-08	-3.19E-10
1982	4.48	273.4	3,628	208.3	7,349	4,363	15,826	8.92	126.1	1,710	2,893	7,654	3,433	15,826	8.00E-11	5.06E-13
1983	1.86	117.1	3,719	191.5	7,362	4,336	15,727	8.68	125.1	1,781	2,826	7,652	3,335	15,727	-3.47E-09	-2.21E-11
1984	5.46	291.9	3,159	172.4	7,399	4,334	15,362	4.18	57.1	1,851	2,790	7,604	3,056	15,362	1.05E-08	6.82E-11
1985	0	0	5,062	142.4	7,380	4,267	16,851	28.4	833.7	1,610	2,803	7,762	3,813	16,851	-8.53E-09	-5.06E-11
1986	0.068	0.048	4,781	128.7	7,357	4,221	16,487	11.7	367.7	1,647	2,866	7,768	3,826	16,487	3.09E-10	1.88E-12
1987	4.91E-04	0.039	4,838	118.3	7,347	4,194	16,497	16.8	396.7	1,624	2,813	7,787	3,860	16,497	-5.61E-07	-3.40E-09
1988	23.5	914.7	2,238	119.0	7,345	4,250	14,890	0	0	1,707	2,820	7,596	2,767	14,890	-3.97E-10	-2.66E-12
1989	16.3	400.4	2,973	135.6	7,386	4,234	15,146	0.005	0.440	1,690	2,913	7,568	2,974	15,146	-4.22E-10	-2.79E-12
1990	7.23	96.2	4,421	140.3	7,435	4,241	16,341	4.63	250.5	1,949	2,891	7,638	3,608	16,341	2.14E-09	1.31E-11
1991	4.93	237.6	5,275	139.0	7,495	4,190	17,341	7.78	322.3	2,406	2,906	7,616	4,083	17,341	1.97E-08	1.14E-10
1992	0.114	6.23	5,953	130.6	7,511	4,256	17,857	17.5	602.8	2,263	2,886	7,702	4,386	17,857	9.08E-09	5.09E-11
1993	21.0	675.0	3,807	145.2	7,458	4,429	16,536	0	0	2,620	2,799	7,525	3,591	16,536	5.09E-11	3.08E-13
1994	0	0	4,802	131.8	7,470	4,341	16,745	9.63	357.9	2,003	2,859	7,603	3,911	16,745	-1.13E-08	-6.77E-11
1995	11.1	476.5	3,715	133.8	7,478	4,369	16,184	0	0	2,295	2,854	7,490	3,546	16,184	8.89E-09	5.50E-11
1996	23.5	841.2	2,638	142.7	7,533	4,530	15,708	0	0	2,324	2,878	7,365	3,141	15,708	1.01E-07	6.45E-10
1997	0	0	5,174	130.6	7,538	4,384	17,227	18.1	638.9	2,231	2,840	7,547	3,952	17,227	1.65E-08	9.58E-11
1998	0.315	0	5,186	135.7	7,514	4,297	17,133	9.53	384.3	2,150	2,949	7,579	4,062	17,133	2.40E-10	1.40E-12
1999	19.4	765.4	2,973	140.4	7,498	4,420	15,816	0	0	2,211	2,939	7,391	3,274	15,816	3.18E-10	2.01E-12
2000	16.6	426.6	4,510	172.6	7,669	4,395	17,190	5.32E-04	0.002	2,849	3,027	7,363	3,951	17,190	1.66E-07	9.66E-10
2001	3.29	115.5	4,046	160.6	7,583	4,492	16,401	1.70	43.7	2,334	2,975	7,376	3,669	16,401	-7.71E-10	-4.70E-12
2002	1.99	18.4	6,880	177.0	7,698	4,277	19,052	14.3	670.0	2,917	3,065	7,496	4,890	19,052	6.11E-10	3.21E-12
2003	1.56	73.3	5,018	165.2	7,604	4,371	17,232	1.23	18.5	2,548	3,024	7,438	4,203	17,232	-1.93E-07	-1.12E-09
2004	0	0	6,588	152.8	7,599	4,279	18,620	25.4	903.7	2,243	3,039	7,637	4,771	18,620	1.00E-08	5.40E-11
2005	18.0	779.4	3,327	150.5	7,510	4,385	16,170	0.009	0.127	2,223	2,994	7,404	3,549	16,170	-7.82E-11	-4.84E-13
2006	8.00	368.6	2,975	139.7	7,478	4,481	15,450	2.55	40.3	1,831	2,946	7,413	3,217	15,450	8.91E-11	5.77E-13
2007	0	0	7,125	124.0	7,451	4,220	18,920	55.6	1,949	1,388	2,959	7,838	4,731	18,920	1.13E-10	5.96E-13
2008	27.8	1,071	2,826	129.7	7,443	4,281	15,779	0	0	2,010	2,972	7,498	3,298	15,779	1.31E-10	8.30E-13
2009	33.3	985.6	4,062	170.3	7,641	4,312	17,204	0	0	2,968	3,046	7,317	3,874	17,204	1.10E-09	6.39E-12
2010	52.9	1,461	5,061	249.1	7,925	4,489	19,237	0	0	4,364	3,192	7,049	4,632	19,237	-3.72E-08	-1.94E-10
2011	62.3	2,098	2,340	289.7	7,981	5,101	17,872	0	0	4,273	3,165	6,737	3,697	17,872	-3.67E-10	-2.06E-12
2012	0.001	0.107	4,038	170.3	7,595	4,884	16,687	61.6	2,044	522.5	3,168	7,402	3,489	16,687	1.72E-08	1.03E-10
2013	0	0	4,418	136.1	7,476	4,319	16,350	42.1	1,366	609.5	3,209	7,549	3,575	16,350	-3.08E-08	-1.89E-10
2014	0.004	0.332	3,924	115.9	7,439	4,153	15,632	23.2	670.1	705.3	3,200	7,561	3,472	15,632	2.73E-06	1.75E-08
2015	0	0	6,484	104.4	7,415	4,143	18,147	54.1	1,824	489.1	3,209	7,841	4,730	18,147	1.98E-08	1.09E-10
2016	0	0	6,183	95.6	7,363	4,168	17,810	39.7	1,262	356.1	3,252	7,938	4,962	17,810	4.50E-08	2.53E-10
2017	0.920	35.3	5,049	92.0	7,329	4,097	16,604	12.5	350.4	439.6	3,298	7,833	4,671	16,604	3.62E-08	2.18E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Middle Wilcox (Layer 8)

Simulated Time Period	Inflows						Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Upper Layers	Lower Layers		Specific Storage	Specific Yield	Wells	Evergreen UWCD	Upper Layers	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	1,054	1,025	21,959	15,579	39,616	0	0	0	2,779	25,159	11,679	39,616	-3.85E-05	-9.72E-08
1980	0	0	994.9	338.7	22,576	15,796	39,706	0	0	1,485	3,370	24,043	10,808	39,706	-1.08E-08	-2.72E-11
1981	0	0	1,275	358.2	22,826	15,699	40,158	18.3	178.8	1,755	3,196	24,087	10,924	40,158	-2.08E-07	-5.19E-10
1982	2.63	86.2	861.7	369.5	22,146	15,815	39,281	1.65	0	1,841	3,105	23,809	10,525	39,281	6.84E-10	1.74E-12
1983	0.111	7.73	883.3	395.9	22,077	15,895	39,259	3.56	4.12	2,009	3,010	23,750	10,482	39,259	-6.84E-09	-1.74E-11
1984	3.52	89.3	750.3	413.3	21,987	16,067	39,311	0.335	0	2,277	2,955	23,630	10,448	39,311	5.78E-08	1.47E-10
1985	0	0	1,202	463.7	22,428	15,775	39,870	18.2	264.8	2,108	2,935	23,868	10,675	39,870	-5.09E-08	-1.28E-10
1986	0.022	0.017	1,136	489.7	22,406	15,725	39,756	3.74	78.1	2,166	2,965	23,836	10,708	39,756	1.38E-08	3.48E-11
1987	0.013	1.05	1,149	543.7	22,407	15,732	39,833	8.47	86.2	2,292	2,896	23,832	10,718	39,833	-1.96E-06	-4.93E-09
1988	18.0	283.1	531.5	514.8	21,639	16,083	39,070	0	0	2,339	2,901	23,529	10,300	39,070	-1.29E-09	-3.30E-12
1989	9.74	80.9	706.2	470.0	21,839	15,981	39,087	0.046	2.77	2,210	2,992	23,469	10,413	39,087	3.55E-09	9.08E-12
1990	0.539	0	1,050	474.6	22,392	15,862	39,780	3.39	99.8	2,264	3,036	23,638	10,738	39,780	8.03E-09	2.02E-11
1991	9.44	29.0	1,253	514.3	23,028	16,234	41,067	1.32	77.6	3,185	2,992	23,560	11,251	41,067	7.51E-08	1.83E-10
1992	0	0	1,414	566.1	23,253	16,191	41,424	11.7	187.1	2,989	2,975	23,832	11,429	41,424	3.60E-08	8.69E-11
1993	13.6	191.7	904.3	560.4	22,644	16,512	40,825	0	0	3,180	2,928	23,624	11,093	40,825	1.30E-09	3.19E-12
1994	0	0	1,141	542.6	22,804	16,072	40,560	8.69	112.7	2,541	2,982	23,719	11,197	40,560	-1.67E-07	-4.13E-10
1995	12.2	175.8	882.5	527.9	22,663	16,392	40,653	0	0	3,091	2,953	23,496	11,113	40,653	6.94E-08	1.71E-10
1996	16.5	240.9	626.6	483.4	22,541	16,727	40,635	0	0	3,153	2,982	23,442	11,059	40,635	4.09E-07	1.01E-09
1997	0	0	1,229	511.5	23,024	16,336	41,101	16.2	234.4	2,961	2,958	23,643	11,288	41,101	6.09E-08	1.48E-10
1998	0.184	0	1,232	508.6	23,042	16,188	40,970	4.13	89.0	2,885	3,023	23,636	11,333	40,970	1.08E-09	2.65E-12
1999	16.6	259.0	706.1	466.8	22,527	16,546	40,521	0	0	3,070	3,009	23,390	11,052	40,521	-7.28E-10	-1.80E-12
2000	15.8	132.2	1,071	463.8	23,507	16,826	42,017	0.008	1.12	3,970	3,078	23,304	11,663	42,017	5.92E-07	1.41E-09
2001	0.344	15.0	961.1	429.0	23,043	16,671	41,119	3.89	21.4	3,254	3,065	23,437	11,338	41,119	-4.68E-09	-1.14E-11
2002	0.496	0	1,634	473.8	24,218	16,548	42,874	5.42	179.5	4,026	3,125	23,435	12,102	42,874	1.82E-08	4.24E-11
2003	0.787	32.3	1,192	453.8	23,507	16,540	41,726	1.45	0.051	3,523	3,108	23,438	11,656	41,726	-6.70E-07	-1.61E-09
2004	0	0	1,565	477.3	23,810	16,210	42,062	19.5	262.1	3,084	3,117	23,759	11,821	42,062	5.17E-08	1.23E-10
2005	14.4	260.1	790.3	439.4	22,786	16,475	40,766	0	0	3,076	3,076	23,398	11,217	40,766	-9.90E-10	-2.43E-12
2006	1.75	77.3	706.7	405.2	22,398	16,447	40,037	2.02	4.47	2,545	3,047	23,515	10,922	40,037	-1.50E-08	-3.76E-11
2007	0	0	1,692	471.9	23,243	15,650	41,057	42.9	597.2	1,904	3,039	24,099	11,375	41,057	-4.87E-09	-1.19E-11
2008	27.6	397.5	671.3	453.7	22,386	16,245	40,181	0	0	2,772	3,024	23,480	10,906	40,181	7.71E-10	1.92E-12
2009	30.1	302.0	965.0	443.5	23,410	16,777	41,927	0	0	4,127	3,073	23,111	11,615	41,927	4.92E-09	1.17E-11
2010	46.7	491.5	1,202	462.5	24,931	17,697	44,832	0	0	6,130	3,238	22,745	12,719	44,832	-1.35E-07	-3.02E-10
2011	42.2	631.1	555.9	399.0	24,555	18,687	44,871	0	0	6,014	3,325	22,778	12,754	44,871	-1.79E-09	-3.99E-12
2012	0	0	959.1	272.8	22,698	16,445	40,375	77.7	909.4	730.1	3,443	24,079	11,136	40,375	6.88E-08	1.70E-10
2013	0	0	1,049	263.6	22,335	15,593	39,241	28.7	360.5	841.5	3,405	23,783	10,823	39,241	-1.55E-07	-3.96E-10
2014	0.052	3.61	932.0	270.1	22,156	15,392	38,753	11.4	116.4	972.0	3,341	23,633	10,680	38,753	2.73E-05	7.06E-08
2015	0	0	1,540	326.6	22,959	14,999	39,825	35.1	491.1	673.2	3,276	24,178	11,171	39,825	3.11E-08	7.82E-11
2016	0	0	1,469	388.3	23,020	14,991	39,868	21.0	286.6	489.9	3,251	24,417	11,403	39,868	2.84E-06	7.12E-09
2017	1.46	17.8	1,199	417.8	22,744	14,937	39,318	2.19	37.6	605.6	3,245	24,146	11,281	39,318	1.44E-07	3.66E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Evergreen UWCD	Guadalupe County GCD	Medina County GCD	Upper Layers	
	(acre-feet)							
Predevelopment	0	0	5,223	14,820	1,220	1,002	2.94E+05	3.16E+05
1980	0	0	4,930	13,749	1,210	751.9	2.99E+05	3.20E+05
1981	0	0	6,319	13,663	1,207	826.1	2.98E+05	3.20E+05
1982	16.8	383.7	4,270	13,713	1,205	816.5	2.98E+05	3.19E+05
1983	2.19	62.7	4,377	13,903	1,203	810.1	2.99E+05	3.19E+05
1984	19.5	407.1	3,718	14,139	1,202	494.7	3.01E+05	3.21E+05
1985	0	0	5,958	13,991	1,202	887.3	2.98E+05	3.20E+05
1986	0.160	5.58	5,626	13,969	1,206	967.6	2.98E+05	3.20E+05
1987	0.193	4.41	5,694	14,221	1,208	969.8	2.98E+05	3.20E+05
1988	65.4	797.9	2,634	14,163	1,208	922.8	3.00E+05	3.20E+05
1989	25.4	59.6	3,499	13,959	1,198	922.5	2.99E+05	3.19E+05
1990	1.22	3.73	5,203	13,963	1,200	993.1	2.99E+05	3.20E+05
1991	15.6	0.370	6,209	13,925	1,203	998.1	2.99E+05	3.21E+05
1992	0	0	7,006	14,114	1,210	1,021	2.99E+05	3.22E+05
1993	45.9	543.5	4,481	14,197	1,209	998.9	2.99E+05	3.20E+05
1994	0.388	22.7	5,652	14,137	1,214	764.2	2.99E+05	3.21E+05
1995	40.5	394.3	4,373	14,167	1,212	699.0	3.00E+05	3.21E+05
1996	55.6	508.5	3,105	14,137	1,212	677.6	3.02E+05	3.21E+05
1997	0	0	6,090	14,119	1,209	783.6	2.99E+05	3.22E+05
1998	1.18	25.9	6,103	13,869	1,212	818.7	2.99E+05	3.21E+05
1999	59.0	662.4	3,499	13,862	1,209	769.4	3.00E+05	3.20E+05
2000	41.0	149.7	5,308	13,932	1,212	766.3	3.02E+05	3.24E+05
2001	1.60	13.3	4,762	13,795	1,208	770.9	3.01E+05	3.21E+05
2002	1.05	0	8,097	13,898	1,213	811.9	3.01E+05	3.25E+05
2003	6.89	211.9	5,905	13,851	1,214	795.6	3.00E+05	3.22E+05
2004	0	0	7,754	13,902	1,220	843.7	3.00E+05	3.24E+05
2005	57.3	807.8	3,916	13,799	1,214	780.5	3.00E+05	3.21E+05
2006	11.1	161.7	3,502	13,701	1,209	771.7	3.00E+05	3.19E+05
2007	0	0	8,386	13,778	1,215	891.7	2.97E+05	3.21E+05
2008	96.5	1,189	3,326	13,821	1,216	793.2	3.00E+05	3.21E+05
2009	84.3	453.9	4,781	13,836	1,210	749.9	3.02E+05	3.23E+05
2010	127.6	625.0	5,956	14,036	1,209	722.0	3.06E+05	3.28E+05
2011	136.0	1,073	2,754	13,980	1,204	675.5	3.08E+05	3.28E+05
2012	0	0	4,752	13,106	1,204	749.0	3.00E+05	3.20E+05
2013	0	0	5,200	12,969	1,204	808.5	2.98E+05	3.18E+05
2014	1.47	67.6	4,618	13,023	1,205	800.4	2.98E+05	3.17E+05
2015	0	0	7,632	13,154	1,209	908.0	2.96E+05	3.19E+05
2016	0.001	0.788	7,278	13,278	1,217	915.8	2.96E+05	3.19E+05
2017	7.67	244.3	5,943	13,267	1,214	889.4	2.96E+05	3.18E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-14.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Bexar - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evergreen UWCD	Guadalupe County GCD	Medina County GCD	Upper Layers			
	(acre-feet)									%
Predevelopment	0	0	0	35,213	3,218	0.785	2.78E+05	3.16E+05	0.003	1.02E-06
1980	0	0	6,225	37,508	3,261	78.2	2.73E+05	3.20E+05	-1.98E-08	-6.18E-12
1981	53.7	420.3	6,416	36,893	3,246	2.82	2.73E+05	3.20E+05	-1.88E-07	-5.87E-11
1982	3.67	0	6,630	36,881	3,257	2.20	2.72E+05	3.19E+05	-4.54E-09	-1.42E-12
1983	8.57	27.8	7,028	36,614	3,262	2.21	2.72E+05	3.19E+05	-7.16E-08	-2.24E-11
1984	0.773	0	8,688	36,548	3,286	215.2	2.72E+05	3.21E+05	1.39E-08	4.34E-12
1985	64.8	776.9	7,184	36,249	3,258	2.30	2.73E+05	3.20E+05	-1.58E-08	-4.94E-12
1986	13.5	97.2	7,438	36,316	3,251	1.93	2.73E+05	3.20E+05	-1.67E-07	-5.21E-11
1987	24.6	126.0	7,647	36,049	3,246	1.87	2.73E+05	3.20E+05	-6.23E-06	-1.95E-09
1988	0	0	7,875	36,575	3,276	1.39	2.72E+05	3.20E+05	1.05E-08	3.29E-12
1989	1.02	49.0	7,475	36,770	3,277	1.61	2.72E+05	3.19E+05	9.78E-08	3.07E-11
1990	17.8	318.5	7,969	36,772	3,267	1.75	2.72E+05	3.20E+05	3.86E-08	1.20E-11
1991	14.5	366.9	7,594	36,587	3,254	1.85	2.73E+05	3.21E+05	1.64E-07	5.12E-11
1992	42.3	399.0	7,091	36,495	3,250	1.66	2.75E+05	3.22E+05	1.29E-07	4.00E-11
1993	0	0	7,549	36,352	3,248	1.46	2.73E+05	3.20E+05	-4.95E-08	-1.54E-11
1994	25.1	172.7	8,067	36,261	3,239	2.74	2.73E+05	3.21E+05	-3.26E-07	-1.02E-10
1995	0	0	8,815	36,298	3,247	18.3	2.72E+05	3.21E+05	5.93E-08	1.85E-11
1996	0	0	9,064	36,806	3,271	35.7	2.72E+05	3.21E+05	2.08E-06	6.46E-10
1997	57.6	709.3	8,507	36,374	3,247	2.86	2.73E+05	3.22E+05	1.93E-07	6.01E-11
1998	15.9	162.1	8,208	36,590	3,240	2.93	2.73E+05	3.21E+05	1.34E-09	4.17E-13
1999	0	0	8,569	36,863	3,257	2.03	2.72E+05	3.20E+05	-2.04E-09	-6.36E-13
2000	1.16	83.8	11,113	37,002	3,263	2.60	2.72E+05	3.24E+05	2.15E-06	6.64E-10
2001	9.51	72.7	9,104	37,002	3,256	2.47	2.72E+05	3.21E+05	-2.74E-09	-8.52E-13
2002	31.4	575.3	11,355	36,695	3,232	3.49	2.73E+05	3.25E+05	1.85E-07	5.69E-11
2003	2.86	0.247	9,890	36,846	3,236	2.91	2.72E+05	3.22E+05	-2.81E-06	-8.72E-10
2004	63.6	590.8	8,706	36,713	3,230	3.40	2.74E+05	3.24E+05	9.77E-08	3.02E-11
2005	0	0	8,596	36,956	3,243	2.23	2.72E+05	3.21E+05	-5.94E-09	-1.85E-12
2006	4.01	11.1	7,102	37,087	3,256	1.98	2.72E+05	3.19E+05	-4.89E-08	-1.53E-11
2007	143.4	1,448	5,384	36,440	3,223	3.29	2.75E+05	3.21E+05	-1.66E-08	-5.18E-12
2008	0	0	7,740	36,925	3,256	2.03	2.73E+05	3.21E+05	1.81E-08	5.65E-12
2009	0.017	14.5	11,538	36,951	3,252	2.40	2.71E+05	3.23E+05	2.09E-08	6.47E-12
2010	0.034	18.4	17,191	37,350	3,252	26.8	2.70E+05	3.28E+05	-5.00E-07	-1.52E-10
2011	0	0	17,096	38,216	3,279	59.0	2.69E+05	3.28E+05	1.34E-08	4.10E-12
2012	229.0	1,860	2,034	39,096	3,278	2.56	2.73E+05	3.20E+05	1.47E-07	4.59E-11
2013	85.5	538.6	2,351	38,741	3,259	2.70	2.73E+05	3.18E+05	-3.45E-07	-1.08E-10
2014	31.2	86.0	2,710	38,589	3,258	2.52	2.73E+05	3.17E+05	4.99E-05	1.57E-08
2015	114.3	982.6	1,884	38,007	3,235	2.83	2.75E+05	3.19E+05	2.44E-07	7.66E-11
2016	63.9	315.2	1,358	37,910	3,233	2.76	2.76E+05	3.19E+05	6.20E-06	1.94E-09
2017	7.04	16.2	1,675	37,936	3,229	2.62	2.75E+05	3.18E+05	5.12E-07	1.61E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Quarternary Alluvium (Layer 1)

Simulated Time Period	Inflows						Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Gonzales County UWCD	Pecan Valley GCD	Lower Layers		Specific Storage	Specific Yield	River Package	Pecan Valley GCD	Lower Layers			
	(acre-feet)														%
Predevelopment	0	0	1.21E-11	0.472	8.93	50.0	59.4	0	0	8.43E-11	0.469	58.9	59.4	2.20E-10	3.71E-10
1980	0	0	1.21E-11	0.473	8.96	50.1	59.5	0	0	8.45E-11	0.470	59.1	59.5	4.33E-12	7.27E-12
1981	0	0	1.21E-11	0.472	8.93	50.0	59.4	2.26E-06	8.97E-04	8.43E-11	0.469	58.9	59.4	-2.48E-12	-4.18E-12
1982	1.06E-07	3.86E-05	1.21E-11	0.472	8.93	50.0	59.4	2.40E-07	1.11E-04	8.43E-11	0.469	58.9	59.4	1.26E-11	2.13E-11
1983	2.61E-07	8.98E-05	1.21E-11	0.472	8.93	50.0	59.4	1.62E-07	7.05E-05	8.43E-11	0.469	58.9	59.4	-7.79E-12	-1.31E-11
1984	6.32E-07	2.34E-04	1.21E-11	0.473	8.96	50.1	59.5	2.29E-07	9.21E-05	8.45E-11	0.470	59.1	59.5	3.22E-11	5.40E-11
1985	0	0	1.21E-11	0.472	8.93	50.0	59.4	3.05E-06	0.001	8.43E-11	0.469	58.9	59.4	1.90E-11	3.20E-11
1986	0	0	1.21E-11	0.472	8.93	50.0	59.4	4.10E-06	0.002	8.43E-11	0.469	58.9	59.4	4.24E-12	7.14E-12
1987	0	0	1.21E-11	0.472	8.93	50.0	59.4	4.50E-06	0.002	8.43E-11	0.469	58.9	59.4	4.39E-10	7.39E-10
1988	2.09E-06	8.19E-04	1.21E-11	0.473	8.96	50.1	59.5	5.75E-07	2.30E-04	8.45E-11	0.470	59.1	59.5	3.93E-12	6.60E-12
1989	2.78E-06	0.001	1.21E-11	0.472	8.93	50.0	59.4	2.33E-07	8.77E-05	8.43E-11	0.469	58.9	59.4	1.18E-11	1.99E-11
1990	2.72E-06	0.001	1.21E-11	0.472	8.93	50.0	59.4	4.13E-08	1.48E-05	8.43E-11	0.469	58.9	59.4	1.26E-11	2.13E-11
1991	1.54E-08	1.05E-05	1.21E-11	0.472	8.93	50.0	59.4	7.36E-07	2.93E-04	8.43E-11	0.469	58.9	59.4	-1.00E-11	-1.68E-11
1992	0	0	1.21E-11	0.473	8.96	50.1	59.5	3.11E-06	0.001	8.45E-11	0.470	59.1	59.5	4.50E-11	7.56E-11
1993	0	0	1.21E-11	0.472	8.93	50.0	59.4	3.07E-06	0.001	8.43E-11	0.469	58.9	59.4	-8.41E-12	-1.42E-11
1994	0	0	1.21E-11	0.472	8.93	50.0	59.4	4.64E-06	0.002	8.43E-11	0.469	58.9	59.4	8.82E-12	1.48E-11
1995	4.44E-09	4.24E-06	1.21E-11	0.472	8.93	50.0	59.4	2.76E-06	0.001	8.43E-11	0.469	58.9	59.4	4.33E-11	7.28E-11
1996	1.36E-06	5.15E-04	1.21E-11	0.473	8.96	50.1	59.5	8.89E-07	3.54E-04	8.45E-11	0.470	59.1	59.5	-3.44E-10	-5.78E-10
1997	0	0	1.21E-11	0.472	8.93	50.0	59.4	3.08E-06	0.001	8.43E-11	0.469	58.9	59.4	6.36E-11	1.07E-10
1998	0	0	1.21E-11	0.472	8.93	50.0	59.4	2.79E-06	0.001	8.43E-11	0.469	58.9	59.4	6.08E-12	1.02E-11
1999	8.89E-07	3.41E-04	1.21E-11	0.472	8.93	50.0	59.4	9.36E-07	3.69E-04	8.43E-11	0.469	58.9	59.4	6.66E-12	1.12E-11
2000	1.13E-06	4.72E-04	1.21E-11	0.473	8.96	50.1	59.5	6.58E-07	2.51E-04	8.45E-11	0.470	59.1	59.5	9.94E-11	1.67E-10
2001	8.16E-07	3.38E-04	1.21E-11	0.472	8.93	50.0	59.4	6.60E-07	2.53E-04	8.43E-11	0.469	58.9	59.4	-2.00E-12	-3.36E-12
2002	0	0	1.21E-11	0.472	8.93	50.0	59.4	2.99E-06	0.001	8.43E-11	0.469	58.9	59.4	1.30E-12	2.19E-12
2003	1.35E-09	2.23E-06	1.21E-11	0.472	8.93	50.0	59.4	1.28E-06	4.74E-04	8.43E-11	0.469	58.9	59.4	1.24E-12	2.08E-12
2004	0	0	1.21E-11	0.473	8.96	50.1	59.5	2.10E-06	8.19E-04	8.45E-11	0.470	59.1	59.5	-1.05E-11	-1.76E-11
2005	2.87E-06	0.001	1.21E-11	0.472	8.93	50.0	59.4	2.53E-07	9.15E-05	8.43E-11	0.469	58.9	59.4	1.93E-11	3.26E-11
2006	3.43E-06	0.001	1.21E-11	0.472	8.93	50.0	59.4	1.43E-07	5.18E-05	8.43E-11	0.469	58.9	59.4	7.47E-12	1.26E-11
2007	0	0	1.21E-11	0.472	8.93	50.0	59.4	7.05E-06	0.003	8.43E-11	0.469	58.9	59.4	-1.57E-12	-2.64E-12
2008	8.40E-07	2.74E-04	1.21E-11	0.473	8.96	50.1	59.5	9.67E-07	3.91E-04	8.45E-11	0.470	59.1	59.5	-9.44E-12	-1.58E-11
2009	4.24E-07	1.70E-04	1.21E-11	0.472	8.93	50.0	59.4	6.60E-07	2.62E-04	8.43E-11	0.469	58.9	59.4	2.67E-11	4.50E-11
2010	4.46E-06	0.002	1.21E-11	0.472	8.93	50.0	59.4	3.52E-09	8.60E-07	8.43E-11	0.469	58.9	59.4	-1.19E-10	-2.00E-10
2011	1.22E-05	0.005	1.21E-11	0.472	8.93	50.0	59.4	0	0	8.43E-11	0.469	58.9	59.4	2.07E-11	3.48E-11
2012	2.51E-05	0.010	1.21E-11	0.473	8.96	50.1	59.5	0	0	8.45E-11	0.470	59.1	59.5	-1.95E-12	-3.27E-12
2013	4.40E-05	0.018	1.21E-11	0.472	8.93	50.0	59.4	0	0	8.43E-11	0.469	58.9	59.4	2.34E-11	3.94E-11
2014	6.62E-05	0.027	1.21E-11	0.471	8.93	50.0	59.4	0	0	8.43E-11	0.469	58.9	59.4	-7.68E-11	-1.29E-10
2015	8.92E-05	0.037	1.21E-11	0.471	8.93	50.0	59.4	0	0	8.43E-11	0.469	58.9	59.4	-2.44E-11	-4.11E-11
2016	8.13E-05	0.033	1.21E-11	0.473	8.96	50.1	59.6	0	0	8.45E-11	0.470	59.1	59.6	-1.15E-10	-1.93E-10
2017	8.04E-05	0.033	1.21E-11	0.471	8.93	50.0	59.4	0	0	8.43E-11	0.469	58.9	59.4	1.51E-12	2.54E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - (Layer 2) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	3,931	5.22E-04	0.001	2.93E-04	58.0	4,636	8,626
1980	0	0	3,948	5.23E-04	0.001	2.93E-04	58.2	4,642	8,649
1981	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1982	0.002	0.007	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1983	3.06E-04	0.001	3,938	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1984	3.45E-04	0.002	3,948	5.23E-04	0.001	2.93E-04	58.2	4,642	8,649
1985	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1986	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1987	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,631	8,625
1988	0.006	0.025	3,948	5.23E-04	0.001	2.93E-04	58.2	4,642	8,649
1989	0.002	0.009	3,938	5.22E-04	0.001	2.93E-04	58.0	4,629	8,625
1990	0.002	0.007	3,938	5.22E-04	0.001	2.93E-04	58.0	4,629	8,625
1991	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1992	0	0	3,948	5.23E-04	0.001	2.93E-04	58.2	4,643	8,649
1993	7.56E-05	4.22E-04	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1994	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,631	8,625
1995	8.43E-04	0.004	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1996	0.003	0.013	3,948	5.23E-04	0.001	2.93E-04	58.2	4,643	8,649
1997	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
1998	6.80E-09	6.60E-09	3,937	5.22E-04	0.001	2.93E-04	58.0	4,631	8,625
1999	0.002	0.010	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
2000	9.95E-04	0.004	3,948	5.23E-04	0.001	2.93E-04	58.2	4,643	8,649
2001	9.46E-07	4.10E-06	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
2002	0	0	3,937	5.22E-04	0.001	2.93E-04	58.0	4,631	8,625
2003	0.001	0.005	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
2004	0	0	3,947	5.23E-04	0.001	2.93E-04	58.2	4,643	8,649
2005	0.005	0.020	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
2006	0.002	0.007	3,938	5.22E-04	0.001	2.93E-04	58.0	4,629	8,625
2007	0	0	3,936	5.22E-04	0.001	2.93E-04	58.0	4,631	8,625
2008	0.006	0.024	3,948	5.23E-04	0.001	2.93E-04	58.2	4,643	8,649
2009	7.56E-04	0.003	3,937	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
2010	0.007	0.026	3,938	5.22E-04	0.001	2.93E-04	58.0	4,630	8,625
2011	0.012	0.047	3,939	5.22E-04	0.001	2.93E-04	58.0	4,628	8,625
2012	0.021	0.083	3,952	5.23E-04	0.001	2.93E-04	58.2	4,638	8,648
2013	0.033	0.133	3,944	5.22E-04	0.001	2.93E-04	58.0	4,622	8,624
2014	0.044	0.174	3,948	5.22E-04	0.001	2.93E-04	58.0	4,617	8,624
2015	0.053	0.209	3,953	5.22E-04	0.001	2.93E-04	58.0	4,611	8,623
2016	0.020	0.074	3,965	5.23E-04	0.001	2.93E-04	58.2	4,623	8,647
2017	0.023	0.090	3,957	5.22E-04	0.001	2.93E-04	58.0	4,608	8,623

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	4,672	8.42E-04	7.43E-04	3.90E-04	49.6	3,904	8,626	1.75E-10	2.02E-12
1980	0	0	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	-1.71E-10	-1.98E-12
1981	0.003	0.012	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	5.46E-12	6.33E-14
1982	0	0	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	2.55E-11	2.95E-13
1983	2.96E-08	0	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,911	8,625	7.28E-12	8.44E-14
1984	3.91E-04	0.001	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	7.28E-12	8.41E-14
1985	0.004	0.018	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	-7.28E-12	-8.44E-14
1986	0.003	0.010	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	-3.09E-11	-3.59E-13
1987	0.002	0.008	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	5.46E-12	6.33E-14
1988	0	0	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	4.91E-11	5.68E-13
1989	0	0	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,911	8,625	1.69E-10	1.96E-12
1990	1.38E-05	8.54E-05	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,911	8,625	4.00E-11	4.64E-13
1991	0.003	0.014	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	-1.09E-11	-1.27E-13
1992	0.003	0.014	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	-1.82E-12	-2.10E-14
1993	0.002	0.007	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	-5.28E-11	-6.12E-13
1994	0.003	0.013	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	4.37E-11	5.06E-13
1995	2.20E-04	7.91E-04	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	2.55E-11	2.95E-13
1996	0	0	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	-1.82E-11	-2.10E-13
1997	0.004	0.017	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	2.36E-11	2.74E-13
1998	6.74E-04	0.003	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	9.09E-12	1.05E-13
1999	0	0	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	4.55E-11	5.27E-13
2000	1.75E-06	1.15E-05	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	6.00E-11	6.94E-13
2001	2.39E-04	8.76E-04	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	4.18E-11	4.85E-13
2002	0.004	0.015	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	1.09E-11	1.27E-13
2003	0	0	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	1.09E-11	1.27E-13
2004	0.001	0.005	4,679	8.44E-04	7.45E-04	3.91E-04	49.7	3,920	8,649	-3.64E-12	-4.21E-14
2005	0	0	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	-2.18E-11	-2.53E-13
2006	0	0	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,911	8,625	1.27E-11	1.48E-13
2007	0.012	0.049	4,667	8.41E-04	7.43E-04	3.90E-04	49.6	3,909	8,625	-3.27E-11	-3.80E-13
2008	0	0	4,678	8.44E-04	7.45E-04	3.91E-04	49.7	3,921	8,649	-6.00E-11	-6.94E-13
2009	1.88E-04	9.39E-04	4,666	8.41E-04	7.43E-04	3.90E-04	49.6	3,910	8,625	-7.28E-12	-8.44E-14
2010	0	0	4,665	8.41E-04	7.43E-04	3.90E-04	49.6	3,911	8,625	-1.27E-11	-1.48E-13
2011	0	0	4,664	8.41E-04	7.43E-04	3.90E-04	49.6	3,912	8,625	-2.18E-11	-2.53E-13
2012	0	0	4,674	8.44E-04	7.45E-04	3.91E-04	49.7	3,925	8,648	2.36E-11	2.73E-13
2013	0	0	4,657	8.41E-04	7.43E-04	3.90E-04	49.5	3,917	8,624	-6.00E-11	-6.96E-13
2014	0	0	4,652	8.41E-04	7.43E-04	3.90E-04	49.5	3,921	8,624	-5.82E-11	-6.75E-13
2015	0	0	4,647	8.41E-04	7.43E-04	3.90E-04	49.5	3,926	8,623	2.00E-11	2.32E-13
2016	0	0	4,659	8.44E-04	7.45E-04	3.91E-04	49.7	3,938	8,647	4.37E-11	5.05E-13
2017	0	0	4,644	8.41E-04	7.43E-04	3.90E-04	49.5	3,930	8,623	-9.09E-12	-1.05E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.3
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	557.4	364.1	218.4	3,917	1,057	6,115
1980	0	558.9	365.1	219.0	3,935	1,049	6,127
1981	0	557.4	364.1	218.4	3,923	1,047	6,110
1982	0.005	557.4	364.1	218.4	3,924	1,046	6,110
1983	6.84E-04	557.4	364.1	218.4	3,924	1,046	6,110
1984	0.001	558.9	365.1	219.0	3,935	1,049	6,126
1985	0	557.4	364.1	218.4	3,923	1,047	6,110
1986	0	557.4	364.1	218.4	3,923	1,047	6,110
1987	0	557.4	364.1	218.4	3,923	1,048	6,111
1988	0.015	558.9	365.1	219.0	3,934	1,049	6,126
1989	0.004	557.4	364.1	218.4	3,924	1,046	6,109
1990	0.002	557.4	364.1	218.4	3,924	1,046	6,109
1991	0	557.4	364.1	218.4	3,924	1,046	6,110
1992	0	558.9	365.1	219.0	3,934	1,050	6,127
1993	5.01E-04	557.4	364.1	218.4	3,923	1,047	6,110
1994	0	557.4	364.1	218.4	3,923	1,048	6,111
1995	0.003	557.4	364.1	218.4	3,923	1,047	6,110
1996	0.008	558.9	365.1	219.0	3,934	1,049	6,127
1997	0	557.4	364.1	218.4	3,923	1,048	6,110
1998	8.75E-07	557.4	364.1	218.4	3,923	1,048	6,110
1999	0.006	557.4	364.1	218.4	3,923	1,047	6,110
2000	0.002	558.9	365.1	219.0	3,934	1,050	6,127
2001	0	557.4	364.1	218.4	3,923	1,047	6,110
2002	0	557.4	364.1	218.4	3,923	1,048	6,110
2003	0.003	557.4	364.1	218.4	3,923	1,047	6,110
2004	0	558.9	365.1	219.0	3,934	1,050	6,127
2005	0.012	557.4	364.1	218.4	3,924	1,046	6,110
2006	0.004	557.4	364.1	218.4	3,924	1,046	6,109
2007	0	557.4	364.1	218.4	3,922	1,049	6,111
2008	0.016	558.9	365.1	219.0	3,934	1,050	6,127
2009	7.53E-04	557.4	364.1	218.4	3,923	1,047	6,110
2010	0.012	557.4	364.1	218.4	3,924	1,046	6,109
2011	0.023	557.4	364.1	218.4	3,925	1,043	6,108
2012	0.042	558.9	365.1	219.0	3,938	1,042	6,123
2013	0.065	557.4	364.1	218.4	3,931	1,032	6,103
2014	0.084	557.5	364.1	218.4	3,935	1,023	6,098
2015	0.098	557.5	364.1	218.4	3,940	1,014	6,094
2016	0.026	559.0	365.1	219.0	3,952	1,014	6,109
2017	0.039	557.5	364.1	218.4	3,943	1,008	6,091

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Net Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	877.3	104.2	254.8	4,596	282.6	6,115	4.95E-08	8.10E-10
1980	0	879.6	104.5	255.6	4,602	285.2	6,127	1.46E-11	2.38E-13
1981	0.006	877.2	104.2	254.9	4,589	284.4	6,110	-3.42E-09	-5.60E-11
1982	0	877.2	104.2	254.9	4,589	284.4	6,110	1.82E-12	2.98E-14
1983	2.30E-07	877.2	104.2	254.9	4,589	284.4	6,110	-3.49E-09	-5.71E-11
1984	3.83E-04	879.6	104.5	255.6	4,602	285.2	6,126	2.02E-08	3.29E-10
1985	0.009	877.2	104.2	254.9	4,590	284.3	6,110	3.72E-10	6.09E-12
1986	0.005	877.2	104.2	254.9	4,590	284.3	6,110	-1.31E-09	-2.15E-11
1987	0.003	877.2	104.2	254.9	4,590	284.3	6,111	3.32E-07	5.43E-09
1988	0	879.6	104.5	255.6	4,602	285.1	6,126	2.23E-09	3.64E-11
1989	0	877.2	104.2	254.9	4,589	284.4	6,109	1.57E-10	2.58E-12
1990	1.10E-04	877.2	104.2	254.9	4,589	284.4	6,109	1.45E-09	2.38E-11
1991	0.008	877.2	104.2	254.9	4,589	284.4	6,110	1.83E-09	3.00E-11
1992	0.007	879.6	104.5	255.6	4,602	285.1	6,127	3.93E-08	6.41E-10
1993	0.002	877.2	104.2	254.9	4,590	284.3	6,110	-2.46E-11	-4.02E-13
1994	0.006	877.2	104.2	254.9	4,590	284.2	6,111	-4.64E-09	-7.59E-11
1995	1.26E-04	877.2	104.2	254.9	4,590	284.2	6,110	2.62E-08	4.29E-10
1996	0	879.6	104.5	255.6	4,602	285.0	6,127	-1.76E-07	-2.88E-09
1997	0.009	877.2	104.2	254.9	4,590	284.2	6,110	3.89E-08	6.36E-10
1998	8.07E-04	877.2	104.2	254.9	4,590	284.2	6,110	0	0
1999	0	877.2	104.2	254.9	4,589	284.2	6,110	-8.19E-12	-1.34E-13
2000	2.43E-05	879.6	104.5	255.6	4,602	285.0	6,127	1.01E-07	1.65E-09
2001	3.88E-04	877.2	104.2	254.9	4,589	284.2	6,110	-4.86E-10	-7.95E-12
2002	0.009	877.2	104.2	254.9	4,590	284.2	6,110	-1.61E-10	-2.63E-12
2003	0	877.2	104.2	254.9	4,590	284.2	6,110	4.11E-09	6.72E-11
2004	0.003	879.6	104.5	255.6	4,603	284.9	6,127	6.10E-10	9.96E-12
2005	0	877.2	104.2	254.9	4,589	284.2	6,110	-2.58E-09	-4.22E-11
2006	0	877.2	104.2	254.9	4,589	284.2	6,109	8.64E-11	1.41E-12
2007	0.027	877.2	104.2	254.9	4,591	284.0	6,111	8.81E-10	1.44E-11
2008	0	879.6	104.5	255.6	4,602	284.9	6,127	-1.00E-11	-1.63E-13
2009	0.001	877.2	104.2	254.9	4,590	284.1	6,110	2.66E-08	4.36E-10
2010	0	877.2	104.2	254.9	4,589	284.2	6,109	-9.94E-08	-1.63E-09
2011	0	877.2	104.2	254.9	4,588	284.4	6,108	-9.61E-09	-1.57E-10
2012	0	879.6	104.5	255.6	4,598	285.5	6,123	7.65E-09	1.25E-10
2013	0	877.2	104.2	254.9	4,581	285.2	6,103	2.32E-08	3.80E-10
2014	0	877.1	104.2	254.9	4,576	285.9	6,098	-5.66E-09	-9.28E-11
2015	0	877.1	104.2	254.9	4,571	286.7	6,094	-1.95E-08	-3.21E-10
2016	0	879.5	104.5	255.6	4,582	287.9	6,109	-5.74E-07	-9.40E-09
2017	0	877.0	104.2	254.9	4,567	287.5	6,091	-7.51E-10	-1.23E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.4
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0.357	0.257	0.178	282.6	1,063	1,346
1980	0	0.357	0.258	0.179	285.2	1,054	1,340
1981	0	0.357	0.257	0.179	284.4	1,052	1,337
1982	0.011	0.356	0.257	0.179	284.4	1,052	1,337
1983	0.001	0.356	0.257	0.179	284.4	1,052	1,337
1984	0.003	0.357	0.258	0.179	285.2	1,054	1,340
1985	0	0.357	0.257	0.179	284.3	1,052	1,338
1986	0	0.357	0.257	0.179	284.3	1,053	1,338
1987	0	0.357	0.257	0.179	284.3	1,053	1,338
1988	0.035	0.357	0.258	0.179	285.1	1,054	1,340
1989	0.009	0.356	0.257	0.179	284.4	1,051	1,336
1990	0.004	0.356	0.257	0.179	284.4	1,051	1,336
1991	0	0.356	0.257	0.179	284.4	1,052	1,337
1992	0	0.358	0.258	0.179	285.1	1,055	1,341
1993	9.94E-04	0.356	0.257	0.179	284.3	1,053	1,338
1994	0	0.357	0.257	0.179	284.2	1,053	1,338
1995	0.008	0.356	0.257	0.179	284.2	1,053	1,338
1996	0.019	0.357	0.258	0.179	285.0	1,055	1,340
1997	0	0.356	0.257	0.179	284.2	1,053	1,338
1998	3.81E-05	0.357	0.257	0.179	284.2	1,053	1,338
1999	0.016	0.356	0.257	0.179	284.2	1,052	1,337
2000	0.004	0.357	0.258	0.179	285.0	1,055	1,341
2001	0	0.356	0.257	0.179	284.2	1,052	1,337
2002	0	0.357	0.257	0.179	284.2	1,053	1,338
2003	0.008	0.356	0.257	0.179	284.2	1,053	1,338
2004	0	0.357	0.258	0.179	284.9	1,056	1,342
2005	0.029	0.356	0.257	0.179	284.2	1,051	1,337
2006	0.008	0.356	0.257	0.179	284.2	1,051	1,336
2007	0	0.357	0.257	0.178	284.0	1,054	1,339
2008	0.039	0.357	0.258	0.179	284.9	1,055	1,341
2009	0.002	0.356	0.257	0.179	284.1	1,052	1,337
2010	0.030	0.356	0.257	0.179	284.2	1,051	1,336
2011	0.054	0.356	0.257	0.179	284.4	1,049	1,334
2012	0.097	0.356	0.258	0.179	285.5	1,047	1,333
2013	0.152	0.355	0.257	0.179	285.2	1,037	1,323
2014	0.195	0.354	0.257	0.179	285.9	1,028	1,315
2015	0.226	0.353	0.258	0.179	286.7	1,018	1,306
2016	0.051	0.354	0.258	0.179	287.9	1,019	1,308
2017	0.087	0.352	0.258	0.179	287.5	1,013	1,301

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	0.767	0.239	0.172	1,064	281.5	1,346	2.44E-09	1.81E-10
1980	0	0.771	0.238	0.172	1,055	284.1	1,340	1.36E-12	1.02E-13
1981	0.015	0.769	0.238	0.172	1,053	283.3	1,337	-1.58E-10	-1.18E-11
1982	0	0.769	0.238	0.172	1,052	283.3	1,337	9.09E-13	6.80E-14
1983	3.64E-06	0.769	0.238	0.172	1,052	283.3	1,337	-1.68E-10	-1.26E-11
1984	4.51E-04	0.771	0.238	0.172	1,055	284.1	1,340	9.27E-10	6.92E-11
1985	0.022	0.769	0.238	0.172	1,053	283.3	1,338	1.48E-11	1.10E-12
1986	0.010	0.768	0.238	0.172	1,054	283.2	1,338	-6.23E-11	-4.66E-12
1987	0.007	0.768	0.238	0.172	1,054	283.2	1,338	1.49E-08	1.11E-09
1988	0	0.771	0.238	0.172	1,055	284.0	1,340	1.15E-10	8.60E-12
1989	0	0.769	0.238	0.172	1,052	283.3	1,336	1.00E-11	7.49E-13
1990	2.31E-04	0.769	0.238	0.172	1,052	283.3	1,336	6.66E-11	4.99E-12
1991	0.019	0.769	0.238	0.172	1,052	283.3	1,337	8.48E-11	6.34E-12
1992	0.016	0.771	0.238	0.172	1,056	284.0	1,341	1.76E-09	1.31E-10
1993	0.004	0.769	0.238	0.172	1,053	283.2	1,338	-1.14E-12	-8.50E-14
1994	0.013	0.768	0.238	0.172	1,054	283.1	1,338	-1.82E-10	-1.36E-11
1995	7.40E-05	0.769	0.238	0.172	1,053	283.1	1,338	1.17E-09	8.78E-11
1996	0	0.771	0.238	0.172	1,055	283.9	1,340	-8.31E-09	-6.20E-10
1997	0.022	0.769	0.238	0.172	1,054	283.1	1,338	1.79E-09	1.34E-10
1998	0.001	0.769	0.238	0.172	1,054	283.1	1,338	-3.18E-12	-2.38E-13
1999	0	0.769	0.238	0.172	1,053	283.1	1,337	-6.82E-13	-5.10E-14
2000	5.10E-05	0.771	0.238	0.172	1,056	283.9	1,341	4.42E-09	3.30E-10
2001	7.98E-04	0.769	0.238	0.172	1,053	283.1	1,337	-1.91E-11	-1.43E-12
2002	0.020	0.768	0.238	0.172	1,054	283.1	1,338	-5.00E-12	-3.74E-13
2003	0	0.769	0.238	0.172	1,053	283.1	1,338	2.03E-10	1.52E-11
2004	0.007	0.771	0.239	0.172	1,057	283.8	1,342	2.61E-11	1.95E-12
2005	0	0.769	0.238	0.172	1,052	283.1	1,337	-1.10E-10	-8.23E-12
2006	0	0.769	0.238	0.172	1,052	283.1	1,336	4.55E-13	3.40E-14
2007	0.064	0.768	0.238	0.172	1,055	283.0	1,339	4.02E-11	3.01E-12
2008	0	0.771	0.238	0.172	1,056	283.8	1,341	-1.14E-12	-8.48E-14
2009	0.002	0.769	0.238	0.172	1,053	283.0	1,337	1.15E-09	8.59E-11
2010	0	0.769	0.238	0.172	1,052	283.2	1,336	-4.38E-09	-3.28E-10
2011	0	0.770	0.237	0.172	1,049	283.3	1,334	-2.15E-10	-1.61E-11
2012	0	0.774	0.237	0.172	1,048	284.4	1,333	3.50E-10	2.63E-11
2013	0	0.774	0.236	0.172	1,038	284.1	1,323	9.48E-10	7.17E-11
2014	0	0.776	0.235	0.171	1,029	284.8	1,315	-8.28E-10	-6.30E-11
2015	0	0.779	0.233	0.171	1,019	285.6	1,306	-8.79E-10	-6.73E-11
2016	0	0.782	0.234	0.172	1,020	286.8	1,308	-2.36E-08	-1.80E-09
2017	0	0.781	0.232	0.171	1,014	286.4	1,301	-3.25E-11	-2.50E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.5
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	5,705	400.9	4,324	281.5	771.4	11,483
1980	0	6,152	413.4	4,453	284.1	536.0	11,839
1981	0	6,173	412.3	4,438	283.3	530.1	11,837
1982	1.19	6,119	412.2	4,440	283.3	530.7	11,787
1983	0.134	6,104	412.0	4,440	283.3	530.6	11,771
1984	0.325	6,092	413.0	4,452	284.1	538.9	11,780
1985	0	6,127	412.3	4,435	283.3	542.1	11,800
1986	0	6,127	412.4	4,432	283.2	549.4	11,805
1987	0	6,120	412.1	4,430	283.2	551.2	11,797
1988	3.62	6,043	412.1	4,449	284.0	541.9	11,733
1989	0.870	6,027	410.8	4,438	283.3	536.6	11,697
1990	0.422	6,087	410.5	4,441	283.3	509.5	11,731
1991	0	6,137	411.1	4,437	283.3	519.6	11,787
1992	0	6,193	412.4	4,445	284.0	522.4	11,857
1993	0.111	6,093	411.5	4,431	283.2	553.3	11,771
1994	0	6,100	411.8	4,427	283.1	566.3	11,788
1995	0.845	6,050	411.6	4,428	283.1	570.6	11,744
1996	1.94	6,018	412.3	4,443	283.9	572.1	11,731
1997	0	6,076	411.6	4,426	283.1	572.0	11,769
1998	0.018	6,099	411.7	4,426	283.1	565.4	11,785
1999	1.62	6,035	411.2	4,428	283.1	571.6	11,731
2000	0.388	6,105	412.4	4,442	283.9	563.0	11,806
2001	0	6,086	411.2	4,429	283.1	563.5	11,773
2002	0	6,206	411.9	4,426	283.1	554.6	11,881
2003	0.873	6,158	411.7	4,427	283.1	559.6	11,840
2004	0	6,172	412.9	4,437	283.8	570.0	11,876
2005	2.99	6,023	410.9	4,430	283.1	576.0	11,726
2006	0.815	5,966	410.5	4,431	283.1	582.0	11,673
2007	0	6,117	411.8	4,418	283.0	591.2	11,821
2008	4.09	5,967	411.7	4,436	283.8	596.9	11,700
2009	0.135	6,055	411.0	4,426	283.0	575.9	11,751
2010	3.00	6,153	411.1	4,434	283.2	541.4	11,826
2011	5.48	6,119	410.6	4,446	283.3	518.9	11,784
2012	9.83	6,050	408.8	4,479	284.4	422.9	11,655
2013	15.3	6,008	403.1	4,500	284.1	251.0	11,462
2014	19.5	5,991	397.7	4,543	284.8	168.6	11,404
2015	22.6	6,125	391.4	4,595	285.6	120.6	11,540
2016	4.77	6,346	391.5	4,623	286.8	103.6	11,755
2017	8.71	6,387	388.4	4,633	286.4	85.1	11,788

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	4,085	2,292	4,044	1,063	0	11,483	2.46E-04	2.14E-06
1980	0	4,472	2,234	4,079	1,054	0	11,839	-1.23E-07	-1.04E-09
1981	1.51	4,480	2,234	4,069	1,052	0	11,837	-1.54E-05	-1.30E-07
1982	0	4,438	2,228	4,069	1,052	0	11,787	1.22E-08	1.04E-10
1983	6.92E-04	4,424	2,227	4,069	1,052	0	11,771	-1.53E-05	-1.30E-07
1984	0.043	4,414	2,231	4,080	1,054	0	11,780	1.08E-04	9.17E-07
1985	2.24	4,438	2,237	4,070	1,052	0	11,800	1.90E-06	1.61E-08
1986	0.976	4,439	2,242	4,070	1,053	0	11,805	-5.80E-06	-4.91E-08
1987	0.664	4,430	2,243	4,070	1,053	0	11,797	0.002	1.44E-05
1988	0	4,373	2,227	4,079	1,054	0	11,733	1.01E-05	8.57E-08
1989	0	4,362	2,217	4,067	1,051	0	11,697	7.13E-07	6.10E-09
1990	0.025	4,401	2,214	4,065	1,051	0	11,731	7.48E-06	6.37E-08
1991	1.93	4,442	2,226	4,066	1,052	0	11,787	9.06E-06	7.68E-08
1992	1.65	4,483	2,240	4,078	1,055	0	11,857	2.00E-04	1.68E-06
1993	0.337	4,414	2,236	4,068	1,053	0	11,771	-9.19E-08	-7.80E-10
1994	1.35	4,421	2,244	4,069	1,053	0	11,788	-2.51E-05	-2.13E-07
1995	0.006	4,385	2,238	4,068	1,053	0	11,744	1.32E-04	1.12E-06
1996	0	4,363	2,234	4,079	1,055	0	11,731	-8.65E-04	-7.37E-06
1997	2.27	4,405	2,240	4,068	1,053	0	11,769	1.88E-04	1.60E-06
1998	0.090	4,424	2,240	4,068	1,053	0	11,785	4.89E-08	4.15E-10
1999	0	4,380	2,231	4,068	1,052	0	11,731	-2.68E-08	-2.29E-10
2000	0.006	4,437	2,236	4,079	1,055	0	11,806	5.35E-04	4.53E-06
2001	0.086	4,424	2,230	4,068	1,052	0	11,773	-2.18E-06	-1.85E-08
2002	2.11	4,515	2,242	4,068	1,053	0	11,881	-8.66E-07	-7.29E-09
2003	0	4,482	2,237	4,068	1,053	0	11,840	1.80E-05	1.52E-07
2004	0.702	4,493	2,247	4,080	1,056	0	11,876	3.04E-06	2.56E-08
2005	0	4,383	2,224	4,067	1,051	0	11,726	-1.44E-05	-1.23E-07
2006	0	4,337	2,218	4,067	1,051	0	11,673	1.62E-07	1.39E-09
2007	6.51	4,438	2,253	4,069	1,054	0	11,821	4.68E-06	3.96E-08
2008	0	4,332	2,235	4,078	1,055	0	11,700	-9.37E-08	-8.01E-10
2009	0.274	4,400	2,231	4,067	1,052	0	11,751	1.30E-04	1.11E-06
2010	0	4,489	2,219	4,067	1,051	0	11,826	-5.18E-04	-4.38E-06
2011	0	4,477	2,193	4,066	1,049	0	11,784	-3.91E-06	-3.32E-08
2012	0	4,400	2,141	4,068	1,047	0	11,655	3.33E-05	2.85E-07
2013	0	4,331	2,045	4,041	1,037	7.90	11,462	1.36E-04	1.19E-06
2014	0	4,282	1,932	4,023	1,028	138.9	11,404	-8.18E-05	-7.17E-07
2015	0	4,331	1,802	3,999	1,018	389.1	11,540	-1.00E-04	-8.66E-07
2016	0	4,499	1,784	4,006	1,019	446.4	11,755	-3.31E-03	-2.81E-05
2017	0	4,523	1,733	3,987	1,013	531.8	11,788	-4.21E-06	-3.57E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.6
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	17.7	0.132	7.62	0	758.0	783.4
1980	0	18.4	0.250	8.68	0	520.4	547.7
1981	0.034	18.4	0.227	8.66	0	514.6	541.9
1982	0.091	18.3	0.229	8.66	0	515.2	542.5
1983	0.024	18.3	0.231	8.65	0	515.2	542.4
1984	6.45E-05	18.1	0.221	8.61	0	524.0	551.0
1985	0	18.2	0.210	8.55	0	527.5	554.4
1986	0	18.3	0.204	8.51	0	534.7	561.7
1987	0	18.3	0.198	8.52	0	536.3	563.4
1988	0.562	17.8	0.204	8.62	0	526.6	553.8
1989	0.149	17.5	0.206	8.61	0	521.8	548.3
1990	0.739	17.5	0.230	8.78	0	493.7	521.0
1991	0	17.7	0.217	8.68	0	505.0	531.7
1992	0	18.0	0.211	8.70	0	507.3	534.2
1993	0	17.9	0.195	8.47	0	539.6	566.2
1994	0	17.8	0.189	8.39	0	552.5	578.9
1995	0.028	17.5	0.187	8.38	0	556.7	582.9
1996	0.165	17.2	0.187	8.40	0	558.3	584.2
1997	0	17.3	0.186	8.35	0	558.5	584.3
1998	0.146	17.1	0.184	8.37	0	551.7	577.5
1999	0.022	17.2	0.184	8.36	0	557.9	583.7
2000	0.278	17.0	0.188	8.41	0	549.1	575.0
2001	0.002	17.2	0.188	8.37	0	549.9	575.6
2002	0.057	17.3	0.191	8.39	0	540.9	566.8
2003	0.002	17.4	0.193	8.38	0	545.8	571.8
2004	0	17.8	0.189	8.38	0	556.2	582.5
2005	0.065	17.5	0.189	8.35	0	562.1	588.2
2006	2.40E-04	17.4	0.188	8.34	0	568.2	594.2
2007	0	18.0	0.179	8.28	0	577.8	604.3
2008	0.218	17.5	0.180	8.32	0	582.8	609.0
2009	0.446	17.0	0.183	8.35	0	561.9	587.9
2010	1.11	16.3	0.206	8.45	0	527.3	553.4
2011	1.05	16.0	0.251	8.52	0	505.0	530.8
2012	3.21	14.1	0.521	8.89	0	408.4	435.1
2013	5.68	13.6	1.77	9.49	7.90	240.8	279.2
2014	6.97	14.1	3.51	10.2	138.9	171.5	345.2
2015	9.35	15.7	5.87	11.4	389.1	126.4	557.8
2016	2.58	15.7	6.34	11.6	446.4	110.5	593.1
2017	3.56	15.9	7.09	12.0	531.8	92.7	663.1

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	4.43	2.42	5.12	771.4	0	783.4	2.62E-06	3.35E-07
1980	0	5.89	0.821	5.01	536.0	0	547.7	-1.34E-09	-2.45E-10
1981	0.049	5.94	0.798	5.05	530.1	0	541.9	-4.36E-08	-8.05E-09
1982	0.004	5.94	0.802	5.06	530.7	0	542.5	3.42E-11	6.31E-12
1983	0.008	5.93	0.813	5.06	530.6	0	542.4	-4.42E-08	-8.15E-09
1984	0.172	5.94	0.925	5.12	538.9	0	551.0	2.60E-07	4.72E-08
1985	0.323	5.90	1.00	5.11	542.1	0	554.4	6.43E-09	1.16E-09
1986	0.279	5.87	1.07	5.13	549.4	0	561.7	-1.79E-08	-3.19E-09
1987	0.110	5.86	1.07	5.12	551.2	0	563.4	4.97E-06	8.83E-07
1988	0	5.88	0.918	5.10	541.9	0	553.8	2.73E-08	4.93E-09
1989	2.07E-04	5.79	0.904	5.07	536.6	0	548.3	2.35E-09	4.28E-10
1990	0	5.85	0.609	5.00	509.5	0	521.0	2.12E-08	4.07E-09
1991	0.429	5.81	0.808	5.04	519.6	0	531.7	2.65E-08	4.98E-09
1992	0.165	5.86	0.816	5.06	522.4	0	534.2	5.54E-07	1.04E-07
1993	0.887	5.72	1.19	5.11	553.3	0	566.2	-1.42E-10	-2.51E-11
1994	0.487	5.70	1.32	5.13	566.3	0	578.9	-9.31E-08	-1.61E-08
1995	0.108	5.68	1.33	5.12	570.6	0	582.9	3.84E-07	6.58E-08
1996	0.035	5.68	1.31	5.12	572.1	0	584.2	-3.07E-06	-5.25E-07
1997	0.241	5.66	1.34	5.10	572.0	0	584.3	6.89E-07	1.18E-07
1998	0.010	5.74	1.28	5.09	565.4	0	577.5	4.27E-09	7.39E-10
1999	0.035	5.68	1.28	5.10	571.6	0	583.7	-6.84E-11	-1.17E-11
2000	3.27E-04	5.79	1.19	5.08	563.0	0	575.0	1.31E-06	2.27E-07
2001	0.053	5.78	1.20	5.07	563.5	0	575.6	-5.56E-09	-9.66E-10
2002	0.006	5.89	1.15	5.06	554.6	0	566.8	-3.72E-09	-6.56E-10
2003	0.038	5.90	1.15	5.08	559.6	0	571.8	4.39E-08	7.68E-09
2004	0.268	5.90	1.21	5.12	570.0	0	582.5	7.97E-09	1.37E-09
2005	0.011	5.83	1.20	5.11	576.0	0	588.2	-2.62E-08	-4.45E-09
2006	0.088	5.75	1.22	5.11	582.0	0	594.2	2.67E-09	4.50E-10
2007	0.786	5.70	1.38	5.15	591.2	0	604.3	1.29E-08	2.13E-09
2008	0.004	5.66	1.35	5.14	596.9	0	609.0	-1.98E-10	-3.26E-11
2009	0	5.74	1.23	5.07	575.9	0	587.9	4.31E-07	7.32E-08
2010	0	5.98	0.977	4.99	541.4	0	553.4	-1.27E-06	-2.29E-07
2011	0	6.18	0.793	4.94	518.9	0	530.8	-2.29E-07	-4.31E-08
2012	0	7.32	0.217	4.65	422.9	0	435.1	1.16E-07	2.67E-08
2013	0	11.7	0	4.12	251.0	12.3	279.2	3.79E-07	1.36E-07
2014	0	17.2	0	3.58	168.6	155.8	345.2	5.24E-07	1.52E-07
2015	0	25.5	0	2.95	120.6	408.8	557.8	-2.85E-07	-5.11E-08
2016	0	23.3	0	3.00	103.6	463.2	593.1	-4.04E-06	-6.82E-07
2017	0	24.8	0	2.90	85.1	550.3	663.1	-4.88E-09	-7.36E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.7
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	704.3	23.5	263.2	0	245.4	1,237
1980	0	768.8	38.0	310.2	0	279.5	1,396
1981	2.91	725.4	38.6	309.6	0	280.8	1,357
1982	1.48	725.9	38.3	309.4	0	280.9	1,356
1983	0.616	726.6	38.1	309.0	0	279.2	1,353
1984	0	728.8	36.4	306.2	0	266.7	1,338
1985	0	733.6	35.9	303.5	0	257.8	1,331
1986	0	738.2	35.6	302.1	0	253.6	1,329
1987	4.52E-04	726.6	35.7	302.5	0	259.3	1,324
1988	14.8	668.9	37.3	307.1	0	283.7	1,312
1989	3.96	639.7	36.6	306.6	0	276.9	1,264
1990	25.9	597.4	47.9	315.8	0	306.5	1,293
1991	0	630.2	37.1	310.2	0	267.6	1,245
1992	0.057	643.6	37.7	311.3	0	266.7	1,259
1993	0	713.1	34.9	299.4	0	223.5	1,271
1994	0	709.4	35.2	296.1	0	224.7	1,265
1995	0.529	680.9	35.1	295.5	0	237.1	1,249
1996	3.53	654.1	34.9	296.1	0	247.1	1,236
1997	0	672.9	35.0	294.0	0	240.9	1,243
1998	5.48	629.3	34.2	295.1	0	250.9	1,215
1999	0	655.4	34.1	294.4	0	245.5	1,229
2000	9.19	634.7	33.9	296.6	0	258.3	1,233
2001	0.057	660.8	33.9	295.0	0	248.9	1,239
2002	4.81	657.0	33.8	296.1	0	254.7	1,246
2003	0	683.0	33.9	295.4	0	248.8	1,261
2004	0	713.1	34.0	295.1	0	241.8	1,284
2005	0.016	700.2	33.9	294.0	0	245.5	1,274
2006	0	699.3	34.0	293.6	0	244.5	1,271
2007	0	730.2	34.0	291.0	0	228.0	1,283
2008	2.64	683.9	33.9	292.5	0	245.7	1,259
2009	15.9	628.4	33.4	294.2	0	267.3	1,239
2010	34.2	569.2	33.2	299.0	0	297.2	1,233
2011	28.1	573.8	33.9	301.6	0	299.5	1,237
2012	98.7	470.9	56.6	319.1	0	382.1	1,327
2013	177.5	803.9	118.6	350.0	12.3	502.7	1,965
2014	215.4	1,200	194.8	391.0	155.8	590.0	2,747
2015	294.7	1,766	305.5	451.3	408.8	713.2	3,940
2016	78.4	1,670	297.3	457.4	463.2	506.2	3,472
2017	110.9	1,772	327.9	475.8	550.3	462.7	3,699

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	234.6	94.6	149.4	758.0	0	1,237	4.78E-04	3.87E-05
1980	0	233.7	448.9	51.7	141.7	520.4	0	1,396	-3.60E-07	-2.58E-08
1981	1.30	230.4	422.6	44.5	144.0	514.6	0	1,357	-2.21E-06	-1.63E-07
1982	0.281	221.4	428.8	45.8	144.5	515.2	0	1,356	1.21E-09	8.91E-11
1983	0.353	212.0	433.6	47.4	144.8	515.2	0	1,353	-2.28E-06	-1.68E-07
1984	6.74	156.9	447.3	55.6	147.6	524.0	0	1,338	1.67E-05	1.25E-06
1985	8.01	141.4	445.9	60.3	147.8	527.5	0	1,331	7.09E-07	5.32E-08
1986	8.20	132.2	442.4	63.6	148.3	534.7	0	1,329	-1.29E-06	-9.73E-08
1987	2.66	146.5	429.3	61.2	148.1	536.3	0	1,324	5.03E-04	3.80E-05
1988	0	192.6	396.2	50.0	146.4	526.6	0	1,312	6.76E-07	5.15E-08
1989	0.066	183.0	363.2	50.1	145.4	521.8	0	1,264	2.18E-07	1.73E-08
1990	0	292.3	329.9	36.1	141.4	493.7	0	1,293	1.92E-06	1.49E-07
1991	12.9	193.1	343.2	46.5	144.2	505.0	0	1,245	2.24E-06	1.80E-07
1992	3.22	210.6	348.5	45.1	144.6	507.3	0	1,259	4.66E-05	3.70E-06
1993	31.3	71.9	402.8	76.8	148.5	539.6	0	1,271	-4.35E-09	-3.42E-10
1994	14.7	59.5	406.8	82.5	149.3	552.5	0	1,265	-1.95E-05	-1.54E-06
1995	4.16	67.8	390.2	81.7	148.6	556.7	0	1,249	3.53E-05	2.83E-06
1996	1.73	65.3	381.4	80.6	148.4	558.3	0	1,236	-3.71E-04	-3.00E-05
1997	5.25	54.6	393.2	83.5	147.8	558.5	0	1,243	8.71E-05	7.01E-06
1998	0.361	70.0	368.9	76.3	147.7	551.7	0	1,215	3.34E-07	2.75E-08
1999	3.01	59.9	383.1	77.6	147.8	557.9	0	1,229	-2.18E-08	-1.77E-09
2000	0.032	77.4	386.8	72.7	146.7	549.1	0	1,233	9.06E-05	7.35E-06
2001	1.97	63.4	402.0	74.4	146.9	549.9	0	1,239	-3.94E-07	-3.18E-08
2002	0.004	78.5	410.1	70.6	146.2	540.9	0	1,246	-6.53E-07	-5.24E-08
2003	2.73	68.7	424.6	72.2	147.1	545.8	0	1,261	5.65E-07	4.48E-08
2004	8.44	60.1	435.5	75.1	148.7	556.2	0	1,284	4.40E-07	3.43E-08
2005	2.33	59.9	425.5	75.5	148.4	562.1	0	1,274	-2.11E-07	-1.66E-08
2006	4.21	57.7	416.5	76.5	148.3	568.2	0	1,271	3.93E-07	3.09E-08
2007	17.9	37.1	417.1	82.9	150.4	577.8	0	1,283	1.51E-06	1.18E-07
2008	0.544	54.1	391.3	80.3	149.5	582.8	0	1,259	-2.28E-08	-1.81E-09
2009	0	80.5	377.5	72.7	146.6	561.9	0	1,239	3.86E-05	3.11E-06
2010	0	119.8	383.4	59.8	142.5	527.3	0	1,233	-7.86E-05	-6.37E-06
2011	0	119.8	417.0	54.6	140.5	505.0	0	1,237	1.97E-06	1.59E-07
2012	0	287.6	473.1	31.5	126.7	408.4	0	1,327	6.03E-06	4.55E-07
2013	0	552.5	1,051	16.4	104.3	240.8	0	1,965	3.63E-05	1.85E-06
2014	0	799.9	1,680	10.0	85.5	171.5	0	2,747	1.18E-04	4.31E-06
2015	0	1,167	2,578	4.14	62.9	126.4	1.36	3,940	-2.68E-05	-6.80E-07
2016	0	995.4	2,290	3.87	66.4	110.5	6.43	3,472	4.43E-04	1.27E-05
2017	0	1,079	2,450	2.52	62.3	92.7	12.1	3,699	8.09E-07	2.19E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.8
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	110.6	0.291	42.7	0	157.0	310.5
1980	0	115.0	0.578	50.8	0	176.2	342.6
1981	1.39	115.5	0.536	50.8	0	176.4	344.8
1982	1.12	115.5	0.535	50.9	0	176.8	344.8
1983	0.747	115.0	0.541	50.9	0	176.0	343.2
1984	0.037	114.3	0.531	50.9	0	168.8	334.6
1985	0	114.1	0.519	50.5	0	162.8	328.0
1986	0	114.6	0.513	50.3	0	159.8	325.2
1987	0	115.0	0.503	50.2	0	162.6	328.3
1988	8.01	112.8	0.495	50.7	0	176.8	348.7
1989	5.41	110.4	0.493	50.7	0	174.1	341.1
1990	16.6	110.2	0.515	51.5	0	190.4	369.1
1991	0.028	111.0	0.515	51.3	0	169.9	332.7
1992	0.001	113.1	0.510	51.4	0	167.3	332.4
1993	0	112.8	0.501	50.4	0	143.1	306.7
1994	0	112.2	0.492	49.8	0	141.3	303.8
1995	2.41E-04	110.7	0.484	49.5	0	148.2	308.9
1996	1.71	108.5	0.481	49.5	0	154.7	314.9
1997	0	108.1	0.480	49.2	0	151.9	309.7
1998	2.76	107.7	0.472	49.3	0	156.8	317.0
1999	0.066	108.0	0.471	49.2	0	154.5	312.2
2000	5.24	106.8	0.478	49.5	0	161.8	323.8
2001	0.447	107.1	0.481	49.3	0	156.8	314.1
2002	2.64	107.7	0.487	49.4	0	159.6	319.8
2003	0.044	109.3	0.490	49.4	0	156.2	315.5
2004	0	112.0	0.488	49.4	0	151.8	313.7
2005	0	111.4	0.484	49.1	0	153.3	314.4
2006	0	110.6	0.480	49.1	0	153.0	313.2
2007	0	113.0	0.469	48.7	0	143.5	305.7
2008	0.240	111.4	0.467	48.8	0	153.0	313.9
2009	9.38	107.6	0.460	48.9	0	166.8	333.1
2010	23.5	103.3	0.486	49.5	0	185.9	362.6
2011	23.9	100.7	0.562	50.1	0	188.9	364.0
2012	68.9	88.0	0.916	52.2	0	237.7	447.7
2013	131.1	77.0	3.66	56.0	0	314.3	582.1
2014	173.4	75.9	10.8	61.5	0	375.0	696.5
2015	235.9	83.5	21.0	71.6	1.36	454.5	867.8
2016	118.7	87.5	25.8	78.0	6.43	334.7	651.2
2017	106.4	90.5	30.1	83.5	12.1	292.3	614.9

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	20.3	13.0	30.6	245.4	1.14	310.5	1.03E-05	3.33E-06
1980	0	0.672	26.0	6.47	28.3	279.5	1.72	342.6	-5.87E-09	-1.71E-09
1981	0.442	0.712	26.3	6.39	28.5	280.8	1.60	344.8	-4.01E-08	-1.16E-08
1982	0.121	0.737	26.4	6.41	28.6	280.9	1.65	344.8	2.57E-11	7.45E-12
1983	0.145	0.763	26.4	6.44	28.6	279.2	1.72	343.2	-4.01E-08	-1.17E-08
1984	3.00	0.798	26.3	6.81	28.9	266.7	2.03	334.6	2.20E-07	6.57E-08
1985	5.08	0.796	26.0	7.10	29.0	257.8	2.24	328.0	9.19E-09	2.80E-09
1986	6.14	0.796	25.9	7.40	29.1	253.6	2.34	325.2	-1.93E-08	-5.93E-09
1987	3.48	0.796	25.9	7.49	29.2	259.3	2.17	328.3	5.93E-06	1.81E-06
1988	0	0.798	26.5	7.08	29.0	283.7	1.67	348.7	2.17E-08	6.21E-09
1989	0.006	0.796	26.2	6.89	28.7	276.9	1.68	341.1	2.74E-09	8.04E-10
1990	0	0.821	26.8	5.83	28.1	306.5	1.03	369.1	2.40E-08	6.50E-09
1991	2.42	0.570	26.2	6.18	28.2	267.6	1.67	332.7	2.95E-08	8.87E-09
1992	2.52	0.571	26.3	6.23	28.3	266.7	1.76	332.4	5.96E-07	1.79E-07
1993	18.1	0.603	25.3	7.45	28.7	223.5	2.99	306.7	1.09E-10	3.55E-11
1994	13.1	0.595	25.2	8.10	29.0	224.7	3.07	303.8	-1.61E-07	-5.29E-08
1995	5.56	0.603	25.4	8.34	29.1	237.1	2.76	308.9	4.41E-07	1.43E-07
1996	1.66	0.605	25.6	8.37	29.0	247.1	2.53	314.9	-4.57E-06	-1.45E-06
1997	2.98	0.603	25.2	8.43	28.9	240.9	2.63	309.7	1.05E-06	3.39E-07
1998	0.299	0.603	25.8	8.21	28.8	250.9	2.34	317.0	1.35E-08	4.27E-09
1999	1.34	0.603	25.4	8.18	28.8	245.5	2.43	312.2	-1.82E-10	-5.82E-11
2000	0.021	0.773	26.0	7.88	28.6	258.3	2.19	323.8	1.14E-06	3.51E-07
2001	0.261	0.620	25.7	7.77	28.5	248.9	2.35	314.1	-3.77E-09	-1.20E-09
2002	0.003	0.779	26.2	7.53	28.4	254.7	2.25	319.8	-7.13E-09	-2.23E-09
2003	1.45	0.670	26.1	7.51	28.5	248.8	2.39	315.5	1.89E-08	5.99E-09
2004	6.04	0.605	26.1	7.70	28.9	241.8	2.56	313.7	6.88E-09	2.19E-09
2005	3.14	0.603	26.0	7.80	28.9	245.5	2.46	314.4	-4.36E-09	-1.39E-09
2006	3.27	0.486	25.6	7.92	28.9	244.5	2.41	313.2	6.39E-09	2.04E-09
2007	11.8	0.377	25.0	8.43	29.3	228.0	2.74	305.7	1.41E-08	4.61E-09
2008	1.96	0.580	25.4	8.56	29.3	245.7	2.39	313.9	-2.57E-10	-8.18E-11
2009	0.003	0.788	26.0	8.14	28.9	267.3	1.97	333.1	6.09E-07	1.83E-07
2010	0	1.21	27.5	7.13	28.1	297.2	1.56	362.6	-1.05E-06	-2.90E-07
2011	0	1.21	28.3	6.15	27.3	299.5	1.53	364.0	-4.71E-07	-1.29E-07
2012	0	2.94	33.7	3.38	24.8	382.1	0.729	447.7	1.52E-07	3.39E-08
2013	0	5.61	53.4	0.362	20.0	502.7	0.018	582.1	4.96E-07	8.52E-08
2014	0	8.19	84.1	0	14.3	590.0	0	696.5	2.04E-06	2.93E-07
2015	0	11.9	133.7	0	8.99	713.2	0	867.8	-3.25E-07	-3.74E-08
2016	0	10.2	126.7	0	8.13	506.2	0	651.2	4.71E-06	7.24E-07
2017	0	11.0	133.9	0	7.31	462.7	0	614.9	7.29E-09	1.19E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-15.9
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows					Total Inflows
	Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers	
	(acre-feet)					
Predevelopment	0	225.2	1.97	84.0	1.14	312.3
1980	0	219.6	3.35	97.5	1.72	322.2
1981	1.89	219.4	3.27	97.4	1.60	323.5
1982	2.32	219.1	3.26	97.5	1.65	323.8
1983	1.84	218.5	3.27	97.5	1.72	322.9
1984	0.075	217.2	3.34	97.6	2.03	320.3
1985	0	216.8	3.38	97.0	2.24	319.5
1986	0	218.3	3.41	96.7	2.34	320.7
1987	0	219.2	3.40	96.4	2.17	321.2
1988	9.13	214.7	3.34	97.0	1.67	325.9
1989	9.71	209.2	3.29	97.1	1.68	321.0
1990	26.5	205.6	3.15	98.2	1.03	334.5
1991	3.12	206.9	3.18	98.3	1.67	313.2
1992	0.049	210.9	3.18	98.5	1.76	314.5
1993	0	213.2	3.32	97.2	2.99	316.7
1994	0	214.0	3.40	96.2	3.07	316.6
1995	0	211.7	3.41	95.6	2.76	313.5
1996	1.01	206.9	3.41	95.7	2.53	309.5
1997	0.004	204.6	3.40	95.2	2.63	305.9
1998	3.24	202.2	3.36	95.3	2.34	306.4
1999	0.506	202.3	3.34	95.2	2.43	303.8
2000	8.36	199.3	3.32	95.7	2.19	308.8
2001	3.26	198.5	3.30	95.4	2.35	302.8
2002	5.57	198.5	3.29	95.5	2.25	305.2
2003	0.976	201.0	3.29	95.5	2.39	303.2
2004	0	206.8	3.31	95.5	2.56	308.2
2005	0	207.6	3.30	95.0	2.46	308.4
2006	0	207.6	3.30	94.9	2.41	308.1
2007	0	213.1	3.32	94.4	2.74	313.5
2008	0	212.2	3.31	94.4	2.39	312.3
2009	11.9	203.7	3.26	94.4	1.97	315.3
2010	40.8	190.2	3.21	95.4	1.56	331.2
2011	50.3	178.4	3.19	96.6	1.53	330.0
2012	118.4	147.9	3.63	100.1	0.729	370.7
2013	227.9	117.4	9.05	106.2	0.018	460.6
2014	321.0	106.6	30.5	115.4	0	573.6
2015	440.4	109.9	62.4	128.4	0	741.1
2016	300.2	115.7	84.7	138.3	0	639.0
2017	245.7	120.0	101.7	145.9	0	613.3

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the

Appendix J Table J-15.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Gonzales - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	Gonzales County UWCD	Pecan Valley GCD	Lavaca	Upper Layers			
	(acre-feet)								%
Predevelopment	0	0	46.5	46.3	62.5	157.0	312.3	9.37E-06	3.00E-06
1980	0	0.092	61.3	23.8	60.9	176.2	322.2	-5.81E-09	-1.80E-09
1981	0.827	0.101	61.4	23.8	61.0	176.4	323.5	-2.51E-08	-7.77E-09
1982	0.371	0.101	61.6	23.8	61.1	176.8	323.8	4.34E-11	1.34E-11
1983	0.205	0.101	61.7	23.7	61.2	176.0	322.9	-2.45E-08	-7.59E-09
1984	3.72	0.109	61.8	24.5	61.3	168.8	320.3	1.44E-07	4.48E-08
1985	8.61	0.109	61.5	25.3	61.2	162.8	319.5	6.21E-09	1.95E-09
1986	12.0	0.109	61.2	26.3	61.3	159.8	320.7	-1.23E-08	-3.84E-09
1987	8.97	0.109	61.1	26.9	61.5	162.6	321.2	3.96E-06	1.23E-06
1988	0.022	0.109	61.3	26.3	61.5	176.8	325.9	1.21E-08	3.71E-09
1989	0.016	0.109	60.4	25.5	60.9	174.1	321.0	1.77E-09	5.53E-10
1990	0	0.117	60.4	23.1	60.4	190.4	334.5	1.61E-08	4.81E-09
1991	0.086	0.126	60.0	22.9	60.3	169.9	313.2	1.96E-08	6.25E-09
1992	3.18	0.126	60.2	23.0	60.6	167.3	314.5	3.97E-07	1.26E-07
1993	27.9	0.134	59.5	25.4	60.7	143.1	316.7	1.06E-11	3.36E-12
1994	27.4	0.134	59.2	27.7	60.9	141.3	316.6	-1.27E-07	-4.01E-08
1995	16.4	0.134	58.9	28.9	61.0	148.2	313.5	2.96E-07	9.45E-08
1996	5.72	0.134	58.8	29.3	60.9	154.7	309.5	-3.10E-06	-1.00E-06
1997	5.70	0.134	58.3	29.3	60.5	151.9	305.9	7.18E-07	2.35E-07
1998	1.55	0.134	58.5	28.9	60.4	156.8	306.4	7.38E-09	2.41E-09
1999	1.92	0.134	58.3	28.6	60.4	154.5	303.8	-1.33E-10	-4.38E-11
2000	0.099	0.176	58.9	27.6	60.2	161.8	308.8	7.87E-07	2.55E-07
2001	0.193	0.142	58.8	26.9	60.0	156.8	302.8	-2.94E-09	-9.71E-10
2002	0.025	0.176	59.3	26.1	60.0	159.6	305.2	-5.05E-09	-1.65E-09
2003	1.18	0.151	59.7	25.8	60.1	156.2	303.2	5.77E-09	1.90E-09
2004	9.26	0.134	60.1	26.2	60.7	151.8	308.2	4.58E-09	1.49E-09
2005	7.57	0.134	59.9	26.6	60.8	153.3	308.4	-2.13E-09	-6.91E-10
2006	7.54	0.109	59.5	27.1	60.8	153.0	308.1	4.51E-09	1.46E-09
2007	21.1	0.084	58.9	28.7	61.2	143.5	313.5	1.02E-08	3.26E-09
2008	9.34	0.118	58.9	29.6	61.4	153.0	312.3	-1.71E-10	-5.47E-11
2009	0.047	0.184	58.8	28.7	60.7	166.8	315.3	3.93E-07	1.25E-07
2010	0	0.268	59.8	25.5	59.7	185.9	331.2	-6.91E-07	-2.09E-07
2011	0	0.268	60.7	21.6	58.6	188.9	330.0	-2.27E-07	-6.88E-08
2012	0	0.647	63.5	13.2	55.7	237.7	370.7	8.86E-08	2.39E-08
2013	0	1.25	93.5	1.93	49.7	314.3	460.6	3.64E-07	7.90E-08
2014	0	1.81	155.1	0	41.7	375.0	573.6	1.59E-06	2.78E-07
2015	0	2.65	252.7	0	31.3	454.5	741.1	-2.18E-07	-2.94E-08
2016	0	2.26	275.9	0	26.1	334.7	639.0	3.48E-06	5.45E-07
2017	0	2.45	296.1	0	22.4	292.3	613.3	6.43E-09	1.05E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Quarternary Alluvium (Layer 1)

Simulated Time Period	Inflows					Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Pecan Valley GCD	Lower Layers		Specific Storage	Specific Yield	River Package	Pecan Valley GCD	Lower Layers			
	(acre-feet)													%
Predevelopment	0	0	2.54E-11	2.25	46.4	48.7	0	0	1.07E-10	1.86	46.8	48.7	6.72E-10	1.38E-09
1980	0	0	2.55E-11	2.26	46.5	48.8	0	0	1.07E-10	1.86	46.9	48.8	-1.15E-12	-2.36E-12
1981	0	0	2.54E-11	2.25	46.4	48.7	3.92E-06	0.001	1.07E-10	1.86	46.8	48.7	-3.24E-11	-6.65E-11
1982	2.96E-07	6.14E-06	2.54E-11	2.25	46.4	48.7	1.51E-06	6.72E-04	1.07E-10	1.86	46.8	48.7	5.85E-12	1.20E-11
1983	1.21E-08	1.10E-06	2.54E-11	2.25	46.4	48.7	1.37E-06	6.03E-04	1.07E-10	1.86	46.8	48.7	-4.53E-11	-9.30E-11
1984	0	0	2.55E-11	2.26	46.5	48.8	2.45E-06	9.93E-04	1.07E-10	1.86	46.9	48.8	8.58E-11	1.76E-10
1985	0	0	2.54E-11	2.25	46.4	48.7	7.00E-06	0.003	1.07E-10	1.86	46.8	48.7	1.13E-11	2.33E-11
1986	0	0	2.54E-11	2.25	46.4	48.7	9.18E-06	0.004	1.07E-10	1.86	46.8	48.7	-2.26E-11	-4.65E-11
1987	0	0	2.54E-11	2.25	46.4	48.7	1.11E-05	0.005	1.07E-10	1.86	46.8	48.7	1.32E-09	2.72E-09
1988	9.91E-07	5.08E-05	2.55E-11	2.26	46.5	48.8	5.70E-06	0.003	1.07E-10	1.86	46.9	48.8	4.17E-11	8.54E-11
1989	5.33E-07	8.06E-05	2.54E-11	2.25	46.4	48.7	3.37E-06	0.001	1.07E-10	1.86	46.8	48.7	5.11E-12	1.05E-11
1990	9.32E-07	2.26E-04	2.54E-11	2.25	46.4	48.7	9.92E-07	4.42E-04	1.07E-10	1.86	46.8	48.7	7.98E-12	1.64E-11
1991	1.37E-10	6.99E-07	2.54E-11	2.25	46.4	48.7	3.68E-06	0.001	1.07E-10	1.86	46.8	48.7	1.68E-11	3.45E-11
1992	0	0	2.55E-11	2.26	46.5	48.8	6.49E-06	0.003	1.07E-10	1.86	46.9	48.8	1.48E-10	3.04E-10
1993	0	0	2.54E-11	2.25	46.4	48.7	8.86E-06	0.004	1.07E-10	1.86	46.8	48.7	-7.74E-13	-1.59E-12
1994	0	0	2.54E-11	2.25	46.4	48.7	1.21E-05	0.005	1.07E-10	1.86	46.8	48.7	3.34E-11	6.87E-11
1995	0	0	2.54E-11	2.25	46.4	48.7	1.10E-05	0.005	1.07E-10	1.86	46.8	48.7	1.19E-10	2.45E-10
1996	3.75E-07	9.58E-06	2.55E-11	2.26	46.5	48.8	8.46E-06	0.004	1.07E-10	1.86	46.9	48.8	-1.64E-09	-3.36E-09
1997	0	0	2.54E-11	2.25	46.4	48.7	1.25E-05	0.005	1.07E-10	1.86	46.8	48.7	3.13E-10	6.44E-10
1998	0	0	2.54E-11	2.25	46.4	48.7	1.17E-05	0.005	1.07E-10	1.86	46.8	48.7	-1.00E-11	-2.05E-11
1999	3.06E-07	6.92E-06	2.54E-11	2.25	46.4	48.7	9.32E-06	0.004	1.07E-10	1.86	46.8	48.7	1.54E-11	3.17E-11
2000	2.18E-07	2.23E-05	2.55E-11	2.26	46.5	48.8	7.78E-06	0.003	1.07E-10	1.86	46.9	48.8	1.19E-10	2.44E-10
2001	0	0	2.54E-11	2.25	46.4	48.7	7.84E-06	0.003	1.07E-10	1.86	46.8	48.7	3.84E-12	7.90E-12
2002	0	0	2.54E-11	2.25	46.4	48.7	1.00E-05	0.004	1.07E-10	1.86	46.8	48.7	1.61E-11	3.30E-11
2003	1.33E-07	8.45E-07	2.54E-11	2.25	46.4	48.7	8.11E-06	0.004	1.07E-10	1.86	46.8	48.7	6.99E-11	1.44E-10
2004	2.56E-15	3.26E-09	2.55E-11	2.26	46.5	48.8	8.81E-06	0.004	1.07E-10	1.86	46.9	48.8	-1.41E-11	-2.88E-11
2005	8.44E-07	8.98E-05	2.54E-11	2.25	46.4	48.7	4.88E-06	0.002	1.07E-10	1.86	46.8	48.7	2.15E-11	4.42E-11
2006	2.45E-07	7.66E-05	2.54E-11	2.25	46.4	48.7	4.02E-06	0.002	1.07E-10	1.86	46.8	48.7	-1.43E-11	-2.95E-11
2007	0	0	2.54E-11	2.25	46.4	48.7	1.63E-05	0.006	1.07E-10	1.86	46.8	48.7	1.17E-11	2.40E-11
2008	8.19E-07	1.01E-05	2.55E-11	2.26	46.5	48.8	9.24E-06	0.004	1.07E-10	1.86	46.9	48.8	-1.76E-11	-3.61E-11
2009	1.69E-07	1.45E-05	2.54E-11	2.25	46.4	48.7	7.69E-06	0.003	1.07E-10	1.86	46.8	48.7	6.30E-11	1.29E-10
2010	3.06E-06	7.75E-04	2.54E-11	2.25	46.4	48.7	8.89E-07	3.82E-04	1.07E-10	1.86	46.8	48.7	-2.10E-10	-4.32E-10
2011	1.52E-05	0.006	2.54E-11	2.25	46.4	48.7	0	0	1.07E-10	1.86	46.8	48.7	6.77E-11	1.39E-10
2012	3.54E-05	0.014	2.55E-11	2.26	46.5	48.8	0	0	1.07E-10	1.86	46.9	48.8	6.64E-11	1.36E-10
2013	6.86E-05	0.027	2.54E-11	2.25	46.4	48.7	0	0	1.07E-10	1.86	46.8	48.7	-8.85E-11	-1.82E-10
2014	1.10E-04	0.045	2.54E-11	2.25	46.4	48.7	0	0	1.07E-10	1.86	46.8	48.7	-6.45E-10	-1.33E-09
2015	1.59E-04	0.065	2.54E-11	2.25	46.4	48.7	0	0	1.07E-10	1.86	46.8	48.7	-8.22E-11	-1.69E-10
2016	1.65E-04	0.071	2.55E-11	2.26	46.5	48.8	0	0	1.07E-10	1.86	47.0	48.8	3.23E-09	6.61E-09
2017	1.80E-04	0.077	2.54E-11	2.25	46.4	48.7	0	0	1.07E-10	1.86	46.8	48.7	3.38E-12	6.93E-12

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - (Layer 2) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Fayette County GCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	5,426	1.77E-04	1.93E-04	3.90E-04	46.8	16,547	22,020
1980	0	0	5,454	1.77E-04	1.93E-04	3.91E-04	46.9	16,569	22,069
1981	0	0	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,524	22,009
1982	0.006	0.015	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,524	22,009
1983	8.10E-04	0.002	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,524	22,009
1984	0	0	5,453	1.77E-04	1.93E-04	3.91E-04	46.9	16,569	22,069
1985	0	0	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,525	22,009
1986	0	0	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,525	22,010
1987	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
1988	0.024	0.058	5,453	1.77E-04	1.93E-04	3.91E-04	46.9	16,570	22,070
1989	0.016	0.037	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,525	22,009
1990	0.019	0.044	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,524	22,009
1991	0	0	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,525	22,009
1992	0	0	5,453	1.77E-04	1.93E-04	3.91E-04	46.9	16,570	22,070
1993	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
1994	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
1995	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
1996	0.009	0.022	5,452	1.77E-04	1.93E-04	3.91E-04	46.9	16,571	22,070
1997	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,010
1998	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,010
1999	0.007	0.018	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,010
2000	0.006	0.015	5,452	1.77E-04	1.93E-04	3.91E-04	46.9	16,572	22,071
2001	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,010
2002	0	0	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,010
2003	0.002	0.006	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,010
2004	2.72E-04	0.001	5,452	1.77E-04	1.93E-04	3.91E-04	46.9	16,572	22,071
2005	0.021	0.050	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
2006	0.007	0.016	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
2007	0	0	5,436	1.77E-04	1.93E-04	3.90E-04	46.8	16,528	22,011
2008	0.017	0.042	5,451	1.77E-04	1.93E-04	3.91E-04	46.9	16,573	22,071
2009	0.006	0.013	5,436	1.77E-04	1.93E-04	3.90E-04	46.8	16,527	22,011
2010	0.050	0.117	5,437	1.77E-04	1.93E-04	3.90E-04	46.8	16,526	22,010
2011	0.082	0.192	5,438	1.77E-04	1.93E-04	3.90E-04	46.8	16,524	22,009
2012	0.136	0.322	5,455	1.77E-04	1.93E-04	3.91E-04	46.9	16,566	22,068
2013	0.228	0.541	5,443	1.77E-04	1.93E-04	3.90E-04	46.8	16,516	22,006
2014	0.311	0.736	5,447	1.77E-04	1.93E-04	3.90E-04	46.8	16,508	22,003
2015	0.396	0.938	5,452	1.77E-04	1.93E-04	3.90E-04	46.8	16,499	22,000
2016	0.216	0.507	5,470	1.77E-04	1.93E-04	3.91E-04	47.0	16,540	22,058
2017	0.214	0.504	5,458	1.77E-04	1.93E-04	3.90E-04	46.8	16,491	21,996

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	16,561	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,412	22,020	3.27E-10	1.49E-12
1980	0	0	16,582	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,440	22,069	2.18E-11	9.89E-14
1981	0.021	0.051	16,538	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-7.28E-11	-3.31E-13
1982	0	0	16,537	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	8.00E-11	3.64E-13
1983	9.42E-08	4.28E-08	16,537	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-2.55E-11	-1.16E-13
1984	0.006	0.015	16,583	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,440	22,069	-9.09E-11	-4.12E-13
1985	0.028	0.065	16,538	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-4.73E-11	-2.15E-13
1986	0.023	0.053	16,539	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-5.82E-11	-2.64E-13
1987	0.021	0.048	16,539	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-1.46E-11	-6.61E-14
1988	0	0	16,584	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,439	22,070	-5.46E-11	-2.47E-13
1989	0	0	16,538	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-4.73E-11	-2.15E-13
1990	0	0	16,538	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-4.00E-11	-1.82E-13
1991	0.014	0.034	16,538	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-9.46E-11	-4.30E-13
1992	0.021	0.049	16,584	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,439	22,070	-5.82E-11	-2.64E-13
1993	0.022	0.051	16,539	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-6.18E-11	-2.81E-13
1994	0.028	0.065	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-4.73E-11	-2.15E-13
1995	0.007	0.015	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-6.18E-11	-2.81E-13
1996	0	0	16,585	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,439	22,070	-1.75E-10	-7.91E-13
1997	0.024	0.057	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,423	22,010	-2.91E-11	-1.32E-13
1998	0.008	0.020	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,423	22,010	1.46E-11	6.61E-14
1999	0	0	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-8.73E-11	-3.97E-13
2000	0	0	16,585	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,438	22,071	-5.09E-11	-2.31E-13
2001	0.003	0.006	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-1.09E-10	-4.96E-13
2002	0.016	0.038	16,541	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,423	22,010	-2.55E-11	-1.16E-13
2003	0	0	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,423	22,010	-4.73E-11	-2.15E-13
2004	0.006	0.014	16,586	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,438	22,071	-8.73E-11	-3.96E-13
2005	0	0	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-9.82E-11	-4.46E-13
2006	0	0	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-3.64E-11	-1.65E-13
2007	0.068	0.161	16,542	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,423	22,011	-4.73E-11	-2.15E-13
2008	0	0	16,586	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,438	22,071	-1.27E-10	-5.77E-13
2009	4.17E-04	0.002	16,541	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,423	22,011	-4.73E-11	-2.15E-13
2010	0	0	16,540	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,424	22,010	-1.02E-10	-4.63E-13
2011	0	0	16,538	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,425	22,009	-1.20E-10	-5.45E-13
2012	0	0	16,580	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,442	22,068	-9.82E-11	-4.45E-13
2013	0	0	16,530	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,430	22,006	-9.46E-11	-4.30E-13
2014	0	0	16,523	9.54E-05	4.10E-04	9.01E-04	2.93E-04	46.5	5,434	22,003	-1.13E-10	-5.13E-13
2015	0	0	16,514	9.55E-05	4.10E-04	9.00E-04	2.93E-04	46.5	5,439	22,000	-1.02E-10	-4.63E-13
2016	0	0	16,555	9.57E-05	4.11E-04	9.03E-04	2.93E-04	46.6	5,457	22,058	-9.82E-11	-4.45E-13
2017	0	0	16,505	9.55E-05	4.10E-04	9.00E-04	2.93E-04	46.5	5,444	21,996	-4.73E-11	-2.15E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Fayette County GCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	3,704	141.7	70.0	254.8	5,419	9,072	18,661
1980	0	3,718	142.1	70.2	255.6	5,447	9,063	18,696
1981	0	3,708	141.7	70.0	254.9	5,431	9,039	18,645
1982	0.007	3,708	141.7	70.0	254.9	5,432	9,038	18,645
1983	1.96E-04	3,708	141.7	70.0	254.9	5,432	9,038	18,645
1984	0	3,718	142.1	70.2	255.6	5,446	9,063	18,696
1985	0	3,708	141.7	70.0	254.9	5,431	9,040	18,645
1986	0	3,708	141.7	70.0	254.9	5,431	9,040	18,646
1987	0	3,708	141.7	70.0	254.9	5,431	9,041	18,646
1988	0.021	3,718	142.1	70.2	255.6	5,446	9,065	18,697
1989	0.011	3,708	141.7	70.0	254.9	5,431	9,040	18,645
1990	0.014	3,708	141.7	70.0	254.9	5,431	9,039	18,645
1991	0	3,708	141.7	70.0	254.9	5,431	9,040	18,645
1992	0	3,718	142.1	70.2	255.6	5,446	9,065	18,697
1993	0	3,708	141.7	70.0	254.9	5,431	9,041	18,646
1994	0	3,708	141.7	70.0	254.9	5,430	9,042	18,646
1995	0	3,708	141.7	70.0	254.9	5,430	9,042	18,646
1996	0.008	3,718	142.1	70.2	255.6	5,445	9,066	18,697
1997	0	3,708	141.7	70.0	254.9	5,430	9,043	18,647
1998	0	3,708	141.7	70.0	254.9	5,430	9,043	18,647
1999	0.007	3,708	141.7	70.0	254.9	5,430	9,042	18,647
2000	0.005	3,718	142.1	70.2	255.6	5,445	9,067	18,698
2001	0	3,708	141.7	70.0	254.9	5,430	9,042	18,647
2002	0	3,708	141.7	70.0	254.9	5,430	9,043	18,647
2003	0.003	3,708	141.7	70.0	254.9	5,430	9,043	18,647
2004	1.92E-04	3,718	142.1	70.2	255.6	5,445	9,068	18,698
2005	0.017	3,708	141.7	70.0	254.9	5,430	9,042	18,647
2006	0.004	3,708	141.7	70.0	254.9	5,430	9,042	18,646
2007	0	3,707	141.7	70.0	254.9	5,429	9,045	18,648
2008	0.019	3,718	142.1	70.2	255.6	5,445	9,068	18,698
2009	0.004	3,707	141.7	70.0	254.9	5,430	9,043	18,647
2010	0.039	3,708	141.7	70.0	254.9	5,430	9,042	18,646
2011	0.062	3,708	141.7	70.0	254.9	5,431	9,039	18,645
2012	0.103	3,719	142.1	70.2	255.6	5,448	9,059	18,694
2013	0.173	3,709	141.7	70.0	254.9	5,436	9,027	18,639
2014	0.232	3,711	141.7	70.0	254.9	5,441	9,016	18,634
2015	0.294	3,712	141.7	70.0	254.9	5,446	9,003	18,628
2016	0.142	3,723	142.0	70.2	255.6	5,463	9,022	18,676
2017	0.154	3,714	141.7	70.0	254.9	5,451	8,991	18,622

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	402.0	75.5	433.4	245.0	218.4	16,439	848.0	18,661	1.23E-07	6.62E-10
1980	0	401.9	75.6	434.6	245.6	219.0	16,460	858.4	18,696	1.26E-09	6.73E-12
1981	0.017	400.9	75.4	433.4	244.9	218.4	16,416	855.8	18,645	-2.25E-08	-1.21E-10
1982	0	400.9	75.4	433.4	244.9	218.4	16,416	855.9	18,645	0	0
1983	1.82E-06	400.9	75.4	433.4	244.9	218.4	16,416	855.9	18,645	-3.28E-08	-1.76E-10
1984	0.005	402.0	75.6	434.6	245.6	219.0	16,461	858.2	18,696	6.15E-08	3.29E-10
1985	0.022	400.9	75.4	433.4	244.9	218.4	16,417	855.6	18,645	4.11E-10	2.20E-12
1986	0.016	400.9	75.4	433.4	244.9	218.4	16,417	855.4	18,646	-1.13E-08	-6.04E-11
1987	0.014	401.0	75.4	433.4	244.9	218.4	16,418	855.3	18,646	8.67E-07	4.65E-09
1988	0	402.0	75.6	434.6	245.6	219.0	16,462	857.9	18,697	2.87E-08	1.54E-10
1989	0	400.9	75.4	433.4	244.9	218.4	16,417	855.7	18,645	1.74E-09	9.35E-12
1990	0	400.9	75.4	433.4	244.9	218.4	16,416	855.8	18,645	3.46E-09	1.86E-11
1991	0.013	400.9	75.4	433.4	244.9	218.4	16,417	855.7	18,645	8.47E-09	4.54E-11
1992	0.016	402.0	75.6	434.6	245.6	219.0	16,462	857.8	18,697	1.13E-07	6.05E-10
1993	0.016	401.0	75.4	433.4	244.9	218.4	16,417	855.3	18,646	-2.26E-10	-1.21E-12
1994	0.021	401.0	75.4	433.4	244.9	218.4	16,418	855.1	18,646	2.14E-08	1.15E-10
1995	0.003	401.0	75.4	433.4	244.9	218.4	16,418	855.1	18,646	7.18E-08	3.85E-10
1996	0	402.1	75.6	434.6	245.6	219.0	16,463	857.5	18,697	-1.05E-06	-5.60E-09
1997	0.020	401.0	75.4	433.4	244.9	218.4	16,419	854.9	18,647	1.98E-07	1.06E-09
1998	0.005	401.0	75.4	433.4	244.9	218.4	16,419	854.9	18,647	-3.67E-09	-1.97E-11
1999	0	401.0	75.4	433.4	244.9	218.4	16,418	855.0	18,647	1.96E-10	1.05E-12
2000	0	402.1	75.6	434.6	245.6	219.0	16,463	857.4	18,698	8.88E-08	4.75E-10
2001	0.003	401.0	75.4	433.4	244.9	218.4	16,418	855.0	18,647	-3.93E-10	-2.11E-12
2002	0.013	401.0	75.4	433.4	244.9	218.4	16,419	854.8	18,647	3.27E-10	1.76E-12
2003	0	401.0	75.4	433.4	244.9	218.4	16,419	854.9	18,647	4.33E-08	2.32E-10
2004	0.005	402.1	75.7	434.6	245.6	219.0	16,464	857.2	18,698	5.09E-10	2.72E-12
2005	0	401.0	75.4	433.4	244.9	218.4	16,418	855.0	18,647	5.68E-09	3.05E-11
2006	0	401.0	75.4	433.4	244.9	218.4	16,418	855.1	18,646	-3.72E-09	-2.00E-11
2007	0.055	401.1	75.4	433.4	244.9	218.4	16,420	854.4	18,648	2.92E-09	1.57E-11
2008	0	402.1	75.7	434.6	245.6	219.0	16,464	857.0	18,698	1.31E-10	7.00E-13
2009	4.39E-04	401.0	75.4	433.4	244.9	218.4	16,419	854.7	18,647	3.98E-08	2.14E-10
2010	0	401.0	75.4	433.4	244.9	218.4	16,418	855.2	18,646	-1.48E-07	-7.96E-10
2011	0	400.9	75.4	433.4	244.9	218.4	16,416	855.9	18,645	4.22E-08	2.26E-10
2012	0	401.8	75.6	434.6	245.5	219.0	16,458	859.4	18,694	5.08E-08	2.72E-10
2013	0	400.4	75.4	433.4	244.9	218.4	16,408	859.1	18,639	-5.08E-08	-2.73E-10
2014	0	400.1	75.4	433.4	244.8	218.4	16,400	861.9	18,634	-4.15E-07	-2.23E-09
2015	0	399.6	75.4	433.3	244.8	218.4	16,391	865.3	18,628	-5.67E-08	-3.04E-10
2016	0	400.5	75.6	434.5	245.4	219.0	16,432	869.1	18,676	1.99E-06	1.06E-08
2017	0	399.1	75.4	433.3	244.8	218.4	16,383	868.5	18,622	-2.27E-09	-1.22E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.4
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Fayette County GCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0.172	0.073	0.172	848.0	9,086	9,935
1980	0	0.173	0.074	0.172	858.4	9,077	9,936
1981	0	0.172	0.073	0.172	855.8	9,053	9,909
1982	0.004	0.172	0.073	0.172	855.9	9,053	9,909
1983	8.59E-07	0.172	0.073	0.172	855.9	9,053	9,909
1984	0	0.173	0.074	0.172	858.2	9,078	9,936
1985	0	0.172	0.073	0.172	855.6	9,054	9,910
1986	0	0.172	0.073	0.172	855.4	9,055	9,910
1987	0	0.172	0.073	0.172	855.3	9,055	9,911
1988	0.011	0.173	0.074	0.172	857.9	9,079	9,937
1989	0.005	0.172	0.073	0.172	855.7	9,054	9,910
1990	0.006	0.172	0.073	0.172	855.8	9,053	9,909
1991	0	0.172	0.073	0.172	855.7	9,054	9,910
1992	0	0.173	0.074	0.172	857.8	9,079	9,938
1993	0	0.172	0.073	0.172	855.3	9,055	9,911
1994	0	0.172	0.073	0.172	855.1	9,056	9,912
1995	0	0.172	0.073	0.172	855.1	9,056	9,912
1996	0.004	0.173	0.074	0.172	857.5	9,081	9,939
1997	0	0.172	0.073	0.172	854.9	9,057	9,912
1998	0	0.172	0.073	0.172	854.9	9,057	9,912
1999	0.003	0.172	0.073	0.172	855.0	9,057	9,912
2000	0.002	0.173	0.074	0.172	857.4	9,081	9,939
2001	0	0.172	0.073	0.172	855.0	9,057	9,912
2002	0	0.172	0.073	0.172	854.8	9,057	9,912
2003	0.002	0.172	0.073	0.172	854.9	9,057	9,912
2004	2.17E-05	0.173	0.074	0.172	857.2	9,082	9,940
2005	0.008	0.172	0.073	0.172	855.0	9,056	9,912
2006	0.001	0.172	0.073	0.172	855.1	9,056	9,912
2007	0	0.172	0.073	0.172	854.4	9,059	9,914
2008	0.010	0.173	0.074	0.172	857.0	9,083	9,940
2009	0.002	0.172	0.073	0.172	854.7	9,058	9,913
2010	0.019	0.172	0.073	0.172	855.2	9,056	9,911
2011	0.029	0.172	0.073	0.172	855.9	9,053	9,909
2012	0.048	0.173	0.074	0.172	859.4	9,073	9,933
2013	0.081	0.172	0.073	0.172	859.1	9,041	9,900
2014	0.108	0.172	0.073	0.171	861.9	9,030	9,893
2015	0.136	0.173	0.073	0.171	865.3	9,017	9,883
2016	0.061	0.173	0.073	0.172	869.1	9,036	9,906
2017	0.071	0.173	0.073	0.171	868.5	9,005	9,874

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0.084	0.397	0.155	0.178	9,089	845.0	9,935	7.66E-09	7.71E-11
1980	0	0.084	0.398	0.155	0.179	9,080	855.4	9,936	8.37E-11	8.42E-13
1981	0.008	0.084	0.397	0.155	0.179	9,056	852.9	9,909	-1.39E-09	-1.40E-11
1982	0	0.084	0.397	0.155	0.179	9,055	852.9	9,909	5.46E-12	5.51E-14
1983	3.89E-05	0.084	0.397	0.155	0.179	9,055	852.9	9,909	-2.05E-09	-2.07E-11
1984	0.003	0.084	0.398	0.155	0.179	9,080	855.2	9,936	3.82E-09	3.85E-11
1985	0.010	0.084	0.397	0.155	0.179	9,056	852.6	9,910	2.36E-11	2.39E-13
1986	0.007	0.084	0.397	0.155	0.179	9,057	852.5	9,910	-7.00E-10	-7.07E-12
1987	0.007	0.084	0.397	0.155	0.179	9,058	852.3	9,911	5.40E-08	5.44E-10
1988	0	0.084	0.398	0.155	0.179	9,082	854.9	9,937	1.80E-09	1.82E-11
1989	0	0.084	0.397	0.155	0.179	9,056	852.7	9,910	1.00E-10	1.01E-12
1990	0	0.084	0.397	0.155	0.179	9,056	852.9	9,909	2.18E-10	2.20E-12
1991	0.007	0.084	0.397	0.155	0.179	9,056	852.7	9,910	5.26E-10	5.30E-12
1992	0.007	0.084	0.398	0.155	0.179	9,082	854.9	9,938	7.06E-09	7.10E-11
1993	0.007	0.084	0.397	0.155	0.179	9,058	852.3	9,911	-3.64E-12	-3.67E-14
1994	0.010	0.084	0.397	0.155	0.179	9,059	852.1	9,912	1.33E-09	1.34E-11
1995	0.001	0.084	0.397	0.155	0.179	9,059	852.1	9,912	4.46E-09	4.50E-11
1996	0	0.084	0.398	0.155	0.179	9,083	854.5	9,939	-6.53E-08	-6.57E-10
1997	0.010	0.084	0.397	0.155	0.179	9,059	851.9	9,912	1.24E-08	1.25E-10
1998	0.002	0.084	0.397	0.155	0.179	9,059	851.9	9,912	-2.40E-10	-2.42E-12
1999	0	0.084	0.397	0.155	0.179	9,059	852.0	9,912	1.64E-11	1.65E-13
2000	0	0.084	0.398	0.155	0.179	9,084	854.4	9,939	5.50E-09	5.54E-11
2001	0.001	0.084	0.397	0.155	0.179	9,059	852.0	9,912	-3.46E-11	-3.49E-13
2002	0.006	0.084	0.397	0.155	0.179	9,060	851.8	9,912	5.46E-12	5.51E-14
2003	0	0.084	0.397	0.155	0.179	9,060	851.9	9,912	2.70E-09	2.72E-11
2004	0.002	0.084	0.398	0.155	0.179	9,085	854.2	9,940	3.09E-11	3.11E-13
2005	0	0.084	0.397	0.155	0.179	9,059	852.1	9,912	3.64E-10	3.67E-12
2006	0	0.084	0.397	0.155	0.179	9,059	852.1	9,912	-2.22E-10	-2.24E-12
2007	0.027	0.084	0.397	0.155	0.178	9,061	851.4	9,914	1.86E-10	1.87E-12
2008	0	0.084	0.398	0.155	0.179	9,085	854.1	9,940	3.64E-12	3.66E-14
2009	1.80E-04	0.084	0.397	0.155	0.179	9,060	851.7	9,913	2.49E-09	2.51E-11
2010	0	0.084	0.397	0.155	0.179	9,058	852.2	9,911	-9.21E-09	-9.29E-11
2011	0	0.084	0.397	0.155	0.179	9,056	852.9	9,909	2.62E-09	2.65E-11
2012	0	0.084	0.398	0.155	0.179	9,076	856.5	9,933	3.16E-09	3.18E-11
2013	0	0.083	0.397	0.155	0.179	9,043	856.2	9,900	-3.21E-09	-3.24E-11
2014	0	0.083	0.397	0.155	0.179	9,033	858.9	9,893	-2.59E-08	-2.62E-10
2015	0	0.083	0.397	0.155	0.179	9,020	862.4	9,883	-3.52E-09	-3.56E-11
2016	0	0.084	0.398	0.155	0.179	9,039	866.2	9,906	1.24E-07	1.25E-09
2017	0	0.083	0.397	0.155	0.179	9,007	865.6	9,874	-1.40E-10	-1.42E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Gonzales	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	3,226	14,327	2,756	4,044	845.0	2,253	27,450
1980	0	3,331	14,507	2,790	4,079	855.4	2,183	27,744
1981	0	3,319	14,464	2,782	4,069	852.9	2,178	27,665
1982	0.337	3,320	14,465	2,782	4,069	852.9	2,179	27,669
1983	8.84E-06	3,320	14,465	2,782	4,069	852.9	2,179	27,669
1984	0	3,329	14,504	2,790	4,080	855.2	2,187	27,745
1985	0	3,317	14,460	2,782	4,070	852.6	2,182	27,663
1986	0	3,315	14,457	2,781	4,070	852.5	2,184	27,660
1987	0	3,313	14,455	2,781	4,070	852.3	2,185	27,655
1988	0.956	3,325	14,498	2,788	4,079	854.9	2,191	27,737
1989	0.414	3,317	14,461	2,781	4,067	852.7	2,184	27,663
1990	0.559	3,319	14,463	2,782	4,065	852.9	2,180	27,663
1991	0	3,317	14,461	2,782	4,066	852.7	2,180	27,659
1992	0	3,324	14,498	2,789	4,078	854.9	2,185	27,729
1993	0	3,313	14,455	2,780	4,068	852.3	2,183	27,651
1994	0	3,311	14,451	2,780	4,069	852.1	2,186	27,648
1995	0	3,310	14,450	2,780	4,068	852.1	2,189	27,650
1996	0.364	3,320	14,491	2,787	4,079	854.5	2,197	27,730
1997	0	3,309	14,448	2,779	4,068	851.9	2,193	27,648
1998	0	3,308	14,447	2,779	4,068	851.9	2,194	27,649
1999	0.304	3,309	14,448	2,779	4,068	852.0	2,196	27,652
2000	0.185	3,319	14,490	2,787	4,079	854.4	2,202	27,730
2001	0	3,309	14,449	2,779	4,068	852.0	2,196	27,654
2002	0	3,308	14,447	2,780	4,068	851.8	2,196	27,650
2003	0.167	3,308	14,447	2,779	4,068	851.9	2,197	27,652
2004	9.28E-04	3,317	14,482	2,786	4,080	854.2	2,204	27,723
2005	0.749	3,310	14,445	2,778	4,067	852.1	2,200	27,653
2006	0.117	3,310	14,445	2,778	4,067	852.1	2,201	27,653
2007	0	3,303	14,437	2,778	4,069	851.4	2,202	27,639
2008	0.940	3,315	14,478	2,784	4,078	854.1	2,209	27,719
2009	0.139	3,306	14,444	2,778	4,067	851.7	2,202	27,649
2010	1.70	3,311	14,452	2,780	4,067	852.2	2,200	27,663
2011	2.56	3,319	14,463	2,781	4,066	852.9	2,197	27,682
2012	4.25	3,341	14,522	2,790	4,068	856.5	2,192	27,774
2013	7.17	3,355	14,515	2,786	4,041	856.2	2,163	27,723
2014	9.53	3,385	14,561	2,791	4,023	858.9	2,129	27,757
2015	12.0	3,422	14,619	2,797	3,999	862.4	2,081	27,793
2016	5.33	3,449	14,685	2,809	4,006	866.2	2,052	27,872
2017	6.23	3,459	14,675	2,805	3,987	865.6	2,012	27,810

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	General Head Boundaries	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers			
	(acre-feet)								%
Predevelopment	0	5,613	1,122	7,305	4,324	9,086	27,450	1.39E-04	5.05E-07
1980	0	5,408	1,144	7,663	4,453	9,077	27,744	1.47E-06	5.30E-09
1981	0.737	5,398	1,140	7,635	4,438	9,053	27,665	-2.66E-05	-9.61E-08
1982	0	5,395	1,140	7,640	4,440	9,053	27,669	2.93E-08	1.06E-10
1983	0.006	5,395	1,140	7,640	4,440	9,053	27,669	-3.88E-05	-1.40E-07
1984	0.224	5,412	1,143	7,660	4,452	9,078	27,745	7.25E-05	2.61E-07
1985	0.922	5,403	1,139	7,631	4,435	9,054	27,663	5.01E-07	1.81E-09
1986	0.640	5,408	1,139	7,625	4,432	9,055	27,660	-1.33E-05	-4.80E-08
1987	0.583	5,412	1,139	7,619	4,430	9,055	27,655	0.001	3.70E-06
1988	0	5,420	1,143	7,646	4,449	9,079	27,737	3.40E-05	1.23E-07
1989	0	5,403	1,140	7,628	4,438	9,054	27,663	2.08E-06	7.53E-09
1990	0	5,399	1,140	7,630	4,441	9,053	27,663	4.12E-06	1.49E-08
1991	0.594	5,403	1,140	7,625	4,437	9,054	27,659	1.00E-05	3.63E-08
1992	0.647	5,422	1,143	7,639	4,445	9,079	27,729	1.34E-04	4.83E-07
1993	0.640	5,412	1,139	7,615	4,431	9,055	27,651	-2.33E-07	-8.43E-10
1994	0.842	5,417	1,138	7,609	4,427	9,056	27,648	2.65E-05	9.57E-08
1995	0.083	5,418	1,138	7,609	4,428	9,056	27,650	8.52E-05	3.08E-07
1996	0	5,430	1,142	7,634	4,443	9,081	27,730	-1.24E-03	-4.46E-06
1997	0.884	5,422	1,138	7,605	4,426	9,057	27,648	2.34E-04	8.47E-07
1998	0.161	5,423	1,138	7,605	4,426	9,057	27,649	-4.27E-06	-1.54E-08
1999	0	5,421	1,138	7,609	4,428	9,057	27,652	2.06E-07	7.47E-10
2000	0	5,434	1,141	7,632	4,442	9,081	27,730	1.04E-04	3.75E-07
2001	0.129	5,420	1,138	7,610	4,429	9,057	27,654	-4.78E-07	-1.73E-09
2002	0.545	5,424	1,138	7,605	4,426	9,057	27,650	3.96E-07	1.43E-09
2003	0	5,423	1,138	7,607	4,427	9,057	27,652	5.12E-05	1.85E-07
2004	0.230	5,439	1,140	7,625	4,437	9,082	27,723	5.95E-07	2.15E-09
2005	0	5,420	1,138	7,610	4,430	9,056	27,653	6.77E-06	2.45E-08
2006	0	5,419	1,138	7,610	4,431	9,056	27,653	-4.39E-06	-1.59E-08
2007	2.38	5,435	1,136	7,589	4,418	9,059	27,639	3.49E-06	1.26E-08
2008	0	5,444	1,140	7,617	4,436	9,083	27,719	1.35E-07	4.87E-10
2009	0.012	5,428	1,137	7,600	4,426	9,058	27,649	4.43E-05	1.60E-07
2010	0	5,416	1,139	7,618	4,434	9,056	27,663	-1.76E-04	-6.35E-07
2011	0	5,399	1,140	7,644	4,446	9,053	27,682	4.83E-05	1.74E-07
2012	0	5,385	1,147	7,690	4,479	9,073	27,774	6.01E-05	2.16E-07
2013	0	5,323	1,150	7,710	4,500	9,041	27,723	-5.91E-05	-2.13E-07
2014	0	5,259	1,158	7,767	4,543	9,030	27,757	-4.91E-04	-1.77E-06
2015	0	5,178	1,168	7,834	4,595	9,017	27,793	-6.73E-05	-2.42E-07
2016	0	5,156	1,175	7,882	4,623	9,036	27,872	0.002	8.49E-06
2017	0	5,100	1,177	7,896	4,633	9,005	27,810	-2.97E-06	-1.07E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Reklaw Formation (Layer 6)

Simulated Time Period	Inflows						Total Inflows	Outflows					Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Lower Layers		Specific Storage	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers			
	(acre-feet)														%
Predevelopment	0	7.52	3.91	0	5.12	2,252	2,269	0	1.97	5.74	7.62	2,253	2,269	8.75E-07	3.86E-08
1980	0	7.72	3.92	0	5.01	2,184	2,201	0	2.09	6.78	8.68	2,183	2,201	2.63E-09	1.19E-10
1981	0.003	7.69	3.94	0	5.05	2,179	2,196	0.069	2.08	6.78	8.66	2,178	2,196	-4.44E-08	-2.02E-09
1982	0.008	7.69	3.94	0	5.06	2,180	2,196	0.013	2.08	6.79	8.66	2,179	2,196	5.50E-11	2.51E-12
1983	4.48E-04	7.69	3.94	0	5.06	2,180	2,197	0.014	2.08	6.80	8.65	2,179	2,197	-6.42E-08	-2.92E-09
1984	0	7.71	3.96	0	5.12	2,188	2,205	0.082	2.09	6.80	8.61	2,187	2,205	1.22E-07	5.52E-09
1985	0	7.68	3.95	0	5.11	2,183	2,200	0.112	2.08	6.77	8.55	2,182	2,200	1.10E-09	5.01E-11
1986	0	7.68	3.95	0	5.13	2,185	2,201	0.106	2.07	6.76	8.51	2,184	2,201	-2.20E-08	-1.00E-09
1987	0	7.67	3.95	0	5.12	2,186	2,202	0.081	2.07	6.76	8.52	2,185	2,202	1.75E-06	7.95E-08
1988	0.064	7.69	3.96	0	5.10	2,191	2,208	0	2.08	6.79	8.62	2,191	2,208	5.60E-08	2.54E-09
1989	0.043	7.68	3.94	0	5.07	2,185	2,202	6.23E-06	2.08	6.77	8.61	2,184	2,202	3.39E-09	1.54E-10
1990	0.180	7.68	3.94	0	5.00	2,181	2,198	0	2.09	6.81	8.78	2,180	2,198	7.08E-09	3.22E-10
1991	0.006	7.69	3.95	0	5.04	2,181	2,197	0.025	2.09	6.78	8.68	2,180	2,197	1.69E-08	7.68E-10
1992	2.58E-06	7.71	3.97	0	5.06	2,186	2,203	0.015	2.09	6.80	8.70	2,185	2,203	2.27E-07	1.03E-08
1993	0	7.68	3.96	0	5.11	2,184	2,200	0.185	2.08	6.71	8.47	2,183	2,200	-3.14E-10	-1.43E-11
1994	0	7.67	3.96	0	5.13	2,187	2,204	0.190	2.07	6.67	8.39	2,186	2,204	3.97E-08	1.80E-09
1995	0	7.67	3.95	0	5.12	2,189	2,206	0.120	2.07	6.65	8.38	2,189	2,206	1.45E-07	6.58E-09
1996	2.06E-04	7.69	3.95	0	5.12	2,198	2,215	0.074	2.08	6.65	8.40	2,197	2,215	-2.08E-06	-9.41E-08
1997	0	7.66	3.94	0	5.10	2,193	2,210	0.126	2.07	6.61	8.35	2,193	2,210	3.96E-07	1.79E-08
1998	3.62E-04	7.66	3.95	0	5.09	2,194	2,211	0.073	2.07	6.61	8.37	2,194	2,211	-5.80E-09	-2.62E-10
1999	2.25E-04	7.66	3.95	0	5.10	2,196	2,213	0.047	2.07	6.59	8.36	2,196	2,213	3.23E-10	1.46E-11
2000	0.018	7.68	3.95	0	5.08	2,202	2,219	0.020	2.08	6.61	8.41	2,202	2,219	1.74E-07	7.86E-09
2001	0	7.66	3.94	0	5.07	2,197	2,213	0.039	2.07	6.58	8.37	2,196	2,213	-4.37E-10	-1.97E-11
2002	0.002	7.66	3.95	0	5.06	2,196	2,213	0.035	2.07	6.58	8.39	2,196	2,213	5.69E-10	2.57E-11
2003	1.09E-04	7.66	3.95	0	5.08	2,197	2,214	0.026	2.07	6.58	8.38	2,197	2,214	8.44E-08	3.81E-09
2004	0	7.68	3.97	0	5.12	2,205	2,222	0.066	2.07	6.59	8.38	2,204	2,222	1.11E-09	5.00E-11
2005	0.004	7.65	3.96	0	5.11	2,200	2,217	0.012	2.06	6.57	8.35	2,200	2,217	1.09E-08	4.91E-10
2006	3.21E-04	7.65	3.95	0	5.11	2,201	2,218	0.025	2.06	6.56	8.34	2,201	2,218	-7.17E-09	-3.23E-10
2007	0	7.64	3.96	0	5.15	2,202	2,219	0.193	2.05	6.55	8.28	2,202	2,219	5.05E-09	2.28E-10
2008	0.011	7.66	3.96	0	5.14	2,209	2,226	0.011	2.06	6.56	8.32	2,209	2,226	2.17E-10	9.74E-12
2009	0.042	7.65	3.94	0	5.07	2,202	2,219	0.007	2.06	6.55	8.35	2,202	2,219	1.15E-07	5.17E-09
2010	0.194	7.66	3.93	0	4.99	2,200	2,217	0	2.08	6.57	8.45	2,200	2,217	-3.03E-07	-1.36E-08
2011	0.258	7.67	3.92	0	4.94	2,198	2,215	0	2.09	6.59	8.52	2,197	2,215	5.16E-08	2.33E-09
2012	0.687	7.73	3.88	0	4.65	2,193	2,210	0	2.17	6.69	8.89	2,192	2,210	1.09E-07	4.93E-09
2013	1.32	7.78	3.80	0	4.12	2,164	2,181	0	2.28	6.83	9.49	2,163	2,181	-9.28E-08	-4.26E-09
2014	1.86	7.88	3.73	0.043	3.58	2,132	2,149	0	2.41	7.08	10.2	2,129	2,149	-7.53E-07	-3.50E-08
2015	2.60	8.01	3.65	0.151	2.95	2,085	2,103	0	2.60	7.48	11.4	2,081	2,103	-1.14E-07	-5.40E-09
2016	1.77	8.12	3.75	0.177	3.00	2,057	2,074	0	2.64	7.67	11.6	2,052	2,074	3.85E-06	1.86E-07
2017	1.83	8.18	3.75	0.214	2.90	2,018	2,034	0	2.70	7.87	12.0	2,012	2,034	-3.55E-09	-1.74E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Lower Layers	
	(acre-feet)							
Predevelopment	0	8.76	379.4	235.8	0.113	149.4	3,159	3,932
1980	0	11.2	395.8	234.0	0.300	141.7	3,151	3,934
1981	0.194	11.1	394.3	237.1	0.302	144.0	3,140	3,927
1982	0.052	11.1	394.0	237.1	0.303	144.5	3,140	3,927
1983	0.016	11.1	393.8	237.0	0.303	144.8	3,140	3,927
1984	0	11.1	394.5	239.1	0.299	147.6	3,145	3,937
1985	0	11.0	393.0	238.6	0.291	147.8	3,135	3,925
1986	0	11.0	392.6	238.7	0.283	148.3	3,134	3,925
1987	0	10.9	392.3	238.7	0.278	148.1	3,136	3,926
1988	1.21	10.9	393.5	238.5	0.281	146.4	3,149	3,940
1989	0.964	10.9	392.7	237.4	0.284	145.4	3,141	3,929
1990	5.11	11.0	393.3	237.3	0.299	141.4	3,148	3,936
1991	0.760	11.0	393.7	238.5	0.304	144.2	3,141	3,930
1992	0.441	11.0	394.8	239.6	0.305	144.6	3,148	3,939
1993	0	11.0	393.2	239.0	0.289	148.5	3,131	3,923
1994	0	10.9	392.5	239.2	0.270	149.3	3,130	3,922
1995	0	10.9	392.1	238.5	0.257	148.6	3,132	3,922
1996	0	10.8	392.9	238.7	0.249	148.4	3,143	3,934
1997	0	10.8	391.6	237.9	0.242	147.8	3,135	3,923
1998	0.023	10.7	391.3	238.9	0.240	147.7	3,136	3,925
1999	0	10.7	391.1	238.7	0.240	147.8	3,137	3,925
2000	0.516	10.7	392.4	238.7	0.242	146.7	3,148	3,937
2001	0	10.7	391.2	238.4	0.243	146.9	3,139	3,926
2002	0.164	10.6	391.3	238.7	0.245	146.2	3,139	3,927
2003	0	10.6	391.1	239.2	0.246	147.1	3,139	3,927
2004	0	10.6	391.8	240.7	0.246	148.7	3,146	3,938
2005	0	10.6	390.4	239.5	0.244	148.4	3,139	3,928
2006	0.001	10.5	390.3	239.0	0.242	148.3	3,140	3,928
2007	0	10.5	389.7	240.1	0.237	150.4	3,137	3,928
2008	0.094	10.5	390.7	239.6	0.234	149.5	3,148	3,939
2009	1.35	10.5	390.0	237.8	0.234	146.6	3,144	3,930
2010	4.18	10.6	391.1	236.5	0.244	142.5	3,149	3,934
2011	5.15	10.7	392.2	235.9	0.257	140.5	3,151	3,935
2012	17.1	11.0	397.2	230.8	0.291	126.7	3,176	3,959
2013	34.3	11.5	403.8	221.9	2.10	104.3	3,194	3,972
2014	49.0	12.4	414.1	214.6	4.61	85.5	3,215	3,996
2015	70.2	13.6	428.5	205.0	8.08	62.9	3,242	4,030
2016	51.3	14.6	437.9	215.2	8.86	66.4	3,215	4,009
2017	52.6	15.5	444.9	215.0	10.0	62.3	3,189	3,989

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-0ut, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers			
	(acre-feet)									%
Predevelopment	0	0	1,157	115.7	143.9	263.2	2,252	3,932	1.15E-05	2.92E-07
1980	0	0.907	1,138	125.3	175.8	310.2	2,184	3,934	9.56E-09	2.43E-10
1981	1.48	0.603	1,135	124.5	176.3	309.6	2,179	3,927	-9.06E-08	-2.31E-09
1982	0.660	0.603	1,135	124.4	176.5	309.4	2,180	3,927	4.60E-10	1.17E-11
1983	0.492	0.603	1,136	124.4	176.6	309.0	2,180	3,927	-1.26E-07	-3.20E-09
1984	2.42	0.462	1,139	124.4	176.7	306.2	2,188	3,937	2.52E-07	6.39E-09
1985	2.49	0.469	1,136	123.8	175.8	303.5	2,183	3,925	5.55E-09	1.41E-10
1986	2.62	0.461	1,137	123.5	175.4	302.1	2,185	3,925	-4.38E-08	-1.11E-09
1987	1.93	0.469	1,137	123.4	175.4	302.5	2,186	3,926	3.96E-06	1.01E-07
1988	0.351	0.462	1,140	124.1	176.5	307.1	2,191	3,940	1.07E-07	2.71E-09
1989	0.125	0.469	1,137	124.1	175.9	306.6	2,185	3,929	6.71E-09	1.71E-10
1990	0	0.486	1,137	124.9	177.4	315.8	2,181	3,936	1.64E-08	4.16E-10
1991	0.601	0.754	1,136	124.7	176.3	310.2	2,181	3,930	3.55E-08	9.05E-10
1992	0.068	0.773	1,139	125.0	176.6	311.3	2,186	3,939	5.02E-07	1.27E-08
1993	5.13	0.821	1,137	123.9	173.7	299.4	2,184	3,923	-2.32E-10	-5.92E-12
1994	5.09	0.771	1,137	123.4	172.5	296.1	2,187	3,922	4.07E-08	1.04E-09
1995	3.81	0.771	1,138	123.2	171.8	295.5	2,189	3,922	3.27E-07	8.35E-09
1996	2.92	0.739	1,141	123.6	171.8	296.1	2,198	3,934	-4.44E-06	-1.13E-07
1997	3.05	0.771	1,138	123.1	170.5	294.0	2,193	3,923	8.56E-07	2.18E-08
1998	2.24	0.679	1,139	123.0	170.5	295.1	2,194	3,925	3.64E-09	9.29E-11
1999	1.96	0.670	1,139	123.0	170.1	294.4	2,196	3,925	1.52E-09	3.87E-11
2000	0.863	0.874	1,142	123.8	170.5	296.6	2,202	3,937	3.15E-07	8.00E-09
2001	1.13	0.704	1,139	123.2	169.8	295.0	2,197	3,926	2.39E-09	6.09E-11
2002	0.590	0.880	1,140	123.3	169.8	296.1	2,196	3,927	1.08E-10	2.74E-12
2003	1.08	0.771	1,140	123.0	169.7	295.4	2,197	3,927	1.60E-07	4.08E-09
2004	1.91	0.672	1,143	122.9	169.9	295.1	2,205	3,938	3.17E-09	8.04E-11
2005	1.21	0.670	1,140	122.5	169.3	294.0	2,200	3,928	1.87E-08	4.75E-10
2006	1.01	0.561	1,140	122.4	169.1	293.6	2,201	3,928	-1.38E-08	-3.52E-10
2007	3.31	0.411	1,141	121.6	168.6	291.0	2,202	3,928	1.44E-09	3.65E-11
2008	1.22	0.605	1,144	122.3	169.0	292.5	2,209	3,939	3.05E-10	7.73E-12
2009	0.378	0.905	1,141	122.8	168.7	294.2	2,202	3,930	6.96E-07	1.77E-08
2010	0.003	1.34	1,141	124.2	169.3	299.0	2,200	3,934	-6.94E-07	-1.77E-08
2011	0	1.34	1,140	125.2	169.8	301.6	2,198	3,935	-2.02E-07	-5.12E-09
2012	0	2.06	1,141	131.3	173.3	319.1	2,193	3,959	3.24E-07	8.19E-09
2013	0	3.52	1,133	141.0	180.1	350.0	2,164	3,972	-1.32E-07	-3.33E-09
2014	0	4.89	1,126	152.5	189.2	391.0	2,132	3,996	-7.71E-07	-1.93E-08
2015	0	6.92	1,116	168.5	202.4	451.3	2,085	4,030	-2.45E-07	-6.07E-09
2016	0	5.97	1,111	170.6	207.5	457.4	2,057	4,009	7.12E-06	1.78E-07
2017	0	6.44	1,099	176.0	214.2	475.8	2,018	3,989	6.26E-09	1.57E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Lower Layers	
	(acre-feet)							
Predevelopment	0	252.5	143.8	34.4	0	30.6	3,410	3,871
1980	0	256.4	148.4	34.2	4.31E-04	28.3	3,416	3,883
1981	0.215	255.7	147.9	34.3	8.50E-04	28.5	3,404	3,871
1982	0.104	255.6	147.8	34.4	0.001	28.6	3,404	3,871
1983	0.027	255.6	147.7	34.3	0.001	28.6	3,405	3,871
1984	0	256.3	148.0	34.4	2.96E-04	28.9	3,411	3,879
1985	0	255.6	147.5	34.3	0	29.0	3,401	3,867
1986	0	255.5	147.4	34.4	0	29.1	3,400	3,867
1987	0	255.5	147.3	34.4	0	29.2	3,401	3,868
1988	0.578	256.2	147.7	34.4	0	29.0	3,415	3,882
1989	0.668	255.5	147.4	34.2	0	28.7	3,406	3,873
1990	3.61	255.5	147.5	34.1	0	28.1	3,411	3,880
1991	0.811	255.5	147.6	34.2	9.36E-04	28.2	3,407	3,873
1992	0.413	256.2	148.1	34.5	0.001	28.3	3,414	3,882
1993	0	255.5	147.6	34.4	0	28.7	3,398	3,864
1994	0	255.5	147.4	34.5	0	29.0	3,396	3,862
1995	0	255.4	147.3	34.4	0	29.1	3,398	3,864
1996	0	256.0	147.6	34.4	0	29.0	3,409	3,876
1997	0	255.3	147.1	34.2	0	28.9	3,399	3,865
1998	0	255.2	147.0	34.3	0	28.8	3,400	3,866
1999	0	255.2	147.0	34.3	0	28.8	3,401	3,866
2000	0.185	255.8	147.4	34.3	0	28.6	3,412	3,878
2001	0	255.1	147.0	34.2	0	28.5	3,402	3,867
2002	0.068	255.1	147.0	34.3	0	28.4	3,403	3,868
2003	0	255.0	147.0	34.4	0	28.5	3,402	3,867
2004	0	255.7	147.3	34.7	0	28.9	3,411	3,877
2005	0	255.0	146.8	34.6	0	28.9	3,402	3,867
2006	0	254.9	146.8	34.5	0	28.9	3,403	3,868
2007	0	254.9	146.6	34.6	0	29.3	3,400	3,866
2008	0.010	255.6	147.0	34.6	0	29.3	3,412	3,878
2009	0.604	254.9	146.7	34.3	0	28.9	3,406	3,871
2010	2.63	254.9	146.9	34.1	0	28.1	3,410	3,877
2011	3.77	255.0	147.2	33.9	0	27.3	3,412	3,879
2012	11.5	255.9	148.6	33.2	0	24.8	3,436	3,910
2013	24.0	255.7	150.0	31.9	0.304	20.0	3,450	3,932
2014	36.1	256.5	152.6	30.6	1.61	14.3	3,471	3,963
2015	52.3	258.2	156.3	29.0	3.40	8.99	3,497	4,005
2016	44.5	260.4	159.0	29.3	4.32	8.13	3,481	3,986
2017	43.9	261.2	160.8	28.9	5.12	7.31	3,458	3,965

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	490.4	18.0	72.9	42.7	3,159	88.8	3,871	8.40E-06	2.17E-07
1980	0	0.084	483.1	19.4	86.2	50.8	3,151	92.3	3,883	6.27E-09	1.61E-10
1981	0.613	0.092	481.9	19.3	86.3	50.8	3,140	92.1	3,871	-4.96E-08	-1.28E-09
1982	0.348	0.092	482.0	19.3	86.4	50.9	3,140	92.1	3,871	3.64E-10	9.40E-12
1983	0.277	0.101	482.0	19.3	86.5	50.9	3,140	92.1	3,871	-6.89E-08	-1.78E-09
1984	1.50	0.101	483.5	19.3	86.5	50.9	3,145	92.4	3,879	1.39E-07	3.57E-09
1985	1.89	0.109	482.3	19.3	86.1	50.5	3,135	92.2	3,867	3.35E-09	8.67E-11
1986	2.12	0.101	482.5	19.2	85.9	50.3	3,134	92.2	3,867	-2.38E-08	-6.16E-10
1987	1.69	0.109	482.6	19.2	85.9	50.2	3,136	92.2	3,868	2.19E-06	5.67E-08
1988	0.326	0.101	484.0	19.3	86.4	50.7	3,149	92.4	3,882	5.88E-08	1.51E-09
1989	0.119	0.109	482.6	19.3	86.2	50.7	3,141	92.1	3,873	3.86E-09	9.96E-11
1990	0	0.109	482.5	19.4	86.8	51.5	3,148	92.0	3,880	9.12E-09	2.35E-10
1991	0.053	0.168	482.4	19.4	86.4	51.3	3,141	92.0	3,873	1.97E-08	5.09E-10
1992	0.027	0.160	483.6	19.5	86.6	51.4	3,148	92.3	3,882	2.78E-07	7.15E-09
1993	3.63	0.184	482.4	19.3	85.3	50.4	3,131	92.1	3,864	1.07E-10	2.77E-12
1994	4.31	0.176	482.6	19.2	84.7	49.8	3,130	92.2	3,862	7.86E-09	2.03E-10
1995	3.61	0.176	482.8	19.2	84.4	49.5	3,132	92.1	3,864	1.81E-07	4.69E-09
1996	2.84	0.176	484.3	19.2	84.4	49.5	3,143	92.3	3,876	-2.46E-06	-6.34E-08
1997	2.77	0.176	483.2	19.2	83.9	49.2	3,135	91.9	3,865	4.74E-07	1.23E-08
1998	2.00	0.184	483.4	19.2	83.8	49.3	3,136	91.8	3,866	1.62E-09	4.20E-11
1999	1.76	0.184	483.5	19.2	83.7	49.2	3,137	91.8	3,866	7.37E-10	1.91E-11
2000	0.884	0.244	484.9	19.3	83.9	49.5	3,148	91.9	3,878	1.72E-07	4.43E-09
2001	0.943	0.193	483.6	19.2	83.6	49.3	3,139	91.6	3,867	1.78E-09	4.60E-11
2002	0.550	0.243	483.6	19.2	83.6	49.4	3,139	91.6	3,868	4.96E-11	1.28E-12
2003	0.782	0.209	483.7	19.2	83.6	49.4	3,139	91.6	3,867	8.80E-08	2.27E-09
2004	1.34	0.185	485.2	19.1	83.7	49.4	3,146	91.8	3,877	1.84E-09	4.75E-11
2005	1.08	0.184	483.9	19.1	83.4	49.1	3,139	91.5	3,867	1.05E-08	2.72E-10
2006	0.928	0.151	484.0	19.1	83.4	49.1	3,140	91.5	3,868	-7.22E-09	-1.87E-10
2007	2.30	0.117	484.2	18.9	83.1	48.7	3,137	91.5	3,866	4.48E-10	1.16E-11
2008	1.30	0.168	485.6	19.0	83.3	48.8	3,148	91.7	3,878	1.29E-10	3.33E-12
2009	0.385	0.251	484.2	19.1	83.2	48.9	3,144	91.4	3,871	4.13E-07	1.07E-08
2010	0.019	0.369	484.0	19.3	83.4	49.5	3,149	91.3	3,877	-3.80E-07	-9.79E-09
2011	0	0.369	483.7	19.5	83.7	50.1	3,151	91.3	3,879	-6.65E-08	-1.71E-09
2012	0	0.807	484.1	20.3	85.1	52.2	3,176	91.4	3,910	1.80E-07	4.61E-09
2013	0	1.52	480.9	21.6	87.4	56.0	3,194	90.9	3,932	-6.90E-08	-1.75E-09
2014	0	2.19	478.0	23.3	91.6	61.5	3,215	90.7	3,963	-3.90E-07	-9.85E-09
2015	0	3.18	474.4	25.7	97.5	71.6	3,242	90.6	4,005	-1.35E-07	-3.37E-09
2016	0	2.71	472.3	26.5	100.6	78.0	3,215	91.1	3,986	3.83E-06	9.61E-08
2017	0	2.94	467.7	27.4	103.6	83.5	3,189	91.3	3,965	1.76E-09	4.43E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	General Head Boundaries	Fayette County GCD	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers	
	(acre-feet)							
Predevelopment	0	3,463	252.0	51.8	0.343	62.5	88.8	3,918
1980	0	3,492	257.0	50.9	0.627	60.9	92.3	3,954
1981	0.124	3,483	256.1	51.0	0.628	61.0	92.1	3,943
1982	0.082	3,482	256.1	51.1	0.629	61.1	92.1	3,943
1983	0.032	3,482	256.0	51.0	0.630	61.2	92.1	3,943
1984	0	3,492	256.6	51.0	0.628	61.3	92.4	3,954
1985	0	3,482	255.8	50.9	0.621	61.2	92.2	3,942
1986	0	3,481	255.7	51.0	0.614	61.3	92.2	3,942
1987	0	3,481	255.6	51.1	0.608	61.5	92.2	3,942
1988	0.749	3,491	256.3	51.1	0.610	61.5	92.4	3,953
1989	2.20	3,481	255.7	50.7	0.611	60.9	92.1	3,943
1990	8.79	3,481	255.8	50.5	0.622	60.4	92.0	3,949
1991	3.95	3,481	255.9	50.6	0.627	60.3	92.0	3,945
1992	1.65	3,491	256.6	51.0	0.631	60.6	92.3	3,954
1993	3.18E-05	3,481	255.8	51.0	0.618	60.7	92.1	3,942
1994	0	3,481	255.7	51.1	0.601	60.9	92.2	3,942
1995	0	3,481	255.6	51.1	0.586	61.0	92.1	3,941
1996	0	3,490	256.2	51.0	0.577	60.9	92.3	3,951
1997	0	3,480	255.4	50.7	0.567	60.5	91.9	3,939
1998	0	3,479	255.3	50.7	0.563	60.4	91.8	3,938
1999	0	3,479	255.3	50.7	0.560	60.4	91.8	3,938
2000	0.456	3,488	256.0	50.7	0.560	60.2	91.9	3,948
2001	0.007	3,479	255.3	50.5	0.558	60.0	91.6	3,937
2002	0.102	3,479	255.3	50.7	0.559	60.0	91.6	3,937
2003	0	3,479	255.2	51.0	0.559	60.1	91.6	3,937
2004	0	3,488	255.8	51.5	0.560	60.7	91.8	3,948
2005	0	3,478	255.1	51.4	0.556	60.8	91.5	3,937
2006	0	3,478	255.0	51.3	0.554	60.8	91.5	3,937
2007	0	3,478	254.9	51.4	0.549	61.2	91.5	3,937
2008	0	3,487	255.6	51.5	0.547	61.4	91.7	3,948
2009	1.66	3,477	254.9	51.1	0.545	60.7	91.4	3,938
2010	7.87	3,478	255.1	50.7	0.550	59.7	91.3	3,943
2011	12.0	3,478	255.4	50.2	0.560	58.6	91.3	3,946
2012	33.6	3,489	257.0	49.3	0.588	55.7	91.4	3,977
2013	70.4	3,483	258.0	47.5	0.644	49.7	90.9	4,000
2014	108.4	3,488	260.5	45.2	0.735	41.7	90.7	4,035
2015	156.6	3,495	264.0	42.4	1.12	31.3	90.6	4,081
2016	140.3	3,512	267.3	41.2	1.62	26.1	91.1	4,080
2017	132.9	3,510	268.9	39.9	2.03	22.4	91.3	4,068

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-16.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Lavaca - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Wells	General Head Boundaries	Gonzales County UWCD	Pecan Valley GCD	Gonzales	Upper Layers			
	(acre-feet)									%
Predevelopment	0	0	314.3	26.2	83.9	84.0	3,410	3,918	4.33E-06	1.11E-07
1980	0	0.076	313.3	28.6	98.6	97.5	3,416	3,954	3.42E-09	8.65E-11
1981	2.45	0.084	312.4	28.4	98.6	97.4	3,404	3,943	-2.24E-08	-5.69E-10
1982	1.98	0.084	312.4	28.4	98.7	97.5	3,404	3,943	3.51E-10	8.90E-12
1983	1.40	0.092	312.4	28.4	98.7	97.5	3,405	3,943	-3.12E-08	-7.92E-10
1984	4.01	0.092	313.3	28.5	98.9	97.6	3,411	3,954	6.18E-08	1.56E-09
1985	5.27	0.101	312.4	28.3	98.5	97.0	3,401	3,942	1.10E-09	2.79E-11
1986	6.03	0.092	312.5	28.3	98.4	96.7	3,400	3,942	-1.10E-08	-2.80E-10
1987	5.28	0.101	312.5	28.2	98.3	96.4	3,401	3,942	9.80E-07	2.49E-08
1988	1.10	0.092	313.4	28.3	98.7	97.0	3,415	3,953	2.60E-08	6.57E-10
1989	0.348	0.101	312.5	28.4	98.4	97.1	3,406	3,943	1.84E-09	4.67E-11
1990	0	0.101	312.5	28.6	98.8	98.2	3,411	3,949	4.14E-09	1.05E-10
1991	0	0.151	312.5	28.6	98.6	98.3	3,407	3,945	8.88E-09	2.25E-10
1992	0.046	0.143	313.3	28.7	98.8	98.5	3,414	3,954	1.24E-07	3.13E-09
1993	7.33	0.159	312.5	28.4	97.9	97.2	3,398	3,942	1.05E-10	2.65E-12
1994	10.9	0.151	312.5	28.3	97.4	96.2	3,396	3,942	-1.36E-09	-3.46E-11
1995	9.82	0.151	312.5	28.2	97.0	95.6	3,398	3,941	8.08E-08	2.05E-09
1996	7.53	0.151	313.4	28.3	97.0	95.7	3,409	3,951	-1.10E-06	-2.78E-08
1997	6.86	0.151	312.6	28.2	96.4	95.2	3,399	3,939	2.11E-07	5.37E-09
1998	5.60	0.159	312.6	28.2	96.3	95.3	3,400	3,938	7.32E-10	1.86E-11
1999	4.63	0.159	312.7	28.2	96.1	95.2	3,401	3,938	5.00E-10	1.27E-11
2000	2.15	0.210	313.6	28.4	96.3	95.7	3,412	3,948	7.51E-08	1.90E-09
2001	2.00	0.168	312.7	28.3	95.9	95.4	3,402	3,937	1.17E-09	2.97E-11
2002	1.37	0.209	312.7	28.3	95.9	95.5	3,403	3,937	4.32E-10	1.10E-11
2003	2.22	0.184	312.8	28.2	95.8	95.5	3,402	3,937	3.90E-08	9.90E-10
2004	4.16	0.160	313.6	28.2	96.0	95.5	3,411	3,948	6.36E-10	1.61E-11
2005	3.55	0.159	312.8	28.0	95.7	95.0	3,402	3,937	5.73E-09	1.45E-10
2006	2.76	0.134	312.8	28.0	95.6	94.9	3,403	3,937	-4.47E-09	-1.14E-10
2007	6.33	0.101	312.8	27.9	95.5	94.4	3,400	3,937	-2.16E-10	-5.47E-12
2008	3.97	0.143	313.7	28.0	95.6	94.4	3,412	3,948	-8.73E-11	-2.21E-12
2009	0.972	0.218	312.8	28.0	95.4	94.4	3,406	3,938	1.95E-07	4.95E-09
2010	0.066	0.318	312.9	28.3	95.5	95.4	3,410	3,943	-1.69E-07	-4.28E-09
2011	0	0.318	312.8	28.6	95.7	96.6	3,412	3,946	-2.63E-08	-6.65E-10
2012	0	0.773	313.6	29.6	96.8	100.1	3,436	3,977	8.21E-08	2.06E-09
2013	0	1.48	312.7	31.2	98.1	106.2	3,450	4,000	-2.63E-08	-6.58E-10
2014	0	2.15	312.5	33.6	100.4	115.4	3,471	4,035	-1.59E-07	-3.94E-09
2015	0	3.14	312.1	36.9	103.9	128.4	3,497	4,081	-6.00E-08	-1.47E-09
2016	0	2.68	312.6	38.8	107.0	138.3	3,481	4,080	1.67E-06	4.10E-08
2017	0	2.91	311.2	40.3	109.6	145.9	3,458	4,068	5.42E-10	1.33E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Quarternary Alluvium (Layer 1)

Simulated Time Period	Inflows						Total Inflows	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Recharge	Wintergarden GCD	Lower Layers		Specific Storage	Specific Yield	River Package	Evapo-transpiration	Wintergarden GCD	Lower Layers			
	(acre-feet)															%
Predevelopment	0	0	9,407	1,325	22.1	11,259	22,013	0	0	11,457	196.9	43.8	10,316	22,013	-1.81E-08	-8.22E-11
1980	0	0	11,482	1,251	6.92	9,248	21,987	0	0	9,298	3.96	6.44	12,680	21,987	-2.27E-07	-1.03E-09
1981	2.54E-07	3.39E-04	11,299	1,603	6.87	9,397	22,306	0.146	76.9	9,462	4.16	6.43	12,757	22,306	-5.26E-07	-2.36E-09
1982	0.154	73.2	11,533	1,083	7.21	9,163	21,860	0	0	9,214	4.03	6.64	12,635	21,860	-7.49E-07	-3.43E-09
1983	0.068	36.7	11,576	1,110	7.26	9,122	21,852	1.34E-04	1.84E-04	9,166	3.94	6.71	12,676	21,852	-5.21E-07	-2.38E-09
1984	0.088	53.5	11,662	943.1	7.05	9,069	21,734	0.003	0.035	9,099	3.76	6.57	12,625	21,734	3.19E-07	1.47E-09
1985	7.32E-04	6.73E-04	11,433	1,511	7.04	9,276	22,227	0.158	80.6	9,329	3.92	6.61	12,808	22,227	-3.18E-07	-1.43E-09
1986	4.65E-06	0.010	11,142	1,427	5.63	9,429	22,004	0.179	76.1	9,472	4.04	5.61	12,446	22,004	-5.00E-07	-2.27E-09
1987	0	0	10,988	1,444	5.12	9,524	21,961	0.145	73.7	9,573	4.16	5.21	12,305	21,961	-6.70E-07	-3.05E-09
1988	0.558	250.5	12,029	668.1	9.05	8,891	21,847	0	0	8,939	3.76	7.87	12,896	21,847	8.88E-07	4.06E-09
1989	0.045	36.9	11,604	887.6	6.67	9,021	21,556	0.068	17.6	9,035	3.57	6.52	12,494	21,556	-4.95E-07	-2.30E-09
1990	0.074	25.8	11,865	1,320	8.93	9,022	22,242	0.030	22.3	9,078	3.61	8.07	13,130	22,242	-8.25E-07	-3.71E-09
1991	0.038	37.0	11,871	1,575	9.47	9,078	22,570	0.052	34.3	9,153	3.45	8.42	13,371	22,570	-7.01E-07	-3.11E-09
1992	0.016	14.9	11,851	1,777	9.73	9,183	22,836	0.074	44.2	9,274	3.43	8.53	13,506	22,836	5.41E-07	2.37E-09
1993	0.076	56.7	11,533	1,137	6.52	9,132	21,865	0.093	29.1	9,174	3.15	6.36	12,653	21,865	-3.90E-07	-1.78E-09
1994	0.030	21.8	11,342	1,434	5.83	9,282	22,086	0.156	68.1	9,336	3.04	5.72	12,673	22,086	-7.77E-07	-3.52E-09
1995	0.130	69.9	11,612	1,109	6.56	9,098	21,896	0.003	2.68	9,156	2.90	6.11	12,728	21,896	-7.53E-07	-3.44E-09
1996	0.212	118.4	11,948	787.5	7.07	8,908	21,769	0	0	8,950	2.78	6.45	12,810	21,769	3.04E-07	1.40E-09
1997	0.013	14.0	11,429	1,545	5.72	9,280	22,274	0.278	122.7	9,332	2.90	5.58	12,811	22,274	-4.60E-07	-2.06E-09
1998	0.023	14.5	11,568	1,548	6.81	9,250	22,388	0.050	29.7	9,335	2.96	6.26	13,014	22,388	-7.73E-07	-3.45E-09
1999	0.270	137.7	11,985	887.5	7.52	8,913	21,931	0	0	8,971	2.82	6.75	12,951	21,931	2.13E-07	9.73E-10
2000	0.009	14.2	11,635	1,347	6.01	9,206	22,208	0.164	65.2	9,256	2.86	5.74	12,877	22,208	4.85E-07	2.18E-09
2001	0.008	11.9	11,532	1,208	5.77	9,190	21,948	0.044	18.6	9,243	2.85	5.41	12,678	21,948	-4.91E-07	-2.24E-09
2002	0	0	11,062	2,054	5.14	9,666	22,787	0.402	209.2	9,746	3.09	5.07	12,823	22,787	-4.83E-07	-2.12E-09
2003	0.060	27.3	11,186	1,498	5.40	9,499	22,216	0.040	31.1	9,587	3.09	5.24	12,589	22,216	-3.07E-07	-1.38E-09
2004	0	0	10,938	1,967	5.12	9,784	22,693	0.245	140.6	9,884	3.42	5.19	12,659	22,693	4.23E-07	1.86E-09
2005	0.327	154.9	11,313	993.4	5.69	9,310	21,777	0.001	1.15	9,386	3.13	5.52	12,382	21,777	-5.86E-07	-2.69E-09
2006	0.201	107.2	11,427	888.3	5.83	9,166	21,594	9.04E-04	1.39	9,220	2.93	5.60	12,364	21,594	-9.65E-07	-4.47E-09
2007	0	0	10,781	2,127	5.01	9,817	22,731	0.493	261.4	9,898	3.44	5.22	12,562	22,731	-5.82E-07	-2.56E-09
2008	0.363	180.5	11,343	843.8	5.76	9,279	21,653	0.002	1.49	9,345	3.10	5.59	12,298	21,653	3.95E-07	1.83E-09
2009	0.042	32.7	11,330	1,213	5.71	9,308	21,889	0.009	5.29	9,374	3.00	5.55	12,501	21,889	-3.37E-07	-1.54E-09
2010	0.008	11.7	11,341	1,511	5.68	9,435	22,305	0.096	44.5	9,516	3.03	5.48	12,735	22,305	-3.72E-07	-1.67E-09
2011	0.353	187.0	11,858	698.7	6.45	9,019	21,769	0	0	9,071	2.79	5.67	12,690	21,769	-6.44E-07	-2.96E-09
2012	0.018	16.7	11,539	1,205	6.40	9,221	21,989	0.055	41.9	9,262	2.86	5.32	12,677	21,989	4.36E-07	1.98E-09
2013	0.004	3.89	11,412	1,319	6.41	9,294	22,036	0.073	57.8	9,339	2.95	5.32	12,630	22,036	-7.93E-07	-3.60E-09
2014	0.048	24.2	11,475	1,171	6.60	9,240	21,917	0.022	29.3	9,285	2.99	5.42	12,594	21,917	-5.34E-07	-2.44E-09
2015	0	0	11,083	1,936	6.08	9,670	22,695	0.353	206.5	9,735	3.33	5.11	12,745	22,695	-8.61E-07	-3.79E-09
2016	3.95E-04	0.024	11,046	1,846	6.07	9,779	22,677	0.190	127.3	9,859	3.83	5.06	12,681	22,677	5.84E-07	2.58E-09
2017	0.077	32.1	11,125	1,508	6.25	9,622	22,293	0.055	45.5	9,700	4.07	5.09	12,538	22,293	-4.13E-07	-1.85E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Maverick does not exist in the model in Layer 2.			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Maverick does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Maverick does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Queen City Aquifer (Layer 5)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Maverick does not exist in model in the Queen City Aquifer (Layer 5).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.6
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	24.6	0.001	1.30E-05	0.002	24.6
1980	0	0	23.2	0.006	0.006	0	23.2
1981	0	0	29.7	0.006	0.006	0	29.8
1982	0.004	0.773	20.1	0.005	0.006	0	20.9
1983	1.42E-04	0.024	20.6	0.005	0.006	0	20.6
1984	0.002	0.270	17.5	0.005	0.006	0	17.8
1985	3.25E-09	7.50E-06	28.0	0.006	0.006	0	28.1
1986	3.23E-04	0.057	26.5	0.006	0.006	0	26.6
1987	0	0	26.8	0.006	0.006	0	26.8
1988	0.007	1.23	12.4	0.005	0.006	0	13.6
1989	7.81E-06	0	16.5	0.005	0.006	0	16.5
1990	0	0	24.5	0.005	0.006	0	24.5
1991	0	0	29.2	0.006	0.006	0	29.2
1992	4.73E-08	1.03E-04	33.0	0.006	0.006	0	33.0
1993	0.005	0.974	21.1	0.005	0.006	0	22.1
1994	9.08E-06	0	26.6	0.006	0.006	0	26.6
1995	0.003	0.480	20.6	0.005	0.006	0	21.1
1996	0.003	0.554	14.6	0.005	0.006	0	15.2
1997	4.29E-07	2.28E-04	28.7	0.006	0.006	0	28.7
1998	5.82E-07	4.23E-04	28.7	0.006	0.006	0	28.7
1999	0.006	1.04	16.5	0.005	0.006	0	17.5
2000	1.35E-06	9.00E-04	25.0	0.006	0.006	0	25.0
2001	9.01E-04	0.160	22.4	0.005	0.006	0	22.6
2002	9.01E-07	6.78E-04	38.1	0.006	0.006	0	38.1
2003	0.004	0.765	27.8	0.006	0.006	0	28.6
2004	7.49E-07	5.45E-04	36.5	0.006	0.006	0	36.5
2005	0.008	1.47	18.4	0.005	0.006	0	19.9
2006	0.002	0.294	16.5	0.005	0.006	0	16.8
2007	2.65E-07	1.52E-04	39.5	0.006	0.006	0	39.5
2008	0.010	1.87	15.7	0.005	0.006	0	17.5
2009	3.60E-05	0.001	22.5	0.005	0.006	0	22.5
2010	2.16E-05	0.002	28.0	0.006	0.007	0	28.0
2011	0.007	1.24	13.0	0.005	0.007	0	14.2
2012	5.82E-05	0.003	22.4	0.006	0.007	0	22.4
2013	3.71E-05	0.004	24.5	0.006	0.007	0	24.5
2014	0.001	0.216	21.7	0.006	0.007	0	22.0
2015	5.75E-06	0.004	35.9	0.006	0.007	0	35.9
2016	2.77E-04	0.051	34.3	0.006	0.007	0	34.3
2017	0.003	0.534	28.0	0.006	0.007	0	28.5

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	0	24.6	0.024	0.002	0.004	24.6	4.19E-13	1.71E-12
1980	0	0	23.1	0.032	1.70E-05	0.059	23.2	-8.10E-13	-3.49E-12
1981	0.003	0.563	29.1	0.032	1.72E-05	0.058	29.8	5.12E-12	1.72E-11
1982	1.38E-07	7.31E-05	20.8	0.032	1.70E-05	0.058	20.9	3.04E-12	1.46E-11
1983	1.26E-07	6.82E-05	20.5	0.032	1.70E-05	0.058	20.6	6.14E-12	2.97E-11
1984	5.83E-08	4.58E-05	17.7	0.032	1.69E-05	0.059	17.8	4.48E-12	2.52E-11
1985	0.005	0.879	27.1	0.032	1.71E-05	0.059	28.1	5.94E-12	2.12E-11
1986	3.59E-05	7.35E-04	26.5	0.032	1.73E-05	0.057	26.6	8.36E-12	3.15E-11
1987	1.76E-04	0.024	26.7	0.032	1.77E-05	0.055	26.8	1.18E-12	4.40E-12
1988	9.62E-07	5.30E-04	13.6	0.031	1.76E-05	0.055	13.6	1.69E-12	1.24E-11
1989	0.001	0.245	16.1	0.031	1.77E-05	0.055	16.5	5.48E-12	3.33E-11
1990	0.004	0.705	23.7	0.032	1.80E-05	0.055	24.5	4.95E-12	2.02E-11
1991	0.003	0.464	28.7	0.032	1.82E-05	0.057	29.2	3.83E-12	1.31E-11
1992	0.002	0.352	32.5	0.032	1.82E-05	0.058	33.0	6.19E-12	1.88E-11
1993	4.88E-07	3.16E-04	22.0	0.032	1.76E-05	0.058	22.1	3.13E-12	1.42E-11
1994	0.002	0.386	26.1	0.032	1.74E-05	0.058	26.6	2.48E-12	9.32E-12
1995	0	0	21.0	0.032	1.70E-05	0.059	21.1	2.54E-12	1.21E-11
1996	0	0	15.1	0.032	1.65E-05	0.060	15.2	2.37E-12	1.56E-11
1997	0.006	1.15	27.4	0.032	1.67E-05	0.060	28.7	4.82E-12	1.68E-11
1998	6.00E-04	0.105	28.5	0.032	1.67E-05	0.061	28.7	2.09E-12	7.27E-12
1999	0	0	17.4	0.031	1.63E-05	0.061	17.5	3.24E-12	1.85E-11
2000	0.004	0.631	24.3	0.032	1.63E-05	0.062	25.0	1.95E-12	7.79E-12
2001	0	0	22.5	0.032	1.62E-05	0.062	22.6	5.89E-12	2.61E-11
2002	0.007	1.32	36.7	0.032	1.65E-05	0.062	38.1	2.88E-12	7.55E-12
2003	0	0	28.5	0.032	1.63E-05	0.062	28.6	3.11E-12	1.09E-11
2004	0.004	0.667	35.7	0.032	1.63E-05	0.062	36.5	3.41E-12	9.34E-12
2005	0	0	19.8	0.032	1.57E-05	0.062	19.9	1.81E-13	9.09E-13
2006	0	0	16.7	0.031	1.53E-05	0.062	16.8	-8.95E-13	-5.33E-12
2007	0.011	1.93	37.4	0.032	1.60E-05	0.061	39.5	3.06E-12	7.76E-12
2008	0	0	17.5	0.032	1.56E-05	0.061	17.5	4.00E-12	2.28E-11
2009	0.002	0.427	22.0	0.032	1.52E-05	0.063	22.5	4.44E-12	1.97E-11
2010	0.003	0.508	27.4	0.032	1.49E-05	0.066	28.0	4.56E-12	1.63E-11
2011	0	0	14.1	0.031	1.38E-05	0.069	14.2	5.74E-12	4.03E-11
2012	0.004	0.689	21.6	0.032	1.34E-05	0.071	22.4	-4.44E-13	-1.98E-12
2013	0.001	0.244	24.1	0.032	1.31E-05	0.073	24.5	6.31E-12	2.58E-11
2014	0	0	21.9	0.032	1.27E-05	0.074	22.0	1.67E-12	7.60E-12
2015	0.007	1.19	34.6	0.032	1.29E-05	0.074	35.9	2.54E-12	7.06E-12
2016	3.11E-05	0	34.2	0.032	1.29E-05	0.073	34.3	2.03E-12	5.90E-12
2017	0	0	28.4	0.032	1.27E-05	0.072	28.5	6.93E-12	2.43E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	727.3	102.1	283.2	667.8	1,780
1980	0	0	686.4	226.8	2,107	402.6	3,422
1981	0.209	19.7	880.0	247.3	2,217	420.4	3,785
1982	1.27	118.8	594.6	256.5	2,073	429.5	3,473
1983	0.490	47.9	609.5	259.8	2,100	435.8	3,453
1984	0.609	69.3	517.7	219.6	2,015	409.1	3,231
1985	0.492	45.3	829.7	253.1	2,224	411.1	3,764
1986	0	0	783.5	126.8	1,954	384.9	3,249
1987	0	0	792.8	98.0	1,836	391.7	3,119
1988	11.2	958.3	366.7	435.3	2,138	579.2	4,488
1989	0.027	6.94	487.3	201.7	1,902	431.1	3,029
1990	4.96	469.2	724.6	441.8	2,384	578.7	4,604
1991	2.62	223.2	864.5	457.5	2,560	602.4	4,710
1992	1.64	147.6	975.6	476.3	2,673	627.7	4,902
1993	0.721	116.1	624.0	183.5	2,002	408.4	3,334
1994	0.221	41.9	787.0	135.0	2,002	338.9	3,305
1995	2.54	244.5	608.9	177.3	1,989	346.9	3,369
1996	3.19	321.9	432.3	198.6	1,975	374.3	3,305
1997	0.096	19.5	848.0	121.6	2,061	324.0	3,374
1998	2.54	202.9	849.8	216.2	2,199	365.7	3,837
1999	3.22	306.9	487.2	252.4	2,073	409.7	3,532
2000	0.284	31.8	739.2	135.7	2,051	349.2	3,307
2001	0.177	28.3	663.2	113.6	1,948	321.4	3,075
2002	0.032	4.10	1,127	101.1	2,148	307.3	3,688
2003	0.510	53.6	822.3	102.9	1,965	296.7	3,241
2004	0	0	1,080	100.4	2,084	309.9	3,574
2005	2.53	216.4	545.3	107.6	1,829	302.6	3,003
2006	1.22	113.3	487.6	109.8	1,828	319.3	2,859
2007	0	0	1,168	99.7	2,124	335.0	3,727
2008	3.03	257.8	463.2	106.8	1,780	301.6	2,913
2009	2.15	200.0	665.8	107.9	1,939	289.4	3,204
2010	2.22	224.0	829.4	110.7	2,071	290.4	3,528
2011	5.69	540.5	383.5	121.9	1,938	312.3	3,302
2012	1.42	163.6	661.7	125.1	2,144	302.1	3,398
2013	0.888	106.0	724.1	125.7	2,187	300.8	3,444
2014	1.30	132.4	643.0	128.3	2,167	307.0	3,379
2015	0.006	2.25	1,063	123.3	2,362	305.5	3,856
2016	0	0	1,013	121.3	2,299	312.9	3,746
2017	0.316	27.6	827.5	121.7	2,188	317.1	3,482

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	0	259.6	151.0	963.1	406.8	1,780	3.03E-09	1.70E-10
1980	0	0	728.5	0	177.9	30.2	2,486	3,422	-1.45E-07	-4.23E-09
1981	1.20	123.3	874.6	0	176.0	37.2	2,572	3,785	3.57E-09	9.43E-11
1982	0.051	7.11	874.5	0	173.1	27.8	2,391	3,473	6.57E-09	1.89E-10
1983	0.024	3.37	874.4	0	171.9	25.8	2,378	3,453	2.26E-09	6.55E-11
1984	0.631	58.7	616.0	0	177.2	22.7	2,356	3,231	7.34E-09	2.27E-10
1985	0.842	88.9	910.2	0	175.3	31.3	2,557	3,764	3.30E-08	8.77E-10
1986	5.78	493.2	14.4	0	210.9	42.5	2,483	3,249	4.26E-09	1.31E-10
1987	4.94	432.5	13.5	0	225.8	56.7	2,385	3,119	1.37E-09	4.38E-11
1988	0.201	32.7	2,225	0	142.9	22.0	2,065	4,488	-7.96E-08	-1.77E-09
1989	4.25	397.6	269.8	0	177.2	23.1	2,157	3,029	5.44E-09	1.80E-10
1990	0.206	48.8	2,109	0	147.1	23.7	2,274	4,604	1.28E-08	2.77E-10
1991	0.102	25.8	1,998	0	150.7	25.8	2,510	4,710	-2.37E-08	-5.03E-10
1992	0.095	20.4	2,054	0	153.8	28.6	2,645	4,902	3.64E-09	7.42E-11
1993	6.44	617.7	13.1	0	197.1	26.1	2,474	3,334	-7.20E-09	-2.16E-10
1994	3.14	250.7	165.1	0	217.7	38.5	2,630	3,305	-1.38E-08	-4.16E-10
1995	2.41E-04	0	579.9	0	195.4	31.5	2,563	3,369	-3.16E-08	-9.39E-10
1996	0	0	614.1	0	186.6	22.0	2,482	3,305	-1.34E-08	-4.05E-10
1997	4.25	356.9	11.9	0	225.8	40.3	2,735	3,374	7.06E-09	2.09E-10
1998	0.204	25.2	881.6	0	182.8	39.0	2,708	3,837	-6.44E-10	-1.68E-11
1999	0	0	881.7	0	175.0	24.0	2,452	3,532	-1.50E-08	-4.24E-10
2000	3.59	307.0	106.1	0	203.0	34.9	2,652	3,307	5.31E-09	1.61E-10
2001	1.33	104.3	87.0	0	217.9	37.9	2,626	3,075	8.13E-10	2.64E-11
2002	3.32	278.2	107.6	6.47	228.2	79.0	2,985	3,688	7.41E-09	2.01E-10
2003	0.071	5.07	94.2	10.3	230.5	65.4	2,835	3,241	1.55E-08	4.77E-10
2004	1.88	151.2	82.5	16.4	237.2	86.6	2,999	3,574	1.18E-08	3.29E-10
2005	0	0	82.2	9.94	226.6	52.9	2,631	3,003	7.19E-09	2.39E-10
2006	0.055	5.42	68.0	6.32	220.4	42.8	2,516	2,859	7.94E-09	2.78E-10
2007	4.69	412.0	50.8	16.6	233.2	87.4	2,922	3,727	2.26E-08	6.06E-10
2008	0	0	74.1	8.22	225.5	48.9	2,556	2,913	-6.91E-09	-2.37E-10
2009	0.020	1.27	110.3	8.21	225.1	48.4	2,810	3,204	7.93E-09	2.47E-10
2010	0.141	17.3	164.3	10.8	224.4	53.7	3,057	3,528	9.56E-09	2.71E-10
2011	0	0	164.2	3.49	219.5	31.1	2,883	3,302	4.66E-08	1.41E-09
2012	0.086	11.9	14.3	2.46	237.6	32.2	3,099	3,398	-1.24E-08	-3.66E-10
2013	0.053	11.6	14.0	2.27	237.8	33.4	3,145	3,444	3.60E-09	1.04E-10
2014	8.83E-04	0.704	14.3	0.883	237.0	30.4	3,096	3,379	4.58E-09	1.36E-10
2015	2.21	196.9	15.0	6.02	237.2	50.6	3,348	3,856	1.66E-08	4.31E-10
2016	1.28	116.3	16.4	8.24	237.5	54.7	3,312	3,746	-7.50E-11	-2.00E-12
2017	0.201	27.2	15.4	6.93	236.3	46.5	3,149	3,482	5.54E-08	1.59E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	Recharge	Wintergarden GCD	Webb	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	283.7	474.6	0	262.1	240.4	1,261
1980	0	0	267.7	164.4	0	2,269	1,122	3,822
1981	0.030	0.088	343.2	173.5	0	2,338	1,106	3,961
1982	0.852	53.9	231.9	175.5	0	2,181	1,135	3,778
1983	0.325	26.7	237.7	174.6	0	2,175	1,140	3,754
1984	0.883	61.6	201.9	165.7	0	2,163	1,127	3,720
1985	0.206	0	323.6	173.2	0	2,337	1,130	3,964
1986	3.83E-06	0.060	305.6	161.8	0	2,270	1,006	3,743
1987	0.002	0.743	309.2	167.7	0	2,181	943.9	3,603
1988	5.81	117.0	143.0	211.6	0	1,892	1,217	3,586
1989	0.499	43.9	190.0	175.4	1.56E-04	1,993	1,073	3,476
1990	2.83	14.7	282.6	218.0	5.27E-04	2,086	1,236	3,841
1991	2.64	10.1	337.2	186.5	0	2,275	1,300	4,111
1992	1.57	12.3	380.5	196.7	0	2,381	1,331	4,304
1993	1.04	72.8	243.4	144.3	0	2,250	1,108	3,820
1994	0.527	17.2	307.0	139.3	0	2,394	1,043	3,901
1995	2.42	72.2	237.5	147.7	0	2,335	1,097	3,892
1996	2.93	137.5	168.6	146.8	0	2,273	1,139	3,868
1997	0.035	1.17	330.8	140.3	0	2,500	1,040	4,012
1998	1.09	0.304	331.5	162.3	0	2,460	1,115	4,070
1999	2.12	112.9	190.0	166.0	0	2,238	1,170	3,880
2000	0.511	16.7	288.3	153.4	0	2,421	1,066	3,946
2001	0.285	22.0	258.7	153.1	0	2,395	1,039	3,868
2002	0.014	0	439.8	157.2	0	2,694	999.7	4,291
2003	0.666	35.8	320.7	163.4	0	2,560	1,005	4,086
2004	0	0	421.1	169.5	0	2,692	990.0	4,273
2005	1.90	115.0	212.7	173.8	0	2,378	1,012	3,894
2006	0.676	62.5	190.2	173.6	0	2,286	1,019	3,732
2007	0	0	455.4	169.1	0	2,624	968.5	4,217
2008	2.89	138.4	180.7	170.0	0	2,311	1,011	3,814
2009	3.26	102.5	259.7	165.7	0	2,550	1,024	4,105
2010	3.46	109.3	323.5	175.3	0	2,771	1,048	4,431
2011	6.65	313.6	149.6	177.0	0	2,638	1,125	4,409
2012	2.42	102.3	258.1	164.1	0	2,833	1,148	4,508
2013	1.47	60.2	282.4	157.6	0	2,869	1,157	4,527
2014	1.50	74.0	250.8	154.0	0	2,827	1,178	4,486
2015	0	0	414.5	157.0	0	3,032	1,147	4,751
2016	7.21E-04	0	395.3	164.4	0	2,991	1,141	4,692
2017	0.180	14.8	322.8	166.8	0	2,851	1,141	4,497

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Wintergarden GCD	Webb	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	159.0	321.5	0.081	556.2	224.1	1,261	8.74E-09	6.93E-10
1980	0	0	163.9	45.8	2,919	0.004	166.8	526.4	3,822	-5.15E-07	-1.35E-08
1981	1.37	66.9	189.5	45.7	2,908	0.004	191.2	558.0	3,961	3.47E-09	8.76E-11
1982	0.021	0	185.6	43.8	2,838	0.003	194.2	516.6	3,778	2.89E-08	7.66E-10
1983	0.015	0	183.8	42.8	2,812	0.002	197.7	518.1	3,754	9.83E-09	2.62E-10
1984	0.234	0	156.0	40.2	2,849	0.001	164.7	509.5	3,720	3.37E-08	9.07E-10
1985	0.422	59.1	187.5	45.7	2,933	0.001	178.4	560.7	3,964	1.44E-07	3.63E-09
1986	4.41	64.7	96.7	45.7	2,827	9.67E-04	154.6	550.4	3,743	1.84E-08	4.92E-10
1987	4.60	95.2	100.3	45.7	2,646	4.42E-04	166.9	544.2	3,603	5.45E-09	1.51E-10
1988	0.060	0	326.8	27.7	2,434	2.44E-04	338.9	458.8	3,586	-2.96E-07	-8.25E-09
1989	2.25	10.9	144.9	37.9	2,610	0	186.9	482.5	3,476	2.29E-08	6.60E-10
1990	0.358	37.4	370.3	33.6	2,533	0	341.4	524.2	3,841	5.43E-08	1.41E-09
1991	0.592	110.0	272.8	36.4	2,806	0.002	363.7	521.8	4,111	-1.04E-07	-2.53E-09
1992	0.536	96.0	286.3	40.0	2,933	0.007	387.2	560.8	4,304	1.64E-08	3.81E-10
1993	3.54	24.4	20.7	45.7	3,039	0.010	167.0	519.2	3,820	-2.84E-08	-7.45E-10
1994	1.30	32.1	39.8	45.7	3,120	0.011	105.4	556.4	3,901	-6.16E-08	-1.58E-09
1995	0.010	2.21	84.6	45.5	3,110	0.010	111.1	538.6	3,892	-1.58E-07	-4.07E-09
1996	0	0	88.0	38.7	3,098	0.008	126.0	517.9	3,868	-5.97E-08	-1.54E-09
1997	2.27	76.0	24.5	45.7	3,181	0.007	88.1	594.2	4,012	3.21E-08	7.99E-10
1998	0.293	39.1	120.6	45.7	3,129	0.007	134.8	600.4	4,070	-2.98E-09	-7.31E-11
1999	0	0	119.9	39.4	3,008	0.005	166.6	545.2	3,880	-5.53E-08	-1.43E-09
2000	1.74	21.6	35.7	45.8	3,143	0.006	107.6	590.4	3,946	2.44E-08	6.18E-10
2001	0.487	3.51	29.0	45.7	3,135	0.008	80.9	572.9	3,868	3.34E-09	8.63E-11
2002	2.19	139.8	38.7	47.0	3,311	0.013	76.6	675.2	4,291	3.29E-08	7.68E-10
2003	0.107	16.1	33.0	46.1	3,302	0.018	67.6	620.8	4,086	6.94E-08	1.70E-09
2004	1.85	108.1	29.8	47.5	3,329	0.026	83.0	673.3	4,273	5.09E-08	1.19E-09
2005	0	0	27.5	45.7	3,185	0.028	69.1	566.1	3,894	2.96E-08	7.59E-10
2006	0.097	0	22.0	45.7	3,048	0.029	76.4	539.0	3,732	3.52E-08	9.44E-10
2007	4.44	245.6	18.4	47.3	3,131	0.038	106.6	662.6	4,217	1.03E-07	2.44E-09
2008	0	0	24.5	45.8	3,138	0.037	65.1	541.0	3,814	-3.06E-08	-8.01E-10
2009	0.090	1.46	36.5	45.7	3,379	0.038	52.8	589.3	4,105	3.56E-08	8.66E-10
2010	0.138	11.7	55.6	45.7	3,609	0.041	54.0	654.8	4,431	4.45E-08	1.01E-09
2011	0	0	51.9	41.9	3,660	0.038	56.0	599.3	4,409	2.03E-07	4.61E-09
2012	0.227	48.1	2.57	45.8	3,744	0.038	47.6	619.0	4,508	-5.55E-08	-1.23E-09
2013	0.279	44.3	2.46	45.7	3,756	0.038	47.6	630.6	4,527	1.58E-08	3.49E-10
2014	0.112	21.6	2.42	45.7	3,746	0.038	49.4	620.7	4,486	1.99E-08	4.45E-10
2015	2.26	162.2	2.58	46.9	3,782	0.044	55.9	699.0	4,751	7.50E-08	1.58E-09
2016	1.70	109.4	2.74	50.9	3,765	0.048	65.8	695.8	4,692	-9.46E-11	-2.02E-12
2017	0.641	32.4	2.53	51.4	3,684	0.050	69.1	656.9	4,497	2.48E-07	5.52E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.9
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Wintergarden GCD	Webb	Upper Layers	
	(acre-feet)						
Predevelopment	0	0	1,982	2,081	10.6	10,398	14,472
1980	0	0	1,871	2,081	16.7	11,275	15,244
1981	0.060	2.85	2,398	2,054	16.3	11,291	15,763
1982	5.76	246.8	1,620	2,112	16.5	11,247	15,248
1983	3.54	162.7	1,661	2,120	16.9	11,254	15,219
1984	6.43	303.6	1,411	2,142	17.5	11,270	15,150
1985	0.038	0.964	2,261	2,090	17.0	11,320	15,689
1986	0.040	2.82	2,135	2,070	16.7	11,226	15,450
1987	0.143	7.80	2,161	2,066	16.6	11,200	15,451
1988	15.3	670.4	999.5	2,209	17.7	11,346	15,257
1989	7.66	358.1	1,328	2,192	18.3	11,201	15,105
1990	2.77	84.1	1,975	2,215	18.1	11,405	15,701
1991	7.19	523.7	2,356	2,063	19.4	11,499	16,468
1992	2.87	214.3	2,659	2,045	20.2	11,583	16,524
1993	8.29	588.6	1,701	2,051	21.6	11,343	15,713
1994	4.10	340.9	2,145	2,027	22.5	11,419	15,959
1995	9.09	547.9	1,659	2,078	23.7	11,458	15,776
1996	13.3	758.9	1,178	2,132	25.3	11,513	15,621
1997	1.35	128.4	2,311	2,052	25.4	11,540	16,058
1998	1.72	141.5	2,316	2,077	25.7	11,619	16,181
1999	12.3	685.5	1,328	2,160	27.7	11,589	15,803
2000	1.50	165.8	2,015	2,091	24.6	11,612	15,909
2001	0.725	91.6	1,807	2,066	22.5	11,503	15,492
2002	0.046	7.31	3,073	1,971	19.5	11,612	16,683
2003	1.45	69.0	2,241	2,003	18.0	11,493	15,825
2004	0	0	2,943	1,962	16.3	11,527	16,448
2005	5.97	282.6	1,486	2,038	16.1	11,346	15,175
2006	3.76	198.2	1,329	2,051	16.3	11,282	14,880
2007	0	0	3,182	1,926	15.0	11,376	16,499
2008	10.3	461.9	1,262	2,039	15.2	11,278	15,066
2009	4.05	230.6	1,815	2,009	15.0	11,381	15,454
2010	5.09	351.9	2,260	1,989	14.7	11,575	16,196
2011	17.9	889.7	1,045	2,068	15.1	11,573	15,609
2012	1.35	12.0	1,803	2,013	15.2	11,385	15,229
2013	0.676	0.286	1,973	1,979	15.0	11,316	15,284
2014	1.57	27.0	1,753	1,983	15.0	11,283	15,062
2015	0	0	2,896	1,908	14.4	11,361	16,179
2016	9.39E-04	0.110	2,762	1,913	13.9	11,366	16,054
2017	0.964	28.5	2,255	1,938	13.7	11,275	15,512

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-17.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Maverick - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Wintergarden GCD	Webb	Upper Layers			
	(acre-feet)									%
Predevelopment	0	0	0	439.3	2,239	1,169	10,625	14,472	3.61E-08	2.50E-10
1980	0	0	724.3	306.4	2,657	992.0	10,564	15,244	-1.77E-07	-1.16E-09
1981	5.64	262.2	820.7	371.0	2,624	993.8	10,685	15,763	9.29E-09	5.89E-11
1982	0.007	0	845.4	290.4	2,634	984.7	10,493	15,248	2.08E-08	1.36E-10
1983	0.005	0.002	864.8	277.2	2,637	977.6	10,462	15,219	7.73E-09	5.08E-11
1984	0.037	1.66	881.3	243.9	2,650	968.7	10,405	15,150	5.16E-08	3.41E-10
1985	5.12	245.5	912.3	328.1	2,630	972.0	10,596	15,689	1.23E-07	7.81E-10
1986	4.32	140.7	791.5	337.2	2,590	974.3	10,613	15,450	1.41E-08	9.11E-11
1987	4.19	128.0	816.7	345.1	2,554	974.9	10,628	15,451	1.06E-09	6.86E-12
1988	0.018	0	1,134	217.2	2,635	960.8	10,311	15,257	-1.48E-07	-9.69E-10
1989	1.28	21.8	1,009	218.4	2,613	939.1	10,302	15,105	1.83E-08	1.21E-10
1990	1.79	109.9	1,294	274.6	2,628	935.1	10,457	15,701	4.83E-08	3.08E-10
1991	11.6	366.2	1,599	260.5	2,701	954.2	10,575	16,468	-5.85E-08	-3.55E-10
1992	7.51	263.6	1,570	293.7	2,718	961.3	10,710	16,524	1.14E-08	6.87E-11
1993	2.43	86.2	1,319	226.2	2,690	943.2	10,446	15,713	-2.03E-09	-1.29E-11
1994	2.76	109.7	1,490	241.3	2,672	931.5	10,511	15,959	-7.71E-08	-4.83E-10
1995	0.314	20.6	1,554	209.1	2,688	915.1	10,389	15,776	7.80E-08	4.94E-10
1996	0.047	2.96	1,576	166.0	2,719	895.1	10,262	15,621	-4.96E-08	-3.17E-10
1997	5.15	192.3	1,564	226.2	2,674	888.9	10,507	16,058	3.15E-08	1.96E-10
1998	1.61	68.0	1,767	242.1	2,670	885.3	10,547	16,181	-8.06E-10	-4.98E-12
1999	0	0	1,779	174.9	2,693	866.3	10,290	15,803	-1.36E-08	-8.61E-11
2000	11.6	700.4	927.7	193.8	2,683	923.8	10,469	15,909	2.89E-08	1.82E-10
2001	7.96	481.7	758.7	186.1	2,679	956.8	10,422	15,492	9.82E-11	6.34E-13
2002	19.9	973.8	956.3	267.7	2,654	1,002	10,810	16,683	2.47E-08	1.48E-10
2003	7.73	409.0	831.3	233.4	2,658	1,025	10,661	15,825	5.02E-08	3.17E-10
2004	15.8	789.4	747.8	283.0	2,649	1,057	10,907	16,448	3.68E-08	2.24E-10
2005	0.623	48.7	721.2	191.3	2,665	1,054	10,494	15,175	3.88E-08	2.56E-10
2006	0.265	16.8	593.9	162.5	2,680	1,051	10,375	14,880	2.75E-08	1.85E-10
2007	21.8	1,071	476.5	289.9	2,642	1,079	10,919	16,499	6.97E-08	4.22E-10
2008	2.54E-04	0	657.9	181.4	2,684	1,073	10,469	15,066	-1.79E-08	-1.19E-10
2009	0.790	43.1	955.2	179.4	2,693	1,072	10,510	15,454	2.78E-08	1.80E-10
2010	3.60	169.5	1,399	186.8	2,699	1,081	10,657	16,196	3.16E-08	1.95E-10
2011	0	0	1,323	124.1	2,738	1,068	10,356	15,609	1.55E-07	9.94E-10
2012	8.52	609.9	29.6	164.4	2,768	1,070	10,579	15,229	-3.92E-08	-2.57E-10
2013	6.61	546.2	29.2	203.0	2,771	1,070	10,658	15,284	1.38E-08	9.04E-11
2014	3.16	327.9	29.7	213.6	2,786	1,069	10,632	15,062	1.44E-08	9.54E-11
2015	16.4	957.9	31.6	317.0	2,764	1,087	11,005	16,179	5.75E-08	3.55E-10
2016	11.2	689.7	34.6	354.8	2,759	1,103	11,102	16,054	1.64E-10	1.02E-12
2017	4.45	330.2	32.3	333.0	2,756	1,102	10,954	15,512	1.86E-07	1.20E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Gonzales County UWCD	Guadalupe County GCD	Plum Creek CD	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	3,837	516.9	174.7	351.1	30.0	3,876	8,786
1980	0	0	4,117	487.9	166.8	285.2	28.4	3,446	8,531
1981	0	0	3,947	625.4	169.8	293.9	29.1	3,578	8,643
1982	0.108	61.6	4,114	422.6	166.3	283.6	28.4	3,414	8,491
1983	0.107	57.6	4,180	433.2	164.8	276.1	28.1	3,354	8,494
1984	0.193	107.0	4,336	367.9	162.4	260.6	27.6	3,218	8,480
1985	0	0	4,088	589.6	165.9	271.5	28.2	3,410	8,553
1986	0	0	4,041	556.8	167.4	278.6	28.6	3,459	8,531
1987	0	0	4,001	563.5	168.5	285.4	28.8	3,506	8,553
1988	0.293	164.6	4,370	260.6	162.1	265.9	27.6	3,223	8,475
1989	0.167	95.5	4,419	346.3	159.8	254.5	27.1	3,150	8,452
1990	0.002	1.84	4,267	515.0	162.1	256.7	27.4	3,243	8,473
1991	0	0	4,057	614.4	166.5	270.4	28.3	3,452	8,589
1992	0	0	3,905	693.4	171.6	287.2	29.5	3,634	8,720
1993	0.029	23.5	4,065	443.5	167.8	283.9	28.7	3,479	8,492
1994	0	0	4,001	559.4	169.3	291.5	29.0	3,551	8,602
1995	0.081	45.4	4,130	432.7	166.7	285.4	28.5	3,440	8,529
1996	0.256	137.3	4,374	307.2	162.6	268.5	27.7	3,254	8,532
1997	0	0	4,091	602.7	166.8	280.2	28.3	3,459	8,628
1998	0	0	3,987	604.0	169.4	290.9	29.0	3,569	8,649
1999	0.182	101.1	4,247	346.3	164.4	275.6	28.0	3,340	8,502
2000	0.018	10.6	4,174	525.3	166.0	276.3	28.2	3,392	8,573
2001	0.028	15.2	4,185	471.3	165.1	273.8	28.1	3,373	8,512
2002	0	0	3,825	801.3	173.1	299.5	29.9	3,728	8,857
2003	0.002	2.80	3,891	584.4	172.2	303.0	29.7	3,666	8,649
2004	0	0	3,713	767.4	177.7	326.7	31.0	3,960	8,976
2005	0.234	122.5	4,012	387.5	170.1	307.0	29.3	3,576	8,605
2006	0.282	139.0	4,204	346.6	165.6	290.3	28.4	3,416	8,590
2007	0	0	3,728	829.9	175.9	325.6	30.6	3,942	9,031
2008	0.307	157.4	4,117	329.2	168.3	302.2	28.9	3,511	8,615
2009	0.176	86.7	4,140	473.2	166.7	290.5	28.5	3,434	8,620
2010	0.084	45.8	4,087	589.5	167.5	284.5	28.7	3,429	8,632
2011	0.424	235.4	4,485	272.6	160.0	255.0	27.5	3,113	8,548
2012	0.045	21.1	4,383	470.3	161.2	259.8	27.2	3,244	8,566
2013	0.001	0.927	4,283	514.6	160.9	265.8	27.1	3,308	8,560
2014	0.086	52.8	4,383	457.0	157.6	261.1	26.6	3,190	8,528
2015	0	0	4,034	755.3	160.8	282.4	27.2	3,474	8,734
2016	0	0	3,934	720.2	162.5	299.1	27.7	3,608	8,752
2017	0.013	12.2	4,030	588.1	159.4	296.9	27.1	3,486	8,600

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Gonzales County UWCD	Guadalupe County GCD	Lost Pines GCD	Plum Creek CD	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	4,549	3.25	57.3	247.6	3.65	56.1	3,869	8,786	2.30E-07	2.62E-09
1980	0	0	4,124	2.17	55.3	211.9	3.08	38.9	4,096	8,531	-1.05E-07	-1.23E-09
1981	0.161	86.2	4,257	2.37	56.0	216.8	3.57	42.4	3,978	8,643	-1.46E-07	-1.69E-09
1982	0	0	4,096	2.25	55.1	210.7	3.09	40.3	4,083	8,491	-1.82E-07	-2.14E-09
1983	2.40E-10	3.20E-07	4,036	2.13	54.7	206.6	2.90	38.0	4,154	8,494	-1.41E-07	-1.67E-09
1984	0	0	3,900	1.90	54.1	198.1	2.57	34.1	4,289	8,480	2.28E-07	2.69E-09
1985	0.112	66.2	4,079	2.05	55.1	205.3	3.16	36.6	4,106	8,553	-1.42E-07	-1.66E-09
1986	0.087	47.4	4,133	2.16	55.4	208.7	3.33	38.7	4,042	8,531	-2.25E-07	-2.64E-09
1987	0.088	46.1	4,186	2.27	55.6	211.6	3.45	40.7	4,007	8,553	-1.59E-07	-1.86E-09
1988	0	0	3,902	1.90	53.9	199.4	2.47	34.1	4,281	8,475	1.48E-07	1.75E-09
1989	5.11E-11	6.81E-08	3,823	1.66	53.4	193.1	2.28	29.9	4,349	8,452	-1.53E-07	-1.81E-09
1990	0.023	16.3	3,916	1.69	54.1	195.4	2.72	30.5	4,256	8,473	-1.12E-07	-1.33E-09
1991	0.198	121.6	4,100	1.93	55.2	205.4	3.28	35.3	4,065	8,589	-1.55E-07	-1.80E-09
1992	0.277	153.7	4,293	2.28	56.4	215.3	3.85	41.8	3,954	8,720	1.42E-07	1.63E-09
1993	0.013	6.16	4,144	2.24	55.4	212.8	3.25	41.2	4,026	8,492	-1.34E-07	-1.58E-09
1994	0.093	47.2	4,224	2.36	55.8	216.8	3.38	42.8	4,009	8,602	-1.44E-07	-1.68E-09
1995	0	0	4,115	2.26	55.2	212.9	3.00	40.8	4,099	8,529	-1.55E-07	-1.81E-09
1996	0	0	3,933	1.95	54.1	203.4	2.39	35.2	4,303	8,532	1.07E-07	1.26E-09
1997	0.129	75.1	4,128	2.11	55.3	210.7	3.08	37.8	4,116	8,628	-1.95E-07	-2.25E-09
1998	0.163	87.6	4,235	2.30	55.9	216.7	3.42	41.4	4,006	8,649	-1.77E-07	-2.05E-09
1999	0	0	4,013	2.07	54.5	207.8	2.71	37.5	4,185	8,502	-9.93E-08	-1.17E-09
2000	0.010	5.63	4,076	2.08	55.1	208.7	2.93	37.6	4,185	8,573	3.89E-08	4.54E-10
2001	7.31E-08	6.78E-04	4,045	2.04	54.8	207.2	2.87	36.9	4,163	8,512	-6.01E-08	-7.07E-10
2002	0.361	198.6	4,395	2.50	56.8	221.6	3.97	44.9	3,934	8,857	-1.42E-07	-1.61E-09
2003	0.117	51.6	4,344	2.64	56.5	222.8	3.78	47.3	3,920	8,649	-1.10E-07	-1.27E-09
2004	0.380	180.2	4,614	3.09	58.0	236.2	4.42	54.5	3,824	8,976	2.09E-07	2.33E-09
2005	0	0	4,268	2.81	56.0	224.0	3.34	49.5	4,001	8,605	-1.49E-07	-1.73E-09
2006	0	0	4,101	2.49	54.9	215.0	2.73	43.3	4,170	8,590	-1.04E-07	-1.21E-09
2007	0.470	239.1	4,579	3.03	57.6	236.0	4.17	52.1	3,860	9,031	-9.40E-08	-1.04E-09
2008	0	0	4,200	2.67	55.6	221.7	3.05	46.3	4,085	8,615	1.79E-07	2.08E-09
2009	1.83E-06	0.003	4,136	2.49	55.2	215.2	2.92	43.0	4,165	8,620	-6.15E-09	-7.13E-11
2010	0.008	5.47	4,141	2.46	55.5	212.0	3.15	42.3	4,171	8,632	-1.83E-07	-2.12E-09
2011	0	0	3,801	1.93	53.4	193.9	2.16	33.4	4,462	8,548	-2.22E-07	-2.60E-09
2012	0.015	9.40	3,912	1.87	53.9	198.2	2.23	31.9	4,357	8,566	1.03E-07	1.21E-09
2013	0.053	37.4	3,966	1.90	53.8	202.3	2.40	32.4	4,263	8,560	-1.22E-07	-1.43E-09
2014	0	0	3,874	1.74	53.1	198.3	2.17	30.2	4,369	8,528	1.37E-07	1.60E-09
2015	0.277	160.3	4,140	2.08	54.0	210.8	3.01	35.7	4,128	8,734	-3.32E-07	-3.80E-09
2016	0.279	144.5	4,275	2.42	54.4	219.5	3.38	41.1	4,011	8,752	7.14E-08	8.16E-10
2017	0.069	27.0	4,175	2.47	53.5	217.6	2.99	41.7	4,080	8,600	-1.72E-07	-2.00E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - (Layer 2)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Caldwell does not exist in the model in Layer 2.			
1980				
1981				
1982				
1983				
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2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Sparta Aquifer (Layer 3)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Caldwell does not exist in model in the Sparta Aquifer (Layer 3).			
1980				
1981				
1982				
1983				
1984				
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1986				
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2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Weches Formation (Layer 4)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Caldwell does not exist in model in the Weches Formation (Layer 4).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
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1995				
1996				
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2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Queen City Aquifer (Layer 5)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Caldwell does not exist in model in the Queen City Aquifer (Layer 5).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Reklaw Formation (Layer 6)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Caldwell does not exist in model in the Reklaw Formation (Layer 6).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
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2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Carrizo-Upper Wilcox (Layer 7)

Simulated Time Period	Inflows				Total Inflows	Outflows				Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Gonzales County UWCD	Plum Creek CD	Lower Layers		Specific Storage	Wells	Gonzales County UWCD	Upper Layers			
	(acre-feet)											%
Predevelopment	0	10.9	3.42	27.3	41.6	0	0	4.75	36.8	41.6	4.52E-10	1.09E-09
1980	0	10.1	3.21	25.1	38.4	0	0.036	4.89	33.5	38.4	-6.30E-12	-1.64E-11
1981	0	10.5	3.38	25.9	39.8	1.41E-04	0.038	4.79	35.0	39.8	-8.18E-12	-2.05E-11
1982	1.39E-04	10.1	3.18	25.0	38.3	0	0.040	4.87	33.4	38.3	7.89E-13	2.06E-12
1983	6.59E-05	9.92	3.13	24.6	37.6	0	0.041	4.90	32.7	37.6	-4.59E-12	-1.22E-11
1984	1.18E-04	9.58	3.02	23.8	36.4	0	0.043	4.97	31.4	36.4	-4.25E-12	-1.17E-11
1985	0	10.1	3.25	24.9	38.3	1.79E-04	0.043	4.86	33.4	38.3	-4.29E-12	-1.12E-11
1986	0	10.3	3.29	25.3	38.9	6.12E-05	0.042	4.83	34.1	38.9	-8.53E-14	-2.19E-13
1987	0	10.4	3.32	25.6	39.4	4.34E-05	0.043	4.81	34.5	39.4	-1.77E-10	-4.50E-10
1988	3.05E-04	9.54	2.96	23.7	36.2	0	0.043	4.99	31.2	36.2	8.53E-13	2.35E-12
1989	8.00E-05	9.24	2.92	23.1	35.2	0	0.043	5.01	30.2	35.2	-2.76E-12	-7.82E-12
1990	0	9.61	3.10	23.8	36.5	1.17E-04	0.044	4.94	31.5	36.5	-2.82E-12	-7.73E-12
1991	0	10.2	3.29	25.1	38.5	1.89E-04	0.045	4.85	33.6	38.5	-4.26E-12	-1.11E-11
1992	0	10.8	3.48	26.3	40.6	1.81E-04	0.044	4.77	35.8	40.6	-6.82E-13	-1.68E-12
1993	1.39E-04	10.3	3.24	25.4	39.0	0	0.047	4.84	34.1	39.0	-5.73E-12	-1.47E-11
1994	0	10.5	3.32	25.8	39.6	5.25E-05	0.046	4.81	34.7	39.6	9.66E-11	2.44E-10
1995	1.08E-04	10.2	3.18	25.1	38.4	0	0.046	4.87	33.5	38.4	4.18E-12	1.09E-11
1996	2.03E-04	9.55	2.97	23.8	36.3	0	0.046	4.99	31.3	36.3	-4.82E-11	-1.33E-10
1997	0	10.1	3.25	25.1	38.4	2.05E-04	0.046	4.86	33.5	38.4	3.92E-12	1.02E-11
1998	0	10.5	3.36	25.8	39.6	1.09E-04	0.047	4.80	34.8	39.6	7.29E-12	1.84E-11
1999	2.14E-04	9.85	3.07	24.4	37.3	0	0.047	4.92	32.4	37.3	-1.88E-12	-5.03E-12
2000	0	10.1	3.19	24.8	38.0	5.22E-05	0.061	4.90	33.0	38.0	-2.08E-11	-5.48E-11
2001	1.53E-05	9.97	3.15	24.6	37.7	0	0.050	4.89	32.8	37.7	-2.45E-12	-6.50E-12
2002	0	11.0	3.56	26.7	41.2	3.25E-04	0.062	4.72	36.5	41.2	-3.86E-12	-9.36E-12
2003	3.41E-05	10.9	3.44	26.5	40.9	0	0.054	4.75	36.1	40.9	-4.66E-12	-1.14E-11
2004	0	11.5	3.68	27.9	43.0	1.91E-04	0.047	4.66	38.3	43.0	1.29E-12	2.99E-12
2005	2.86E-04	10.6	3.26	26.0	39.8	0	0.047	4.81	35.0	39.8	-2.16E-12	-5.42E-12
2006	1.89E-04	9.95	3.08	24.8	37.8	0	0.039	4.91	32.8	37.8	-1.34E-12	-3.55E-12
2007	0	11.2	3.64	27.4	42.3	4.16E-04	0.029	4.68	37.6	42.3	-5.12E-12	-1.21E-11
2008	3.20E-04	10.3	3.18	25.5	38.9	0	0.043	4.88	34.0	38.9	-1.85E-12	-4.76E-12
2009	5.29E-05	10.1	3.18	25.0	38.3	0	0.063	4.87	33.3	38.3	7.73E-11	2.02E-10
2010	0	10.4	3.27	25.1	38.7	3.95E-05	0.094	4.83	33.8	38.7	-2.03E-11	-5.25E-11
2011	3.28E-04	9.38	2.89	22.9	35.2	0	0.094	5.00	30.1	35.2	-6.81E-10	-1.93E-09
2012	0	9.45	2.98	23.1	35.5	1.21E-05	0.228	5.00	30.3	35.5	5.31E-11	1.50E-10
2013	4.78E-05	9.46	2.96	22.7	35.1	0	0.440	4.99	29.7	35.1	2.56E-11	7.30E-11
2014	2.17E-04	9.06	2.77	21.1	32.9	0	0.637	5.08	27.2	32.9	2.17E-09	6.60E-09
2015	0	9.57	2.95	21.5	34.0	7.52E-05	0.931	5.01	28.1	34.0	-5.95E-12	-1.75E-11
2016	0	9.78	2.99	21.8	34.6	5.93E-05	0.793	5.00	28.8	34.6	-1.30E-09	-3.75E-09
2017	1.52E-04	9.36	2.81	20.8	32.9	0	0.860	5.07	27.0	32.9	-2.63E-13	-7.98E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Guadalupe County GCD	Lost Pines GCD	Plum Creek CD	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	336.3	116.0	47.9	92.3	181.2	3,230	783.2	4,787
1980	0	0	317.4	103.8	43.4	89.8	129.4	3,398	698.7	4,781
1981	0	0	406.9	110.3	43.9	93.3	152.4	3,283	719.9	4,810
1982	0.234	24.0	275.0	103.1	42.7	89.2	133.8	3,383	699.5	4,750
1983	0.110	10.5	281.9	100.3	42.0	88.2	122.4	3,436	685.6	4,767
1984	0.201	18.6	239.4	94.4	39.5	86.1	106.8	3,535	660.4	4,780
1985	0	0	383.7	103.6	42.4	91.0	125.4	3,383	691.4	4,820
1986	0	0	362.3	106.6	43.2	91.5	138.0	3,336	702.8	4,780
1987	0	0	366.6	108.8	43.9	92.2	146.7	3,308	712.1	4,779
1988	0.485	48.2	169.6	93.9	41.4	84.6	108.8	3,549	661.9	4,758
1989	0.114	9.69	225.3	89.9	39.6	84.2	93.7	3,596	641.5	4,779
1990	0	0	335.1	96.2	40.3	88.0	102.6	3,499	652.9	4,815
1991	0	0	399.8	104.1	42.4	91.7	130.5	3,349	690.7	4,809
1992	0	0	451.2	113.6	44.2	95.5	161.3	3,248	720.0	4,833
1993	0.215	24.9	288.6	105.9	43.6	90.1	142.0	3,341	702.9	4,740
1994	0	0	364.0	108.8	44.2	91.9	146.3	3,319	709.9	4,784
1995	0.176	17.6	281.6	103.5	43.2	88.9	129.7	3,405	688.8	4,758
1996	0.332	34.4	199.9	94.1	41.3	84.6	102.6	3,573	662.7	4,793
1997	0	0	392.2	104.3	42.9	90.8	121.4	3,403	687.1	4,842
1998	0	0	393.0	109.0	43.8	92.4	142.6	3,316	707.0	4,804
1999	0.347	34.7	225.3	98.3	41.8	86.4	116.8	3,479	668.2	4,750
2000	0.002	0.614	341.8	102.3	41.9	89.5	117.3	3,455	669.4	4,817
2001	0.016	2.01	306.7	100.6	41.9	88.4	116.1	3,449	669.8	4,775
2002	0	0	521.4	116.9	44.5	97.0	163.4	3,226	723.0	4,892
2003	0.056	7.52	380.3	114.4	44.5	94.3	164.6	3,241	725.6	4,773
2004	0	0	499.3	152.6	46.8	99.0	198.0	3,147	768.2	4,911
2005	0.472	48.8	252.2	109.5	44.2	90.7	153.5	3,321	716.8	4,737
2006	0.284	28.0	225.5	100.4	42.8	87.0	123.2	3,467	685.6	4,760
2007	0	0	540.0	128.7	46.8	98.4	183.7	3,177	765.4	4,940
2008	0.546	55.3	214.2	105.4	43.7	88.8	139.3	3,398	705.0	4,750
2009	0.116	9.75	307.9	103.6	42.4	89.2	124.3	3,439	679.3	4,795
2010	0.035	4.08	383.6	107.0	41.4	91.6	124.8	3,411	669.0	4,832
2011	0.531	51.7	177.4	90.6	38.0	83.6	84.7	3,656	609.4	4,792
2012	0	0	306.0	92.5	41.9	84.5	95.0	3,613	637.0	4,870
2013	0.009	0	334.8	92.1	42.5	84.7	110.7	3,546	638.9	4,850
2014	0.248	15.4	297.4	87.1	42.0	82.7	104.9	3,619	600.5	4,849
2015	0	0	491.4	93.2	43.8	88.8	145.8	3,407	631.7	4,902
2016	0	0	468.6	95.7	44.7	90.1	174.6	3,320	654.2	4,848
2017	0.194	16.1	382.7	90.3	43.5	86.6	167.8	3,389	628.7	4,805

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Gonzales County UWCD	Guadalupe County GCD	Lost Pines GCD	Plum Creek CD	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	663.6	0.060	1,325	121.6	2,387	289.1	4,787	1.49E-07	3.11E-09
1980	0	0	48.5	757.0	0	1,320	141.9	2,222	291.3	4,781	-7.55E-11	-1.58E-12
1981	0.223	22.8	56.2	679.1	0	1,321	131.1	2,294	306.4	4,810	-4.35E-09	-9.05E-11
1982	0	0	61.4	749.9	0	1,315	136.1	2,210	277.5	4,750	2.65E-10	5.57E-12
1983	0	0	63.7	783.0	0	1,315	142.5	2,179	284.2	4,767	-1.57E-10	-3.30E-12
1984	0	0	69.5	838.8	0	1,316	150.1	2,125	280.7	4,780	-3.98E-10	-8.33E-12
1985	0.291	29.4	63.6	744.9	0	1,319	142.3	2,213	307.8	4,820	1.79E-09	3.71E-11
1986	0.087	8.31	66.3	715.5	0	1,318	135.7	2,238	298.1	4,780	1.96E-10	4.09E-12
1987	0.066	5.84	68.2	697.0	0	1,318	131.6	2,260	297.3	4,779	-3.96E-08	-8.29E-10
1988	0	0	69.4	852.5	0	1,314	147.2	2,112	263.0	4,758	-2.82E-10	-5.93E-12
1989	0	0	66.3	883.5	0	1,314	156.3	2,077	283.3	4,779	-1.03E-09	-2.15E-11
1990	0.166	18.9	75.4	813.5	0	1,316	150.9	2,134	305.4	4,815	1.60E-10	3.32E-12
1991	0.349	32.8	41.3	726.3	0	1,319	140.8	2,238	310.8	4,809	5.27E-10	1.10E-11
1992	0.268	25.6	56.4	639.7	0	1,324	124.9	2,341	321.4	4,833	2.39E-09	4.94E-11
1993	0	0	44.4	726.5	0	1,314	132.5	2,242	279.5	4,740	1.09E-09	2.30E-11
1994	0.085	7.17	44.1	710.2	0	1,317	134.5	2,272	299.5	4,784	4.61E-07	9.65E-09
1995	0	0	40.3	767.9	0	1,314	140.5	2,212	283.3	4,758	3.08E-09	6.47E-11
1996	0	0	60.7	870.3	0	1,314	155.0	2,119	275.0	4,793	-1.17E-08	-2.44E-10
1997	0.337	36.0	42.6	760.9	0	1,318	147.6	2,222	314.1	4,842	-1.43E-08	-2.94E-10
1998	0.177	17.8	41.3	703.7	0	1,318	137.7	2,278	307.1	4,804	1.54E-07	3.21E-09
1999	0	0	41.9	814.3	0	1,311	146.5	2,163	273.8	4,750	1.46E-10	3.06E-12
2000	0.067	8.27	54.1	787.9	0	1,318	148.0	2,194	307.2	4,817	-5.78E-07	-1.20E-08
2001	0.001	0.480	44.4	790.8	0	1,313	147.9	2,183	294.9	4,775	1.56E-09	3.27E-11
2002	0.513	51.2	54.9	625.5	0	1,323	130.1	2,368	339.6	4,892	1.12E-10	2.29E-12
2003	6.64E-04	0	48.0	649.4	0	1,318	125.8	2,332	299.2	4,773	-1.16E-09	-2.44E-11
2004	0.330	31.1	42.1	589.3	0	1,329	113.9	2,481	323.9	4,911	-2.73E-12	-5.56E-14
2005	0	0	41.9	716.0	0	1,315	128.9	2,268	267.0	4,737	3.21E-10	6.78E-12
2006	0	0	34.7	813.6	0	1,313	145.6	2,182	271.3	4,760	1.22E-10	2.56E-12
2007	0.700	70.6	25.9	605.1	0	1,329	124.2	2,447	338.3	4,940	-1.25E-08	-2.53E-10
2008	0	0	37.8	764.5	0	1,318	135.9	2,232	262.0	4,750	-5.00E-10	-1.05E-11
2009	1.37E-05	0.051	56.3	786.4	0	1,314	145.0	2,197	296.2	4,795	3.26E-07	6.80E-09
2010	0.041	7.18	83.9	755.6	0	1,314	145.1	2,205	321.2	4,832	3.00E-08	6.22E-10
2011	0	0	83.9	909.0	0	1,305	161.2	2,047	285.0	4,792	-3.69E-06	-7.70E-08
2012	0.142	16.9	43.1	905.5	0	1,332	165.8	2,098	308.2	4,870	3.66E-07	7.52E-09
2013	0.076	14.2	40.8	873.5	0	1,335	159.7	2,117	309.8	4,850	8.57E-09	1.77E-10
2014	0	0	71.7	916.7	0	1,334	162.7	2,052	312.7	4,849	1.61E-06	3.33E-08
2015	0.347	46.3	56.4	786.9	0	1,348	151.2	2,169	344.1	4,902	-2.33E-09	-4.75E-11
2016	0.153	19.2	51.8	729.8	0	1,350	139.0	2,227	330.8	4,848	-4.31E-07	-8.89E-09
2017	0	0	58.5	789.6	0	1,348	141.9	2,155	312.2	4,805	-4.05E-10	-8.42E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	Recharge	Gonzales County UWCD	Guadalupe County GCD	Lost Pines GCD	Plum Creek CD	Upper Layers	
	(acre-feet)								
Predevelopment	0	0	1,864	127.9	712.2	36.8	342.7	1,016	4,100
1980	0	0	1,760	113.1	642.1	36.3	298.7	1,086	3,936
1981	3.96E-05	0	2,256	120.0	655.6	35.3	310.5	1,096	4,474
1982	7.62	274.9	1,524	113.2	643.3	36.7	300.2	1,076	3,976
1983	4.70	184.9	1,562	109.5	635.6	37.1	293.6	1,100	3,928
1984	8.82	351.0	1,327	100.8	600.4	37.6	285.4	1,141	3,852
1985	0.001	0.079	2,127	111.5	630.6	35.7	293.2	1,130	4,328
1986	0	0	2,008	116.9	648.3	35.6	297.9	1,101	4,208
1987	0	0	2,032	120.8	665.3	35.7	301.1	1,092	4,247
1988	18.0	727.6	940.1	105.1	640.0	38.1	280.2	1,097	3,846
1989	6.23	305.4	1,249	96.5	606.5	37.6	273.8	1,143	3,718
1990	0.165	12.5	1,857	102.0	608.2	35.9	281.0	1,165	4,062
1991	0	0	2,216	108.9	605.9	34.7	292.0	1,125	4,382
1992	0	0	2,501	120.8	637.8	34.3	312.5	1,124	4,730
1993	6.33	245.3	1,600	114.7	636.1	36.3	297.5	1,061	3,997
1994	0	0	2,018	117.9	650.2	36.3	299.7	1,083	4,205
1995	5.87	237.3	1,561	111.9	637.5	37.3	292.6	1,074	3,957
1996	13.5	550.7	1,108	101.7	618.2	38.4	277.6	1,104	3,813
1997	0.015	1.15	2,174	110.5	627.3	36.1	289.3	1,122	4,361
1998	0	0	2,179	116.3	642.5	35.6	302.1	1,091	4,366
1999	12.3	484.5	1,249	105.2	618.5	37.5	285.6	1,077	3,870
2000	0.624	13.8	1,895	108.7	626.7	36.8	283.0	1,134	4,099
2001	0.923	51.6	1,700	106.6	618.3	36.7	283.4	1,106	3,904
2002	0	0	2,890	125.0	667.8	34.5	310.7	1,138	5,167
2003	0.538	12.9	2,108	124.1	672.6	35.9	310.4	1,070	4,334
2004	0	0	2,768	134.3	708.6	37.1	333.4	1,090	5,071
2005	15.2	571.7	1,398	119.9	677.6	37.5	308.7	1,040	4,169
2006	11.6	510.6	1,250	107.9	645.4	38.1	295.2	1,070	3,929
2007	0	0	2,993	128.6	691.9	36.2	333.3	1,109	5,292
2008	18.6	693.0	1,187	114.7	663.4	37.5	304.5	1,044	4,063
2009	6.16	196.7	1,707	112.2	654.8	37.9	289.1	1,117	4,121
2010	3.11	47.9	2,126	116.7	666.7	37.3	289.0	1,177	4,464
2011	21.4	835.0	983.2	98.3	626.6	39.3	267.9	1,198	4,070
2012	0.949	63.6	1,696	97.6	616.1	39.2	270.0	1,153	3,937
2013	0.347	19.8	1,856	97.0	615.8	38.5	282.6	1,124	4,034
2014	6.74	186.4	1,648	98.9	638.6	38.8	274.1	1,161	4,053
2015	0	0	2,724	106.0	659.7	37.4	301.4	1,156	4,984
2016	0	0	2,598	110.3	681.9	37.4	320.9	1,110	4,858
2017	3.09	66.8	2,121	107.1	683.2	39.0	314.3	1,092	4,427

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-18.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Caldwell - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	Evapo-transpiration	Gonzales County UWCD	Guadalupe County GCD	Lost Pines GCD	Plum Creek CD	Upper Layers			
	(acre-feet)											%
Predevelopment	0	0	0	19.0	36.1	367.3	338.4	896.0	2,444	4,100	2.05E-07	4.99E-09
1980	0	0	388.0	0	40.9	340.3	316.9	780.7	2,069	3,936	-1.31E-10	-3.32E-12
1981	8.54	373.5	421.6	3.05	36.5	342.4	325.8	805.0	2,157	4,474	-3.28E-09	-7.33E-11
1982	0.010	0.778	432.2	0	39.7	339.9	319.2	793.8	2,050	3,976	2.27E-12	5.72E-14
1983	0	0	452.4	0	41.4	340.8	314.3	776.1	2,003	3,928	-1.11E-10	-2.81E-12
1984	0	0	502.1	0	43.9	356.8	307.0	748.3	1,894	3,852	-5.59E-10	-1.45E-11
1985	9.66	370.3	456.2	0	39.2	342.6	315.9	761.8	2,032	4,328	1.30E-09	3.00E-11
1986	3.74	175.7	492.4	0	36.9	334.1	320.7	776.1	2,069	4,208	-1.07E-10	-2.55E-12
1987	3.18	155.1	506.0	0.184	35.5	328.3	324.1	790.2	2,105	4,247	-5.58E-08	-1.31E-09
1988	0	0	510.8	0	44.0	330.7	306.2	747.5	1,907	3,846	-7.91E-11	-2.06E-12
1989	0	0	464.1	0	46.7	344.6	297.5	718.3	1,847	3,718	-7.80E-10	-2.10E-11
1990	5.32	209.7	540.3	0	43.2	343.7	303.2	720.1	1,897	4,062	1.29E-10	3.18E-12
1991	12.9	475.9	391.9	0	40.2	346.0	317.4	749.4	2,049	4,382	1.49E-10	3.40E-12
1992	12.2	528.4	510.9	6.21	34.7	343.4	331.3	797.0	2,166	4,730	2.88E-09	6.09E-11
1993	0.154	11.5	413.0	0	38.6	334.1	324.0	788.9	2,086	3,997	7.75E-10	1.94E-11
1994	3.45	144.2	424.3	1.20	37.6	333.6	326.9	795.4	2,138	4,205	2.55E-07	6.06E-09
1995	0	0	425.0	0	40.7	331.6	321.2	778.5	2,060	3,957	2.62E-09	6.61E-11
1996	0	0	434.1	0	46.0	334.0	308.7	757.6	1,932	3,813	-1.46E-08	-3.82E-10
1997	11.3	417.7	407.6	0	41.1	335.0	318.9	761.6	2,067	4,361	-7.67E-09	-1.76E-10
1998	7.61	316.4	404.2	0.067	38.1	336.9	327.7	788.8	2,146	4,366	1.04E-07	2.37E-09
1999	0	0	438.0	0	43.5	333.6	315.1	757.0	1,983	3,870	2.00E-11	5.17E-13
2000	1.78	89.4	566.2	0	41.8	330.2	318.1	744.7	2,007	4,099	-3.43E-07	-8.38E-09
2001	0.256	3.49	464.2	0	42.4	331.9	316.4	746.7	1,998	3,904	1.05E-09	2.70E-11
2002	19.2	819.1	574.4	17.7	33.2	332.4	336.9	798.6	2,235	5,167	7.28E-12	1.41E-13
2003	1.35	79.4	502.3	17.0	34.0	330.7	337.5	820.6	2,212	4,334	-1.47E-09	-3.39E-11
2004	13.9	549.4	440.0	65.0	29.6	343.0	346.2	872.2	2,412	5,071	2.66E-10	5.24E-12
2005	0.024	1.82	438.8	7.03	37.3	331.0	335.2	839.9	2,178	4,169	1.82E-12	4.36E-14
2006	0	0	363.1	0	43.6	333.4	323.2	801.4	2,064	3,929	7.73E-11	1.97E-12
2007	24.9	933.3	271.1	47.3	33.1	353.0	343.1	861.8	2,425	5,292	-8.23E-09	-1.55E-10
2008	0	0	395.3	1.85	40.5	335.8	331.6	823.3	2,134	4,063	7.28E-12	1.79E-13
2009	2.41E-04	0	588.8	0	41.1	326.1	325.4	780.2	2,060	4,121	2.21E-07	5.36E-09
2010	1.70	104.3	877.6	1.79	38.0	314.8	329.4	764.4	2,032	4,464	1.61E-08	3.60E-10
2011	0	0	877.6	0	46.5	323.8	309.9	711.9	1,800	4,070	-2.17E-06	-5.34E-08
2012	6.59	127.1	445.3	0	52.8	332.0	329.9	726.0	1,917	3,937	2.22E-07	5.63E-09
2013	5.47	173.9	403.8	0	59.7	340.3	340.8	741.0	1,970	4,034	8.51E-09	2.11E-10
2014	0	0	711.5	0	72.9	334.8	338.8	720.4	1,875	4,053	1.67E-06	4.11E-08
2015	18.2	756.5	531.8	0	81.1	347.6	371.1	787.6	2,090	4,984	-5.17E-09	-1.04E-10
2016	10.6	464.2	492.7	27.2	81.5	356.5	383.2	845.0	2,197	4,858	-2.96E-07	-6.08E-09
2017	0.676	45.0	561.2	16.3	89.5	357.1	386.0	850.3	2,121	4,427	-2.24E-10	-5.05E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.1
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Quarternary Alluvium (Layer 1) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	River Package	Recharge	Wintergarden GCD	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	3.40E+05	2,595	0.983	3.00E+05	6.42E+05
1980	0	0	3.43E+05	2,449	1.19	2.99E+05	6.44E+05
1981	0	0	3.41E+05	3,139	1.11	2.98E+05	6.42E+05
1982	2.77	121.5	3.43E+05	2,121	1.21	2.98E+05	6.43E+05
1983	1.36	71.8	3.43E+05	2,174	1.22	2.97E+05	6.43E+05
1984	2.50	138.3	3.45E+05	1,847	1.26	2.98E+05	6.45E+05
1985	5.27E-04	0.137	3.42E+05	2,960	1.14	2.98E+05	6.43E+05
1986	0.022	0.031	3.42E+05	2,795	1.16	2.98E+05	6.42E+05
1987	9.79E-12	3.25E-05	3.42E+05	2,828	1.15	2.98E+05	6.42E+05
1988	6.44	315.0	3.45E+05	1,308	1.32	2.98E+05	6.45E+05
1989	2.07	133.3	3.44E+05	1,738	1.29	2.97E+05	6.43E+05
1990	0.300	16.0	3.43E+05	2,585	1.21	2.98E+05	6.43E+05
1991	0.066	5.95	3.41E+05	3,084	1.14	2.98E+05	6.43E+05
1992	0.046	3.98	3.41E+05	3,480	1.09	2.99E+05	6.44E+05
1993	3.32	138.5	3.42E+05	2,226	1.20	2.98E+05	6.42E+05
1994	0.098	9.24	3.42E+05	2,808	1.13	2.98E+05	6.42E+05
1995	2.43	114.2	3.43E+05	2,172	1.20	2.98E+05	6.43E+05
1996	4.48	238.1	3.45E+05	1,542	1.28	2.98E+05	6.45E+05
1997	0.164	11.5	3.42E+05	3,025	1.12	2.98E+05	6.43E+05
1998	0.074	6.66	3.41E+05	3,032	1.11	2.98E+05	6.42E+05
1999	4.78	230.2	3.44E+05	1,738	1.25	2.97E+05	6.43E+05
2000	0.020	3.79	3.43E+05	2,637	1.17	2.98E+05	6.44E+05
2001	0.426	25.9	3.43E+05	2,366	1.19	2.97E+05	6.43E+05
2002	0.003	3.32	3.40E+05	4,022	1.05	2.99E+05	6.42E+05
2003	1.20	45.2	3.41E+05	2,934	1.12	2.98E+05	6.42E+05
2004	0.004	4.89	3.40E+05	3,852	1.06	3.00E+05	6.44E+05
2005	5.92	264.2	3.43E+05	1,945	1.19	2.98E+05	6.43E+05
2006	3.94	210.4	3.44E+05	1,740	1.21	2.97E+05	6.43E+05
2007	0.003	2.95	3.40E+05	4,166	1.03	2.99E+05	6.43E+05
2008	6.40	305.7	3.45E+05	1,652	1.21	2.98E+05	6.45E+05
2009	0.668	55.0	3.43E+05	2,375	1.17	2.98E+05	6.43E+05
2010	0.086	9.05	3.42E+05	2,959	1.12	2.98E+05	6.43E+05
2011	6.11	316.0	3.45E+05	1,368	1.26	2.97E+05	6.43E+05
2012	0.465	41.2	3.45E+05	2,361	1.17	2.98E+05	6.45E+05
2013	0.234	18.2	3.43E+05	2,583	1.16	2.98E+05	6.43E+05
2014	0.894	55.3	3.43E+05	2,294	1.18	2.97E+05	6.43E+05
2015	0.094	5.61	3.40E+05	3,791	1.07	2.98E+05	6.43E+05
2016	0.106	5.28	3.41E+05	3,615	1.08	2.99E+05	6.44E+05
2017	1.59	58.3	3.41E+05	2,952	1.12	2.98E+05	6.42E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Wintergarden GCD	Lower Layers			
									%
Predevelopment	0	0	2.99E+05	390.3	1.84	3.43E+05	6.42E+05	5.30E-08	8.25E-12
1980	0	0	2.98E+05	387.4	2.49	3.46E+05	6.44E+05	1.50E-06	2.33E-10
1981	3.23	167.5	2.98E+05	388.2	2.45	3.44E+05	6.42E+05	-1.64E-06	-2.55E-10
1982	4.60E-04	0.344	2.97E+05	386.7	2.48	3.45E+05	6.43E+05	-6.13E-07	-9.54E-11
1983	0.004	0.191	2.97E+05	386.0	2.49	3.45E+05	6.43E+05	-1.08E-06	-1.67E-10
1984	2.93E-05	0.032	2.98E+05	385.6	2.53	3.47E+05	6.45E+05	6.78E-07	1.05E-10
1985	3.52	159.2	2.98E+05	386.6	2.49	3.45E+05	6.43E+05	-7.85E-07	-1.22E-10
1986	1.25	70.2	2.98E+05	387.4	2.48	3.44E+05	6.42E+05	-3.19E-07	-4.96E-11
1987	0.968	63.5	2.98E+05	388.0	2.47	3.44E+05	6.42E+05	-6.37E-07	-9.92E-11
1988	5.65E-05	0.045	2.97E+05	385.4	2.55	3.47E+05	6.45E+05	-4.07E-08	-6.32E-12
1989	0.094	2.20	2.96E+05	383.3	2.57	3.46E+05	6.43E+05	-4.46E-07	-6.94E-11
1990	2.62	102.6	2.97E+05	384.7	2.55	3.45E+05	6.43E+05	-1.92E-07	-2.99E-11
1991	3.52	172.4	2.98E+05	386.7	2.49	3.44E+05	6.43E+05	-8.51E-07	-1.32E-10
1992	3.98	221.4	2.99E+05	390.2	2.44	3.44E+05	6.44E+05	2.25E-07	3.49E-11
1993	0.112	6.12	2.97E+05	387.4	2.45	3.45E+05	6.42E+05	-5.97E-07	-9.30E-11
1994	1.05	64.0	2.98E+05	388.2	2.43	3.44E+05	6.42E+05	-5.55E-07	-8.64E-11
1995	0.025	1.82	2.97E+05	386.9	2.45	3.45E+05	6.43E+05	-6.49E-07	-1.01E-10
1996	2.87E-04	0.234	2.97E+05	385.5	2.50	3.47E+05	6.45E+05	8.35E-08	1.29E-11
1997	4.12	183.0	2.97E+05	386.9	2.45	3.45E+05	6.43E+05	-9.83E-07	-1.53E-10
1998	2.20	120.0	2.98E+05	388.3	2.43	3.44E+05	6.42E+05	-5.95E-07	-9.26E-11
1999	2.61E-04	0.218	2.97E+05	385.7	2.49	3.46E+05	6.43E+05	-5.56E-07	-8.65E-11
2000	1.61	69.0	2.98E+05	387.6	2.47	3.46E+05	6.44E+05	6.79E-07	1.05E-10
2001	0.368	21.9	2.97E+05	386.3	2.47	3.45E+05	6.43E+05	-6.17E-07	-9.60E-11
2002	7.97	416.7	2.98E+05	390.8	2.38	3.43E+05	6.42E+05	-6.71E-07	-1.05E-10
2003	1.37	98.2	2.98E+05	390.6	2.37	3.44E+05	6.42E+05	-5.23E-07	-8.15E-11
2004	5.03	294.1	2.99E+05	394.5	2.32	3.44E+05	6.44E+05	4.35E-07	6.75E-11
2005	0.535	28.7	2.97E+05	390.1	2.37	3.45E+05	6.43E+05	-8.94E-07	-1.39E-10
2006	0.163	10.5	2.97E+05	387.6	2.39	3.46E+05	6.43E+05	-7.38E-07	-1.15E-10
2007	9.10	449.5	2.98E+05	393.0	2.29	3.43E+05	6.43E+05	-6.79E-07	-1.06E-10
2008	0.103	6.28	2.98E+05	390.0	2.37	3.47E+05	6.45E+05	3.34E-07	5.18E-11
2009	0.434	17.8	2.97E+05	388.7	2.36	3.46E+05	6.43E+05	-3.54E-07	-5.51E-11
2010	2.54	117.1	2.98E+05	390.0	2.33	3.45E+05	6.43E+05	-7.30E-07	-1.14E-10
2011	0	0	2.96E+05	386.3	2.40	3.47E+05	6.43E+05	-7.81E-07	-1.21E-10
2012	1.22	41.1	2.98E+05	387.7	2.39	3.47E+05	6.45E+05	4.89E-07	7.58E-11
2013	1.38	55.2	2.97E+05	387.3	2.37	3.46E+05	6.43E+05	-8.50E-07	-1.32E-10
2014	9.35E-04	1.08	2.97E+05	386.8	2.38	3.46E+05	6.43E+05	-4.13E-07	-6.42E-11
2015	6.40	321.8	2.98E+05	390.6	2.31	3.44E+05	6.43E+05	-1.25E-06	-1.94E-10
2016	3.09	193.0	2.99E+05	393.7	2.28	3.44E+05	6.44E+05	6.07E-07	9.42E-11
2017	0.584	51.6	2.98E+05	392.3	2.28	3.44E+05	6.42E+05	-9.87E-07	-1.54E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - (Layer 2) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	35,758	937.3	2.32E-04	322.5	22,037	59,055
1980	0	0	35,925	884.7	2.33E-04	316.5	22,059	59,185
1981	0	0	35,712	1,134	2.32E-04	340.6	22,028	59,215
1982	0.276	16.2	35,846	766.3	2.32E-04	307.2	22,006	58,942
1983	0.045	3.48	35,865	785.5	2.32E-04	306.3	21,993	58,953
1984	0.134	8.82	36,031	667.2	2.33E-04	294.4	22,032	59,033
1985	8.83E-06	0.006	35,774	1,069	2.32E-04	331.1	22,000	59,174
1986	0.014	0.471	35,765	1,010	2.32E-04	328.9	22,014	59,118
1987	0	0	35,746	1,022	2.32E-04	331.3	22,024	59,123
1988	0.490	29.5	36,083	472.6	2.33E-04	279.5	22,032	58,897
1989	0.040	3.30	35,978	628.0	2.32E-04	287.7	21,951	58,848
1990	1.90E-04	0.133	35,860	933.8	2.32E-04	316.1	21,971	59,080
1991	1.66E-05	0.010	35,752	1,114	2.32E-04	336.8	22,004	59,207
1992	5.97E-07	8.95E-04	35,752	1,257	2.33E-04	355.4	22,103	59,468
1993	0.347	19.8	35,813	804.2	2.32E-04	313.2	22,017	58,968
1994	0.002	0.033	35,747	1,014	2.32E-04	330.4	22,022	59,114
1995	0.192	11.7	35,840	784.7	2.32E-04	308.5	22,003	58,948
1996	0.261	16.6	36,065	557.1	2.33E-04	285.2	22,028	58,952
1997	5.21E-06	0.004	35,767	1,093	2.32E-04	332.8	22,000	59,193
1998	0.002	0.050	35,724	1,095	2.32E-04	337.4	22,022	59,179
1999	0.390	23.2	35,913	627.9	2.32E-04	293.8	21,986	58,844
2000	0.723	8.93	35,987	952.6	2.33E-04	321.7	22,004	59,275
2001	0.089	3.68	35,920	854.7	2.32E-04	313.0	21,944	59,035
2002	0.067	0.697	35,678	1,453	2.32E-04	372.5	21,995	59,500
2003	0.190	10.6	35,755	1,060	2.32E-04	339.9	22,007	59,173
2004	0.923	11.0	35,824	1,392	2.33E-04	372.7	22,015	59,615
2005	1.21	43.7	36,047	702.8	2.32E-04	306.9	21,864	58,966
2006	0.094	10.8	36,078	628.4	2.32E-04	293.3	21,872	58,883
2007	0	0	35,677	1,505	2.32E-04	376.4	21,981	59,540
2008	1.44	50.8	36,175	596.9	2.32E-04	295.3	21,925	59,044
2009	0.906	13.3	36,112	858.0	2.33E-04	313.3	21,814	59,112
2010	4.75E-05	0.033	35,875	1,069	2.32E-04	333.9	21,940	59,218
2011	1.30	40.0	36,200	494.3	2.32E-04	280.6	21,826	58,842
2012	0.001	0.341	36,055	852.8	2.33E-04	309.9	21,989	59,207
2013	1.99E-04	0.133	35,890	933.2	2.32E-04	318.6	21,948	59,090
2014	0.045	2.72	35,902	828.7	2.32E-04	309.9	21,961	59,004
2015	2.17E-07	6.72E-04	35,662	1,370	2.32E-04	363.4	22,022	59,418
2016	0.015	0.456	35,725	1,306	2.33E-04	363.9	22,112	59,508
2017	0.161	8.92	35,693	1,067	2.32E-04	341.6	22,046	59,156

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	22,266	3.82E-05	6.15E-04	1,307	35,481	59,055	1.46E-10	2.46E-13
1980	0	0	22,266	3.83E-05	6.17E-04	1,315	35,604	59,185	1.22E-09	2.05E-12
1981	0.235	14.8	22,321	3.82E-05	6.15E-04	1,296	35,583	59,215	-5.31E-10	-8.97E-13
1982	1.93E-05	0.010	22,181	3.82E-05	6.15E-04	1,317	35,444	58,942	-3.06E-10	-5.18E-13
1983	0.001	0.032	22,165	3.82E-05	6.15E-04	1,318	35,471	58,953	-6.40E-10	-1.09E-12
1984	2.81E-08	6.76E-05	22,159	3.83E-05	6.17E-04	1,330	35,545	59,033	4.00E-10	6.78E-13
1985	0.328	19.0	22,261	3.82E-05	6.15E-04	1,302	35,592	59,174	-2.18E-10	-3.69E-13
1986	0.040	3.29	22,267	3.82E-05	6.15E-04	1,303	35,544	59,118	-5.82E-11	-9.85E-14
1987	0.034	3.00	22,284	3.82E-05	6.15E-04	1,302	35,534	59,123	-3.86E-10	-6.52E-13
1988	0	0	22,103	3.83E-05	6.17E-04	1,340	35,454	58,897	-7.57E-10	-1.28E-12
1989	0.052	1.90	22,056	3.82E-05	6.15E-04	1,330	35,459	58,848	3.42E-10	5.81E-13
1990	0.256	13.6	22,180	3.82E-05	6.15E-04	1,311	35,575	59,080	-3.49E-10	-5.91E-13
1991	0.226	15.1	22,286	3.82E-05	6.15E-04	1,298	35,608	59,207	-4.95E-10	-8.36E-13
1992	0.203	14.8	22,449	3.83E-05	6.17E-04	1,291	35,713	59,468	3.78E-10	6.36E-13
1993	1.97E-04	0.144	22,212	3.82E-05	6.15E-04	1,313	35,442	58,968	-3.64E-10	-6.17E-13
1994	0.119	7.28	22,278	3.82E-05	6.15E-04	1,303	35,527	59,114	-4.73E-10	-8.00E-13
1995	3.70E-05	0.018	22,183	3.82E-05	6.15E-04	1,316	35,449	58,948	-4.73E-10	-8.02E-13
1996	0.001	0.036	22,121	3.83E-05	6.17E-04	1,336	35,496	58,952	2.33E-10	3.95E-13
1997	0.411	23.1	22,266	3.82E-05	6.15E-04	1,301	35,602	59,193	-5.38E-10	-9.10E-13
1998	0.096	7.48	22,305	3.82E-05	6.15E-04	1,298	35,568	59,179	-6.55E-11	-1.11E-13
1999	3.31E-07	5.49E-04	22,112	3.82E-05	6.15E-04	1,326	35,405	58,844	8.15E-10	1.38E-12
2000	0.135	8.37	22,231	3.83E-05	6.16E-04	1,312	35,724	59,275	3.35E-10	5.65E-13
2001	0.002	0.018	22,140	3.82E-05	6.14E-04	1,313	35,583	59,035	-6.26E-10	-1.06E-12
2002	0.469	32.9	22,406	3.82E-05	6.14E-04	1,277	35,783	59,500	-4.95E-10	-8.32E-13
2003	0.172	2.68	22,295	3.82E-05	6.14E-04	1,297	35,578	59,173	-3.20E-10	-5.41E-13
2004	0.163	14.4	22,426	3.82E-05	6.15E-04	1,282	35,893	59,615	1.16E-10	1.95E-13
2005	6.98E-05	0.037	22,034	3.81E-05	6.13E-04	1,318	35,614	58,966	-8.88E-10	-1.51E-12
2006	0.538	5.96	21,988	3.81E-05	6.14E-04	1,327	35,562	58,883	1.82E-10	3.09E-13
2007	1.33	52.4	22,401	3.82E-05	6.14E-04	1,276	35,809	59,540	-2.11E-10	-3.54E-13
2008	7.01E-07	0.001	22,055	3.82E-05	6.15E-04	1,329	35,660	59,044	3.57E-10	6.04E-13
2009	0.093	4.01	22,008	3.81E-05	6.13E-04	1,313	35,786	59,112	-5.24E-10	-8.86E-13
2010	1.68	33.0	22,199	3.82E-05	6.14E-04	1,300	35,683	59,218	-4.00E-10	-6.76E-13
2011	0	0	21,906	3.81E-05	6.13E-04	1,335	35,601	58,842	-2.26E-10	-3.83E-13
2012	1.66	30.3	22,163	3.83E-05	6.16E-04	1,320	35,693	59,207	1.09E-10	1.84E-13
2013	0.334	9.81	22,164	3.82E-05	6.15E-04	1,310	35,607	59,090	-1.24E-10	-2.09E-13
2014	0.180	2.28	22,145	3.82E-05	6.15E-04	1,315	35,542	59,004	-1.24E-10	-2.10E-13
2015	0.537	31.7	22,398	3.82E-05	6.15E-04	1,283	35,704	59,418	-4.37E-10	-7.35E-13
2016	0.087	7.97	22,490	3.83E-05	6.16E-04	1,286	35,723	59,508	3.86E-10	6.48E-13
2017	0.006	0.587	22,341	3.82E-05	6.15E-04	1,296	35,518	59,156	-3.49E-10	-5.90E-13

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Sparta Aquifer (Layer 3) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	9,364	1,823	759.5	35,671	1,701	49,318
1980	0	0	9,398	1,721	753.9	35,784	1,699	49,355
1981	0	0	9,344	2,206	753.5	35,787	1,695	49,785
1982	4.76	271.5	9,382	1,490	753.1	35,613	1,694	49,209
1983	1.65	165.7	9,384	1,528	752.3	35,642	1,694	49,167
1984	3.77	326.3	9,424	1,298	752.3	35,704	1,698	49,206
1985	0.041	2.94	9,355	2,080	750.2	35,790	1,694	49,671
1986	0.100	0.255	9,357	1,964	751.1	35,735	1,695	49,502
1987	0	0	9,354	1,987	751.7	35,727	1,695	49,516
1988	10.2	735.8	9,443	919.3	751.9	35,596	1,698	49,154
1989	2.68	317.9	9,406	1,221	747.2	35,614	1,693	49,002
1990	0.252	20.3	9,372	1,816	747.5	35,758	1,694	49,408
1991	0.063	3.45	9,347	2,167	748.9	35,808	1,695	49,770
1992	0.008	0.319	9,354	2,446	752.8	35,929	1,700	50,182
1993	5.47	272.2	9,375	1,564	751.6	35,616	1,694	49,279
1994	0.016	0.006	9,356	1,973	750.2	35,721	1,694	49,495
1995	3.71	242.7	9,381	1,526	750.0	35,621	1,693	49,218
1996	6.57	549.1	9,436	1,084	751.4	35,646	1,697	49,169
1997	0.022	1.86	9,353	2,126	749.8	35,802	1,693	49,726
1998	0.029	0	9,347	2,130	749.5	35,769	1,694	49,690
1999	7.42	484.4	9,398	1,221	749.8	35,562	1,693	49,115
2000	2.80	34.2	9,396	1,853	756.4	35,913	1,698	49,653
2001	1.52	89.1	9,378	1,662	754.2	35,762	1,693	49,341
2002	0.509	13.8	9,313	2,826	754.2	36,024	1,695	50,627
2003	2.39	41.8	9,347	2,061	755.0	35,782	1,694	49,684
2004	3.56	28.0	9,343	2,707	750.2	36,134	1,700	50,666
2005	13.5	687.5	9,392	1,367	750.2	35,796	1,693	49,700
2006	5.89	579.5	9,406	1,222	747.3	35,735	1,692	49,388
2007	2.52E-04	0.015	9,310	2,927	748.6	36,062	1,694	50,742
2008	15.5	765.1	9,430	1,161	749.9	35,830	1,697	49,649
2009	5.13	223.9	9,387	1,669	760.2	35,983	1,692	49,720
2010	0.029	2.45	9,356	2,079	756.5	35,895	1,692	49,781
2011	13.9	807.3	9,423	961.4	758.6	35,759	1,690	49,414
2012	0.405	42.2	9,409	1,659	752.6	35,879	1,694	49,436
2013	0.135	12.5	9,370	1,815	750.0	35,797	1,690	49,436
2014	1.01	63.5	9,380	1,612	751.2	35,721	1,690	49,218
2015	0.001	0.110	9,320	2,664	754.0	35,937	1,692	50,367
2016	0.086	0.035	9,346	2,540	756.3	35,950	1,697	50,290
2017	2.01	48.3	9,344	2,074	754.7	35,724	1,692	49,640

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	12,573	402.5	10.2	1,454	30,157	4,721	49,318	2.03E-09	4.12E-12
1980	0	0	0	12,604	355.0	10.2	1,458	30,191	4,736	49,355	4.00E-10	8.11E-13
1981	5.29	388.0	0	12,576	470.4	10.2	1,455	30,150	4,730	49,785	-3.36E-07	-6.75E-10
1982	0.064	4.50	0	12,569	333.6	10.2	1,454	30,113	4,725	49,209	2.55E-10	5.18E-13
1983	0.018	0.875	0	12,568	312.3	10.2	1,454	30,099	4,722	49,167	-1.38E-10	-2.81E-13
1984	7.15E-04	0.027	0	12,599	255.8	10.2	1,457	30,153	4,730	49,206	2.07E-08	4.20E-11
1985	6.00	385.1	0	12,573	401.9	10.2	1,454	30,117	4,724	49,671	0	0
1986	1.74	184.8	0	12,573	420.0	10.2	1,455	30,130	4,727	49,502	2.76E-10	5.59E-13
1987	1.67	167.0	0	12,574	436.6	10.2	1,456	30,142	4,729	49,516	2.26E-09	4.57E-12
1988	5.91E-04	0.028	0	12,596	211.4	10.2	1,458	30,148	4,730	49,154	1.38E-10	2.81E-13
1989	0.439	2.34	0	12,562	213.7	10.2	1,453	30,047	4,713	49,002	4.15E-10	8.46E-13
1990	4.16	253.8	0	12,569	320.5	10.2	1,454	30,079	4,717	49,408	3.07E-08	6.21E-11
1991	5.48	444.6	0	12,575	431.9	10.2	1,455	30,123	4,725	49,770	-1.78E-09	-3.57E-12
1992	6.28	546.7	0	12,615	542.4	10.2	1,461	30,254	4,747	50,182	1.16E-10	2.32E-13
1993	0.216	18.4	0	12,570	368.1	10.2	1,456	30,126	4,729	49,279	2.04E-09	4.13E-12
1994	2.46	151.6	0	12,574	427.7	10.2	1,457	30,140	4,731	49,495	-6.63E-09	-1.34E-11
1995	0.113	7.47	0	12,569	336.4	10.2	1,457	30,111	4,727	49,218	5.09E-09	1.03E-11
1996	0.040	0.896	0	12,597	224.6	10.2	1,458	30,147	4,732	49,169	1.18E-07	2.40E-10
1997	7.12	433.0	0	12,574	403.1	10.2	1,455	30,118	4,726	49,726	4.60E-08	9.25E-11
1998	3.31	307.7	0	12,576	461.7	10.2	1,457	30,143	4,731	49,690	-9.65E-09	-1.94E-11
1999	0.011	0.505	0	12,565	274.3	10.2	1,455	30,087	4,723	49,115	1.38E-10	2.81E-13
2000	2.47	124.1	235.7	12,599	357.0	10.1	1,454	30,135	4,736	49,653	2.51E-08	5.05E-11
2001	0.021	0	214.0	12,563	334.4	10.1	1,449	30,048	4,722	49,341	-5.17E-10	-1.05E-12
2002	11.6	855.7	253.7	12,578	601.1	10.1	1,451	30,129	4,736	50,627	-2.11E-10	-4.17E-13
2003	1.39	99.7	188.0	12,572	497.6	10.1	1,453	30,126	4,737	49,684	2.95E-09	5.93E-12
2004	6.35	529.6	501.3	12,607	627.1	10.0	1,460	30,169	4,755	50,666	-3.13E-10	-6.18E-13
2005	0.074	6.28	649.9	12,552	339.2	9.95	1,451	29,964	4,728	49,700	-1.18E-09	-2.37E-12
2006	1.61	1.01	432.1	12,553	252.7	10.0	1,451	29,966	4,721	49,388	1.09E-10	2.21E-13
2007	16.5	941.7	279.5	12,578	607.3	10.1	1,454	30,116	4,738	50,742	5.38E-10	1.06E-12
2008	0.004	0.266	534.3	12,586	285.7	10.0	1,455	30,042	4,736	49,649	5.73E-09	1.15E-11
2009	1.03	7.46	774.4	12,548	314.9	9.91	1,436	29,910	4,718	49,720	7.36E-08	1.48E-10
2010	9.07	260.1	293.6	12,566	421.7	10.1	1,445	30,049	4,727	49,781	-1.53E-08	-3.08E-11
2011	0	0	596.1	12,545	204.2	9.97	1,437	29,908	4,713	49,414	-1.15E-09	-2.33E-12
2012	7.94	110.3	127.4	12,597	291.4	10.1	1,451	30,109	4,732	49,436	1.40E-07	2.84E-10
2013	3.14	168.6	117.6	12,566	347.0	10.1	1,449	30,051	4,723	49,436	-9.46E-10	-1.91E-12
2014	0.985	19.3	68.3	12,566	321.4	10.1	1,449	30,060	4,723	49,218	1.12E-09	2.28E-12
2015	11.3	803.8	63.6	12,580	559.7	10.1	1,451	30,150	4,736	50,367	-9.84E-08	-1.95E-10
2016	5.14	510.9	66.1	12,616	601.6	10.2	1,458	30,265	4,757	50,290	4.15E-09	8.25E-12
2017	1.25	110.0	61.2	12,577	514.0	10.1	1,455	30,168	4,744	49,640	-8.33E-09	-1.68E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Weches Formation (Layer 4) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	228.4	5.43	4,732	1,688	6,654
1980	0	0	215.6	5.43	4,748	1,686	6,655
1981	0	0	276.3	5.42	4,742	1,682	6,706
1982	0.303	9.67	186.7	5.41	4,736	1,682	6,620
1983	0.131	7.66	191.4	5.41	4,734	1,681	6,619
1984	0.289	19.1	162.6	5.42	4,741	1,685	6,614
1985	9.45E-04	0.163	260.5	5.41	4,736	1,682	6,684
1986	9.12E-04	0.107	246.0	5.41	4,739	1,682	6,672
1987	0	0	249.0	5.41	4,741	1,683	6,678
1988	0.762	38.4	115.2	5.42	4,740	1,685	6,585
1989	0.228	21.9	153.0	5.39	4,724	1,680	6,584
1990	0.023	3.97	227.5	5.40	4,729	1,681	6,647
1991	7.29E-04	0.102	271.5	5.40	4,737	1,682	6,696
1992	0	0	306.4	5.43	4,759	1,688	6,759
1993	0.347	7.48	195.9	5.41	4,740	1,682	6,631
1994	0.001	0	247.1	5.40	4,743	1,682	6,678
1995	0.247	8.04	191.2	5.40	4,738	1,681	6,624
1996	0.518	30.1	135.8	5.41	4,742	1,684	6,598
1997	7.66E-05	0.014	266.3	5.41	4,738	1,681	6,691
1998	1.05E-04	0	266.9	5.40	4,743	1,682	6,697
1999	0.530	21.8	153.0	5.40	4,733	1,680	6,594
2000	0.044	0.459	232.1	5.44	4,748	1,685	6,671
2001	0.082	2.21	208.2	5.42	4,733	1,680	6,629
2002	0	0	354.0	5.43	4,749	1,682	6,791
2003	0.131	5.68	258.2	5.43	4,749	1,682	6,700
2004	0.038	0	339.1	5.42	4,768	1,687	6,800
2005	0.724	22.0	171.2	5.41	4,739	1,681	6,619
2006	0.438	24.7	153.1	5.41	4,731	1,679	6,594
2007	0	0	366.7	5.42	4,752	1,682	6,806
2008	0.849	33.4	145.5	5.42	4,746	1,684	6,616
2009	0.191	7.03	209.1	5.47	4,730	1,680	6,631
2010	0.002	0.296	260.5	5.46	4,739	1,679	6,685
2011	0.874	40.5	120.4	5.46	4,723	1,677	6,568
2012	0.058	8.95	207.8	5.45	4,743	1,682	6,647
2013	0.024	3.48	227.4	5.43	4,734	1,678	6,648
2014	0.073	5.45	201.9	5.43	4,734	1,678	6,624
2015	3.18E-04	0.042	333.7	5.45	4,750	1,680	6,768
2016	8.43E-04	0.181	318.2	5.46	4,770	1,685	6,779
2017	0.125	4.19	259.9	5.44	4,756	1,680	6,706

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Evapo-transpiration	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	30.6	0.092	11.2	1,698	4,914	6,654	4.50E-10	6.77E-12
1980	0	0	24.9	0.093	11.2	1,696	4,923	6,655	1.63E-10	2.45E-12
1981	0.332	13.1	49.4	0.092	11.2	1,692	4,940	6,706	-5.55E-08	-8.28E-10
1982	0.002	0.442	18.8	0.092	11.2	1,692	4,898	6,620	3.64E-12	5.50E-14
1983	2.43E-05	0.003	18.8	0.092	11.2	1,691	4,898	6,619	1.55E-11	2.34E-13
1984	0	0	12.9	0.093	11.2	1,695	4,894	6,614	5.39E-09	8.15E-11
1985	0.441	18.4	33.3	0.092	11.2	1,692	4,929	6,684	3.37E-11	5.03E-13
1986	0.144	8.82	35.9	0.092	11.2	1,692	4,924	6,672	5.46E-11	8.18E-13
1987	0.109	7.47	39.5	0.092	11.2	1,693	4,927	6,678	4.65E-10	6.96E-12
1988	0	0	6.33	0.093	11.2	1,695	4,872	6,585	-1.46E-11	-2.21E-13
1989	0.012	0.677	10.3	0.092	11.2	1,690	4,872	6,584	5.91E-11	8.98E-13
1990	0.321	13.0	24.2	0.092	11.2	1,691	4,907	6,647	5.97E-09	8.99E-11
1991	0.423	23.3	37.2	0.092	11.2	1,692	4,932	6,696	-2.88E-10	-4.31E-12
1992	0.386	21.1	63.2	0.093	11.2	1,698	4,965	6,759	2.73E-11	4.04E-13
1993	0.019	3.54	21.1	0.092	11.2	1,692	4,903	6,631	-4.16E-10	-6.27E-12
1994	0.153	10.8	35.4	0.092	11.2	1,692	4,928	6,678	-1.14E-09	-1.71E-11
1995	0.006	0.959	19.4	0.092	11.2	1,691	4,901	6,624	9.16E-10	1.38E-11
1996	0	0	8.80	0.093	11.2	1,694	4,883	6,598	2.41E-08	3.65E-10
1997	0.522	22.2	32.5	0.092	11.2	1,691	4,933	6,691	9.46E-09	1.41E-10
1998	0.239	12.6	44.8	0.092	11.2	1,692	4,936	6,697	-1.93E-09	-2.88E-11
1999	0	0	12.0	0.092	11.2	1,690	4,881	6,594	5.46E-12	8.28E-14
2000	0.151	8.46	26.6	0.092	11.2	1,695	4,929	6,671	6.26E-09	9.38E-11
2001	0.003	0.524	22.7	0.092	11.1	1,690	4,905	6,629	-5.18E-11	-7.82E-13
2002	0.699	33.6	80.7	0.092	11.2	1,692	4,973	6,791	-5.00E-11	-7.37E-13
2003	0.079	11.2	46.0	0.092	11.2	1,692	4,940	6,700	4.26E-10	6.35E-12
2004	0.361	26.4	79.3	0.092	11.2	1,697	4,985	6,800	-1.27E-11	-1.87E-13
2005	0.016	2.48	16.5	0.091	11.2	1,691	4,898	6,619	-1.93E-10	-2.91E-12
2006	0.010	0.131	11.2	0.091	11.2	1,689	4,882	6,594	9.09E-12	1.38E-13
2007	1.01	44.0	75.1	0.092	11.2	1,692	4,983	6,806	9.91E-11	1.46E-12
2008	8.85E-04	0.119	11.6	0.092	11.2	1,695	4,898	6,616	1.01E-09	1.52E-11
2009	0.043	3.21	21.9	0.091	11.1	1,690	4,905	6,631	1.57E-08	2.37E-10
2010	0.373	12.8	36.0	0.092	11.1	1,689	4,935	6,685	-2.99E-09	-4.48E-11
2011	0	0	7.19	0.091	11.1	1,688	4,862	6,568	-1.80E-10	-2.74E-12
2012	0.273	5.92	19.9	0.092	11.2	1,692	4,918	6,647	2.19E-08	3.30E-10
2013	0.197	7.31	26.2	0.092	11.1	1,688	4,916	6,648	-1.30E-10	-1.96E-12
2014	0.017	0.177	21.3	0.092	11.1	1,688	4,904	6,624	1.44E-10	2.17E-12
2015	0.704	30.1	68.9	0.092	11.2	1,689	4,968	6,768	-1.68E-08	-2.48E-10
2016	0.317	20.6	71.2	0.092	11.2	1,695	4,980	6,779	8.48E-10	1.25E-11
2017	0.091	11.2	46.1	0.092	11.2	1,690	4,947	6,706	-8.76E-10	-1.31E-11

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Queen City Aquifer (Layer 5) - Inflows

Simulated Time Period	Inflows							Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)							
Predevelopment	0	0	7,238	9,858	41,023	3.46E+05	501.6	4.04E+05
1980	0	0	7,321	9,304	40,858	3.49E+05	11.0	4.07E+05
1981	0	0	7,283	11,927	40,803	3.47E+05	10.7	4.07E+05
1982	102.6	882.9	7,304	8,059	40,746	3.48E+05	10.7	4.05E+05
1983	30.9	321.9	7,308	8,261	40,728	3.49E+05	10.6	4.05E+05
1984	60.1	596.2	7,339	7,017	40,804	3.50E+05	10.8	4.06E+05
1985	0	0	7,293	11,245	40,771	3.48E+05	10.7	4.07E+05
1986	0.002	0.071	7,289	10,619	40,794	3.48E+05	10.7	4.06E+05
1987	0	0	7,286	10,746	40,807	3.47E+05	10.7	4.06E+05
1988	203.0	1,834	7,344	4,971	40,801	3.50E+05	10.9	4.06E+05
1989	22.3	311.4	7,325	6,604	40,672	3.50E+05	10.9	4.05E+05
1990	0	0	7,304	9,821	40,736	3.48E+05	10.8	4.06E+05
1991	0	0	7,286	11,718	40,792	3.47E+05	9.56	4.07E+05
1992	0	0	7,291	13,223	40,952	3.47E+05	9.78	4.09E+05
1993	134.5	1,089	7,299	8,457	40,753	3.48E+05	9.96	4.06E+05
1994	0.056	0	7,293	10,668	40,758	3.48E+05	9.99	4.06E+05
1995	79.9	704.6	7,309	8,253	40,707	3.48E+05	9.97	4.05E+05
1996	121.6	1,146	7,350	5,860	40,743	3.50E+05	9.97	4.06E+05
1997	0	0	7,299	11,494	40,725	3.48E+05	9.83	4.07E+05
1998	0	0	7,291	11,519	40,759	3.47E+05	9.62	4.07E+05
1999	156.9	1,355	7,321	6,604	40,664	3.49E+05	9.54	4.05E+05
2000	0	0	7,329	10,019	40,791	3.49E+05	9.54	4.07E+05
2001	18.1	132.1	7,314	8,988	40,663	3.48E+05	9.39	4.06E+05
2002	0	0	7,275	15,282	40,772	3.46E+05	9.11	4.10E+05
2003	65.4	433.8	7,291	11,146	40,736	3.47E+05	8.95	4.07E+05
2004	0	0	7,293	14,635	40,903	3.47E+05	8.72	4.10E+05
2005	223.7	1,947	7,317	7,391	40,664	3.48E+05	8.57	4.06E+05
2006	116.2	1,155	7,336	6,609	40,597	3.49E+05	8.33	4.05E+05
2007	0	0	7,280	15,827	40,767	3.46E+05	7.95	4.10E+05
2008	242.7	2,100	7,349	6,278	40,742	3.50E+05	7.80	4.06E+05
2009	9.96	102.5	7,327	9,024	40,606	3.49E+05	7.51	4.06E+05
2010	0	0	7,314	11,242	40,628	3.48E+05	7.21	4.07E+05
2011	201.6	1,754	7,354	5,198	40,494	3.50E+05	6.98	4.05E+05
2012	8.41E-04	0	7,361	8,969	40,633	3.50E+05	6.61	4.07E+05
2013	0	0	7,332	9,814	40,558	3.49E+05	6.31	4.06E+05
2014	22.5	194.1	7,337	8,716	40,553	3.49E+05	6.05	4.06E+05
2015	0	0	7,300	14,404	40,679	3.47E+05	5.75	4.09E+05
2016	2.37E-04	0.004	7,313	13,735	40,833	3.47E+05	5.51	4.09E+05
2017	66.2	521.7	7,307	11,216	40,688	3.47E+05	5.28	4.07E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	General Head Boundaries	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)									%
Predevelopment	0	0	15,714	3,511	97,761	2.86E+05	1,403	4.04E+05	1.38E-05	3.41E-09
1980	0	0	15,593	3,531	97,799	2.86E+05	3,925	4.07E+05	8.72E-06	2.14E-09
1981	97.1	891.5	15,576	3,523	97,678	2.86E+05	3,948	4.07E+05	-2.13E-03	-5.24E-07
1982	0	0	15,552	3,521	97,516	2.85E+05	3,911	4.05E+05	6.65E-08	1.64E-11
1983	1.14E-06	0	15,543	3,520	97,468	2.85E+05	3,909	4.05E+05	-1.99E-07	-4.91E-11
1984	0	0	15,570	3,529	97,646	2.85E+05	3,906	4.06E+05	8.82E-05	2.17E-08
1985	131.5	1,138	15,562	3,522	97,577	2.85E+05	3,938	4.07E+05	1.14E-06	2.79E-10
1986	28.4	303.6	15,572	3,522	97,611	2.85E+05	3,936	4.06E+05	2.01E-06	4.95E-10
1987	18.9	213.2	15,579	3,522	97,632	2.85E+05	3,932	4.06E+05	1.25E-05	3.09E-09
1988	0	0	15,570	3,528	97,586	2.85E+05	3,873	4.06E+05	-1.91E-07	-4.72E-11
1989	2.28	16.7	15,519	3,518	97,300	2.84E+05	3,865	4.05E+05	2.09E-06	5.17E-10
1990	106.0	897.4	15,545	3,520	97,468	2.85E+05	3,898	4.06E+05	1.75E-04	4.31E-08
1991	106.3	1,031	15,572	3,522	97,640	2.85E+05	3,953	4.07E+05	-1.13E-05	-2.78E-09
1992	95.2	996.5	15,637	3,533	98,059	2.87E+05	3,996	4.09E+05	6.17E-07	1.51E-10
1993	0	0	15,557	3,521	97,592	2.85E+05	3,935	4.06E+05	3.67E-05	9.04E-09
1994	29.0	271.4	15,559	3,522	97,649	2.85E+05	3,956	4.06E+05	-1.11E-04	-2.73E-08
1995	0	0	15,536	3,521	97,537	2.85E+05	3,941	4.05E+05	3.80E-05	9.38E-09
1996	0	0	15,545	3,528	97,628	2.85E+05	3,940	4.06E+05	6.27E-04	1.55E-07
1997	156.9	1,344	15,540	3,522	97,605	2.85E+05	4,002	4.07E+05	2.62E-04	6.43E-08
1998	57.8	596.2	15,555	3,523	97,696	2.85E+05	4,035	4.07E+05	-3.70E-05	-9.09E-09
1999	0	0	15,515	3,520	97,455	2.85E+05	4,006	4.05E+05	1.08E-07	2.66E-11
2000	59.0	519.8	15,565	3,531	97,832	2.86E+05	4,071	4.07E+05	1.23E-04	3.02E-08
2001	0	0	15,516	3,521	97,546	2.85E+05	4,079	4.06E+05	-1.99E-06	-4.91E-10
2002	217.8	2,051	15,565	3,524	97,897	2.86E+05	4,185	4.10E+05	-1.99E-06	-4.87E-10
2003	8.17E-04	0.014	15,549	3,523	97,794	2.86E+05	4,175	4.07E+05	2.41E-05	5.94E-09
2004	102.5	1,010	15,613	3,535	98,222	2.87E+05	4,251	4.10E+05	-4.77E-07	-1.16E-10
2005	0	0	15,513	3,522	97,618	2.85E+05	4,185	4.06E+05	-6.96E-06	-1.72E-09
2006	0	0	15,479	3,520	97,448	2.84E+05	4,200	4.05E+05	3.78E-07	9.34E-11
2007	287.2	2,508	15,551	3,526	97,889	2.86E+05	4,336	4.10E+05	2.73E-06	6.64E-10
2008	0	0	15,536	3,531	97,787	2.85E+05	4,287	4.06E+05	3.68E-05	9.06E-09
2009	11.3	85.4	15,483	3,521	97,549	2.85E+05	4,343	4.06E+05	3.98E-04	9.80E-08
2010	71.6	676.1	15,493	3,523	97,691	2.85E+05	4,430	4.07E+05	-8.22E-05	-2.02E-08
2011	0	0	15,435	3,520	97,410	2.84E+05	4,435	4.05E+05	-6.14E-06	-1.52E-09
2012	55.6	429.9	15,485	3,532	97,777	2.85E+05	4,549	4.07E+05	0.001	2.53E-07
2013	48.6	426.5	15,455	3,524	97,582	2.85E+05	4,624	4.06E+05	-3.56E-06	-8.77E-10
2014	0	0	15,452	3,523	97,536	2.85E+05	4,686	4.06E+05	8.22E-06	2.03E-09
2015	199.7	1,814	15,504	3,527	97,825	2.86E+05	4,821	4.09E+05	-6.99E-04	-1.71E-07
2016	53.1	594.4	15,565	3,537	98,155	2.87E+05	4,897	4.09E+05	2.49E-05	6.09E-09
2017	0	0	15,508	3,526	97,771	2.85E+05	4,907	4.07E+05	-6.12E-05	-1.50E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.6
Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Reklaw Formation (Layer 6) - Inflows

Simulated Time Period	Inflows						Total Inflows
	Specific Storage	Specific Yield	Recharge	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)						
Predevelopment	0	0	96.1	0.621	1,436	497.8	2,030
1980	0	0	90.7	0.464	3,961	10.0	4,062
1981	0.736	0	116.3	0.466	3,990	9.75	4,117
1982	1.64	13.6	78.5	0.469	3,944	9.74	4,048
1983	1.22	6.45	80.5	0.478	3,942	9.68	4,041
1984	0.782	7.16	68.4	0.478	3,936	9.85	4,023
1985	0.013	0.008	109.6	0.487	3,978	9.75	4,098
1986	4.69E-05	0.113	103.5	0.499	3,974	9.75	4,088
1987	0	0	104.7	0.512	3,971	9.78	4,086
1988	1.17	24.8	48.4	0.524	3,899	9.99	3,984
1989	0.709	6.24	64.4	0.523	3,895	9.96	3,976
1990	0.385	0.038	95.7	0.527	3,935	9.85	4,042
1991	7.06	0.002	114.2	0.508	3,994	8.57	4,124
1992	6.91	0	128.9	0.476	4,040	8.84	4,185
1993	10.6	18.3	82.4	0.434	3,969	9.02	4,090
1994	12.7	0.006	104.0	0.388	3,995	9.05	4,121
1995	16.3	11.6	80.4	0.345	3,974	9.02	4,092
1996	19.4	15.8	57.1	0.322	3,968	9.01	4,070
1997	16.8	0.004	112.0	0.318	4,043	8.88	4,181
1998	19.4	7.47E-05	112.3	0.320	4,075	8.66	4,216
1999	23.2	22.1	64.4	0.338	4,036	8.57	4,154
2000	25.5	0.071	97.7	0.371	4,108	8.58	4,240
2001	27.6	2.60	87.6	0.413	4,114	8.43	4,240
2002	30.2	1.49E-04	148.9	0.458	4,233	8.15	4,421
2003	32.8	2.93	108.6	0.500	4,215	8.00	4,368
2004	32.0	0	142.6	0.531	4,298	7.81	4,480
2005	33.7	36.8	72.0	0.551	4,216	7.67	4,367
2006	33.2	25.2	64.4	0.568	4,230	7.46	4,361
2007	27.4	0.017	154.3	0.567	4,385	7.12	4,575
2008	32.4	39.8	61.2	0.578	4,316	6.97	4,457
2009	41.2	5.73	88.0	0.620	4,378	6.70	4,520
2010	46.6	0.059	109.6	0.704	4,469	6.42	4,633
2011	54.8	27.7	50.7	0.806	4,461	6.23	4,601
2012	51.1	0.795	87.4	0.851	4,584	5.91	4,730
2013	47.9	0.258	95.7	0.855	4,660	5.62	4,811
2014	44.7	4.16	84.9	0.839	4,721	5.37	4,861
2015	38.4	0.069	140.4	0.815	4,868	5.05	5,052
2016	34.9	0.091	133.9	0.780	4,942	4.85	5,117
2017	32.1	6.16	109.3	0.740	4,947	4.66	5,100

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods.
The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)								%
Predevelopment	0	0	0.078	1.04	501.6	1,527	2,030	5.83E-08	2.87E-09
1980	0	0	0.043	2.17	11.0	4,049	4,062	9.43E-08	2.32E-09
1981	0.824	17.6	0.043	2.16	10.7	4,086	4,117	-2.42E-08	-5.88E-10
1982	0.295	7.52E-04	0.043	2.16	10.7	4,034	4,048	4.31E-10	1.07E-11
1983	1.01	0	0.043	2.16	10.6	4,027	4,041	4.93E-09	1.22E-10
1984	0.764	0	0.043	2.17	10.8	4,009	4,023	1.08E-08	2.68E-10
1985	2.97	14.9	0.043	2.15	10.7	4,068	4,098	2.42E-09	5.90E-11
1986	3.22	5.80	0.043	2.15	10.7	4,066	4,088	4.68E-09	1.15E-10
1987	4.04	5.10	0.043	2.14	10.7	4,064	4,086	1.94E-09	4.76E-11
1988	3.26	0	0.043	2.14	10.9	3,968	3,984	1.02E-09	2.57E-11
1989	2.23	0	0.043	2.13	10.9	3,961	3,976	1.50E-08	3.77E-10
1990	2.60	6.88	0.043	2.13	10.8	4,019	4,042	5.22E-09	1.29E-10
1991	0.589	16.9	0.043	2.15	9.56	4,095	4,124	1.66E-08	4.02E-10
1992	0.846	23.8	0.044	2.18	9.78	4,149	4,185	6.00E-11	1.43E-12
1993	0.490	0.112	0.045	2.18	9.96	4,077	4,090	1.10E-08	2.70E-10
1994	0.727	4.13	0.046	2.21	9.99	4,104	4,121	-3.27E-08	-7.94E-10
1995	0.003	0.018	0.048	2.23	9.97	4,080	4,092	-5.38E-09	-1.31E-10
1996	0	0	0.050	2.29	9.97	4,057	4,070	2.52E-08	6.20E-10
1997	0.605	17.3	0.051	2.32	9.83	4,151	4,181	3.35E-08	8.01E-10
1998	0.276	12.0	0.052	2.39	9.62	4,192	4,216	1.38E-08	3.28E-10
1999	0	0	0.054	2.48	9.54	4,142	4,154	1.25E-09	3.00E-11
2000	0.121	4.94	0.055	2.61	9.54	4,223	4,240	4.65E-08	1.10E-09
2001	4.79E-04	0.012	0.057	2.73	9.39	4,228	4,240	-5.27E-10	-1.24E-11
2002	1.03	44.8	0.058	2.87	9.11	4,363	4,421	2.66E-09	6.01E-11
2003	0.027	0.699	0.060	3.00	8.95	4,355	4,368	8.12E-10	1.86E-11
2004	0.474	27.5	0.061	3.11	8.72	4,441	4,480	4.65E-09	1.04E-10
2005	3.39E-05	0.002	0.062	3.19	8.57	4,355	4,367	-1.81E-10	-4.14E-12
2006	0.005	0	0.063	3.20	8.33	4,349	4,361	3.95E-10	9.05E-12
2007	1.11	49.5	0.063	3.26	7.95	4,513	4,575	9.00E-10	1.97E-11
2008	0	0	0.063	3.36	7.80	4,446	4,457	1.12E-09	2.52E-11
2009	2.08E-04	0.010	0.063	3.53	7.51	4,509	4,520	1.54E-08	3.41E-10
2010	0.225	10.8	0.064	3.77	7.21	4,611	4,633	1.81E-08	3.91E-10
2011	0.032	0	0.066	4.04	6.98	4,590	4,601	8.26E-09	1.80E-10
2012	0.386	0.762	0.068	4.20	6.61	4,718	4,730	2.91E-08	6.16E-10
2013	0.301	4.20	0.069	4.28	6.31	4,795	4,811	4.00E-09	8.32E-11
2014	0.104	0	0.069	4.31	6.05	4,850	4,861	3.94E-08	8.11E-10
2015	0.508	37.5	0.069	4.29	5.75	5,004	5,052	-5.48E-09	-1.09E-10
2016	0.290	19.8	0.068	4.26	5.51	5,087	5,117	5.78E-10	1.13E-11
2017	0.151	0.070	0.067	4.20	5.28	5,090	5,100	-1.87E-10	-3.67E-12

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Carrizo-Upper Wilcox (Layer 7) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers	
	(acre-feet)								
Predevelopment	0	0	0	404.1	0	2,130	1,554	1,260	5,347
1980	0	0	289.0	381.4	4.36	326.5	4,081	2,558	7,640
1981	159.5	0	287.5	488.9	3.10	329.4	4,119	2,557	7,945
1982	140.7	52.1	286.7	330.3	2.06	328.1	4,067	2,550	7,756
1983	130.5	45.2	282.0	338.6	0	324.5	4,059	2,351	7,530
1984	233.9	92.8	285.0	287.6	1.94	324.8	4,041	2,734	8,002
1985	0.351	0	277.3	461.0	0	318.4	4,101	2,153	7,311
1986	0	0	272.0	435.3	0	318.4	4,100	2,100	7,226
1987	0	0	266.1	440.5	0	321.2	4,097	2,021	7,146
1988	13.9	174.3	265.1	203.8	0	331.7	3,999	2,182	7,170
1989	474.0	102.7	267.8	270.7	0	342.1	3,993	2,764	8,214
1990	173.1	2.45	269.0	402.6	0	356.2	4,052	2,572	7,828
1991	3,273	0	293.3	480.3	24.0	465.0	4,129	5,595	14,259
1992	2,919	0	319.6	542.0	37.8	541.4	4,183	5,784	14,326
1993	3,202	35.6	346.3	346.7	49.0	608.9	4,109	6,119	14,817
1994	3,349	0	374.7	437.3	58.2	669.1	4,137	6,388	15,414
1995	3,206	42.8	400.3	338.3	61.1	695.5	4,112	6,288	15,144
1996	2,967	137.1	423.6	240.2	61.2	699.8	4,089	6,083	14,700
1997	1,127	0	427.9	471.1	42.2	623.9	4,184	4,262	11,138
1998	2,995	0	451.2	472.2	61.1	717.4	4,225	6,207	15,129
1999	3,231	106.7	476.0	270.7	70.5	772.4	4,174	6,598	15,700
2000	4,629	1.01	515.2	410.7	94.6	894.3	4,256	8,224	19,025
2001	3,522	13.8	540.8	368.4	92.8	904.1	4,261	7,287	16,989
2002	4,534	0	576.4	626.4	108.7	999.0	4,397	8,379	19,620
2003	3,703	3.42	603.7	456.9	107.5	1,011	4,389	7,700	17,975
2004	2,618	0	622.4	599.9	98.5	995.8	4,475	6,650	16,059
2005	2,313	105.8	634.8	303.0	94.6	985.5	4,388	6,314	15,138
2006	1,611	133.0	639.4	270.9	82.6	944.6	4,381	5,316	13,378
2007	1,215	0	645.5	648.8	82.0	951.0	4,547	5,324	13,414
2008	3,466	151.1	673.7	257.3	108.7	1,070	4,479	7,631	17,837
2009	7,908	42.9	733.5	369.9	163.5	1,314	4,542	12,120	27,194
2010	8,306	1.00	800.3	460.8	191.9	1,455	4,645	13,150	29,010
2011	8,336	189.5	865.6	213.1	207.6	1,541	4,622	13,446	29,421
2012	3,414	40.0	885.5	367.7	160.2	1,322	4,751	8,428	19,369
2013	2,343	17.4	891.6	402.3	139.9	1,231	4,829	7,183	17,038
2014	1,661	46.3	891.6	357.3	123.0	1,144	4,884	6,276	15,383
2015	1,319	0	879.9	590.4	100.9	1,047	5,040	5,459	14,435
2016	1,127	0	871.6	563.0	93.5	996.3	5,122	5,222	13,996
2017	983.0	3.35	861.5	459.8	91.2	967.1	5,125	5,135	13,626

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	McMullen GCD	Wintergarden GCD	Upper Layers	Lower Layers			
	(acre-feet)										%
Predevelopment	0	0	0	354.5	69.2	766.4	2,680	1,477	5,347	0.003	4.80E-05
1980	0	0	348.4	0	0	3,366	1,824	2,102	7,640	-1.13E-03	-1.48E-05
1981	128.4	98.1	656.2	0	0	3,112	1,822	2,128	7,945	0.001	1.52E-05
1982	148.2	0	670.7	0	0	3,031	1,821	2,085	7,756	1.80E-04	2.32E-06
1983	575.9	0	685.0	0	4.39	2,105	1,819	2,342	7,530	0.002	2.81E-05
1984	77.4	0	423.3	0	0	3,618	1,820	2,063	8,002	0.002	2.16E-05
1985	841.2	77.0	279.8	0	8.50	1,723	1,817	2,565	7,311	0.001	1.40E-05
1986	713.4	51.2	247.3	0	9.88	1,955	1,819	2,430	7,226	0.002	2.75E-05
1987	819.7	51.2	184.8	0	12.0	1,805	1,821	2,452	7,146	7.34E-04	1.03E-05
1988	363.5	0	233.4	0	8.50	2,653	1,821	2,090	7,170	4.27E-04	5.95E-06
1989	127.0	0	594.6	0	2.01	3,665	1,812	2,013	8,214	0.006	7.80E-05
1990	113.5	33.2	581.6	0	3.23	3,243	1,812	2,042	7,828	6.03E-04	7.70E-06
1991	27.1	102.3	2,496	0	0	7,938	1,812	1,883	14,259	6.05E-04	4.24E-06
1992	137.7	159.3	1,072	0	0	9,126	1,824	2,008	14,326	1.83E-05	1.28E-07
1993	111.7	10.3	768.5	0	0	10,084	1,820	2,022	14,817	0.005	3.55E-05
1994	102.0	52.7	571.0	0	0	10,779	1,823	2,086	15,414	0.006	4.16E-05
1995	1.67E-05	0	805.8	0	0	10,471	1,822	2,045	15,144	-2.53E-03	-1.67E-05
1996	0	0	905.2	0	0	9,956	1,821	2,017	14,700	0.005	3.15E-05
1997	8.17	87.4	696.4	0	0	6,395	1,817	2,133	11,138	7.09E-04	6.36E-06
1998	5.12	84.0	864.5	0	0	10,207	1,819	2,149	15,129	0.006	4.06E-05
1999	0	0	907.3	0	0	10,871	1,815	2,107	15,700	5.34E-04	3.40E-06
2000	12.0	24.7	842.5	0	0	14,088	1,819	2,239	19,025	0.013	6.91E-05
2001	2.73	0	689.9	0	0	12,217	1,812	2,268	16,989	-2.19E-04	-1.29E-06
2002	13.5	224.4	853.9	0	0	14,329	1,818	2,381	19,620	0.001	5.85E-06
2003	6.26	60.6	748.8	0	0	12,950	1,820	2,389	17,975	3.12E-04	1.74E-06
2004	16.8	183.1	655.4	0	0	10,891	1,830	2,482	16,059	0.002	1.26E-05
2005	0.007	0.195	653.6	0	0	10,232	1,822	2,431	15,138	-5.77E-05	-3.81E-07
2006	5.51	0	1,258	0	0	8,012	1,815	2,288	13,378	1.75E-04	1.31E-06
2007	50.4	223.4	404.4	0	0	8,344	1,818	2,574	13,414	5.98E-04	4.46E-06
2008	0	0	592.4	0	0	12,923	1,816	2,506	17,837	1.83E-04	1.03E-06
2009	0	0	1,886	0	0	21,044	1,806	2,459	27,194	0.002	6.27E-06
2010	95.8	42.9	1,308	0	0	23,205	1,803	2,556	29,010	0.002	6.21E-06
2011	6.50	0	1,308	0	0	23,768	1,792	2,547	29,421	0.004	1.22E-05
2012	144.1	0.356	705.8	0	0	14,081	1,789	2,648	19,369	0.006	3.33E-05
2013	57.0	13.3	556.2	0	0	11,903	1,778	2,731	17,038	3.24E-04	1.90E-06
2014	348.9	0	493.9	0	0	9,799	1,770	2,971	15,383	0.017	1.09E-04
2015	1,392	170.1	493.6	0	0	6,840	1,769	3,769	14,435	1.89E-04	1.31E-06
2016	1,265	133.8	494.3	0	0	6,638	1,774	3,691	13,996	7.26E-05	5.19E-07
2017	971.2	28.0	490.0	0	0	6,907	1,766	3,464	13,626	-4.68E-04	-3.44E-06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Middle Wilcox (Layer 8) - Inflows

Simulated Time Period	Inflows									Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	McMullen GCD	Wintergarden GCD	Maverick	Upper Layers	Lower Layers	
	(acre-feet)									
Predevelopment	0	0	0	35.0	0	634.1	0.081	1,613	1,070	3,352
1980	0	0	287.0	33.1	0.142	484.5	0.004	2,316	1,760	4,881
1981	54.7	0	285.5	42.4	0.106	483.6	0.004	2,361	1,756	4,983
1982	63.9	27.7	284.7	28.6	0.076	485.2	0.003	2,286	1,754	4,930
1983	63.1	20.1	280.1	29.4	0	484.1	0.002	2,547	1,639	5,062
1984	122.5	38.0	283.1	24.9	0.071	483.9	0.001	2,261	1,846	5,060
1985	0.100	0	275.6	40.0	0	480.7	0.001	2,798	1,521	5,115
1986	0	0	270.3	37.7	0	482.1	9.67E-04	2,656	1,486	4,932
1987	0	0	264.4	38.2	0	483.9	4.42E-04	2,677	1,438	4,902
1988	14.9	74.8	263.4	17.7	0	486.1	2.44E-04	2,271	1,534	4,663
1989	200.8	42.0	265.9	23.5	0	482.3	0	2,214	1,851	5,079
1990	77.1	0.363	267.1	34.9	0	481.4	0	2,272	1,755	4,888
1991	1,505	0	289.9	41.6	0.709	487.0	0.002	2,123	3,382	7,829
1992	1,497	0	316.3	47.0	1.11	496.3	0.007	2,253	3,521	8,131
1993	1,611	11.1	343.0	30.1	1.44	502.1	0.010	2,225	3,712	8,435
1994	1,688	0	371.4	37.9	1.71	505.3	0.011	2,306	3,868	8,779
1995	1,601	19.3	396.8	29.3	1.80	507.9	0.010	2,245	3,836	8,637
1996	1,492	54.2	420.0	20.8	1.81	509.0	0.008	2,201	3,742	8,441
1997	602.0	0	424.7	40.8	1.26	505.3	0.007	2,365	2,772	6,711
1998	1,513	0	447.5	40.9	1.80	509.3	0.007	2,378	3,789	8,679
1999	1,659	51.0	472.0	23.5	2.08	513.4	0.005	2,296	4,026	9,044
2000	2,334	0	510.7	35.6	2.78	518.1	0.006	2,459	4,910	10,770
2001	1,833	1.77	536.4	31.9	2.73	520.9	0.008	2,477	4,442	9,847
2002	2,300	0	571.6	54.3	3.20	527.1	0.013	2,634	5,029	11,120
2003	1,922	0	598.9	39.6	3.17	535.2	0.018	2,605	4,693	10,398
2004	1,388	0	617.8	52.0	2.91	543.6	0.026	2,719	4,138	9,460
2005	1,225	36.2	630.3	26.3	2.79	548.0	0.028	2,608	3,956	9,031
2006	806.8	41.9	635.1	23.5	2.45	550.2	0.029	2,461	3,418	7,939
2007	722.3	0	641.2	56.2	2.43	554.0	0.038	2,816	3,405	8,197
2008	1,787	51.0	668.8	22.3	3.20	562.7	0.037	2,675	4,639	10,409
2009	3,835	6.87	727.5	32.1	4.79	566.3	0.038	2,649	7,072	14,894
2010	4,178	0	793.6	39.9	5.63	571.4	0.041	2,764	7,693	16,046
2011	4,234	68.0	858.5	18.5	6.10	574.9	0.038	2,708	7,900	16,368
2012	1,822	4.19	879.3	31.9	4.73	568.7	0.038	2,844	5,243	11,398
2013	1,258	0.008	885.8	34.9	4.14	563.3	0.038	2,934	4,526	10,206
2014	920.5	12.9	886.1	31.0	3.65	560.7	0.038	3,165	4,008	9,588
2015	747.0	0	874.8	51.2	3.00	559.7	0.044	4,007	3,524	9,767
2016	642.7	0	866.7	48.8	2.78	564.9	0.048	3,917	3,376	9,419
2017	564.7	0.369	856.6	39.9	2.71	567.8	0.050	3,667	3,320	9,019

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	McMullen GCD	Wintergarden GCD	Maverick	Upper Layers	Lower Layers			
	(acre-feet)											%
Predevelopment	0	0	0	354.0	2.06	29.8	0	2,054	912.0	3,352	1.21E-04	3.61E-06
1980	0	0	3.42	0	0	222.2	0	3,220	1,435	4,881	3.07E-06	6.30E-08
1981	65.2	38.1	3.80	0	0	220.9	0	3,222	1,433	4,983	4.98E-05	9.99E-07
1982	69.9	0	3.89	0	0	219.2	0	3,212	1,426	4,930	7.32E-06	1.48E-07
1983	281.2	0	4.02	0	0.111	214.6	0	3,010	1,552	5,062	8.58E-05	1.69E-06
1984	25.2	0	3.99	0	0	216.1	0	3,391	1,423	5,060	6.92E-05	1.37E-06
1985	397.5	33.4	2.81	0	0.229	211.4	0	2,812	1,658	5,115	4.16E-05	8.13E-07
1986	345.0	16.2	2.51	0	0.272	208.6	0	2,761	1,598	4,932	8.07E-05	1.64E-06
1987	387.4	14.6	2.16	0	0.335	204.4	0	2,684	1,609	4,902	2.98E-05	6.07E-07
1988	171.1	0	2.59	0	0.233	201.9	0	2,839	1,448	4,663	1.73E-05	3.72E-07
1989	58.4	0	4.12	0	0.044	201.4	1.56E-04	3,413	1,402	5,079	2.60E-04	5.12E-06
1990	45.4	11.6	3.97	0	0.078	200.3	5.27E-04	3,223	1,404	4,888	2.44E-05	4.99E-07
1991	29.7	56.9	5.05	0	0	214.5	0	6,252	1,271	7,829	2.94E-05	3.76E-07
1992	41.6	72.3	3.95	0	0	229.7	0	6,452	1,332	8,131	7.45E-07	9.16E-09
1993	33.5	0.683	4.55	0	0	243.3	0	6,784	1,369	8,435	2.13E-04	2.53E-06
1994	29.8	22.7	3.66	0	0	257.4	0	7,056	1,410	8,779	2.50E-04	2.85E-06
1995	0.005	0	4.93	0	0	268.2	0	6,953	1,411	8,637	-1.03E-04	-1.19E-06
1996	0	0	5.42	0	0	276.5	0	6,743	1,417	8,441	1.87E-04	2.22E-06
1997	5.67	38.8	5.16	0	0	272.7	0	4,924	1,464	6,711	4.32E-05	6.43E-07
1998	6.92	27.8	5.37	0	0	283.0	0	6,873	1,483	8,679	2.49E-04	2.87E-06
1999	0	0	5.69	0	0	291.2	0	7,259	1,488	9,044	2.17E-05	2.40E-07
2000	3.50	14.0	5.71	0	0	308.8	0	8,888	1,551	10,770	5.35E-04	4.97E-06
2001	0.028	2.33	4.67	0	0	315.5	0	7,949	1,576	9,847	-8.99E-06	-9.13E-08
2002	18.7	94.7	5.81	0	0	330.2	0	9,052	1,618	11,120	4.66E-05	4.19E-07
2003	8.24	24.2	5.07	0	0	337.8	0	8,377	1,646	10,398	1.27E-05	1.22E-07
2004	17.3	68.5	4.45	0	0	340.3	0	7,338	1,692	9,460	8.23E-05	8.70E-07
2005	0	0	4.44	0	0	339.0	0	6,994	1,694	9,031	-2.38E-06	-2.64E-08
2006	0	0	3.70	0	0	332.0	0	5,990	1,613	7,939	7.12E-06	8.97E-08
2007	15.7	93.3	2.78	0	0	329.9	0	6,010	1,745	8,197	2.40E-05	2.92E-07
2008	0	0	4.06	0	0	342.0	0	8,312	1,751	10,409	7.45E-06	7.15E-08
2009	5.29E-05	0.013	5.94	0	0	374.4	0	12,798	1,716	14,894	6.92E-05	4.64E-07
2010	2.29	24.8	8.88	0	0	406.9	0	13,831	1,772	16,046	7.35E-05	4.58E-07
2011	0	0	8.88	0	0	435.1	0	14,117	1,807	16,368	1.45E-04	8.88E-07
2012	0.040	0.548	4.64	0	0	432.8	0	9,099	1,860	11,398	2.62E-04	2.30E-06
2013	0.299	6.52	3.67	0	0	427.1	0	7,853	1,916	10,206	1.22E-05	1.19E-07
2014	172.4	0	3.31	0	0	419.0	0	6,945	2,049	9,588	6.83E-04	7.12E-06
2015	714.0	69.5	3.28	0	0	405.7	0	6,135	2,439	9,767	8.35E-06	8.55E-08
2016	654.5	45.2	3.27	0	0	396.8	0	5,907	2,413	9,419	2.94E-06	3.13E-08
2017	499.0	5.13	3.24	0	0	388.0	0	5,818	2,305	9,019	-2.01E-05	-2.22E-07

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Lower Wilcox (Layer 9) - Inflows

Simulated Time Period	Inflows								Total Inflows
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	McMullen GCD	Wintergarden GCD	Maverick	Upper Layers	
	(acre-feet)								
Predevelopment	0	0	0	26.2	0	1,185	1,169	1,896	4,276
1980	0	0	286.4	24.8	0.090	950.4	992.0	2,364	4,618
1981	71.8	0	284.9	31.7	0.067	947.9	993.8	2,369	4,700
1982	88.7	8.52	284.1	21.5	0.048	946.2	984.7	2,349	4,683
1983	88.8	6.68	279.6	22.0	0	943.5	977.6	2,476	4,794
1984	132.5	12.0	282.4	18.7	0.044	942.2	968.7	2,345	4,702
1985	0.200	0	275.2	29.9	0	939.3	972.0	2,591	4,808
1986	6.07E-05	0	269.8	28.3	0	940.0	974.3	2,528	4,741
1987	0	0	264.0	28.6	0	940.9	974.9	2,540	4,748
1988	13.6	20.6	262.8	13.2	0	941.6	960.8	2,361	4,573
1989	217.8	14.9	265.2	17.6	0	932.7	939.1	2,317	4,704
1990	94.8	1.88	266.5	26.1	0	931.6	935.1	2,328	4,584
1991	1,787	1.88	288.8	31.2	0.440	970.0	954.2	2,202	6,235
1992	1,854	0.337	315.1	35.2	0.697	991.1	961.3	2,270	6,427
1993	1,997	7.26	341.8	22.5	0.905	996.8	943.2	2,286	6,596
1994	2,108	1.86	370.0	28.4	1.07	1,002	931.5	2,333	6,776
1995	2,038	11.2	395.4	22.0	1.13	1,004	915.1	2,323	6,711
1996	1,932	20.6	418.6	15.6	1.14	1,005	895.1	2,320	6,608
1997	911.9	0.055	423.6	30.6	0.798	1,001	888.9	2,382	5,639
1998	1,908	0.416	446.0	30.7	1.13	1,006	885.3	2,397	6,675
1999	2,123	19.3	470.5	17.6	1.31	1,009	866.3	2,383	6,889
2000	2,922	0	508.8	26.7	1.74	1,023	923.8	2,454	7,860
2001	2,400	0	534.6	23.9	1.72	1,030	956.8	2,471	7,418
2002	2,934	0	569.5	40.7	2.01	1,047	1,002	2,539	8,134
2003	2,537	0	597.0	29.7	1.99	1,059	1,025	2,557	7,807
2004	1,913	0	616.0	39.0	1.83	1,075	1,057	2,627	7,329
2005	1,688	2.39	628.5	19.7	1.76	1,080	1,054	2,607	7,082
2006	1,204	4.75	633.5	17.6	1.55	1,084	1,051	2,530	6,527
2007	1,051	0	639.6	42.1	1.53	1,096	1,079	2,698	6,608
2008	2,247	11.2	666.8	16.7	2.01	1,107	1,073	2,677	7,801
2009	4,701	0.016	724.6	24.0	3.01	1,116	1,072	2,652	10,293
2010	5,251	0	790.5	29.9	3.54	1,127	1,081	2,718	11,001
2011	5,400	16.6	855.2	13.8	3.83	1,132	1,068	2,733	11,222
2012	2,669	0.594	876.8	23.9	2.99	1,128	1,070	2,803	8,575
2013	1,885	0	883.5	26.1	2.61	1,119	1,070	2,859	7,846
2014	1,396	2.67	883.9	23.2	2.30	1,115	1,069	2,988	7,480
2015	1,119	0	872.9	38.3	1.90	1,115	1,087	3,399	7,632
2016	950.7	0	864.8	36.6	1.76	1,121	1,103	3,375	7,453
2017	827.4	0.075	854.7	29.9	1.72	1,123	1,102	3,259	7,197

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-19.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Webb - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Specific Storage	Specific Yield	Wells	General Head Boundaries	McMullen GCD	Wintergarden GCD	Maverick	Upper Layers			
	(acre-feet)										%
Predevelopment	0	0	0	353.2	1.30	57.4	10.6	3,854	4,276	1.00E-05	2.34E-07
1980	0	0	0.870	0	0	356.9	16.7	4,243	4,618	2.35E-05	5.09E-07
1981	71.9	9.14	0.942	0	0	354.5	16.3	4,247	4,700	1.06E-06	2.25E-08
1982	82.6	0	0.943	0	0	351.6	16.5	4,231	4,683	1.46E-07	3.13E-09
1983	325.6	0	0.940	0	0.068	343.5	16.9	4,107	4,794	1.70E-06	3.55E-08
1984	31.5	0	0.966	0	0	346.0	17.5	4,306	4,702	1.43E-06	3.05E-08
1985	458.4	7.08	0.819	0	0.142	337.9	17.0	3,987	4,808	8.49E-07	1.77E-08
1986	431.6	3.13	0.788	0	0.170	332.3	16.7	3,956	4,741	1.61E-06	3.39E-08
1987	490.8	2.79	0.657	0	0.210	324.7	16.6	3,912	4,748	5.91E-07	1.25E-08
1988	250.8	0	0.631	0	0.147	320.7	17.7	3,983	4,573	3.49E-07	7.64E-09
1989	88.0	0	0.819	0	0.029	320.6	18.3	4,276	4,704	5.17E-06	1.10E-07
1990	62.1	0.360	0.815	0	0.049	319.4	18.1	4,183	4,584	4.81E-07	1.05E-08
1991	36.6	16.4	0.871	0	0	344.9	19.4	5,817	6,235	3.61E-06	5.79E-08
1992	39.9	16.6	0.666	0	0	373.6	20.2	5,976	6,427	1.55E-08	2.40E-10
1993	34.2	0	0.736	0	0	399.7	21.6	6,140	6,596	4.24E-06	6.43E-08
1994	31.9	1.90	0.707	0	0	426.4	22.5	6,292	6,776	2.00E-06	2.95E-08
1995	0.014	0	0.769	0	0	447.1	23.7	6,239	6,711	-2.03E-06	-3.03E-08
1996	0	0	0.840	0	0	463.1	25.3	6,119	6,608	3.48E-06	5.26E-08
1997	3.47	3.56	0.737	0	0	457.2	25.4	5,149	5,639	7.29E-06	1.29E-07
1998	5.69	2.00	0.804	0	0	474.2	25.7	6,166	6,675	4.95E-06	7.42E-08
1999	0	0	0.846	0	0	489.8	27.7	6,371	6,889	4.32E-07	6.27E-09
2000	3.08	17.8	0.731	0	0	521.9	24.6	7,292	7,860	1.18E-05	1.51E-07
2001	1.13	15.7	0.587	0	0	536.0	22.5	6,842	7,418	-1.86E-07	-2.51E-09
2002	18.7	40.2	0.729	0	0	562.6	19.5	7,492	8,134	9.25E-07	1.14E-08
2003	9.83	18.5	0.628	0	0	577.8	18.0	7,182	7,807	2.41E-07	3.09E-09
2004	17.9	30.8	0.563	0	0	582.9	16.3	6,681	7,329	1.63E-06	2.22E-08
2005	0.029	0.092	0.561	0	0	580.9	16.1	6,484	7,082	-5.05E-08	-7.13E-10
2006	0.005	0	0.461	0	0	569.0	16.3	5,941	6,527	1.41E-07	2.16E-09
2007	14.4	32.5	0.360	0	0	564.1	15.0	5,981	6,608	3.43E-07	5.20E-09
2008	9.22E-04	0	0.521	0	0	584.8	15.2	7,201	7,801	1.59E-07	2.04E-09
2009	0.063	1.90	0.746	0	0	642.7	15.0	9,632	10,293	1.38E-06	1.34E-08
2010	2.16	9.76	2.40	0	0	703.4	14.7	10,269	11,001	1.51E-06	1.37E-08
2011	0	0	1.12	0	0	756.6	15.1	10,449	11,222	2.89E-06	2.58E-08
2012	0.012	0.572	0.634	0	0	755.4	15.2	7,803	8,575	5.29E-06	6.17E-08
2013	0.191	2.52	0.484	0	0	743.6	15.0	7,084	7,846	4.30E-08	5.48E-10
2014	175.7	0	0.459	0	0	727.1	15.0	6,562	7,480	1.36E-05	1.81E-07
2015	785.1	20.5	0.459	0	0	700.9	14.4	6,111	7,632	7.02E-07	9.19E-09
2016	751.8	14.7	0.460	0	0	681.6	13.9	5,990	7,453	5.87E-08	7.87E-10
2017	587.2	3.30	0.459	0	0	663.7	13.7	5,929	7,197	-4.76E-07	-6.62E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Quarternary Alluvium (Layer 1)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Flow to Upper Layers does not exist in model in the Quarternary Alluvium (Layer 1).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
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2000				
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2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - (Layer 2) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	River Package	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
	(acre-feet)								
Predevelopment	0	0	2.46E+06	43,380	1.32	4,667	0.307	1,905	244.0
1980	0	0	2.57E+06	40,943	1.32	4,628	0.306	1,904	244.4
1981	6.19E-04	0.393	2.55E+06	52,485	1.31	4,623	0.306	1,906	243.7
1982	10.5	2,364	2.56E+06	35,463	1.31	4,618	0.305	1,900	243.7
1983	5.43	1,508	2.56E+06	36,352	1.31	4,619	0.305	1,898	243.7
1984	11.5	3,460	2.58E+06	30,879	1.32	4,629	0.305	1,899	244.4
1985	0.004	1.92	2.55E+06	49,485	1.31	4,621	0.306	1,901	243.7
1986	0.037	14.4	2.54E+06	46,729	1.31	4,619	0.306	1,904	243.7
1987	0.002	0.668	2.54E+06	47,288	1.31	4,622	0.306	1,907	243.7
1988	25.8	6,559	2.57E+06	21,874	1.32	4,626	0.304	1,899	244.4
1989	9.51	3,152	2.57E+06	29,062	1.31	4,611	0.304	1,891	243.7
1990	0.583	167.7	2.56E+06	43,217	1.31	4,615	0.305	1,895	243.7
1991	0.258	135.1	2.55E+06	51,565	1.31	4,617	0.306	1,903	243.7
1992	0.145	66.4	2.55E+06	58,189	1.32	4,633	0.308	1,920	244.4
1993	11.6	2,527	2.56E+06	37,217	1.31	4,615	0.305	1,905	243.7
1994	0.475	282.0	2.56E+06	46,943	1.31	4,617	0.306	1,906	243.7
1995	10.2	2,793	2.57E+06	36,317	1.31	4,613	0.305	1,900	243.7
1996	19.6	5,677	2.60E+06	25,785	1.32	4,622	0.304	1,898	244.3
1997	0.204	50.8	2.57E+06	50,579	1.31	4,617	0.306	1,900	243.7
1998	0.170	82.6	2.57E+06	50,688	1.31	4,615	0.306	1,906	243.7
1999	18.8	4,750	2.59E+06	29,059	1.31	4,610	0.304	1,897	243.7
2000	2.18	986.0	2.60E+06	44,089	1.32	4,623	0.307	1,906	244.3
2001	3.92	1,262	2.59E+06	39,553	1.31	4,611	0.305	1,899	243.7
2002	1.50	839.4	2.58E+06	67,247	1.31	4,617	0.308	1,919	243.7
2003	4.70	1,035	2.59E+06	49,046	1.31	4,613	0.306	1,915	243.7
2004	0.139	122.6	2.58E+06	64,400	1.32	4,629	0.306	1,928	244.4
2005	23.9	5,679	2.60E+06	32,524	1.31	4,608	0.301	1,904	243.7
2006	17.6	4,893	2.60E+06	29,084	1.31	4,608	0.300	1,895	243.7
2007	0.011	8.35	2.56E+06	69,647	1.31	4,623	0.306	1,917	243.7
2008	27.4	6,775	2.61E+06	27,627	1.32	4,620	0.301	1,903	244.4
2009	6.53	2,465	2.62E+06	39,711	1.31	4,608	0.305	1,900	243.7
2010	2.72	1,301	2.63E+06	49,470	1.31	4,604	0.306	1,904	243.6
2011	28.2	7,663	2.67E+06	22,875	1.31	4,597	0.303	1,893	243.6
2012	3.71	1,320	2.65E+06	39,469	1.32	4,618	0.304	1,897	244.2
2013	1.36	479.7	2.63E+06	43,186	1.31	4,606	0.305	1,895	243.6
2014	4.75	1,514	2.63E+06	38,353	1.31	4,605	0.303	1,894	243.6
2015	0.356	99.6	2.60E+06	63,384	1.31	4,613	0.305	1,909	243.5
2016	0.189	41.4	2.60E+06	60,442	1.32	4,626	0.306	1,922	244.2
2017	5.07	972.5	2.60E+06	49,358	1.31	4,608	0.304	1,914	243.5

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - (Layer 2) - Inflows, Page 2 of 2

Simulated Time Period	Inflows								Total Inflows
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers	
	(acre-feet)								
Predevelopment	4.70E-12	879.7	409.3	458.5	49.6	46.5	1,307	2.58E+06	5.10E+06
1980	3.67E-12	881.9	410.4	459.8	49.7	46.6	1,315	2.51E+06	5.14E+06
1981	6.27E-12	879.5	409.3	458.5	49.6	46.5	1,296	2.52E+06	5.13E+06
1982	3.13E-12	879.5	409.3	458.5	49.6	46.5	1,317	2.51E+06	5.12E+06
1983	5.75E-12	879.5	409.3	458.5	49.6	46.5	1,318	2.51E+06	5.11E+06
1984	9.43E-12	881.9	410.4	459.8	49.7	46.6	1,330	2.51E+06	5.13E+06
1985	3.66E-12	879.5	409.3	458.5	49.6	46.5	1,302	2.52E+06	5.12E+06
1986	5.22E-13	879.5	409.3	458.5	49.6	46.5	1,303	2.52E+06	5.12E+06
1987	3.66E-12	879.5	409.3	458.5	49.6	46.5	1,302	2.52E+06	5.11E+06
1988	1.83E-11	881.9	410.4	459.8	49.7	46.6	1,340	2.51E+06	5.11E+06
1989	3.66E-12	879.5	409.3	458.5	49.6	46.5	1,330	2.50E+06	5.11E+06
1990	7.83E-12	879.5	409.3	458.5	49.6	46.5	1,311	2.51E+06	5.11E+06
1991	4.18E-12	879.5	409.3	458.5	49.6	46.5	1,298	2.51E+06	5.13E+06
1992	5.76E-12	881.9	410.4	459.8	49.7	46.6	1,291	2.53E+06	5.15E+06
1993	2.61E-12	879.5	409.3	458.5	49.6	46.5	1,313	2.51E+06	5.12E+06
1994	9.40E-12	879.5	409.3	458.5	49.6	46.5	1,303	2.51E+06	5.13E+06
1995	1.20E-11	879.5	409.3	458.5	49.6	46.5	1,316	2.50E+06	5.13E+06
1996	4.19E-12	881.8	410.4	459.8	49.7	46.6	1,336	2.50E+06	5.14E+06
1997	4.70E-12	879.4	409.3	458.5	49.6	46.5	1,301	2.51E+06	5.14E+06
1998	4.18E-12	879.4	409.3	458.5	49.6	46.5	1,298	2.51E+06	5.14E+06
1999	0	879.4	409.3	458.5	49.6	46.5	1,326	2.49E+06	5.13E+06
2000	6.28E-12	881.9	410.4	459.8	49.7	46.6	1,312	2.50E+06	5.16E+06
2001	8.88E-12	879.5	409.3	458.5	49.6	46.5	1,313	2.50E+06	5.14E+06
2002	2.61E-12	879.5	409.3	458.5	49.6	46.5	1,277	2.51E+06	5.17E+06
2003	2.61E-12	879.5	409.3	458.5	49.6	46.5	1,297	2.51E+06	5.15E+06
2004	2.62E-12	881.9	410.4	459.8	49.7	46.6	1,282	2.53E+06	5.18E+06
2005	4.70E-12	879.4	409.3	458.5	49.6	46.5	1,318	2.50E+06	5.14E+06
2006	1.57E-12	879.4	409.3	458.5	49.6	46.5	1,327	2.49E+06	5.14E+06
2007	1.04E-12	879.5	409.3	458.5	49.6	46.5	1,276	2.53E+06	5.16E+06
2008	2.10E-12	881.8	410.4	459.8	49.7	46.6	1,329	2.50E+06	5.15E+06
2009	2.61E-12	879.4	409.3	458.5	49.6	46.5	1,313	2.49E+06	5.16E+06
2010	8.88E-12	879.4	409.3	458.5	49.6	46.5	1,300	2.49E+06	5.18E+06
2011	1.04E-12	879.4	409.3	458.5	49.6	46.5	1,335	2.46E+06	5.17E+06
2012	4.71E-12	881.8	410.4	459.8	49.7	46.6	1,320	2.48E+06	5.18E+06
2013	7.31E-12	879.4	409.3	458.5	49.5	46.5	1,310	2.48E+06	5.16E+06
2014	3.13E-12	879.4	409.2	458.5	49.5	46.5	1,315	2.47E+06	5.15E+06
2015	4.70E-12	879.4	409.2	458.5	49.5	46.5	1,283	2.49E+06	5.16E+06
2016	4.71E-12	881.8	410.3	459.8	49.7	46.6	1,286	2.50E+06	5.17E+06
2017	7.31E-12	879.4	409.2	458.5	49.5	46.5	1,296	2.49E+06	5.15E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows									
	Specific Storage	Specific Yield	River Package	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD	Lost Pines GCD
	(acre feet)									
Predevelopment	0	0	2.59E+06	5,874	0.796	6,696	54.6	1,956	244.4	1.62E-11
1980	0	0	2.53E+06	3,081	0.794	6,658	54.8	1,952	244.8	4.19E-12
1981	14.1	3,884	2.53E+06	3,141	0.792	6,692	54.6	1,958	244.1	3.65E-12
1982	0.222	147.3	2.52E+06	3,100	0.792	6,616	54.7	1,950	244.1	4.18E-12
1983	0.373	227.2	2.52E+06	3,079	0.792	6,619	54.7	1,945	244.1	5.22E-12
1984	0.182	117.2	2.52E+06	3,026	0.794	6,613	54.8	1,943	244.8	3.66E-12
1985	14.5	3,787	2.53E+06	3,087	0.792	6,678	54.7	1,947	244.1	5.22E-12
1986	6.65	2,265	2.53E+06	3,127	0.792	6,665	54.6	1,953	244.1	1.41E-11
1987	6.54	2,412	2.53E+06	3,165	0.792	6,667	54.6	1,958	244.1	8.35E-12
1988	0.061	52.4	2.52E+06	3,060	0.794	6,570	54.8	1,944	244.8	0
1989	0.428	110.1	2.51E+06	3,010	0.792	6,584	54.7	1,933	244.1	1.31E-11
1990	8.63	1,886	2.52E+06	3,052	0.792	6,648	54.7	1,938	244.1	3.66E-12
1991	14.4	4,133	2.53E+06	3,125	0.792	6,686	54.7	1,949	244.1	6.79E-12
1992	18.3	5,581	2.54E+06	3,232	0.794	6,734	54.8	1,972	244.8	6.81E-12
1993	0.590	236.2	2.52E+06	3,175	0.792	6,621	54.7	1,957	244.1	7.83E-12
1994	5.00	1,311	2.52E+06	3,190	0.792	6,664	54.6	1,960	244.1	4.18E-12
1995	0.049	16.0	2.51E+06	3,135	0.792	6,617	54.7	1,952	244.1	3.13E-12
1996	7.44E-04	0.651	2.51E+06	3,042	0.794	6,588	54.8	1,943	244.8	1.20E-11
1997	15.7	3,620	2.52E+06	3,100	0.792	6,681	54.7	1,948	244.2	4.18E-12
1998	9.49	2,647	2.52E+06	3,148	0.792	6,682	54.6	1,957	244.2	2.61E-12
1999	0.004	1.92	2.50E+06	3,062	0.792	6,586	54.7	1,944	244.1	1.25E-11
2000	4.52	778.2	2.51E+06	3,079	0.794	6,671	54.8	1,953	244.8	2.62E-12
2001	0.494	82.6	2.51E+06	3,054	0.792	6,633	54.7	1,946	244.1	7.31E-12
2002	28.8	7,268	2.52E+06	3,184	0.792	6,758	54.6	1,973	244.1	4.18E-12
2003	4.55	1,240	2.52E+06	3,186	0.792	6,677	54.6	1,974	244.1	5.22E-12
2004	21.0	5,633	2.54E+06	3,292	0.794	6,764	54.7	1,994	244.8	7.33E-12
2005	0.567	47.7	2.51E+06	3,169	0.792	6,606	54.6	1,966	244.1	1.57E-12
2006	0.188	32.5	2.50E+06	3,077	0.792	6,590	54.7	1,948	244.1	5.74E-12
2007	36.6	9,230	2.54E+06	3,239	0.792	6,769	54.6	1,974	244.1	7.83E-12
2008	0.113	14.5	2.51E+06	3,123	0.795	6,602	54.8	1,957	244.8	4.19E-12
2009	0.855	85.8	2.50E+06	3,085	0.792	6,637	54.7	1,948	244.1	5.74E-12
2010	6.23	1,153	2.50E+06	3,103	0.792	6,685	54.6	1,955	244.2	4.18E-12
2011	0.002	1.47	2.47E+06	2,982	0.792	6,572	54.7	1,938	244.2	6.27E-12
2012	5.09	1,191	2.49E+06	2,990	0.794	6,662	54.8	1,944	244.9	8.38E-12
2013	5.01	1,340	2.49E+06	2,998	0.792	6,661	54.7	1,942	244.2	8.88E-12
2014	0.523	266.7	2.49E+06	2,983	0.792	6,640	54.7	1,940	244.2	3.13E-12
2015	24.7	6,527	2.50E+06	3,093	0.792	6,749	54.6	1,962	244.2	8.88E-12
2016	14.7	4,705	2.52E+06	3,177	0.794	6,754	54.8	1,982	244.9	2.10E-12
2017	3.23	1,081	2.50E+06	3,173	0.792	6,687	54.6	1,975	244.2	3.13E-12

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers			
	(acre feet)									%
Predevelopment	933.6	400.9	426.9	58.0	46.8	322.5	2.49E+06	5.10E+06	1.59E-05	3.12E-10
1980	936.0	402.0	428.1	58.2	46.9	316.5	2.60E+06	5.14E+06	-1.17E-07	-2.28E-12
1981	933.4	400.9	426.9	58.0	46.8	340.6	2.58E+06	5.13E+06	-1.45E-05	-2.82E-10
1982	933.4	400.9	426.9	58.0	46.8	307.2	2.58E+06	5.12E+06	-1.25E-05	-2.45E-10
1983	933.4	400.9	426.9	58.0	46.8	306.3	2.58E+06	5.11E+06	-1.23E-05	-2.40E-10
1984	936.0	402.0	428.1	58.2	46.9	294.4	2.60E+06	5.13E+06	9.00E-06	1.76E-10
1985	933.4	400.9	426.9	58.0	46.8	331.1	2.58E+06	5.12E+06	-1.06E-05	-2.07E-10
1986	933.4	400.9	426.9	58.0	46.8	328.9	2.57E+06	5.12E+06	-9.66E-06	-1.89E-10
1987	933.4	400.9	426.9	58.0	46.8	331.3	2.57E+06	5.11E+06	-1.03E-05	-2.02E-10
1988	936.0	402.0	428.1	58.2	46.9	279.5	2.58E+06	5.11E+06	8.56E-06	1.67E-10
1989	933.4	400.9	426.9	58.0	46.8	287.7	2.58E+06	5.11E+06	-8.41E-06	-1.65E-10
1990	933.4	400.9	426.9	58.0	46.8	316.1	2.58E+06	5.11E+06	-9.88E-06	-1.93E-10
1991	933.4	400.9	426.9	58.0	46.8	336.8	2.58E+06	5.13E+06	-1.14E-05	-2.22E-10
1992	936.0	402.0	428.1	58.2	46.9	355.4	2.59E+06	5.15E+06	6.15E-06	1.19E-10
1993	933.4	400.9	426.9	58.0	46.8	313.2	2.59E+06	5.12E+06	-1.13E-05	-2.20E-10
1994	933.4	400.9	426.9	58.0	46.8	330.4	2.59E+06	5.13E+06	-1.38E-05	-2.69E-10
1995	933.5	400.9	426.9	58.0	46.8	308.5	2.60E+06	5.13E+06	-1.14E-05	-2.23E-10
1996	936.0	402.0	428.1	58.2	46.9	285.2	2.62E+06	5.14E+06	8.08E-06	1.57E-10
1997	933.5	400.9	426.9	58.0	46.8	332.8	2.60E+06	5.14E+06	-9.93E-06	-1.93E-10
1998	933.4	400.9	426.9	58.0	46.8	337.4	2.60E+06	5.14E+06	-1.05E-05	-2.04E-10
1999	933.4	400.9	426.9	58.0	46.8	293.8	2.61E+06	5.13E+06	-8.30E-06	-1.62E-10
2000	936.0	402.0	428.1	58.2	46.9	321.7	2.63E+06	5.16E+06	5.45E-06	1.06E-10
2001	933.4	400.9	426.9	58.0	46.8	313.0	2.62E+06	5.14E+06	-1.16E-05	-2.26E-10
2002	933.4	400.9	426.9	58.0	46.8	372.5	2.62E+06	5.17E+06	-1.03E-05	-1.99E-10
2003	933.4	400.9	426.9	58.0	46.8	339.9	2.62E+06	5.15E+06	-1.07E-05	-2.07E-10
2004	936.0	402.0	428.1	58.2	46.9	372.7	2.62E+06	5.18E+06	7.09E-06	1.37E-10
2005	933.5	400.9	426.9	58.0	46.8	306.9	2.62E+06	5.14E+06	-1.11E-05	-2.15E-10
2006	933.5	400.9	426.9	58.0	46.8	293.3	2.62E+06	5.14E+06	-1.21E-05	-2.35E-10
2007	933.4	400.9	426.9	58.0	46.8	376.4	2.60E+06	5.16E+06	-1.73E-05	-3.35E-10
2008	936.0	402.0	428.1	58.2	46.9	295.3	2.63E+06	5.15E+06	7.19E-06	1.39E-10
2009	933.4	400.9	426.9	58.0	46.8	313.3	2.64E+06	5.16E+06	-2.04E-06	-3.96E-11
2010	933.5	400.9	426.9	58.0	46.8	333.9	2.66E+06	5.18E+06	-1.09E-05	-2.11E-10
2011	933.5	400.9	426.9	58.0	46.8	280.6	2.69E+06	5.17E+06	-1.20E-05	-2.31E-10
2012	936.1	402.0	428.1	58.2	46.9	309.9	2.67E+06	5.18E+06	8.34E-06	1.61E-10
2013	933.5	400.9	426.9	58.0	46.8	318.6	2.66E+06	5.16E+06	-1.15E-05	-2.22E-10
2014	933.5	400.9	426.9	58.0	46.8	309.9	2.65E+06	5.15E+06	8.51E-07	1.65E-11
2015	933.4	401.0	426.9	58.0	46.8	363.4	2.64E+06	5.16E+06	-1.61E-05	-3.12E-10
2016	935.9	402.1	428.1	58.2	47.0	363.9	2.63E+06	5.17E+06	5.51E-06	1.06E-10
2017	933.4	401.0	426.9	58.0	46.8	341.6	2.63E+06	5.15E+06	-1.07E-05	-2.08E-10

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Sparta Aquifer (Layer 3) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	2.46E+06	1.54E+05	45,180	978.7	77,196	9,448	22,649
1980	0	0	2.57E+06	1.85E+05	42,641	968.4	62,257	9,400	22,307
1981	0.017	0.505	2.55E+06	1.80E+05	54,663	966.1	63,968	9,409	22,428
1982	11.1	2,400	2.56E+06	1.79E+05	36,934	966.2	64,199	9,379	22,287
1983	5.65	1,518	2.56E+06	1.77E+05	37,860	966.3	64,814	9,374	22,268
1984	11.8	3,480	2.58E+06	1.77E+05	32,160	969.1	65,085	9,384	22,252
1985	0.024	2.16	2.55E+06	1.73E+05	51,538	966.6	65,534	9,399	22,384
1986	0.503	23.5	2.54E+06	1.74E+05	48,668	966.7	65,113	9,408	22,436
1987	0.014	0.867	2.54E+06	1.72E+05	49,250	967.0	66,060	9,412	22,472
1988	27.3	6,633	2.57E+06	1.75E+05	22,781	969.6	65,189	9,374	22,223
1989	11.4	3,194	2.57E+06	1.77E+05	30,268	966.8	63,691	9,340	22,110
1990	1.09	172.2	2.56E+06	1.76E+05	45,009	966.6	63,806	9,373	22,244
1991	0.584	139.1	2.55E+06	1.76E+05	53,704	966.6	63,914	9,408	22,434
1992	0.188	67.0	2.55E+06	1.76E+05	60,603	969.4	64,938	9,466	22,686
1993	12.5	2,579	2.56E+06	1.76E+05	38,760	966.8	64,261	9,394	22,417
1994	1.16	294.2	2.56E+06	1.77E+05	48,890	966.9	64,216	9,391	22,475
1995	10.9	2,826	2.57E+06	1.78E+05	37,824	966.8	63,808	9,369	22,342
1996	21.2	5,733	2.60E+06	1.80E+05	26,854	969.3	63,150	9,359	22,213
1997	0.297	51.5	2.57E+06	1.78E+05	52,677	966.8	63,927	9,382	22,289
1998	1.35	100.8	2.57E+06	1.79E+05	52,791	966.7	63,324	9,413	22,420
1999	19.8	4,805	2.59E+06	1.80E+05	30,264	966.7	62,883	9,363	22,188
2000	4.23	1,024	2.60E+06	1.82E+05	45,918	969.2	62,111	9,427	22,430
2001	4.14	1,271	2.59E+06	1.81E+05	41,194	966.7	62,394	9,393	22,329
2002	2.42	856.6	2.58E+06	1.82E+05	70,036	966.7	62,201	9,466	22,727
2003	5.42	1,064	2.59E+06	1.82E+05	51,080	966.6	62,219	9,435	22,565
2004	3.81	180.4	2.58E+06	1.85E+05	67,071	969.4	62,729	9,428	22,546
2005	26.4	5,793	2.60E+06	1.86E+05	33,873	966.7	61,872	9,316	22,042
2006	17.9	4,928	2.60E+06	1.85E+05	30,290	966.8	62,234	9,285	21,882
2007	0.011	8.38	2.56E+06	1.80E+05	72,536	967.3	64,541	9,411	22,480
2008	31.8	6,925	2.61E+06	1.85E+05	28,773	969.9	62,918	9,317	21,972
2009	9.36	2,518	2.62E+06	1.85E+05	41,358	967.0	61,594	9,375	22,242
2010	7.70	1,378	2.63E+06	1.91E+05	51,522	966.1	58,981	9,405	22,383
2011	33.3	7,772	2.67E+06	1.96E+05	23,824	965.2	57,453	9,343	22,093
2012	6.27	1,365	2.65E+06	1.91E+05	41,106	967.6	60,090	9,352	21,889
2013	2.97	489.2	2.63E+06	1.88E+05	44,978	964.4	60,568	9,378	21,848
2014	7.27	1,530	2.63E+06	1.87E+05	39,945	963.6	60,849	9,346	21,779
2015	3.15	109.1	2.60E+06	1.83E+05	66,013	962.5	62,130	9,404	22,062
2016	1.82	49.1	2.60E+06	1.83E+05	62,950	964.6	62,867	9,438	22,207
2017	7.35	1,005	2.60E+06	1.83E+05	51,405	961.3	62,137	9,396	22,171

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Sparta Aquifer (Layer 3) - Inflows, Page 2 of 2

Simulated Time Period	Inflows									Total Inflows
	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers	
	(acre-feet)									
Predevelopment	30,047	2,204	22,780	13,311	28,160	4,596	16,439	30,157	2.56E+06	5.48E+06
1980	29,928	2,167	22,480	13,332	27,887	4,602	16,460	30,191	2.50E+06	5.54E+06
1981	29,853	2,194	22,429	13,296	27,996	4,589	16,416	30,150	2.50E+06	5.53E+06
1982	29,854	2,160	22,426	13,296	27,857	4,589	16,416	30,113	2.49E+06	5.51E+06
1983	29,854	2,153	22,422	13,296	27,825	4,589	16,416	30,099	2.49E+06	5.51E+06
1984	29,936	2,142	22,481	13,332	27,810	4,602	16,461	30,153	2.49E+06	5.52E+06
1985	29,856	2,180	22,430	13,296	27,978	4,590	16,417	30,117	2.50E+06	5.51E+06
1986	29,857	2,189	22,430	13,296	28,032	4,590	16,417	30,130	2.50E+06	5.51E+06
1987	29,861	2,195	22,433	13,297	28,081	4,590	16,418	30,142	2.50E+06	5.51E+06
1988	29,942	2,139	22,490	13,333	27,842	4,602	16,462	30,148	2.49E+06	5.51E+06
1989	29,857	2,123	22,423	13,296	27,690	4,589	16,417	30,047	2.48E+06	5.50E+06
1990	29,854	2,151	22,419	13,296	27,810	4,589	16,416	30,079	2.49E+06	5.51E+06
1991	29,853	2,187	22,414	13,296	27,986	4,589	16,417	30,123	2.50E+06	5.52E+06
1992	29,936	2,223	22,477	13,333	28,254	4,602	16,462	30,254	2.51E+06	5.54E+06
1993	29,854	2,175	22,410	13,297	27,991	4,590	16,417	30,126	2.49E+06	5.52E+06
1994	29,853	2,192	22,406	13,297	28,002	4,590	16,418	30,140	2.49E+06	5.53E+06
1995	29,852	2,168	22,400	13,297	27,889	4,590	16,418	30,111	2.49E+06	5.52E+06
1996	29,931	2,137	22,454	13,333	27,745	4,602	16,463	30,147	2.48E+06	5.53E+06
1997	29,850	2,182	22,389	13,297	27,924	4,590	16,419	30,118	2.49E+06	5.53E+06
1998	29,846	2,212	22,381	13,297	28,001	4,590	16,419	30,143	2.49E+06	5.53E+06
1999	29,849	2,165	22,397	13,297	27,758	4,589	16,418	30,087	2.48E+06	5.52E+06
2000	29,932	2,193	22,467	13,334	27,745	4,602	16,463	30,135	2.49E+06	5.55E+06
2001	29,852	2,183	22,410	13,297	27,586	4,589	16,418	30,048	2.48E+06	5.54E+06
2002	29,852	2,258	22,411	13,297	27,844	4,590	16,419	30,129	2.50E+06	5.57E+06
2003	29,852	2,229	22,406	13,297	27,771	4,590	16,419	30,126	2.49E+06	5.55E+06
2004	29,934	2,266	22,456	13,334	27,869	4,603	16,464	30,169	2.51E+06	5.58E+06
2005	29,851	2,186	22,382	13,297	27,497	4,589	16,418	29,964	2.48E+06	5.54E+06
2006	29,851	2,158	22,375	13,297	27,359	4,589	16,418	29,966	2.47E+06	5.54E+06
2007	29,859	2,251	22,387	13,298	27,773	4,591	16,420	30,116	2.51E+06	5.56E+06
2008	29,940	2,173	22,442	13,334	27,478	4,602	16,464	30,042	2.48E+06	5.55E+06
2009	29,853	2,180	22,381	13,298	27,545	4,590	16,419	29,910	2.47E+06	5.56E+06
2010	29,839	2,208	22,365	13,297	27,653	4,589	16,418	30,049	2.47E+06	5.58E+06
2011	29,825	2,149	22,339	13,296	27,405	4,588	16,416	29,908	2.44E+06	5.58E+06
2012	29,906	2,145	22,392	13,331	27,490	4,598	16,458	30,109	2.47E+06	5.59E+06
2013	29,821	2,154	22,328	13,292	27,469	4,581	16,408	30,051	2.46E+06	5.57E+06
2014	29,815	2,148	22,328	13,289	27,470	4,576	16,400	30,060	2.46E+06	5.55E+06
2015	29,809	2,209	22,335	13,284	27,790	4,571	16,391	30,150	2.47E+06	5.56E+06
2016	29,889	2,227	22,404	13,319	27,953	4,582	16,432	30,265	2.49E+06	5.57E+06
2017	29,803	2,182	22,345	13,280	27,815	4,567	16,383	30,168	2.47E+06	5.54E+06

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows									
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
Predevelopment	0	0	2.59E+06	2.45E+05	5,893	4,017	58,388	2,943	14,122	575.9
1980	0	0	2.53E+06	2.29E+05	3,094	4,042	85,920	2,970	14,493	601.2
1981	17.2	3,963	2.53E+06	2.31E+05	3,161	4,030	82,178	2,954	14,427	598.7
1982	1.31	165.6	2.52E+06	2.31E+05	3,110	4,030	80,552	2,960	14,411	598.5
1983	1.66	248.7	2.52E+06	2.32E+05	3,087	4,030	78,946	2,963	14,392	598.2
1984	0.970	128.9	2.52E+06	2.32E+05	3,028	4,041	78,396	2,976	14,418	599.6
1985	16.6	3,848	2.53E+06	2.33E+05	3,107	4,030	77,262	2,960	14,388	597.8
1986	7.09	2,278	2.53E+06	2.32E+05	3,147	4,030	77,995	2,955	14,345	597.6
1987	7.90	2,440	2.53E+06	2.33E+05	3,185	4,029	76,222	2,953	14,350	597.0
1988	0.080	52.6	2.52E+06	2.32E+05	3,060	4,040	77,149	2,975	14,379	598.7
1989	0.484	112.2	2.51E+06	2.30E+05	3,010	4,029	79,662	2,972	14,383	597.5
1990	9.15	1,915	2.52E+06	2.31E+05	3,062	4,030	79,926	2,966	14,392	597.8
1991	15.0	4,169	2.53E+06	2.31E+05	3,145	4,030	80,283	2,956	14,349	597.9
1992	19.5	5,636	2.54E+06	2.33E+05	3,252	4,040	79,478	2,957	14,384	599.2
1993	0.829	238.7	2.52E+06	2.31E+05	3,187	4,029	79,423	2,958	14,339	597.5
1994	5.33	1,323	2.52E+06	2.31E+05	3,210	4,029	79,990	2,965	14,353	597.4
1995	0.132	16.9	2.51E+06	2.31E+05	3,144	4,029	80,465	2,968	14,365	597.6
1996	0.024	1.14	2.51E+06	2.30E+05	3,042	4,040	81,954	2,986	14,427	599.4
1997	17.3	3,679	2.52E+06	2.31E+05	3,118	4,029	80,818	2,969	14,414	597.5
1998	9.75	2,670	2.52E+06	2.30E+05	3,168	4,029	82,300	2,956	14,386	597.8
1999	0.535	5.56	2.50E+06	2.30E+05	3,064	4,029	82,543	2,966	14,379	597.8
2000	5.66	805.8	2.51E+06	2.30E+05	3,089	4,041	85,408	2,967	14,323	599.7
2001	1.21	93.3	2.51E+06	2.29E+05	3,061	4,029	84,261	2,960	14,298	597.8
2002	29.7	7,353	2.52E+06	2.30E+05	3,206	4,029	86,384	2,947	14,325	598.0
2003	4.94	1,247	2.52E+06	2.29E+05	3,206	4,029	85,809	2,951	14,358	598.0
2004	21.7	5,686	2.54E+06	2.30E+05	3,315	4,040	86,352	2,976	14,853	599.4
2005	0.572	47.9	2.51E+06	2.28E+05	3,174	4,029	86,184	2,982	14,888	597.8
2006	1.65	53.9	2.50E+06	2.28E+05	3,077	4,029	84,997	2,991	14,855	597.5
2007	42.1	9,396	2.54E+06	2.32E+05	3,259	4,029	82,061	2,967	14,686	596.5
2008	0.126	14.5	2.51E+06	2.29E+05	3,123	4,040	84,189	2,994	14,930	598.3
2009	3.71	142.2	2.50E+06	2.28E+05	3,090	4,029	86,896	2,967	14,431	597.3
2010	8.32	1,201	2.50E+06	2.26E+05	3,121	4,030	94,541	2,959	14,395	599.2
2011	0.005	1.52	2.47E+06	2.24E+05	2,982	4,031	98,279	2,971	14,371	601.0
2012	9.89	1,289	2.49E+06	2.27E+05	2,990	4,042	92,365	2,988	14,948	602.6
2013	6.55	1,376	2.49E+06	2.27E+05	2,998	4,032	90,268	2,963	14,927	601.7
2014	1.34	283.5	2.49E+06	2.27E+05	2,983	4,033	88,946	2,970	14,929	603.1
2015	26.7	6,615	2.50E+06	2.29E+05	3,113	4,035	86,832	2,960	14,963	604.8
2016	15.4	4,743	2.52E+06	2.30E+05	3,199	4,046	85,663	2,967	15,012	607.2
2017	3.74	1,094	2.50E+06	2.29E+05	3,189	4,036	85,786	2,961	14,751	606.6

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers			
											%
Predevelopment	80.8	3,453	8,746	22,163	3,917	5,419	35,671	2.48E+06	5.48E+06	1.59E-05	2.90E-10
1980	76.1	3,606	8,786	25,151	3,935	5,447	35,784	2.59E+06	5.54E+06	-1.56E-07	-2.82E-12
1981	80.6	3,591	8,762	24,644	3,923	5,431	35,787	2.57E+06	5.53E+06	-1.45E-05	-2.62E-10
1982	77.8	3,593	8,762	24,177	3,924	5,432	35,613	2.58E+06	5.51E+06	-1.25E-05	-2.27E-10
1983	75.9	3,594	8,762	23,744	3,924	5,432	35,642	2.57E+06	5.51E+06	-1.22E-05	-2.21E-10
1984	71.7	3,604	8,786	23,372	3,935	5,446	35,704	2.59E+06	5.52E+06	9.08E-06	1.64E-10
1985	75.8	3,589	8,761	22,359	3,923	5,431	35,790	2.57E+06	5.51E+06	-1.06E-05	-1.92E-10
1986	77.6	3,590	8,761	22,321	3,923	5,431	35,735	2.56E+06	5.51E+06	-9.65E-06	-1.75E-10
1987	80.1	3,588	8,761	22,314	3,923	5,431	35,727	2.56E+06	5.51E+06	-1.03E-05	-1.88E-10
1988	72.6	3,599	8,785	22,357	3,934	5,446	35,596	2.58E+06	5.51E+06	8.57E-06	1.56E-10
1989	68.6	3,592	8,761	22,433	3,924	5,431	35,614	2.58E+06	5.50E+06	-8.39E-06	-1.53E-10
1990	71.0	3,594	8,761	22,439	3,924	5,431	35,758	2.57E+06	5.51E+06	-9.85E-06	-1.79E-10
1991	75.4	3,596	8,761	22,436	3,924	5,431	35,808	2.58E+06	5.52E+06	-1.14E-05	-2.07E-10
1992	80.8	3,606	8,785	22,552	3,934	5,446	35,929	2.58E+06	5.54E+06	6.18E-06	1.12E-10
1993	80.6	3,598	8,761	22,425	3,923	5,431	35,616	2.58E+06	5.52E+06	-1.13E-05	-2.05E-10
1994	82.4	3,601	8,760	23,062	3,923	5,430	35,721	2.58E+06	5.53E+06	-1.38E-05	-2.50E-10
1995	79.4	3,603	8,760	22,969	3,923	5,430	35,621	2.59E+06	5.52E+06	-1.14E-05	-2.07E-10
1996	72.8	3,615	8,784	23,339	3,934	5,445	35,646	2.61E+06	5.53E+06	8.06E-06	1.46E-10
1997	77.0	3,608	8,760	22,956	3,923	5,430	35,802	2.59E+06	5.53E+06	-9.92E-06	-1.79E-10
1998	79.9	3,613	8,760	23,208	3,923	5,430	35,769	2.59E+06	5.53E+06	-1.05E-05	-1.89E-10
1999	75.1	3,602	8,760	23,276	3,923	5,430	35,562	2.60E+06	5.52E+06	-8.30E-06	-1.50E-10
2000	76.8	3,607	8,784	23,192	3,934	5,445	35,913	2.62E+06	5.55E+06	5.41E-06	9.74E-11
2001	75.5	3,596	8,760	23,316	3,923	5,430	35,762	2.61E+06	5.54E+06	-1.16E-05	-2.09E-10
2002	81.1	3,596	8,760	24,152	3,923	5,430	36,024	2.61E+06	5.57E+06	-1.03E-05	-1.85E-10
2003	82.8	3,599	8,760	23,747	3,923	5,430	35,782	2.61E+06	5.55E+06	-1.07E-05	-1.92E-10
2004	86.3	3,616	8,784	25,516	3,934	5,445	36,134	2.61E+06	5.58E+06	7.15E-06	1.28E-10
2005	86.2	3,612	8,760	25,730	3,924	5,430	35,796	2.61E+06	5.54E+06	-1.11E-05	-2.00E-10
2006	81.2	3,615	8,760	25,604	3,924	5,430	35,735	2.61E+06	5.54E+06	-1.21E-05	-2.18E-10
2007	83.1	3,609	8,759	24,941	3,922	5,429	36,062	2.59E+06	5.56E+06	-1.73E-05	-3.11E-10
2008	82.9	3,623	8,783	25,703	3,934	5,445	35,830	2.62E+06	5.55E+06	7.16E-06	1.29E-10
2009	80.1	3,610	8,760	23,962	3,923	5,430	35,983	2.63E+06	5.56E+06	-2.07E-06	-3.73E-11
2010	81.6	3,617	8,760	23,871	3,924	5,430	35,895	2.66E+06	5.58E+06	-1.09E-05	-1.96E-10
2011	73.4	3,628	8,762	23,941	3,925	5,431	35,759	2.68E+06	5.58E+06	-1.19E-05	-2.14E-10
2012	73.7	3,643	8,787	24,491	3,938	5,448	35,879	2.66E+06	5.59E+06	8.41E-06	1.51E-10
2013	74.1	3,634	8,766	24,331	3,931	5,436	35,797	2.65E+06	5.57E+06	-1.14E-05	-2.06E-10
2014	73.4	3,633	8,769	24,011	3,935	5,441	35,721	2.65E+06	5.55E+06	8.57E-07	1.54E-11
2015	80.9	3,630	8,773	23,511	3,940	5,446	35,937	2.63E+06	5.56E+06	-1.61E-05	-2.89E-10
2016	83.1	3,636	8,799	23,666	3,952	5,463	35,950	2.63E+06	5.57E+06	5.56E-06	9.98E-11
2017	84.2	3,625	8,777	23,665	3,943	5,451	35,724	2.62E+06	5.54E+06	-1.08E-05	-1.95E-10

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Weches Formation (Layer 4) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	2.46E+06	1.85E+05	66,125	1,142	63,294	4,889	5,979
1980	0	0	2.57E+06	2.16E+05	62,410	1,124	48,616	4,888	5,946
1981	0.042	0.505	2.55E+06	2.11E+05	80,004	1,121	50,192	4,892	5,945
1982	63.1	4,556	2.56E+06	2.10E+05	54,057	1,121	50,604	4,871	5,931
1983	21.5	2,681	2.56E+06	2.08E+05	55,412	1,122	51,264	4,869	5,929
1984	45.9	5,774	2.58E+06	2.07E+05	47,069	1,125	51,599	4,875	5,942
1985	0.299	11.3	2.55E+06	2.04E+05	75,431	1,122	51,861	4,887	5,945
1986	5.50	31.1	2.54E+06	2.05E+05	71,230	1,122	51,359	4,887	5,946
1987	0.045	0.909	2.54E+06	2.03E+05	72,082	1,123	52,295	4,888	5,948
1988	129.9	12,430	2.57E+06	2.05E+05	33,342	1,126	51,688	4,866	5,937
1989	52.6	5,455	2.57E+06	2.07E+05	44,300	1,122	50,263	4,857	5,918
1990	4.49	276.4	2.56E+06	2.07E+05	65,876	1,122	50,239	4,875	5,926
1991	3.57	172.5	2.55E+06	2.07E+05	78,601	1,122	50,176	4,891	5,940
1992	1.06	71.2	2.55E+06	2.06E+05	88,698	1,125	50,946	4,917	5,968
1993	81.9	5,031	2.56E+06	2.07E+05	56,730	1,122	50,576	4,876	5,936
1994	12.2	334.8	2.56E+06	2.07E+05	71,556	1,122	50,461	4,889	5,944
1995	54.1	4,955	2.57E+06	2.08E+05	55,359	1,122	50,206	4,874	5,934
1996	93.5	10,212	2.60E+06	2.11E+05	39,304	1,125	49,716	4,871	5,938
1997	0.970	82.3	2.57E+06	2.08E+05	77,098	1,122	50,287	4,890	5,944
1998	13.8	171.8	2.57E+06	2.10E+05	77,265	1,122	49,576	4,893	5,948
1999	99.0	8,942	2.59E+06	2.11E+05	44,295	1,122	49,426	4,863	5,928
2000	40.2	2,406	2.60E+06	2.13E+05	67,205	1,125	48,535	4,890	5,944
2001	32.5	3,044	2.59E+06	2.12E+05	60,292	1,122	48,941	4,874	5,927
2002	53.5	4,180	2.58E+06	2.13E+05	1.03E+05	1,122	48,335	4,914	5,958
2003	50.6	2,257	2.59E+06	2.13E+05	74,761	1,122	48,540	4,890	5,944
2004	42.5	734.8	2.58E+06	2.15E+05	98,165	1,125	49,028	4,917	5,982
2005	169.6	12,168	2.60E+06	2.17E+05	49,577	1,122	48,693	4,857	5,932
2006	80.4	10,008	2.60E+06	2.16E+05	44,333	1,122	49,248	4,846	5,919
2007	0.057	13.2	2.56E+06	2.10E+05	1.06E+05	1,123	50,992	4,908	5,969
2008	182.4	12,750	2.61E+06	2.15E+05	42,112	1,126	49,880	4,865	5,949
2009	45.0	4,279	2.62E+06	2.15E+05	60,532	1,123	48,302	4,872	5,932
2010	48.4	2,219	2.63E+06	2.22E+05	75,408	1,121	45,539	4,887	5,932
2011	158.8	15,593	2.67E+06	2.27E+05	34,869	1,120	44,404	4,851	5,901
2012	29.9	2,554	2.65E+06	2.22E+05	60,163	1,122	47,329	4,872	5,900
2013	7.98	920.5	2.63E+06	2.19E+05	65,830	1,118	47,813	4,849	5,840
2014	23.5	2,562	2.63E+06	2.18E+05	58,463	1,117	48,117	4,837	5,776
2015	6.20	117.5	2.60E+06	2.14E+05	96,618	1,115	49,055	4,862	5,733
2016	6.03	51.6	2.60E+06	2.13E+05	92,133	1,117	49,616	4,876	5,744
2017	39.5	1,609	2.60E+06	2.13E+05	75,237	1,113	48,986	4,842	5,689

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Weches Formation (Layer 4) - Inflows, Page 2 of 2

Simulated Time Period	Inflows									Total Inflows
	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers	
	(acre-feet)									
Predevelopment	24,030	143.9	17,402	3,573	3,279	1,064	9,089	1,698	2.56E+06	5.41E+06
1980	23,878	148.5	17,034	3,558	3,270	1,055	9,080	1,696	2.50E+06	5.47E+06
1981	23,820	146.6	17,000	3,549	3,259	1,053	9,056	1,692	2.50E+06	5.46E+06
1982	23,821	146.7	16,996	3,549	3,256	1,052	9,055	1,692	2.49E+06	5.44E+06
1983	23,821	148.3	16,993	3,549	3,254	1,052	9,055	1,691	2.49E+06	5.44E+06
1984	23,887	150.6	17,038	3,559	3,260	1,055	9,080	1,695	2.49E+06	5.45E+06
1985	23,823	149.0	17,002	3,550	3,248	1,053	9,056	1,692	2.50E+06	5.45E+06
1986	23,824	146.7	17,003	3,550	3,249	1,054	9,057	1,692	2.50E+06	5.44E+06
1987	23,829	145.6	17,007	3,551	3,250	1,054	9,058	1,693	2.50E+06	5.44E+06
1988	23,893	148.8	17,048	3,560	3,257	1,055	9,082	1,695	2.49E+06	5.43E+06
1989	23,824	151.9	16,995	3,550	3,248	1,052	9,056	1,690	2.48E+06	5.42E+06
1990	23,821	151.4	16,992	3,550	3,249	1,052	9,056	1,691	2.49E+06	5.44E+06
1991	23,820	148.6	16,987	3,550	3,250	1,052	9,056	1,692	2.50E+06	5.45E+06
1992	23,887	145.8	17,035	3,560	3,259	1,056	9,082	1,698	2.51E+06	5.48E+06
1993	23,821	144.7	16,981	3,551	3,247	1,053	9,058	1,692	2.49E+06	5.44E+06
1994	23,820	145.1	16,976	3,551	3,250	1,054	9,059	1,692	2.49E+06	5.46E+06
1995	23,819	146.1	16,970	3,551	3,247	1,053	9,059	1,691	2.48E+06	5.45E+06
1996	23,881	150.0	17,008	3,561	3,256	1,055	9,083	1,694	2.48E+06	5.46E+06
1997	23,817	148.8	16,957	3,552	3,247	1,054	9,059	1,691	2.49E+06	5.46E+06
1998	23,813	145.2	16,948	3,552	3,249	1,054	9,059	1,692	2.49E+06	5.47E+06
1999	23,816	145.7	16,964	3,552	3,247	1,053	9,059	1,690	2.48E+06	5.45E+06
2000	23,882	146.4	17,021	3,561	3,252	1,056	9,084	1,695	2.48E+06	5.49E+06
2001	23,819	145.8	16,978	3,552	3,242	1,053	9,059	1,690	2.48E+06	5.47E+06
2002	23,819	142.9	16,979	3,552	3,243	1,054	9,060	1,692	2.50E+06	5.51E+06
2003	23,819	139.8	16,973	3,552	3,243	1,053	9,060	1,692	2.49E+06	5.48E+06
2004	23,884	139.0	17,008	3,562	3,261	1,057	9,085	1,697	2.51E+06	5.52E+06
2005	23,817	139.0	16,948	3,552	3,250	1,052	9,059	1,691	2.48E+06	5.47E+06
2006	23,818	143.3	16,939	3,552	3,246	1,052	9,059	1,689	2.47E+06	5.47E+06
2007	23,827	142.7	16,953	3,553	3,246	1,055	9,061	1,692	2.51E+06	5.51E+06
2008	23,890	142.2	16,992	3,562	3,257	1,056	9,085	1,695	2.48E+06	5.48E+06
2009	23,820	145.3	16,945	3,552	3,235	1,053	9,060	1,690	2.47E+06	5.49E+06
2010	23,805	144.4	16,927	3,551	3,233	1,052	9,058	1,689	2.47E+06	5.52E+06
2011	23,789	146.5	16,898	3,549	3,228	1,049	9,056	1,688	2.44E+06	5.51E+06
2012	23,853	150.2	16,933	3,557	3,238	1,048	9,076	1,692	2.47E+06	5.52E+06
2013	23,785	148.9	16,883	3,543	3,229	1,038	9,043	1,688	2.46E+06	5.50E+06
2014	23,778	148.3	16,884	3,537	3,228	1,029	9,033	1,688	2.46E+06	5.48E+06
2015	23,772	145.7	16,892	3,530	3,229	1,019	9,020	1,689	2.47E+06	5.50E+06
2016	23,835	142.6	16,946	3,536	3,241	1,020	9,039	1,695	2.49E+06	5.51E+06
2017	23,764	142.2	16,903	3,523	3,233	1,014	9,007	1,690	2.47E+06	5.48E+06

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Weches Formation (Layer 4) -Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows										
	Specific Storage	Specific Yield	Wells	River Package	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
	(acre-feet)										
Predevelopment	0	0	0	2.59E+06	2.67E+05	13,062	1,090	47,826	764.4	350.7	285.2
1980	0	0	4,827	2.53E+06	2.52E+05	9,359	1,107	75,069	766.3	341.6	301.4
1981	98.8	7,057	4,199	2.53E+06	2.53E+05	10,844	1,103	71,793	765.6	398.7	300.0
1982	15.6	331.3	3,623	2.52E+06	2.53E+05	9,155	1,103	69,407	764.0	319.4	299.9
1983	17.7	495.4	3,004	2.52E+06	2.53E+05	8,804	1,103	67,756	763.2	320.9	299.7
1984	12.0	344.6	2,447	2.52E+06	2.54E+05	7,971	1,106	66,913	763.9	303.6	300.3
1985	94.9	7,397	1,384	2.53E+06	2.55E+05	9,889	1,103	66,618	763.9	376.9	299.4
1986	26.7	3,823	1,341	2.53E+06	2.54E+05	10,229	1,103	67,471	764.5	370.4	299.3
1987	35.3	3,924	1,357	2.53E+06	2.55E+05	10,509	1,102	65,582	765.0	374.2	298.8
1988	0.587	153.4	1,421	2.52E+06	2.54E+05	7,438	1,106	65,484	763.7	289.7	299.7
1989	2.38	160.0	1,650	2.51E+06	2.52E+05	7,343	1,103	68,350	761.0	294.0	299.2
1990	46.7	4,193	1,683	2.52E+06	2.53E+05	8,786	1,103	69,118	762.4	341.1	299.4
1991	73.7	7,636	1,633	2.53E+06	2.53E+05	10,322	1,103	70,022	765.1	392.4	299.4
1992	95.9	9,637	1,685	2.54E+06	2.55E+05	11,850	1,106	69,518	769.4	428.3	300.0
1993	2.61	303.5	1,688	2.52E+06	2.53E+05	9,711	1,103	68,724	765.1	328.2	299.2
1994	29.3	2,289	2,429	2.52E+06	2.53E+05	10,425	1,102	69,692	765.4	371.9	299.1
1995	1.66	38.5	2,394	2.51E+06	2.53E+05	9,210	1,103	69,717	764.1	322.1	299.2
1996	0.338	4.25	2,804	2.51E+06	2.52E+05	7,556	1,106	70,731	763.8	293.6	300.2
1997	92.3	7,368	2,492	2.52E+06	2.53E+05	9,883	1,102	70,370	764.1	377.8	299.1
1998	45.9	4,836	2,752	2.52E+06	2.52E+05	10,723	1,103	72,194	765.4	390.4	299.4
1999	3.11	7.19	2,902	2.50E+06	2.51E+05	8,285	1,103	71,503	763.0	299.0	299.4
2000	34.9	1,860	4,301	2.51E+06	2.52E+05	9,041	1,106	75,314	766.9	352.8	300.4
2001	6.10	107.7	4,781	2.51E+06	2.51E+05	8,655	1,103	73,765	764.5	335.6	299.4
2002	145.5	13,041	9,061	2.52E+06	2.52E+05	11,734	1,103	77,392	768.3	473.4	299.5
2003	14.2	1,783	5,388	2.52E+06	2.51E+05	10,632	1,103	75,948	767.7	387.7	299.5
2004	100.2	8,971	10,352	2.54E+06	2.52E+05	12,339	1,106	76,226	768.9	462.2	300.2
2005	1.49	95.0	11,281	2.51E+06	2.50E+05	8,845	1,103	74,361	762.1	312.9	299.4
2006	11.6	76.5	10,316	2.50E+06	2.50E+05	7,549	1,103	72,709	759.9	301.2	299.2
2007	216.9	17,173	7,868	2.54E+06	2.54E+05	11,733	1,102	71,833	765.5	477.2	298.5
2008	0.925	67.4	9,878	2.51E+06	2.51E+05	8,030	1,105	71,889	762.5	299.4	299.4
2009	41.8	359.4	6,551	2.50E+06	2.50E+05	8,379	1,102	76,342	763.3	331.6	299.1
2010	45.7	2,889	5,661	2.50E+06	2.48E+05	9,532	1,103	85,241	765.2	383.8	300.3
2011	0.024	2.25	6,987	2.47E+06	2.46E+05	6,773	1,104	87,634	762.2	291.9	301.4
2012	58.1	2,206	9,323	2.49E+06	2.49E+05	7,701	1,108	80,028	764.4	329.6	302.2
2013	33.3	2,586	8,972	2.49E+06	2.49E+05	8,284	1,105	78,069	766.6	358.8	301.9
2014	13.8	464.4	8,469	2.49E+06	2.49E+05	7,952	1,107	76,560	766.6	345.6	302.7
2015	150.2	13,334	7,206	2.50E+06	2.51E+05	10,710	1,108	75,659	771.5	476.4	303.8
2016	77.2	8,610	7,556	2.52E+06	2.52E+05	11,443	1,112	74,507	775.7	467.3	305.1
2017	12.7	1,721	7,485	2.50E+06	2.51E+05	10,501	1,110	74,217	773.8	417.4	305.1

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers			
	(acre-feet)										%
Predevelopment	153.6	263.5	704.1	1,886	282.6	848.0	4,732	2.48E+06	5.41E+06	1.71E-05	3.16E-10
1980	144.6	351.8	716.7	1,917	285.2	858.4	4,748	2.59E+06	5.47E+06	-1.22E-07	-2.23E-12
1981	171.5	347.5	714.5	1,933	284.4	855.8	4,742	2.57E+06	5.46E+06	-1.54E-05	-2.81E-10
1982	138.4	350.5	714.6	1,913	284.4	855.9	4,736	2.57E+06	5.44E+06	-1.25E-05	-2.29E-10
1983	136.3	352.7	714.6	1,905	284.4	855.9	4,734	2.57E+06	5.44E+06	-1.24E-05	-2.27E-10
1984	127.4	354.5	716.5	1,894	285.2	858.2	4,741	2.59E+06	5.45E+06	9.49E-06	1.74E-10
1985	158.2	350.0	714.3	1,916	284.3	855.6	4,736	2.57E+06	5.45E+06	-1.06E-05	-1.95E-10
1986	159.6	350.9	714.1	1,921	284.3	855.4	4,739	2.56E+06	5.44E+06	-9.70E-06	-1.78E-10
1987	162.2	350.2	713.9	1,926	284.3	855.3	4,741	2.56E+06	5.44E+06	-4.52E-06	-8.31E-11
1988	119.2	352.3	716.0	1,886	285.1	857.9	4,740	2.58E+06	5.43E+06	8.72E-06	1.61E-10
1989	120.7	352.5	714.1	1,872	284.4	855.7	4,724	2.58E+06	5.42E+06	-8.35E-06	-1.54E-10
1990	139.1	353.9	714.3	1,893	284.4	855.8	4,729	2.57E+06	5.44E+06	-9.71E-06	-1.79E-10
1991	167.3	356.4	714.1	1,918	284.4	855.7	4,737	2.57E+06	5.45E+06	-1.14E-05	-2.08E-10
1992	189.6	357.1	715.9	1,951	285.1	857.8	4,759	2.58E+06	5.48E+06	7.09E-06	1.29E-10
1993	142.9	357.6	713.8	1,928	284.3	855.3	4,740	2.58E+06	5.44E+06	-1.13E-05	-2.08E-10
1994	160.8	358.6	713.6	1,938	284.2	855.1	4,743	2.58E+06	5.46E+06	-1.37E-05	-2.51E-10
1995	139.5	359.6	713.6	1,923	284.2	855.1	4,738	2.59E+06	5.45E+06	-1.09E-05	-2.00E-10
1996	121.9	362.0	715.7	1,903	285.0	857.5	4,742	2.61E+06	5.46E+06	2.68E-06	4.91E-11
1997	158.8	363.1	713.5	1,930	284.2	854.9	4,738	2.59E+06	5.46E+06	-8.65E-06	-1.58E-10
1998	169.4	366.9	713.5	1,942	284.2	854.9	4,743	2.59E+06	5.47E+06	-1.05E-05	-1.91E-10
1999	129.7	356.6	713.5	1,911	284.2	855.0	4,733	2.60E+06	5.45E+06	-8.29E-06	-1.52E-10
2000	148.5	353.5	715.6	1,923	285.0	857.4	4,748	2.62E+06	5.49E+06	1.43E-05	2.61E-10
2001	142.9	350.8	713.6	1,905	284.2	855.0	4,733	2.61E+06	5.47E+06	-1.16E-05	-2.12E-10
2002	215.1	351.4	713.5	1,923	284.2	854.8	4,749	2.61E+06	5.51E+06	-1.03E-05	-1.87E-10
2003	171.5	353.1	713.5	1,908	284.2	854.9	4,749	2.61E+06	5.48E+06	-1.04E-05	-1.90E-10
2004	212.7	357.7	715.4	1,933	284.9	857.2	4,768	2.61E+06	5.52E+06	7.16E-06	1.30E-10
2005	140.9	359.7	713.6	1,879	284.2	855.0	4,739	2.61E+06	5.47E+06	-1.11E-05	-2.03E-10
2006	129.8	360.9	713.6	1,843	284.2	855.1	4,731	2.61E+06	5.47E+06	-1.21E-05	-2.21E-10
2007	216.0	357.8	713.0	1,897	284.0	854.4	4,752	2.59E+06	5.51E+06	-1.72E-05	-3.13E-10
2008	132.5	360.1	715.1	1,861	284.9	857.0	4,746	2.62E+06	5.48E+06	7.16E-06	1.31E-10
2009	140.8	358.4	713.3	1,856	284.1	854.7	4,730	2.63E+06	5.49E+06	1.28E-05	2.32E-10
2010	165.4	363.9	713.8	1,874	284.2	855.2	4,739	2.65E+06	5.52E+06	-1.22E-05	-2.22E-10
2011	120.4	371.9	714.6	1,824	284.4	855.9	4,723	2.68E+06	5.51E+06	-1.20E-05	-2.18E-10
2012	136.5	375.6	717.4	1,830	285.5	859.4	4,743	2.66E+06	5.52E+06	8.97E-06	1.63E-10
2013	146.8	375.4	716.9	1,827	285.2	859.1	4,734	2.65E+06	5.50E+06	-1.15E-05	-2.10E-10
2014	139.5	374.9	718.8	1,815	285.9	861.9	4,734	2.64E+06	5.48E+06	-4.64E-07	-8.46E-12
2015	201.7	372.9	721.3	1,860	286.7	865.3	4,750	2.63E+06	5.50E+06	-1.68E-05	-3.05E-10
2016	200.9	371.6	724.4	1,884	287.9	869.1	4,770	2.63E+06	5.51E+06	9.09E-06	1.65E-10
2017	172.4	369.5	723.8	1,873	287.5	868.5	4,756	2.62E+06	5.48E+06	-1.08E-05	-1.97E-10

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Queen City Aquifer (Layer 5) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	2.46E+06	1.85E+05	70,939	1,129	3.56E+05	4,877	9.06E+05
1980	0	0	2.57E+06	2.16E+05	66,953	1,111	3.15E+05	4,877	9.05E+05
1981	0.042	0.505	2.55E+06	2.11E+05	85,829	1,108	3.17E+05	4,881	9.04E+05
1982	71.7	4,774	2.56E+06	2.10E+05	57,992	1,108	3.17E+05	4,859	9.03E+05
1983	23.0	2,765	2.56E+06	2.08E+05	59,446	1,108	3.18E+05	4,857	9.03E+05
1984	49.6	5,961	2.58E+06	2.07E+05	50,496	1,112	3.18E+05	4,863	9.04E+05
1985	0.401	13.4	2.55E+06	2.04E+05	80,922	1,109	3.20E+05	4,875	9.04E+05
1986	7.36	42.1	2.54E+06	2.05E+05	76,416	1,109	3.19E+05	4,875	9.04E+05
1987	0.046	0.909	2.54E+06	2.03E+05	77,330	1,110	3.21E+05	4,877	9.04E+05
1988	145.0	13,047	2.57E+06	2.05E+05	35,770	1,113	3.19E+05	4,854	9.04E+05
1989	60.5	5,701	2.57E+06	2.07E+05	47,525	1,109	3.16E+05	4,845	9.01E+05
1990	5.44	296.3	2.56E+06	2.07E+05	70,672	1,109	3.17E+05	4,864	9.03E+05
1991	5.27	187.5	2.55E+06	2.07E+05	84,323	1,109	3.17E+05	4,879	9.04E+05
1992	1.33	75.3	2.55E+06	2.06E+05	95,155	1,112	3.19E+05	4,905	9.07E+05
1993	95.6	5,383	2.56E+06	2.07E+05	60,860	1,109	3.15E+05	4,865	9.03E+05
1994	14.1	359.0	2.56E+06	2.07E+05	76,765	1,109	3.15E+05	4,877	9.04E+05
1995	62.5	5,209	2.57E+06	2.08E+05	59,389	1,109	3.14E+05	4,863	9.03E+05
1996	103.9	10,672	2.60E+06	2.11E+05	42,165	1,112	3.13E+05	4,859	9.04E+05
1997	1.12	83.2	2.57E+06	2.08E+05	82,711	1,109	3.15E+05	4,878	9.04E+05
1998	17.5	203.2	2.57E+06	2.10E+05	82,890	1,109	3.13E+05	4,881	9.04E+05
1999	112.6	9,422	2.59E+06	2.11E+05	47,520	1,109	3.11E+05	4,852	9.02E+05
2000	47.1	2,522	2.60E+06	2.13E+05	72,098	1,112	3.10E+05	4,879	9.05E+05
2001	36.0	3,130	2.59E+06	2.12E+05	64,681	1,109	3.10E+05	4,863	9.03E+05
2002	59.6	4,217	2.58E+06	2.13E+05	1.10E+05	1,109	3.10E+05	4,902	9.05E+05
2003	60.6	2,427	2.59E+06	2.13E+05	80,204	1,109	3.09E+05	4,879	9.04E+05
2004	44.9	740.4	2.58E+06	2.15E+05	1.05E+05	1,112	3.11E+05	4,905	9.07E+05
2005	192.1	12,764	2.60E+06	2.17E+05	53,187	1,109	3.09E+05	4,846	9.02E+05
2006	86.7	10,352	2.60E+06	2.16E+05	47,561	1,109	3.09E+05	4,834	9.01E+05
2007	0.076	14.6	2.56E+06	2.10E+05	1.14E+05	1,110	3.14E+05	4,897	9.06E+05
2008	208.6	13,504	2.61E+06	2.15E+05	45,178	1,113	3.10E+05	4,854	9.04E+05
2009	54.5	4,498	2.62E+06	2.15E+05	64,938	1,110	3.06E+05	4,861	9.02E+05
2010	64.8	2,520	2.63E+06	2.22E+05	80,897	1,108	3.02E+05	4,875	9.03E+05
2011	184.3	16,434	2.67E+06	2.27E+05	37,408	1,107	2.98E+05	4,840	9.00E+05
2012	32.8	2,604	2.65E+06	2.22E+05	64,543	1,109	3.03E+05	4,861	9.01E+05
2013	9.83	938.8	2.63E+06	2.19E+05	70,622	1,105	3.03E+05	4,838	8.96E+05
2014	27.5	2,618	2.63E+06	2.18E+05	62,719	1,104	3.03E+05	4,825	8.92E+05
2015	8.17	119.1	2.60E+06	2.14E+05	1.04E+05	1,102	3.06E+05	4,851	8.90E+05
2016	7.13	54.8	2.60E+06	2.13E+05	98,841	1,104	3.08E+05	4,864	8.93E+05
2017	46.7	1,717	2.60E+06	2.13E+05	80,714	1,100	3.06E+05	4,830	8.89E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Queen City Aquifer (Layer 5) - Inflows, Page 2 of 2

Simulated Time Period	Inflows										Total Inflows
	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers	
	(acre-feet)										
Predevelopment	24,019	145.3	17,392	3,572	4,670	4.56E+05	1,063	9,086	2.86E+05	6.28E+05	5.42E+06
1980	23,867	149.5	17,024	3,557	4,660	4.54E+05	1,054	9,077	2.86E+05	5.90E+05	5.47E+06
1981	23,808	148.4	16,990	3,548	4,685	4.55E+05	1,052	9,053	2.86E+05	5.95E+05	5.47E+06
1982	23,809	147.6	16,986	3,547	4,637	4.53E+05	1,052	9,053	2.85E+05	5.89E+05	5.44E+06
1983	23,810	148.9	16,982	3,547	4,633	4.53E+05	1,052	9,053	2.85E+05	5.88E+05	5.44E+06
1984	23,875	150.6	17,027	3,557	4,628	4.53E+05	1,054	9,078	2.85E+05	5.84E+05	5.45E+06
1985	23,811	150.3	16,992	3,548	4,671	4.54E+05	1,052	9,054	2.85E+05	5.92E+05	5.45E+06
1986	23,813	148.3	16,993	3,549	4,671	4.54E+05	1,053	9,055	2.85E+05	5.93E+05	5.45E+06
1987	23,817	147.2	16,997	3,549	4,673	4.54E+05	1,053	9,055	2.85E+05	5.96E+05	5.44E+06
1988	23,881	148.4	17,038	3,558	4,606	4.52E+05	1,054	9,079	2.85E+05	5.86E+05	5.44E+06
1989	23,812	151.4	16,985	3,548	4,603	4.51E+05	1,051	9,054	2.84E+05	5.83E+05	5.43E+06
1990	23,810	152.2	16,982	3,548	4,647	4.53E+05	1,051	9,053	2.85E+05	5.87E+05	5.44E+06
1991	23,808	150.3	16,976	3,548	4,681	4.55E+05	1,052	9,054	2.85E+05	5.91E+05	5.46E+06
1992	23,875	147.9	17,024	3,558	4,721	4.57E+05	1,055	9,079	2.87E+05	5.98E+05	5.49E+06
1993	23,809	146.0	16,971	3,549	4,647	4.53E+05	1,053	9,055	2.85E+05	5.90E+05	5.45E+06
1994	23,809	146.7	16,966	3,550	4,667	4.54E+05	1,053	9,056	2.85E+05	5.92E+05	5.46E+06
1995	23,807	147.0	16,959	3,550	4,635	4.53E+05	1,053	9,056	2.85E+05	5.87E+05	5.45E+06
1996	23,869	149.6	16,997	3,559	4,610	4.52E+05	1,055	9,081	2.85E+05	5.81E+05	5.46E+06
1997	23,805	150.1	16,947	3,550	4,669	4.54E+05	1,053	9,057	2.85E+05	5.89E+05	5.47E+06
1998	23,801	146.9	16,938	3,550	4,681	4.55E+05	1,053	9,057	2.85E+05	5.91E+05	5.47E+06
1999	23,804	146.1	16,954	3,550	4,614	4.52E+05	1,052	9,057	2.85E+05	5.82E+05	5.45E+06
2000	23,870	147.5	17,010	3,559	4,663	4.54E+05	1,055	9,081	2.86E+05	5.84E+05	5.49E+06
2001	23,807	146.7	16,968	3,550	4,643	4.52E+05	1,052	9,057	2.85E+05	5.83E+05	5.47E+06
2002	23,807	145.2	16,969	3,550	4,730	4.56E+05	1,053	9,057	2.86E+05	5.92E+05	5.52E+06
2003	23,807	141.9	16,963	3,550	4,676	4.54E+05	1,053	9,057	2.86E+05	5.90E+05	5.49E+06
2004	23,873	141.2	16,998	3,560	4,696	4.57E+05	1,056	9,082	2.87E+05	6.00E+05	5.53E+06
2005	23,806	140.2	16,937	3,550	4,579	4.52E+05	1,051	9,056	2.85E+05	5.87E+05	5.48E+06
2006	23,806	143.4	16,929	3,550	4,552	4.51E+05	1,051	9,056	2.84E+05	5.84E+05	5.47E+06
2007	23,815	144.8	16,942	3,551	4,696	4.56E+05	1,054	9,059	2.86E+05	6.03E+05	5.51E+06
2008	23,879	142.8	16,981	3,561	4,577	4.53E+05	1,055	9,083	2.85E+05	5.88E+05	5.49E+06
2009	23,808	146.1	16,934	3,551	4,632	4.52E+05	1,052	9,058	2.85E+05	5.82E+05	5.49E+06
2010	23,793	146.0	16,916	3,549	4,669	4.53E+05	1,051	9,056	2.85E+05	5.77E+05	5.52E+06
2011	23,777	146.2	16,887	3,547	4,591	4.49E+05	1,049	9,053	2.84E+05	5.64E+05	5.51E+06
2012	23,842	150.7	16,922	3,555	4,634	4.52E+05	1,047	9,073	2.85E+05	5.79E+05	5.52E+06
2013	23,773	150.0	16,872	3,541	4,632	4.52E+05	1,037	9,041	2.85E+05	5.82E+05	5.50E+06
2014	23,767	149.1	16,873	3,535	4,614	4.51E+05	1,028	9,030	2.85E+05	5.80E+05	5.49E+06
2015	23,760	147.8	16,881	3,528	4,686	4.55E+05	1,018	9,017	2.86E+05	5.92E+05	5.51E+06
2016	23,823	144.8	16,936	3,535	4,701	4.57E+05	1,019	9,036	2.87E+05	5.97E+05	5.51E+06
2017	23,753	144.2	16,892	3,521	4,652	4.54E+05	1,013	9,005	2.85E+05	5.91E+05	5.48E+06

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows										
	Specific Storage	Specific Yield	Wells	River Package	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
	(acre-feet)										
Predevelopment	0	0	0	2.59E+06	2.67E+05	14,152	1,077	4.32E+05	773.5	7.47E+05	276.0
1980	0	0	4,827	2.53E+06	2.52E+05	10,292	1,094	4.99E+05	773.2	7.50E+05	292.1
1981	114.9	7,465	4,199	2.53E+06	2.53E+05	12,167	1,091	4.92E+05	793.1	7.48E+05	290.7
1982	19.5	386.5	3,623	2.52E+06	2.53E+05	9,931	1,091	4.88E+05	770.5	7.48E+05	290.6
1983	22.5	602.7	3,004	2.52E+06	2.53E+05	9,573	1,090	4.84E+05	769.8	7.48E+05	290.4
1984	14.8	411.3	2,447	2.52E+06	2.54E+05	8,558	1,093	4.85E+05	770.3	7.50E+05	291.0
1985	108.7	7,845	1,384	2.53E+06	2.55E+05	11,048	1,090	4.81E+05	784.6	7.48E+05	290.1
1986	29.2	3,956	1,341	2.53E+06	2.54E+05	11,370	1,090	4.81E+05	780.7	7.48E+05	289.9
1987	41.6	4,113	1,357	2.53E+06	2.55E+05	11,681	1,090	4.77E+05	782.2	7.48E+05	289.5
1988	0.744	157.7	1,421	2.52E+06	2.54E+05	7,789	1,093	4.80E+05	769.5	7.50E+05	290.3
1989	2.75	175.8	1,650	2.51E+06	2.52E+05	7,844	1,090	4.85E+05	767.2	7.48E+05	289.9
1990	52.7	4,440	1,683	2.52E+06	2.53E+05	9,711	1,090	4.86E+05	770.2	7.48E+05	290.0
1991	81.8	7,961	1,633	2.53E+06	2.53E+05	11,568	1,090	4.91E+05	790.9	7.48E+05	290.1
1992	106.4	10,030	1,685	2.54E+06	2.55E+05	13,386	1,093	4.93E+05	808.5	7.50E+05	290.7
1993	2.78	308.8	1,688	2.52E+06	2.53E+05	10,557	1,090	4.94E+05	771.7	7.48E+05	289.9
1994	33.2	2,380	2,429	2.52E+06	2.53E+05	11,549	1,090	4.98E+05	781.4	7.48E+05	289.8
1995	1.69	39.6	2,394	2.51E+06	2.53E+05	9,989	1,090	5.01E+05	770.7	7.48E+05	289.9
1996	0.340	4.25	2,804	2.51E+06	2.52E+05	7,981	1,093	5.05E+05	769.9	7.50E+05	290.8
1997	105.2	7,809	2,492	2.52E+06	2.53E+05	11,028	1,090	5.00E+05	786.6	7.48E+05	289.8
1998	49.4	5,002	2,752	2.52E+06	2.52E+05	11,984	1,090	5.05E+05	789.6	7.48E+05	290.0
1999	3.88	7.19	2,902	2.50E+06	2.51E+05	8,834	1,090	5.08E+05	769.2	7.48E+05	290.0
2000	39.1	1,983	4,301	2.51E+06	2.52E+05	10,011	1,093	5.20E+05	776.2	7.50E+05	291.0
2001	7.31	113.8	4,781	2.51E+06	2.51E+05	9,521	1,090	5.18E+05	771.2	7.48E+05	290.1
2002	163.1	13,626	9,061	2.52E+06	2.52E+05	13,525	1,090	5.26E+05	825.5	7.48E+05	290.2
2003	15.1	1,814	5,388	2.52E+06	2.51E+05	11,892	1,090	5.24E+05	788.7	7.48E+05	290.2
2004	112.0	9,318	10,352	2.54E+06	2.52E+05	14,114	1,093	5.25E+05	820.1	7.50E+05	290.8
2005	1.53	98.1	11,281	2.51E+06	2.50E+05	9,523	1,090	5.22E+05	768.8	7.48E+05	290.0
2006	13.4	85.0	10,316	2.50E+06	2.50E+05	8,058	1,090	5.19E+05	766.4	7.48E+05	289.8
2007	248.2	18,129	7,868	2.54E+06	2.54E+05	13,527	1,089	5.16E+05	826.9	7.48E+05	289.1
2008	0.938	67.6	9,878	2.51E+06	2.51E+05	8,558	1,092	5.22E+05	768.9	7.50E+05	290.0
2009	44.7	411.5	6,551	2.50E+06	2.50E+05	9,196	1,089	5.37E+05	770.2	7.48E+05	289.7
2010	50.9	3,050	5,661	2.50E+06	2.48E+05	10,678	1,090	5.58E+05	786.4	7.48E+05	291.0
2011	0.024	2.25	6,987	2.47E+06	2.46E+05	7,132	1,091	5.69E+05	768.1	7.49E+05	292.2
2012	72.2	2,545	9,323	2.49E+06	2.49E+05	8,469	1,095	5.55E+05	771.4	7.52E+05	292.9
2013	40.3	2,815	8,972	2.49E+06	2.49E+05	9,210	1,092	5.48E+05	775.1	7.51E+05	292.7
2014	17.4	544.4	8,469	2.49E+06	2.49E+05	8,754	1,094	5.43E+05	773.8	7.52E+05	293.6
2015	172.7	14,070	7,206	2.50E+06	2.51E+05	12,324	1,095	5.36E+05	821.0	7.54E+05	294.8
2016	86.5	8,969	7,556	2.52E+06	2.52E+05	13,080	1,099	5.31E+05	819.4	7.56E+05	296.1
2017	14.3	1,793	7,485	2.50E+06	2.51E+05	11,750	1,097	5.28E+05	795.1	7.54E+05	296.0

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Gonzales	Lavaca	Webb	Lower Layers			
	(acre-feet)											%
Predevelopment	319.4	254.6	702.4	8,887	4.42E+05	281.5	845.0	3.46E+05	5.63E+05	5.42E+06	1.73E-05	3.20E-10
1980	300.7	341.4	714.9	8,967	4.46E+05	284.1	855.4	3.49E+05	6.22E+05	5.47E+06	-2.10E-07	-3.83E-12
1981	367.7	337.1	712.7	8,856	4.44E+05	283.3	852.9	3.47E+05	6.16E+05	5.47E+06	-1.57E-05	-2.87E-10
1982	279.3	340.1	712.8	8,962	4.45E+05	283.3	852.9	3.48E+05	6.16E+05	5.44E+06	-1.25E-05	-2.30E-10
1983	275.6	342.4	712.8	8,975	4.45E+05	283.3	852.9	3.49E+05	6.16E+05	5.44E+06	-1.24E-05	-2.28E-10
1984	246.7	344.1	714.7	9,042	4.47E+05	284.1	855.2	3.50E+05	6.23E+05	5.45E+06	9.55E-06	1.75E-10
1985	340.6	339.7	712.5	8,892	4.45E+05	283.3	852.6	3.48E+05	6.16E+05	5.45E+06	-1.07E-05	-1.96E-10
1986	337.7	340.6	712.3	8,888	4.44E+05	283.2	852.5	3.48E+05	6.12E+05	5.45E+06	-9.53E-06	-1.75E-10
1987	342.9	340.0	712.1	8,882	4.44E+05	283.2	852.3	3.47E+05	6.08E+05	5.44E+06	-3.96E-06	-7.28E-11
1988	211.2	342.0	714.2	9,088	4.48E+05	284.0	854.9	3.50E+05	6.14E+05	5.44E+06	8.72E-06	1.60E-10
1989	229.9	342.3	712.3	9,047	4.47E+05	283.3	852.7	3.50E+05	6.16E+05	5.43E+06	-8.41E-06	-1.55E-10
1990	297.2	343.6	712.4	8,947	4.45E+05	283.3	852.9	3.48E+05	6.16E+05	5.44E+06	-9.52E-06	-1.75E-10
1991	359.3	346.1	712.3	8,866	4.44E+05	283.3	852.7	3.47E+05	6.17E+05	5.46E+06	-1.13E-05	-2.07E-10
1992	407.7	346.7	714.1	8,825	4.45E+05	284.0	854.9	3.47E+05	6.17E+05	5.49E+06	7.14E-06	1.30E-10
1993	293.7	347.3	712.0	8,938	4.45E+05	283.2	852.3	3.48E+05	6.15E+05	5.45E+06	-1.13E-05	-2.08E-10
1994	339.0	348.2	711.8	8,898	4.45E+05	283.1	852.1	3.48E+05	6.16E+05	5.46E+06	-1.36E-05	-2.50E-10
1995	281.2	349.3	711.8	8,970	4.46E+05	283.1	852.1	3.48E+05	6.19E+05	5.45E+06	-1.09E-05	-1.99E-10
1996	224.5	351.5	713.8	9,085	4.48E+05	283.9	854.5	3.50E+05	6.25E+05	5.46E+06	2.20E-06	4.02E-11
1997	343.6	352.7	711.7	8,899	4.45E+05	283.1	851.9	3.48E+05	6.21E+05	5.47E+06	-8.51E-06	-1.56E-10
1998	360.9	356.5	711.7	8,867	4.44E+05	283.1	851.9	3.47E+05	6.19E+05	5.47E+06	-1.05E-05	-1.92E-10
1999	247.9	346.1	711.7	9,019	4.46E+05	283.1	852.0	3.49E+05	6.22E+05	5.45E+06	-8.53E-06	-1.56E-10
2000	312.8	343.0	713.8	8,965	4.47E+05	283.9	854.4	3.49E+05	6.28E+05	5.49E+06	1.45E-05	2.63E-10
2001	294.3	340.4	711.8	8,955	4.47E+05	283.1	852.0	3.48E+05	6.24E+05	5.47E+06	-1.16E-05	-2.12E-10
2002	459.4	341.0	711.7	8,757	4.46E+05	283.1	851.8	3.46E+05	6.25E+05	5.52E+06	-1.04E-05	-1.88E-10
2003	367.0	342.6	711.7	8,878	4.46E+05	283.1	851.9	3.47E+05	6.22E+05	5.49E+06	-1.04E-05	-1.90E-10
2004	453.8	347.2	713.6	8,907	4.46E+05	283.8	854.2	3.47E+05	6.21E+05	5.53E+06	7.20E-06	1.30E-10
2005	280.0	349.1	711.8	9,127	4.47E+05	283.1	852.1	3.48E+05	6.20E+05	5.48E+06	-1.11E-05	-2.03E-10
2006	245.0	350.2	711.8	9,196	4.48E+05	283.1	852.1	3.49E+05	6.20E+05	5.47E+06	-1.21E-05	-2.21E-10
2007	464.9	347.2	711.1	8,859	4.45E+05	283.0	851.4	3.46E+05	6.14E+05	5.51E+06	-1.73E-05	-3.14E-10
2008	254.2	349.5	713.3	9,186	4.48E+05	283.8	854.1	3.50E+05	6.20E+05	5.49E+06	7.16E-06	1.31E-10
2009	290.1	347.9	711.5	8,989	4.47E+05	283.0	851.7	3.49E+05	6.29E+05	5.49E+06	1.31E-05	2.39E-10
2010	350.6	353.3	712.0	8,899	4.47E+05	283.2	852.2	3.48E+05	6.41E+05	5.52E+06	-1.25E-05	-2.26E-10
2011	215.9	360.8	712.8	9,073	4.49E+05	283.3	852.9	3.50E+05	6.49E+05	5.51E+06	-1.21E-05	-2.20E-10
2012	282.6	364.4	715.6	9,034	4.50E+05	284.4	856.5	3.50E+05	6.36E+05	5.52E+06	9.11E-06	1.65E-10
2013	308.9	364.2	715.1	8,983	4.48E+05	284.1	856.2	3.49E+05	6.30E+05	5.50E+06	-1.15E-05	-2.09E-10
2014	286.9	363.7	717.0	9,025	4.48E+05	284.8	858.9	3.49E+05	6.30E+05	5.49E+06	-7.44E-07	-1.36E-11
2015	433.5	361.8	719.5	8,860	4.46E+05	285.6	862.4	3.47E+05	6.25E+05	5.51E+06	-1.69E-05	-3.07E-10
2016	432.0	360.5	722.6	8,875	4.46E+05	286.8	866.2	3.47E+05	6.22E+05	5.51E+06	9.93E-06	1.80E-10
2017	368.4	358.5	722.0	8,930	4.46E+05	286.4	865.6	3.47E+05	6.20E+05	5.48E+06	-1.07E-05	-1.95E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Reklaw Formation (Layer 6) - Inflows, Page 1 of 2

Simulated Time Period	Inflows									
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD
	(acre-feet)									
Predevelopment	0	0	2.46E+06	2.36E+05	1.23E+05	22.9	39,208	484.4	15,067	62.2
1980	0	0	2.57E+06	2.69E+05	1.16E+05	0	5,728	482.1	11,398	47.1
1981	0.042	0.505	2.55E+06	2.63E+05	1.49E+05	0	7,253	481.6	11,485	53.1
1982	403.3	8,511	2.56E+06	2.62E+05	1.01E+05	0	7,450	481.5	11,321	46.3
1983	119.2	3,941	2.56E+06	2.60E+05	1.03E+05	0	8,309	481.3	11,260	43.9
1984	324.3	9,727	2.58E+06	2.60E+05	87,671	0	8,034	482.6	11,086	39.1
1985	9.06	15.7	2.55E+06	2.56E+05	1.40E+05	0	8,261	481.8	11,350	46.6
1986	155.3	151.9	2.54E+06	2.57E+05	1.33E+05	0	7,400	482.0	11,615	49.1
1987	0.058	0.909	2.54E+06	2.55E+05	1.34E+05	0	8,656	482.2	11,656	51.2
1988	1,125	24,145	2.57E+06	2.59E+05	62,103	0	7,785	482.8	10,914	39.1
1989	963.3	12,338	2.57E+06	2.60E+05	82,513	0	6,387	481.1	10,569	36.4
1990	134.7	871.8	2.56E+06	2.60E+05	1.23E+05	0	6,364	481.1	10,283	40.6
1991	553.8	5,890	2.55E+06	2.59E+05	1.46E+05	0	6,061	481.6	10,828	47.0
1992	216.6	3,168	2.55E+06	2.58E+05	1.65E+05	0	6,773	483.3	11,240	54.5
1993	1,133	17,696	2.56E+06	2.59E+05	1.06E+05	0	6,614	481.9	11,522	46.7
1994	498.6	6,575	2.56E+06	2.60E+05	1.33E+05	0	6,527	482.2	11,658	49.0
1995	872.5	15,123	2.57E+06	2.61E+05	1.03E+05	0	6,474	482.0	11,452	44.1
1996	1,110	22,664	2.60E+06	2.64E+05	73,207	0	6,266	482.8	10,897	37.2
1997	22.4	138.0	2.57E+06	2.60E+05	1.44E+05	0	7,004	481.9	11,043	44.4
1998	653.3	4,699	2.57E+06	2.62E+05	1.44E+05	0	6,021	482.3	11,058	48.1
1999	1,200	23,518	2.59E+06	2.64E+05	82,504	0	6,042	481.9	10,894	39.5
2000	1,260	15,042	2.60E+06	2.66E+05	1.25E+05	0	5,231	483.2	10,517	41.2
2001	440.5	9,776	2.59E+06	2.64E+05	1.12E+05	0	5,874	481.9	10,586	40.3
2002	784.4	10,632	2.58E+06	2.64E+05	1.91E+05	0	5,239	482.6	10,782	52.9
2003	568.8	8,835	2.59E+06	2.65E+05	1.39E+05	0	5,715	482.8	11,009	50.3
2004	195.3	1,007	2.58E+06	2.67E+05	1.83E+05	0	6,353	484.9	11,660	59.4
2005	1,234	25,186	2.60E+06	2.70E+05	92,342	0	6,657	483.1	11,385	45.9
2006	465.5	15,762	2.60E+06	2.69E+05	82,575	0	7,635	482.4	11,242	40.0
2007	0.077	14.6	2.56E+06	2.62E+05	1.98E+05	0	8,559	483.5	12,197	58.9
2008	1,894	32,247	2.61E+06	2.69E+05	78,438	0	7,332	484.2	11,701	43.7
2009	1,888	24,830	2.62E+06	2.68E+05	1.13E+05	0	5,510	482.2	10,766	41.8
2010	2,743	25,101	2.63E+06	2.74E+05	1.40E+05	0	4,220	482.0	9,639	42.1
2011	3,067	48,050	2.67E+06	2.80E+05	64,947	0	4,284	481.0	8,675	31.3
2012	244.1	4,185	2.65E+06	2.75E+05	1.12E+05	0	7,379	480.5	6,701	33.7
2013	175.5	1,559	2.63E+06	2.72E+05	1.23E+05	0	7,377	476.4	4,092	34.1
2014	270.1	4,033	2.63E+06	2.71E+05	1.09E+05	0	7,838	472.4	2,438	30.3
2015	187.5	140.7	2.60E+06	2.67E+05	1.80E+05	0	8,706	467.8	1,492	35.1
2016	52.8	57.5	2.60E+06	2.66E+05	1.72E+05	0	8,534	468.0	1,566	38.2
2017	336.8	3,620	2.60E+06	2.67E+05	1.40E+05	0	7,727	464.3	1,340	33.6

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Reklaw Formation (Layer 6) - Inflows, Page 2 of 2

Simulated Time Period	Inflows											Total Inflows
	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Gonzales	Lavaca	Maverick	Webb	Lower Layers	
	(acre-feet)											
Predevelopment	186.8	2.71	231.8	740.8	3.50	998.1	771.4	2,253	0.002	501.6	6.26E+05	3.51E+06
1980	0	1.70	0	388.0	1.36	0.362	536.0	2,183	1.70E-05	11.0	5.89E+05	3.57E+06
1981	0	1.89	0	385.7	3.17	0.371	530.1	2,178	1.72E-05	10.7	5.93E+05	3.58E+06
1982	0	2.24	0	384.4	1.61	0.368	530.7	2,179	1.70E-05	10.7	5.88E+05	3.54E+06
1983	0	1.79	0	382.6	0.794	0.368	530.6	2,179	1.70E-05	10.6	5.87E+05	3.54E+06
1984	0	1.41	0	384.3	0.046	0.366	538.9	2,187	1.69E-05	10.8	5.83E+05	3.54E+06
1985	0	1.07	0	384.6	1.53	0.362	542.1	2,182	1.71E-05	10.7	5.90E+05	3.56E+06
1986	0	1.74	0	387.4	2.37	0.371	549.4	2,184	1.73E-05	10.7	5.92E+05	3.55E+06
1987	0	2.13	0	389.9	2.94	0.391	551.2	2,185	1.77E-05	10.7	5.94E+05	3.54E+06
1988	0	2.06	0	392.3	0.017	0.400	541.9	2,191	1.76E-05	10.9	5.84E+05	3.52E+06
1989	0	0.936	0	393.3	0	0.395	536.6	2,184	1.77E-05	10.9	5.81E+05	3.53E+06
1990	0	0.482	0	390.8	0.190	0.395	509.5	2,180	1.80E-05	10.8	5.85E+05	3.54E+06
1991	0	1.08	0	393.0	2.05	0.378	519.6	2,180	1.82E-05	9.56	5.90E+05	3.57E+06
1992	0	2.13	0	395.5	4.36	0.434	522.4	2,185	1.82E-05	9.78	5.97E+05	3.60E+06
1993	0	2.65	0	402.8	2.52	0.378	553.3	2,183	1.76E-05	9.96	5.89E+05	3.56E+06
1994	0	2.31	0	410.5	2.98	0.353	566.3	2,186	1.74E-05	9.99	5.91E+05	3.57E+06
1995	0	2.23	0	417.6	1.62	0.339	570.6	2,189	1.70E-05	9.97	5.86E+05	3.56E+06
1996	0	1.68	0	425.3	0	0.329	572.1	2,197	1.65E-05	9.97	5.80E+05	3.56E+06
1997	0	0.985	0	429.5	1.48	0.321	572.0	2,193	1.67E-05	9.83	5.88E+05	3.58E+06
1998	0	1.77	0	433.8	2.95	0.317	565.4	2,194	1.67E-05	9.62	5.89E+05	3.59E+06
1999	0	2.04	0	438.4	0.535	0.317	571.6	2,196	1.63E-05	9.54	5.81E+05	3.56E+06
2000	0	1.36	0	441.9	1.12	0.322	563.0	2,202	1.63E-05	9.54	5.83E+05	3.61E+06
2001	0	1.49	0	442.8	0.957	0.324	563.5	2,196	1.62E-05	9.39	5.82E+05	3.58E+06
2002	0	1.93	0	443.0	5.14	0.488	554.6	2,196	1.65E-05	9.11	5.91E+05	3.65E+06
2003	0	3.12	0	444.1	5.07	0.444	559.6	2,197	1.63E-05	8.95	5.88E+05	3.61E+06
2004	0	4.26	0	446.6	9.40	0.538	570.0	2,204	1.63E-05	8.72	5.98E+05	3.65E+06
2005	0	4.32	0	447.5	4.13	0.410	576.0	2,200	1.57E-05	8.57	5.85E+05	3.59E+06
2006	0	2.92	0	449.3	1.63	0.360	582.0	2,201	1.53E-05	8.33	5.82E+05	3.57E+06
2007	0	2.52	0	451.2	6.70	0.521	591.2	2,202	1.60E-05	7.95	6.02E+05	3.64E+06
2008	0	3.37	0	456.4	2.68	0.395	596.9	2,209	1.56E-05	7.80	5.87E+05	3.60E+06
2009	0	1.93	0	456.1	1.37	0.332	575.9	2,202	1.52E-05	7.51	5.81E+05	3.62E+06
2010	0	1.57	0	453.9	2.22	0.293	541.4	2,200	1.49E-05	7.21	5.75E+05	3.67E+06
2011	0	1.56	0	449.8	0	0.271	518.9	2,197	1.38E-05	6.98	5.63E+05	3.65E+06
2012	0	0.339	0	437.1	0	0.259	422.9	2,192	1.34E-05	6.61	5.78E+05	3.63E+06
2013	0	0.195	0	408.4	0.124	0.250	251.0	2,163	1.31E-05	6.31	5.81E+05	3.62E+06
2014	0	0.187	0	367.5	0	0.246	168.6	2,129	1.27E-05	6.05	5.79E+05	3.61E+06
2015	0	0	0	309.2	1.14	0.352	120.6	2,081	1.29E-05	5.75	5.91E+05	3.65E+06
2016	0	0.726	0	259.5	2.64	0.441	103.6	2,052	1.29E-05	5.51	5.96E+05	3.64E+06
2017	0	0.948	0	210.6	1.44	0.391	85.1	2,012	1.27E-05	5.28	5.90E+05	3.61E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows											
	Specific Storage	Specific Yield	Wells	River Package	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD
	(acre-feet)											
Predevelopment	0	0	0	2.59E+06	3.16E+05	17,452	0	19,282	200.5	479.3	250.4	0
1980	0	0	10,794	2.53E+06	3.00E+05	11,676	60.0	92,208	218.0	609.7	278.4	252.1
1981	1,507	18,084	9,205	2.53E+06	3.01E+05	13,605	58.1	81,381	214.8	639.6	309.9	235.9
1982	575.0	3,647	7,667	2.52E+06	3.01E+05	11,310	56.2	77,971	213.9	568.3	257.4	226.3
1983	756.1	5,972	6,081	2.52E+06	3.02E+05	10,939	54.3	72,134	216.9	583.6	266.5	217.5
1984	416.6	2,953	4,562	2.52E+06	3.02E+05	9,893	53.0	75,094	220.3	592.1	258.6	213.5
1985	1,317	20,190	3,047	2.53E+06	3.03E+05	12,451	52.3	69,540	219.2	660.1	313.5	216.5
1986	307.7	8,091	3,407	2.53E+06	3.03E+05	12,789	51.9	74,307	215.5	613.1	298.0	215.9
1987	813.1	10,237	3,104	2.53E+06	3.03E+05	13,120	50.4	67,597	213.3	608.3	295.8	205.0
1988	19.3	187.6	3,535	2.52E+06	3.02E+05	9,112	49.5	72,173	217.7	553.3	226.4	203.0
1989	8.35	266.9	4,188	2.51E+06	3.00E+05	9,150	49.8	82,121	223.6	639.3	262.6	210.4
1990	401.2	8,239	4,044	2.52E+06	3.01E+05	11,066	50.5	81,206	225.3	740.7	307.7	215.5
1991	380.8	11,838	4,015	2.53E+06	3.01E+05	12,965	51.3	95,688	220.7	706.0	325.3	221.4
1992	665.8	15,546	3,844	2.54E+06	3.03E+05	14,842	51.3	94,126	215.5	675.3	336.8	219.0
1993	11.2	308.8	4,084	2.52E+06	3.01E+05	11,920	51.3	99,122	211.8	564.7	272.9	221.0
1994	113.2	3,467	4,001	2.52E+06	3.02E+05	12,925	51.6	1.06E+05	212.6	613.6	306.7	223.7
1995	2.09	39.6	4,049	2.51E+06	3.01E+05	11,329	52.0	1.07E+05	213.7	579.7	277.7	227.5
1996	0.340	4.25	4,467	2.51E+06	3.00E+05	9,282	52.7	1.08E+05	219.4	606.0	259.0	232.5
1997	1,135	18,778	3,924	2.52E+06	3.01E+05	12,381	52.4	96,645	220.0	723.9	335.8	229.7
1998	201.4	7,162	4,292	2.52E+06	3.01E+05	13,357	53.2	1.14E+05	215.6	696.3	328.5	238.9
1999	99.1	7.19	4,469	2.50E+06	3.00E+05	10,146	53.7	1.15E+05	216.1	611.2	268.0	239.5
2000	179.9	3,515	7,940	2.51E+06	3.00E+05	11,348	55.1	1.36E+05	220.4	763.4	326.2	246.0
2001	127.4	190.2	8,498	2.51E+06	3.00E+05	10,848	55.1	1.27E+05	219.0	715.8	311.9	241.0
2002	673.7	20,293	16,914	2.52E+06	3.00E+05	14,945	55.8	1.44E+05	215.7	808.6	390.1	245.6
2003	78.8	2,200	10,889	2.52E+06	3.00E+05	13,271	56.0	1.36E+05	208.6	688.0	324.8	244.5
2004	587.0	15,113	22,719	2.54E+06	3.01E+05	15,543	55.4	1.29E+05	201.9	660.9	362.7	239.7
2005	2.06	98.1	25,301	2.51E+06	2.98E+05	10,845	54.5	1.24E+05	200.6	552.5	266.4	235.3
2006	260.0	1,186	24,125	2.50E+06	2.98E+05	9,343	53.2	1.14E+05	207.2	566.1	267.2	227.5
2007	2,283	38,181	16,845	2.54E+06	3.02E+05	14,919	51.0	1.13E+05	206.7	648.8	378.6	214.4
2008	1.10	68.8	22,388	2.51E+06	3.00E+05	9,856	50.2	1.28E+05	204.1	511.7	249.7	214.4
2009	116.9	1,013	10,672	2.50E+06	2.98E+05	10,505	51.7	1.66E+05	215.3	702.2	305.2	229.6
2010	191.2	5,214	9,693	2.50E+06	2.96E+05	12,015	56.6	1.98E+05	220.0	979.2	352.7	265.7
2011	0.024	2.25	11,996	2.47E+06	2.94E+05	8,409	61.9	2.05E+05	225.3	1,070	292.3	295.8
2012	1,838	13,844	19,160	2.49E+06	2.97E+05	9,759	61.9	1.54E+05	239.5	1,838	339.7	281.1
2013	975.9	11,999	19,522	2.49E+06	2.97E+05	10,504	60.5	1.48E+05	251.7	4,059	344.9	271.1
2014	739.4	8,054	19,233	2.49E+06	2.97E+05	10,041	59.3	1.41E+05	269.5	7,844	333.4	264.3
2015	2,077	36,342	16,186	2.50E+06	2.99E+05	13,657	57.9	1.33E+05	290.4	14,185	411.3	255.7
2016	1,247	23,018	16,538	2.52E+06	3.00E+05	14,428	56.7	1.28E+05	287.8	13,324	389.3	249.6
2017	367.6	7,256	16,710	2.50E+06	2.98E+05	13,074	56.0	1.29E+05	293.7	14,840	356.7	248.2

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Gonzales	Maverick	Webb	Lower Layers			
	(acre-feet)											%
Predevelopment	306.2	0	0	30.0	181.9	0	1.30E-05	1,436	5.61E+05	3.51E+06	0.003	7.54E-08
1980	324.8	154.2	5.55	34.8	2,616	0	0.006	3,961	6.19E+05	3.57E+06	1.37E-05	3.83E-10
1981	314.8	148.4	5.57	31.8	2,592	0	0.006	3,990	6.14E+05	3.58E+06	-3.49E-03	-9.76E-08
1982	318.6	158.1	6.76	33.7	2,552	0	0.006	3,944	6.13E+05	3.54E+06	-1.06E-05	-2.99E-10
1983	325.9	167.3	7.80	35.3	2,529	0	0.006	3,942	6.14E+05	3.54E+06	-4.17E-04	-1.18E-08
1984	335.4	174.5	8.18	38.3	2,552	0	0.006	3,936	6.20E+05	3.54E+06	0.001	3.33E-08
1985	327.5	169.9	7.72	35.0	2,601	0	0.006	3,978	6.14E+05	3.56E+06	8.33E-06	2.34E-10
1986	318.9	173.5	6.86	33.1	2,489	0	0.006	3,974	6.09E+05	3.55E+06	-1.37E-04	-3.86E-09
1987	313.9	173.7	5.99	31.8	2,350	0	0.006	3,971	6.05E+05	3.54E+06	0.017	4.73E-07
1988	331.4	177.3	5.21	38.0	2,300	0	0.006	3,899	6.12E+05	3.52E+06	3.48E-04	9.87E-09
1989	343.4	179.0	4.45	41.5	2,325	0	0.006	3,895	6.13E+05	3.53E+06	4.33E-05	1.23E-09
1990	339.8	182.3	3.93	38.7	2,329	0	0.006	3,935	6.14E+05	3.54E+06	4.73E-04	1.34E-08
1991	325.4	189.1	3.46	34.4	2,471	0	0.006	3,994	6.14E+05	3.57E+06	1.12E-04	3.14E-09
1992	309.7	192.0	2.94	29.8	2,558	0	0.006	4,040	6.14E+05	3.60E+06	0.002	6.56E-08
1993	312.0	197.5	2.35	32.0	2,577	0	0.006	3,969	6.12E+05	3.56E+06	-1.50E-04	-4.23E-09
1994	313.3	202.7	1.86	31.5	2,635	0	0.006	3,995	6.13E+05	3.57E+06	-5.70E-05	-1.59E-09
1995	319.6	208.3	1.43	33.6	2,680	0	0.006	3,974	6.16E+05	3.56E+06	0.001	4.14E-08
1996	335.8	215.2	1.09	38.8	2,723	0	0.006	3,968	6.22E+05	3.56E+06	-1.08E-02	-3.04E-07
1997	329.3	223.4	0.852	35.2	2,732	0	0.006	4,043	6.18E+05	3.58E+06	0.004	1.04E-07
1998	317.2	235.8	0.661	32.2	2,728	0	0.006	4,075	6.16E+05	3.59E+06	-9.04E-05	-2.52E-09
1999	326.0	216.3	0.525	35.6	2,692	0	0.006	4,036	6.19E+05	3.56E+06	-5.26E-06	-1.48E-10
2000	329.5	209.7	0.463	35.4	2,779	0	0.006	4,108	6.25E+05	3.61E+06	0.004	1.23E-07
2001	328.0	207.0	0.424	35.4	2,780	0	0.006	4,114	6.21E+05	3.58E+06	-2.60E-05	-7.25E-10
2002	308.8	210.8	0.436	28.9	2,874	0	0.006	4,233	6.21E+05	3.65E+06	1.65E-05	4.51E-10
2003	300.4	215.5	0.448	28.3	2,889	0	0.006	4,215	6.19E+05	3.61E+06	5.08E-04	1.41E-08
2004	287.6	220.0	0.449	25.3	2,895	0	0.006	4,298	6.17E+05	3.65E+06	3.40E-05	9.32E-10
2005	299.5	223.5	0.415	29.4	2,843	0	0.006	4,216	6.17E+05	3.59E+06	-3.17E-05	-8.81E-10
2006	319.1	226.1	0.367	34.1	2,785	0	0.006	4,230	6.17E+05	3.57E+06	-4.99E-05	-1.40E-09
2007	302.2	226.9	0.294	27.6	2,798	0	0.006	4,385	6.10E+05	3.64E+06	4.39E-05	1.21E-09
2008	310.9	230.9	0.205	32.3	2,850	0	0.006	4,316	6.17E+05	3.60E+06	6.43E-05	1.79E-09
2009	324.2	241.9	0.176	34.4	3,086	0	0.006	4,378	6.26E+05	3.62E+06	0.002	6.58E-08
2010	323.2	262.3	0.214	33.5	3,325	0	0.007	4,469	6.37E+05	3.67E+06	-4.29E-03	-1.17E-07
2011	339.0	285.7	0.363	40.0	3,493	0	0.007	4,461	6.45E+05	3.65E+06	-1.19E-03	-3.27E-08
2012	355.3	298.1	0.757	41.0	3,582	0	0.007	4,584	6.32E+05	3.63E+06	0.002	5.42E-08
2013	356.8	305.0	1.51	40.5	3,596	7.90	0.007	4,660	6.27E+05	3.62E+06	2.32E-04	6.40E-09
2014	366.5	310.2	3.44	43.3	3,605	138.9	0.007	4,721	6.27E+05	3.61E+06	-2.95E-03	-8.19E-08
2015	362.3	312.3	8.98	38.3	3,579	389.1	0.007	4,868	6.21E+05	3.65E+06	-2.17E-03	-5.93E-08
2016	348.0	313.5	18.3	34.8	3,536	446.4	0.007	4,942	6.18E+05	3.64E+06	0.004	9.97E-08
2017	353.1	313.4	31.5	36.4	3,482	531.8	0.007	4,947	6.17E+05	3.61E+06	7.90E-06	2.19E-10

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Carrizo-Upper Wilcox (Layer 7) - Inflows, Page 1 of 2

Simulated Time Period	Inflows												
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD
	(acre-feet)												
Predevelopment	0	0	2.46E+06	2.36E+05	1.29E+05	22.3	1.58E+05	470.1	17,418	2,613	190.2	47,146	239.1
1980	0	0	2.57E+06	2.69E+05	1.22E+05	0	1.22E+05	468.9	13,467	2,351	0	47,265	0
1981	0.926	0.505	2.55E+06	2.63E+05	1.57E+05	0	1.24E+05	468.0	13,636	2,429	0	47,153	0
1982	435.4	8,937	2.56E+06	2.62E+05	1.06E+05	0	1.23E+05	468.3	13,388	2,336	0	47,132	0
1983	132.3	4,076	2.56E+06	2.60E+05	1.08E+05	0	1.24E+05	468.3	13,282	2,299	0	47,130	0
1984	359.6	10,138	2.58E+06	2.60E+05	92,156	0	1.23E+05	469.8	13,029	2,206	0	47,250	0
1985	20.9	15.8	2.55E+06	2.56E+05	1.48E+05	0	1.25E+05	468.3	13,405	2,321	0	47,145	0
1986	168.5	162.5	2.54E+06	2.57E+05	1.39E+05	0	1.24E+05	468.5	13,718	2,361	0	47,145	0
1987	1.63	0.909	2.54E+06	2.55E+05	1.41E+05	0	1.25E+05	468.5	13,791	2,398	0	47,146	0
1988	1,194	25,350	2.57E+06	2.59E+05	65,280	0	1.23E+05	470.0	12,851	2,225	0	47,242	0
1989	1,050	12,889	2.57E+06	2.60E+05	86,734	0	1.21E+05	468.5	12,431	2,161	0	47,115	0
1990	157.1	891.8	2.56E+06	2.60E+05	1.29E+05	0	1.22E+05	468.1	12,200	2,224	0	47,134	0
1991	674.3	6,115	2.55E+06	2.59E+05	1.54E+05	0	1.22E+05	468.1	12,881	2,328	0	47,149	0
1992	291.3	3,290	2.55E+06	2.58E+05	1.74E+05	0	1.24E+05	469.3	13,427	2,452	0	47,291	0
1993	1,271	18,761	2.56E+06	2.59E+05	1.11E+05	0	1.22E+05	468.5	13,641	2,351	0	47,135	0
1994	609.1	6,958	2.56E+06	2.60E+05	1.40E+05	0	1.22E+05	468.6	13,810	2,391	0	47,144	0
1995	1,004	15,982	2.57E+06	2.61E+05	1.08E+05	0	1.22E+05	468.7	13,534	2,318	0	47,131	0
1996	1,261	23,804	2.60E+06	2.64E+05	76,952	0	1.20E+05	470.1	12,843	2,200	0	47,243	0
1997	81.0	166.9	2.57E+06	2.60E+05	1.51E+05	0	1.22E+05	468.5	13,106	2,308	0	47,145	0
1998	793.5	4,935	2.57E+06	2.62E+05	1.51E+05	0	1.22E+05	468.6	13,188	2,367	0	47,149	0
1999	1,342	24,796	2.59E+06	2.64E+05	86,724	0	1.20E+05	468.9	12,898	2,230	0	47,121	0
2000	1,471	15,663	2.60E+06	2.66E+05	1.32E+05	0	1.19E+05	469.9	12,538	2,261	0	47,264	0
2001	545.9	10,214	2.59E+06	2.64E+05	1.18E+05	0	1.19E+05	468.7	12,598	2,238	0	47,132	0
2002	962.2	10,742	2.58E+06	2.64E+05	2.01E+05	0	1.20E+05	468.4	12,995	2,441	0	47,172	0
2003	712.1	9,330	2.59E+06	2.65E+05	1.46E+05	0	1.20E+05	468.9	13,220	2,413	0	47,152	0
2004	289.3	1,032	2.58E+06	2.67E+05	1.92E+05	0	1.22E+05	470.6	14,005	2,567	0	47,303	0
2005	1,402	26,420	2.60E+06	2.70E+05	97,066	0	1.20E+05	469.9	13,555	2,371	0	47,132	0
2006	568.1	16,340	2.60E+06	2.69E+05	86,799	0	1.20E+05	469.9	13,289	2,267	0	47,120	0
2007	74.9	23.0	2.56E+06	2.62E+05	2.08E+05	0	1.25E+05	469.4	14,513	2,548	0	47,179	0
2008	2,159	33,954	2.61E+06	2.69E+05	82,450	0	1.21E+05	471.2	13,823	2,330	0	47,254	0
2009	2,284	26,043	2.62E+06	2.68E+05	1.19E+05	0	1.19E+05	469.1	12,818	2,290	0	47,130	0
2010	3,224	26,312	2.63E+06	2.74E+05	1.48E+05	0	1.16E+05	468.5	11,680	2,292	0	47,141	0
2011	3,531	50,261	2.67E+06	2.80E+05	68,269	0	1.13E+05	468.5	10,491	2,093	0	47,109	0
2012	456.6	4,293	2.65E+06	2.75E+05	1.18E+05	0	1.17E+05	468.8	8,478	2,152	0	47,231	0
2013	390.4	1,631	2.63E+06	2.72E+05	1.29E+05	0	1.18E+05	465.6	5,784	2,177	0	47,105	0
2014	491.3	4,276	2.63E+06	2.71E+05	1.14E+05	0	1.18E+05	463.2	4,000	2,140	0	47,096	0
2015	401.0	170.6	2.60E+06	2.67E+05	1.89E+05	0	1.21E+05	459.5	3,040	2,278	0	47,117	0
2016	168.2	72.9	2.60E+06	2.66E+05	1.80E+05	0	1.22E+05	459.8	3,145	2,350	0	47,251	0
2017	487.3	3,888	2.60E+06	2.67E+05	1.47E+05	0	1.20E+05	457.0	2,816	2,288	0	47,102	0

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Carrizo-Upper Wilcox (Layer 7) - Inflows, Page 2 of 2

Simulated Time Period	Inflows												Total Inflows
	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	Lower Layers	
	(acre-feet)												
Predevelopment	491.0	731.0	65.6	2,454	9,699	8,293	758.0	2,252	963.1	36.8	2,680	4.27E+05	3.51E+06
1980	179.6	381.0	60.7	1,805	4,581	7,652	520.4	2,184	30.2	33.5	1,824	4.02E+05	3.57E+06
1981	198.7	378.6	63.7	1,850	4,626	7,751	514.6	2,179	37.2	35.0	1,822	4.05E+05	3.58E+06
1982	184.6	377.2	60.3	1,814	4,579	7,654	515.2	2,180	27.8	33.4	1,821	4.01E+05	3.54E+06
1983	182.6	375.5	59.2	1,810	4,570	7,652	515.2	2,180	25.8	32.7	1,819	4.00E+05	3.54E+06
1984	161.3	377.1	57.1	1,791	4,553	7,604	524.0	2,188	22.7	31.4	1,820	3.96E+05	3.54E+06
1985	190.9	377.5	61.1	1,836	4,598	7,762	527.5	2,183	31.3	33.4	1,817	4.03E+05	3.56E+06
1986	201.1	380.2	62.0	1,865	4,626	7,768	534.7	2,185	42.5	34.1	1,819	4.04E+05	3.55E+06
1987	212.2	382.7	62.8	1,894	4,660	7,787	536.3	2,186	56.7	34.5	1,821	4.06E+05	3.55E+06
1988	180.3	384.9	56.2	1,821	4,585	7,596	526.6	2,191	22.0	31.2	1,821	3.98E+05	3.52E+06
1989	175.0	386.1	55.0	1,805	4,560	7,568	521.8	2,185	23.1	30.2	1,812	3.96E+05	3.53E+06
1990	191.9	383.6	58.0	1,844	4,606	7,638	493.7	2,181	23.7	31.5	1,812	3.99E+05	3.55E+06
1991	205.2	386.0	61.7	1,877	4,642	7,616	505.0	2,181	25.8	33.6	1,812	4.03E+05	3.58E+06
1992	219.1	388.3	65.5	1,917	4,702	7,702	507.3	2,186	28.6	35.8	1,824	4.08E+05	3.60E+06
1993	194.5	395.7	61.5	1,859	4,619	7,525	539.6	2,184	26.1	34.1	1,820	4.02E+05	3.56E+06
1994	189.6	403.1	62.8	1,873	4,636	7,603	552.5	2,187	38.5	34.7	1,823	4.04E+05	3.58E+06
1995	170.4	410.1	60.4	1,835	4,591	7,490	556.7	2,189	31.5	33.5	1,822	4.00E+05	3.57E+06
1996	147.0	417.7	56.5	1,787	4,543	7,365	558.3	2,198	22.0	31.3	1,821	3.96E+05	3.56E+06
1997	169.5	422.0	61.2	1,841	4,602	7,547	558.5	2,193	40.3	33.5	1,817	4.01E+05	3.58E+06
1998	172.4	426.2	63.3	1,856	4,629	7,579	551.7	2,194	39.0	34.8	1,819	4.03E+05	3.59E+06
1999	146.1	430.7	58.3	1,794	4,558	7,391	557.9	2,196	24.0	32.4	1,815	3.96E+05	3.56E+06
2000	150.4	434.2	60.2	1,818	4,599	7,363	549.1	2,202	34.9	33.0	1,819	3.98E+05	3.61E+06
2001	143.5	435.2	59.6	1,801	4,578	7,376	549.9	2,197	37.9	32.8	1,812	3.97E+05	3.58E+06
2002	171.4	435.4	66.9	1,879	4,700	7,496	540.9	2,196	79.0	36.5	1,818	4.04E+05	3.66E+06
2003	157.9	436.5	65.2	1,846	4,664	7,438	545.8	2,197	65.4	36.1	1,820	4.02E+05	3.61E+06
2004	175.0	438.9	69.6	1,899	4,759	7,637	556.2	2,205	86.6	38.3	1,830	4.10E+05	3.65E+06
2005	142.5	439.8	62.4	1,809	4,630	7,404	562.1	2,200	52.9	35.0	1,822	4.00E+05	3.59E+06
2006	127.9	441.7	58.8	1,777	4,587	7,413	568.2	2,201	42.8	32.8	1,815	3.98E+05	3.58E+06
2007	173.6	443.6	68.5	1,895	4,753	7,838	577.8	2,202	87.4	37.6	1,818	4.12E+05	3.65E+06
2008	132.9	448.5	60.7	1,794	4,624	7,498	582.8	2,209	48.9	34.0	1,816	4.01E+05	3.60E+06
2009	127.9	448.3	60.2	1,781	4,598	7,317	561.9	2,202	48.4	33.3	1,806	3.97E+05	3.63E+06
2010	128.5	446.1	61.6	1,780	4,612	7,049	527.3	2,200	53.7	33.8	1,803	3.93E+05	3.67E+06
2011	98.8	442.2	54.6	1,682	4,497	6,737	505.0	2,198	31.1	30.1	1,792	3.84E+05	3.65E+06
2012	107.2	429.8	55.7	1,711	4,527	7,402	408.4	2,193	32.2	30.3	1,789	3.96E+05	3.63E+06
2013	112.3	401.9	55.1	1,721	4,526	7,549	240.8	2,164	33.4	29.7	1,778	3.98E+05	3.62E+06
2014	109.4	362.3	51.2	1,712	4,506	7,561	171.5	2,132	30.4	27.2	1,770	3.97E+05	3.61E+06
2015	146.2	305.9	53.8	1,793	4,612	7,841	126.4	2,085	50.6	28.1	1,769	4.06E+05	3.65E+06
2016	154.9	257.6	54.8	1,823	4,656	7,938	110.5	2,057	54.7	28.8	1,774	4.10E+05	3.65E+06
2017	148.4	208.9	51.4	1,802	4,621	7,833	92.7	2,018	46.5	27.0	1,766	4.06E+05	3.61E+06

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows												
	Specific Storage	Specific Yield	Wells	River Package	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD
	(acre-feet)												
Predevelopment	0	0	0	2.59E+06	3.16E+05	19,536	0	95,109	174.2	1,932	2,286	0	45,584
1980	0	0	10,794	2.53E+06	3.00E+05	12,849	55.7	1.75E+05	191.9	2,014	2,209	256.7	45,683
1981	1,622	18,999	9,205	2.53E+06	3.01E+05	15,137	53.7	1.63E+05	188.1	2,287	2,347	236.8	45,675
1982	622.4	3,767	7,667	2.52E+06	3.01E+05	12,355	51.9	1.60E+05	188.2	1,905	2,159	228.1	45,530
1983	825.4	6,244	6,081	2.52E+06	3.02E+05	11,964	50.1	1.54E+05	191.0	1,897	2,159	219.2	45,513
1984	446.4	3,032	4,562	2.52E+06	3.02E+05	10,745	48.9	1.58E+05	194.6	1,779	2,100	215.8	45,571
1985	1,413	21,227	3,047	2.53E+06	3.03E+05	13,845	48.4	1.52E+05	192.5	2,200	2,286	220.3	45,623
1986	369.6	8,395	3,407	2.53E+06	3.03E+05	14,162	48.0	1.57E+05	189.2	2,146	2,266	219.0	45,626
1987	926.5	10,692	3,104	2.53E+06	3.03E+05	14,518	46.5	1.50E+05	187.0	2,169	2,283	205.8	45,640
1988	39.3	190.3	3,535	2.52E+06	3.02E+05	9,741	45.7	1.56E+05	192.7	1,605	2,001	205.3	45,510
1989	19.0	280.8	4,188	2.51E+06	3.00E+05	9,910	46.2	1.66E+05	197.9	1,747	2,060	215.0	45,410
1990	425.0	8,678	4,044	2.52E+06	3.01E+05	12,250	46.8	1.65E+05	199.0	2,135	2,210	219.8	45,550
1991	404.0	12,266	4,015	2.53E+06	3.01E+05	14,446	47.6	1.80E+05	193.9	2,306	2,314	226.0	45,656
1992	718.0	16,109	3,844	2.54E+06	3.03E+05	16,574	47.4	1.78E+05	188.6	2,471	2,421	221.8	45,872
1993	22.8	312.8	4,084	2.52E+06	3.01E+05	13,047	47.6	1.83E+05	186.2	1,963	2,193	224.9	45,569
1994	121.7	3,588	4,001	2.52E+06	3.02E+05	14,285	47.8	1.90E+05	186.3	2,164	2,301	227.7	45,634
1995	4.48	42.5	4,049	2.51E+06	3.01E+05	12,388	48.2	1.91E+05	188.0	1,929	2,184	231.8	45,534
1996	1.74	6.60	4,467	2.51E+06	3.00E+05	9,991	48.9	1.94E+05	194.1	1,706	2,060	237.1	45,529
1997	1,213	19,792	3,924	2.52E+06	3.01E+05	13,792	48.5	1.80E+05	193.2	2,281	2,321	232.7	45,630
1998	214.9	7,391	4,292	2.52E+06	3.01E+05	14,842	49.4	1.99E+05	189.1	2,320	2,338	244.4	45,666
1999	121.2	10.3	4,469	2.50E+06	3.00E+05	10,995	49.8	2.01E+05	190.8	1,816	2,099	243.2	45,464
2000	187.4	3,666	7,940	2.51E+06	3.00E+05	12,582	51.3	2.23E+05	194.1	2,228	2,275	250.8	45,708
2001	142.5	199.0	8,498	2.51E+06	3.00E+05	11,978	51.0	2.12E+05	193.0	2,100	2,210	243.7	45,549
2002	725.3	21,153	16,914	2.52E+06	3.00E+05	16,880	51.9	2.30E+05	188.3	2,779	2,547	250.1	45,821
2003	85.7	2,217	10,889	2.52E+06	3.00E+05	14,778	51.9	2.22E+05	182.5	2,365	2,357	247.9	45,697
2004	657.7	15,881	22,719	2.54E+06	3.01E+05	17,456	51.3	2.13E+05	175.2	2,633	2,549	242.1	45,953
2005	9.42	103.4	25,301	2.51E+06	2.98E+05	11,872	50.5	2.09E+05	175.8	1,916	2,185	237.8	45,544
2006	307.8	1,227	24,125	2.50E+06	2.98E+05	10,164	49.1	1.98E+05	182.2	1,760	2,114	228.8	45,447
2007	2,457	40,149	16,845	2.54E+06	3.02E+05	16,914	47.0	1.95E+05	179.2	2,624	2,565	214.1	45,824
2008	2.84	73.2	22,388	2.51E+06	3.00E+05	10,739	46.4	2.12E+05	179.5	1,748	2,116	216.5	45,600
2009	117.5	1,039	10,672	2.50E+06	2.98E+05	11,622	48.1	2.53E+05	189.3	2,102	2,248	235.3	45,547
2010	196.5	5,385	9,693	2.50E+06	2.96E+05	13,432	53.2	2.88E+05	193.6	2,618	2,391	276.8	45,653
2011	0.072	4.82	11,996	2.47E+06	2.94E+05	9,055	58.1	2.96E+05	200.5	2,184	2,098	307.0	45,405
2012	2,013	14,614	19,160	2.49E+06	2.97E+05	10,802	57.4	2.39E+05	214.5	3,263	2,203	282.9	45,680
2013	1,050	12,588	19,522	2.49E+06	2.97E+05	11,673	56.1	2.33E+05	227.5	5,719	2,239	273.2	45,610
2014	803.5	8,435	19,233	2.49E+06	2.97E+05	11,071	54.9	2.26E+05	246.7	9,599	2,198	266.4	45,588
2015	2,241	37,995	16,186	2.50E+06	2.99E+05	15,369	53.6	2.17E+05	267.4	16,669	2,511	256.9	45,852
2016	1,366	23,952	16,538	2.52E+06	3.00E+05	16,131	52.5	2.13E+05	264.5	15,653	2,495	250.6	45,987
2017	409.5	7,493	16,710	2.50E+06	2.98E+05	14,473	51.9	2.14E+05	271.6	17,001	2,384	250.1	45,787

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows											Total Outflows	Net Flows In-Out	Percent Discrepancy
	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD	Bexar	Gonzales	Maverick	Webb	Lower Layers			
	(acre-feet)													%
Predevelopment	0	1,095	0	106.0	2,032	6,945	6,983	0	283.2	1,554	4.18E+05	3.51E+06	0.003	7.61E-08
1980	147.3	2,800	5.63	109.6	3,126	23,964	7,422	0	2,107	4,081	4.51E+05	3.57E+06	1.35E-05	3.78E-10
1981	138.6	3,025	5.64	113.2	3,115	23,865	7,394	0	2,217	4,119	4.47E+05	3.58E+06	-3.49E-03	-9.74E-08
1982	152.3	2,535	6.92	108.8	3,033	23,351	7,349	0	2,073	4,067	4.47E+05	3.54E+06	-1.05E-05	-2.97E-10
1983	162.5	2,539	7.95	106.3	3,047	23,358	7,362	0	2,100	4,059	4.47E+05	3.54E+06	-4.18E-04	-1.18E-08
1984	170.2	2,581	8.29	102.7	3,054	23,500	7,399	0	2,015	4,041	4.53E+05	3.54E+06	0.001	3.30E-08
1985	161.7	2,958	7.78	112.7	3,109	24,041	7,380	0	2,224	4,101	4.46E+05	3.56E+06	8.64E-06	2.42E-10
1986	166.8	2,746	6.91	112.5	3,021	22,735	7,357	0	1,954	4,100	4.44E+05	3.55E+06	-1.36E-04	-3.83E-09
1987	165.8	2,645	6.02	112.8	2,962	21,778	7,347	0	1,836	4,097	4.42E+05	3.55E+06	0.017	4.74E-07
1988	170.5	2,042	5.26	100.3	2,900	21,729	7,345	0	2,138	3,999	4.47E+05	3.52E+06	3.48E-04	9.88E-09
1989	173.1	2,252	4.50	101.2	2,981	22,263	7,386	0	1,902	3,993	4.47E+05	3.53E+06	4.82E-05	1.37E-09
1990	176.9	2,609	3.98	111.6	3,029	22,648	7,435	0	2,384	4,052	4.46E+05	3.55E+06	4.74E-04	1.34E-08
1991	186.9	2,772	3.48	113.7	3,039	23,953	7,495	0	2,560	4,129	4.45E+05	3.58E+06	1.14E-04	3.20E-09
1992	190.7	2,856	2.96	117.3	3,037	24,306	7,511	0	2,673	4,183	4.45E+05	3.60E+06	0.002	6.56E-08
1993	199.6	2,503	2.37	111.0	2,946	23,566	7,458	0	2,002	4,109	4.45E+05	3.56E+06	-1.53E-04	-4.29E-09
1994	207.1	2,880	1.85	112.3	3,006	23,986	7,470	0	2,002	4,137	4.46E+05	3.58E+06	-6.19E-05	-1.73E-09
1995	215.0	2,780	1.44	108.9	2,990	24,050	7,478	0	1,989	4,112	4.48E+05	3.57E+06	0.001	4.15E-08
1996	224.3	2,639	1.11	100.1	3,012	24,251	7,533	0	1,975	4,089	4.53E+05	3.56E+06	-1.09E-02	-3.05E-07
1997	233.2	3,231	0.849	113.2	3,107	24,614	7,538	0	2,061	4,184	4.48E+05	3.58E+06	0.004	1.04E-07
1998	248.9	3,210	0.663	113.9	3,077	24,449	7,514	0	2,199	4,225	4.47E+05	3.59E+06	-8.91E-05	-2.48E-09
1999	220.4	2,688	0.529	105.1	3,010	23,906	7,498	0	2,073	4,174	4.50E+05	3.56E+06	-5.18E-06	-1.45E-10
2000	216.3	3,198	0.471	112.3	3,113	24,733	7,669	0	2,051	4,256	4.53E+05	3.61E+06	0.004	1.23E-07
2001	215.2	3,087	0.432	109.5	3,090	24,395	7,583	0	1,948	4,261	4.51E+05	3.58E+06	-2.56E-05	-7.15E-10
2002	223.1	3,846	0.447	119.3	3,183	25,299	7,698	0	2,148	4,397	4.49E+05	3.66E+06	2.09E-05	5.70E-10
2003	230.0	3,389	0.460	115.5	3,085	24,726	7,604	0	1,965	4,389	4.49E+05	3.61E+06	5.06E-04	1.40E-08
2004	235.2	3,716	0.458	118.4	3,132	24,838	7,599	0	2,084	4,475	4.47E+05	3.65E+06	3.40E-05	9.31E-10
2005	239.1	2,950	0.426	108.9	3,012	23,975	7,510	0	1,829	4,388	4.48E+05	3.59E+06	-3.19E-05	-8.86E-10
2006	240.2	2,842	0.373	102.1	3,045	23,701	7,478	0	1,828	4,381	4.49E+05	3.58E+06	-5.05E-05	-1.41E-09
2007	238.5	3,874	0.298	116.3	3,168	24,357	7,451	0	2,124	4,547	4.42E+05	3.65E+06	4.42E-05	1.21E-09
2008	244.8	2,843	0.208	106.6	3,014	24,037	7,443	0	1,780	4,479	4.49E+05	3.60E+06	6.44E-05	1.79E-09
2009	262.6	3,267	0.181	109.0	3,136	25,831	7,641	0	1,939	4,542	4.54E+05	3.63E+06	0.002	6.59E-08
2010	293.1	3,696	0.226	115.1	3,232	27,108	7,925	0	2,071	4,645	4.61E+05	3.67E+06	-4.30E-03	-1.17E-07
2011	324.2	3,009	0.396	103.3	3,204	27,492	7,981	0	1,938	4,622	4.68E+05	3.65E+06	-1.21E-03	-3.31E-08
2012	333.1	3,512	0.800	112.8	3,309	27,903	7,595	0	2,144	4,751	4.56E+05	3.63E+06	0.002	5.43E-08
2013	336.9	3,568	1.61	117.6	3,302	27,817	7,476	12.3	2,187	4,829	4.51E+05	3.62E+06	2.35E-04	6.49E-09
2014	338.4	3,370	3.68	118.3	3,280	27,736	7,439	155.8	2,167	4,884	4.52E+05	3.61E+06	-2.91E-03	-8.07E-08
2015	335.6	4,033	9.44	132.2	3,331	27,699	7,415	408.8	2,362	5,040	4.46E+05	3.65E+06	-2.17E-03	-5.93E-08
2016	332.3	3,805	18.4	134.3	3,258	27,206	7,363	463.2	2,299	5,122	4.44E+05	3.65E+06	0.004	9.84E-08
2017	329.3	3,424	31.0	132.7	3,183	26,678	7,329	550.3	2,188	5,125	4.44E+05	3.61E+06	9.33E-06	2.58E-10

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Middle Wilcox (Layer 8) - Inflows, Page 1 of 3

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	2.46E+06	2.37E+05	1.82E+05	6.48	79,610	830.8	8,132
1980	0	0	2.57E+06	2.70E+05	1.72E+05	25.5	85,436	842.4	7,600
1981	171.7	24.4	2.55E+06	2.65E+05	2.21E+05	22.9	81,742	831.7	7,769
1982	2,325	12,609	2.56E+06	2.64E+05	1.49E+05	20.7	82,310	840.0	7,666
1983	1,317	5,700	2.56E+06	2.62E+05	1.53E+05	18.5	80,345	841.2	7,491
1984	5,009	20,284	2.58E+06	2.62E+05	1.30E+05	17.0	81,770	843.9	7,235
1985	1,644	2,081	2.55E+06	2.58E+05	2.08E+05	16.8	78,806	831.0	7,321
1986	1,012	184.7	2.54E+06	2.59E+05	1.96E+05	16.8	81,355	830.8	7,433
1987	85.0	3.26	2.54E+06	2.57E+05	1.99E+05	15.1	79,271	831.8	7,612
1988	5,114	39,645	2.57E+06	2.60E+05	91,913	14.5	82,121	849.2	7,525
1989	8,425	22,909	2.57E+06	2.62E+05	1.22E+05	15.8	84,011	845.2	7,170
1990	1,718	2,028	2.56E+06	2.61E+05	1.82E+05	17.1	82,392	837.3	7,345
1991	23,060	19,869	2.55E+06	2.61E+05	2.17E+05	18.5	88,614	829.4	7,310
1992	14,356	10,277	2.55E+06	2.60E+05	2.45E+05	18.6	85,924	829.3	7,620
1993	17,660	33,060	2.56E+06	2.61E+05	1.56E+05	19.0	87,118	836.8	7,335
1994	16,854	16,395	2.56E+06	2.61E+05	1.97E+05	19.6	87,992	833.8	7,407
1995	15,950	31,732	2.57E+06	2.63E+05	1.53E+05	20.4	87,012	839.6	7,380
1996	15,147	43,808	2.60E+06	2.66E+05	1.08E+05	21.3	87,183	848.1	7,180
1997	3,243	993.2	2.57E+06	2.62E+05	2.13E+05	21.0	81,987	832.0	7,192
1998	17,725	9,372	2.57E+06	2.64E+05	2.13E+05	22.2	90,527	829.3	7,472
1999	13,898	40,243	2.59E+06	2.66E+05	1.22E+05	22.9	88,108	840.4	7,135
2000	26,425	31,273	2.60E+06	2.68E+05	1.85E+05	24.4	94,306	839.2	7,244
2001	11,310	16,374	2.59E+06	2.66E+05	1.66E+05	24.1	87,681	835.9	7,038
2002	23,095	19,112	2.58E+06	2.66E+05	2.83E+05	24.9	93,918	824.0	7,492
2003	12,822	14,741	2.59E+06	2.67E+05	2.06E+05	24.8	89,780	831.6	7,498
2004	7,182	1,312	2.58E+06	2.69E+05	2.71E+05	23.9	88,020	829.3	7,727
2005	8,549	39,160	2.60E+06	2.72E+05	1.37E+05	22.8	88,517	844.2	7,575
2006	3,360	24,144	2.60E+06	2.71E+05	1.22E+05	21.2	85,165	847.4	7,220
2007	3,007	41.8	2.56E+06	2.64E+05	2.93E+05	18.6	85,334	823.2	7,498
2008	24,164	59,866	2.61E+06	2.71E+05	1.16E+05	18.0	93,629	846.2	7,536
2009	52,423	68,866	2.62E+06	2.70E+05	1.67E+05	20.1	1.04E+05	843.2	7,513
2010	52,643	70,109	2.63E+06	2.77E+05	2.08E+05	26.1	1.07E+05	841.8	7,679
2011	47,874	1.09E+05	2.67E+06	2.83E+05	96,122	32.0	1.05E+05	855.0	7,109
2012	10,841	15,377	2.65E+06	2.77E+05	1.66E+05	30.6	87,323	874.7	8,508
2013	8,107	7,247	2.63E+06	2.75E+05	1.81E+05	28.4	90,835	894.0	10,577
2014	6,721	9,740	2.63E+06	2.74E+05	1.61E+05	26.5	90,516	928.5	12,010
2015	5,820	1,188	2.60E+06	2.69E+05	2.66E+05	24.4	88,727	953.4	14,550
2016	2,373	557.8	2.60E+06	2.69E+05	2.54E+05	22.6	89,325	934.7	11,899
2017	3,306	5,828	2.60E+06	2.70E+05	2.07E+05	21.7	90,812	951.5	12,190

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Middle Wilcox (Layer 8) - Inflows, Page 2 of 3

Simulated Time Period	Inflows							
	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD
	(acre-feet)							
Predevelopment	1,143	67.6	24,137	360.3	1,084	359.9	7,314	1,771
1980	901.9	164.0	23,816	238.9	1,413	248.0	5,846	882.6
1981	943.6	128.7	24,204	152.8	1,331	250.1	6,365	925.7
1982	885.4	115.2	23,720	296.1	1,357	255.5	5,834	901.3
1983	849.9	102.3	23,579	392.1	1,359	256.4	5,661	899.1
1984	758.2	99.4	23,374	515.1	1,538	248.2	5,348	887.7
1985	860.9	112.0	23,874	341.8	1,402	239.4	5,832	924.8
1986	900.1	113.1	23,972	399.7	1,321	234.4	5,926	945.4
1987	928.2	91.5	24,053	381.9	1,259	234.6	6,084	966.8
1988	810.0	93.9	23,284	463.7	1,333	243.5	5,344	912.8
1989	739.2	116.2	23,098	545.1	1,310	242.5	5,140	899.7
1990	781.7	126.3	23,508	567.6	1,255	256.5	5,302	927.3
1991	870.4	137.8	23,997	1,013	1,204	243.8	5,918	955.5
1992	993.2	128.7	24,506	1,202	1,198	243.5	6,319	989.3
1993	1,066	135.0	23,837	1,432	1,260	222.5	5,886	946.6
1994	1,074	139.5	23,988	1,575	1,231	219.2	5,981	957.3
1995	1,018	146.2	23,642	1,635	1,344	222.6	5,694	930.3
1996	940.3	153.5	23,223	1,677	1,507	227.7	5,131	893.8
1997	1,012	144.1	23,814	1,411	1,472	228.8	5,685	933.3
1998	1,082	163.8	24,066	1,803	1,417	235.3	5,928	945.0
1999	1,049	159.9	23,396	1,391	1,511	238.0	5,403	900.4
2000	1,129	171.4	23,686	1,598	1,458	245.6	5,393	916.2
2001	1,118	156.6	23,565	1,490	1,532	246.4	5,423	904.2
2002	1,283	166.6	24,594	1,752	1,394	251.0	6,121	966.9
2003	1,260	160.1	24,287	1,733	1,460	251.7	6,090	944.5
2004	1,320	146.8	24,910	1,584	1,442	251.0	6,781	984.9
2005	1,184	139.4	23,866	1,506	1,559	250.7	5,969	919.8
2006	1,078	123.3	23,410	1,285	1,674	250.3	5,612	891.2
2007	1,221	98.0	24,759	1,193	1,520	244.6	6,954	979.3
2008	1,112	105.1	23,697	1,547	1,596	248.0	5,872	905.5
2009	1,148	142.3	23,588	2,435	1,507	254.8	5,462	894.0
2010	1,278	215.5	23,823	3,106	1,444	269.0	5,185	899.3
2011	1,123	261.3	23,012	3,517	1,612	277.9	4,421	829.7
2012	1,004	203.7	23,000	2,738	1,773	307.5	4,992	852.3
2013	931.0	180.1	23,118	2,371	1,773	353.8	5,323	859.0
2014	848.6	163.8	22,984	2,034	1,799	402.1	4,770	849.5
2015	916.1	144.1	23,739	1,628	1,697	463.4	5,594	910.0
2016	950.9	130.5	24,067	1,418	1,632	435.8	5,968	928.5
2017	915.2	130.1	23,605	1,314	1,615	419.4	5,625	912.8

Note:
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Appendix J Table J-23.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Middle Wilcox (Layer 8) - Inflows, Page 3 of 3

Simulated Time Period	Inflows								Total Inflows
	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	Lower Layers	
	(acre-feet)								
Predevelopment	8,469	25,159	245.4	3,159	556.2	2,387	2,054	3.69E+05	3.42E+06
1980	39,151	24,043	279.5	3,151	166.8	2,222	3,220	3.50E+05	3.56E+06
1981	37,526	24,087	280.8	3,140	191.2	2,294	3,222	3.51E+05	3.58E+06
1982	37,894	23,809	280.9	3,140	194.2	2,210	3,212	3.49E+05	3.53E+06
1983	37,666	23,750	279.2	3,140	197.7	2,179	3,010	3.48E+05	3.52E+06
1984	41,032	23,630	266.7	3,145	164.7	2,125	3,391	3.46E+05	3.54E+06
1985	40,947	23,868	257.8	3,135	178.4	2,213	2,812	3.50E+05	3.56E+06
1986	32,894	23,836	253.6	3,134	154.6	2,238	2,761	3.51E+05	3.54E+06
1987	31,103	23,832	259.3	3,136	166.9	2,260	2,684	3.52E+05	3.53E+06
1988	35,707	23,529	283.7	3,149	338.9	2,112	2,839	3.48E+05	3.51E+06
1989	39,113	23,469	276.9	3,141	186.9	2,077	3,413	3.46E+05	3.52E+06
1990	35,824	23,638	306.5	3,148	341.4	2,134	3,223	3.48E+05	3.54E+06
1991	55,967	23,560	267.6	3,141	363.7	2,238	6,252	3.50E+05	3.64E+06
1992	52,899	23,832	266.7	3,148	387.2	2,341	6,452	3.54E+05	3.65E+06
1993	52,154	23,624	223.5	3,131	167.0	2,242	6,784	3.50E+05	3.60E+06
1994	53,291	23,719	224.7	3,130	105.4	2,272	7,056	3.51E+05	3.63E+06
1995	53,411	23,496	237.1	3,132	111.1	2,212	6,953	3.48E+05	3.61E+06
1996	52,839	23,442	247.1	3,143	126.0	2,119	6,743	3.46E+05	3.60E+06
1997	45,174	23,643	240.9	3,135	88.1	2,222	4,924	3.49E+05	3.60E+06
1998	50,980	23,636	250.9	3,136	134.8	2,278	6,873	3.50E+05	3.64E+06
1999	49,663	23,390	245.5	3,137	166.6	2,163	7,259	3.46E+05	3.59E+06
2000	58,700	23,304	258.3	3,148	107.6	2,194	8,888	3.47E+05	3.69E+06
2001	51,239	23,437	248.9	3,139	80.9	2,183	7,949	3.46E+05	3.62E+06
2002	59,039	23,435	254.7	3,139	76.6	2,368	9,052	3.51E+05	3.75E+06
2003	53,800	23,438	248.8	3,139	67.6	2,332	8,377	3.50E+05	3.66E+06
2004	49,205	23,759	241.8	3,146	83.0	2,481	7,338	3.55E+05	3.70E+06
2005	48,279	23,398	245.5	3,139	69.1	2,268	6,994	3.48E+05	3.62E+06
2006	42,910	23,515	244.5	3,140	76.4	2,182	5,990	3.47E+05	3.58E+06
2007	45,414	24,099	228.0	3,137	106.6	2,447	6,010	3.56E+05	3.69E+06
2008	58,571	23,480	245.7	3,148	65.1	2,232	8,312	3.49E+05	3.66E+06
2009	81,411	23,111	267.3	3,144	52.8	2,197	12,798	3.46E+05	3.79E+06
2010	82,088	22,745	297.2	3,149	54.0	2,205	13,831	3.43E+05	3.86E+06
2011	82,226	22,778	299.5	3,151	56.0	2,047	14,117	3.38E+05	3.82E+06
2012	61,047	24,079	382.1	3,176	47.6	2,098	9,099	3.47E+05	3.69E+06
2013	58,027	23,783	502.7	3,194	47.6	2,117	7,853	3.48E+05	3.68E+06
2014	56,646	23,633	590.0	3,215	49.4	2,052	6,945	3.48E+05	3.66E+06
2015	51,441	24,178	713.2	3,242	55.9	2,169	6,135	3.54E+05	3.72E+06
2016	50,978	24,417	506.2	3,215	65.8	2,227	5,907	3.57E+05	3.70E+06
2017	51,009	24,146	462.7	3,189	69.1	2,155	5,818	3.54E+05	3.66E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 3

Simulated Time Period	Outflows								
	Specific Storage	Specific Yield	Wells	River Package	General Head Boundaries	Evapo-transpiration	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	0	2.59E+06	3.20E+05	24,173	34,183	15.8	5,209
1980	0	0	1.89E+05	2.53E+06	3.03E+05	13,503	38,019	8.98	4,871
1981	8,212	33,692	1.55E+05	2.53E+06	3.05E+05	16,049	39,637	12.6	5,843
1982	3,588	7,106	1.59E+05	2.52E+06	3.05E+05	12,951	37,222	9.64	4,555
1983	6,732	10,812	1.41E+05	2.52E+06	3.05E+05	12,542	37,087	8.21	4,500
1984	1,577	4,209	1.68E+05	2.52E+06	3.06E+05	11,200	36,260	6.30	3,986
1985	9,002	34,501	1.37E+05	2.53E+06	3.06E+05	14,635	38,142	10.1	5,474
1986	8,848	24,718	1.29E+05	2.53E+06	3.06E+05	14,986	36,921	11.6	5,411
1987	11,756	29,584	1.09E+05	2.53E+06	3.07E+05	15,404	37,779	12.4	5,495
1988	1,408	2,620	1.54E+05	2.52E+06	3.06E+05	10,113	34,927	5.89	3,358
1989	691.4	2,036	1.81E+05	2.51E+06	3.04E+05	10,316	35,603	4.60	3,674
1990	2,226	15,264	1.66E+05	2.52E+06	3.04E+05	12,887	37,286	6.38	4,841
1991	930.7	18,696	2.51E+05	2.53E+06	3.05E+05	15,307	37,336	10.6	5,702
1992	2,365	24,921	2.27E+05	2.54E+06	3.07E+05	17,656	39,156	14.6	6,435
1993	683.2	1,404	2.34E+05	2.52E+06	3.05E+05	13,671	37,676	11.2	4,845
1994	442.7	5,768	2.45E+05	2.52E+06	3.05E+05	15,025	38,962	12.0	5,489
1995	126.4	114.2	2.45E+05	2.51E+06	3.04E+05	12,903	38,556	9.51	4,622
1996	116.3	33.8	2.45E+05	2.51E+06	3.04E+05	10,293	37,654	5.56	3,599
1997	6,941	32,519	1.86E+05	2.52E+06	3.05E+05	14,462	40,461	9.58	5,535
1998	1,125	13,101	2.53E+05	2.52E+06	3.04E+05	15,581	39,267	12.2	5,737
1999	3,092	1,705	2.42E+05	2.50E+06	3.03E+05	11,340	38,588	7.59	4,023
2000	760.7	5,300	3.14E+05	2.51E+06	3.04E+05	13,089	40,535	8.42	5,065
2001	1,685	1,363	2.59E+05	2.51E+06	3.03E+05	12,422	41,280	8.38	4,765
2002	1,133	32,682	3.26E+05	2.52E+06	3.04E+05	17,862	43,419	15.6	7,081
2003	758.1	3,283	2.81E+05	2.52E+06	3.04E+05	15,486	42,902	14.6	5,877
2004	4,214	30,173	2.60E+05	2.54E+06	3.05E+05	18,468	44,286	18.8	7,126
2005	998.7	1,937	2.62E+05	2.51E+06	3.02E+05	12,276	40,804	11.7	4,608
2006	5,434	7,003	2.21E+05	2.50E+06	3.02E+05	10,455	40,624	7.67	4,012
2007	7,939	67,750	2.13E+05	2.54E+06	3.06E+05	17,871	42,873	17.4	7,261
2008	109.9	136.6	3.07E+05	2.51E+06	3.03E+05	11,056	38,123	9.85	4,098
2009	123.4	1,073	4.32E+05	2.50E+06	3.02E+05	12,011	40,337	8.44	4,766
2010	308.1	6,364	4.77E+05	2.50E+06	3.00E+05	13,950	45,437	8.90	5,570
2011	6.58	4.82	4.77E+05	2.47E+06	2.97E+05	9,260	45,794	3.58	3,424
2012	15,897	31,032	2.88E+05	2.49E+06	3.00E+05	11,106	49,251	1.53	4,480
2013	5,626	25,348	3.03E+05	2.49E+06	3.00E+05	12,043	44,154	0.415	4,805
2014	6,479	17,312	2.97E+05	2.49E+06	2.99E+05	11,398	43,094	0	4,446
2015	17,245	71,486	2.61E+05	2.50E+06	3.01E+05	16,073	45,379	0	6,512
2016	12,043	48,553	2.60E+05	2.52E+06	3.03E+05	16,920	43,914	0	6,582
2017	6,204	18,649	2.80E+05	2.50E+06	3.01E+05	15,097	42,070	0	5,753

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 3

Simulated Time Period	Outflows								
	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD
	(acre-feet)								
Predevelopment	6,747	2.31	2,455	734.7	1,185	0	2,157	1,917	7,253
1980	6,475	0	2,374	24.5	2,238	0.810	2,489	4,310	21,483
1981	7,628	0	2,811	99.8	2,180	0.931	2,393	4,303	21,864
1982	6,153	0	2,194	48.5	1,838	0.161	2,494	3,987	20,919
1983	6,077	0	2,213	93.4	1,809	0.119	2,526	3,984	22,148
1984	5,549	0	2,026	23.4	2,538	0.506	2,606	3,903	20,695
1985	7,176	0	2,691	142.4	2,076	1.86	2,506	4,129	24,226
1986	7,068	0	2,600	127.4	1,830	3.67	2,490	3,902	21,610
1987	7,179	0	2,625	151.1	1,752	4.49	2,449	3,766	21,011
1988	4,751	0	1,768	97.6	1,344	3.83	2,542	3,469	18,342
1989	5,163	0	1,964	35.9	1,458	3.45	2,621	3,654	19,303
1990	6,497	0	2,456	48.9	1,681	2.05	2,674	3,836	19,834
1991	7,451	0	2,781	0	1,829	1.86	2,496	3,947	21,266
1992	8,211	0	3,044	0	1,911	1.93	2,504	4,004	21,613
1993	6,311	0	2,280	0	1,715	2.64	2,505	3,708	20,047
1994	7,050	0	2,611	0	2,142	2.85	2,538	3,887	20,597
1995	6,044	0	2,228	0	2,121	2.36	2,560	3,792	20,473
1996	4,912	0	1,885	0	2,008	1.65	2,767	3,752	20,201
1997	7,141	0	2,736	0	2,273	1.29	2,595	4,105	21,478
1998	7,364	0	2,755	0	2,273	0.923	2,558	4,057	20,691
1999	5,346	0	1,993	0	1,962	0.639	2,601	3,774	19,630
2000	6,710	0	2,500	2.28	2,360	0.252	2,782	4,065	21,353
2001	6,232	0	2,335	27.0	2,276	0.185	2,637	3,989	20,571
2002	8,991	0	3,382	24.8	2,803	0.079	2,678	4,369	22,866
2003	7,499	0	2,728	46.4	2,528	0.074	2,558	4,071	21,844
2004	8,842	0	3,284	78.1	2,683	0.119	2,493	4,249	22,154
2005	5,975	0	2,153	96.0	2,233	0.140	2,520	3,814	20,493
2006	5,230	0	1,991	141.0	2,082	0.194	2,529	3,815	20,057
2007	8,904	0	3,453	180.2	2,639	0.488	2,411	4,312	20,777
2008	5,418	0	1,973	125.4	2,118	0.384	2,519	3,757	20,018
2009	6,385	0	2,346	56.4	2,523	0.094	2,824	4,086	24,719
2010	7,562	0	2,718	24.4	3,058	0	3,206	4,378	28,868
2011	4,980	0	1,852	26.4	2,670	0	3,362	4,139	28,843
2012	5,928	0	2,433	138.9	2,719	0	2,776	4,447	25,921
2013	6,396	0	2,522	202.6	2,705	0	2,616	4,482	24,193
2014	6,124	0	2,402	270.0	2,553	0	2,998	4,408	24,610
2015	8,749	0	3,256	366.8	2,841	0	2,717	4,715	27,615
2016	8,708	0	3,136	419.7	2,678	0.207	2,582	4,550	25,991
2017	7,818	0	2,784	426.7	2,443	0.976	2,642	4,314	24,285

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 3 of 3

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Bexar	Gonzales	Maverick	Caldwell	Webb	Lower Layers			
	(acre-feet)								%
Predevelopment	21,959	0	262.1	3,230	1,613	3.92E+05	3.42E+06	0.017	5.08E-07
1980	22,576	0	2,269	3,398	2,316	4.20E+05	3.56E+06	-5.02E-03	-1.41E-07
1981	22,826	0	2,338	3,283	2,361	4.16E+05	3.58E+06	0.001	4.06E-08
1982	22,146	0	2,181	3,383	2,286	4.17E+05	3.53E+06	0.001	2.94E-08
1983	22,077	0	2,175	3,436	2,547	4.17E+05	3.52E+06	0.009	2.61E-07
1984	21,987	0	2,163	3,535	2,261	4.22E+05	3.54E+06	0.017	4.73E-07
1985	22,428	0	2,337	3,383	2,798	4.16E+05	3.56E+06	0.005	1.33E-07
1986	22,406	0	2,270	3,336	2,656	4.14E+05	3.54E+06	0.009	2.53E-07
1987	22,407	0	2,181	3,308	2,677	4.12E+05	3.53E+06	0.020	5.72E-07
1988	21,639	0	1,892	3,549	2,271	4.16E+05	3.51E+06	0.003	7.75E-08
1989	21,839	0	1,993	3,596	2,214	4.16E+05	3.52E+06	0.029	8.27E-07
1990	22,392	0	2,086	3,499	2,272	4.16E+05	3.54E+06	0.004	1.07E-07
1991	23,028	0	2,275	3,349	2,123	4.15E+05	3.64E+06	0.002	6.77E-08
1992	23,253	0	2,381	3,248	2,253	4.15E+05	3.65E+06	0.003	7.41E-08
1993	22,644	0	2,250	3,341	2,225	4.15E+05	3.60E+06	0.023	6.41E-07
1994	22,804	0	2,394	3,319	2,306	4.16E+05	3.63E+06	0.025	6.86E-07
1995	22,663	0	2,335	3,405	2,245	4.17E+05	3.61E+06	-9.86E-03	-2.73E-07
1996	22,541	0	2,273	3,573	2,201	4.21E+05	3.60E+06	0.008	2.15E-07
1997	23,024	0	2,500	3,403	2,365	4.17E+05	3.60E+06	0.007	2.07E-07
1998	23,042	0	2,460	3,316	2,378	4.17E+05	3.64E+06	0.027	7.52E-07
1999	22,527	0	2,238	3,479	2,296	4.19E+05	3.59E+06	0.003	7.31E-08
2000	23,507	0	2,421	3,455	2,459	4.22E+05	3.69E+06	0.065	1.76E-06
2001	23,043	0	2,395	3,449	2,477	4.19E+05	3.62E+06	-4.96E-04	-1.37E-08
2002	24,218	0	2,694	3,226	2,634	4.18E+05	3.75E+06	0.006	1.53E-07
2003	23,507	0	2,560	3,241	2,605	4.18E+05	3.66E+06	9.66E-04	2.64E-08
2004	23,810	0	2,692	3,147	2,719	4.17E+05	3.70E+06	0.008	2.23E-07
2005	22,786	0	2,378	3,321	2,608	4.18E+05	3.62E+06	-2.72E-04	-7.52E-09
2006	22,398	0	2,286	3,467	2,461	4.18E+05	3.58E+06	5.38E-04	1.50E-08
2007	23,243	0	2,624	3,177	2,816	4.12E+05	3.69E+06	0.003	9.28E-08
2008	22,386	0	2,311	3,398	2,675	4.18E+05	3.66E+06	9.91E-04	2.71E-08
2009	23,410	0	2,550	3,439	2,649	4.22E+05	3.79E+06	0.011	2.79E-07
2010	24,931	0	2,771	3,411	2,764	4.28E+05	3.86E+06	0.004	9.33E-08
2011	24,555	0	2,638	3,656	2,708	4.33E+05	3.82E+06	0.015	3.81E-07
2012	22,698	0	2,833	3,613	2,844	4.24E+05	3.69E+06	0.031	8.40E-07
2013	22,335	0	2,869	3,546	2,934	4.20E+05	3.68E+06	0.001	3.90E-08
2014	22,156	0	2,827	3,619	3,165	4.20E+05	3.66E+06	0.076	2.09E-06
2015	22,959	1.36	3,032	3,407	4,007	4.16E+05	3.72E+06	-1.56E-03	-4.20E-08
2016	23,020	6.43	2,991	3,320	3,917	4.15E+05	3.70E+06	0.006	1.54E-07
2017	22,744	12.1	2,851	3,389	3,667	4.14E+05	3.66E+06	-5.23E-05	-1.43E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Lower Wilcox (Layer 9) - Inflows, Page 1 of 3

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	River Package	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	2.46E+06	2.45E+05	1.99E+05	5.21	65,697	1,029	4,091
1980	0	0	2.57E+06	2.79E+05	1.88E+05	17.4	70,538	1,032	3,839
1981	230.9	24.5	2.55E+06	2.73E+05	2.40E+05	16.8	68,197	1,022	3,898
1982	2,803	15,242	2.56E+06	2.72E+05	1.62E+05	16.1	68,668	1,031	3,908
1983	1,669	7,015	2.56E+06	2.71E+05	1.67E+05	15.4	67,683	1,034	3,818
1984	7,533	24,667	2.58E+06	2.71E+05	1.41E+05	15.0	68,323	1,040	3,718
1985	2,449	2,147	2.55E+06	2.66E+05	2.27E+05	14.7	66,496	1,025	3,669
1986	1,280	185.8	2.54E+06	2.67E+05	2.14E+05	14.5	67,646	1,023	3,721
1987	121.0	5.06	2.54E+06	2.65E+05	2.17E+05	14.1	66,586	1,024	3,825
1988	7,273	46,088	2.57E+06	2.69E+05	1.00E+05	14.0	68,844	1,045	3,932
1989	12,237	25,466	2.57E+06	2.71E+05	1.33E+05	14.5	70,059	1,042	3,726
1990	2,413	2,093	2.56E+06	2.70E+05	1.98E+05	15.1	68,534	1,031	3,772
1991	34,876	20,120	2.55E+06	2.69E+05	2.36E+05	15.9	71,759	1,021	3,669
1992	22,403	10,373	2.55E+06	2.68E+05	2.67E+05	16.1	70,025	1,021	3,797
1993	26,796	36,275	2.56E+06	2.69E+05	1.70E+05	17.0	71,062	1,027	3,703
1994	25,996	16,891	2.56E+06	2.70E+05	2.15E+05	17.0	71,445	1,026	3,728
1995	24,469	35,002	2.57E+06	2.71E+05	1.66E+05	17.3	71,010	1,033	3,777
1996	23,076	49,738	2.60E+06	2.75E+05	1.18E+05	17.8	71,690	1,046	3,758
1997	4,985	1,035	2.57E+06	2.71E+05	2.32E+05	17.8	68,295	1,026	3,648
1998	26,514	9,379	2.57E+06	2.72E+05	2.32E+05	18.3	72,942	1,022	3,802
1999	21,545	45,183	2.59E+06	2.75E+05	1.33E+05	18.6	72,165	1,035	3,697
2000	40,360	31,857	2.60E+06	2.76E+05	2.02E+05	20.3	75,782	1,034	3,758
2001	17,766	16,918	2.59E+06	2.75E+05	1.81E+05	20.0	71,682	1,030	3,622
2002	35,337	19,159	2.58E+06	2.74E+05	3.08E+05	21.0	74,804	1,017	3,788
2003	19,871	15,481	2.59E+06	2.76E+05	2.25E+05	20.7	72,432	1,022	3,817
2004	11,208	1,312	2.58E+06	2.78E+05	2.95E+05	19.7	71,144	1,021	3,860
2005	12,919	45,146	2.60E+06	2.81E+05	1.49E+05	19.0	72,068	1,036	3,901
2006	5,267	28,188	2.60E+06	2.80E+05	1.33E+05	17.6	70,512	1,044	3,735
2007	4,935	41.8	2.56E+06	2.72E+05	3.19E+05	15.5	69,498	1,018	3,673
2008	36,511	67,250	2.61E+06	2.80E+05	1.27E+05	15.7	75,278	1,040	3,893
2009	79,705	72,388	2.62E+06	2.79E+05	1.82E+05	18.2	81,231	1,038	3,948
2010	79,393	73,599	2.63E+06	2.86E+05	2.27E+05	23.6	83,054	1,033	4,121
2011	72,695	1.20E+05	2.67E+06	2.93E+05	1.05E+05	27.4	82,434	1,050	3,924
2012	17,210	16,529	2.65E+06	2.88E+05	1.81E+05	25.8	72,978	1,057	4,781
2013	12,986	7,815	2.63E+06	2.85E+05	1.98E+05	24.1	74,236	1,058	6,193
2014	10,954	11,533	2.63E+06	2.84E+05	1.76E+05	22.8	74,316	1,073	7,255
2015	9,501	1,265	2.60E+06	2.79E+05	2.90E+05	21.7	72,872	1,070	8,916
2016	4,307	578.4	2.60E+06	2.79E+05	2.77E+05	20.7	72,832	1,052	6,988
2017	5,449	7,213	2.60E+06	2.80E+05	2.26E+05	20.0	73,689	1,057	7,159

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Lower Wilcox (Layer 9) - Inflows Page 2 of 3

Simulated Time Period	Inflows							
	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD
	(acre-feet)							
Predevelopment	30,566	35.7	18,457	60.6	24,650	235.7	4,876	3,955
1980	28,735	119.6	18,312	100.2	24,879	146.9	3,898	3,183
1981	28,910	106.1	18,432	71.9	25,000	148.3	4,198	3,276
1982	28,444	97.1	18,288	134.1	24,934	152.0	3,875	3,263
1983	28,260	89.3	18,211	173.8	24,901	153.2	3,751	3,269
1984	27,609	85.8	18,144	210.6	24,531	147.4	3,522	3,332
1985	28,323	89.0	18,265	138.9	25,062	140.8	3,883	3,381
1986	28,578	90.5	18,336	146.6	25,053	136.3	3,967	3,404
1987	28,809	82.7	18,389	139.2	25,053	136.0	4,057	3,413
1988	28,147	81.5	18,143	159.2	25,017	142.2	3,500	3,353
1989	27,694	89.2	17,977	210.2	24,992	141.9	3,359	3,342
1990	27,888	95.2	18,090	223.3	25,095	151.9	3,499	3,385
1991	28,366	101.0	18,281	489.6	25,311	143.6	3,928	3,406
1992	28,918	99.2	18,555	605.4	25,573	142.8	4,135	3,443
1993	28,631	100.6	18,332	754.7	25,518	128.0	3,902	3,394
1994	28,870	102.7	18,369	854.6	25,356	124.8	3,993	3,410
1995	28,556	106.0	18,245	909.0	25,341	127.0	3,786	3,390
1996	28,080	109.9	18,091	950.0	25,410	130.8	3,405	3,364
1997	28,535	107.3	18,222	806.1	25,501	131.9	3,805	3,412
1998	28,811	114.1	18,352	1,028	25,612	136.6	3,991	3,426
1999	28,174	114.8	18,131	820.5	25,601	138.8	3,587	3,378
2000	28,252	119.9	18,214	950.7	25,817	144.1	3,638	3,417
2001	28,171	116.2	18,156	896.6	25,839	145.1	3,636	3,406
2002	29,035	119.4	18,541	1,066	26,037	148.4	4,187	3,484
2003	28,937	118.3	18,513	1,064	26,054	149.1	4,143	3,458
2004	29,808	113.5	18,805	973.4	26,242	148.7	4,571	3,509
2005	28,860	109.3	18,430	921.8	26,045	148.5	4,018	3,433
2006	28,477	102.4	18,204	773.6	26,017	148.2	3,718	3,404
2007	29,949	91.2	18,659	697.0	26,262	144.3	4,600	3,501
2008	28,833	91.0	18,354	908.7	26,182	146.3	3,901	3,416
2009	28,398	104.8	18,212	1,474	26,292	151.3	3,691	3,411
2010	28,091	136.2	18,265	1,943	26,444	161.4	3,636	3,445
2011	27,191	162.4	17,976	2,229	26,588	168.4	3,057	3,390
2012	28,040	148.3	17,648	1,730	26,878	189.7	3,364	3,418
2013	28,325	134.9	17,546	1,472	26,807	223.8	3,555	3,418
2014	28,265	125.1	17,390	1,240	26,706	261.0	3,292	3,403
2015	29,173	115.0	17,509	975.0	26,791	308.6	3,891	3,479
2016	29,722	107.4	17,709	823.7	26,777	290.8	4,167	3,494
2017	29,404	105.1	17,443	741.2	26,578	277.3	3,989	3,461

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Lower Wilcox (Layer 9) - Inflows, Page 3 of 3

Simulated Time Period	Inflows							Total Inflows
	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	
	(acre-feet)							
Predevelopment	20,666	2.78E+05	157.0	3,410	10,625	2,444	3,854	3.38E+06
1980	37,906	2.73E+05	176.2	3,416	10,564	2,069	4,243	3.52E+06
1981	36,921	2.73E+05	176.4	3,404	10,685	2,157	4,247	3.55E+06
1982	37,141	2.72E+05	176.8	3,404	10,493	2,050	4,231	3.50E+06
1983	37,130	2.72E+05	176.0	3,405	10,462	2,003	4,107	3.49E+06
1984	39,135	2.72E+05	168.8	3,411	10,405	1,894	4,306	3.50E+06
1985	39,180	2.73E+05	162.8	3,401	10,596	2,032	3,987	3.53E+06
1986	34,357	2.73E+05	159.8	3,400	10,613	2,069	3,956	3.50E+06
1987	32,972	2.73E+05	162.6	3,401	10,628	2,105	3,912	3.50E+06
1988	35,799	2.72E+05	176.8	3,415	10,311	1,907	3,983	3.47E+06
1989	37,841	2.72E+05	174.1	3,406	10,302	1,847	4,276	3.49E+06
1990	35,940	2.72E+05	190.4	3,411	10,457	1,897	4,183	3.51E+06
1991	45,973	2.73E+05	169.9	3,407	10,575	2,049	5,817	3.61E+06
1992	44,207	2.75E+05	167.3	3,414	10,710	2,166	5,976	3.62E+06
1993	43,679	2.73E+05	143.1	3,398	10,446	2,086	6,140	3.56E+06
1994	44,240	2.73E+05	141.3	3,396	10,511	2,138	6,292	3.59E+06
1995	44,306	2.72E+05	148.2	3,398	10,389	2,060	6,239	3.57E+06
1996	44,059	2.72E+05	154.7	3,409	10,262	1,932	6,119	3.56E+06
1997	40,185	2.73E+05	151.9	3,399	10,507	2,067	5,149	3.56E+06
1998	43,159	2.73E+05	156.8	3,400	10,547	2,146	6,166	3.60E+06
1999	42,434	2.72E+05	154.5	3,401	10,290	1,983	6,371	3.56E+06
2000	47,320	2.72E+05	161.8	3,412	10,469	2,007	7,292	3.65E+06
2001	43,271	2.72E+05	156.8	3,402	10,422	1,998	6,842	3.58E+06
2002	47,481	2.73E+05	159.6	3,403	10,810	2,235	7,492	3.72E+06
2003	44,592	2.72E+05	156.2	3,402	10,661	2,212	7,182	3.62E+06
2004	42,277	2.74E+05	151.8	3,411	10,907	2,412	6,681	3.66E+06
2005	41,608	2.72E+05	153.3	3,402	10,494	2,178	6,484	3.58E+06
2006	38,784	2.72E+05	153.0	3,403	10,375	2,064	5,941	3.54E+06
2007	39,751	2.75E+05	143.5	3,400	10,919	2,425	5,981	3.65E+06
2008	46,464	2.73E+05	153.0	3,412	10,469	2,134	7,201	3.62E+06
2009	58,084	2.71E+05	166.8	3,406	10,510	2,060	9,632	3.75E+06
2010	58,960	2.70E+05	185.9	3,410	10,657	2,032	10,269	3.82E+06
2011	58,958	2.69E+05	188.9	3,412	10,356	1,800	10,449	3.78E+06
2012	48,102	2.73E+05	237.7	3,436	10,579	1,917	7,803	3.65E+06
2013	46,805	2.73E+05	314.3	3,450	10,658	1,970	7,084	3.64E+06
2014	46,224	2.73E+05	375.0	3,471	10,632	1,875	6,562	3.62E+06
2015	43,861	2.75E+05	454.5	3,497	11,005	2,090	6,111	3.69E+06
2016	43,501	2.76E+05	334.7	3,481	11,102	2,197	5,990	3.66E+06
2017	43,302	2.75E+05	292.3	3,458	10,954	2,121	5,929	3.62E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 3

Simulated Time Period	Outflows									
	Specific Storage	Specific Yield	Wells	River Package	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)									
Predevelopment	0	0	0	2.59E+06	3.29E+05	25,986	0	36,202	4.19	1,571
1980	0	0	2.07E+05	2.53E+06	3.11E+05	13,914	6.72	42,093	2.23	1,499
1981	11,352	38,252	1.71E+05	2.53E+06	3.13E+05	16,716	6.83	42,347	5.35	1,749
1982	5,031	7,411	1.76E+05	2.52E+06	3.12E+05	13,447	7.01	41,275	2.49	1,443
1983	9,691	11,122	1.59E+05	2.52E+06	3.12E+05	13,011	7.20	41,298	1.85	1,401
1984	2,051	4,284	1.89E+05	2.52E+06	3.13E+05	11,426	7.40	41,229	1.34	1,287
1985	12,942	39,613	1.55E+05	2.53E+06	3.14E+05	15,125	7.42	41,479	3.51	1,653
1986	13,808	28,045	1.43E+05	2.53E+06	3.14E+05	15,667	7.35	40,078	4.58	1,673
1987	17,784	32,793	1.22E+05	2.53E+06	3.15E+05	16,181	7.34	40,261	4.67	1,686
1988	2,273	2,781	1.72E+05	2.52E+06	3.13E+05	10,497	7.33	39,522	1.24	1,146
1989	1,116	2,189	2.00E+05	2.51E+06	3.11E+05	10,724	7.13	39,967	0.663	1,183
1990	3,360	18,115	1.84E+05	2.52E+06	3.11E+05	13,489	6.91	40,611	1.31	1,477
1991	1,456	23,009	2.69E+05	2.53E+06	3.12E+05	16,114	6.71	40,192	5.14	1,733
1992	3,240	29,612	2.44E+05	2.54E+06	3.15E+05	18,641	6.60	40,436	8.62	1,934
1993	1,030	1,630	2.51E+05	2.52E+06	3.12E+05	14,384	6.54	40,086	3.45	1,546
1994	675.5	7,054	2.62E+05	2.52E+06	3.13E+05	15,678	6.44	40,456	3.77	1,662
1995	196.8	201.0	2.63E+05	2.51E+06	3.12E+05	13,355	6.35	40,875	2.26	1,449
1996	160.2	34.2	2.63E+05	2.51E+06	3.11E+05	10,537	6.28	41,387	0.999	1,182
1997	10,018	37,212	2.01E+05	2.52E+06	3.12E+05	15,048	6.23	42,464	2.76	1,647
1998	1,799	15,962	2.69E+05	2.52E+06	3.12E+05	16,282	6.17	41,110	5.21	1,744
1999	3,785	1,746	2.60E+05	2.50E+06	3.10E+05	11,722	6.11	41,621	1.84	1,321
2000	947.9	6,216	3.36E+05	2.51E+06	3.11E+05	13,588	6.12	42,527	1.90	1,530
2001	2,247	1,545	2.77E+05	2.51E+06	3.10E+05	12,904	6.06	42,998	2.01	1,488
2002	1,725	40,039	3.48E+05	2.52E+06	3.12E+05	18,755	6.08	43,022	9.26	2,065
2003	1,061	3,856	3.01E+05	2.52E+06	3.11E+05	16,221	6.07	43,151	6.16	1,805
2004	6,185	35,698	2.77E+05	2.54E+06	3.13E+05	19,445	6.11	43,353	9.80	2,094
2005	1,528	1,996	2.79E+05	2.51E+06	3.09E+05	12,817	6.18	42,556	2.83	1,462
2006	8,079	7,090	2.35E+05	2.50E+06	3.09E+05	10,856	6.27	43,112	1.42	1,267
2007	11,078	78,744	2.23E+05	2.54E+06	3.14E+05	18,892	6.39	42,583	8.97	2,089
2008	197.0	158.6	3.22E+05	2.51E+06	3.10E+05	11,520	6.58	41,393	2.23	1,344
2009	132.9	1,112	4.55E+05	2.50E+06	3.09E+05	12,463	6.63	42,883	1.59	1,428
2010	351.3	7,146	5.11E+05	2.50E+06	3.07E+05	14,444	6.51	45,593	1.58	1,642
2011	6.58	4.82	5.11E+05	2.47E+06	3.04E+05	9,444	6.15	47,379	0.400	1,151
2012	22,395	34,719	3.03E+05	2.49E+06	3.07E+05	11,471	5.92	49,327	0.007	1,308
2013	7,965	28,119	3.17E+05	2.49E+06	3.06E+05	12,550	5.98	44,968	0	1,368
2014	9,415	17,834	3.12E+05	2.49E+06	3.06E+05	11,867	6.22	44,534	0	1,289
2015	25,502	79,377	2.75E+05	2.50E+06	3.08E+05	16,967	6.53	44,645	0	1,781
2016	17,955	53,191	2.73E+05	2.52E+06	3.10E+05	17,918	6.86	43,156	0.022	1,995
2017	9,579	19,498	2.95E+05	2.50E+06	3.07E+05	15,947	7.11	42,216	0	1,798

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 3

Simulated Time Period	Outflows								
	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD
	(acre-feet)								
Predevelopment	30,590	19.2	2,590	380.6	26,655	12.5	2,651	5,810	18,328
1980	30,842	11.3	2,570	7.63	29,401	22.8	3,398	11,263	33,166
1981	31,326	11.3	2,706	89.6	28,744	22.6	3,349	10,153	33,155
1982	30,762	11.4	2,502	51.9	28,378	21.9	3,375	9,641	32,668
1983	30,718	11.3	2,516	73.2	28,323	21.9	3,364	9,493	33,220
1984	30,882	11.3	2,475	11.3	30,834	22.6	3,346	9,030	32,499
1985	31,130	11.2	2,683	107.2	28,298	23.7	3,531	9,005	33,993
1986	31,052	11.1	2,643	74.6	27,965	24.9	3,571	8,657	33,476
1987	31,076	11.0	2,645	106.0	27,794	25.4	3,488	8,419	32,277
1988	30,194	10.9	2,389	53.5	27,468	24.8	3,080	8,292	30,277
1989	30,361	10.8	2,471	9.65	27,544	24.5	3,240	8,461	30,871
1990	30,879	10.6	2,629	12.3	27,692	22.8	3,724	8,546	31,257
1991	31,270	10.5	2,716	0.593	27,877	23.4	3,552	8,659	32,123
1992	31,717	10.4	2,789	0.546	28,057	23.5	3,820	8,697	32,903
1993	30,646	10.3	2,528	0.475	27,771	25.0	3,491	8,529	32,765
1994	30,924	10.2	2,644	0.443	28,830	25.2	3,699	8,672	33,066
1995	30,526	10.1	2,524	0.431	28,981	24.6	3,523	8,667	33,315
1996	30,192	10.1	2,438	0.431	29,088	23.8	3,577	8,747	33,703
1997	30,915	10.0	2,708	0.443	28,840	23.3	3,755	8,923	34,288
1998	31,018	10.00	2,702	0.469	28,830	22.5	3,825	8,841	33,725
1999	30,246	10.1	2,456	11.2	28,647	22.1	3,445	8,687	33,423
2000	30,886	10.2	2,638	5.55	29,305	21.4	4,091	8,911	33,647
2001	30,550	10.3	2,572	2.49	29,066	21.1	3,711	8,834	33,718
2002	31,738	10.4	2,915	0.889	29,672	20.6	4,462	9,035	34,112
2003	31,116	10.4	2,674	0.951	29,341	20.5	3,965	8,828	34,219
2004	31,717	10.5	2,859	1.02	29,476	20.7	4,025	8,900	34,412
2005	30,538	10.6	2,487	1.11	29,009	20.6	3,548	8,648	33,807
2006	30,153	10.6	2,455	5.98	28,852	20.6	3,258	8,681	33,826
2007	31,534	10.7	2,926	20.5	29,134	21.2	3,637	8,896	33,298
2008	30,363	10.8	2,446	1.48	28,942	21.0	3,336	8,649	33,247
2009	30,728	10.7	2,580	1.58	29,650	20.3	4,097	9,014	35,295
2010	31,353	10.7	2,711	1.65	30,592	19.3	5,138	9,319	37,311
2011	30,554	10.7	2,440	1.71	30,621	18.8	4,724	9,370	38,529
2012	30,446	10.8	2,849	1.83	29,766	17.2	3,739	9,566	39,415
2013	30,565	10.9	2,902	5.86	29,480	14.5	3,577	9,564	38,643
2014	30,531	11.2	2,901	21.9	29,336	12.8	4,397	9,525	38,901
2015	31,651	11.5	3,241	67.0	29,312	11.5	4,289	9,597	40,380
2016	31,707	11.8	3,154	93.5	29,193	12.5	4,087	9,403	39,033
2017	31,293	12.1	3,099	93.2	28,904	13.7	4,106	9,210	37,797

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-23.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Upper Layers - Lower Wilcox (Layer 9) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 3 of 3

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb			
	(acre-feet)								%
Predevelopment	2.94E+05	1.14	88.8	10,398	1,016	1,896	3.38E+06	0.019	5.54E-07
1980	2.99E+05	1.72	92.3	11,275	1,086	2,364	3.52E+06	-5.55E-03	-1.58E-07
1981	2.98E+05	1.60	92.1	11,291	1,096	2,369	3.55E+06	0.002	5.59E-08
1982	2.98E+05	1.65	92.1	11,247	1,076	2,349	3.50E+06	0.001	3.50E-08
1983	2.99E+05	1.72	92.1	11,254	1,100	2,476	3.49E+06	0.010	2.91E-07
1984	3.01E+05	2.03	92.4	11,270	1,141	2,345	3.50E+06	0.019	5.38E-07
1985	2.98E+05	2.24	92.2	11,320	1,130	2,591	3.53E+06	0.005	1.50E-07
1986	2.98E+05	2.34	92.2	11,226	1,101	2,528	3.50E+06	0.010	2.83E-07
1987	2.98E+05	2.17	92.2	11,200	1,092	2,540	3.50E+06	0.020	5.63E-07
1988	3.00E+05	1.67	92.4	11,346	1,097	2,361	3.47E+06	0.003	8.79E-08
1989	2.99E+05	1.68	92.1	11,201	1,143	2,317	3.49E+06	0.032	9.22E-07
1990	2.99E+05	1.03	92.0	11,405	1,165	2,328	3.51E+06	0.004	1.21E-07
1991	2.99E+05	1.67	92.0	11,499	1,125	2,202	3.61E+06	0.003	6.97E-08
1992	2.99E+05	1.76	92.3	11,583	1,124	2,270	3.62E+06	0.003	7.60E-08
1993	2.99E+05	2.99	92.1	11,343	1,061	2,286	3.56E+06	0.025	7.13E-07
1994	2.99E+05	3.07	92.2	11,419	1,083	2,333	3.59E+06	0.027	7.50E-07
1995	3.00E+05	2.76	92.1	11,458	1,074	2,323	3.57E+06	-1.10E-02	-3.09E-07
1996	3.02E+05	2.53	92.3	11,513	1,104	2,320	3.56E+06	0.010	2.72E-07
1997	2.99E+05	2.63	91.9	11,540	1,122	2,382	3.56E+06	0.008	2.21E-07
1998	2.99E+05	2.34	91.8	11,619	1,091	2,397	3.60E+06	0.030	8.37E-07
1999	3.00E+05	2.43	91.8	11,589	1,077	2,383	3.56E+06	0.003	8.18E-08
2000	3.02E+05	2.19	91.9	11,612	1,134	2,454	3.65E+06	0.071	1.95E-06
2001	3.01E+05	2.35	91.6	11,503	1,106	2,471	3.58E+06	-4.63E-04	-1.29E-08
2002	3.01E+05	2.25	91.6	11,612	1,138	2,539	3.72E+06	0.006	1.74E-07
2003	3.00E+05	2.39	91.6	11,493	1,070	2,557	3.62E+06	8.61E-04	2.38E-08
2004	3.00E+05	2.56	91.8	11,527	1,090	2,627	3.66E+06	0.009	2.41E-07
2005	3.00E+05	2.46	91.5	11,346	1,040	2,607	3.58E+06	-2.97E-04	-8.30E-09
2006	3.00E+05	2.41	91.5	11,282	1,070	2,530	3.54E+06	5.32E-04	1.50E-08
2007	2.97E+05	2.74	91.5	11,376	1,109	2,698	3.65E+06	0.004	1.11E-07
2008	3.00E+05	2.39	91.7	11,278	1,044	2,677	3.62E+06	0.001	3.02E-08
2009	3.02E+05	1.97	91.4	11,381	1,117	2,652	3.75E+06	0.012	3.08E-07
2010	3.06E+05	1.56	91.3	11,575	1,177	2,718	3.82E+06	0.005	1.18E-07
2011	3.08E+05	1.53	91.3	11,573	1,198	2,733	3.78E+06	0.016	4.23E-07
2012	3.00E+05	0.729	91.4	11,385	1,153	2,803	3.65E+06	0.034	9.32E-07
2013	2.98E+05	0.018	90.9	11,316	1,124	2,859	3.64E+06	0.002	4.25E-08
2014	2.98E+05	0	90.7	11,283	1,161	2,988	3.62E+06	0.086	2.37E-06
2015	2.96E+05	0	90.6	11,361	1,156	3,399	3.69E+06	-1.45E-03	-3.94E-08
2016	2.96E+05	0	91.1	11,366	1,110	3,375	3.66E+06	0.006	1.57E-07
2017	2.96E+05	0	91.3	11,275	1,092	3,259	3.62E+06	1.15E-04	3.19E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Quarternary Alluvium (Layer 1) - Inflows, Page 1 of 3

Simulated Time Period	Inflows							
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)							
Predevelopment	0	0	2.65E+05	1.81E+05	0.796	4.97E+05	110.7	7.46E+05
1980	0	0	3.00E+05	1.71E+05	0.794	5.47E+05	107.9	7.49E+05
1981	310.6	38.1	2.93E+05	2.19E+05	0.792	5.41E+05	114.0	7.47E+05
1982	3,659	15,932	2.93E+05	1.48E+05	0.792	5.40E+05	106.6	7.47E+05
1983	2,308	7,178	2.91E+05	1.51E+05	0.792	5.38E+05	105.7	7.47E+05
1984	10,915	28,268	2.92E+05	1.29E+05	0.794	5.41E+05	101.8	7.49E+05
1985	3,383	2,180	2.87E+05	2.06E+05	0.792	5.35E+05	110.5	7.47E+05
1986	1,669	185.6	2.87E+05	1.95E+05	0.792	5.34E+05	110.8	7.47E+05
1987	168.6	17.6	2.85E+05	1.97E+05	0.792	5.31E+05	112.1	7.47E+05
1988	10,866	46,928	2.90E+05	91,159	0.794	5.37E+05	99.0	7.49E+05
1989	17,673	25,539	2.92E+05	1.21E+05	0.792	5.39E+05	98.9	7.47E+05
1990	3,557	2,057	2.90E+05	1.80E+05	0.792	5.39E+05	105.5	7.47E+05
1991	48,568	20,881	2.90E+05	2.15E+05	0.792	5.42E+05	111.5	7.47E+05
1992	31,487	10,628	2.88E+05	2.43E+05	0.794	5.44E+05	119.5	7.49E+05
1993	37,326	37,091	2.90E+05	1.55E+05	0.792	5.46E+05	108.6	7.47E+05
1994	36,418	17,638	2.90E+05	1.96E+05	0.792	5.50E+05	112.7	7.47E+05
1995	34,525	36,177	2.92E+05	1.51E+05	0.792	5.53E+05	107.5	7.47E+05
1996	33,173	51,026	2.96E+05	1.07E+05	0.794	5.59E+05	100.3	7.50E+05
1997	7,189	1,113	2.91E+05	2.11E+05	0.792	5.53E+05	111.2	7.47E+05
1998	36,770	9,502	2.93E+05	2.11E+05	0.792	5.56E+05	113.2	7.47E+05
1999	31,026	46,356	2.96E+05	1.21E+05	0.792	5.60E+05	102.9	7.47E+05
2000	57,247	31,579	2.97E+05	1.84E+05	0.794	5.70E+05	109.1	7.50E+05
2001	25,252	16,221	2.96E+05	1.65E+05	0.792	5.69E+05	107.0	7.47E+05
2002	49,721	18,362	2.95E+05	2.80E+05	0.792	5.73E+05	126.0	7.47E+05
2003	28,002	15,119	2.96E+05	2.04E+05	0.792	5.73E+05	120.5	7.47E+05
2004	15,960	1,189	2.98E+05	2.68E+05	0.794	5.72E+05	133.3	7.49E+05
2005	18,639	46,035	3.02E+05	1.36E+05	0.792	5.72E+05	112.6	7.48E+05
2006	8,123	27,908	3.01E+05	1.21E+05	0.792	5.71E+05	104.9	7.48E+05
2007	7,326	33.5	2.93E+05	2.90E+05	0.792	5.65E+05	129.2	7.47E+05
2008	51,800	69,120	3.01E+05	1.15E+05	0.795	5.74E+05	105.6	7.50E+05
2009	1.13E+05	73,699	3.00E+05	1.65E+05	0.792	5.88E+05	108.6	7.47E+05
2010	1.13E+05	75,458	3.07E+05	2.06E+05	0.792	6.03E+05	113.2	7.48E+05
2011	1.04E+05	1.24E+05	3.14E+05	95,334	0.792	6.16E+05	99.6	7.48E+05
2012	25,772	15,917	3.10E+05	1.64E+05	0.794	6.05E+05	105.6	7.51E+05
2013	20,580	7,552	3.07E+05	1.80E+05	0.792	5.97E+05	107.5	7.50E+05
2014	18,688	11,074	3.06E+05	1.60E+05	0.792	5.94E+05	105.5	7.52E+05
2015	17,107	1,165	3.01E+05	2.64E+05	0.792	5.86E+05	120.9	7.53E+05
2016	8,352	539.4	3.01E+05	2.52E+05	0.794	5.81E+05	127.3	7.55E+05
2017	9,918	7,358	3.02E+05	2.06E+05	0.792	5.78E+05	123.1	7.53E+05

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Quarternary Alluvium (Layer 1) - Inflows, Page 2 of 3

Simulated Time Period	Inflows							
	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD
	(acre-feet)							
Predevelopment	30,985	244.4	47,203	929.1	25,897	400.0	17,579	7,756
1980	31,793	244.7	47,373	931.4	29,480	401.1	18,029	14,017
1981	31,757	244.0	47,230	928.8	29,191	400.0	17,843	13,026
1982	31,776	244.0	47,248	928.9	28,577	400.0	17,987	12,526
1983	31,891	244.0	47,271	928.9	28,546	400.0	18,048	12,393
1984	32,429	244.7	47,436	931.4	30,056	401.1	18,202	12,001
1985	31,951	244.0	47,261	928.9	29,017	400.0	18,004	11,905
1986	31,765	244.0	47,231	928.9	28,457	400.0	17,953	11,566
1987	31,689	244.0	47,226	928.8	28,188	400.0	17,903	11,313
1988	31,910	244.7	47,484	931.4	27,651	401.1	18,136	11,205
1989	32,175	244.1	47,351	928.9	27,838	400.0	18,210	11,381
1990	32,160	244.1	47,297	928.9	28,122	400.0	18,225	11,445
1991	31,977	244.1	47,254	928.9	28,201	400.0	17,967	11,414
1992	31,958	244.7	47,353	931.4	28,269	401.1	17,972	11,373
1993	31,666	244.1	47,243	928.9	27,864	400.0	17,980	11,218
1994	31,759	244.1	47,240	928.9	28,718	400.0	18,023	11,363
1995	31,806	244.1	47,269	928.9	28,864	400.0	18,078	11,381
1996	32,133	244.8	47,487	931.5	29,014	401.1	18,403	11,539
1997	31,998	244.1	47,280	928.9	29,273	400.0	18,124	11,706
1998	31,842	244.1	47,239	928.9	29,163	400.0	18,023	11,591
1999	31,951	244.1	47,307	928.9	28,741	400.0	18,140	11,495
2000	32,288	244.8	47,413	931.4	29,512	401.1	18,374	11,719
2001	32,080	244.1	47,273	928.9	29,275	400.0	18,165	11,648
2002	32,087	244.1	47,256	928.9	30,050	400.0	18,105	11,744
2003	31,864	244.1	47,211	928.9	29,521	400.0	18,019	11,511
2004	31,841	244.7	47,331	931.4	29,789	401.1	18,061	11,560
2005	31,793	244.1	47,275	928.9	29,040	400.0	18,205	11,359
2006	31,929	244.1	47,333	928.9	28,971	400.0	18,289	11,506
2007	31,685	244.1	47,245	928.9	29,732	400.0	17,947	11,640
2008	31,828	244.7	47,422	931.4	28,954	401.1	18,263	11,392
2009	32,184	244.1	47,296	928.9	29,653	400.0	18,418	11,711
2010	32,607	244.1	47,282	928.9	30,528	400.0	18,776	11,958
2011	32,969	244.2	47,431	928.9	30,212	400.0	19,034	12,062
2012	32,372	244.9	47,683	931.5	30,122	401.1	18,450	12,354
2013	32,020	244.2	47,502	928.9	29,875	400.0	18,202	12,338
2014	31,961	244.2	47,589	928.9	29,626	400.0	18,632	12,310
2015	31,872	244.2	47,527	928.9	29,971	400.1	18,259	12,339
2016	31,703	244.8	47,572	931.4	29,643	401.2	18,107	12,105
2017	31,654	244.2	47,543	928.8	29,154	400.1	18,180	11,905

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Quarternary Alluvium (Layer 1) - Inflows, Page 3 of 3

Simulated Time Period	Inflows							Total Inflows
	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	
	(acre-feet)							
Predevelopment	4.62E+05	3.07E+05	58.9	46.8	10,316	3,869	3.43E+05	2.95E+06
1980	4.93E+05	3.15E+05	59.1	46.9	12,680	4,096	3.46E+05	3.08E+06
1981	4.90E+05	3.13E+05	58.9	46.8	12,757	3,978	3.44E+05	3.11E+06
1982	4.91E+05	3.14E+05	58.9	46.8	12,635	4,083	3.45E+05	3.05E+06
1983	4.91E+05	3.15E+05	58.9	46.8	12,676	4,154	3.45E+05	3.05E+06
1984	4.94E+05	3.17E+05	59.1	46.9	12,625	4,289	3.47E+05	3.07E+06
1985	4.92E+05	3.14E+05	58.9	46.8	12,808	4,106	3.45E+05	3.09E+06
1986	4.89E+05	3.14E+05	58.9	46.8	12,446	4,042	3.44E+05	3.07E+06
1987	4.86E+05	3.13E+05	58.9	46.8	12,305	4,007	3.44E+05	3.06E+06
1988	4.91E+05	3.16E+05	59.1	46.9	12,896	4,281	3.47E+05	3.03E+06
1989	4.91E+05	3.16E+05	58.9	46.8	12,494	4,349	3.46E+05	3.05E+06
1990	4.90E+05	3.15E+05	58.9	46.8	13,130	4,256	3.45E+05	3.07E+06
1991	4.91E+05	3.14E+05	58.9	46.8	13,371	4,065	3.44E+05	3.17E+06
1992	4.91E+05	3.14E+05	59.1	46.9	13,506	3,954	3.44E+05	3.17E+06
1993	4.91E+05	3.14E+05	58.9	46.8	12,653	4,026	3.45E+05	3.12E+06
1994	4.91E+05	3.14E+05	58.9	46.8	12,673	4,009	3.44E+05	3.14E+06
1995	4.93E+05	3.15E+05	58.9	46.8	12,728	4,099	3.45E+05	3.12E+06
1996	4.96E+05	3.18E+05	59.1	46.9	12,810	4,303	3.47E+05	3.11E+06
1997	4.93E+05	3.15E+05	58.9	46.8	12,811	4,116	3.45E+05	3.12E+06
1998	4.92E+05	3.14E+05	58.9	46.8	13,014	4,006	3.44E+05	3.16E+06
1999	4.93E+05	3.16E+05	58.9	46.8	12,951	4,185	3.46E+05	3.11E+06
2000	4.95E+05	3.18E+05	59.1	46.9	12,877	4,185	3.46E+05	3.21E+06
2001	4.94E+05	3.17E+05	58.9	46.8	12,678	4,163	3.45E+05	3.13E+06
2002	4.95E+05	3.16E+05	58.9	46.8	12,823	3,934	3.43E+05	3.28E+06
2003	4.94E+05	3.16E+05	58.9	46.8	12,589	3,920	3.44E+05	3.17E+06
2004	4.94E+05	3.15E+05	59.1	46.9	12,659	3,824	3.44E+05	3.21E+06
2005	4.94E+05	3.16E+05	58.9	46.8	12,382	4,001	3.45E+05	3.13E+06
2006	4.95E+05	3.16E+05	58.9	46.8	12,364	4,170	3.46E+05	3.09E+06
2007	4.92E+05	3.12E+05	58.9	46.8	12,562	3,860	3.43E+05	3.21E+06
2008	4.95E+05	3.16E+05	59.1	46.9	12,298	4,085	3.47E+05	3.17E+06
2009	4.98E+05	3.18E+05	58.9	46.8	12,501	4,165	3.46E+05	3.31E+06
2010	4.99E+05	3.21E+05	58.9	46.8	12,735	4,171	3.45E+05	3.38E+06
2011	5.03E+05	3.24E+05	58.9	46.8	12,690	4,462	3.47E+05	3.34E+06
2012	5.04E+05	3.16E+05	59.1	46.9	12,677	4,357	3.47E+05	3.20E+06
2013	5.02E+05	3.13E+05	58.9	46.8	12,630	4,263	3.46E+05	3.18E+06
2014	5.02E+05	3.13E+05	58.9	46.8	12,594	4,369	3.46E+05	3.16E+06
2015	4.99E+05	3.11E+05	58.9	46.8	12,745	4,128	3.44E+05	3.23E+06
2016	4.98E+05	3.10E+05	59.1	47.0	12,681	4,011	3.44E+05	3.21E+06
2017	4.97E+05	3.10E+05	58.9	46.8	12,538	4,080	3.44E+05	3.16E+06

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 3

Simulated Time Period	Outflows								
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)								
Predevelopment	0	0	0	3.31E+05	22,720	1.32	4.66E+05	7.08	8.86E+05
1980	0	0	2.31E+05	3.13E+05	12,090	1.32	4.30E+05	6.01	8.85E+05
1981	16,025	40,335	1.91E+05	3.14E+05	15,260	1.31	4.32E+05	7.94	8.84E+05
1982	7,016	8,114	1.97E+05	3.14E+05	11,597	1.31	4.30E+05	5.83	8.83E+05
1983	13,431	11,636	1.79E+05	3.14E+05	11,152	1.31	4.30E+05	5.43	8.83E+05
1984	2,848	4,670	2.20E+05	3.15E+05	9,271	1.32	4.30E+05	3.77	8.84E+05
1985	18,319	43,166	1.72E+05	3.16E+05	13,512	1.31	4.33E+05	6.83	8.84E+05
1986	20,043	29,898	1.60E+05	3.15E+05	14,148	1.31	4.33E+05	7.02	8.84E+05
1987	25,363	33,980	1.38E+05	3.16E+05	14,717	1.31	4.35E+05	7.46	8.84E+05
1988	3,323	2,920	1.90E+05	3.15E+05	8,385	1.32	4.30E+05	3.11	8.83E+05
1989	1,652	2,431	2.19E+05	3.12E+05	8,754	1.31	4.28E+05	2.44	8.81E+05
1990	4,834	19,123	2.04E+05	3.13E+05	11,947	1.31	4.29E+05	5.04	8.82E+05
1991	2,545	23,929	2.89E+05	3.14E+05	14,858	1.31	4.31E+05	7.14	8.84E+05
1992	4,993	29,454	2.63E+05	3.17E+05	17,659	1.32	4.34E+05	8.84	8.88E+05
1993	1,736	1,640	2.68E+05	3.14E+05	12,859	1.31	4.29E+05	6.57	8.83E+05
1994	1,185	7,307	2.83E+05	3.14E+05	14,134	1.31	4.29E+05	7.63	8.84E+05
1995	386.8	222.1	2.85E+05	3.13E+05	11,483	1.31	4.27E+05	6.10	8.83E+05
1996	278.7	38.5	2.87E+05	3.12E+05	8,370	1.32	4.24E+05	3.42	8.84E+05
1997	14,290	38,741	2.21E+05	3.14E+05	13,507	1.31	4.28E+05	7.04	8.84E+05
1998	2,855	16,373	2.91E+05	3.14E+05	14,886	1.31	4.27E+05	7.73	8.84E+05
1999	4,615	1,757	2.81E+05	3.12E+05	9,748	1.31	4.23E+05	4.62	8.82E+05
2000	1,211	6,923	3.62E+05	3.13E+05	11,904	1.32	4.23E+05	6.34	8.85E+05
2001	3,093	2,137	2.99E+05	3.12E+05	11,180	1.31	4.21E+05	5.80	8.82E+05
2002	2,974	41,465	3.76E+05	3.14E+05	17,817	1.31	4.24E+05	10.00	8.86E+05
2003	1,626	3,634	3.25E+05	3.13E+05	14,864	1.31	4.23E+05	8.62	8.84E+05
2004	9,499	36,779	2.98E+05	3.15E+05	18,600	1.32	4.27E+05	10.6	8.88E+05
2005	2,244	2,004	3.00E+05	3.11E+05	10,995	1.31	4.21E+05	7.08	8.82E+05
2006	11,543	7,191	2.52E+05	3.11E+05	8,887	1.31	4.20E+05	5.33	8.81E+05
2007	16,751	81,748	2.36E+05	3.16E+05	18,184	1.31	4.29E+05	10.4	8.86E+05
2008	395.8	144.1	3.41E+05	3.12E+05	9,624	1.32	4.22E+05	5.77	8.84E+05
2009	166.2	1,113	4.82E+05	3.11E+05	10,716	1.31	4.18E+05	6.33	8.83E+05
2010	406.1	6,776	5.52E+05	3.09E+05	12,858	1.31	4.13E+05	7.71	8.83E+05
2011	6.57	3.35	5.52E+05	3.06E+05	7,224	1.31	4.07E+05	3.42	8.79E+05
2012	32,027	39,097	3.15E+05	3.08E+05	9,672	1.32	4.13E+05	5.01	8.81E+05
2013	11,621	30,557	3.30E+05	3.08E+05	11,027	1.31	4.14E+05	5.81	8.76E+05
2014	13,192	18,513	3.27E+05	3.08E+05	10,279	1.31	4.14E+05	5.19	8.72E+05
2015	36,067	82,609	2.88E+05	3.10E+05	16,222	1.31	4.19E+05	9.20	8.70E+05
2016	25,379	54,298	2.85E+05	3.11E+05	17,249	1.32	4.22E+05	9.76	8.73E+05
2017	13,474	19,451	3.08E+05	3.09E+05	14,951	1.31	4.19E+05	8.86	8.69E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 3

Simulated Time Period	Outflows								
	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD
	(acre-feet)								
Predevelopment	35,615	244.1	72,366	884.9	23,657	408.9	14,186	6,494	4.80E+05
1980	33,349	244.5	71,933	887.1	21,725	410.0	12,421	4,840	4.68E+05
1981	33,720	243.8	72,449	884.7	22,021	408.9	13,130	4,964	4.69E+05
1982	33,026	243.8	71,690	884.7	21,929	408.9	12,376	4,883	4.67E+05
1983	32,757	243.8	71,473	884.7	21,935	408.9	12,137	4,880	4.67E+05
1984	31,923	244.5	71,230	887.1	21,338	410.0	11,700	4,876	4.67E+05
1985	32,925	243.8	71,937	884.7	22,031	408.9	12,438	5,009	4.68E+05
1986	33,246	243.8	72,095	884.7	22,240	408.9	12,577	5,070	4.69E+05
1987	33,532	243.8	72,227	884.7	22,391	408.9	12,780	5,133	4.69E+05
1988	32,406	244.5	71,031	887.1	22,163	410.0	11,641	4,956	4.66E+05
1989	31,860	243.8	70,673	884.7	22,077	408.9	11,380	4,927	4.65E+05
1990	32,257	243.8	71,340	884.7	22,277	408.9	11,698	5,031	4.67E+05
1991	32,986	243.8	72,107	884.7	22,473	408.9	12,545	5,126	4.69E+05
1992	33,785	244.5	73,022	887.1	22,759	410.0	13,127	5,239	4.72E+05
1993	33,222	243.8	71,880	884.7	22,485	408.9	12,447	5,094	4.67E+05
1994	33,533	243.8	72,138	884.7	22,222	408.9	12,632	5,137	4.68E+05
1995	33,038	243.8	71,588	884.7	21,966	408.9	12,184	5,048	4.67E+05
1996	32,267	244.4	70,970	887.1	21,765	410.0	11,396	4,931	4.66E+05
1997	33,049	243.8	71,852	884.7	22,024	408.9	12,248	5,069	4.68E+05
1998	33,454	243.8	72,249	884.7	22,107	408.9	12,606	5,108	4.69E+05
1999	32,464	243.8	71,165	884.7	21,858	408.9	11,762	4,951	4.65E+05
2000	32,647	244.4	71,748	887.1	21,921	410.0	11,876	5,029	4.68E+05
2001	32,513	243.8	71,464	884.7	21,854	408.9	11,862	4,988	4.66E+05
2002	33,841	243.8	73,088	884.7	22,129	408.9	13,012	5,204	4.70E+05
2003	33,643	243.8	72,615	884.7	22,053	408.9	12,860	5,123	4.68E+05
2004	34,815	244.5	73,711	887.1	22,364	410.0	13,814	5,265	4.72E+05
2005	33,404	243.8	71,937	884.6	21,975	408.9	12,534	5,034	4.66E+05
2006	32,781	243.8	71,213	884.6	21,862	408.9	11,970	4,945	4.64E+05
2007	34,933	243.8	73,370	884.7	22,414	408.9	13,959	5,245	4.71E+05
2008	33,300	244.5	71,737	887.1	22,001	410.0	12,350	4,991	4.66E+05
2009	32,800	243.8	71,509	884.6	21,804	408.9	11,942	4,973	4.65E+05
2010	32,516	243.7	71,877	884.6	21,687	408.9	11,737	4,999	4.67E+05
2011	31,065	243.7	70,516	884.6	21,366	408.9	10,559	4,761	4.62E+05
2012	32,166	244.3	70,315	887.0	21,760	410.0	11,296	4,827	4.65E+05
2013	32,595	243.7	70,238	884.6	21,827	408.9	11,715	4,844	4.65E+05
2014	32,482	243.6	69,819	884.6	21,812	408.8	11,050	4,810	4.64E+05
2015	33,782	243.6	70,812	884.6	22,255	408.8	12,300	5,017	4.69E+05
2016	34,464	244.3	71,430	887.1	22,463	409.9	12,837	5,085	4.71E+05
2017	33,987	243.6	70,461	884.6	22,359	408.8	12,354	5,025	4.68E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.1 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Quarternary Alluvium (Layer 1) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 3 of 3

Simulated Time Period	Outflows						Total Outflows	Net Flows In-Out	Percent Discrepancy
	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb			
	(acre-feet)								%
Predevelopment	2.90E+05	50.0	46.4	11,259	3,876	3.00E+05	2.95E+06	0.022	7.40E-07
1980	2.84E+05	50.1	46.5	9,248	3,446	2.99E+05	3.08E+06	-5.56E-03	-1.80E-07
1981	2.84E+05	50.0	46.4	9,397	3,578	2.98E+05	3.11E+06	0.002	6.44E-08
1982	2.83E+05	50.0	46.4	9,163	3,414	2.98E+05	3.05E+06	0.001	4.09E-08
1983	2.82E+05	50.0	46.4	9,122	3,354	2.97E+05	3.05E+06	0.010	3.34E-07
1984	2.82E+05	50.1	46.5	9,069	3,218	2.98E+05	3.07E+06	0.019	6.14E-07
1985	2.84E+05	50.0	46.4	9,276	3,410	2.98E+05	3.09E+06	0.005	1.73E-07
1986	2.84E+05	50.0	46.4	9,429	3,459	2.98E+05	3.07E+06	0.010	3.24E-07
1987	2.84E+05	50.0	46.4	9,524	3,506	2.98E+05	3.06E+06	0.020	6.39E-07
1988	2.82E+05	50.1	46.5	8,891	3,223	2.98E+05	3.03E+06	0.003	1.01E-07
1989	2.82E+05	50.0	46.4	9,021	3,150	2.97E+05	3.05E+06	0.032	1.06E-06
1990	2.83E+05	50.0	46.4	9,022	3,243	2.98E+05	3.07E+06	0.004	1.39E-07
1991	2.83E+05	50.0	46.4	9,078	3,452	2.98E+05	3.17E+06	0.002	7.87E-08
1992	2.85E+05	50.1	46.5	9,183	3,634	2.99E+05	3.17E+06	0.003	8.67E-08
1993	2.83E+05	50.0	46.4	9,132	3,479	2.98E+05	3.12E+06	0.025	8.17E-07
1994	2.83E+05	50.0	46.4	9,282	3,551	2.98E+05	3.14E+06	0.027	8.56E-07
1995	2.82E+05	50.0	46.4	9,098	3,440	2.98E+05	3.12E+06	-1.10E-02	-3.51E-07
1996	2.81E+05	50.1	46.5	8,908	3,254	2.98E+05	3.11E+06	0.010	3.11E-07
1997	2.82E+05	50.0	46.4	9,280	3,459	2.98E+05	3.12E+06	0.008	2.54E-07
1998	2.83E+05	50.0	46.4	9,250	3,569	2.98E+05	3.16E+06	0.030	9.56E-07
1999	2.81E+05	50.0	46.4	8,913	3,340	2.97E+05	3.11E+06	0.003	9.36E-08
2000	2.81E+05	50.1	46.5	9,206	3,392	2.98E+05	3.21E+06	0.071	2.22E-06
2001	2.81E+05	50.0	46.4	9,190	3,373	2.97E+05	3.13E+06	-4.44E-04	-1.42E-08
2002	2.82E+05	50.0	46.4	9,666	3,728	2.99E+05	3.28E+06	0.007	1.99E-07
2003	2.82E+05	50.0	46.4	9,499	3,666	2.98E+05	3.17E+06	8.61E-04	2.71E-08
2004	2.84E+05	50.1	46.5	9,784	3,960	3.00E+05	3.21E+06	0.009	2.73E-07
2005	2.81E+05	50.0	46.4	9,310	3,576	2.98E+05	3.13E+06	-2.80E-04	-8.93E-09
2006	2.81E+05	50.0	46.4	9,166	3,416	2.97E+05	3.09E+06	5.33E-04	1.72E-08
2007	2.86E+05	50.0	46.4	9,817	3,942	2.99E+05	3.21E+06	0.004	1.28E-07
2008	2.82E+05	50.1	46.5	9,279	3,511	2.98E+05	3.17E+06	0.001	3.43E-08
2009	2.80E+05	50.0	46.4	9,308	3,434	2.98E+05	3.31E+06	0.012	3.51E-07
2010	2.77E+05	50.0	46.4	9,435	3,429	2.98E+05	3.38E+06	0.005	1.34E-07
2011	2.74E+05	50.0	46.4	9,019	3,113	2.97E+05	3.34E+06	0.016	4.80E-07
2012	2.83E+05	50.1	46.5	9,221	3,244	2.98E+05	3.20E+06	0.034	1.07E-06
2013	2.84E+05	50.0	46.4	9,294	3,308	2.98E+05	3.18E+06	0.002	4.97E-08
2014	2.83E+05	50.0	46.4	9,240	3,190	2.97E+05	3.16E+06	0.086	2.73E-06
2015	2.87E+05	50.0	46.4	9,670	3,474	2.98E+05	3.23E+06	-1.43E-03	-4.41E-08
2016	2.88E+05	50.1	46.5	9,779	3,608	2.99E+05	3.21E+06	0.006	1.80E-07
2017	2.87E+05	50.0	46.4	9,622	3,486	2.98E+05	3.16E+06	1.67E-04	5.29E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - (Layer 2) - Inflows, Page 1 of 2

Simulated Time Period	Inflows							
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD
	(acre-feet)							
Predevelopment	0	0	1.11E+05	1.79E+05	4,028	55,707	2,833	11,249
1980	0	0	1.14E+05	1.69E+05	4,053	82,992	2,862	11,650
1981	310.6	38.0	1.13E+05	2.17E+05	4,041	79,138	2,841	11,523
1982	3,658	15,897	1.14E+05	1.46E+05	4,041	77,760	2,853	11,582
1983	2,308	7,168	1.14E+05	1.50E+05	4,041	76,160	2,857	11,577
1984	10,914	28,248	1.15E+05	1.27E+05	4,052	75,693	2,872	11,639
1985	3,383	2,180	1.13E+05	2.04E+05	4,041	74,329	2,849	11,526
1986	1,669	176.6	1.13E+05	1.93E+05	4,041	75,097	2,845	11,474
1987	168.6	17.4	1.13E+05	1.95E+05	4,040	73,339	2,842	11,462
1988	10,865	46,853	1.15E+05	90,252	4,051	74,566	2,874	11,620
1989	17,671	25,497	1.15E+05	1.20E+05	4,041	76,969	2,871	11,638
1990	3,556	2,052	1.14E+05	1.78E+05	4,041	77,057	2,860	11,583
1991	48,568	20,877	1.13E+05	2.13E+05	4,041	77,313	2,845	11,473
1992	31,487	10,627	1.13E+05	2.40E+05	4,052	76,436	2,839	11,430
1993	37,325	37,039	1.14E+05	1.54E+05	4,040	76,633	2,849	11,481
1994	36,417	17,626	1.14E+05	1.94E+05	4,040	77,061	2,853	11,459
1995	34,525	36,144	1.14E+05	1.50E+05	4,040	77,664	2,861	11,528
1996	33,171	50,969	1.16E+05	1.06E+05	4,052	79,268	2,884	11,661
1997	7,189	1,113	1.14E+05	2.09E+05	4,040	77,828	2,858	11,547
1998	36,769	9,484	1.14E+05	2.09E+05	4,040	79,304	2,843	11,489
1999	31,026	46,300	1.15E+05	1.20E+05	4,040	79,821	2,862	11,588
2000	57,245	31,542	1.15E+05	1.82E+05	4,052	82,413	2,858	11,471
2001	25,251	16,212	1.15E+05	1.63E+05	4,040	81,322	2,852	11,470
2002	49,720	18,345	1.13E+05	2.77E+05	4,040	82,957	2,824	11,335
2003	28,001	15,090	1.14E+05	2.02E+05	4,041	82,679	2,832	11,416
2004	15,957	1,131	1.14E+05	2.66E+05	4,051	83,008	2,846	11,809
2005	18,636	45,921	1.16E+05	1.34E+05	4,040	83,249	2,870	12,007
2006	8,123	27,874	1.16E+05	1.20E+05	4,040	82,121	2,885	12,045
2007	7,326	33.4	1.13E+05	2.87E+05	4,040	78,714	2,841	11,679
2008	51,795	68,971	1.17E+05	1.14E+05	4,051	81,383	2,888	12,096
2009	1.13E+05	73,647	1.16E+05	1.64E+05	4,040	83,896	2,858	11,594
2010	1.13E+05	75,380	1.15E+05	2.04E+05	4,041	91,305	2,847	11,508
2011	1.04E+05	1.24E+05	1.18E+05	94,385	4,042	95,307	2,870	11,620
2012	25,769	15,872	1.19E+05	1.63E+05	4,053	89,249	2,881	12,135
2013	20,579	7,543	1.18E+05	1.78E+05	4,043	87,167	2,855	12,102
2014	18,685	11,059	1.19E+05	1.58E+05	4,044	85,959	2,864	12,129
2015	17,104	1,156	1.18E+05	2.62E+05	4,046	83,565	2,841	12,027
2016	8,351	531.8	1.18E+05	2.49E+05	4,057	82,473	2,842	12,037
2017	9,916	7,326	1.19E+05	2.04E+05	4,047	82,744	2,840	11,827

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - (Layer 2) - Inflows, Page 2 of 2

Simulated Time Period	Inflows									Total Inflows
	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers	
	(acre-feet)									
Predevelopment	581.8	0	3,464	8,775	20,137	3,904	5,412	35,481	2.49E+06	2.93E+06
1980	608.6	1.79E-11	3,617	8,815	23,155	3,921	5,440	35,604	2.60E+06	3.06E+06
1981	606.0	8.74E-12	3,602	8,791	22,630	3,910	5,425	35,583	2.58E+06	3.09E+06
1982	605.8	2.68E-11	3,604	8,791	22,197	3,910	5,425	35,444	2.58E+06	3.04E+06
1983	605.5	0	3,605	8,791	21,752	3,911	5,425	35,471	2.58E+06	3.03E+06
1984	606.9	8.76E-12	3,615	8,815	21,381	3,921	5,440	35,545	2.60E+06	3.05E+06
1985	605.1	8.92E-12	3,600	8,791	20,345	3,910	5,425	35,592	2.58E+06	3.07E+06
1986	604.9	8.74E-12	3,601	8,790	20,324	3,910	5,424	35,544	2.57E+06	3.05E+06
1987	604.2	0	3,599	8,790	20,315	3,910	5,424	35,534	2.57E+06	3.04E+06
1988	605.9	2.65E-11	3,611	8,814	20,385	3,921	5,439	35,454	2.58E+06	3.02E+06
1989	604.8	0	3,603	8,790	20,443	3,911	5,425	35,459	2.58E+06	3.04E+06
1990	605.0	8.92E-12	3,605	8,791	20,438	3,911	5,425	35,575	2.58E+06	3.05E+06
1991	605.2	0	3,607	8,790	20,436	3,910	5,425	35,608	2.58E+06	3.15E+06
1992	606.5	0	3,617	8,814	20,533	3,921	5,439	35,713	2.59E+06	3.16E+06
1993	604.8	1.77E-11	3,609	8,790	20,453	3,910	5,424	35,442	2.59E+06	3.10E+06
1994	604.7	0	3,612	8,790	21,054	3,910	5,424	35,527	2.59E+06	3.13E+06
1995	604.8	8.74E-12	3,614	8,789	20,977	3,910	5,424	35,449	2.60E+06	3.11E+06
1996	606.8	8.94E-12	3,627	8,814	21,346	3,921	5,439	35,496	2.62E+06	3.10E+06
1997	604.8	0	3,619	8,789	20,928	3,910	5,423	35,602	2.60E+06	3.10E+06
1998	605.2	0	3,624	8,789	21,195	3,910	5,423	35,568	2.60E+06	3.14E+06
1999	605.1	0	3,613	8,789	21,301	3,910	5,424	35,405	2.61E+06	3.10E+06
2000	607.1	8.94E-12	3,618	8,814	20,914	3,921	5,438	35,724	2.63E+06	3.19E+06
2001	605.2	1.78E-11	3,607	8,789	20,944	3,910	5,424	35,583	2.62E+06	3.12E+06
2002	605.3	8.74E-12	3,607	8,789	20,993	3,910	5,423	35,783	2.62E+06	3.26E+06
2003	605.3	0	3,610	8,789	21,182	3,910	5,423	35,578	2.62E+06	3.16E+06
2004	606.7	0	3,627	8,813	22,915	3,920	5,438	35,893	2.62E+06	3.20E+06
2005	605.1	0	3,623	8,789	23,185	3,910	5,424	35,614	2.62E+06	3.12E+06
2006	604.8	8.74E-12	3,626	8,789	23,036	3,911	5,424	35,562	2.62E+06	3.08E+06
2007	603.7	0	3,620	8,788	22,311	3,909	5,423	35,809	2.60E+06	3.19E+06
2008	605.5	0	3,634	8,813	23,307	3,921	5,438	35,660	2.63E+06	3.16E+06
2009	604.6	0	3,621	8,789	21,433	3,910	5,423	35,786	2.64E+06	3.29E+06
2010	606.6	0	3,628	8,790	21,306	3,911	5,424	35,683	2.66E+06	3.36E+06
2011	608.5	3.53E-11	3,639	8,791	21,324	3,912	5,425	35,601	2.69E+06	3.32E+06
2012	610.1	3.54E-11	3,654	8,816	21,792	3,925	5,442	35,693	2.67E+06	3.18E+06
2013	609.3	1.75E-11	3,645	8,795	21,660	3,917	5,430	35,607	2.66E+06	3.17E+06
2014	610.7	8.74E-12	3,644	8,798	21,362	3,921	5,434	35,542	2.65E+06	3.15E+06
2015	612.4	8.74E-12	3,641	8,802	20,869	3,926	5,439	35,704	2.64E+06	3.22E+06
2016	614.9	0	3,647	8,829	21,100	3,938	5,457	35,723	2.63E+06	3.19E+06
2017	614.4	0	3,636	8,807	21,144	3,930	5,444	35,518	2.63E+06	3.15E+06

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows									
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
Predevelopment	0	0	0	86,377	22,701	1,010	73,699	9,436	19,320	30,113
1980	0	0	2.31E+05	83,039	12,076	999.7	59,437	9,388	19,035	29,993
1981	16,022	40,256	1.91E+05	83,512	15,240	997.3	60,950	9,397	19,070	29,918
1982	7,015	8,095	1.97E+05	82,774	11,587	997.4	61,321	9,368	19,027	29,918
1983	13,430	11,615	1.79E+05	82,599	11,144	997.5	61,948	9,363	19,031	29,919
1984	2,848	4,658	2.20E+05	82,451	9,269	1,000	62,291	9,373	19,063	30,001
1985	18,317	43,106	1.72E+05	83,090	13,492	997.8	62,565	9,387	19,086	29,921
1986	20,043	29,885	1.60E+05	83,250	14,128	997.9	62,128	9,396	19,116	29,922
1987	25,362	33,952	1.38E+05	83,387	14,697	998.2	63,006	9,400	19,131	29,926
1988	3,323	2,920	1.90E+05	82,269	8,385	1,001	62,454	9,363	19,056	30,007
1989	1,652	2,428	2.19E+05	81,953	8,754	998.0	61,032	9,329	18,972	29,921
1990	4,834	19,094	2.04E+05	82,548	11,937	997.8	61,010	9,362	19,021	29,919
1991	2,545	23,893	2.89E+05	83,246	14,837	997.8	60,959	9,397	19,111	29,917
1992	4,992	29,398	2.63E+05	84,148	17,639	1,001	61,773	9,454	19,251	30,001
1993	1,736	1,638	2.68E+05	83,000	12,846	998.0	61,325	9,382	19,112	29,919
1994	1,185	7,294	2.83E+05	83,284	14,114	998.1	61,216	9,378	19,132	29,918
1995	386.7	221.2	2.85E+05	82,752	11,473	998.0	60,940	9,357	19,075	29,916
1996	278.7	38.0	2.87E+05	82,228	8,370	1,001	60,466	9,347	19,045	29,996
1997	14,289	38,681	2.21E+05	83,035	13,489	998.0	61,009	9,370	18,987	29,915
1998	2,855	16,350	2.91E+05	83,398	14,865	997.9	60,344	9,401	19,068	29,911
1999	4,614	1,754	2.81E+05	82,355	9,746	997.9	60,148	9,351	18,977	29,914
2000	1,210	6,896	3.62E+05	82,964	11,895	1,001	59,352	9,415	19,143	29,997
2001	3,092	2,126	2.99E+05	82,649	11,173	997.9	59,694	9,381	19,068	29,917
2002	2,973	41,380	3.76E+05	84,159	17,795	997.8	59,224	9,454	19,239	29,917
2003	1,626	3,627	3.25E+05	83,659	14,844	997.8	59,340	9,423	19,145	29,916
2004	9,499	36,726	2.98E+05	84,648	18,577	1,001	59,664	9,415	19,011	29,999
2005	2,244	2,004	3.00E+05	82,813	10,990	997.9	59,161	9,304	18,738	29,915
2006	11,542	7,169	2.52E+05	82,182	8,887	998.0	59,661	9,273	18,679	29,916
2007	16,745	81,582	2.36E+05	84,340	18,163	998.5	61,494	9,398	18,998	29,924
2008	395.8	144.1	3.41E+05	82,715	9,624	1,001	60,285	9,306	18,730	30,004
2009	163.3	1,057	4.82E+05	82,588	10,711	998.2	58,991	9,363	18,984	29,918
2010	404.0	6,728	5.52E+05	82,894	12,841	997.3	56,353	9,393	19,051	29,904
2011	6.57	3.29	5.52E+05	81,522	7,224	996.4	55,132	9,332	18,934	29,889
2012	32,022	38,999	3.15E+05	81,346	9,672	998.9	57,671	9,340	18,686	29,970
2013	11,620	30,521	3.30E+05	81,006	11,027	995.6	58,093	9,366	18,624	29,885
2014	13,191	18,496	3.27E+05	80,311	10,279	994.7	58,391	9,336	18,582	29,880
2015	36,065	82,520	2.88E+05	80,830	16,202	993.6	59,334	9,392	18,674	29,874
2016	25,378	54,260	2.85E+05	81,244	17,227	995.8	59,938	9,427	18,761	29,954
2017	13,473	19,438	3.08E+05	80,169	14,935	992.4	59,309	9,384	18,786	29,867

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.2 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - (Layer 2) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers			
											%
Predevelopment	2,161	22,652	13,188	24,332	4,636	16,547	22,037	2.58E+06	2.93E+06	0.022	7.44E-07
1980	2,129	22,354	13,209	24,194	4,642	16,569	22,059	2.51E+06	3.06E+06	-5.56E-03	-1.81E-07
1981	2,148	22,304	13,173	24,150	4,630	16,524	22,028	2.52E+06	3.09E+06	0.002	6.48E-08
1982	2,121	22,300	13,173	24,164	4,630	16,524	22,006	2.51E+06	3.04E+06	0.001	4.11E-08
1983	2,117	22,296	13,173	24,183	4,630	16,524	21,993	2.51E+06	3.03E+06	0.010	3.36E-07
1984	2,111	22,355	13,209	24,267	4,642	16,569	22,032	2.51E+06	3.05E+06	0.019	6.17E-07
1985	2,139	22,304	13,173	24,256	4,630	16,525	22,000	2.52E+06	3.07E+06	0.005	1.74E-07
1986	2,147	22,304	13,173	24,261	4,630	16,525	22,014	2.52E+06	3.05E+06	0.010	3.26E-07
1987	2,150	22,307	13,174	24,264	4,631	16,526	22,024	2.52E+06	3.04E+06	0.020	6.42E-07
1988	2,109	22,364	13,209	24,326	4,642	16,570	22,032	2.51E+06	3.02E+06	0.003	1.01E-07
1989	2,096	22,297	13,173	24,246	4,629	16,525	21,951	2.50E+06	3.04E+06	0.032	1.06E-06
1990	2,117	22,294	13,173	24,236	4,629	16,524	21,971	2.51E+06	3.05E+06	0.004	1.40E-07
1991	2,144	22,289	13,173	24,236	4,630	16,525	22,004	2.51E+06	3.15E+06	0.002	7.91E-08
1992	2,172	22,351	13,210	24,299	4,643	16,570	22,103	2.53E+06	3.16E+06	0.003	8.71E-08
1993	2,133	22,284	13,174	24,233	4,630	16,526	22,017	2.51E+06	3.10E+06	0.025	8.21E-07
1994	2,147	22,280	13,174	24,178	4,631	16,526	22,022	2.51E+06	3.13E+06	0.027	8.61E-07
1995	2,129	22,275	13,174	24,183	4,630	16,526	22,003	2.50E+06	3.11E+06	-1.10E-02	-3.53E-07
1996	2,108	22,329	13,210	24,222	4,643	16,571	22,028	2.50E+06	3.10E+06	0.010	3.12E-07
1997	2,141	22,264	13,174	24,191	4,630	16,527	22,000	2.51E+06	3.10E+06	0.008	2.55E-07
1998	2,166	22,256	13,174	24,166	4,631	16,527	22,022	2.51E+06	3.14E+06	0.030	9.61E-07
1999	2,130	22,271	13,174	24,154	4,630	16,527	21,986	2.49E+06	3.10E+06	0.003	9.40E-08
2000	2,154	22,342	13,210	24,258	4,643	16,572	22,004	2.50E+06	3.19E+06	0.071	2.23E-06
2001	2,145	22,284	13,174	24,181	4,630	16,527	21,944	2.50E+06	3.12E+06	-4.44E-04	-1.42E-08
2002	2,202	22,285	13,174	24,177	4,631	16,527	21,995	2.51E+06	3.26E+06	0.007	2.00E-07
2003	2,179	22,280	13,174	24,158	4,630	16,527	22,007	2.51E+06	3.16E+06	8.62E-04	2.73E-08
2004	2,206	22,331	13,211	24,070	4,643	16,572	22,015	2.53E+06	3.20E+06	0.009	2.75E-07
2005	2,143	22,257	13,174	23,974	4,630	16,526	21,864	2.50E+06	3.12E+06	-2.80E-04	-8.97E-09
2006	2,123	22,250	13,174	23,985	4,629	16,526	21,872	2.49E+06	3.08E+06	5.33E-04	1.73E-08
2007	2,195	22,261	13,175	24,045	4,631	16,528	21,981	2.53E+06	3.19E+06	0.004	1.29E-07
2008	2,135	22,316	13,211	24,036	4,643	16,573	21,925	2.50E+06	3.16E+06	0.001	3.44E-08
2009	2,141	22,256	13,175	24,115	4,630	16,527	21,814	2.49E+06	3.29E+06	0.012	3.53E-07
2010	2,163	22,240	13,174	24,135	4,630	16,526	21,940	2.49E+06	3.36E+06	0.005	1.35E-07
2011	2,119	22,215	13,173	24,126	4,628	16,524	21,826	2.46E+06	3.32E+06	0.016	4.82E-07
2012	2,111	22,267	13,207	24,155	4,638	16,566	21,989	2.48E+06	3.18E+06	0.034	1.07E-06
2013	2,117	22,204	13,169	24,097	4,622	16,516	21,948	2.48E+06	3.17E+06	0.002	4.99E-08
2014	2,112	22,204	13,166	24,128	4,617	16,508	21,961	2.47E+06	3.15E+06	0.086	2.75E-06
2015	2,157	22,210	13,161	24,183	4,611	16,499	22,022	2.49E+06	3.22E+06	-1.43E-03	-4.43E-08
2016	2,172	22,279	13,195	24,233	4,623	16,540	22,112	2.50E+06	3.19E+06	0.006	1.81E-07
2017	2,132	22,220	13,157	24,157	4,608	16,491	22,046	2.49E+06	3.15E+06	1.67E-04	5.31E-09

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Sparta Aquifer (Layer 3) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
	(acre-feet)								
Predevelopment	0	0	80,143	1.58E+05	1,090	47,722	764.4	323.3	285.2
1980	0	0	83,524	1.49E+05	1,107	74,723	766.3	314.5	301.4
1981	310.5	38.0	82,350	1.91E+05	1,103	71,486	765.6	369.2	300.0
1982	3,606	13,740	83,436	1.29E+05	1,103	69,115	764.0	293.6	299.9
1983	2,292	6,004	83,605	1.32E+05	1,103	67,474	763.2	295.1	299.7
1984	10,880	25,954	84,379	1.12E+05	1,106	66,636	763.9	279.2	300.3
1985	3,383	2,171	82,747	1.80E+05	1,103	66,344	763.9	348.0	299.4
1986	1,664	169.0	82,632	1.70E+05	1,103	67,198	764.5	342.2	299.3
1987	168.6	17.3	82,491	1.72E+05	1,102	65,328	765.0	345.8	298.8
1988	10,762	41,057	84,740	79,691	1,106	65,216	763.7	267.4	299.7
1989	17,630	23,235	84,493	1.06E+05	1,103	68,047	761.0	270.1	299.2
1990	3,553	1,948	83,436	1.57E+05	1,103	68,814	762.4	313.5	299.4
1991	48,565	20,844	82,583	1.88E+05	1,103	69,731	765.1	363.3	299.4
1992	31,486	10,623	82,149	2.12E+05	1,106	69,252	769.4	397.9	300.0
1993	37,256	34,587	83,367	1.36E+05	1,103	68,454	765.1	301.8	299.2
1994	36,406	17,585	83,014	1.71E+05	1,102	69,415	765.4	343.5	299.1
1995	34,482	34,015	83,882	1.32E+05	1,103	69,429	764.1	296.2	299.2
1996	33,099	46,491	85,309	93,940	1,106	70,417	763.8	270.4	300.2
1997	7,189	1,082	83,367	1.84E+05	1,102	70,064	764.1	348.7	299.1
1998	36,756	9,413	83,081	1.85E+05	1,103	71,890	765.4	361.4	299.4
1999	30,946	42,164	84,751	1.06E+05	1,103	71,186	763.0	274.9	299.4
2000	57,209	30,159	84,358	1.61E+05	1,106	74,953	766.9	324.9	300.4
2001	25,223	14,440	84,390	1.44E+05	1,103	73,415	764.5	308.9	299.4
2002	49,669	15,022	82,449	2.45E+05	1,103	77,031	768.5	442.0	299.5
2003	27,956	13,897	83,471	1.79E+05	1,103	75,598	767.7	358.7	299.5
2004	15,918	576.7	82,973	2.35E+05	1,106	75,893	769.4	430.7	300.2
2005	18,493	39,546	85,046	1.18E+05	1,103	74,018	762.1	286.9	299.4
2006	8,060	22,793	85,872	1.06E+05	1,103	72,365	759.9	276.7	299.2
2007	7,326	28.7	82,761	2.54E+05	1,102	71,534	765.8	445.5	298.5
2008	51,644	63,145	85,851	1.01E+05	1,105	71,576	762.5	274.2	299.4
2009	1.12E+05	71,885	85,237	1.45E+05	1,102	75,971	763.3	304.7	299.1
2010	1.13E+05	74,539	84,871	1.80E+05	1,103	84,755	765.2	354.9	300.3
2011	1.03E+05	1.16E+05	87,266	83,340	1,104	87,081	762.2	269.3	301.4
2012	25,745	14,683	87,934	1.44E+05	1,108	79,594	764.4	302.6	302.2
2013	20,574	7,112	87,729	1.57E+05	1,105	77,672	766.6	330.8	301.9
2014	18,669	10,027	88,660	1.40E+05	1,107	76,188	766.6	318.6	302.7
2015	17,101	1,147	87,345	2.31E+05	1,108	75,326	771.6	444.4	303.8
2016	8,346	529.2	87,305	2.20E+05	1,112	74,208	776.0	435.6	305.1
2017	9,884	6,722	88,436	1.80E+05	1,110	73,923	773.9	387.7	305.1

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Sparta Aquifer (Layer 3) - Inflows, Page 2 of 2

Simulated Time Period	Inflows								Total Inflows
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers	
	(acre-feet)								
Predevelopment	153.6	263.5	704.1	1,855	282.6	848.0	4,721	2.48E+06	2.78E+06
1980	144.6	351.8	716.7	1,884	285.2	858.4	4,736	2.59E+06	2.91E+06
1981	171.5	347.5	714.5	1,900	284.4	855.8	4,730	2.57E+06	2.93E+06
1982	138.4	350.5	714.6	1,880	284.4	855.9	4,725	2.58E+06	2.89E+06
1983	136.3	352.7	714.6	1,872	284.4	855.9	4,722	2.57E+06	2.88E+06
1984	127.4	354.5	716.5	1,862	285.2	858.2	4,730	2.59E+06	2.90E+06
1985	158.2	350.0	714.3	1,882	284.3	855.6	4,724	2.57E+06	2.92E+06
1986	159.6	350.9	714.1	1,887	284.3	855.4	4,727	2.56E+06	2.90E+06
1987	162.2	350.2	713.9	1,892	284.3	855.3	4,729	2.56E+06	2.89E+06
1988	119.2	352.3	716.0	1,854	285.1	857.9	4,730	2.58E+06	2.87E+06
1989	120.7	352.5	714.1	1,839	284.4	855.7	4,713	2.58E+06	2.89E+06
1990	139.1	353.9	714.3	1,859	284.4	855.8	4,717	2.57E+06	2.90E+06
1991	167.3	356.4	714.1	1,884	284.4	855.7	4,725	2.58E+06	3.00E+06
1992	189.6	357.1	715.9	1,917	285.1	857.8	4,747	2.58E+06	3.00E+06
1993	142.9	357.6	713.8	1,894	284.3	855.3	4,729	2.58E+06	2.95E+06
1994	160.8	358.6	713.6	1,905	284.2	855.1	4,731	2.58E+06	2.97E+06
1995	139.5	359.6	713.6	1,890	284.2	855.1	4,727	2.59E+06	2.96E+06
1996	121.9	362.0	715.7	1,870	285.0	857.5	4,732	2.61E+06	2.95E+06
1997	158.8	363.1	713.5	1,895	284.2	854.9	4,726	2.59E+06	2.95E+06
1998	169.4	366.9	713.5	1,908	284.2	854.9	4,731	2.59E+06	2.99E+06
1999	129.7	356.6	713.5	1,878	284.2	855.0	4,723	2.60E+06	2.95E+06
2000	148.5	353.5	715.6	1,888	285.0	857.4	4,736	2.62E+06	3.04E+06
2001	142.9	350.8	713.6	1,870	284.2	855.0	4,722	2.61E+06	2.96E+06
2002	214.9	351.4	713.5	1,886	284.2	854.8	4,736	2.61E+06	3.09E+06
2003	171.4	353.1	713.5	1,871	284.2	854.9	4,737	2.61E+06	3.00E+06
2004	212.2	357.7	715.4	1,896	284.9	857.2	4,755	2.61E+06	3.03E+06
2005	140.9	359.7	713.6	1,842	284.2	855.0	4,728	2.61E+06	2.96E+06
2006	129.8	360.9	713.6	1,807	284.2	855.1	4,721	2.61E+06	2.92E+06
2007	215.8	357.8	713.0	1,860	284.0	854.4	4,738	2.59E+06	3.02E+06
2008	132.5	360.1	715.1	1,824	284.9	857.0	4,736	2.62E+06	3.00E+06
2009	140.8	358.4	713.3	1,819	284.1	854.7	4,718	2.63E+06	3.14E+06
2010	165.4	363.9	713.8	1,836	284.2	855.2	4,727	2.66E+06	3.20E+06
2011	120.4	371.9	714.6	1,787	284.4	855.9	4,713	2.68E+06	3.17E+06
2012	136.5	375.6	717.4	1,792	285.5	859.4	4,732	2.66E+06	3.03E+06
2013	146.8	375.4	716.9	1,789	285.2	859.1	4,723	2.65E+06	3.01E+06
2014	139.5	374.9	718.8	1,778	285.9	861.9	4,723	2.65E+06	2.99E+06
2015	201.6	372.9	721.3	1,821	286.7	865.3	4,736	2.63E+06	3.05E+06
2016	200.5	371.6	724.4	1,846	287.9	869.1	4,757	2.63E+06	3.03E+06
2017	172.2	369.5	723.8	1,835	287.5	868.5	4,744	2.62E+06	2.99E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows										
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD	Lost Pines GCD
	(acre-feet)										
Predevelopment	0	0	0	64,397	15,532	1,129	63,004	4,915	5,918	23,915	155.6
1980	0	0	2.26E+05	61,026	5,811	1,111	48,498	4,915	5,886	23,763	160.0
1981	15,940	37,162	1.87E+05	61,551	7,557	1,109	50,056	4,918	5,884	23,706	158.6
1982	7,001	7,930	1.93E+05	60,821	5,542	1,109	50,469	4,897	5,871	23,706	158.2
1983	13,414	11,368	1.76E+05	60,647	5,427	1,109	51,124	4,896	5,869	23,707	159.6
1984	2,837	4,442	2.17E+05	60,442	4,326	1,112	51,458	4,902	5,882	23,772	161.8
1985	18,239	39,557	1.70E+05	61,132	6,710	1,110	51,720	4,913	5,884	23,709	160.7
1986	20,023	28,340	1.59E+05	61,292	7,046	1,110	51,221	4,913	5,885	23,710	158.5
1987	25,334	32,469	1.37E+05	61,427	7,373	1,110	52,148	4,914	5,887	23,714	157.4
1988	3,323	2,819	1.88E+05	60,262	4,006	1,113	51,566	4,893	5,877	23,778	159.8
1989	1,650	2,381	2.17E+05	60,006	4,420	1,110	50,151	4,884	5,858	23,709	162.8
1990	4,796	16,816	2.03E+05	60,594	6,213	1,110	50,117	4,902	5,866	23,707	162.8
1991	2,486	20,426	2.87E+05	61,286	7,660	1,110	50,043	4,917	5,879	23,705	160.5
1992	4,916	25,397	2.61E+05	62,122	9,040	1,113	50,799	4,943	5,906	23,772	158.1
1993	1,734	1,573	2.66E+05	61,044	6,323	1,110	50,444	4,902	5,876	23,707	156.4
1994	1,161	6,329	2.80E+05	61,324	6,899	1,110	50,329	4,915	5,883	23,706	157.0
1995	385.2	199.6	2.83E+05	60,798	5,408	1,110	50,084	4,901	5,874	23,704	157.6
1996	278.4	34.9	2.84E+05	60,220	3,856	1,113	49,609	4,898	5,879	23,766	161.0
1997	14,214	34,992	2.19E+05	61,076	6,724	1,110	50,164	4,916	5,883	23,702	160.5
1998	2,819	14,184	2.88E+05	61,436	7,310	1,110	49,456	4,919	5,887	23,699	157.1
1999	4,611	1,752	2.78E+05	60,404	4,525	1,110	49,320	4,890	5,868	23,702	157.0
2000	1,181	5,842	3.58E+05	60,953	5,942	1,113	48,434	4,917	5,883	23,767	158.0
2001	3,087	2,112	2.94E+05	60,700	5,578	1,110	48,839	4,901	5,867	23,705	157.2
2002	2,858	35,692	3.66E+05	62,195	9,267	1,110	48,224	4,940	5,896	23,705	155.4
2003	1,616	3,091	3.19E+05	61,701	7,418	1,110	48,434	4,916	5,883	23,704	152.0
2004	9,420	33,441	2.88E+05	62,630	9,554	1,113	48,915	4,943	5,920	23,770	151.5
2005	2,243	1,957	2.88E+05	60,876	5,319	1,110	48,595	4,884	5,872	23,703	150.6
2006	11,532	7,147	2.42E+05	60,245	4,415	1,110	49,153	4,872	5,860	23,704	154.4
2007	16,570	73,805	2.28E+05	62,376	9,689	1,111	50,861	4,934	5,907	23,712	155.1
2008	395.0	91.2	3.31E+05	60,718	4,718	1,114	49,778	4,892	5,889	23,776	153.5
2009	125.3	839.4	4.76E+05	60,654	5,422	1,110	48,207	4,899	5,872	23,705	156.7
2010	366.6	5,041	5.46E+05	60,943	6,429	1,109	45,449	4,913	5,871	23,691	156.3
2011	6.55	2.57	5.45E+05	59,593	3,433	1,107	44,330	4,878	5,842	23,675	157.4
2012	31,974	38,082	3.06E+05	59,342	4,961	1,110	47,251	4,899	5,841	23,739	161.5
2013	11,593	29,311	3.21E+05	59,059	5,741	1,106	47,729	4,876	5,781	23,670	160.4
2014	13,179	18,315	3.19E+05	58,368	5,310	1,105	48,032	4,863	5,718	23,664	159.6
2015	35,942	75,802	2.80E+05	58,877	8,605	1,103	48,944	4,888	5,674	23,657	157.9
2016	25,316	50,393	2.77E+05	59,230	8,983	1,105	49,492	4,901	5,685	23,720	154.9
2017	13,464	18,811	3.01E+05	58,222	7,624	1,101	48,872	4,867	5,631	23,650	154.4

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.3 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Sparta Aquifer (Layer 3) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows							Total Outflows	Net Flows In-Out	Percent Discrepancy
	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers			
	(acre-feet)									%
Predevelopment	17,407	3,591	3,273	1,057	9,072	1,701	2.56E+06	2.78E+06	0.022	7.85E-07
1980	17,038	3,577	3,264	1,049	9,063	1,699	2.50E+06	2.91E+06	-5.56E-03	-1.91E-07
1981	17,004	3,567	3,253	1,047	9,039	1,695	2.50E+06	2.93E+06	0.002	6.83E-08
1982	17,000	3,567	3,250	1,046	9,038	1,694	2.49E+06	2.89E+06	0.001	4.33E-08
1983	16,997	3,567	3,248	1,046	9,038	1,694	2.49E+06	2.88E+06	0.010	3.53E-07
1984	17,042	3,577	3,254	1,049	9,063	1,698	2.49E+06	2.90E+06	0.019	6.50E-07
1985	17,007	3,568	3,242	1,047	9,040	1,694	2.50E+06	2.92E+06	0.005	1.84E-07
1986	17,007	3,568	3,243	1,047	9,040	1,695	2.50E+06	2.90E+06	0.010	3.43E-07
1987	17,011	3,569	3,244	1,048	9,041	1,695	2.50E+06	2.89E+06	0.020	6.76E-07
1988	17,052	3,578	3,251	1,049	9,065	1,698	2.49E+06	2.87E+06	0.003	1.06E-07
1989	16,999	3,568	3,242	1,046	9,040	1,693	2.48E+06	2.89E+06	0.032	1.12E-06
1990	16,996	3,568	3,243	1,046	9,039	1,694	2.49E+06	2.90E+06	0.004	1.47E-07
1991	16,991	3,568	3,244	1,046	9,040	1,695	2.50E+06	3.00E+06	0.002	8.32E-08
1992	17,039	3,578	3,253	1,050	9,065	1,700	2.51E+06	3.00E+06	0.003	9.17E-08
1993	16,985	3,569	3,241	1,047	9,041	1,694	2.49E+06	2.95E+06	0.025	8.63E-07
1994	16,980	3,569	3,244	1,048	9,042	1,694	2.49E+06	2.97E+06	0.027	9.05E-07
1995	16,974	3,569	3,242	1,047	9,042	1,693	2.49E+06	2.96E+06	-1.10E-02	-3.71E-07
1996	17,012	3,579	3,250	1,049	9,066	1,697	2.48E+06	2.95E+06	0.010	3.28E-07
1997	16,961	3,570	3,241	1,048	9,043	1,693	2.49E+06	2.95E+06	0.008	2.69E-07
1998	16,952	3,570	3,243	1,048	9,043	1,694	2.49E+06	2.99E+06	0.030	1.01E-06
1999	16,968	3,570	3,241	1,047	9,042	1,693	2.48E+06	2.95E+06	0.003	9.89E-08
2000	17,025	3,579	3,246	1,050	9,067	1,698	2.49E+06	3.04E+06	0.071	2.35E-06
2001	16,982	3,570	3,236	1,047	9,042	1,693	2.48E+06	2.96E+06	-4.44E-04	-1.50E-08
2002	16,983	3,570	3,237	1,048	9,043	1,695	2.50E+06	3.09E+06	0.007	2.11E-07
2003	16,977	3,570	3,237	1,047	9,043	1,694	2.49E+06	3.00E+06	8.61E-04	2.87E-08
2004	17,012	3,580	3,255	1,050	9,068	1,700	2.51E+06	3.03E+06	0.009	2.90E-07
2005	16,952	3,570	3,244	1,046	9,042	1,693	2.48E+06	2.96E+06	-2.80E-04	-9.46E-09
2006	16,943	3,570	3,241	1,046	9,042	1,692	2.47E+06	2.92E+06	5.33E-04	1.82E-08
2007	16,957	3,571	3,240	1,049	9,045	1,694	2.51E+06	3.02E+06	0.004	1.36E-07
2008	16,996	3,580	3,251	1,050	9,068	1,697	2.48E+06	3.00E+06	0.001	3.62E-08
2009	16,949	3,570	3,229	1,047	9,043	1,692	2.47E+06	3.14E+06	0.012	3.70E-07
2010	16,931	3,569	3,227	1,046	9,042	1,692	2.47E+06	3.20E+06	0.005	1.42E-07
2011	16,902	3,567	3,222	1,043	9,039	1,690	2.44E+06	3.17E+06	0.016	5.05E-07
2012	16,937	3,575	3,232	1,042	9,059	1,694	2.47E+06	3.03E+06	0.034	1.13E-06
2013	16,887	3,561	3,223	1,032	9,027	1,690	2.46E+06	3.01E+06	0.002	5.26E-08
2014	16,887	3,555	3,222	1,023	9,016	1,690	2.46E+06	2.99E+06	0.086	2.89E-06
2015	16,895	3,548	3,223	1,014	9,003	1,692	2.47E+06	3.05E+06	-1.43E-03	-4.67E-08
2016	16,950	3,554	3,235	1,014	9,022	1,697	2.49E+06	3.03E+06	0.006	1.91E-07
2017	16,907	3,541	3,227	1,008	8,991	1,692	2.47E+06	2.99E+06	1.67E-04	5.60E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Weches Formation (Layer 4) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
	(acre-feet)								
Predevelopment	0	0	80,143	1.53E+05	1,077	49,631	773.5	1,019	276.0
1980	0	0	83,524	1.45E+05	1,094	76,866	773.2	971.6	292.1
1981	310.5	38.0	82,350	1.85E+05	1,091	73,760	793.1	1,172	290.7
1982	3,598	13,523	83,436	1.25E+05	1,091	71,006	770.5	904.5	290.6
1983	2,291	5,920	83,605	1.28E+05	1,090	69,272	769.8	894.8	290.4
1984	10,876	25,767	84,379	1.09E+05	1,093	68,279	770.3	810.9	291.0
1985	3,382	2,169	82,747	1.75E+05	1,090	68,456	784.6	1,100	290.1
1986	1,662	157.9	82,632	1.65E+05	1,090	69,404	780.7	1,080	289.9
1987	168.6	17.3	82,491	1.67E+05	1,090	67,445	782.2	1,095	289.5
1988	10,747	40,439	84,740	77,263	1,093	66,781	769.5	719.6	290.3
1989	17,622	22,990	84,493	1.03E+05	1,090	69,801	767.2	771.7	289.9
1990	3,552	1,928	83,436	1.53E+05	1,090	70,915	770.2	980.7	290.0
1991	48,563	20,829	82,583	1.82E+05	1,090	72,106	790.9	1,145	290.1
1992	31,486	10,619	82,149	2.06E+05	1,093	71,760	808.5	1,284	290.7
1993	37,242	34,234	83,367	1.31E+05	1,090	70,578	771.7	950.6	289.9
1994	36,405	17,561	83,014	1.66E+05	1,090	71,718	781.4	1,086	289.8
1995	34,473	33,762	83,882	1.28E+05	1,090	71,494	770.7	909.8	289.9
1996	33,089	46,030	85,309	91,078	1,093	72,162	769.9	752.0	290.8
1997	7,188	1,081	83,367	1.79E+05	1,090	72,340	786.6	1,114	289.8
1998	36,752	9,381	83,081	1.79E+05	1,090	74,350	789.6	1,149	290.0
1999	30,933	41,684	84,751	1.03E+05	1,090	73,097	769.2	813.7	290.0
2000	57,202	30,043	84,358	1.56E+05	1,093	77,340	776.2	1,018	291.0
2001	25,219	14,353	84,390	1.40E+05	1,090	75,583	771.2	947.9	290.1
2002	49,663	14,984	82,449	2.38E+05	1,090	80,033	825.5	1,417	290.2
2003	27,946	13,727	83,471	1.73E+05	1,090	78,181	788.7	1,162	290.2
2004	15,916	571.1	82,973	2.27E+05	1,093	78,798	820.1	1,406	290.8
2005	18,470	38,950	85,046	1.15E+05	1,090	76,172	768.8	903.8	290.0
2006	8,054	22,450	85,872	1.03E+05	1,090	74,192	766.4	802.6	289.8
2007	7,326	27.3	82,761	2.46E+05	1,089	74,255	826.9	1,441	289.1
2008	51,618	62,391	85,851	97,586	1,092	73,584	768.9	834.3	290.0
2009	1.12E+05	71,667	85,237	1.40E+05	1,089	78,305	770.2	944.6	289.7
2010	1.13E+05	74,239	84,871	1.75E+05	1,090	87,693	786.4	1,120	291.0
2011	1.03E+05	1.15E+05	87,266	80,802	1,091	89,244	768.1	730.9	292.2
2012	25,742	14,633	87,934	1.39E+05	1,095	81,568	771.4	929.0	292.9
2013	20,572	7,093	87,729	1.53E+05	1,092	79,844	775.1	1,012	292.7
2014	18,665	9,970	88,660	1.35E+05	1,094	78,223	773.8	944.8	293.6
2015	17,099	1,146	87,345	2.24E+05	1,095	77,936	821.0	1,381	294.8
2016	8,345	526.1	87,305	2.13E+05	1,099	76,835	819.4	1,377	296.1
2017	9,877	6,614	88,436	1.74E+05	1,097	76,360	795.1	1,202	296.0

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Weches Formation (Layer 4) - Inflows, Page 2 of 2

Simulated Time Period	Inflows								Total Inflows
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers	
	(acre-feet)								
Predevelopment	319.4	254.6	702.4	2,549	281.5	845.0	4,914	2.48E+06	2.78E+06
1980	300.7	341.4	714.9	2,568	284.1	855.4	4,923	2.59E+06	2.91E+06
1981	367.7	337.1	712.7	2,645	283.3	852.9	4,940	2.57E+06	2.93E+06
1982	279.3	340.1	712.8	2,537	283.3	852.9	4,898	2.57E+06	2.88E+06
1983	275.6	342.4	712.8	2,530	283.3	852.9	4,898	2.57E+06	2.88E+06
1984	246.7	344.1	714.7	2,483	284.1	855.2	4,894	2.59E+06	2.90E+06
1985	340.6	339.7	712.5	2,609	283.3	852.6	4,929	2.57E+06	2.91E+06
1986	337.7	340.6	712.3	2,602	283.2	852.5	4,924	2.56E+06	2.90E+06
1987	342.9	340.0	712.1	2,611	283.2	852.3	4,927	2.56E+06	2.89E+06
1988	211.2	342.0	714.2	2,424	284.0	854.9	4,872	2.58E+06	2.87E+06
1989	229.9	342.3	712.3	2,437	283.3	852.7	4,872	2.58E+06	2.89E+06
1990	297.2	343.6	712.4	2,545	283.3	852.9	4,907	2.57E+06	2.90E+06
1991	359.3	346.1	712.3	2,620	283.3	852.7	4,932	2.57E+06	2.99E+06
1992	407.7	346.7	714.1	2,693	284.0	854.9	4,965	2.58E+06	2.99E+06
1993	293.7	347.3	712.0	2,569	283.2	852.3	4,903	2.58E+06	2.95E+06
1994	339.0	348.2	711.8	2,629	283.1	852.1	4,928	2.58E+06	2.97E+06
1995	281.2	349.3	711.8	2,556	283.1	852.1	4,901	2.59E+06	2.96E+06
1996	224.5	351.5	713.8	2,468	283.9	854.5	4,883	2.61E+06	2.95E+06
1997	343.6	352.7	711.7	2,631	283.1	851.9	4,933	2.59E+06	2.95E+06
1998	360.9	356.5	711.7	2,648	283.1	851.9	4,936	2.59E+06	2.99E+06
1999	247.9	346.1	711.7	2,500	283.1	852.0	4,881	2.60E+06	2.95E+06
2000	312.8	343.0	713.8	2,599	283.9	854.4	4,929	2.62E+06	3.04E+06
2001	294.3	340.4	711.8	2,557	283.1	852.0	4,905	2.61E+06	2.96E+06
2002	459.4	341.0	711.7	2,734	283.1	851.8	4,973	2.61E+06	3.09E+06
2003	367.0	342.6	711.7	2,632	283.1	851.9	4,940	2.61E+06	3.00E+06
2004	453.8	347.2	713.6	2,732	283.8	854.2	4,985	2.61E+06	3.03E+06
2005	280.0	349.1	711.8	2,524	283.1	852.1	4,898	2.61E+06	2.96E+06
2006	245.0	350.2	711.8	2,450	283.1	852.1	4,882	2.61E+06	2.92E+06
2007	464.9	347.2	711.1	2,711	283.0	851.4	4,983	2.59E+06	3.02E+06
2008	254.2	349.5	713.3	2,471	283.8	854.1	4,898	2.62E+06	3.00E+06
2009	290.1	347.9	711.5	2,520	283.0	851.7	4,905	2.63E+06	3.13E+06
2010	350.6	353.3	712.0	2,593	283.2	852.2	4,935	2.65E+06	3.20E+06
2011	215.9	360.8	712.8	2,394	283.3	852.9	4,862	2.68E+06	3.17E+06
2012	282.6	364.4	715.6	2,489	284.4	856.5	4,918	2.66E+06	3.02E+06
2013	308.9	364.2	715.1	2,505	284.1	856.2	4,916	2.65E+06	3.01E+06
2014	286.9	363.7	717.0	2,466	284.8	858.9	4,904	2.64E+06	2.99E+06
2015	433.5	361.8	719.5	2,639	285.6	862.4	4,968	2.63E+06	3.05E+06
2016	432.0	360.5	722.6	2,657	286.8	866.2	4,980	2.63E+06	3.03E+06
2017	368.4	358.5	722.0	2,596	286.4	865.6	4,947	2.62E+06	2.99E+06

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows									
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD
	(acre-feet)									
Predevelopment	0	0	0	64,397	14,441	1,129	63,119	4,887	5,972	24,019
1980	0	0	2.26E+05	61,026	4,878	1,111	48,474	4,886	5,940	23,867
1981	15,924	36,754	1.87E+05	61,551	6,234	1,108	50,041	4,890	5,938	23,808
1982	6,997	7,874	1.93E+05	60,821	4,766	1,108	50,449	4,869	5,926	23,809
1983	13,409	11,261	1.76E+05	60,647	4,658	1,108	51,104	4,867	5,923	23,810
1984	2,834	4,376	2.17E+05	60,442	3,739	1,112	51,432	4,873	5,937	23,875
1985	18,225	39,108	1.70E+05	61,132	5,550	1,109	51,691	4,885	5,937	23,811
1986	20,021	28,207	1.59E+05	61,292	5,904	1,109	51,194	4,885	5,939	23,813
1987	25,328	32,279	1.37E+05	61,427	6,201	1,110	52,122	4,886	5,941	23,817
1988	3,323	2,815	1.88E+05	60,262	3,655	1,113	51,532	4,864	5,932	23,881
1989	1,650	2,365	2.17E+05	60,006	3,920	1,109	50,113	4,856	5,913	23,812
1990	4,790	16,569	2.03E+05	60,594	5,288	1,109	50,086	4,874	5,920	23,810
1991	2,478	20,101	2.87E+05	61,286	6,415	1,109	50,021	4,889	5,933	23,808
1992	4,905	25,004	2.61E+05	62,122	7,504	1,112	50,780	4,915	5,960	23,875
1993	1,734	1,568	2.66E+05	61,044	5,477	1,109	50,423	4,874	5,930	23,809
1994	1,157	6,237	2.80E+05	61,324	5,775	1,109	50,307	4,887	5,937	23,809
1995	385.1	198.5	2.83E+05	60,798	4,628	1,109	50,057	4,873	5,928	23,807
1996	278.4	34.9	2.84E+05	60,220	3,430	1,112	49,569	4,869	5,933	23,869
1997	14,201	34,552	2.19E+05	61,076	5,579	1,109	50,135	4,888	5,937	23,805
1998	2,815	14,018	2.88E+05	61,436	6,049	1,109	49,429	4,891	5,941	23,801
1999	4,611	1,752	2.78E+05	60,404	3,975	1,109	49,280	4,862	5,923	23,804
2000	1,177	5,719	3.58E+05	60,953	4,973	1,112	48,393	4,889	5,937	23,870
2001	3,086	2,106	2.94E+05	60,700	4,713	1,109	48,800	4,873	5,921	23,807
2002	2,840	35,107	3.66E+05	62,195	7,476	1,109	48,197	4,912	5,951	23,807
2003	1,615	3,060	3.19E+05	61,701	6,158	1,109	48,403	4,888	5,937	23,807
2004	9,408	33,095	2.88E+05	62,630	7,778	1,112	48,889	4,914	5,973	23,873
2005	2,243	1,953	2.88E+05	60,876	4,641	1,109	48,553	4,856	5,926	23,806
2006	11,530	7,138	2.42E+05	60,245	3,906	1,109	49,108	4,844	5,914	23,806
2007	16,539	72,849	2.28E+05	62,376	7,895	1,110	50,837	4,906	5,962	23,815
2008	395.0	91.0	3.31E+05	60,718	4,190	1,113	49,737	4,864	5,943	23,879
2009	122.3	787.4	4.76E+05	60,654	4,606	1,110	48,163	4,871	5,926	23,808
2010	361.4	4,879	5.46E+05	60,943	5,283	1,108	45,409	4,885	5,925	23,793
2011	6.55	2.57	5.45E+05	59,593	3,074	1,107	44,270	4,850	5,895	23,777
2012	31,960	37,743	3.06E+05	59,342	4,194	1,109	47,197	4,871	5,894	23,842
2013	11,586	29,082	3.21E+05	59,059	4,814	1,105	47,676	4,848	5,833	23,773
2014	13,175	18,235	3.19E+05	58,368	4,508	1,104	47,977	4,835	5,769	23,767
2015	35,919	75,065	2.80E+05	58,877	6,991	1,102	48,907	4,860	5,724	23,760
2016	25,307	50,034	2.77E+05	59,230	7,346	1,104	49,461	4,873	5,736	23,823
2017	13,463	18,740	3.01E+05	58,222	6,374	1,100	48,833	4,840	5,680	23,753

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.4 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Weches Formation (Layer 4) - Outflows, Net Flows In-Out, Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers			
	(acre-feet)										%
Predevelopment	141.0	17,392	3,572	3,248	1,063	9,086	1,688	2.56E+06	2.78E+06	0.022	7.85E-07
1980	145.2	17,024	3,557	3,239	1,054	9,077	1,686	2.50E+06	2.91E+06	-5.56E-03	-1.91E-07
1981	144.1	16,990	3,548	3,229	1,052	9,053	1,682	2.50E+06	2.93E+06	0.002	6.84E-08
1982	143.3	16,986	3,547	3,226	1,052	9,053	1,682	2.49E+06	2.88E+06	0.001	4.33E-08
1983	144.6	16,982	3,547	3,223	1,052	9,053	1,681	2.49E+06	2.88E+06	0.010	3.53E-07
1984	146.2	17,027	3,557	3,230	1,054	9,078	1,685	2.49E+06	2.90E+06	0.019	6.50E-07
1985	146.0	16,992	3,548	3,218	1,052	9,054	1,682	2.50E+06	2.91E+06	0.005	1.84E-07
1986	144.0	16,993	3,549	3,219	1,053	9,055	1,682	2.50E+06	2.90E+06	0.010	3.44E-07
1987	142.9	16,997	3,549	3,220	1,053	9,055	1,683	2.50E+06	2.89E+06	0.020	6.77E-07
1988	144.0	17,038	3,558	3,226	1,054	9,079	1,685	2.49E+06	2.87E+06	0.003	1.06E-07
1989	146.9	16,985	3,548	3,217	1,051	9,054	1,680	2.48E+06	2.89E+06	0.032	1.12E-06
1990	147.7	16,982	3,548	3,219	1,051	9,053	1,681	2.49E+06	2.90E+06	0.004	1.47E-07
1991	145.9	16,976	3,548	3,219	1,052	9,054	1,682	2.50E+06	2.99E+06	0.002	8.33E-08
1992	143.6	17,024	3,558	3,229	1,055	9,079	1,688	2.51E+06	2.99E+06	0.003	9.18E-08
1993	141.8	16,971	3,549	3,216	1,053	9,055	1,682	2.49E+06	2.95E+06	0.025	8.64E-07
1994	142.5	16,966	3,550	3,219	1,053	9,056	1,682	2.49E+06	2.97E+06	0.027	9.06E-07
1995	142.7	16,959	3,550	3,217	1,053	9,056	1,681	2.48E+06	2.96E+06	-1.10E-02	-3.71E-07
1996	145.2	16,997	3,559	3,225	1,055	9,081	1,684	2.48E+06	2.95E+06	0.010	3.28E-07
1997	145.7	16,947	3,550	3,217	1,053	9,057	1,681	2.49E+06	2.95E+06	0.008	2.69E-07
1998	142.6	16,938	3,550	3,218	1,053	9,057	1,682	2.49E+06	2.99E+06	0.030	1.01E-06
1999	141.7	16,954	3,550	3,216	1,052	9,057	1,680	2.48E+06	2.95E+06	0.003	9.89E-08
2000	143.2	17,010	3,559	3,221	1,055	9,081	1,685	2.48E+06	3.04E+06	0.071	2.35E-06
2001	142.4	16,968	3,550	3,212	1,052	9,057	1,680	2.48E+06	2.96E+06	-4.44E-04	-1.50E-08
2002	140.9	16,969	3,550	3,213	1,053	9,057	1,682	2.50E+06	3.09E+06	0.007	2.11E-07
2003	137.7	16,963	3,550	3,212	1,053	9,057	1,682	2.49E+06	3.00E+06	8.61E-04	2.87E-08
2004	137.1	16,998	3,560	3,230	1,056	9,082	1,687	2.51E+06	3.03E+06	0.009	2.90E-07
2005	136.1	16,937	3,550	3,219	1,051	9,056	1,681	2.48E+06	2.96E+06	-2.80E-04	-9.46E-09
2006	139.3	16,929	3,550	3,216	1,051	9,056	1,679	2.47E+06	2.92E+06	5.33E-04	1.83E-08
2007	140.6	16,942	3,551	3,216	1,054	9,059	1,682	2.51E+06	3.02E+06	0.004	1.36E-07
2008	138.7	16,981	3,561	3,226	1,055	9,083	1,684	2.48E+06	3.00E+06	0.001	3.62E-08
2009	141.8	16,934	3,551	3,205	1,052	9,058	1,680	2.47E+06	3.13E+06	0.012	3.70E-07
2010	141.7	16,916	3,549	3,203	1,051	9,056	1,679	2.47E+06	3.20E+06	0.005	1.42E-07
2011	141.8	16,887	3,547	3,197	1,049	9,053	1,677	2.44E+06	3.17E+06	0.016	5.05E-07
2012	146.4	16,922	3,555	3,208	1,047	9,073	1,682	2.47E+06	3.02E+06	0.034	1.13E-06
2013	145.7	16,872	3,541	3,199	1,037	9,041	1,678	2.46E+06	3.01E+06	0.002	5.26E-08
2014	144.9	16,873	3,535	3,198	1,028	9,030	1,678	2.46E+06	2.99E+06	0.086	2.89E-06
2015	143.6	16,881	3,528	3,199	1,018	9,017	1,680	2.47E+06	3.05E+06	-1.43E-03	-4.67E-08
2016	140.7	16,936	3,535	3,210	1,019	9,036	1,685	2.49E+06	3.03E+06	0.006	1.91E-07
2017	140.1	16,892	3,521	3,202	1,013	9,005	1,680	2.47E+06	2.99E+06	1.67E-04	5.60E-09

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Queen City Aquifer (Layer 5) - Inflows, Page 1 of 2

Simulated Time Period	Inflows								
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD
	(acre-feet)								
Predevelopment	0	0	28,695	1.01E+05	0	18,003	201.3	349.7	68.0
1980	0	0	30,773	95,330	60.0	89,740	218.8	446.3	64.2
1981	310.5	38.0	30,249	1.22E+05	58.1	78,992	215.6	484.6	82.2
1982	3,266	9,786	30,729	82,571	56.2	75,719	214.7	411.7	55.6
1983	2,195	4,744	30,858	84,641	54.3	69,961	217.7	416.6	57.0
1984	10,602	22,001	31,268	71,898	53.0	72,947	221.1	410.8	48.4
1985	3,374	2,167	30,504	1.15E+05	52.3	67,415	220.1	486.2	77.5
1986	1,514	48.1	30,399	1.09E+05	51.9	72,212	216.4	452.3	73.2
1987	168.6	17.3	30,305	1.10E+05	50.4	65,592	214.1	453.8	74.1
1988	9,767	29,342	31,394	50,930	49.5	70,224	218.5	380.2	34.3
1989	16,719	16,352	31,403	67,667	49.8	80,039	224.5	443.7	45.5
1990	3,423	1,353	30,883	1.01E+05	50.5	79,056	226.2	545.6	67.7
1991	48,015	15,126	30,464	1.20E+05	51.3	93,436	221.6	530.0	80.8
1992	31,270	7,527	30,237	1.35E+05	51.3	91,870	216.4	519.0	91.2
1993	36,205	21,922	30,825	86,654	51.3	96,893	212.7	405.3	58.3
1994	35,920	11,345	30,757	1.09E+05	51.6	1.03E+05	213.4	450.9	73.6
1995	33,663	23,847	31,229	84,560	52.0	1.05E+05	214.5	409.4	56.9
1996	32,083	34,038	32,020	60,036	52.7	1.06E+05	220.3	413.5	40.4
1997	7,167	1,026	31,146	1.18E+05	52.4	94,221	220.9	533.4	79.3
1998	36,117	4,886	31,011	1.18E+05	53.2	1.12E+05	216.5	522.5	79.4
1999	29,845	27,588	31,847	67,660	53.7	1.13E+05	216.9	427.0	45.5
2000	55,989	17,523	31,769	1.03E+05	55.1	1.33E+05	221.3	565.3	69.1
2001	24,815	7,707	31,842	92,095	55.1	1.24E+05	219.9	520.8	62.0
2002	48,938	8,569	31,015	1.57E+05	55.8	1.41E+05	216.5	633.3	105.4
2003	27,438	7,319	31,396	1.14E+05	56.0	1.33E+05	209.3	525.0	76.9
2004	15,765	304.4	31,050	1.50E+05	55.4	1.26E+05	202.7	514.8	100.9
2005	17,429	26,528	31,975	75,729	54.5	1.22E+05	201.4	392.6	51.0
2006	7,675	17,040	32,483	67,718	53.2	1.12E+05	208.0	384.6	45.6
2007	7,326	27.3	31,139	1.62E+05	51.0	1.10E+05	207.5	493.6	109.1
2008	49,933	43,648	32,474	64,326	50.2	1.25E+05	204.9	347.1	43.3
2009	1.11E+05	51,334	32,600	92,461	51.7	1.63E+05	216.2	514.2	62.2
2010	1.10E+05	51,658	32,626	1.15E+05	56.6	1.95E+05	220.9	775.7	77.5
2011	1.01E+05	83,604	33,963	53,262	61.9	2.02E+05	226.2	842.4	35.8
2012	25,531	13,052	34,765	91,898	61.9	1.50E+05	240.5	1,604	61.8
2013	20,406	6,473	34,713	1.01E+05	60.5	1.45E+05	252.7	3,824	67.7
2014	18,422	8,555	35,277	89,301	59.3	1.38E+05	270.7	7,598	60.1
2015	16,920	1,124	34,696	1.48E+05	57.9	1.30E+05	291.6	13,925	99.3
2016	8,300	523.3	34,454	1.41E+05	56.7	1.26E+05	289.0	13,086	94.7
2017	9,587	4,711	35,161	1.15E+05	56.0	1.26E+05	294.9	14,603	77.3

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Queen City Aquifer (Layer 5) - Inflows, Page 2 of 2

Simulated Time Period	Inflows									Total Inflows
	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Gonzales	Webb	Upper Layers	
	(acre-feet)									
Predevelopment	0	304.6	0	0	9.45	127.3	0	1,403	5.63E+05	7.13E+05
1980	252.1	322.9	154.2	5.55	11.8	2,538	0	3,925	6.22E+05	8.46E+05
1981	235.9	313.1	148.4	5.57	10.3	2,506	0	3,948	6.16E+05	8.56E+05
1982	226.3	316.8	158.1	6.76	11.3	2,478	0	3,911	6.16E+05	8.26E+05
1983	217.5	324.0	167.3	7.80	12.1	2,455	0	3,909	6.16E+05	8.17E+05
1984	213.5	333.5	174.5	8.18	13.8	2,483	0	3,906	6.23E+05	8.39E+05
1985	216.5	325.7	169.9	7.72	11.9	2,516	0	3,938	6.16E+05	8.43E+05
1986	215.9	317.2	173.5	6.86	10.9	2,407	0	3,936	6.12E+05	8.33E+05
1987	205.0	312.2	173.7	5.99	10.3	2,267	0	3,932	6.08E+05	8.22E+05
1988	203.0	329.4	177.3	5.21	13.7	2,238	0	3,873	6.14E+05	8.13E+05
1989	210.4	341.4	179.0	4.45	15.9	2,258	0	3,865	6.16E+05	8.35E+05
1990	215.5	337.8	182.3	3.93	13.9	2,249	0	3,898	6.16E+05	8.39E+05
1991	221.4	323.6	189.1	3.46	11.5	2,385	0	3,953	6.17E+05	9.32E+05
1992	219.0	308.0	192.0	2.94	9.24	2,469	0	3,996	6.17E+05	9.21E+05
1993	221.0	310.2	197.5	2.35	10.6	2,501	0	3,935	6.15E+05	8.95E+05
1994	223.7	311.6	202.7	1.86	10.2	2,553	0	3,956	6.16E+05	9.15E+05
1995	227.5	317.8	208.3	1.43	11.3	2,606	0	3,941	6.19E+05	9.05E+05
1996	232.5	333.8	215.2	1.09	14.1	2,658	0	3,940	6.25E+05	8.97E+05
1997	229.7	327.4	223.4	0.852	11.9	2,647	0	4,002	6.21E+05	8.81E+05
1998	238.9	315.5	235.8	0.661	10.4	2,643	0	4,035	6.19E+05	9.29E+05
1999	239.5	324.1	216.3	0.525	12.2	2,622	0	4,006	6.22E+05	9.00E+05
2000	246.0	327.6	209.7	0.463	12.1	2,698	0	4,071	6.28E+05	9.78E+05
2001	241.0	326.1	207.0	0.424	12.1	2,703	0	4,079	6.24E+05	9.13E+05
2002	245.6	307.1	210.8	0.436	8.78	2,780	0	4,185	6.25E+05	1.02E+06
2003	244.5	298.7	215.5	0.448	8.75	2,806	0	4,175	6.22E+05	9.45E+05
2004	239.7	286.1	220.0	0.449	7.62	2,805	0	4,251	6.21E+05	9.52E+05
2005	235.3	297.9	223.5	0.415	9.45	2,769	0	4,185	6.20E+05	9.02E+05
2006	227.5	317.3	226.1	0.367	11.6	2,714	0	4,200	6.20E+05	8.65E+05
2007	214.4	300.6	226.9	0.294	8.25	2,706	0	4,336	6.14E+05	9.33E+05
2008	214.4	309.2	230.9	0.205	10.7	2,779	0	4,287	6.20E+05	9.44E+05
2009	229.6	322.4	241.9	0.176	11.7	3,009	0	4,343	6.29E+05	1.09E+06
2010	265.7	321.4	262.3	0.214	11.2	3,242	0	4,430	6.41E+05	1.15E+06
2011	295.8	336.9	285.7	0.363	15.0	3,427	0	4,435	6.49E+05	1.13E+06
2012	281.1	353.1	298.1	0.757	15.5	3,504	0	4,549	6.36E+05	9.63E+05
2013	271.1	354.6	305.0	1.51	15.2	3,515	7.90	4,624	6.30E+05	9.51E+05
2014	264.3	364.1	310.2	3.44	17.3	3,528	138.9	4,686	6.30E+05	9.37E+05
2015	255.7	359.9	312.3	8.98	14.3	3,486	389.1	4,821	6.25E+05	9.79E+05
2016	249.6	345.7	313.5	18.3	12.6	3,446	446.4	4,897	6.22E+05	9.55E+05
2017	248.2	350.7	313.4	31.5	13.8	3,398	531.8	4,907	6.20E+05	9.36E+05

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-0ut, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows										
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Live Oak UWCD	Lost Pines GCD
	(acre-feet)										
Predevelopment	0	0	0	15,086	11,142	22.9	37,886	484.4	14,291	186.8	2.71
1980	0	0	2.20E+05	12,678	3,494	0	4,996	482.1	10,753	0	1.70
1981	14,532	26,135	1.82E+05	13,148	4,796	0	6,512	481.6	10,804	0	1.89
1982	6,441	4,613	1.89E+05	12,629	3,388	0	6,711	481.5	10,680	0	2.24
1983	12,675	5,892	1.73E+05	12,478	3,292	0	7,564	481.3	10,636	0	1.79
1984	2,432	1,834	2.15E+05	12,223	2,404	0	7,293	482.6	10,494	0	1.41
1985	17,017	26,764	1.69E+05	12,778	4,148	0	7,504	481.8	10,713	0	1.07
1986	19,742	24,071	1.57E+05	12,912	4,485	0	6,640	482.0	10,956	0	1.74
1987	24,557	26,155	1.35E+05	13,016	4,762	0	7,886	482.2	10,983	0	2.13
1988	3,304	2,785	1.86E+05	12,089	2,332	0	7,030	482.8	10,323	0	2.06
1989	1,644	2,274	2.15E+05	11,949	2,613	0	5,644	481.1	10,006	0	0.936
1990	4,441	12,770	2.00E+05	12,353	3,933	0	5,617	481.1	9,698	0	0.482
1991	2,179	16,224	2.85E+05	12,882	5,017	0	5,320	481.6	10,192	0	1.08
1992	4,346	19,488	2.59E+05	13,448	6,049	0	6,026	483.3	10,549	0	2.13
1993	1,725	1,568	2.64E+05	12,766	4,114	0	5,884	481.9	10,868	0	2.65
1994	1,077	5,150	2.79E+05	12,954	4,399	0	5,804	482.2	10,989	0	2.31
1995	384.7	198.5	2.81E+05	12,573	3,288	0	5,763	482.0	10,814	0	2.23
1996	278.4	34.9	2.82E+05	12,057	2,130	0	5,567	482.8	10,313	0	1.68
1997	13,171	23,583	2.18E+05	12,720	4,226	0	6,291	481.9	10,411	0	0.985
1998	2,663	11,858	2.87E+05	13,019	4,677	0	5,314	482.3	10,400	0	1.77
1999	4,515	1,752	2.77E+05	12,284	2,663	0	5,352	481.9	10,291	0	2.04
2000	1,036	4,186	3.54E+05	12,560	3,636	0	4,552	483.2	9,905	0	1.36
2001	2,966	2,029	2.90E+05	12,478	3,386	0	5,200	481.9	9,981	0	1.49
2002	2,329	28,440	3.59E+05	13,586	6,056	0	4,564	482.6	10,094	0	1.93
2003	1,552	2,674	3.14E+05	13,297	4,778	0	5,045	482.8	10,327	0	3.12
2004	8,933	27,299	2.75E+05	13,968	6,349	0	5,671	484.9	10,916	0	4.26
2005	2,243	1,953	2.74E+05	12,802	3,319	0	5,988	483.1	10,723	0	4.32
2006	11,283	6,037	2.28E+05	12,311	2,621	0	6,966	482.4	10,629	0	2.92
2007	14,505	52,797	2.19E+05	13,817	6,503	0	7,867	483.5	11,465	0	2.52
2008	394.9	89.8	3.18E+05	12,574	2,891	0	6,662	484.2	11,057	0	3.37
2009	50.1	186.0	4.72E+05	12,501	3,297	0	4,868	482.2	10,144	0	1.93
2010	221.1	2,715	5.42E+05	12,695	3,946	0	3,599	482.0	9,021	0	1.57
2011	6.55	2.57	5.40E+05	11,769	1,797	0	3,686	481.0	8,146	0	1.56
2012	30,194	26,444	2.96E+05	11,341	2,904	0	6,765	480.5	6,191	0	0.339
2013	10,650	19,898	3.10E+05	11,257	3,520	0	6,758	476.4	3,633	0	0.195
2014	12,453	10,725	3.08E+05	10,779	3,222	0	7,216	472.4	2,063	0	0.187
2015	34,015	52,794	2.71E+05	11,139	5,658	0	8,066	467.8	1,160	0	0
2016	24,146	35,985	2.68E+05	11,415	5,998	0	7,879	468.0	1,212	0	0.726
2017	13,109	13,276	2.91E+05	10,785	5,050	0	7,073	464.3	1,030	0	0.948

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.5 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Queen City Aquifer (Layer 5) - Outflows, Net Flows In-0ut, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows								Total Outflows	Net Flows In-Out	Percent Discrepancy
	McMullen GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Gonzales	Lavaca	Webb	Upper Layers			
	(acre-feet)										%
Predevelopment	231.8	740.8	3.50	997.2	771.4	2,253	501.6	6.28E+05	7.13E+05	0.019	2.69E-06
1980	0	388.0	1.36	0.306	536.0	2,183	11.0	5.90E+05	8.46E+05	-5.57E-03	-6.59E-07
1981	0	385.7	3.17	0.303	530.1	2,178	10.7	5.95E+05	8.56E+05	0.005	6.39E-07
1982	0	384.4	1.61	0.308	530.7	2,179	10.7	5.89E+05	8.26E+05	0.001	1.51E-07
1983	0	382.6	0.794	0.311	530.6	2,179	10.6	5.88E+05	8.17E+05	0.011	1.29E-06
1984	0	384.3	0.046	0.313	538.9	2,187	10.8	5.84E+05	8.39E+05	0.018	2.10E-06
1985	0	384.6	1.53	0.306	542.1	2,182	10.7	5.92E+05	8.43E+05	0.005	6.33E-07
1986	0	387.4	2.37	0.314	549.4	2,184	10.7	5.93E+05	8.33E+05	0.010	1.21E-06
1987	0	389.9	2.94	0.331	551.2	2,185	10.7	5.96E+05	8.22E+05	0.003	3.36E-07
1988	0	392.3	0.017	0.347	541.9	2,191	10.9	5.86E+05	8.13E+05	0.003	3.33E-07
1989	0	393.3	0	0.344	536.6	2,184	10.9	5.83E+05	8.35E+05	0.032	3.85E-06
1990	0	390.8	0.190	0.340	509.5	2,180	10.8	5.87E+05	8.39E+05	0.004	4.52E-07
1991	0	393.0	2.05	0.318	519.6	2,180	9.56	5.91E+05	9.32E+05	0.002	2.54E-07
1992	0	395.5	4.36	0.299	522.4	2,185	9.78	5.98E+05	9.21E+05	3.98E-04	4.33E-08
1993	0	402.8	2.52	0.294	553.3	2,183	9.96	5.90E+05	8.95E+05	0.026	2.86E-06
1994	0	410.5	2.98	0.287	566.3	2,186	9.99	5.92E+05	9.15E+05	0.027	2.95E-06
1995	0	417.6	1.62	0.282	570.6	2,189	9.97	5.87E+05	9.05E+05	-1.25E-02	-1.38E-06
1996	0	425.3	0	0.279	572.1	2,197	9.97	5.81E+05	8.97E+05	0.021	2.29E-06
1997	0	429.5	1.48	0.269	572.0	2,193	9.83	5.89E+05	8.81E+05	0.004	4.77E-07
1998	0	433.8	2.95	0.263	565.4	2,194	9.62	5.91E+05	9.29E+05	0.030	3.26E-06
1999	0	438.4	0.535	0.267	571.6	2,196	9.54	5.82E+05	9.00E+05	0.003	3.23E-07
2000	0	441.9	1.12	0.271	563.0	2,202	9.54	5.84E+05	9.78E+05	0.067	6.83E-06
2001	0	442.8	0.957	0.274	563.5	2,196	9.39	5.83E+05	9.13E+05	-4.30E-04	-4.71E-08
2002	0	443.0	5.14	0.282	554.6	2,196	9.11	5.92E+05	1.02E+06	0.006	6.36E-07
2003	0	444.1	5.07	0.271	559.6	2,197	8.95	5.90E+05	9.45E+05	3.43E-04	3.63E-08
2004	0	446.6	9.21	0.263	570.0	2,204	8.72	6.00E+05	9.52E+05	0.009	9.20E-07
2005	0	447.5	4.13	0.271	576.0	2,200	8.57	5.87E+05	9.02E+05	-2.59E-04	-2.87E-08
2006	0	449.3	1.63	0.278	582.0	2,201	8.33	5.84E+05	8.65E+05	5.70E-04	6.59E-08
2007	0	451.2	6.70	0.266	591.2	2,202	7.95	6.03E+05	9.33E+05	0.004	4.34E-07
2008	0	456.4	2.68	0.267	596.9	2,209	7.80	5.88E+05	9.44E+05	0.001	1.09E-07
2009	0	456.1	1.37	0.255	575.9	2,202	7.51	5.82E+05	1.09E+06	0.009	8.48E-07
2010	0	453.9	2.22	0.236	541.4	2,200	7.21	5.77E+05	1.15E+06	0.009	7.63E-07
2011	0	449.8	0	0.227	518.9	2,197	6.98	5.64E+05	1.13E+06	0.017	1.52E-06
2012	0	437.1	0	0.216	422.9	2,192	6.61	5.79E+05	9.63E+05	0.032	3.34E-06
2013	0	408.4	0.124	0.208	251.0	2,163	6.31	5.82E+05	9.51E+05	0.001	1.41E-07
2014	0	367.5	0	0.204	168.6	2,129	6.05	5.80E+05	9.37E+05	0.089	9.53E-06
2015	0	309.2	1.14	0.197	120.6	2,081	5.75	5.92E+05	9.79E+05	7.22E-04	7.38E-08
2016	0	259.5	2.64	0.196	103.6	2,052	5.51	5.97E+05	9.55E+05	0.002	2.26E-07
2017	0	210.6	1.44	0.201	85.1	2,012	5.28	5.91E+05	9.36E+05	1.49E-04	1.59E-08

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Reklaw Formation (Layer 6) - Inflows, Page 1 of 2

Simulated Time Period	Inflows										
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD
	(acre-feet)										
Predevelopment	0	0	28,695	94,705	0	16,001	174.2	1,410	535.4	0	1,037
1980	0	0	30,773	89,384	55.7	90,992	191.9	1,504	556.0	256.7	1,014
1981	309.6	38.0	30,249	1.15E+05	53.7	79,686	188.1	1,746	653.1	236.8	1,127
1982	3,234	9,360	30,729	77,421	51.9	76,279	188.2	1,402	510.6	228.1	981.4
1983	2,181	4,610	30,858	79,361	50.1	70,060	191.0	1,395	519.3	219.2	965.8
1984	10,566	21,590	31,268	67,413	48.9	73,420	194.6	1,293	481.5	215.8	902.1
1985	3,362	2,167	30,504	1.08E+05	48.4	67,758	192.5	1,675	635.4	220.3	1,076
1986	1,501	37.5	30,399	1.02E+05	48.0	73,264	189.2	1,624	611.1	219.0	1,078
1987	167.0	17.3	30,305	1.03E+05	46.5	66,162	187.0	1,641	613.0	205.8	1,092
1988	9,698	28,136	31,394	47,753	45.7	70,830	192.7	1,135	403.3	205.3	839.1
1989	16,632	15,801	31,403	63,447	46.2	81,149	197.9	1,271	468.8	215.0	862.3
1990	3,400	1,333	30,883	94,348	46.8	80,168	199.0	1,629	595.5	219.8	1,002
1991	47,894	14,902	30,464	1.13E+05	47.6	95,650	193.9	1,776	664.8	226.0	1,108
1992	31,196	7,405	30,237	1.27E+05	47.4	93,903	188.6	1,913	721.0	221.8	1,201
1993	36,067	20,857	30,825	81,249	47.6	98,870	186.2	1,454	545.2	224.9	1,020
1994	35,809	10,962	30,757	1.02E+05	47.8	1.05E+05	186.3	1,633	624.9	227.7	1,087
1995	33,532	22,988	31,229	79,286	48.2	1.06E+05	188.0	1,423	538.9	231.8	985.6
1996	31,931	32,898	32,020	56,291	48.9	1.07E+05	194.1	1,228	457.1	237.1	859.0
1997	7,108	997.3	31,146	1.10E+05	48.5	94,971	193.2	1,751	666.9	232.7	1,082
1998	35,976	4,649	31,011	1.11E+05	49.4	1.14E+05	189.1	1,783	669.8	244.4	1,118
1999	29,703	26,310	31,847	63,440	49.8	1.15E+05	190.8	1,328	491.8	243.2	915.7
2000	55,778	16,902	31,769	96,252	51.3	1.36E+05	194.1	1,706	632.9	250.8	1,038
2001	24,710	7,269	31,842	86,351	51.0	1.26E+05	193.0	1,591	590.4	243.7	1,002
2002	48,760	8,459	31,015	1.47E+05	51.9	1.44E+05	188.3	2,194	828.2	250.1	1,271
2003	27,294	6,824	31,396	1.07E+05	51.9	1.36E+05	182.5	1,815	668.4	247.9	1,147
2004	15,671	279.8	31,050	1.41E+05	51.3	1.28E+05	175.2	2,043	785.2	242.1	1,281
2005	17,261	25,294	31,975	71,005	50.5	1.23E+05	175.8	1,398	516.1	237.8	993.6
2006	7,573	16,462	32,483	63,494	49.1	1.12E+05	182.2	1,262	481.6	228.8	900.2
2007	7,251	18.9	31,139	1.52E+05	47.0	1.11E+05	179.2	2,037	809.7	214.1	1,273
2008	49,668	41,941	32,474	60,313	46.4	1.27E+05	179.5	1,252	470.2	216.5	927.2
2009	1.10E+05	50,122	32,600	86,694	48.1	1.66E+05	189.3	1,582	590.2	235.3	999.7
2010	1.09E+05	50,447	32,626	1.08E+05	53.2	1.99E+05	193.6	2,069	709.2	276.8	1,105
2011	1.00E+05	81,394	33,963	49,940	58.1	2.05E+05	200.5	1,696	495.3	307.0	854.7
2012	25,319	12,943	34,765	86,166	57.4	1.50E+05	214.5	2,740	601.6	282.9	1,003
2013	20,191	6,401	34,713	94,282	56.1	1.45E+05	227.5	5,169	637.9	273.2	1,056
2014	18,201	8,312	35,277	83,731	54.9	1.38E+05	246.7	9,026	608.5	266.4	1,031
2015	16,706	1,094	34,696	1.38E+05	53.6	1.29E+05	267.4	16,000	839.7	256.9	1,294
2016	8,184	507.9	34,454	1.32E+05	52.5	1.26E+05	264.5	15,003	802.5	250.6	1,309
2017	9,436	4,443	35,161	1.08E+05	51.9	1.27E+05	271.6	16,367	713.7	250.1	1,227

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Reklaw Formation (Layer 6) - Inflows, Page 2 of 2

Simulated Time Period	Inflows										Total Inflows
	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Wintergarden GCD	Bexar	Gonzales	Maverick	Webb	Upper Layers	
	(acre-feet)										
Predevelopment	0	58.5	0	92.7	328.5	103.0	0	0.004	1,527	5.61E+05	7.06E+05
1980	147.3	83.9	5.63	94.8	2,850	98.1	0	0.059	4,049	6.19E+05	8.41E+05
1981	138.6	107.5	5.64	99.5	2,829	116.1	0	0.058	4,086	6.14E+05	8.50E+05
1982	152.3	72.6	6.92	93.4	2,773	81.4	0	0.058	4,034	6.13E+05	8.21E+05
1983	162.5	74.5	7.95	91.5	2,748	83.3	0	0.058	4,027	6.14E+05	8.11E+05
1984	170.2	63.2	8.29	87.9	2,776	72.1	0	0.059	4,009	6.20E+05	8.35E+05
1985	161.7	101.4	7.78	98.3	2,846	112.1	0	0.059	4,068	6.14E+05	8.37E+05
1986	166.8	95.7	6.91	98.0	2,695	109.5	0	0.057	4,066	6.09E+05	8.27E+05
1987	165.8	96.9	6.02	98.5	2,544	108.0	0	0.055	4,064	6.05E+05	8.16E+05
1988	170.5	44.8	5.26	84.8	2,494	54.5	0	0.055	3,968	6.12E+05	8.09E+05
1989	173.1	59.5	4.50	86.3	2,537	72.2	0	0.055	3,961	6.13E+05	8.31E+05
1990	176.9	88.5	3.98	96.1	2,548	103.7	0	0.055	4,019	6.14E+05	8.34E+05
1991	186.9	105.6	3.48	99.5	2,742	120.5	0	0.057	4,095	6.14E+05	9.27E+05
1992	190.7	119.2	2.96	103.7	2,839	134.3	0	0.058	4,149	6.14E+05	9.15E+05
1993	199.6	76.2	2.37	95.7	2,829	91.5	0	0.058	4,077	6.12E+05	8.90E+05
1994	207.1	96.2	1.85	98.1	2,899	109.6	0	0.058	4,104	6.13E+05	9.10E+05
1995	215.0	74.4	1.44	93.6	2,940	86.3	0	0.059	4,080	6.16E+05	9.00E+05
1996	224.3	52.8	1.11	85.4	2,970	63.5	0	0.060	4,057	6.22E+05	8.93E+05
1997	233.2	103.6	0.849	98.8	2,987	115.4	0	0.060	4,151	6.18E+05	8.74E+05
1998	248.9	103.8	0.663	99.8	2,987	119.0	0	0.061	4,192	6.16E+05	9.24E+05
1999	220.4	59.5	0.529	89.4	2,929	70.4	0	0.061	4,142	6.19E+05	8.95E+05
2000	216.3	90.3	0.471	97.3	3,054	107.1	0	0.062	4,223	6.25E+05	9.73E+05
2001	215.2	81.0	0.432	94.4	3,041	92.0	0	0.062	4,228	6.21E+05	9.08E+05
2002	223.1	137.7	0.447	106.7	3,195	157.9	0	0.062	4,363	6.21E+05	1.01E+06
2003	230.0	100.5	0.460	101.4	3,179	114.8	0	0.062	4,355	6.19E+05	9.39E+05
2004	235.2	131.9	0.458	106.0	3,199	147.4	0	0.062	4,441	6.17E+05	9.45E+05
2005	239.1	66.6	0.426	93.9	3,097	77.7	0	0.062	4,355	6.17E+05	8.97E+05
2006	240.2	59.6	0.373	87.3	3,017	66.7	0	0.062	4,349	6.17E+05	8.60E+05
2007	238.5	142.7	0.298	104.7	3,087	154.9	0	0.061	4,513	6.10E+05	9.25E+05
2008	244.8	56.6	0.208	90.9	3,117	68.9	0	0.061	4,446	6.17E+05	9.39E+05
2009	262.6	81.3	0.181	94.0	3,412	99.7	0	0.063	4,509	6.26E+05	1.08E+06
2010	293.1	101.3	0.226	100.6	3,675	128.4	0	0.066	4,611	6.37E+05	1.15E+06
2011	324.2	46.9	0.396	87.6	3,821	64.3	0	0.069	4,590	6.45E+05	1.13E+06
2012	333.1	80.8	0.800	97.0	3,894	81.5	0	0.071	4,718	6.32E+05	9.55E+05
2013	336.9	88.5	1.61	101.3	3,896	93.2	12.3	0.073	4,795	6.27E+05	9.44E+05
2014	338.4	78.6	3.68	101.4	3,895	85.5	155.8	0.074	4,850	6.27E+05	9.31E+05
2015	335.6	129.8	9.44	116.2	3,882	141.0	408.8	0.074	5,004	6.21E+05	9.70E+05
2016	332.3	123.8	18.4	117.8	3,837	132.6	463.2	0.073	5,087	6.18E+05	9.47E+05
2017	329.3	101.1	31.0	115.1	3,763	113.4	550.3	0.072	5,090	6.17E+05	9.29E+05

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows										
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD
	(acre-feet)										
Predevelopment	0	0	0	15,086	9,057	22.3	34,602	470.1	14,611	52.9	190.2
1980	0	0	2.20E+05	12,678	2,321	0	2,623	468.9	10,950	41.0	0
1981	14,418	25,221	1.82E+05	13,148	3,264	0	3,868	468.0	11,009	45.4	0
1982	6,394	4,493	1.89E+05	12,629	2,342	0	4,092	468.3	10,879	40.7	0
1983	12,606	5,619	1.73E+05	12,478	2,267	0	4,842	468.3	10,825	38.4	0
1984	2,402	1,755	2.15E+05	12,223	1,552	0	4,792	469.8	10,665	34.0	0
1985	16,921	25,726	1.69E+05	12,778	2,754	0	4,969	468.3	10,896	40.2	0
1986	19,680	23,768	1.57E+05	12,912	3,112	0	4,408	468.5	11,157	42.5	0
1987	24,443	25,700	1.35E+05	13,016	3,364	0	5,481	468.5	11,192	44.2	0
1988	3,284	2,782	1.86E+05	12,089	1,703	0	4,740	470.0	10,501	34.9	0
1989	1,633	2,260	2.15E+05	11,949	1,853	0	3,579	468.5	10,154	31.2	0
1990	4,418	12,331	2.00E+05	12,353	2,748	0	3,506	468.1	9,833	35.0	0
1991	2,156	15,796	2.85E+05	12,882	3,537	0	3,459	468.1	10,362	40.7	0
1992	4,294	18,925	2.59E+05	13,448	4,317	0	3,994	469.3	10,747	46.7	0
1993	1,714	1,564	2.64E+05	12,766	2,986	0	3,820	468.5	11,082	41.4	0
1994	1,069	5,029	2.79E+05	12,954	3,038	0	3,711	468.6	11,201	42.8	0
1995	382.3	195.6	2.81E+05	12,573	2,230	0	3,539	468.7	11,016	39.0	0
1996	277.0	32.5	2.82E+05	12,057	1,420	0	3,164	470.1	10,486	32.5	0
1997	13,093	22,569	2.18E+05	12,720	2,815	0	3,638	468.5	10,586	38.5	0
1998	2,650	11,629	2.87E+05	13,019	3,191	0	3,105	468.6	10,586	41.9	0
1999	4,493	1,749	2.77E+05	12,284	1,815	0	2,981	468.9	10,473	34.8	0
2000	1,028	4,035	3.54E+05	12,560	2,402	0	2,330	469.9	10,064	35.8	0
2001	2,951	2,020	2.90E+05	12,478	2,256	0	2,654	468.7	10,147	35.1	0
2002	2,278	27,580	3.59E+05	13,586	4,121	0	2,237	468.4	10,271	45.5	0
2003	1,545	2,657	3.14E+05	13,297	3,272	0	2,441	468.9	10,530	44.1	0
2004	8,863	26,531	2.75E+05	13,968	4,436	0	2,847	470.6	11,140	50.9	0
2005	2,235	1,948	2.74E+05	12,802	2,292	0	2,891	469.9	10,940	41.1	0
2006	11,236	5,996	2.28E+05	12,311	1,800	0	3,449	469.9	10,825	35.4	0
2007	14,331	50,828	2.19E+05	13,817	4,509	0	4,620	469.4	11,693	49.8	0
2008	393.1	85.3	3.18E+05	12,574	2,009	0	3,655	471.2	11,273	39.3	0
2009	49.5	159.8	4.72E+05	12,501	2,179	0	2,331	469.1	10,317	36.5	0
2010	215.8	2,544	5.42E+05	12,695	2,529	0	994.2	468.5	9,157	36.5	0
2011	6.50	0	5.40E+05	11,769	1,151	0	650.8	468.5	8,248	26.3	0
2012	30,019	25,674	2.96E+05	11,341	1,861	0	2,285	468.8	6,252	27.8	0
2013	10,577	19,309	3.10E+05	11,257	2,352	0	2,448	465.6	3,661	28.0	0
2014	12,389	10,345	3.08E+05	10,779	2,191	0	2,842	463.2	2,091	24.1	0
2015	33,850	51,140	2.71E+05	11,139	3,946	0	3,777	459.5	1,153	28.1	0
2016	24,028	35,051	2.68E+05	11,415	4,295	0	3,907	459.8	1,217	31.3	0
2017	13,068	13,040	2.91E+05	10,785	3,652	0	3,401	457.0	1,022	27.1	0

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.6 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Reklaw Formation (Layer 6) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows									Total Outflows	Net Flows In-Out	Percent Discrepancy
	McMullen GCD	Pecan Valley GCD	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Webb	Upper Layers			
	(acre-feet)											%
Predevelopment	239.1	731.0	993.8	0	758.0	2,252	0.002	497.8	6.26E+05	7.06E+05	0.019	2.71E-06
1980	0	381.0	0	0	520.4	2,184	0	10.0	5.89E+05	8.41E+05	-5.57E-03	-6.63E-07
1981	0	378.6	0	0	514.6	2,179	0	9.75	5.93E+05	8.50E+05	0.005	6.44E-07
1982	0	377.2	0	0	515.2	2,180	0	9.74	5.88E+05	8.21E+05	0.001	1.52E-07
1983	0	375.5	0	0	515.2	2,180	0	9.68	5.87E+05	8.11E+05	0.011	1.30E-06
1984	0	377.1	0	0	524.0	2,188	0	9.85	5.83E+05	8.35E+05	0.018	2.12E-06
1985	0	377.5	0	0	527.5	2,183	0	9.75	5.90E+05	8.37E+05	0.005	6.37E-07
1986	0	380.2	0	0	534.7	2,185	0	9.75	5.92E+05	8.27E+05	0.010	1.22E-06
1987	0	382.7	0	0	536.3	2,186	0	9.78	5.94E+05	8.16E+05	0.003	3.35E-07
1988	0	384.9	0	0	526.6	2,191	0	9.99	5.84E+05	8.09E+05	0.003	3.35E-07
1989	0	386.1	0	0	521.8	2,185	0	9.96	5.81E+05	8.31E+05	0.032	3.87E-06
1990	0	383.6	0	0	493.7	2,181	0	9.85	5.85E+05	8.34E+05	0.004	4.54E-07
1991	0	386.0	0	0	505.0	2,181	0	8.57	5.90E+05	9.27E+05	0.002	2.56E-07
1992	0	388.3	0	0	507.3	2,186	0	8.84	5.97E+05	9.15E+05	3.94E-04	4.31E-08
1993	0	395.7	0	0	539.6	2,184	0	9.02	5.89E+05	8.90E+05	0.026	2.88E-06
1994	0	403.1	0	0	552.5	2,187	0	9.05	5.91E+05	9.10E+05	0.027	2.96E-06
1995	0	410.1	0	0	556.7	2,189	0	9.02	5.86E+05	9.00E+05	-1.25E-02	-1.38E-06
1996	0	417.7	0	0	558.3	2,198	0	9.01	5.80E+05	8.93E+05	0.021	2.30E-06
1997	0	422.0	0	0	558.5	2,193	0	8.88	5.88E+05	8.74E+05	0.004	4.80E-07
1998	0	426.2	0	0	551.7	2,194	0	8.66	5.89E+05	9.24E+05	0.030	3.28E-06
1999	0	430.7	0	0	557.9	2,196	0	8.57	5.81E+05	8.95E+05	0.003	3.25E-07
2000	0	434.2	0	0	549.1	2,202	0	8.58	5.83E+05	9.73E+05	0.067	6.86E-06
2001	0	435.2	0	0	549.9	2,197	0	8.43	5.82E+05	9.08E+05	-4.30E-04	-4.74E-08
2002	0	435.4	0	0	540.9	2,196	0	8.15	5.91E+05	1.01E+06	0.006	6.39E-07
2003	0	436.5	0	0	545.8	2,197	0	8.00	5.88E+05	9.39E+05	3.44E-04	3.66E-08
2004	0	438.9	0	0	556.2	2,205	0	7.81	5.98E+05	9.45E+05	0.009	9.27E-07
2005	0	439.8	0	0	562.1	2,200	0	7.67	5.85E+05	8.97E+05	-2.59E-04	-2.89E-08
2006	0	441.7	0	0	568.2	2,201	0	7.46	5.82E+05	8.60E+05	5.71E-04	6.64E-08
2007	0	443.6	0	0	577.8	2,202	0	7.12	6.02E+05	9.25E+05	0.004	4.38E-07
2008	0	448.5	0	0	582.8	2,209	0	6.97	5.87E+05	9.39E+05	0.001	1.10E-07
2009	0	448.3	0	0	561.9	2,202	0	6.70	5.81E+05	1.08E+06	0.009	8.51E-07
2010	0	446.1	0	0	527.3	2,200	0	6.42	5.75E+05	1.15E+06	0.009	7.68E-07
2011	0	442.2	0	0	505.0	2,198	0	6.23	5.63E+05	1.13E+06	0.017	1.52E-06
2012	0	429.8	0	3.18	408.4	2,193	0	5.91	5.78E+05	9.55E+05	0.032	3.36E-06
2013	0	401.9	0	0	240.8	2,164	0	5.62	5.81E+05	9.44E+05	0.001	1.41E-07
2014	0	362.3	0	0	171.5	2,132	0	5.37	5.79E+05	9.31E+05	0.089	9.59E-06
2015	0	305.9	0	0	126.4	2,085	0	5.05	5.91E+05	9.70E+05	7.25E-04	7.47E-08
2016	0	257.6	0	0	110.5	2,057	0	4.85	5.96E+05	9.47E+05	0.002	2.32E-07
2017	0	208.9	0	0	92.7	2,018	0	4.66	5.90E+05	9.29E+05	1.47E-04	1.59E-08

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Carrizo-Upper Wilcox (Layer 7) - Inflows, Page 1 of 2

Simulated Time Period	Inflows									
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD
	(acre-feet)									
Predevelopment	0	0	27,605	41,886	32,676	15.8	5,186	6,557	2.31	1,836
1980	0	0	29,090	39,533	36,194	8.98	4,845	6,255	0	1,717
1981	138.8	14.1	28,582	50,678	37,868	12.6	5,815	7,390	0	2,185
1982	1,344	5,688	29,061	34,242	35,431	9.64	4,530	5,943	0	1,523
1983	996.9	2,986	29,193	35,100	35,307	8.21	4,476	5,860	0	1,529
1984	5,917	11,444	29,597	29,816	34,417	6.30	3,962	5,328	0	1,303
1985	1,739	101.3	28,852	47,781	36,397	10.1	5,444	6,930	0	2,041
1986	657.8	15.4	28,756	45,120	35,185	11.6	5,383	6,835	0	1,963
1987	83.6	15.0	28,671	45,660	36,071	12.4	5,467	6,950	0	1,993
1988	5,778	13,842	29,751	21,120	33,120	5.89	3,338	4,559	0	987.4
1989	9,257	5,782	29,758	28,061	33,772	4.60	3,650	4,943	0	1,208
1990	1,840	196.4	29,234	41,728	35,486	6.38	4,812	6,252	0	1,771
1991	25,508	1,147	28,790	49,789	35,566	10.6	5,671	7,201	0	2,138
1992	17,131	417.1	28,530	56,185	37,423	14.6	6,406	7,960	0	2,427
1993	19,677	6,558	29,086	35,935	35,901	11.2	4,820	6,102	0	1,614
1994	19,565	1,525	28,984	45,327	37,176	12.0	5,462	6,821	0	1,969
1995	18,586	7,238	29,418	35,067	36,727	9.51	4,598	5,830	0	1,547
1996	18,045	12,895	30,169	24,897	35,746	5.56	3,578	4,707	0	1,114
1997	3,946	171.0	29,290	48,837	38,642	9.58	5,506	6,891	0	2,076
1998	19,044	212.1	29,124	48,943	37,432	12.2	5,709	7,121	0	2,122
1999	17,148	10,863	29,929	28,058	36,680	7.59	4,001	5,139	0	1,267
2000	30,824	1,292	29,799	42,570	38,585	8.42	5,037	6,467	0	1,824
2001	13,946	1,109	29,842	38,191	39,350	8.38	4,739	5,999	0	1,658
2002	26,627	89.9	28,975	64,931	41,519	15.6	7,053	8,713	0	2,760
2003	15,184	1,413	29,319	47,357	41,005	14.6	5,850	7,265	0	2,108
2004	8,779	0	28,947	62,182	42,438	18.8	7,103	8,588	0	2,691
2005	10,114	12,554	29,852	31,404	38,892	11.7	4,580	5,774	0	1,457
2006	4,781	8,657	30,347	28,082	38,692	7.67	3,986	5,025	0	1,252
2007	4,320	0	29,006	67,248	41,071	17.4	7,236	8,637	0	2,839
2008	27,663	16,029	30,295	26,676	36,209	9.85	4,072	5,223	0	1,259
2009	60,105	7,299	30,347	38,343	38,338	8.44	4,740	6,156	0	1,657
2010	59,982	6,649	30,276	47,766	43,321	8.90	5,542	7,302	0	2,057
2011	55,761	23,022	31,507	22,088	43,528	3.58	3,402	4,754	0	1,023
2012	14,934	1,860	32,238	38,109	47,191	1.53	4,452	5,679	0	1,580
2013	12,475	784.8	32,127	41,699	42,152	0.415	4,776	6,146	0	1,726
2014	11,971	2,849	32,605	37,033	41,097	0	4,416	5,883	0	1,538
2015	11,287	76.6	31,950	61,201	43,481	0	6,474	8,465	0	2,499
2016	5,979	23.0	31,696	58,361	42,057	0	6,544	8,444	0	2,425
2017	6,618	2,503	32,360	47,658	40,198	0	5,718	7,574	0	1,991

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Carrizo-Upper Wilcox (Layer 7) - Inflows, Page 2 of 2

Simulated Time Period	Inflows											Total Inflows
	McMullen GCD	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD	Bexar	Gonzales	Maverick	Webb	Upper Layers	
	(acre-feet)											
Predevelopment	734.7	1,406	0	5.79	969.7	7,034	4,718	0	406.8	1,477	4.18E+05	5.51E+05
1980	24.5	2,088	0.810	4.29	2,066	20,438	3,775	0	2,486	2,102	4.51E+05	6.02E+05
1981	99.8	2,142	0.931	1.13	2,134	20,781	4,219	0	2,572	2,128	4.47E+05	6.13E+05
1982	48.5	1,772	0.161	7.29	1,920	19,928	3,433	0	2,391	2,085	4.47E+05	5.97E+05
1983	93.4	1,743	0.119	5.82	1,931	21,146	3,335	0	2,378	2,342	4.47E+05	5.96E+05
1984	23.4	2,190	0.506	5.96	1,892	19,707	3,056	0	2,356	2,063	4.53E+05	6.06E+05
1985	142.4	2,012	1.86	0.482	2,097	23,134	3,813	0	2,557	2,565	4.46E+05	6.12E+05
1986	127.4	1,841	3.67	2.47	1,956	20,578	3,826	0	2,483	2,430	4.44E+05	6.01E+05
1987	151.1	1,806	4.49	3.35	1,886	20,021	3,860	0	2,385	2,452	4.42E+05	5.99E+05
1988	97.6	1,295	3.83	10.3	1,647	17,478	2,767	0	2,065	2,090	4.47E+05	5.87E+05
1989	35.9	1,416	3.45	5.52	1,780	18,362	2,974	0	2,157	2,013	4.47E+05	5.92E+05
1990	48.9	1,707	2.05	1.15	1,930	18,818	3,608	0	2,274	2,042	4.46E+05	5.98E+05
1991	0	1,919	1.86	0.305	2,035	20,219	4,083	0	2,510	1,883	4.45E+05	6.34E+05
1992	0	2,063	1.93	0.607	2,095	20,552	4,386	0	2,645	2,008	4.45E+05	6.35E+05
1993	0	1,785	2.64	8.69	1,854	19,094	3,591	0	2,474	2,022	4.45E+05	6.16E+05
1994	0	2,160	2.85	5.16	1,987	19,597	3,911	0	2,630	2,086	4.46E+05	6.25E+05
1995	0	2,049	2.36	8.01	1,899	19,518	3,546	0	2,563	2,045	4.48E+05	6.19E+05
1996	0	1,844	1.65	9.15	1,834	19,272	3,141	0	2,482	2,017	4.53E+05	6.15E+05
1997	0	2,247	1.29	0.953	2,114	20,416	3,952	0	2,735	2,133	4.48E+05	6.17E+05
1998	0	2,277	0.923	2.12	2,095	19,657	4,062	0	2,708	2,149	4.47E+05	6.30E+05
1999	0	1,869	0.639	9.29	1,860	18,706	3,274	0	2,452	2,107	4.50E+05	6.13E+05
2000	2.28	2,293	0.252	4.22	2,079	20,347	3,951	0	2,652	2,239	4.53E+05	6.43E+05
2001	27.0	2,202	0.185	4.92	2,023	19,591	3,669	0	2,626	2,268	4.51E+05	6.18E+05
2002	24.8	2,848	0.079	0.253	2,349	21,768	4,890	0	2,985	2,381	4.49E+05	6.67E+05
2003	46.4	2,528	0.074	6.01	2,124	20,847	4,203	0	2,835	2,389	4.49E+05	6.33E+05
2004	78.1	2,770	0.119	2.80	2,277	21,105	4,771	0	2,999	2,482	4.47E+05	6.44E+05
2005	96.0	2,178	0.140	13.4	1,921	19,602	3,549	0	2,631	2,431	4.48E+05	6.15E+05
2006	141.0	1,983	0.194	11.1	1,894	19,182	3,217	0	2,516	2,288	4.49E+05	6.01E+05
2007	180.2	2,738	0.488	0.264	2,319	19,731	4,731	0	2,922	2,574	4.42E+05	6.37E+05
2008	125.4	2,032	0.384	12.3	1,871	19,164	3,298	0	2,556	2,506	4.49E+05	6.28E+05
2009	56.4	2,428	0.094	7.00	2,100	23,775	3,874	0	2,810	2,459	4.54E+05	6.78E+05
2010	24.4	2,945	0	3.80	2,312	27,849	4,632	0	3,057	2,556	4.61E+05	7.07E+05
2011	26.4	2,404	0	11.0	2,078	27,909	3,697	0	2,883	2,547	4.68E+05	6.94E+05
2012	138.9	2,585	0	4.46	2,287	24,864	3,489	0	3,099	2,648	4.56E+05	6.41E+05
2013	202.6	2,616	0	2.58	2,318	23,123	3,575	0	3,145	2,731	4.51E+05	6.31E+05
2014	270.0	2,453	0	4.10	2,258	23,566	3,472	0	3,096	2,971	4.52E+05	6.27E+05
2015	366.8	2,886	0	0	2,516	26,475	4,730	1.36	3,348	3,769	4.46E+05	6.56E+05
2016	419.7	2,754	0.207	0.218	2,419	24,898	4,962	6.43	3,312	3,691	4.44E+05	6.42E+05
2017	426.7	2,491	0.976	4.99	2,246	23,266	4,671	12.1	3,149	3,464	4.44E+05	6.28E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows													
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD
	(acre-feet)													
Predevelopment	0	0	0	10,648	4,420	6.48	76,016	830.8	7,983	778.3	67.6	2,928	360.3	767.0
1980	0	0	41,768	9,161	1,667	25.5	83,266	842.4	7,482	632.1	164.0	3,038	238.9	1,277
1981	7,827	10,528	36,527	9,421	2,352	22.9	79,399	831.7	7,641	655.2	128.7	2,927	152.8	1,145
1982	3,428	1,155	37,698	9,124	1,746	20.7	80,020	840.0	7,551	623.0	115.2	3,045	296.1	1,176
1983	6,699	1,052	37,216	9,043	1,688	18.5	78,001	841.2	7,382	600.5	102.3	3,073	392.1	1,178
1984	1,271	577.6	51,914	8,918	1,097	17.0	79,515	843.9	7,136	543.6	99.4	3,147	515.1	1,433
1985	9,332	12,453	35,247	9,199	1,964	16.8	76,339	831.0	7,206	605.3	112.0	2,985	341.8	1,222
1986	11,202	7,445	31,183	9,276	2,288	16.8	78,822	830.8	7,313	632.2	113.1	2,965	399.7	1,089
1987	13,614	6,808	29,452	9,335	2,478	15.1	76,609	831.8	7,488	650.1	91.5	2,952	381.9	1,006
1988	1,916	352.5	35,627	8,851	1,331	14.5	79,666	849.2	7,429	583.0	93.9	3,216	463.7	1,111
1989	960.9	504.3	38,576	8,773	1,447	15.8	81,645	845.2	7,080	533.4	116.2	3,199	545.1	1,092
1990	2,617	5,745	38,619	8,974	2,112	17.1	79,970	837.3	7,245	559.1	126.3	3,073	567.6	1,011
1991	1,629	9,366	37,875	9,263	2,676	18.5	86,154	829.4	7,192	607.4	137.8	2,961	1,013	934.0
1992	2,646	10,114	36,484	9,598	3,235	18.6	83,313	829.3	7,487	696.0	128.7	2,871	1,202	904.2
1993	1,053	472.9	34,136	9,192	2,363	19.0	84,645	836.8	7,213	790.1	135.0	3,012	1,432	984.1
1994	747.7	2,849	37,972	9,296	2,299	19.6	85,530	833.8	7,280	787.1	139.5	2,965	1,575	1,008
1995	260.5	123.9	40,059	9,085	1,714	20.4	84,680	839.6	7,262	751.0	146.2	3,051	1,635	1,143
1996	162.4	5.29	41,054	8,831	1,118	21.3	85,008	848.1	7,079	711.3	153.5	3,203	1,677	1,333
1997	7,365	9,841	35,240	9,161	2,145	21.0	79,643	832.0	7,073	748.0	144.1	2,992	1,411	1,262
1998	1,740	5,918	38,521	9,333	2,452	22.2	88,217	829.3	7,344	798.6	163.8	2,938	1,803	1,190
1999	1,522	54.3	39,063	8,931	1,469	22.9	85,966	840.4	7,026	806.1	159.9	3,123	1,391	1,310
2000	455.0	2,402	48,720	9,081	1,894	24.4	92,233	839.2	7,130	882.0	171.4	3,048	1,598	1,253
2001	1,408	856.7	39,934	9,032	1,811	24.1	85,633	835.9	6,926	873.4	156.6	3,051	1,490	1,325
2002	1,870	16,051	49,618	9,663	3,139	24.9	91,752	824.0	7,354	981.7	166.6	2,815	1,752	1,151
2003	872.4	1,591	43,332	9,493	2,564	24.8	87,665	831.6	7,363	963.6	160.1	2,899	1,733	1,222
2004	5,306	12,239	38,073	9,889	3,424	23.9	85,747	829.3	7,575	979.2	146.8	2,780	1,584	1,176
2005	1,246	114.9	37,762	9,205	1,887	22.8	86,451	844.2	7,447	897.7	139.4	3,033	1,506	1,330
2006	6,110	220.0	31,217	8,946	1,509	21.2	83,165	847.4	7,107	820.9	123.3	3,135	1,285	1,463
2007	8,849	23,228	23,526	9,795	3,551	18.6	82,990	823.2	7,348	878.9	98.0	2,779	1,193	1,247
2008	286.0	22.0	34,040	9,090	1,691	18.0	91,588	846.2	7,414	835.3	105.1	3,103	1,547	1,371
2009	43.6	125.4	50,612	9,041	1,791	20.1	1.02E+05	843.2	7,397	891.3	142.3	3,066	2,435	1,289
2010	104.2	1,565	75,247	9,142	2,011	26.1	1.05E+05	841.8	7,564	1,031	215.5	3,009	3,106	1,231
2011	0	0	74,670	8,678	946.0	32.0	1.03E+05	855.0	7,022	936.0	261.3	3,260	3,517	1,434
2012	16,135	9,256	26,898	8,431	1,557	30.6	85,729	874.7	8,412	784.0	203.7	3,423	2,738	1,566
2013	6,001	6,549	26,823	8,409	1,981	28.4	89,162	894.0	10,479	699.2	180.1	3,458	2,371	1,552
2014	6,714	1,468	30,417	8,193	1,864	26.5	88,810	928.5	11,928	634.6	163.8	3,623	2,034	1,583
2015	18,847	17,649	26,343	8,401	3,242	24.4	86,711	953.4	14,455	661.6	144.1	3,561	1,628	1,428
2016	13,350	10,450	24,541	8,567	3,506	22.6	87,147	934.7	11,798	676.0	130.5	3,506	1,418	1,349
2017	7,273	1,883	28,217	8,237	3,028	21.7	88,647	951.5	12,101	659.9	130.1	3,701	1,314	1,341

Note:

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Appendix J Table J-24.7 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Carrizo-Upper Wilcox (Layer 7) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows											Total Outflows	Net Flows In-Out	Percent Discrepancy
	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	Upper Layers			
	(acre-feet)													%
Predevelopment	359.9	86.1	755.0	8,211	4,402	245.4	3,159	667.8	27.3	1,260	4.27E+05	5.51E+05	0.004	8.09E-07
1980	248.0	82.4	237.2	39,116	4,523	279.5	3,151	402.6	25.1	2,558	4.02E+05	6.02E+05	-5.37E-04	-8.92E-08
1981	250.1	89.8	250.8	37,491	4,428	280.8	3,140	420.4	25.9	2,557	4.05E+05	6.13E+05	5.34E-04	8.70E-08
1982	255.5	81.6	244.7	37,861	4,363	280.9	3,140	429.5	25.0	2,550	4.01E+05	5.97E+05	1.98E-04	3.33E-08
1983	256.4	79.2	242.8	37,635	4,336	279.2	3,140	435.8	24.6	2,351	4.00E+05	5.96E+05	9.77E-04	1.64E-07
1984	248.2	74.3	239.0	40,996	4,334	266.7	3,145	409.1	23.8	2,734	3.96E+05	6.06E+05	0.002	3.52E-07
1985	239.4	83.6	246.9	40,910	4,267	257.8	3,135	411.1	24.9	2,153	4.03E+05	6.12E+05	6.07E-04	9.92E-08
1986	234.4	85.6	256.9	32,874	4,221	253.6	3,134	384.9	25.3	2,100	4.04E+05	6.01E+05	9.93E-04	1.65E-07
1987	234.6	87.3	266.2	31,085	4,194	259.3	3,136	391.7	25.6	2,021	4.06E+05	5.99E+05	-6.41E-04	-1.07E-07
1988	243.5	72.2	252.6	35,678	4,250	283.7	3,149	579.2	23.7	2,182	3.98E+05	5.87E+05	3.42E-04	5.83E-08
1989	242.5	69.8	243.7	39,075	4,234	276.9	3,141	431.1	23.1	2,764	3.96E+05	5.92E+05	0.003	5.25E-07
1990	256.5	79.0	249.1	35,787	4,241	306.5	3,148	578.7	23.8	2,572	3.99E+05	5.98E+05	4.68E-04	7.83E-08
1991	243.8	84.9	258.0	55,894	4,190	267.6	3,141	602.4	25.1	5,595	4.03E+05	6.34E+05	1.53E-05	2.42E-09
1992	243.5	94.5	269.8	52,824	4,256	266.7	3,148	627.7	26.3	5,784	4.08E+05	6.35E+05	4.82E-05	7.59E-09
1993	222.5	82.4	256.9	52,086	4,429	223.5	3,131	408.4	25.4	6,119	4.02E+05	6.16E+05	0.002	3.85E-07
1994	219.2	85.0	257.7	53,215	4,341	224.7	3,130	338.9	25.8	6,388	4.04E+05	6.25E+05	0.002	3.23E-07
1995	222.6	79.3	249.1	53,333	4,369	237.1	3,132	346.9	25.1	6,288	4.00E+05	6.19E+05	-1.13E-03	-1.82E-07
1996	227.7	70.0	238.4	52,763	4,530	247.1	3,143	374.3	23.8	6,083	3.96E+05	6.15E+05	0.002	3.18E-07
1997	228.8	81.7	246.1	45,107	4,384	240.9	3,135	324.0	25.1	4,262	4.01E+05	6.17E+05	4.65E-04	7.54E-08
1998	235.3	86.1	250.7	50,907	4,297	250.9	3,136	365.7	25.8	6,207	4.03E+05	6.30E+05	0.003	4.47E-07
1999	238.0	74.5	239.8	49,592	4,420	245.5	3,137	409.7	24.4	6,598	3.96E+05	6.13E+05	2.77E-04	4.53E-08
2000	245.6	80.1	239.6	58,609	4,395	258.3	3,148	349.2	24.8	8,224	3.98E+05	6.43E+05	0.006	1.00E-06
2001	246.4	77.8	236.2	51,157	4,492	248.9	3,139	321.4	24.6	7,287	3.97E+05	6.18E+05	4.04E-05	6.54E-09
2002	251.0	97.8	253.5	58,937	4,277	254.7	3,139	307.3	26.7	8,379	4.04E+05	6.67E+05	7.69E-04	1.15E-07
2003	251.7	90.3	248.8	53,705	4,371	248.8	3,139	296.7	26.5	7,700	4.02E+05	6.33E+05	-1.15E-04	-1.81E-08
2004	251.0	99.5	260.7	49,116	4,279	241.8	3,146	309.9	27.9	6,650	4.10E+05	6.44E+05	5.61E-04	8.71E-08
2005	250.7	83.7	242.7	48,199	4,385	245.5	3,139	302.6	26.0	6,314	4.00E+05	6.15E+05	-1.89E-05	-3.07E-09
2006	250.3	75.1	232.9	42,843	4,481	244.5	3,140	319.3	24.8	5,316	3.98E+05	6.01E+05	-1.69E-05	-2.82E-09
2007	244.6	99.7	257.7	45,336	4,220	228.0	3,137	335.0	27.4	5,324	4.12E+05	6.37E+05	6.72E-04	1.05E-07
2008	248.0	79.5	239.1	58,476	4,281	245.7	3,148	301.6	25.5	7,631	4.01E+05	6.28E+05	1.04E-04	1.65E-08
2009	254.8	80.1	229.0	81,270	4,312	267.3	3,144	289.4	25.0	12,120	3.97E+05	6.78E+05	0.001	1.50E-07
2010	269.0	86.1	228.2	81,941	4,489	297.2	3,149	290.4	25.1	13,150	3.93E+05	7.07E+05	9.26E-04	1.31E-07
2011	277.9	69.3	211.7	82,119	5,101	299.5	3,151	312.3	22.9	13,446	3.84E+05	6.94E+05	0.001	2.07E-07
2012	307.5	74.6	217.6	60,933	4,884	382.1	3,176	302.1	23.1	8,428	3.96E+05	6.41E+05	0.003	4.77E-07
2013	353.8	82.9	219.3	57,923	4,319	502.7	3,194	300.8	22.7	7,183	3.98E+05	6.31E+05	1.34E-04	2.12E-08
2014	402.1	86.3	218.0	56,545	4,153	590.0	3,215	307.0	21.1	6,276	3.97E+05	6.27E+05	0.010	1.60E-06
2015	463.4	109.8	231.8	51,359	4,143	713.2	3,242	305.5	21.5	5,459	4.06E+05	6.56E+05	1.22E-04	1.86E-08
2016	435.8	110.0	239.0	50,899	4,168	506.2	3,215	312.9	21.8	5,222	4.10E+05	6.42E+05	9.56E-05	1.49E-08
2017	419.4	106.0	235.6	50,929	4,097	462.7	3,189	317.1	20.8	5,135	4.06E+05	6.28E+05	2.09E-04	3.32E-08

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Middle Wilcox (Layer 8) - Inflows, Page 1 of 2

Simulated Time Period	Inflows												
	Specific Storage	Specific Yield	General Head Boundaries	Recharge	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD	Medina County GCD
	(acre-feet)												
Predevelopment	0	0	19,976	25,458	0	10,895	4.19	1,569	4,106	19.2	693.2	380.6	1,629
1980	0	0	20,628	24,027	6.72	13,116	2.23	1,497	3,597	11.3	660.8	7.63	2,929
1981	79.7	14.0	20,493	30,801	6.83	14,139	5.35	1,748	4,149	11.3	790.4	89.6	2,658
1982	866.3	3,055	20,582	20,811	7.01	12,761	2.49	1,442	3,511	11.4	611.7	51.9	2,474
1983	644.4	1,670	20,600	21,333	7.20	12,975	1.85	1,401	3,367	11.3	612.7	73.2	2,448
1984	3,393	7,061	20,711	18,121	7.40	11,972	1.34	1,287	3,024	11.3	565.1	11.3	3,773
1985	933.8	35.4	20,541	29,040	7.42	13,529	3.51	1,652	3,755	11.2	756.7	107.2	2,344
1986	389.5	14.2	20,523	27,423	7.35	12,187	4.58	1,672	3,838	11.1	733.8	74.6	2,292
1987	47.6	13.2	20,502	27,751	7.34	12,816	4.67	1,684	3,942	11.0	739.6	106.0	2,245
1988	3,619	7,399	20,727	12,836	7.33	11,089	1.24	1,146	2,792	10.9	492.0	53.5	2,002
1989	5,445	3,225	20,683	17,055	7.13	11,388	0.663	1,183	2,736	10.8	553.6	9.65	2,085
1990	1,145	131.8	20,603	25,361	6.91	12,218	1.31	1,476	3,303	10.6	697.1	12.3	2,214
1991	13,693	896.8	20,545	30,260	6.71	12,151	5.14	1,732	3,881	10.5	787.7	0.593	2,420
1992	9,084	321.0	20,556	34,148	6.60	12,885	8.62	1,933	4,382	10.4	863.2	0.546	2,551
1993	10,541	3,343	20,641	21,840	6.54	12,184	3.45	1,545	3,515	10.3	639.5	0.475	2,445
1994	10,423	1,029	20,642	27,548	6.44	12,569	3.77	1,661	3,758	10.2	734.7	0.443	3,070
1995	10,066	3,968	20,739	21,313	6.35	12,542	2.26	1,448	3,282	10.1	624.5	0.431	3,088
1996	10,116	6,965	20,925	15,132	6.28	12,392	0.999	1,181	2,627	10.1	526.7	0.431	3,019
1997	2,204	129.6	20,744	29,682	6.23	14,407	2.76	1,646	3,540	10.0	772.9	0.443	2,920
1998	10,256	205.6	20,736	29,746	6.17	12,814	5.21	1,743	3,783	10.00	784.2	0.469	2,978
1999	9,500	5,923	20,896	17,053	6.11	12,741	1.84	1,320	2,845	10.1	559.1	11.2	2,836
2000	16,889	708.3	20,949	25,873	6.12	13,293	1.90	1,529	3,248	10.2	708.5	5.55	3,196
2001	7,489	565.1	20,933	23,212	6.06	14,032	2.01	1,487	3,070	10.3	660.0	2.49	3,103
2002	14,385	42.2	20,806	39,463	6.08	14,469	9.26	2,064	4,359	10.4	970.7	0.889	3,536
2003	8,135	672.9	20,895	28,782	6.07	14,499	6.16	1,804	3,878	10.4	774.6	0.951	3,358
2004	4,752	0	20,874	37,793	6.11	15,292	9.80	2,093	4,566	10.5	938.1	1.02	3,439
2005	5,743	6,568	21,017	19,087	6.18	13,775	2.83	1,461	3,321	10.6	603.6	1.11	3,153
2006	2,874	4,613	21,097	17,068	6.27	14,252	1.42	1,266	2,794	10.6	549.9	5.98	3,004
2007	2,391	0	20,855	40,872	6.39	15,260	8.97	2,088	4,515	10.7	985.5	20.5	3,290
2008	15,316	8,645	21,167	16,213	6.58	12,642	2.23	1,343	3,080	10.8	554.1	1.48	3,110
2009	32,823	3,777	21,183	23,304	6.63	13,419	1.59	1,427	3,185	10.7	660.7	1.58	3,556
2010	33,233	3,159	21,242	29,031	6.51	15,066	1.58	1,641	3,489	10.7	779.3	1.65	4,071
2011	30,940	11,539	21,507	13,424	6.15	15,657	0.400	1,151	2,293	10.7	523.0	1.71	3,938
2012	8,565	707.8	21,832	23,162	5.92	20,012	0.007	1,307	2,735	10.8	831.4	1.83	3,514
2013	7,596	217.0	21,811	25,344	5.98	16,200	0	1,365	3,166	10.9	885.1	5.86	3,475
2014	7,739	1,055	21,940	22,508	6.22	15,800	0	1,285	3,184	11.2	867.6	21.9	3,391
2015	7,606	0.181	21,884	37,197	6.53	16,997	0	1,775	4,475	11.5	1,168	67.0	3,493
2016	4,045	2.46	21,881	35,470	6.86	15,759	0.022	1,989	4,680	11.8	1,112	93.5	3,439
2017	4,474	1,118	22,010	28,965	7.11	14,567	0	1,792	4,290	12.1	1,051	93.2	3,300

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Middle Wilcox (Layer 8)

Simulated Time Period	Inflows											Total Inflows
	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	Upper Layers	
	(acre-feet)											
Predevelopment	12.5	1,403	1,396	4,523	11,679	1.14	88.8	224.1	289.1	912.0	3.92E+05	4.78E+05
1980	22.8	2,142	3,199	7,812	10,808	1.72	92.3	526.4	291.3	1,435	4.20E+05	5.13E+05
1981	22.6	2,042	2,993	8,248	10,924	1.60	92.1	558.0	306.4	1,433	4.16E+05	5.18E+05
1982	21.9	2,147	2,807	7,764	10,525	1.65	92.1	516.6	277.5	1,426	4.17E+05	5.09E+05
1983	21.9	2,123	2,796	8,319	10,482	1.72	92.1	518.1	284.2	1,552	4.17E+05	5.08E+05
1984	22.6	2,122	2,707	7,214	10,448	2.03	92.4	509.5	280.7	1,423	4.22E+05	5.16E+05
1985	23.7	2,221	2,841	8,684	10,675	2.24	92.2	560.7	307.8	1,658	4.16E+05	5.16E+05
1986	24.9	2,290	2,652	9,467	10,708	2.34	92.2	550.4	298.1	1,598	4.14E+05	5.11E+05
1987	25.4	2,206	2,531	9,384	10,718	2.17	92.2	544.2	297.3	1,609	4.12E+05	5.09E+05
1988	24.8	1,908	2,408	6,789	10,300	1.67	92.4	458.8	263.0	1,448	4.16E+05	5.02E+05
1989	24.5	2,020	2,540	6,793	10,413	1.68	92.1	482.5	283.3	1,402	4.16E+05	5.05E+05
1990	22.8	2,427	2,635	7,316	10,738	1.03	92.0	524.2	305.4	1,404	4.16E+05	5.08E+05
1991	23.4	2,240	2,789	7,197	11,251	1.67	92.0	521.8	310.8	1,271	4.15E+05	5.27E+05
1992	23.5	2,470	2,858	7,668	11,429	1.76	92.3	560.8	321.4	1,332	4.15E+05	5.28E+05
1993	25.0	2,250	2,708	7,454	11,093	2.99	92.1	519.2	279.5	1,369	4.15E+05	5.17E+05
1994	25.2	2,401	2,810	7,623	11,197	3.07	92.2	556.4	299.5	1,410	4.16E+05	5.23E+05
1995	24.6	2,276	2,776	7,561	11,113	2.76	92.1	538.6	283.3	1,411	4.17E+05	5.21E+05
1996	23.8	2,359	2,762	7,500	11,059	2.53	92.3	517.9	275.0	1,417	4.21E+05	5.20E+05
1997	23.3	2,421	2,924	8,413	11,288	2.63	91.9	594.2	314.1	1,464	4.17E+05	5.21E+05
1998	22.5	2,516	2,895	8,126	11,333	2.34	91.8	600.4	307.1	1,483	4.17E+05	5.27E+05
1999	22.1	2,236	2,736	7,841	11,052	2.43	91.8	545.2	273.8	1,488	4.19E+05	5.19E+05
2000	21.4	2,779	2,912	7,809	11,663	2.19	91.9	590.4	307.2	1,551	4.22E+05	5.36E+05
2001	21.1	2,441	2,866	8,021	11,338	2.35	91.6	572.9	294.9	1,576	4.19E+05	5.21E+05
2002	20.6	3,059	3,103	8,335	12,102	2.25	91.6	675.2	339.6	1,618	4.18E+05	5.48E+05
2003	20.5	2,665	2,965	8,395	11,656	2.39	91.6	620.8	299.2	1,646	4.18E+05	5.29E+05
2004	20.7	2,657	3,052	8,877	11,821	2.56	91.8	673.3	323.9	1,692	4.17E+05	5.36E+05
2005	20.6	2,304	2,817	8,300	11,217	2.46	91.5	566.1	267.0	1,694	4.18E+05	5.20E+05
2006	20.6	2,024	2,772	8,589	10,922	2.41	91.5	539.0	271.3	1,613	4.18E+05	5.12E+05
2007	21.2	2,237	3,020	8,638	11,375	2.74	91.5	662.6	338.3	1,745	4.12E+05	5.31E+05
2008	21.0	2,116	2,789	7,748	10,906	2.39	91.7	541.0	262.0	1,751	4.18E+05	5.26E+05
2009	20.3	2,796	3,062	8,405	11,615	1.97	91.4	589.3	296.2	1,716	4.22E+05	5.54E+05
2010	19.3	3,758	3,302	9,278	12,719	1.56	91.3	654.8	321.2	1,772	4.28E+05	5.72E+05
2011	18.8	3,445	3,253	9,370	12,754	1.53	91.3	599.3	285.0	1,807	4.33E+05	5.66E+05
2012	17.2	2,429	3,350	10,138	11,136	0.729	91.4	619.0	308.2	1,860	4.24E+05	5.36E+05
2013	14.5	2,287	3,354	9,668	10,823	0.018	90.9	630.6	309.8	1,916	4.20E+05	5.29E+05
2014	12.8	3,110	3,311	10,001	10,680	0	90.7	620.7	312.7	2,049	4.20E+05	5.28E+05
2015	11.5	2,901	3,422	12,257	11,171	0	90.6	699.0	344.1	2,439	4.16E+05	5.44E+05
2016	12.5	2,741	3,319	11,414	11,403	0	91.1	695.8	330.8	2,413	4.15E+05	5.35E+05
2017	13.7	2,801	3,192	10,465	11,281	0	91.3	656.9	312.2	2,305	4.14E+05	5.27E+05

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 1 of 2

Simulated Time Period	Outflows												
	Specific Storage	Specific Yield	Wells	General Head Boundaries	Evapo-transpiration	Bee GCD	Evergreen UWCD	Fayette County GCD	Gonzales County UWCD	Guadalupe County GCD	Live Oak UWCD	Lost Pines GCD	McMullen GCD
	(acre-feet)												
Predevelopment	0	0	0	2,393	2,607	5.21	50,063	1,029	4,025	1,036	35.7	14,665	60.6
1980	0	0	23,963	1,792	1,256	17.4	57,300	1,032	3,783	1,037	119.6	14,633	100.2
1981	4,687	5,967	19,909	1,805	1,685	16.8	54,523	1,022	3,838	962.2	106.1	14,634	71.9
1982	1,985	850.2	20,411	1,783	1,250	16.1	55,309	1,031	3,852	1,030	97.1	14,617	134.1
1983	3,740	741.7	20,081	1,779	1,219	15.4	54,218	1,034	3,764	1,055	89.3	14,582	173.8
1984	797.4	502.8	30,591	1,773	870.6	15.0	55,338	1,040	3,666	1,088	85.8	14,594	210.6
1985	5,392	7,340	17,264	1,794	1,474	14.7	52,710	1,025	3,614	1,001	89.0	14,575	138.9
1986	6,242	4,118	17,446	1,795	1,607	14.5	53,824	1,023	3,664	993.8	90.5	14,608	146.6
1987	7,586	3,599	16,646	1,797	1,701	14.1	52,484	1,024	3,767	992.5	82.7	14,628	139.2
1988	1,050	191.3	17,958	1,767	946.8	14.0	55,473	1,045	3,880	1,166	81.5	14,623	159.2
1989	536.8	351.9	19,037	1,762	1,040	14.5	56,851	1,042	3,678	1,162	89.2	14,517	210.2
1990	1,482	2,894	20,561	1,778	1,510	15.1	55,115	1,031	3,721	1,066	95.2	14,524	223.3
1991	1,104	5,053	19,646	1,796	1,869	15.9	58,032	1,021	3,614	997.7	101.0	14,575	489.6
1992	1,772	5,422	19,280	1,817	2,250	16.1	55,854	1,021	3,737	946.8	99.2	14,686	605.4
1993	706.2	246.5	17,385	1,785	1,649	17.0	57,315	1,027	3,645	1,054	100.6	14,626	754.7
1994	514.9	1,563	21,014	1,795	1,646	17.0	57,617	1,026	3,669	1,041	102.7	14,615	854.6
1995	190.0	37.1	22,327	1,779	1,262	17.3	57,535	1,033	3,720	1,102	106.0	14,590	909.0
1996	118.5	4.93	23,258	1,767	874.4	17.8	58,665	1,046	3,706	1,203	109.9	14,583	950.0
1997	4,288	5,149	20,423	1,791	1,559	17.8	54,614	1,026	3,593	1,069	107.3	14,549	806.1
1998	1,065	3,057	21,672	1,798	1,751	18.3	59,384	1,022	3,743	1,037	114.1	14,599	1,028
1999	829.1	13.3	21,851	1,768	1,088	18.6	59,151	1,035	3,643	1,156	114.8	14,566	820.5
2000	267.8	1,485	26,608	1,785	1,395	20.3	62,832	1,034	3,704	1,102	119.9	14,579	950.7
2001	846.6	674.5	21,808	1,777	1,330	20.0	58,687	1,030	3,568	1,123	116.2	14,547	896.6
2002	1,278	8,694	27,156	1,819	2,246	21.0	61,339	1,017	3,727	982.5	119.4	14,635	1,066
2003	569.5	1,018	23,683	1,802	1,829	20.7	59,141	1,022	3,756	1,031	118.3	14,662	1,064
2004	3,335	6,714	20,848	1,831	2,447	19.7	57,278	1,021	3,794	986.3	113.5	14,764	973.4
2005	716.9	55.7	20,610	1,783	1,347	19.0	58,972	1,036	3,840	1,117	109.3	14,673	921.8
2006	3,464	132.8	17,033	1,770	1,108	17.6	57,532	1,044	3,680	1,201	102.4	14,591	773.6
2007	5,709	12,234	12,904	1,829	2,530	15.5	55,235	1,018	3,609	1,002	91.2	14,680	697.0
2008	198.9	0	18,579	1,778	1,227	15.7	62,110	1,040	3,834	1,146	91.0	14,675	908.7
2009	34.1	87.2	27,625	1,777	1,339	18.2	68,566	1,038	3,892	1,126	104.8	14,563	1,474
2010	61.0	783.1	41,075	1,786	1,517	23.6	70,966	1,033	4,065	1,077	136.2	14,558	1,943
2011	0	0	40,759	1,755	761.6	27.4	71,181	1,050	3,876	1,295	162.4	14,518	2,229
2012	9,637	5,569	12,370	1,741	1,192	25.8	60,320	1,057	4,733	1,212	148.3	14,346	1,730
2013	3,661	3,778	12,334	1,733	1,475	24.1	61,270	1,058	6,147	1,123	134.9	14,284	1,472
2014	3,778	945.7	14,863	1,721	1,396	22.8	61,349	1,073	7,215	1,108	125.1	14,234	1,240
2015	10,590	9,758	12,438	1,733	2,348	21.7	59,016	1,070	8,876	962.7	115.0	14,220	975.0
2016	7,438	5,812	11,296	1,744	2,508	20.7	58,703	1,052	6,947	945.1	107.4	14,324	823.7
2017	3,898	1,034	13,326	1,719	2,178	20.0	59,869	1,057	7,121	985.1	105.1	14,214	741.2

Note:

Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.8 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Middle Wilcox (Layer 8) - Outflows, Net Flows In-Out, and Percent Discrepancy, Page 2 of 2

Simulated Time Period	Outflows												Total Outflows	Net Flows In-Out	Percent Discrepancy
	Medina County GCD	Pecan Valley GCD	Plum Creek CD	Uvalde County UWCD	Wintergarden GCD	Bexar	Gonzales	Lavaca	Maverick	Caldwell	Webb	Upper Layers			
	(acre-feet)														%
Predevelopment	1,829	235.7	2,676	940.5	5,919	15,579	157.0	3,410	240.4	783.2	1,070	3.69E+05	4.78E+05	0.003	6.46E-07
1980	3,335	146.9	1,979	654.1	29,467	15,796	176.2	3,416	1,122	698.7	1,760	3.50E+05	5.13E+05	-4.45E-06	-8.67E-10
1981	3,235	148.3	2,112	705.7	28,387	15,699	176.4	3,404	1,106	719.9	1,756	3.51E+05	5.18E+05	2.40E-06	4.64E-10
1982	3,236	152.0	1,968	713.0	28,690	15,815	176.8	3,404	1,135	699.5	1,754	3.49E+05	5.09E+05	1.30E-05	2.56E-09
1983	3,196	153.2	1,906	715.7	28,689	15,895	176.0	3,405	1,140	685.6	1,639	3.48E+05	5.08E+05	6.91E-06	1.36E-09
1984	3,322	147.4	1,798	750.0	30,746	16,067	168.8	3,411	1,127	660.4	1,846	3.46E+05	5.16E+05	1.76E-05	3.42E-09
1985	3,275	140.8	1,944	747.2	30,737	15,775	162.8	3,401	1,130	691.4	1,521	3.50E+05	5.16E+05	3.42E-05	6.62E-09
1986	3,122	136.3	1,981	755.6	25,723	15,725	159.8	3,400	1,006	702.8	1,486	3.51E+05	5.11E+05	1.35E-05	2.65E-09
1987	3,009	136.0	2,029	751.1	24,134	15,732	162.6	3,401	943.9	712.1	1,438	3.52E+05	5.09E+05	-1.43E-04	-2.81E-08
1988	3,121	142.2	1,810	741.5	27,187	16,083	176.8	3,415	1,217	661.9	1,534	3.48E+05	5.02E+05	7.15E-06	1.43E-09
1989	3,167	141.9	1,723	736.4	29,334	15,981	174.1	3,406	1,073	641.5	1,851	3.46E+05	5.05E+05	4.78E-05	9.48E-09
1990	3,119	151.9	1,746	741.1	27,352	15,862	190.4	3,411	1,236	652.9	1,755	3.48E+05	5.08E+05	1.94E-05	3.82E-09
1991	3,167	143.6	1,977	724.8	37,459	16,234	169.9	3,407	1,300	690.7	3,382	3.50E+05	5.27E+05	-3.19E-05	-6.05E-09
1992	3,179	142.8	2,039	717.9	35,660	16,191	167.3	3,414	1,331	720.0	3,521	3.54E+05	5.28E+05	8.40E-06	1.59E-09
1993	3,337	128.0	1,987	719.5	35,269	16,512	143.1	3,398	1,108	702.9	3,712	3.50E+05	5.17E+05	5.52E-05	1.07E-08
1994	3,375	124.8	2,006	716.8	35,804	16,072	141.3	3,396	1,043	709.9	3,868	3.51E+05	5.23E+05	-7.13E-06	-1.36E-09
1995	3,564	127.0	1,931	722.8	35,967	16,392	148.2	3,398	1,097	688.8	3,836	3.48E+05	5.21E+05	3.57E-05	6.86E-09
1996	3,774	130.8	1,754	728.1	35,818	16,727	154.7	3,409	1,139	662.7	3,742	3.46E+05	5.20E+05	3.23E-07	6.21E-11
1997	3,681	131.9	1,909	730.5	31,810	16,336	151.9	3,399	1,040	687.1	2,772	3.49E+05	5.21E+05	3.03E-05	5.81E-09
1998	3,719	136.6	1,990	732.5	34,730	16,188	156.8	3,400	1,115	707.0	3,789	3.50E+05	5.27E+05	3.11E-05	5.90E-09
1999	3,890	138.8	1,844	736.2	34,117	16,546	154.5	3,401	1,170	668.2	4,026	3.46E+05	5.19E+05	-6.52E-06	-1.26E-09
2000	4,039	144.1	1,817	737.5	38,931	16,826	161.8	3,412	1,066	669.4	4,910	3.47E+05	5.36E+05	1.27E-04	2.36E-08
2001	4,118	145.1	1,840	740.2	34,909	16,671	156.8	3,402	1,039	669.8	4,442	3.46E+05	5.21E+05	7.78E-06	1.49E-09
2002	4,106	148.4	2,014	736.8	38,970	16,548	159.6	3,403	999.7	723.0	5,029	3.51E+05	5.48E+05	2.49E-05	4.55E-09
2003	4,172	149.1	2,044	738.0	36,161	16,540	156.2	3,402	1,005	725.6	4,693	3.50E+05	5.29E+05	-1.04E-05	-1.96E-09
2004	4,102	148.7	2,226	735.3	33,694	16,210	151.8	3,411	990.0	768.2	4,138	3.55E+05	5.36E+05	-2.12E-05	-3.97E-09
2005	4,211	148.5	2,031	741.2	33,219	16,475	153.3	3,402	1,012	716.8	3,956	3.48E+05	5.20E+05	6.32E-06	1.22E-09
2006	4,266	148.2	1,915	741.9	30,410	16,447	153.0	3,403	1,019	685.6	3,418	3.47E+05	5.12E+05	-1.17E-05	-2.28E-09
2007	4,082	144.3	2,281	737.9	31,077	15,650	143.5	3,400	968.5	765.4	3,405	3.56E+05	5.31E+05	5.81E-05	1.09E-08
2008	4,300	146.3	2,001	738.5	38,067	16,245	153.0	3,412	1,011	705.0	4,639	3.49E+05	5.26E+05	1.21E-06	2.30E-10
2009	4,566	151.3	1,842	731.1	49,873	16,777	166.8	3,406	1,024	679.3	7,072	3.46E+05	5.54E+05	4.37E-05	7.89E-09
2010	4,813	161.4	1,747	741.7	50,851	17,697	185.9	3,410	1,048	669.0	7,693	3.43E+05	5.72E+05	1.34E-05	2.35E-09
2011	5,186	168.4	1,511	754.1	51,134	18,687	188.9	3,412	1,125	609.4	7,900	3.38E+05	5.66E+05	-2.08E-05	-3.68E-09
2012	5,131	189.7	1,691	761.0	40,221	16,445	237.7	3,436	1,148	637.0	5,243	3.47E+05	5.36E+05	3.83E-05	7.15E-09
2013	5,022	223.8	1,782	762.3	38,895	15,593	314.3	3,450	1,157	638.9	4,526	3.48E+05	5.29E+05	2.44E-05	4.61E-09
2014	4,938	261.0	1,603	762.7	38,326	15,392	375.0	3,471	1,178	600.5	4,008	3.48E+05	5.28E+05	7.96E-04	1.51E-07
2015	4,690	308.6	1,826	771.5	35,734	14,999	454.5	3,497	1,147	631.7	3,524	3.54E+05	5.44E+05	1.03E-05	1.90E-09
2016	4,504	290.8	1,955	767.8	35,262	14,991	334.7	3,481	1,141	654.2	3,376	3.57E+05	5.35E+05	3.32E-05	6.20E-09
2017	4,396	277.3	1,869	761.5	35,110	14,937	292.3	3,458	1,141	628.7	3,320	3.54E+05	5.27E+05	4.12E-05	7.82E-09

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

Appendix J Table J-24.9 Water Budget by Groundwater Conservation District or Texas County for Transient 1980 to 2017 Simulation
Flow to Lower Layers - Lower Wilcox (Layer 9)

Simulated Time Period	Total Inflows	Total Outflows	Net Flows In-Out	Percent Discrepancy
	(acre-feet)			%
Predevelopment	Flow to Lower Layers does not exist in model in the Lower Wilcox (Layer 9).			
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				

Note:
Predevelopment period is a steady-state period in the model and does not relate directly to a specific range of years like other stress periods. The Predevelopment period volume shown is calculated as a 365-day (one-year) volume for any year in the Predevelopment period.

APPENDIX K

Predictive Simulation Technical Memoranda

Technical Memorandum 1

Pumping Comparison: Previous GAM, Previous GAM Update, Updated GAM, and 2021 Preliminary MAG Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifer

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January 31, 2023

Professional Engineer and Professional Geoscientist Seals

This report was prepared by William R. Hutchison, Ph.D., P.E., P.G., who is licensed in the State of Texas as follows:

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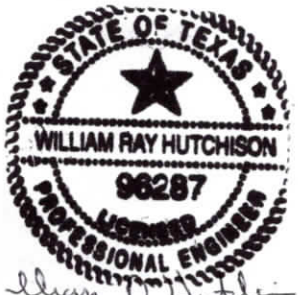
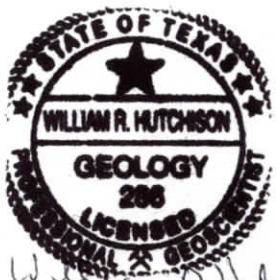


William R Hutchison
1/31/2023



William R Hutchison
1/31/2023

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Appendix

A – County-Aquifer Pumping Comparisons

1.0 Executive Summary

This technical memorandum presents county-aquifer pumping estimates from the old GAM (including the update), the new GAM, and estimates of the Modeled Available Groundwater values associated with the 2021 desired future condition for GMA 13.

This technical memorandum also presents GMA 13 pumping estimates from the new GAM broken down by outcrop and downdip pumping.

2.0 Background

One of the uses of the updated Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers documented in the main report will be to support the Joint Planning Process that leads to the adoption of desired future conditions by the groundwater conservation districts in Groundwater Management Area 13 and the calculation of the modeled available groundwater by TWDB. As part of the work associated with developing the updated Groundwater Availability Model, five technical memoranda appear in the Appendix of the report:

- Technical Memorandum 1: Pumping Comparisons
- Technical Memorandum 2: Pumping Sensitivity
- Technical Memorandum 3: Recharge Sensitivity
- Technical Memorandum 4: Calculation of Drawdown from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model
- Technical Memorandum 5: Calculation of Future Pumping from Existing Desired Future Conditions Using Updated Groundwater Availability Model

This technical memorandum summarizes a comparison of pumping output from:

- Old GAM from 1975 to 1999
- Old GAM update from 2000 to 2011
- Updated GAM (this GAM) from 1980 to 2017
- Estimated Modeled Available Groundwater (MAG) from 2021 Desired Future Condition

Pumping comparisons were completed for each county-aquifer unit in GMA 13. Table 1 summarizes the county-aquifer units with data. Hydrographs with the comparisons are presented in Appendix A.

Table 1. County-Aquifer Units with Pumping Comparisons

County	Sparta	Queen City	Carrizo-Wilcox
Atascosa	X	X	X
Bexar	No	No	X
Caldwell	No	X	X
Dimmit	No	X	X
Frio	X	X	X
Gonzales	X	X	X
Guadalupe	No	No	X
Karnes	No	No	X
LaSalle	X	X	X
Maverick	No	No	X
McMullen	X	X	X
Medina	No	No	X
Uvalde	No	No	X
Webb	No	No	X
Wilson	X	X	X
Zavala	X	X	X

This technical memorandum also summarizes the GMA 13 outcrop, downdip, and total pumping from the new GAM for the Sparta, Queen City, and Carrizo-Wilcox aquifers.

3.0 Parameters and Assumptions

3.1 County-Aquifer Pumping Comparison

Pumping estimates were extracted from model output (i.e. the cbb file) using FORTRAN programs. All files (cbb files, FORTRAN source code, FORTRAN executables, and pumping output) are provided on the share site:

- The directory named *getpump7599* includes all files associated with the old GAM with a calibration period of 1975 to 1999.
- The directory named *getpump0011* includes all files associated with the updated calibration period of the old GAM (2000 to 2011).
- The directory named *CalibPump* includes all files associated with the new GAM with a calibration period of 1981 to 2017.
- The directory named *getMAG* includes all files associated with the test run of the most recent desired future condition simulation. Although the actual modeled available groundwater values will be eventually developed by the Texas Water Development

Board, these estimates are assumed to be reasonably similar to the future MAGs for comparative purposes.

All output from these post-processors are also gathered in the directory *AllPumpData*. Please note that the output files are organized by county and model, with each file containing pumping from each of the three aquifers (Sparta, Queen City, Carrizo-Wilcox). Files names follow this convention:

- Old7599"county" = old GAM (1975 to 1999)
- Old0011"county" = old GAM (2000 to 2011)
- Tot"county" = new GAM (1980 to 2017)
- MAG"county" = future simulation associated with 2021 desired future condition (2012 to 2080)

Each output file has seven columns:

1. County Code
2. County Names
3. Year number of simulation
4. Year
5. Sparta Aquifer Pumping (AF/yr)
6. Queen City Aquifer Pumping (AF/yr)
7. Carrizo-Wilcox Pumping (AF/yr)

3.2 Outcrop and Downdip Pumping in GMA 13 – New GAM

The directory named *OCDDPump* includes the new GAM cbb file for the calibration period, a FORTRAN post-processor (*CalibPump.f95)* and the output from the post-processor (*gma13calpump.dat*) that includes pumping from GAM 13 from 1981 to 2017 split out by outcrop and downdip pumping.

The file *gma13calpump.dat* has 10 columns. The first column is the year. Columns 2 to 4 contain outcrop pumping from GMA 13 for the Sparta (column 2), Queen City (column 3), and Carrizo-Wilcox (column 4). Columns 5 to 7 contain the downdip pumping from GMA 13 for the Sparta (column 5), Queen City (column 6), and Carrizo-Wilcox (column 7). Columns 8 to 10 contain the total pumping from GMA 13 for the Sparta (column 8), Queen City (column 9), and Carrizo-Wilcox (column 10).

4.0 Methods and Results

4.1 County-Aquifer Pumping Comparison

As noted above, comparison hydrographs are presented in Appendix A organized by county (alphabetically) then aquifer (by stratigraphic depth).

The hydrographs can be viewed as a resource to evaluate the similarities and differences in the historic pumping estimates of the old GAM and the new GAM, and the assumptions of future pumping embedded in the desired future condition simulation adopted by GMA 13 in 2021 using the old GAM.

In general, the pumping estimates in the old GAM from 1975 to 1999 and the new GAM for the same time period are similar. Also, in general, the pumping estimates associated with the update of the old GAM from 2000 to 2011 are lower than the pumping estimates from the new GAM for the same time period. The old GAM update was limited to adjusting pumping to match groundwater elevation targets. Since the old GAM tended to over predict drawdown, the low pumping estimates from this exercise yielded pumping estimates that are generally lower than the pumping estimates from the new GAM.

Comparisons of the MAG values with the historic pumping are difficult to generally characterize. Some MAG values are within or slightly lower than the historic pumping while some MAG values are significantly higher than the historic pumping (due to the inclusion of new pumping wells). Some MAG values increase over the simulation period (2012 to 2080), while some MAG values decrease over the simulation period. Where MAG values decrease slightly during the simulation period, it is possible that these suggest that dry cells that resulted in reduced pumping. The improvements in the model code and the construction of the new GAM will eliminate the issue of dry cells to a large extent. However, reductions in input pumping are still possible, and simulations need to evaluate these in more detail to understand the sustainability of any proposed pumping.

4.2 Outcrop and Downdip Pumping in GMA 13 – New GAM

Bar graphs for GMA 13 pumping (with outcrop and downdip pumping separated) are presented below as:

- Figure 1: Sparta Aquifer
- Figure 2: Queen City Aquifer
- Figure 3: Carrizo-Wilcox Aquifer

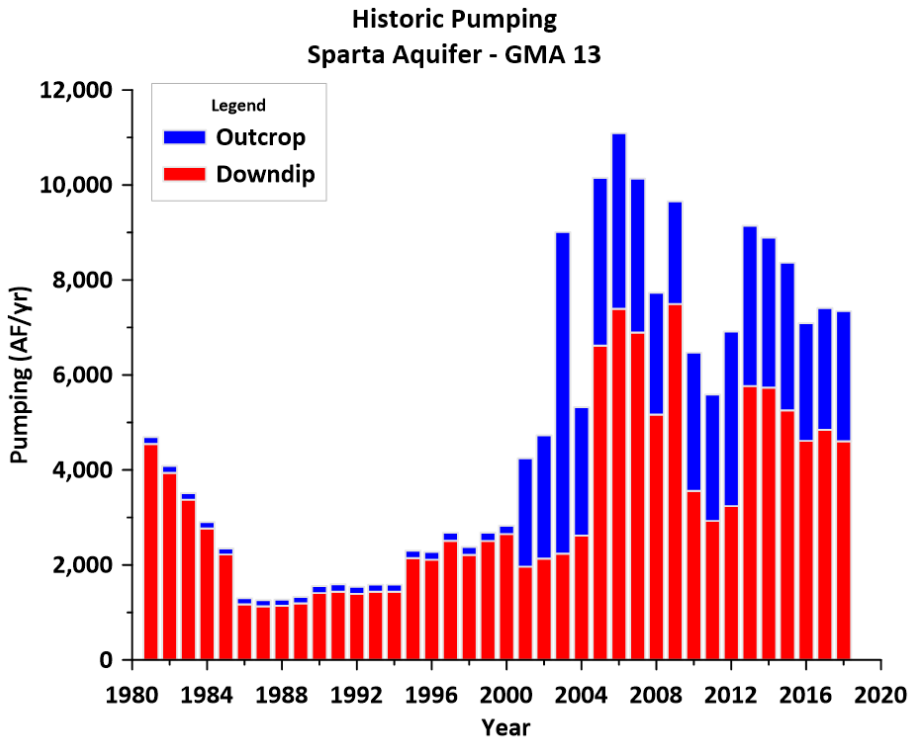


Figure 1. GMA 13 Historic Pumping - Sparta Aquifer

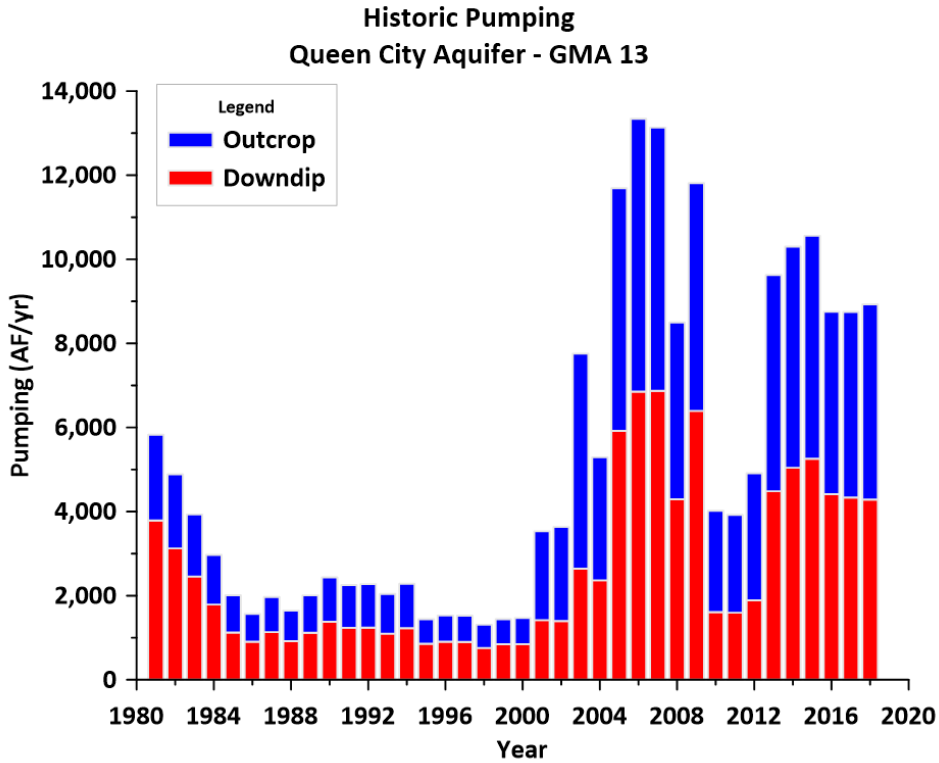


Figure 2. GMA 13 Historic Pumping - Queen City Aquifer

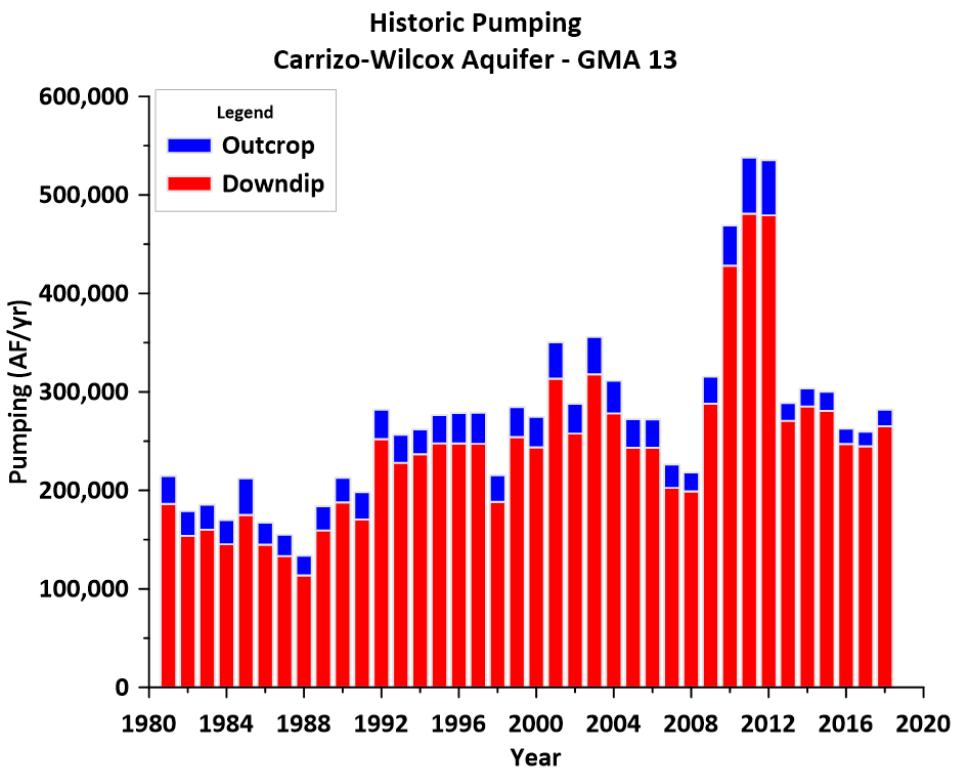


Figure 3. GMA 13 Historic Pumping - Carrizo Wilcox Aquifer

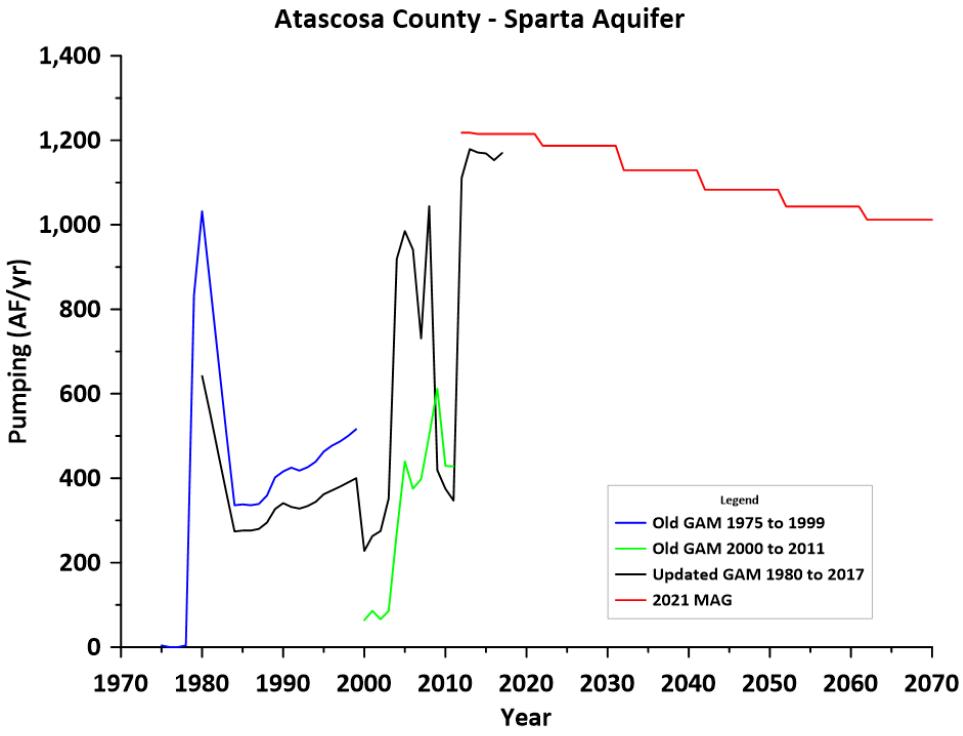
5.0 Limitations

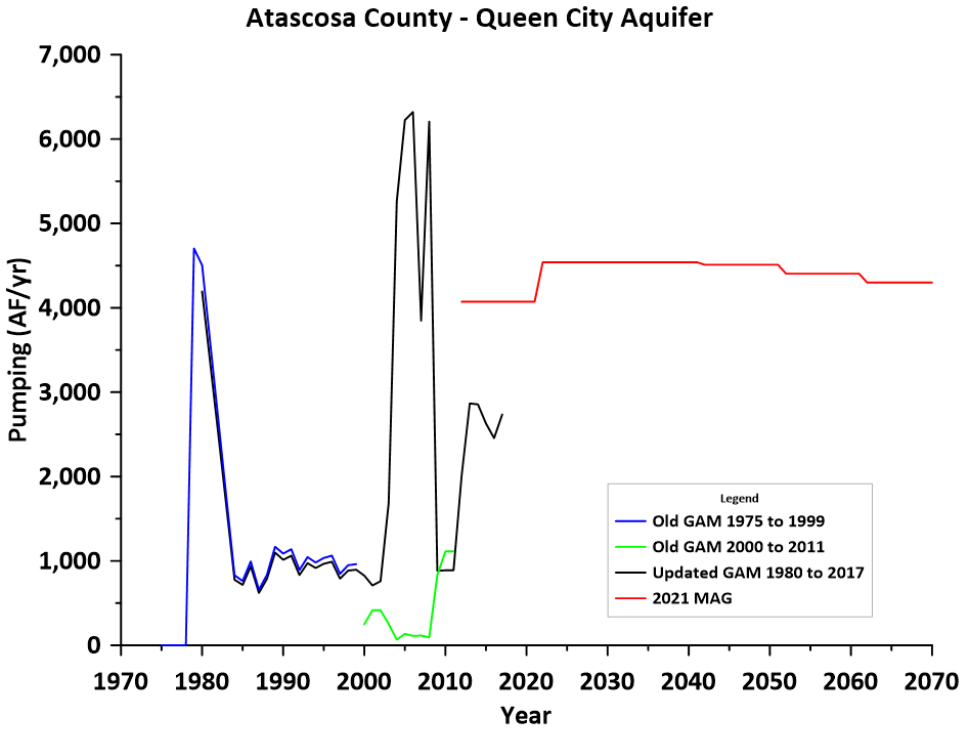
The historic county-aquifer pumping estimates are useful to provide a general sense of pumping in each of the county-aquifer units but are estimates and not based on a rigorous metering program. These estimates can be used as part of the joint planning process to understand and characterize trends of historic pumping but are limited when viewed on a close scale.

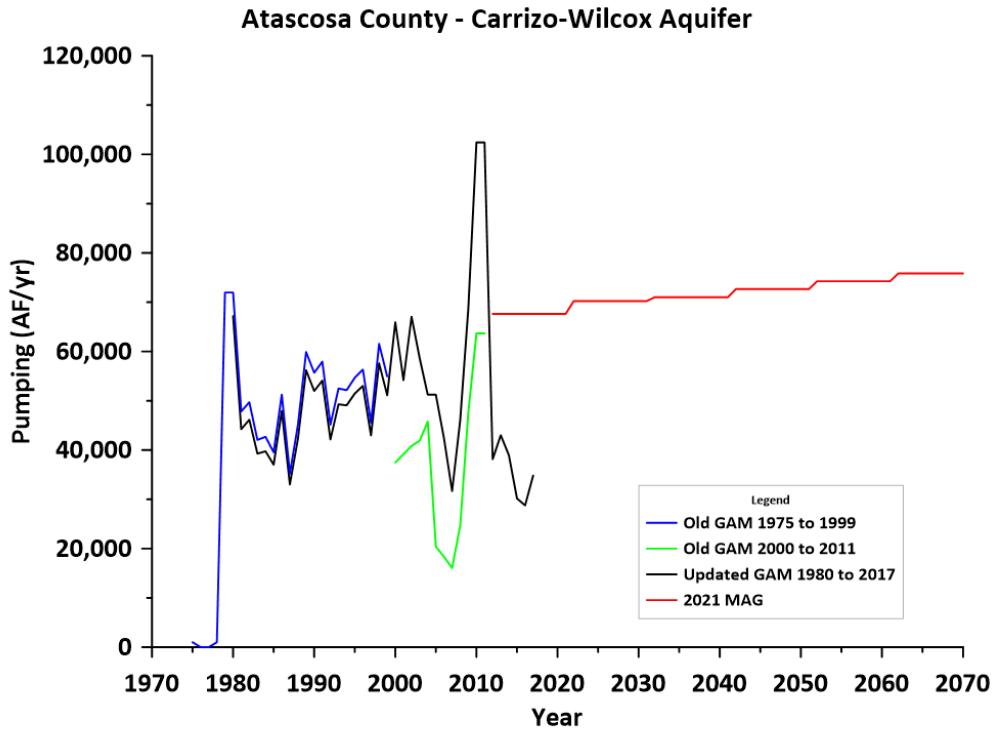
Similar to the county-aquifer pumping estimates, the GMA 13 pumping estimates from the new GAM that are split into outcrop and downdip pumping provide a basic conceptual understanding of the relative pumping in each aquifer between the outcrop area and the downdip area. This is particularly useful since the current primary DFC in GMA 13 is tied to saturated thickness of the outcrop area. This issue is evaluated in greater detail in Technical Memoranda 2 and 3.

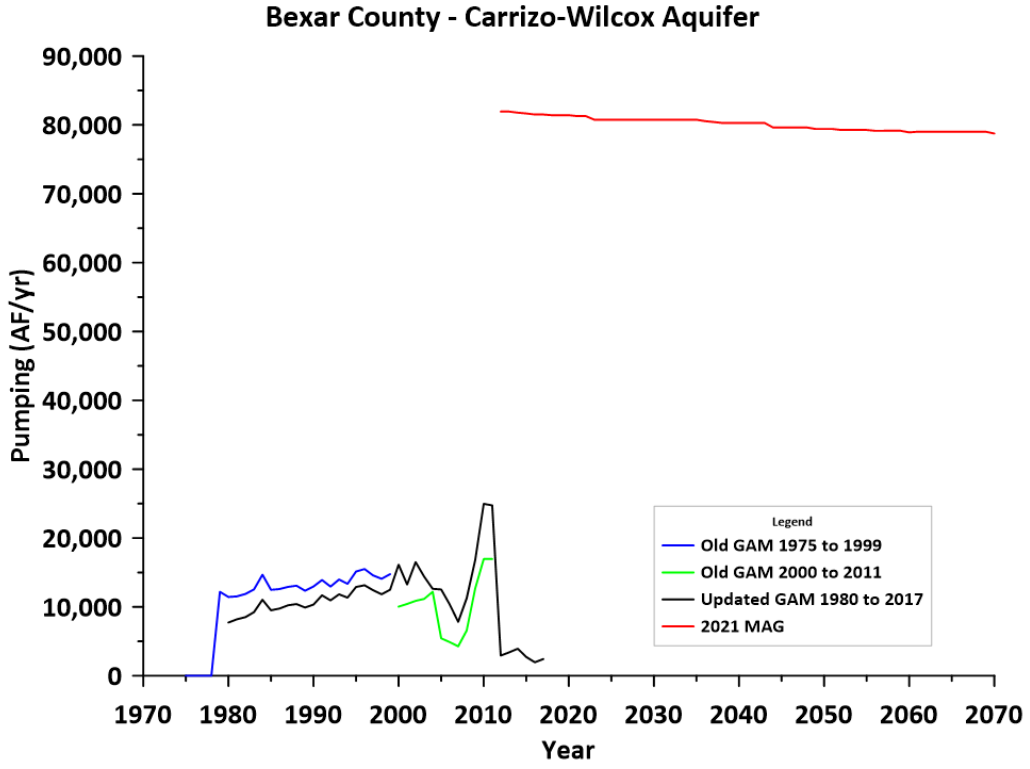
Appendix A

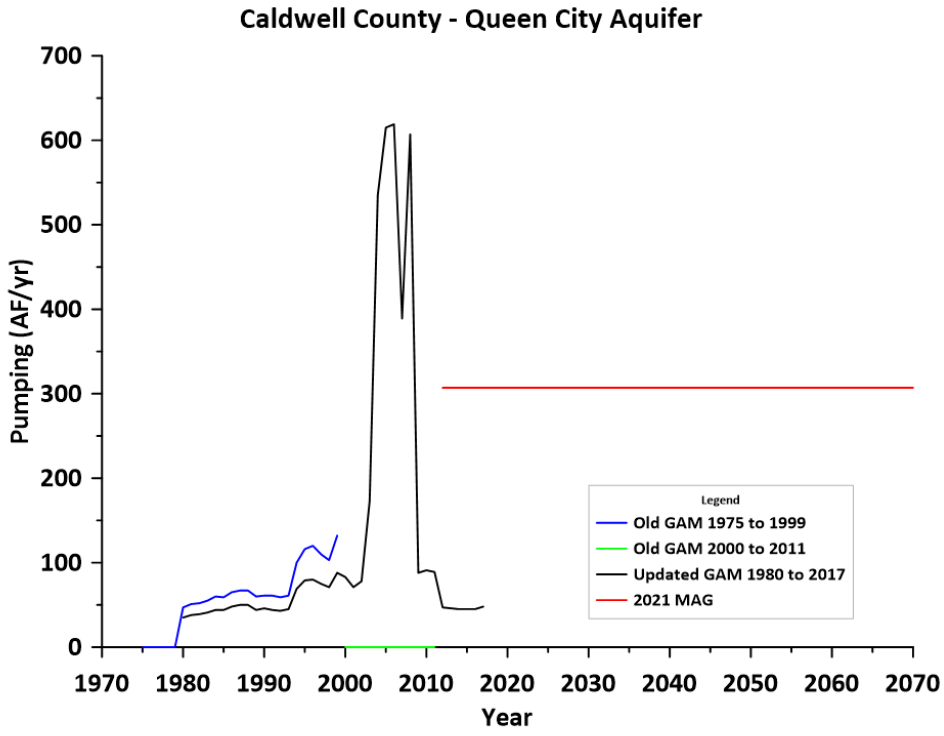
County-Aquifer Pumping Comparisons

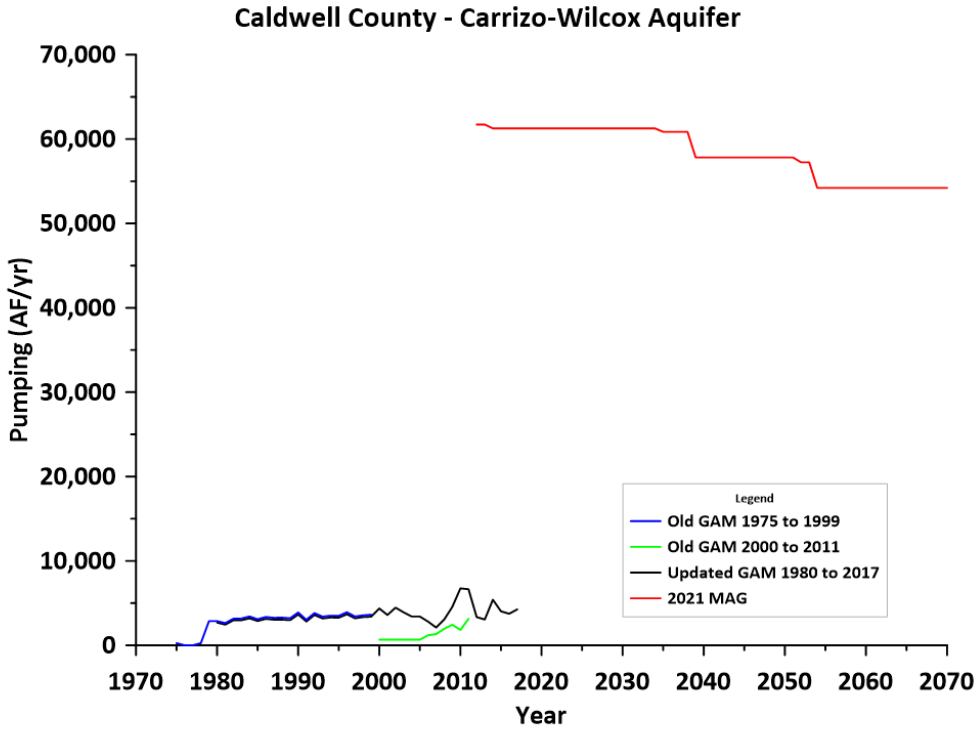

Atascosa County - Sparta Aquifer
Pumping (AF/yr)
1,400
1,200
1,000
800
600
400
200
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

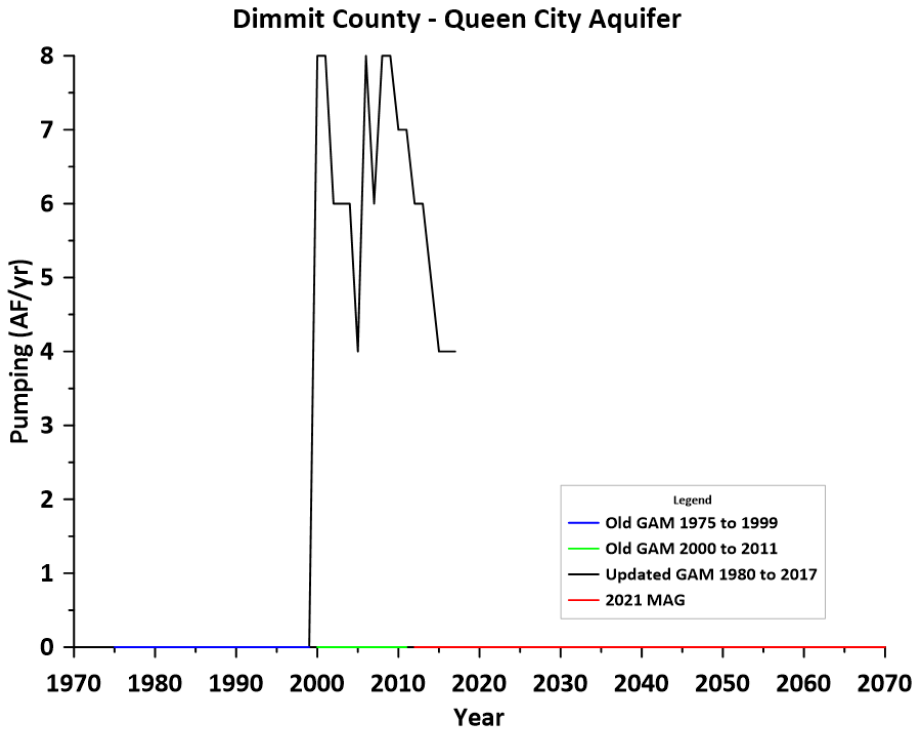

Atascosa County - Queen City Aquifer
Pumping (AF/yr)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

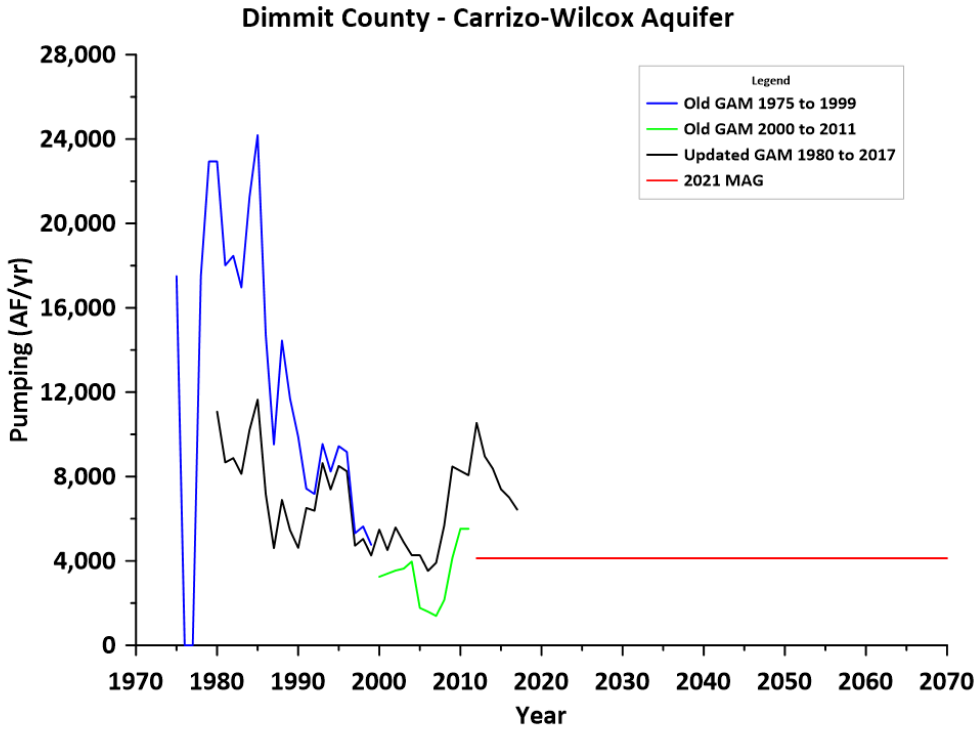

Atascosa County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
120,000
100,000
80,000
60,000
40,000
20,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

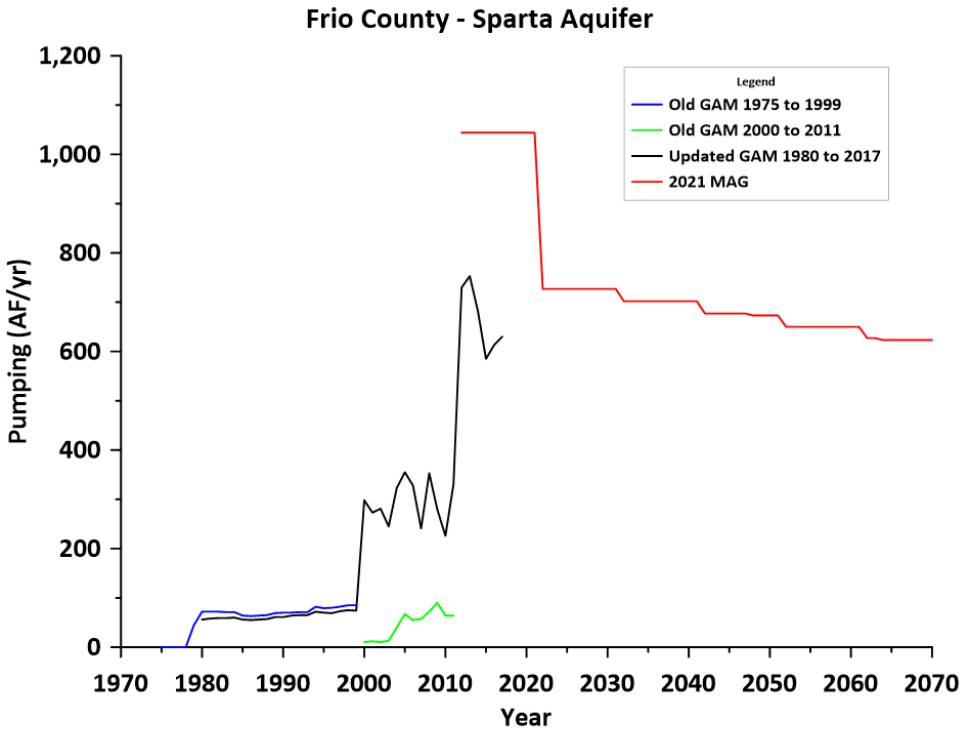

Bexar County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

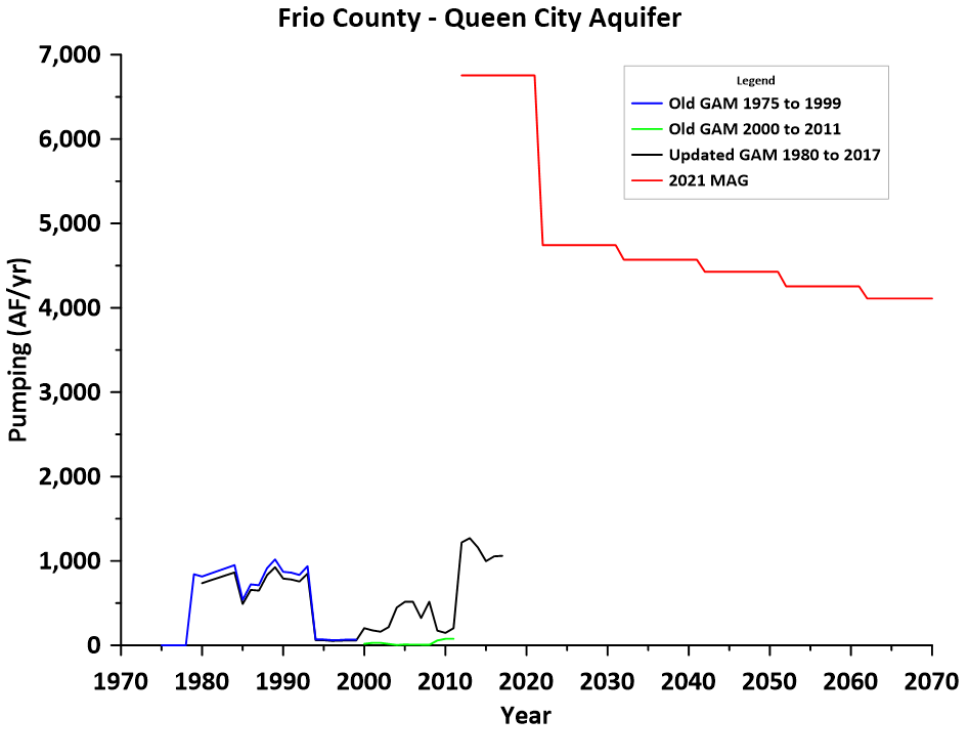

Caldwell County - Queen City Aquifer
Pumping (AF/yr)
700
600
500
400
300
200
100
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

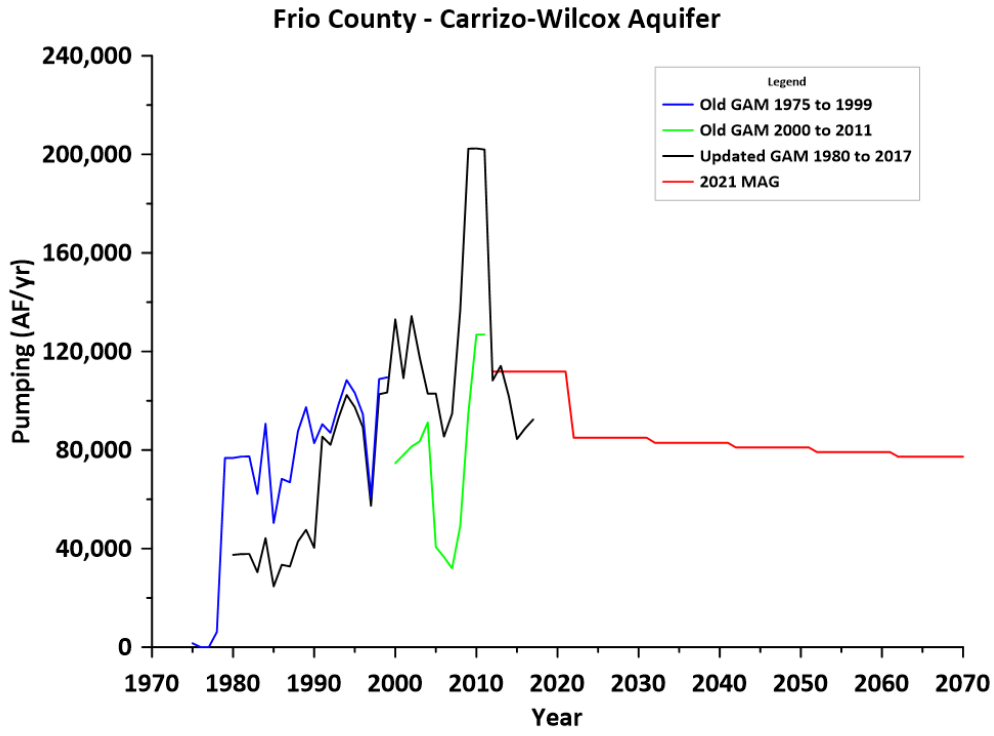

Caldwell County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

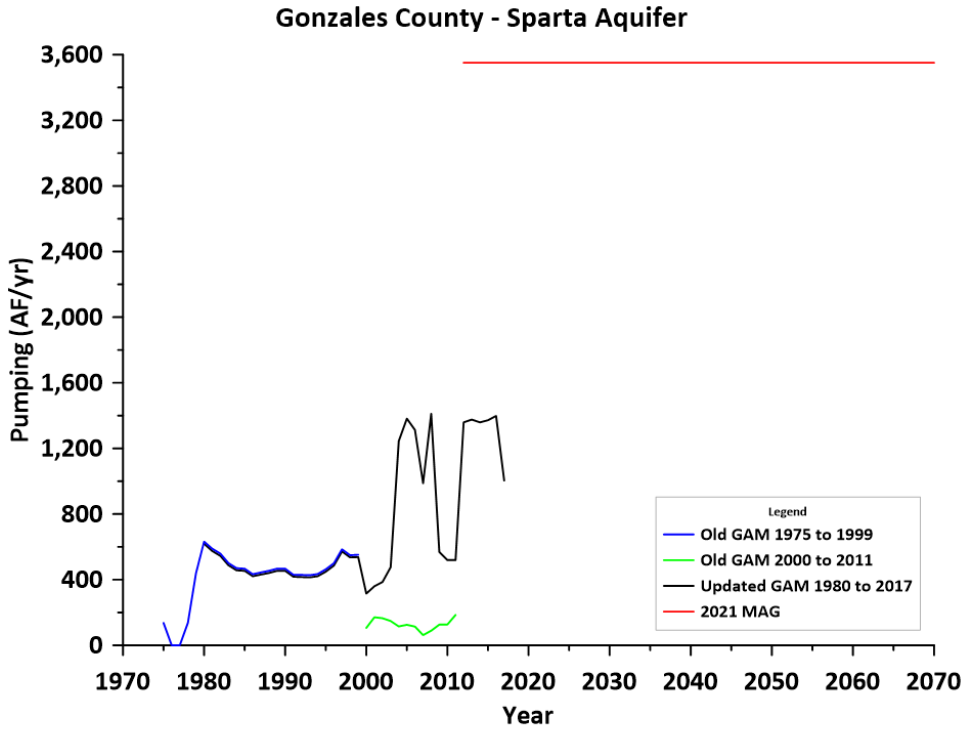

Dimmit County - Queen City Aquifer
Pumping (AF/yr)
0
1
2
3
4
5
6
7
8
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

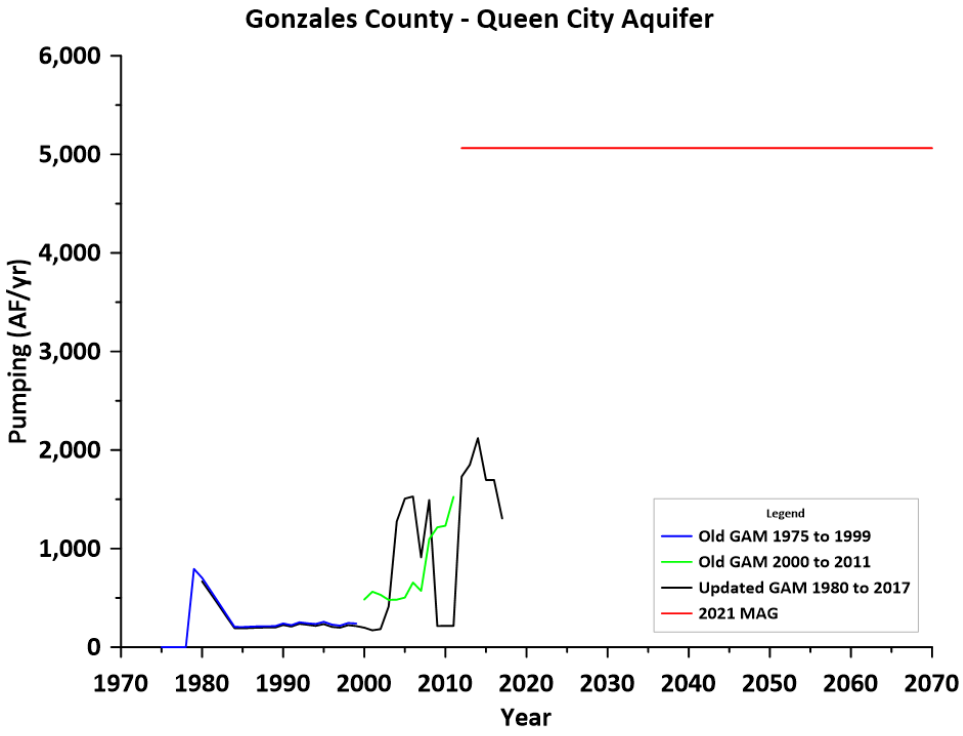

Dimmit County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
0
4,000
8,000
12,000
16,000
20,000
24,000
28,000
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

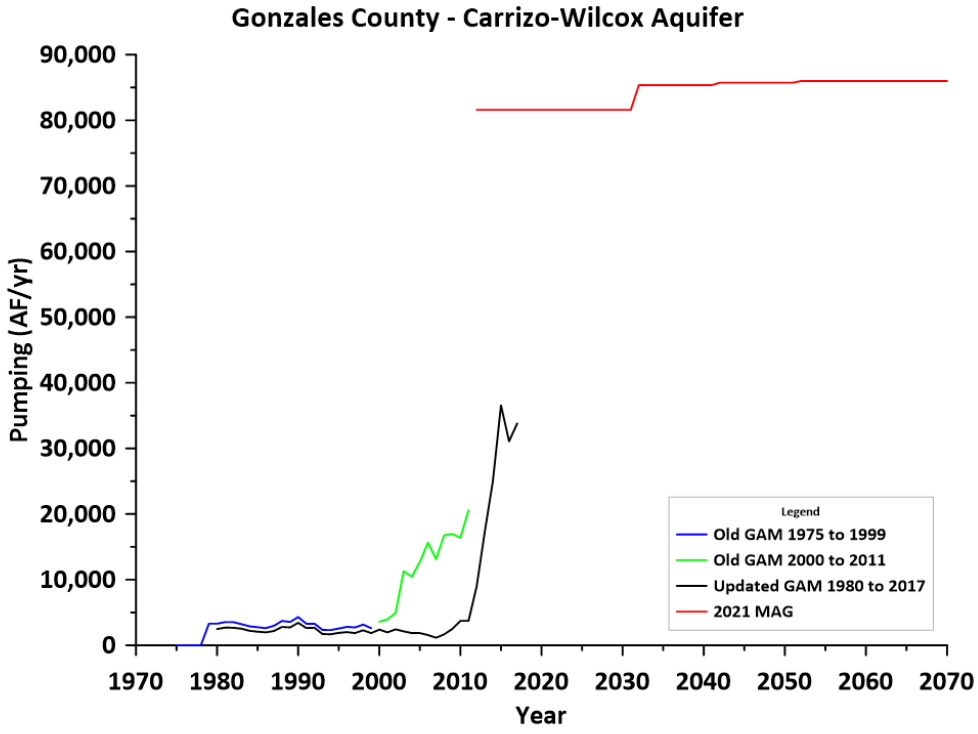

Frio County - Sparta Aquifer
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG
Pumping (AF/yr)
1,200
1,000
800
600
400
200
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year

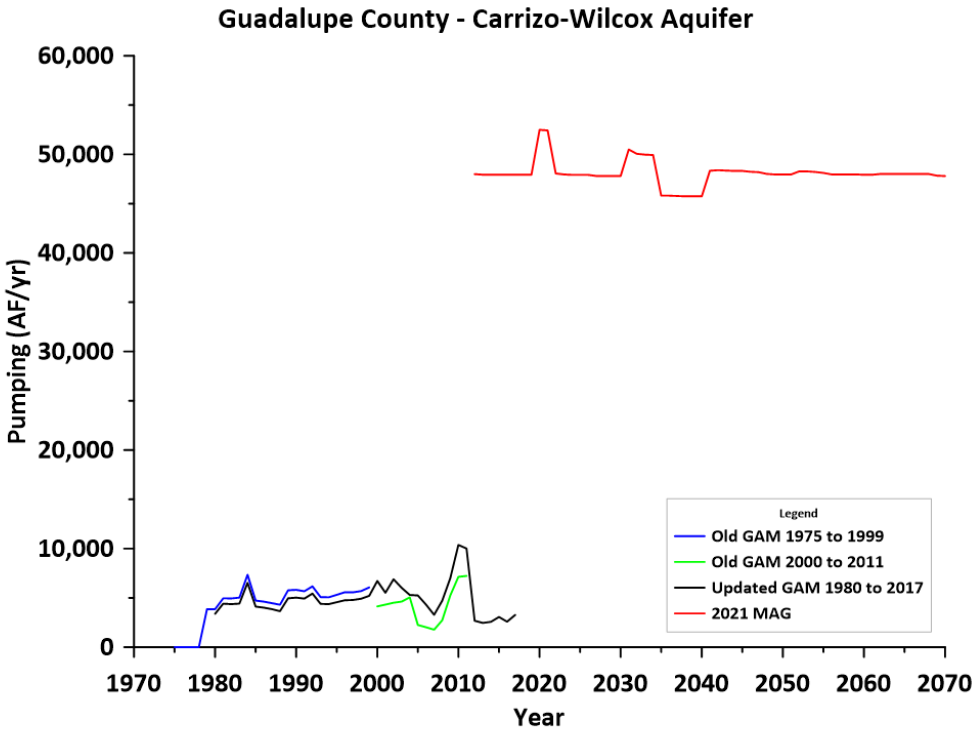

Frio County - Queen City Aquifer
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG
Pumping (AF/yr)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year

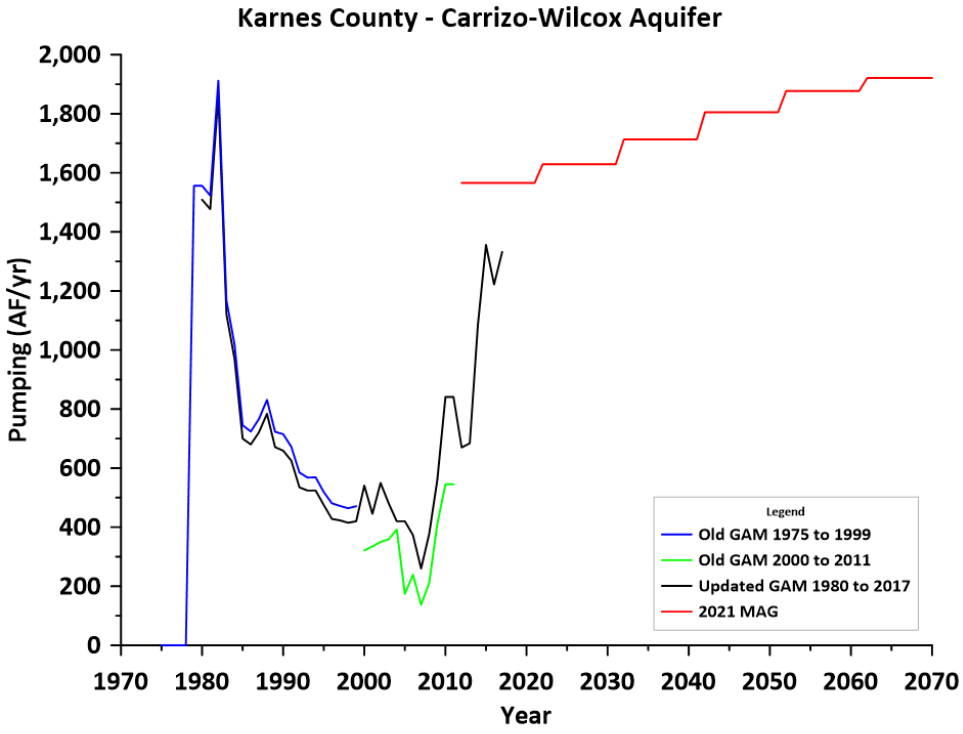

Frio County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
240,000
200,000
160,000
120,000
80,000
40,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

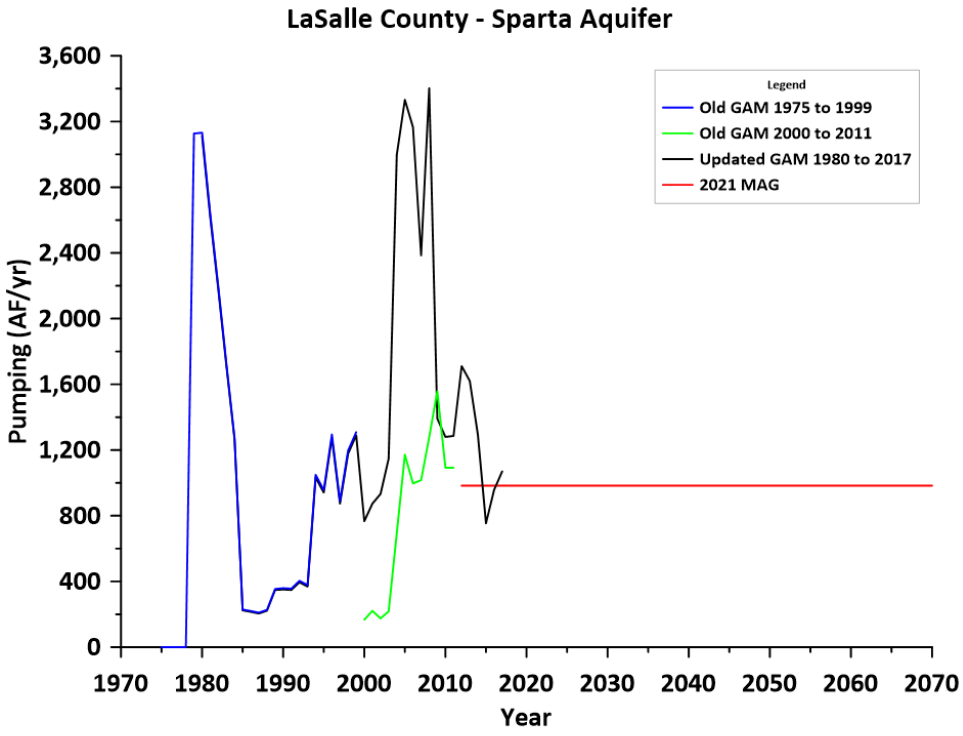

Gonzales County - Sparta Aquifer
Pumping (AF/yr)
3,600
3,200
2,800
2,400
2,000
1,600
1,200
800
400
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

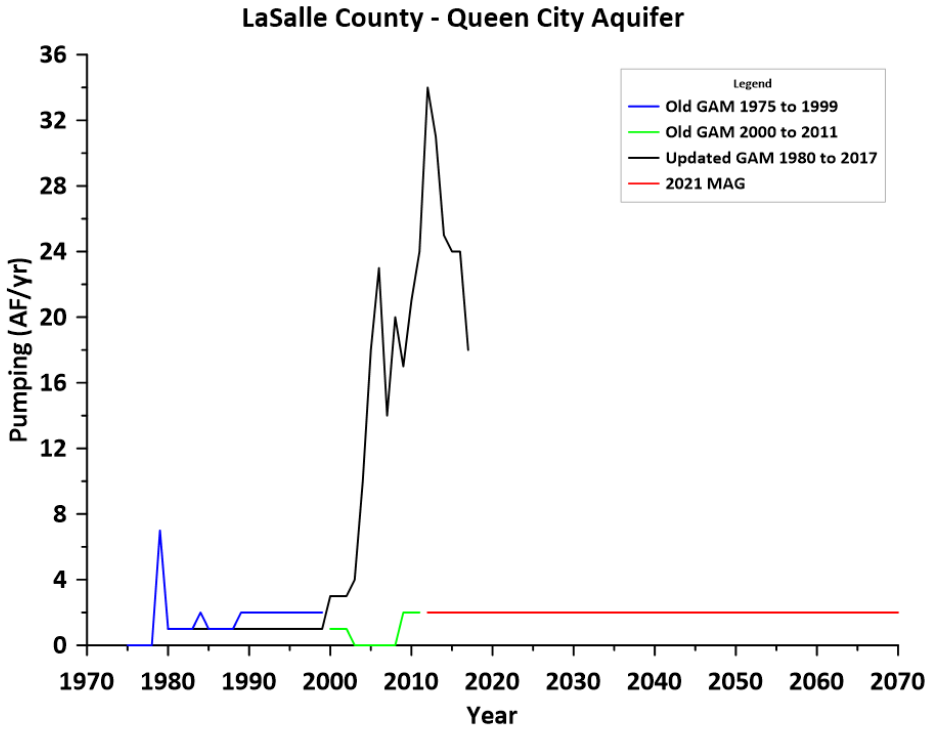

Gonzales County - Queen City Aquifer
Pumping (AF/yr)
6,000
5,000
4,000
3,000
2,000
1,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

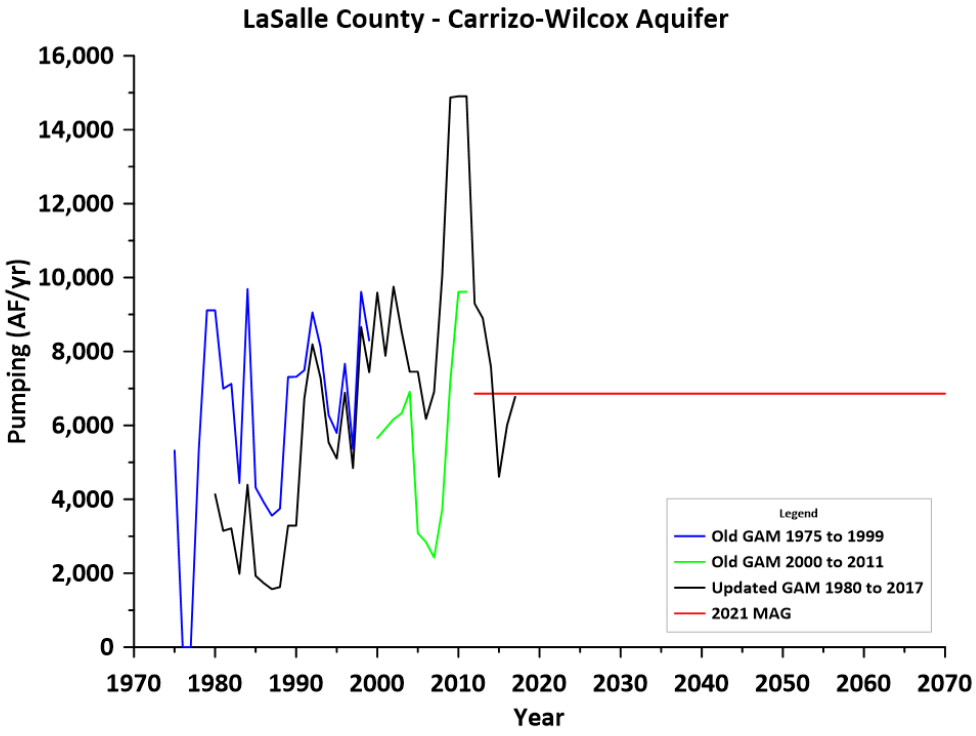

Gonzales County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

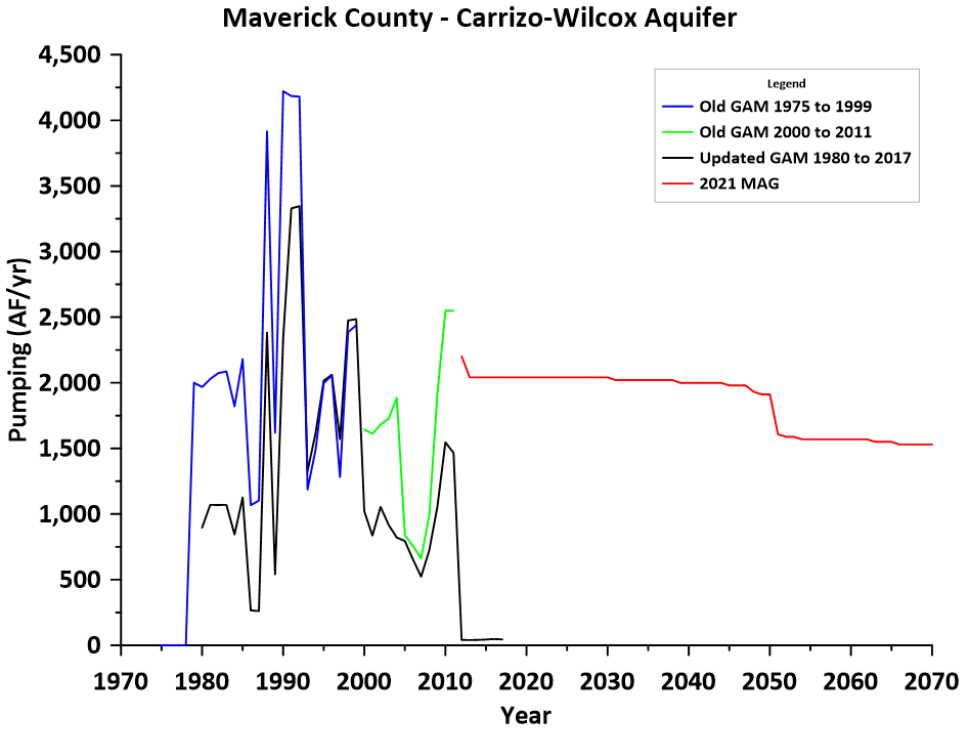

Guadalupe County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
60,000
50,000
40,000
30,000
20,000
10,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

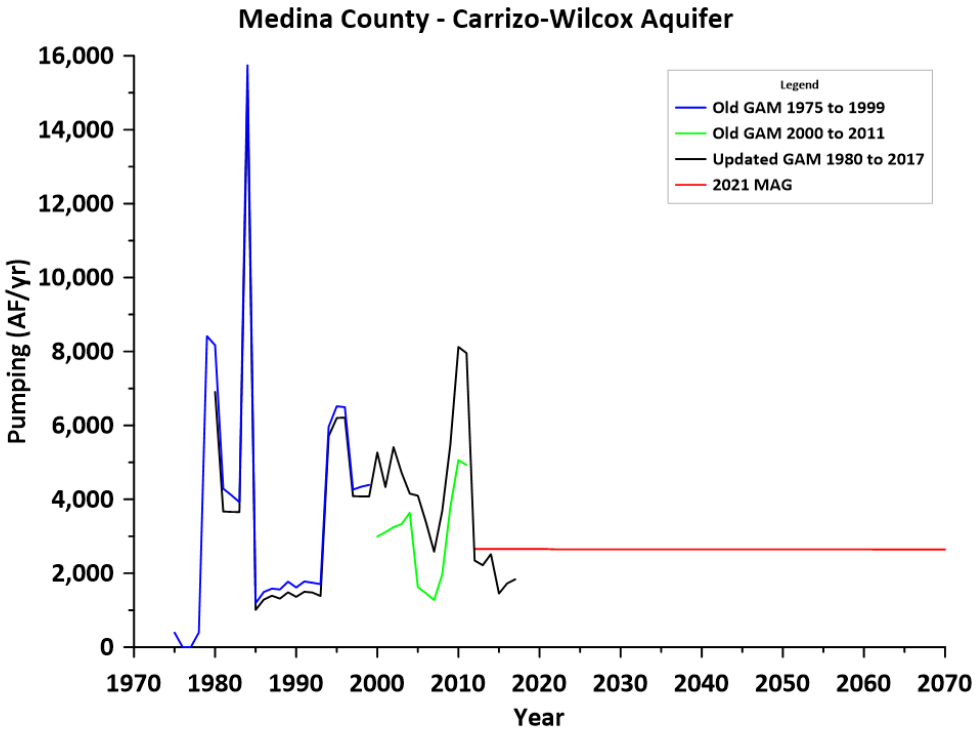

Karnes County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

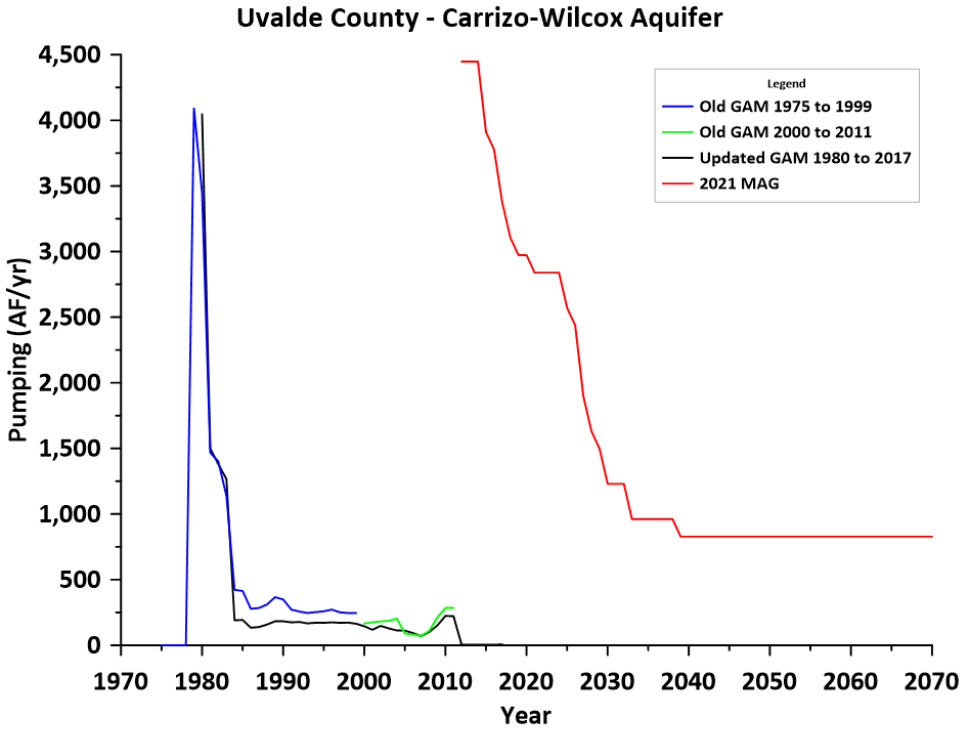

LaSalle County - Sparta Aquifer
Pumping (AF/yr)
3,600
3,200
2,800
2,400
2,000
1,600
1,200
800
400
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

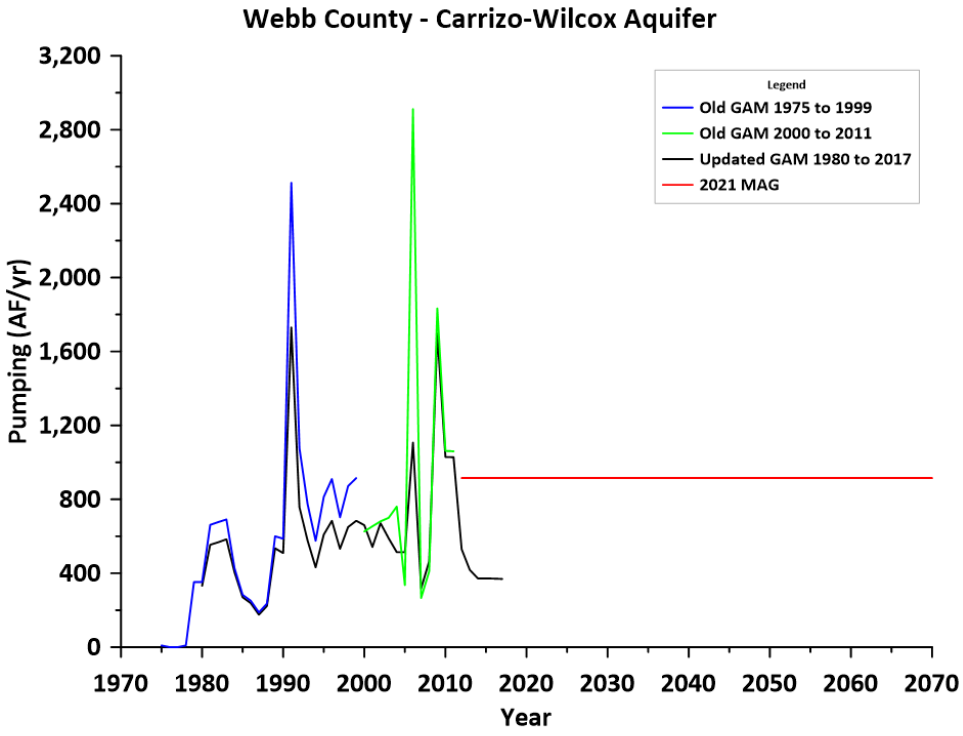

LaSalle County - Queen City Aquifer
Pumping (AF/yr)
36
32
28
24
20
16
12
8
4
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

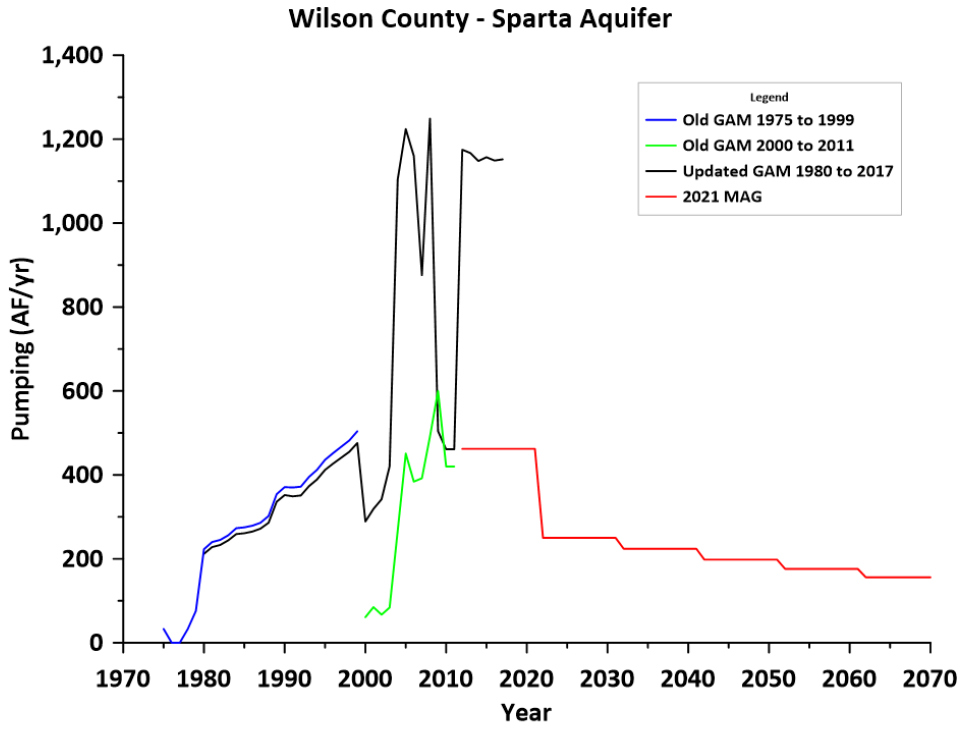

LaSalle County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

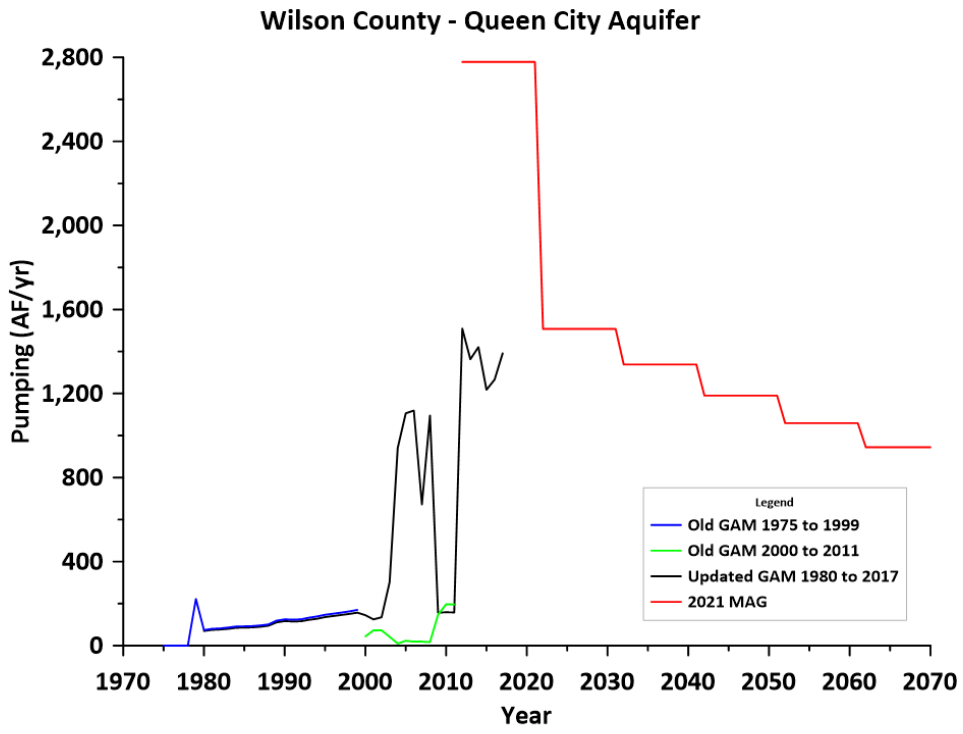

Maverick County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

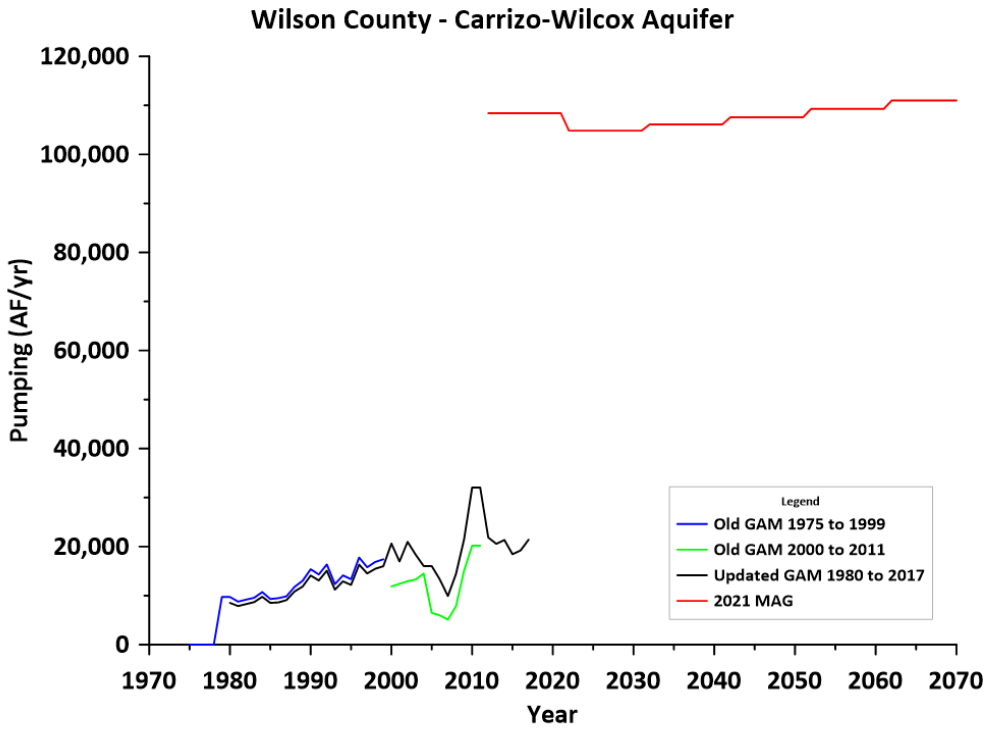

Medina County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

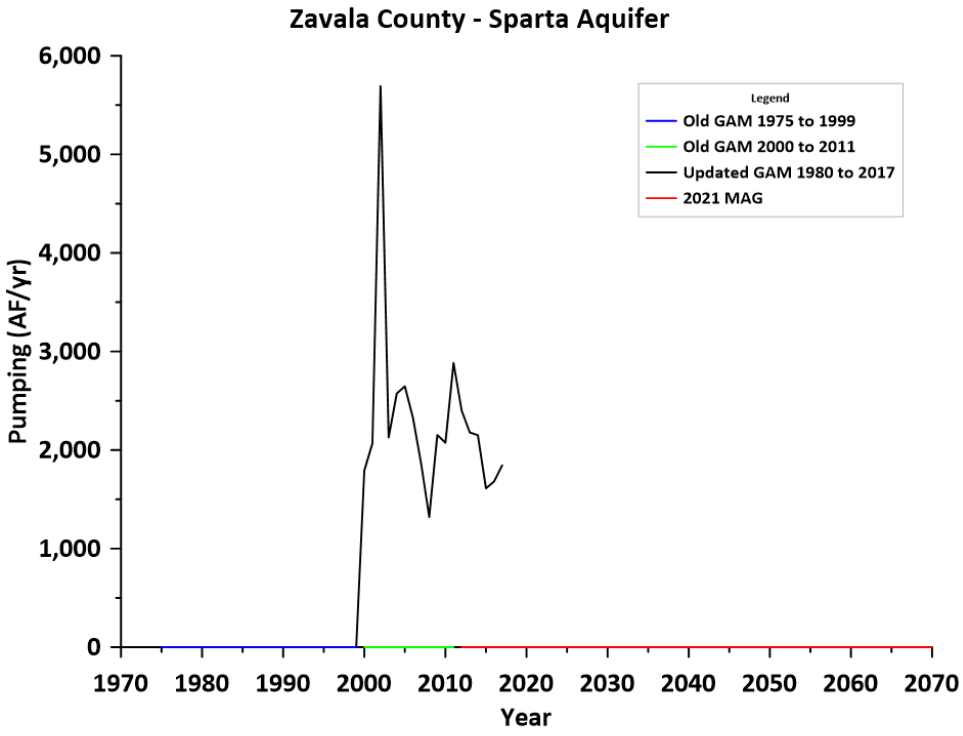

Uvalde County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

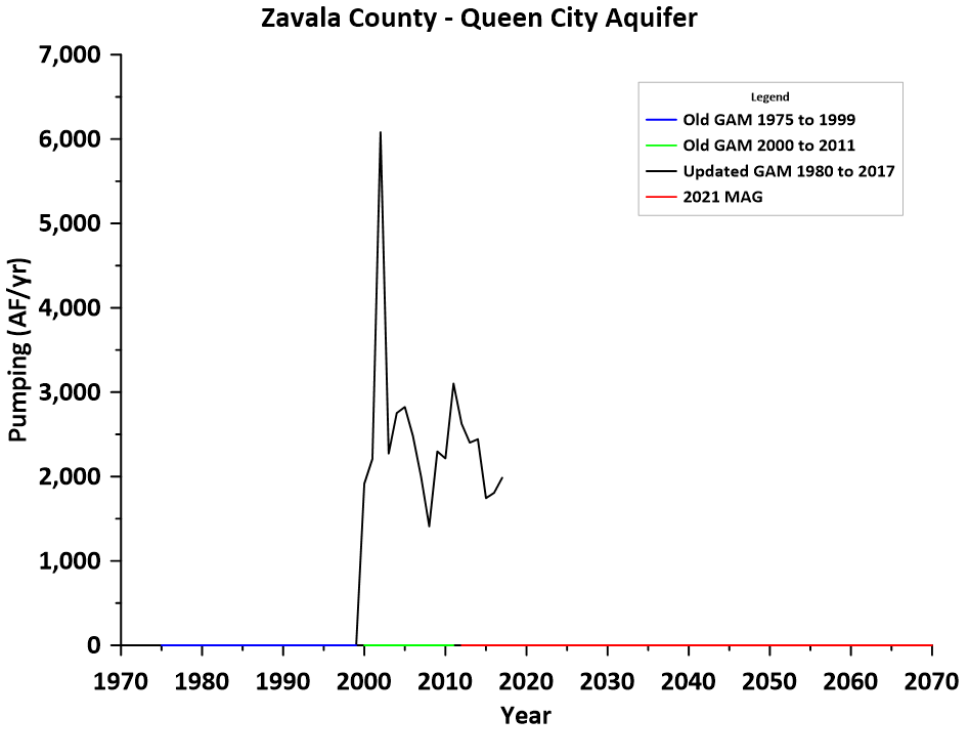

Webb County - Carrizo-Wilcox Aquifer
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG
Pumping (AF/yr)
3,200
2,800
2,400
2,000
1,600
1,200
800
400
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year

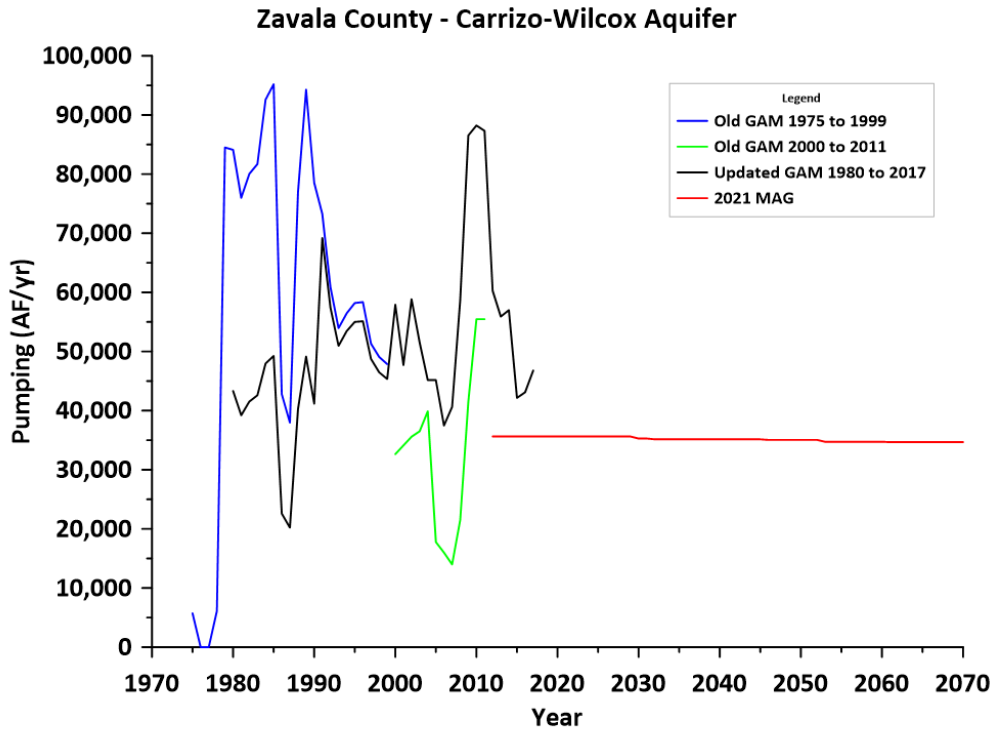

Wilson County - Sparta Aquifer
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG
Pumping (AF/yr)
1,400
1,200
1,000
800
600
400
200
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year


Wilson County - Queen City Aquifer
Pumping (AF/yr)
2,800
2,400
2,000
1,600
1,200
800
400
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG


Wilson County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
120,000
100,000
80,000
60,000
40,000
20,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG


Zavala County - Sparta Aquifer
Pumping (AF/yr)
6,000
5,000
4,000
3,000
2,000
1,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG


Zavala County - Queen City Aquifer
Pumping (AF/yr)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG


Zavala County - Carrizo-Wilcox Aquifer
Pumping (AF/yr)
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
Year
Legend
Old GAM 1975 to 1999
Old GAM 2000 to 2011
Updated GAM 1980 to 2017
2021 MAG

Technical Memorandum 2

Pumping Sensitivity

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Prepared by:
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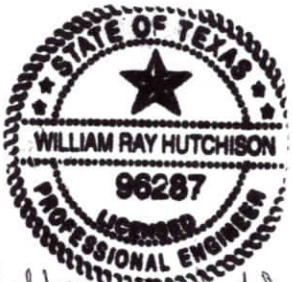
January 31, 2023

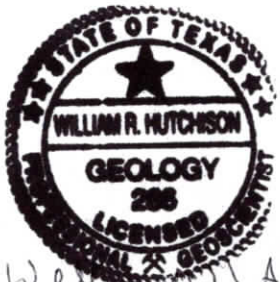
Professional Engineer and Professional Geoscientist Seals

This report was prepared by William R. Hutchison, Ph.D., P.E., P.G., who is licensed in the State of Texas as follows:

- Professional Engineer (Geological and Civil) No. 96287
- Engineering Firm Registration No. 14526
- Professional Geoscientist (Geology) No. 286



1/31/2023



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Appendix

A – Grid Cell Count and Acreage by County and Aquifer
B – Overall Average Drawdown Hydrographs of Pumping Sensitivity Scenarios
C – Outcrop Volume Remaining Hydrographs

1.0 Executive Summary

This technical memorandum documents the pumping sensitivity simulations completed with the new GAM. Pumping sensitivity was evaluated by simulating variations in pumping and observing the change in average drawdown. The pumping sensitivity simulations consisted of two groups of five simulations. The first group assumed a baseline pumping equal to the pumping in 2011, when the GMA 13 pumping was 535,318 AF/yr during a drought year. The second group assumed a baseline pumping equal to 2017 pumping, the last year of the calibration period, when the GMA 13 pumping was 259,507 AF/yr. The five simulations in each group varied the baseline pumping (increased and decreased) as follows:

- Scenario 1: 80% of Baseline pumping
- Scenario 2: 90% of Baseline pumping
- Scenario 3: 100% of Baseline pumping
- Scenario 4: 110% of Baseline pumping
- Scenario 5: 120% of Baseline pumping

Results of the simulations included average drawdown and outcrop area volume remaining.

2.0 Background

One of the uses of the updated Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers documented in the main report will be to support the Joint Planning Process that leads to the adoption of desired future conditions by the groundwater conservation districts in Groundwater Management Area 13 and the calculation of the modeled available groundwater by TWDB. As part of the work associated with developing the updated Groundwater Availability Model, five technical memoranda appear in the Appendix of the report:

- Technical Memorandum 1: Pumping Comparisons
- Technical Memorandum 2: Pumping Sensitivity
- Technical Memorandum 3: Recharge Sensitivity
- Technical Memorandum 4: Calculation of Drawdown from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model
- Technical Memorandum 5: Calculation of Future Pumping from Existing Desired Future Conditions Using Updated Groundwater Availability Model

This technical memorandum summarizes a sensitivity analysis of pumping as measured by average drawdown in GMA 13.

3.0 Parameters and Assumptions

Pumping sensitivity was evaluated by simulating variations in pumping and observing the change in average drawdown. Section 3.1 documents the model files used in the simulations. Section 3.2 documents the pumping files used in the simulations. Section 3.3 documents the calculation of average drawdown.

3.1 Model Files

The directory on the share site named *BaseFiles* contains all model files for the simulations other than the simulated pumping files.

3.1.1 Files Unchanged from Calibrated Model

Table 1 presents the model files that were unchanged from the calibration run of the model.

Table 1. Model Files Unchanged from Calibrated Model

File Name	File Date	Description
GMA13_Historical_Period_Calibration._kx	5/10/2022	Horizontal hydraulic conductivity
GMA13_Historical_Period_Calibration._kz	5/10/2022	Vertical hydraulic conductivity
GMA13_Historical_Period_Calibration._ss	5/10/2022	Specific storage
GMA13_Historical_Period_Calibration._sy	5/10/2022	Specific yield
GMA13_Historical_Period_Calibration.dis	5/10/2022	Discretization
GMA13_Historical_Period_Calibration.hfb	5/10/2022	Horizontal fflow barrier
GMA13_Historical_Period_Calibration.ims	5/10/2022	Solver
GMA13_Historical_Period_Calibration.npf	5/10/2022	Node property flow

3.1.2 Files Modified from the Calibrated Model

Table 2 presents the model files that were modified from the calibration run of the model in order to run the sensitivity simulations. The pumping files are discussed in the next subsection.

Table 2. Model Files Modified from the Calibrated Model

File Name	File Date	Description
calsp39hds.dat	5/27/2022	Starting heads
mfsim.nam	5/27/2022	Simulation name file
pred.evt	5/25/2022	Evapotranspiration
pred.ghb	5/25/2022	General head boundary
pred.ic6	5/27/2022	Initial condition file
pred.oc6	5/26/2022	Output control
pred.riv	5/25/2022	River
pred.sto	5/25/2022	Storage
pred.tdis	5/25/2022	Time discretization
predbase.nam	5/26/2022	GWF Model name file

The modifications were generally associated with using the final stress period from the calibrated model and holding all parameters constant for the sensitivity simulation, which was run from 2018 to 2080 (63 stress periods). Modifications also included updating the file names for the simulations. Please note that no recharge file is listed above. It was not part of the general group of modified files and not included in this directory. Details of the recharge file used for these sensitivity simulations are provided below.

3.2 Pumping and Recharge Files

The pumping sensitivity simulations consisted of two groups of five simulations. The first group assumed a baseline pumping equal to the pumping in 2011, when the GMA 13 pumping was 535,318 AF/yr during a drought year. The second group assumed a baseline pumping equal to 2017 pumping, the last year of the calibration period, when the GMA 13 pumping was 259,507 AF/yr. The five simulations in each group varied the baseline pumping (increased and decreased) as follows:

- Scenario 1: 80% of Baseline pumping
- Scenario 2: 90% of Baseline pumping
- Scenario 3: 100% of Baseline pumping
- Scenario 4: 110% of Baseline pumping
- Scenario 5: 120% of Baseline pumping

It was assumed that pumping was constant from 2018 to 2080 (the full simulation). Figure 1 presents the GMA 13 pumping associated with each scenario.

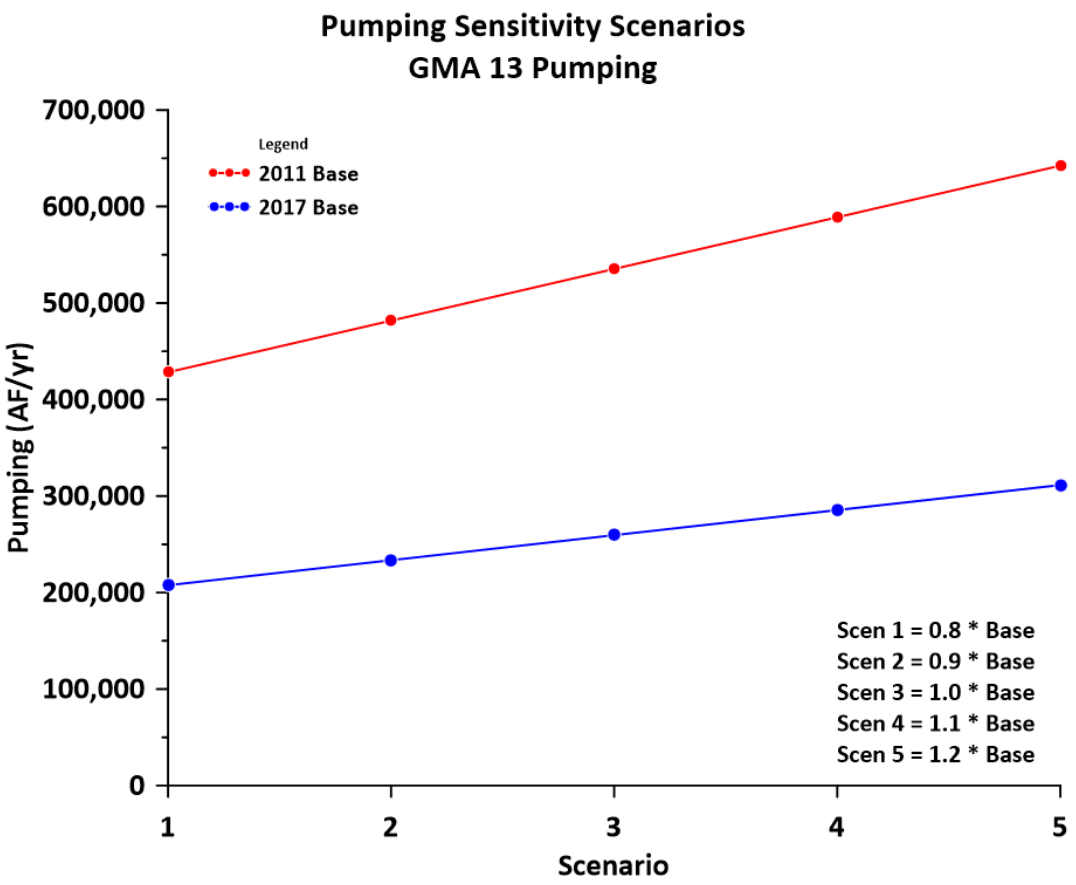


Figure 1. Pumping Sensitivity Scenarios - GMA 13 Pumping

The directory named *Pump* on the share site contains the 10 pumping files that were used in the sensitivity simulations. Each pumping file is labeled with a "p" and a year (either 2011 or 2017), then "scen" and the scenario number as presented above.

The recharge file for all 10 simulations was the average annual recharge as defined in the steady state version of the calibration model.

3.3 Average Drawdown Calculation

3.3.1 Grid Counts and Acreage

Model output includes groundwater elevation results for each model cell. Drawdown can be calculated by subtracting the groundwater elevation in a specific cell over two different time periods. Average drawdown can be calculated by averaging the drawdown results in multiple cells. Typical average drawdown calculations involve county-aquifer units or GMA-aquifer units.

The old GAM had a regular grid where all cells were 640 acres, or one square mile. Averaging drawdowns with the old GAM was a relatively simple calculation of summing all drawdown results over a defined area and dividing the sum by the number of cells.

The new GAM has a variable grid that is refined near streams, and the cell sizes range from 10 acres to 640 acres. Thus, averaging drawdown must be weighted by the cell size. Appendix A contains summary tables of cell counts, areas, and average cell size for each county-aquifer unit for outcrop, downdip and total areas. Appendix A also presents bar graphs of the average cell size for each county-aquifer unit. Data for these tables and graphs was developed using a FORTRAN code that read the grid file of the new GAM. All data associated with the tables and graphs in Appendix A are contained in the directory named *GridFile* on the share site.

3.3.2 Average Drawdown Calculations

Average drawdown calculations were performed using a FORTRAN post-processor named *CalibDD.exe* (for the calibration period) and *PredDD.exe* (for the predictive period). The post-processor reads the simulation output file (a hds file) and the files with acreage totals for each unit (county-aquifer and GMA13-aquifer). Drawdowns for each cell are calculated based on a starting point of 2017 (the last stress period of the calibration period). The cell drawdown values are then multiplied by the cell acreage (drawdown-acreage product). The sum of all drawdown-acreage products for a particular unit (county-aquifer or GMA13-aquifer) are then divided by the total acreage of that unit to obtain and average drawdown.

The source code, executable and all files associated with these calculations are contained in the directory *CalibDD* (for the calibration period) and the directory *PredDD* (for the predictive period) on the share site. Please note that the directory *PredDD* also includes the results from the recharge sensitivity simulations that are the subject of Technical Memorandum 3.

The overall GMA 13 drawdown files are contained in the directory *AllAqGMA13* on the share site. A post-processor named *TotPredDD.exe* was developed to read the GMA 13 files from the predictive simulations and calculate overall average drawdowns for all aquifers (Sparta, Queen City, and Carrizo-Wilcox).

3.3.3 Volumetric/Saturated Thickness Calculations

The current DFC for GMA 13 includes a "Primary" DFC that covers the Sparta, Queen City, and Carrizo-Wilcox aquifers in GMA 13: "75 percent of the saturated thickness in the outcrop at the end of 2012 remains at the end of 2080". It was noted that this DFC could not be simulated with the old GAM. One of the key objectives of this update was to improve the GAM so that this type of calculation could be completed.

As part of this model evaluation in the context of predictive simulations that are similar to those that might be used by GMA 13 in the future, calculations using model output were completed to demonstrate that the new GAM can provide results that would be useful in the next round of joint planning. These calculations involved a volumetric analysis to provide additional context to saturated thickness calculations. The volume of groundwater in each model cell was calculated as:

Volume (Acre-feet) = Saturated Thickness (ft) * Cell Area (acres) * Specific Yield (dimensionless)

The files associated with these calculations are provided on the share site under the directory *SatThick*. A FORTRAN post-processor named *SatThick.exe* was developed to read the model grid file, read the starting heads and predictive heads, and calculate volumes for each aquifer's outcrop area for all of GMA 13. These results were then imported into an Excel file named *VolumeSummary.xlsx* that contains the volumetric calculations for each aquifer (and total) and calculates the percentage remaining volume using 2017 as the baseline for each aquifer (and total).

4.0 Methods and Results

4.1 Average Drawdown

The calculated average drawdowns for the calibration period and the predictive period are contained in files for each county-aquifer unit (or county-GMA13) are contained in files with 12 columns of results organized as follows:

- Column 1 = County Code
- Column 2 = County Name
- Column 3 = Year
- Column 4 = Sparta Aquifer drawdown from 2017 (outcrop area)
- Column 5 = Sparta Aquifer drawdown from 2017 (downdip area)
- Column 6 = Sparta Aquifer drawdown from 2017 (total area)
- Column 7 = Queen City Aquifer drawdown from 2017 (outcrop area)
- Column 8 = Queen City Aquifer drawdown from 2017 (downdip area)
- Column 9 = Queen City Aquifer drawdown from 2017 (total area)
- Column 10 = Carrizo-Wilcox Aquifer drawdown from 2017 (outcrop area)
- Column 11 = Carrizo-Wilcox Aquifer drawdown from 2017 (downdip area)
- Column 12 = Carrizo-Wilcox Aquifer drawdown from 2017 (total area)

Names of the calibration period files start with the base name *CalibDD* and are followed by the county name (or GMA13). Names of the predictive period files start with a *p* (for pumping scenarios) and the year of the base pumping (either 2011 or 2017) and the pumping scenario (*scen1* to *scen5*) followed by the county (or GMA13).

The overall predictive drawdown files for GMA 13 are named with a *p* (for pumping scenarios) and the year of the base pumping (either 2011 or 2017) and the pumping scenario (*s1* to *s5*) followed by *tot*. These files have four columns: the year followed by the outcrop area drawdown, the downdip area drawdown, and the total area drawdown. The calibration period overall drawdown file is named *bigavgcaldd.dat*. The columns of the calibration file are the same as the predictive files.

Appendix B presents the hydrographs of average drawdown for the Sparta, Queen City, and Carrizo-Wilcox aquifers for GMA 13. Included are hydrographs of the outcrop area, the downdip area, and the total area. The calibration period is presented along with the results of the five

simulations using 2011 as the base pumping and with the results of the five simulations using 2017 as the base pumping.

Note that, generally, drawdown stabilizes after some initial adjustment period, either as an overall rise or decline in average groundwater level depending on the amount of pumping. This suggests that the model is suitable for use in evaluating alternative pumping scenarios related to the joint planning process, even in the outcrop area.

4.2 Remaining Volume in the Outcrop Area

As noted above, the results of the model were processed, and the Excel file named *VolumeSummary.xlsx* contains the volumetric calculations for each aquifer (and total) and calculates the percentage remaining volume using 2017 as the baseline for each aquifer (and total).

Figure 2 presents the initial (2017) outcrop area volume for the Sparta, Queen City, Carrizo-Wilcox aquifer, a total of the three aquifers, and the 75 percent of the total (the primary DFC). Please note that the Queen City Aquifer initial storage is significantly higher than the initial storage in the Sparta and Carrizo-Wilcox aquifers.

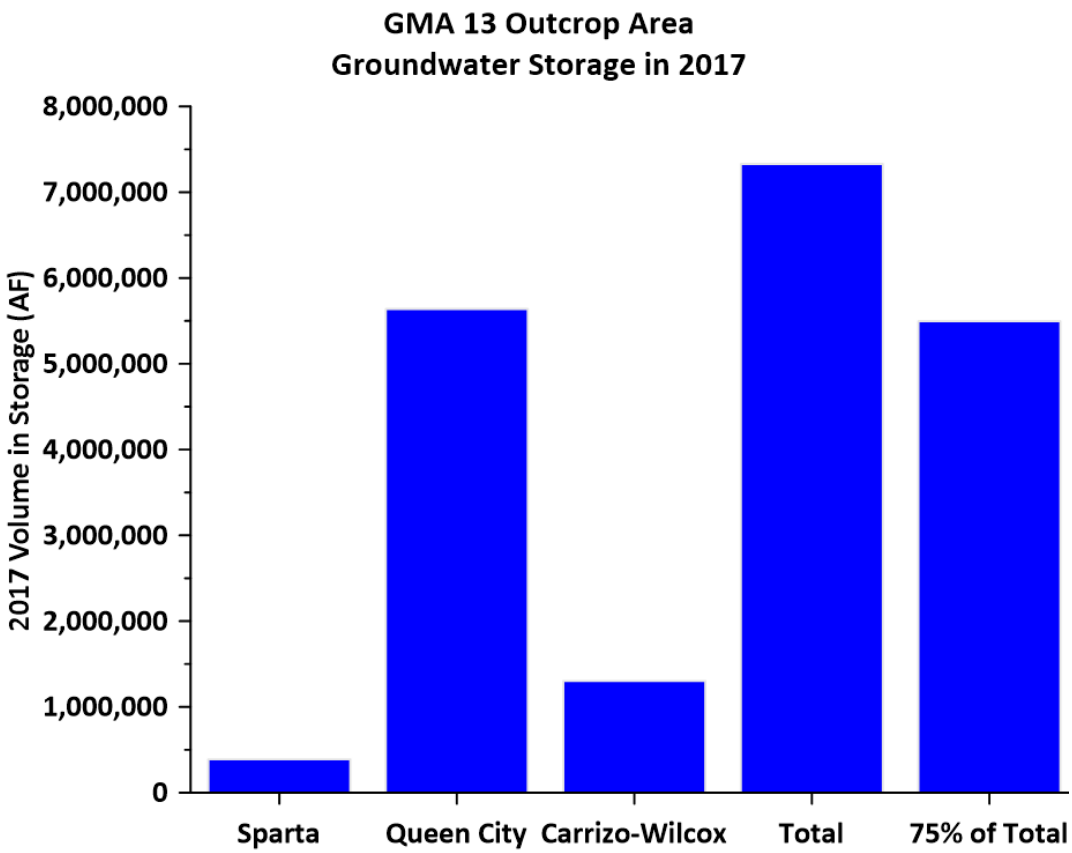


Figure 2. GMA 13 Outcrop Area Groundwater Storage in 2017

Appendix C presents the hydrographs of the volume remaining. Please note that the worst-case scenario (120 percent of 2011 base pumping) in the Carrizo-Wilcox yields a volume remaining of 84 percent in 2080 as compared to 2017 in the outcrop area. At the other end of the spectrum, a 20 percent reduction in 2011 pumping results in about an increase in outcrop groundwater storage in the Carrizo-Wilcox (104 percent of 2017 storage) in 2080. These ranges suggest that the new GAM is a suitable tool to evaluate volume remaining in the outcrop area in the joint planning process.

5.0 Limitations

The simulations using two alternative base pumping levels simply increased and decreased pumping from these baseline years to evaluate the impacts of long-term pumping at those levels. One of the features of the simulation used to develop the 2016 and 2021 DFCs in GMA 13 was the addition of pumping in "new" areas. Therefore, one of the limitations of this analysis is that it does not consider the effects (either in terms of average drawdown or volume remaining) of pumping in areas different from either 2011 or 2017 baseline locations.

Appendix A

Grid Cell County and Acreage by County and Aquifer

Outcrop Area

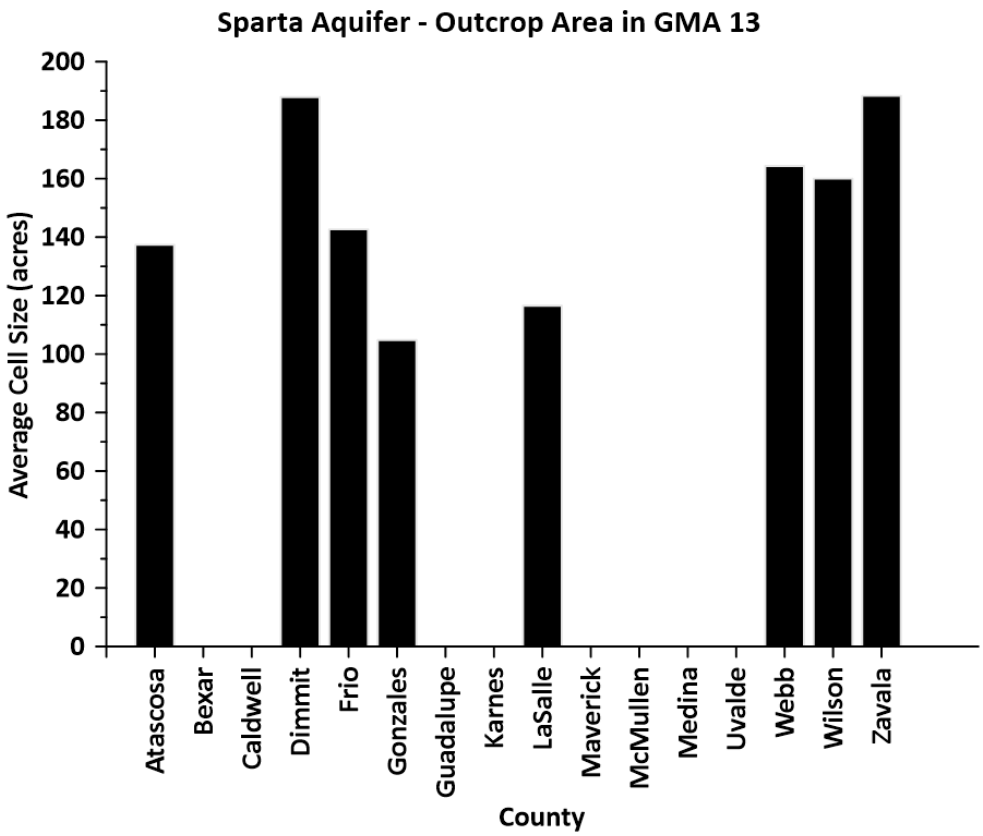
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	233	1,229	540	32,000	113,000	78,720	137	92	146
11	Bastrop	21	45	1,156	3,840	24,480	126,400	183	544	109
13	Bee	0	0	0	0	0	0	0	0	0
15	Bexar	0	0	2,022	0	0	207,360	0	0	103
28	Caldwell	0	90	1,615	0	10,560	205,600	0	117	127
59	DeWitt	0	0	0	0	0	0	0	0	0
64	Dimmit	417	3,759	991	78,360	477,480	157,000	188	127	158
75	Fayette	8	0	0	1,400	0	0	175	0	0
82	Frio	1,045	2,467	163	149,080	279,040	13,480	143	113	83
89	Gonzales	287	922	115	30,080	90,280	11,800	105	98	103
94	Guadalupe	0	4	1,125	0	640	218,880	0	160	195
128	Karnes	0	0	0	0	0	0	0	0	0
139	LaSalle	1,047	0	0	122,040	0	0	117	0	0
143	Lavaca	0	0	0	0	0	0	0	0	0
149	LiveOak	0	0	0	0	0	0	0	0	0
159	Maverick	0	0	1,180	0	0	130,120	0	0	110
162	McMullen	0	0	0	0	0	0	0	0	0
163	Medina	0	0	1,850	0	0	207,200	0	0	112
232	Uvalde	0	0	887	0	0	88,280	0	0	100
240	Webb	469	3,130	276	77,080	492,040	18,840	164	157	68
247	Wilson	148	967	662	23,680	140,560	85,760	160	145	130
254	Zavala	636	4,426	1,489	119,760	421,240	147,760	188	95	99
255	Mexico	237	323	890	57,720	59,960	152,720	244	186	172
999	GMA 13	4,485	17,204	13,062	686,520	2,078,480	1,629,360	153	121	125

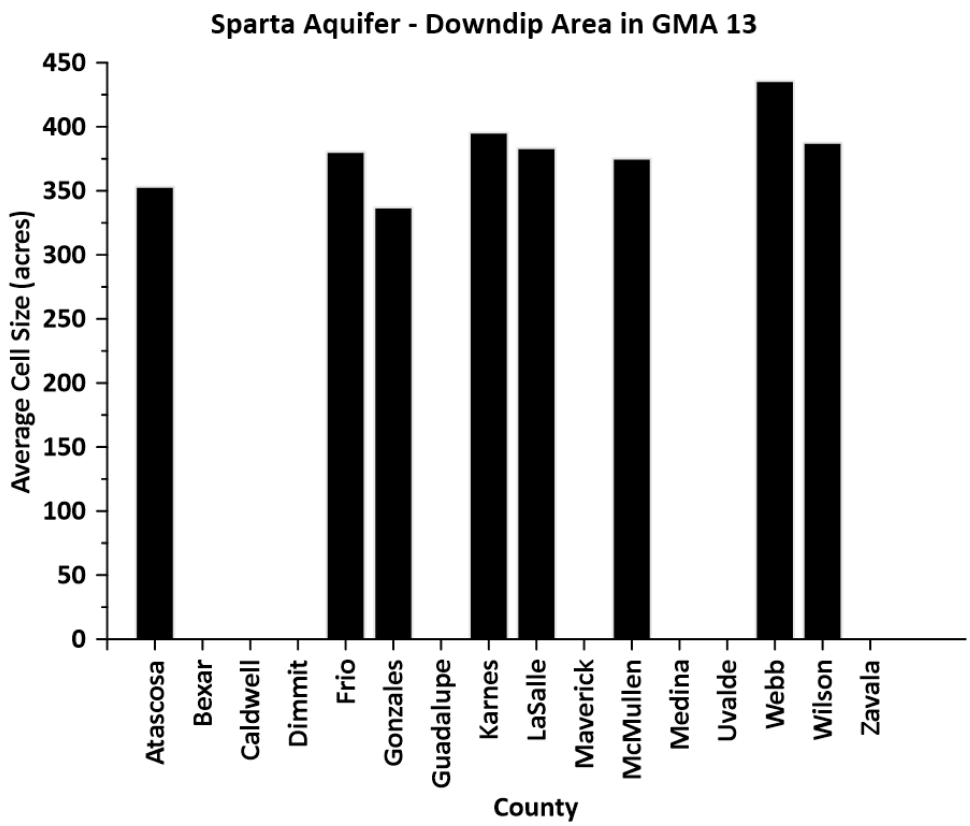
Downdip Area

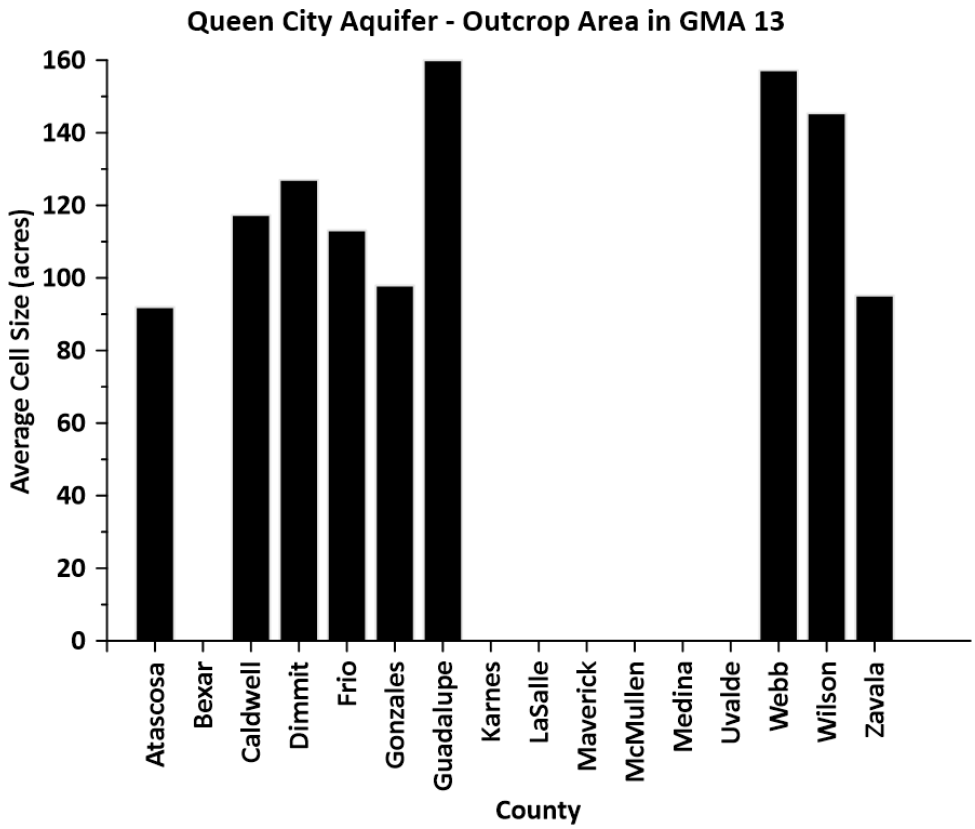
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	1,307	862	3,348	461,600	507,040	2,067,840	353	588	618
11	Bastrop	6	19	497	3,840	11,200	249,920	640	589	503
13	Bee	103	64	192	41,920	40,960	122,880	407	640	640
15	Bexar	0	0	239	0	0	96,320	0	0	403
28	Caldwell	0	0	537	0	0	231,840	0	0	432
59	DeWitt	883	543	1,629	350,080	347,520	1,042,560	396	640	640
64	Dimmit	0	192	3,473	0	104,640	2,091,200	0	545	602
75	Fayette	153	125	372	78,240	79,520	238,080	511	636	640
82	Frio	331	680	3,213	125,920	339,200	1,995,360	380	499	621
89	Gonzales	1,321	850	3,029	445,120	500,320	1,891,040	337	589	624
94	Guadalupe	0	0	330	0	0	160,800	0	0	487
128	Karnes	974	599	1,797	385,280	383,360	1,150,080	396	640	640
139	LaSalle	2,050	1,403	4,203	785,920	896,960	2,689,920	383	639	640
143	Lavaca	763	455	1,365	292,480	291,200	873,600	383	640	640
149	LiveOak	626	329	987	213,920	210,560	631,680	342	640	640
159	Maverick	0	0	140	0	0	41,120	0	0	294
162	McMullen	1,515	882	2,646	568,320	564,480	1,693,440	375	640	640
163	Medina	0	0	465	0	0	165,600	0	0	356
232	Uvalde	0	0	157	0	0	41,440	0	0	264
240	Webb	1,370	1,109	5,601	596,960	684,800	3,531,840	436	617	631
247	Wilson	443	394	2,201	171,680	217,600	1,322,240	388	552	601
254	Zavala	0	258	3,607	0	151,680	2,074,720	0	588	575
255	Mexico	597	664	3,130	294,720	414,400	1,890,880	494	624	604
999	GMA 13	8,770	7,071	35,498	3,338,560	4,240,800	21,479,360	381	600	605

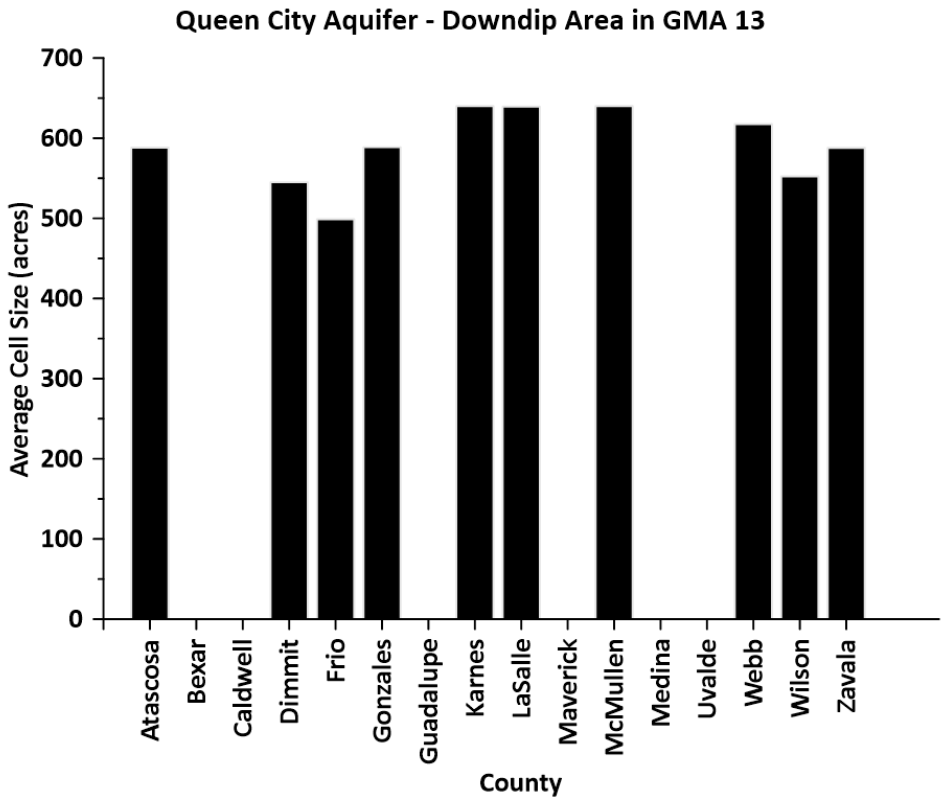
Total Area

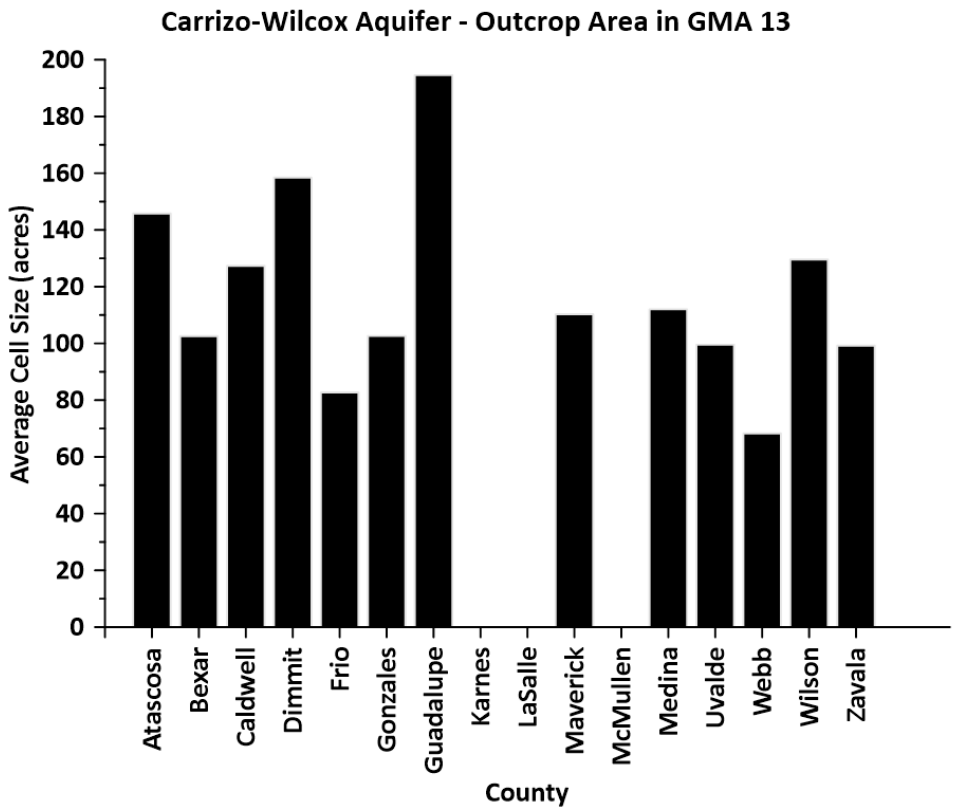
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	1,540	2,091	3,888	493,600	620,040	2,146,560	321	297	552
11	Bastrop	27	64	1,653	7,680	35,680	376,320	284	558	228
13	Bee	103	64	192	41,920	40,960	122,880	407	640	640
15	Bexar	0	0	2,261	0	0	303,680	0	0	134
28	Caldwell	0	90	2,152	0	10,560	437,440	0	117	203
59	DeWitt	883	543	1,629	350,080	347,520	1,042,560	396	640	640
64	Dimmit	417	3,951	4,464	78,360	582,120	2,248,200	188	147	504
75	Fayette	161	125	372	79,640	79,520	238,080	495	636	640
82	Frio	1,376	3,147	3,376	275,000	618,240	2,008,840	200	196	595
89	Gonzales	1,608	1,772	3,144	475,200	590,600	1,902,840	296	333	605
94	Guadalupe	0	4	1,455	0	640	379,680	0	160	261
128	Karnes	974	599	1,797	385,280	383,360	1,150,080	396	640	640
139	LaSalle	3,097	1,403	4,203	907,960	896,960	2,689,920	293	639	640
143	Lavaca	763	455	1,365	292,480	291,200	873,600	383	640	640
149	LiveOak	626	329	987	213,920	210,560	631,680	342	640	640
159	Maverick	0	0	1,320	0	0	171,240	0	0	130
162	McMullen	1,515	882	2,646	568,320	564,480	1,693,440	375	640	640
163	Medina	0	0	2,315	0	0	372,800	0	0	161
232	Uvalde	0	0	1,044	0	0	129,720	0	0	124
240	Webb	1,839	4,239	5,877	674,040	1,176,840	3,550,680	367	278	604
247	Wilson	591	1,361	2,863	195,360	358,160	1,408,000	331	263	492
254	Zavala	636	4,684	5,096	119,760	572,920	2,222,480	188	122	436
255	Mexico	834	987	4,020	352,440	474,360	2,043,600	423	481	508
999	GMA 13	13,255	24,275	48,560	4,025,080	6,319,280	23,108,720	304	260	476

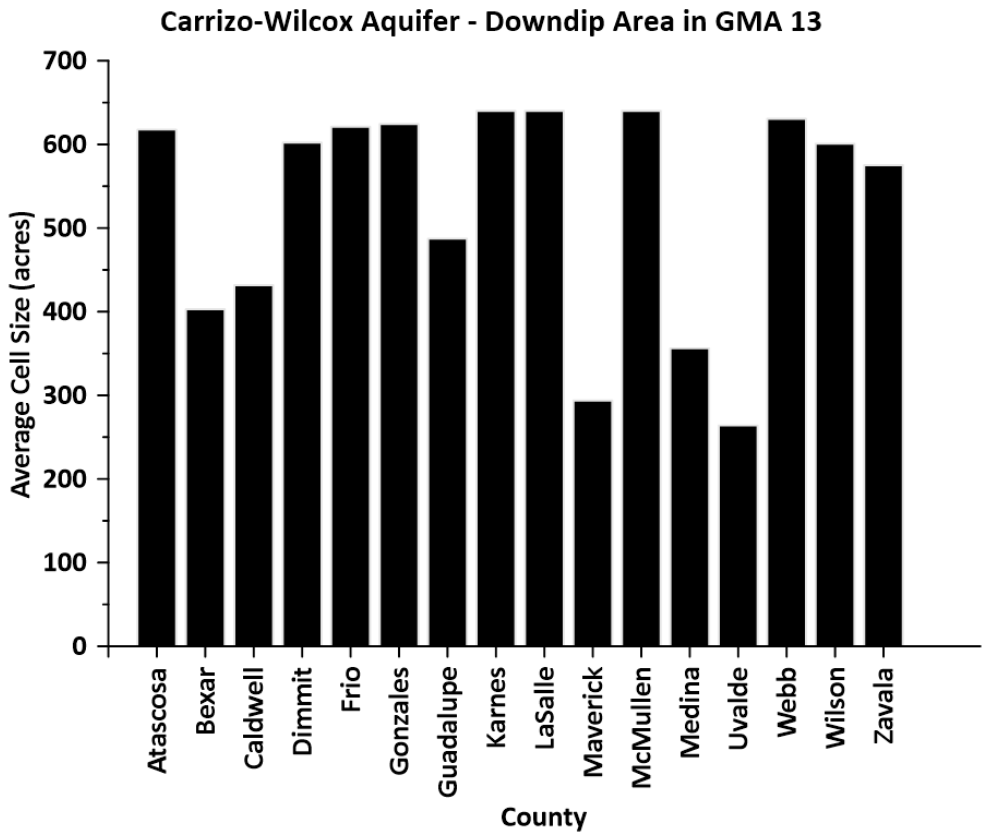

Sparta Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
180
200
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County


Sparta Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
50
100
150
200
250
300
350
400
450
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County


Queen City Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

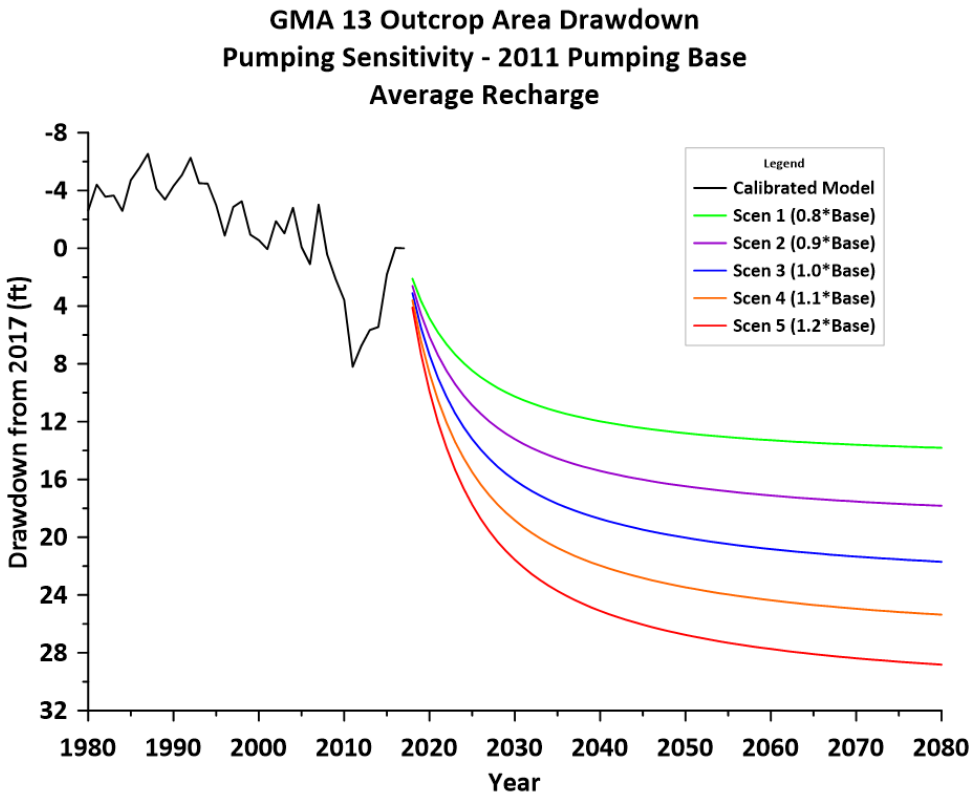

Queen City Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
100
200
300
400
500
600
700
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

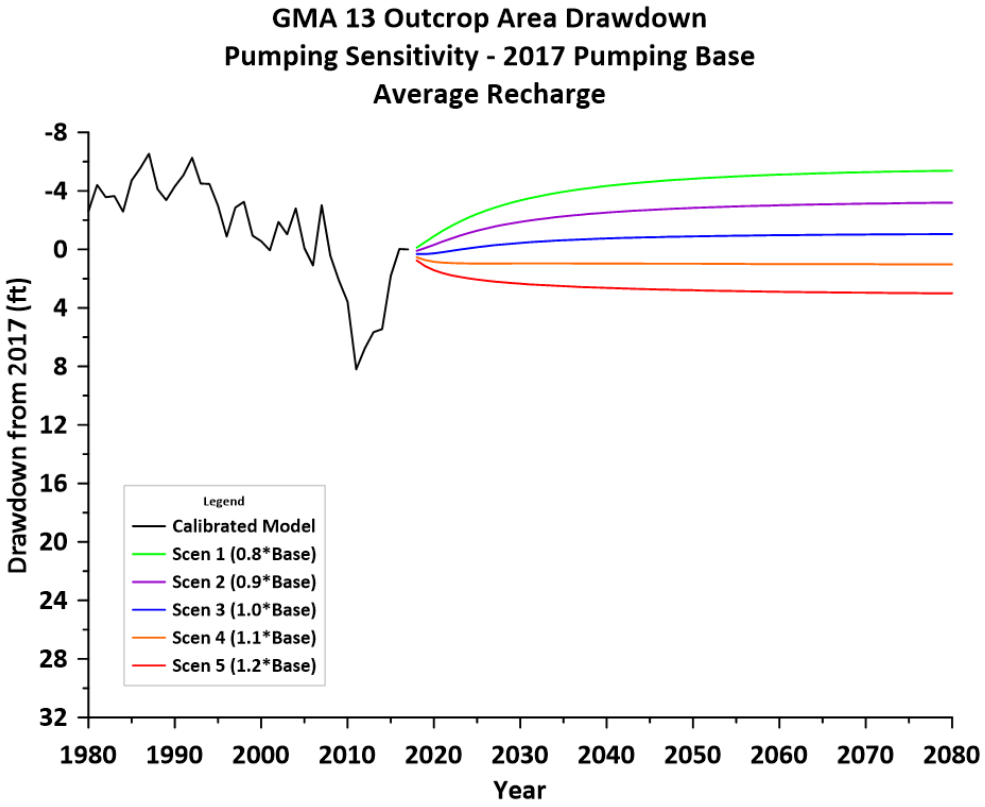

Carrizo-Wilcox Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
180
200
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

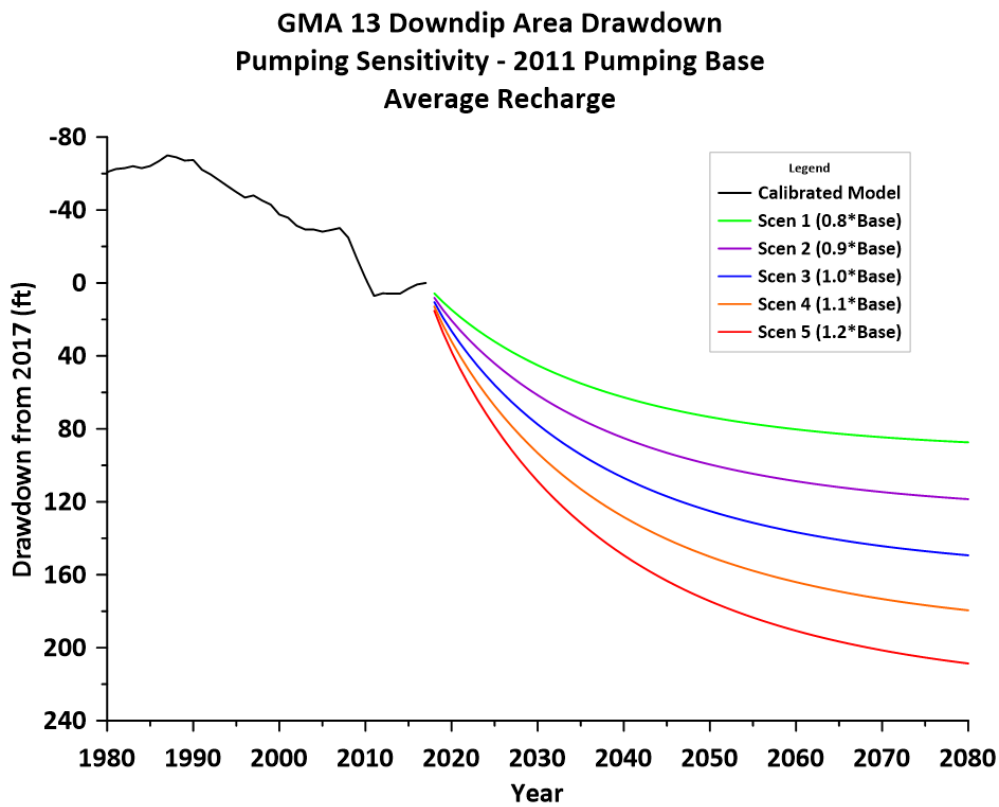

Carrizo-Wilcox Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
100
200
300
400
500
600
700
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

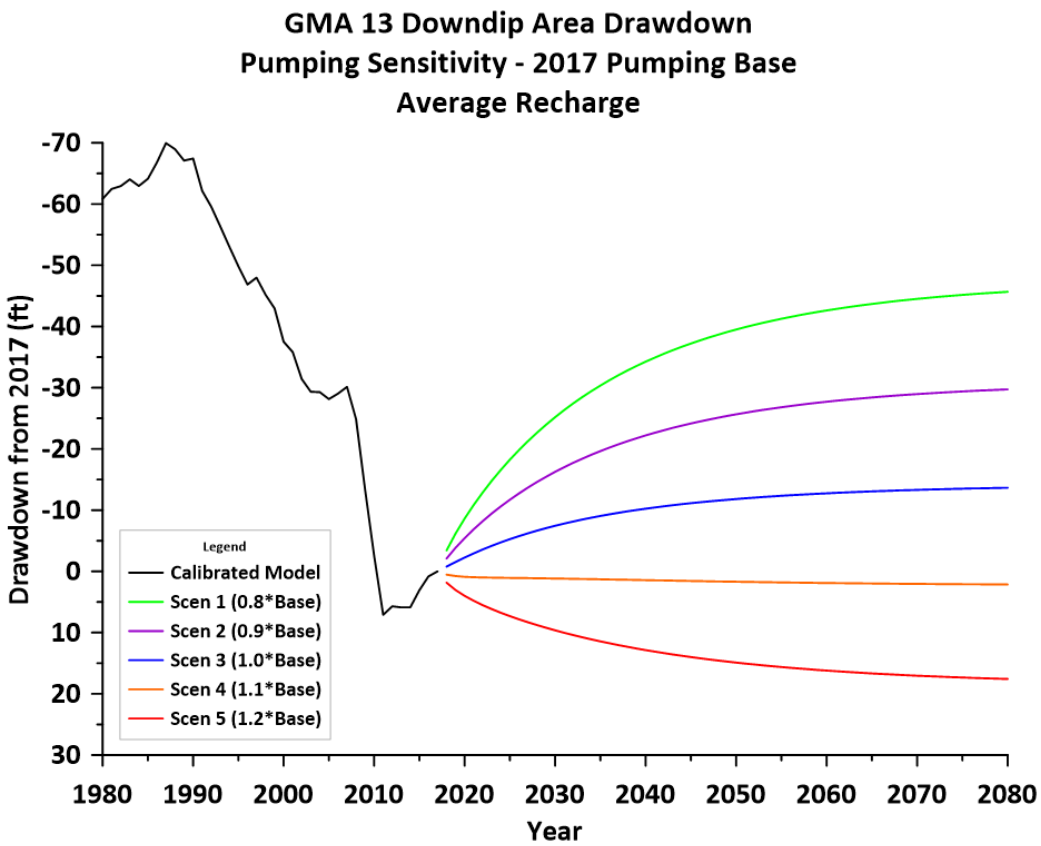
Appendix B

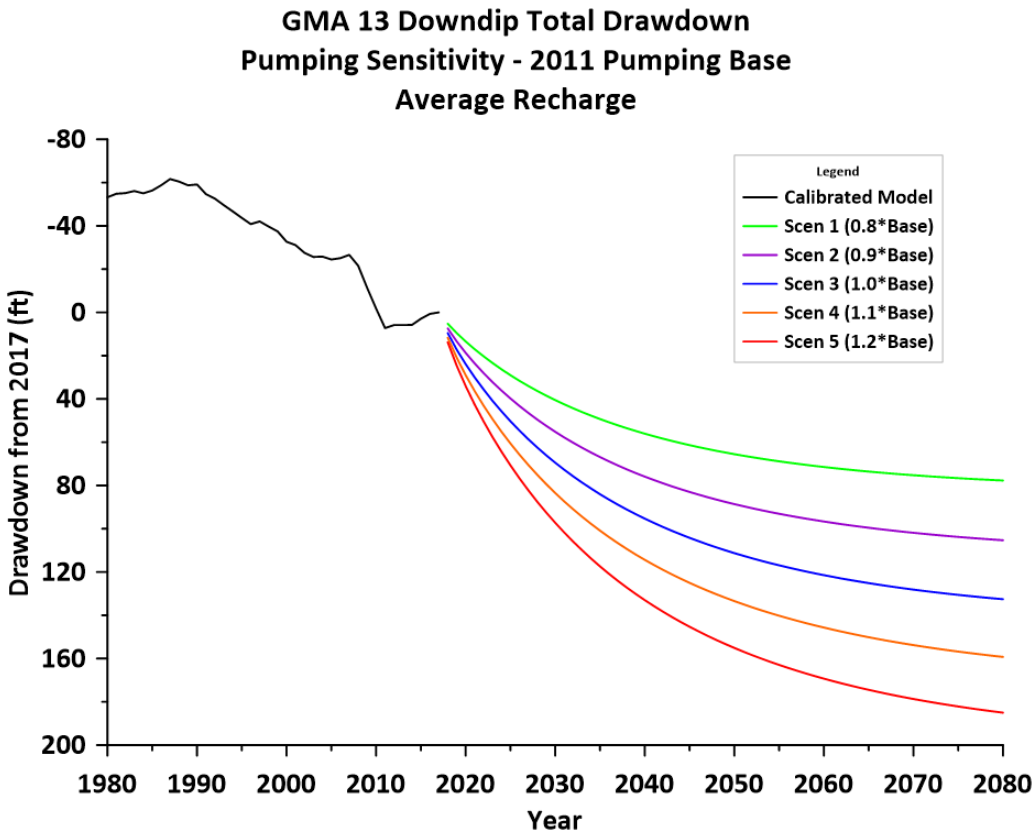
Overall Average Drawdown Hydrographs of Pumping Sensitivity Scenarios

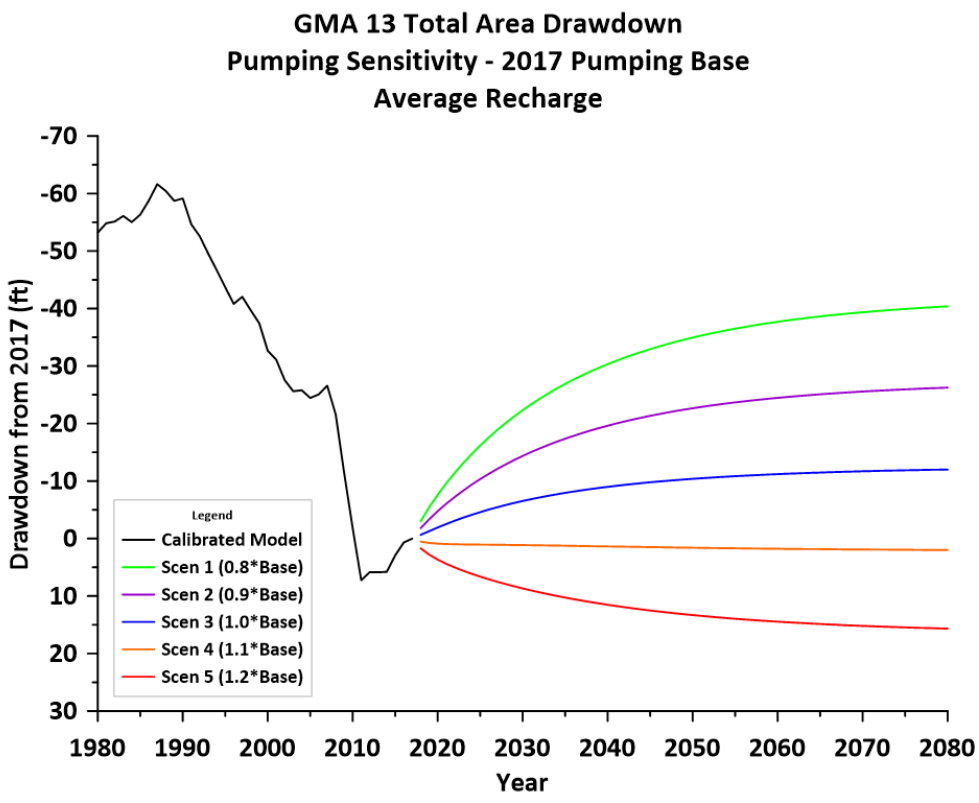

GMA 13 Outcrop Area Drawdown
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Outcrop Area Drawdown
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Downdip Area Drawdown
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Drawdown from 2017 (ft)
-80
-40
0
40
80
120
160
200
240
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

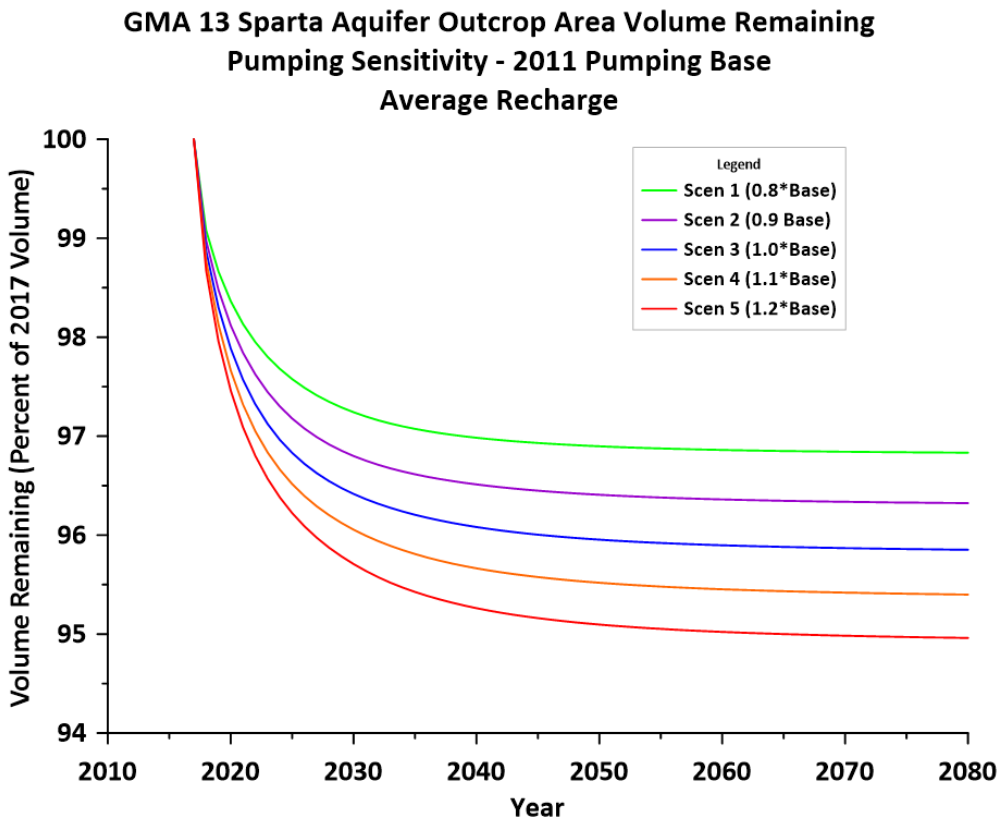

GMA 13 Downdip Area Drawdown
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Drawdown from 2017 (ft)
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

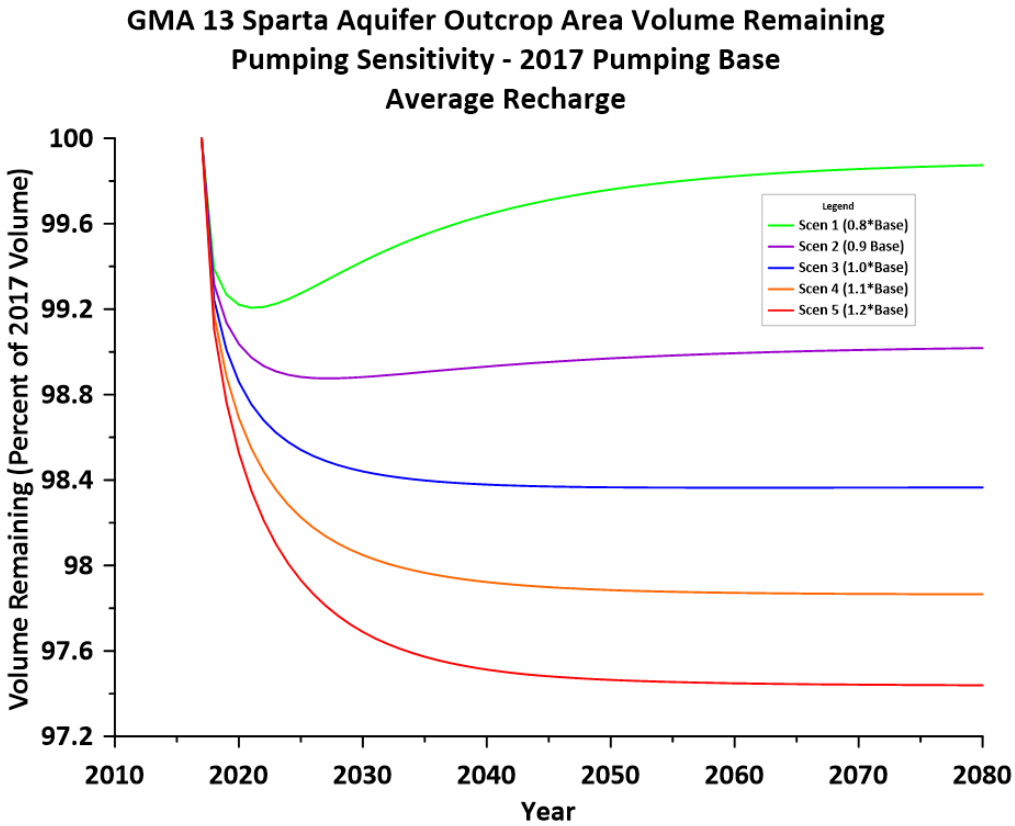

GMA 13 Downdip Total Drawdown
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

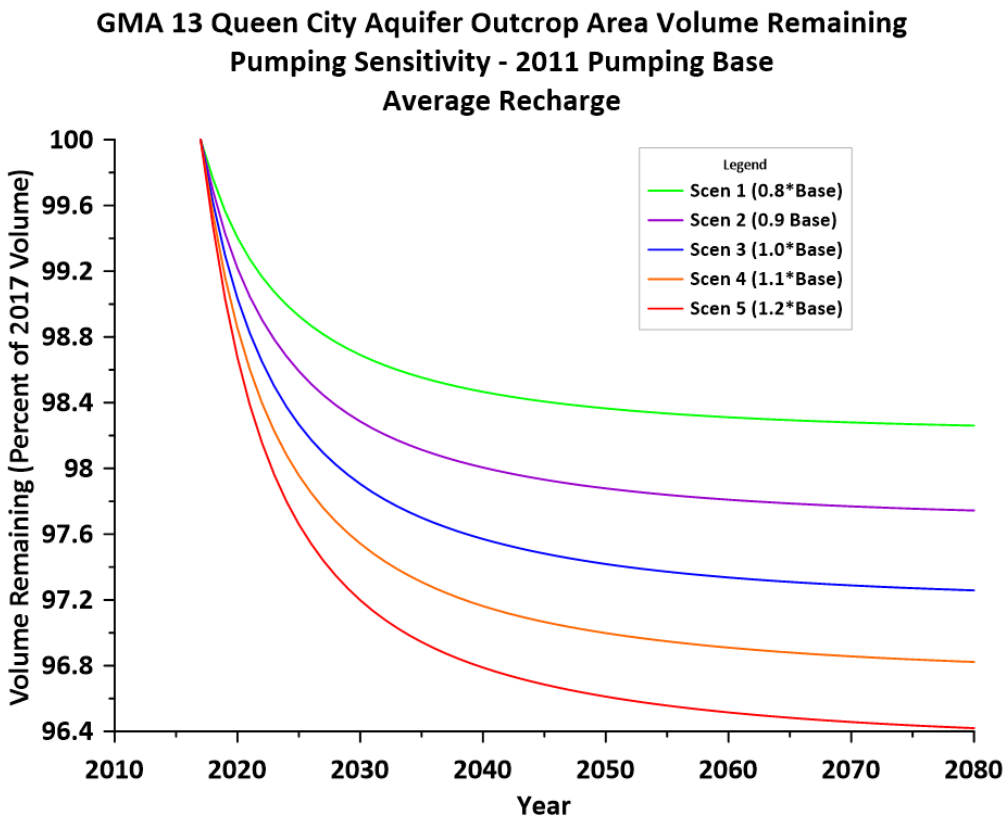

GMA 13 Total Area Drawdown
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

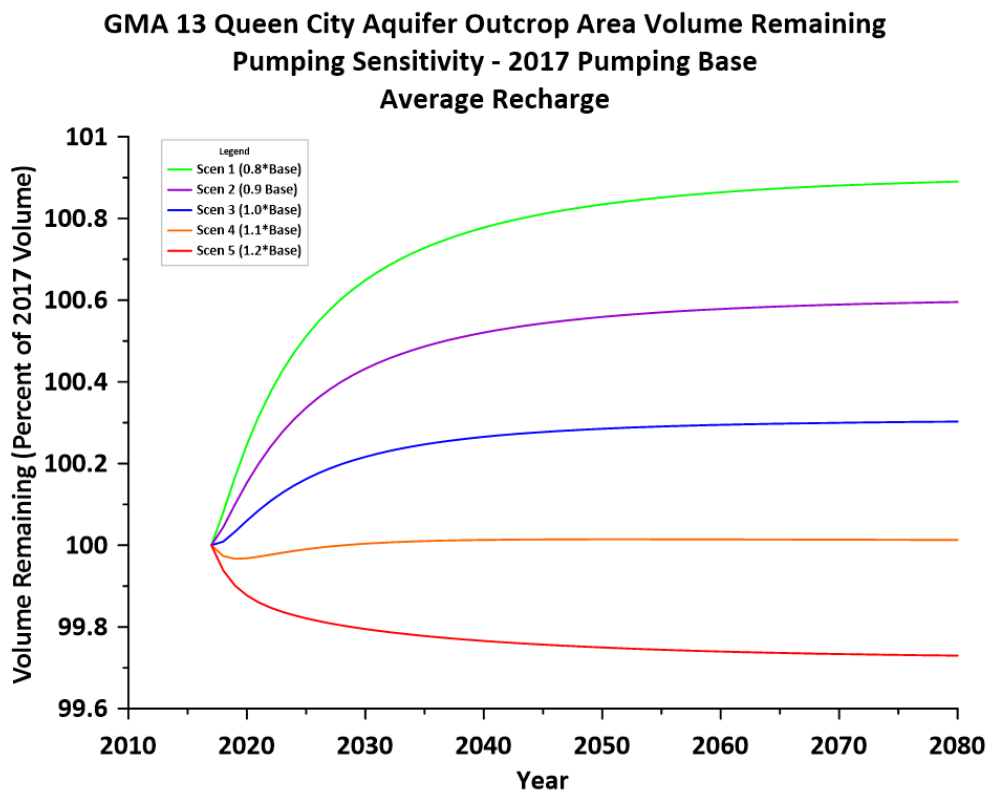
Appendix C

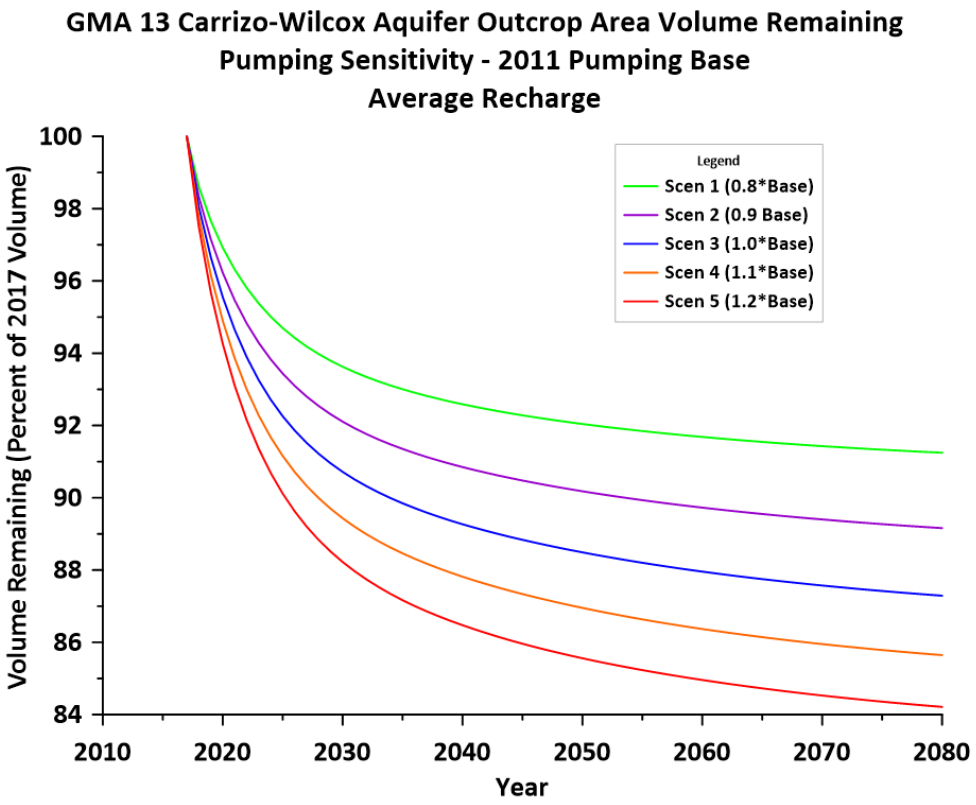
Outcrop Volume Remaining Hydrographs

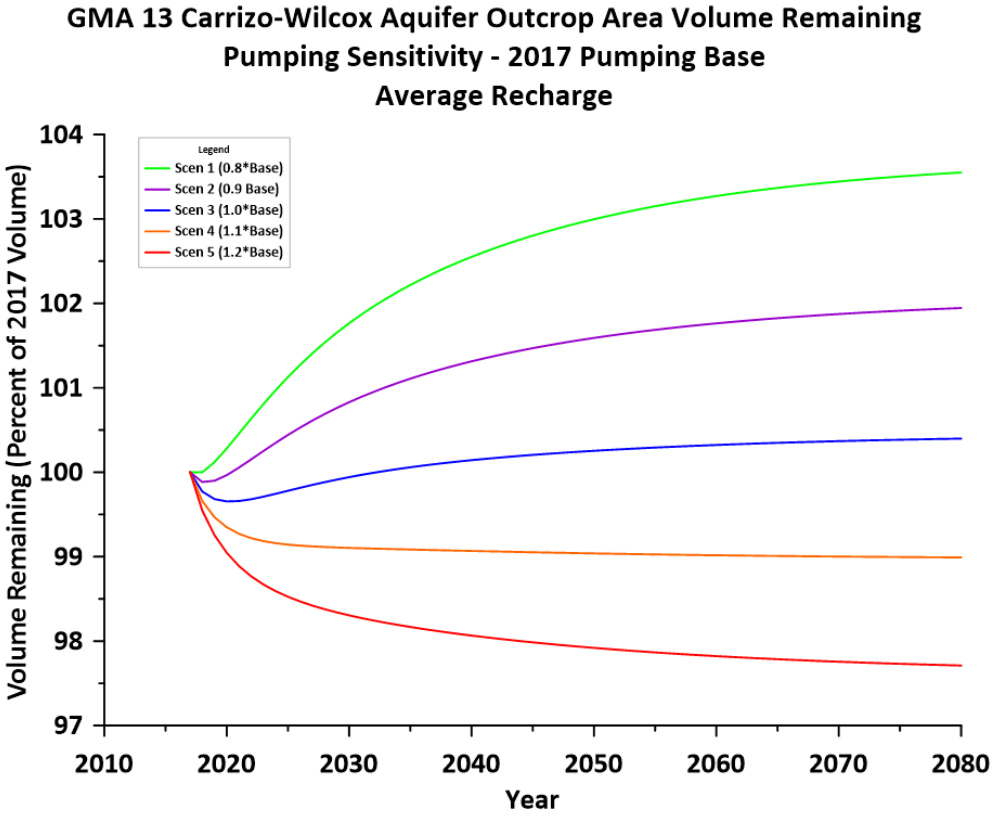

GMA 13 Sparta Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Volume Remaining (Percent of 2017 Volume)
100
99
98
97
96
95
94
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

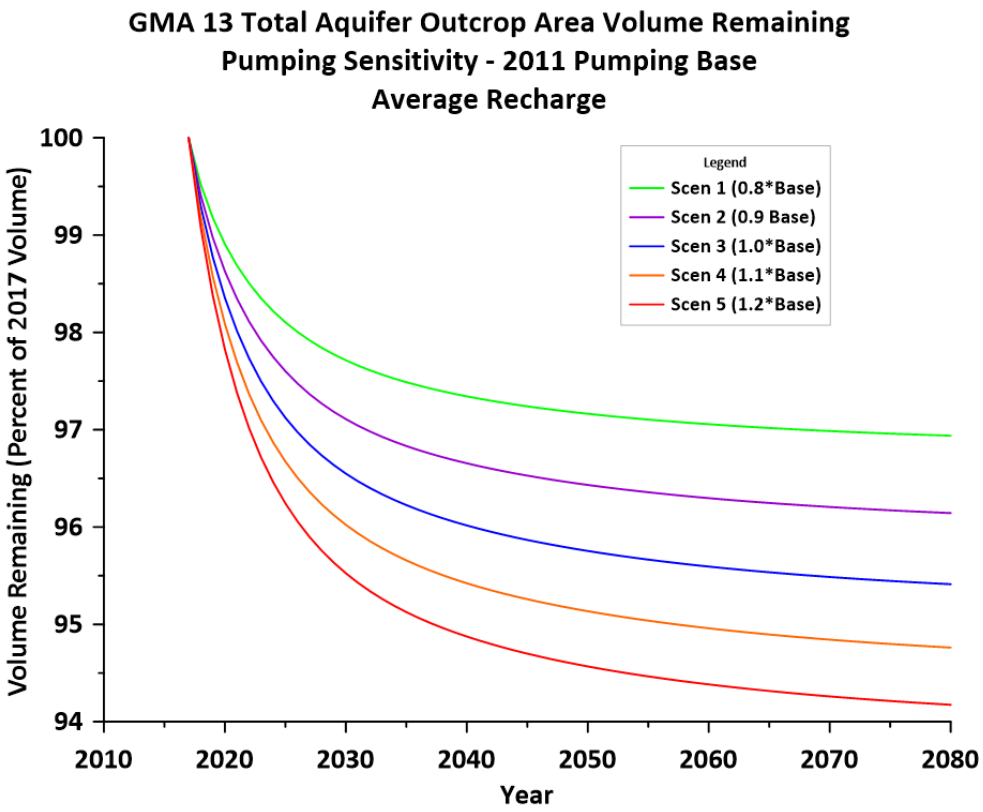

GMA 13 Sparta Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Volume Remaining (Percent of 2017 Volume)
100
99.6
99.2
98.8
98.4
98
97.6
97.2
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

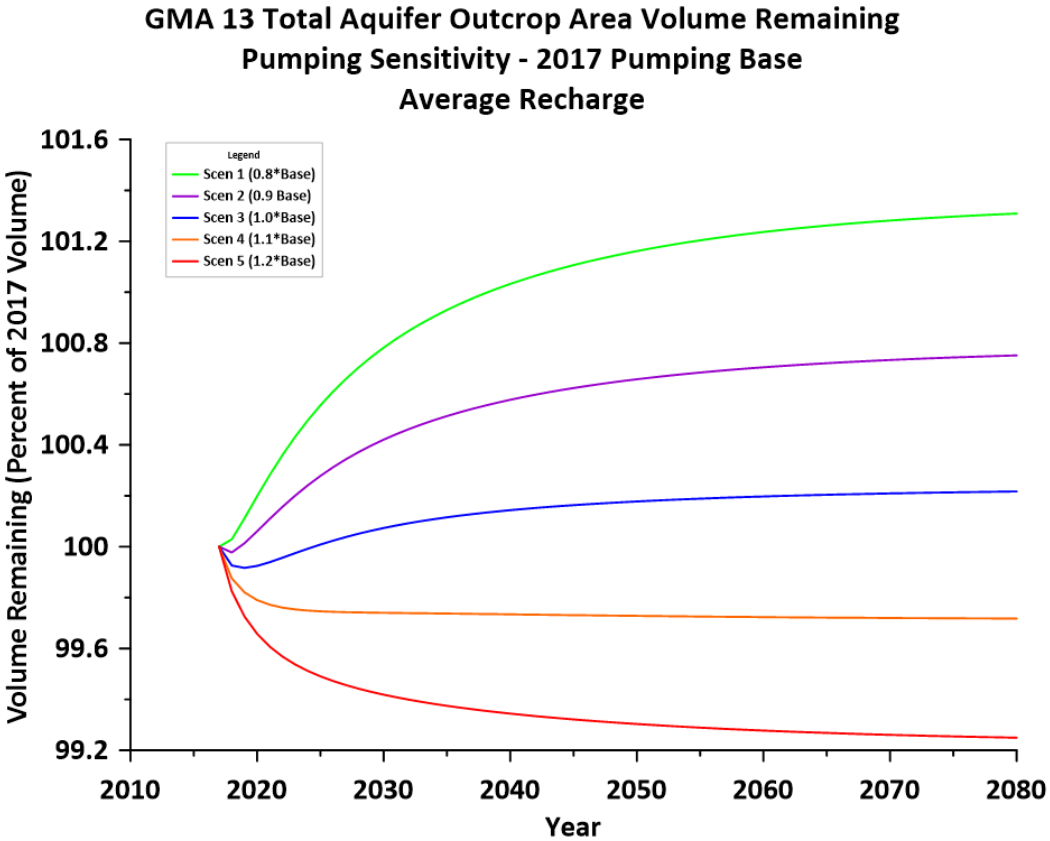

GMA 13 Queen City Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Volume Remaining (Percent of 2017 Volume)
100
99.6
99.2
98.8
98.4
98
97.6
97.2
96.8
96.4
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Queen City Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Volume Remaining (Percent of 2017 Volume)
101
100.8
100.6
100.4
100.2
100
99.8
99.6
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Carrizo-Wilcox Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)
Volume Remaining (Percent of 2017 Volume)
100
98
96
94
92
90
88
86
84
2010
2020
2030
2040
2050
2060
2070
2080
Year


GMA 13 Carrizo-Wilcox Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)
Volume Remaining (Percent of 2017 Volume)
104
103
102
101
100
99
98
97
2010
2020
2030
2040
2050
2060
2070
2080
Year


GMA 13 Total Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2011 Pumping Base
Average Recharge
Volume Remaining (Percent of 2017 Volume)
100
99
98
97
96
95
94
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Total Aquifer Outcrop Area Volume Remaining
Pumping Sensitivity - 2017 Pumping Base
Average Recharge
Volume Remaining (Percent of 2017 Volume)
101.6
101.2
100.8
100.4
100
99.6
99.2
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

Technical Memorandum 3

Recharge Sensitivity

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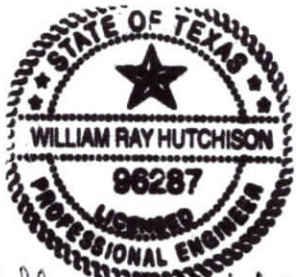
January 31, 2023

Technical Memorandum 3

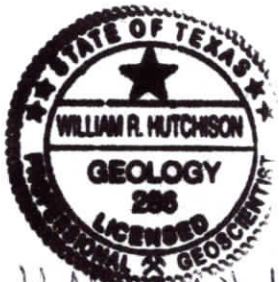
Professional Engineer and Professional Geoscientist Seals

This report was prepared by William R. Hutchison, Ph.D., P.E., P.G., who is licensed in the State of Texas as follows:

- Professional Engineer (Geological and Civil) No. 96287
- Engineering Firm Registration No. 14526
- Professional Geoscientist (Geology) No. 286



William R Hutchison
1/31/2023



William R Hutchison
1/31/2023

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B – Overall Average Drawdown Hydrographs of Pumping Sensitivity Scenarios
C – Outcrop Volume Remaining Hydrographs

1.0 Executive Summary

This technical memorandum documents the recharge sensitivity simulations completed with the new GAM. Recharge sensitivity was evaluated by simulating variations in recharge and observing the change in average drawdown. The recharge sensitivity simulations consisted of two groups of five simulations. The first group assumed constant pumping at 2011 amounts and locations, the second group assumed constant pumping at 2017 amounts and locations. The five simulations in each group varied the baseline recharge (increased and decreased) as follows:

- Scenario 1: 80% of Baseline recharge
- Scenario 2: 90% of Baseline recharge
- Scenario 3: 100% of Baseline recharge
- Scenario 4: 110% of Baseline recharge
- Scenario 5: 120% of Baseline recharge

Results of the simulations included average drawdown and outcrop area volume remaining.

2.0 Background

One of the uses of the updated Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers documented in the main report will be to support the Joint Planning Process that leads to the adoption of desired future conditions by the groundwater conservation districts in Groundwater Management Area 13 and the calculation of the modeled available groundwater by TWDB. As part of the work associated with developing the updated Groundwater Availability Model, five technical memoranda appear in the Appendix of the report:

- Technical Memorandum 1: Pumping Comparisons
- Technical Memorandum 2: Pumping Sensitivity
- Technical Memorandum 3: Recharge Sensitivity
- Technical Memorandum 4: Calculation of Drawdown from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model
- Technical Memorandum 5: Calculation of Future Pumping from Existing Desired Future Conditions Using Updated Groundwater Availability Model

This technical memorandum summarizes a sensitivity analysis of recharge as measured by average drawdown in GMA 13.

3.0 Parameters and Assumptions

Recharge sensitivity was evaluated by simulating variations in recharge and observing the change in average drawdown. Section 3.1 documents the model files used in the simulations. Section 3.2 documents the pumping files used in the simulations. Section 3.3 documents the calculation of average drawdown.

3.1 Model Files

The directory on the share site named *BaseFiles* contains all model files for the simulations other than the simulated pumping files.

3.1.1 Files Unchanged from Calibrated Model

Table 1 presents the model files that were unchanged from the calibration run of the model.

Table 1. Model Files Unchanged from Calibrated Model

File Name	File Date	Description
GMA13_Historical_Period_Calibration._kx	5/10/2022	Horizontal hydraulic conductivity
GMA13_Historical_Period_Calibration._kz	5/10/2022	Vertical hydraulic conductivity
GMA13_Historical_Period_Calibration._ss	5/10/2022	Specific storage
GMA13_Historical_Period_Calibration._sy	5/10/2022	Specific yield
GMA13_Historical_Period_Calibration.dis	5/10/2022	Discretization
GMA13_Historical_Period_Calibration.hfb	5/10/2022	Horizontal fflow barrier
GMA13_Historical_Period_Calibration.ims	5/10/2022	Solver
GMA13_Historical_Period_Calibration.npf	5/10/2022	Node property flow

3.1.2 Files Modified from the Calibrated Model

Table 2 presents the model files that were modified from the calibration run of the model in order to run the sensitivity simulations. The pumping and recharge files are discussed in the next subsection.

Table 2. Model Files Modified from the Calibrated Model

File Name	File Date	Description
calsp39hds.dat	5/27/2022	Starting heads
mfsim.nam	5/27/2022	Simulation name file
pred.evt	5/25/2022	Evapotranspiration
pred.ghb	5/25/2022	General head boundary
pred.ic6	5/27/2022	Initial condition file
pred.oc6	5/26/2022	Output control
pred.riv	5/25/2022	River
pred.sto	5/25/2022	Storage
pred.tdis	5/25/2022	Time discretization
predbase.nam	5/26/2022	GWF Model name file

The modifications were generally associated with using the final stress period from the calibrated model and holding all parameters constant for the sensitivity simulation, which was run from 2018 to 2080 (63 stress periods). Modifications also included updating the file names for the simulations. Please note that no recharge and pumping file is listed above. It was not part of the general group of modified files and not included in this directory. Details of the recharge and pumping files used for these sensitivity simulations are provided below.

3.2 Pumping and Recharge Files

The recharge sensitivity simulations consisted of two groups of five simulations. The first group assumed constant pumping at 2011 amounts and locations, the second group assumed constant pumping at 2017 amounts and locations. The five simulations in each group varied the baseline recharge (increased and decreased) as follows:

- Scenario 1: 80% of Baseline recharge
- Scenario 2: 90% of Baseline recharge
- Scenario 3: 100% of Baseline recharge
- Scenario 4: 110% of Baseline recharge
- Scenario 5: 120% of Baseline recharge

It was assumed that recharge and pumping were constant from 2018 to 2080 (the full simulation).

The directory named *Rech* on the share site contains the five recharge files that were used in the sensitivity simulations (*scen1.rch* to *scen5.rch*).

Pumping files included were labeled *p2011scen3.wel* and *p2017scen3.wel*. The year after the "*p*" is the baseline year for pumping, and "scen3" designates the 100 percent of the baseline pumping as documented in Technical Memorandum 2.

3.3 Average Drawdown Calculation

3.3.1 Grid Counts and Acreage

Model output includes groundwater elevation results for each model cell. Drawdown can be calculated by subtracting the groundwater elevation in a specific cell over two different time periods. Average drawdown can be calculated by averaging the drawdown results in multiple cells. Typical average drawdown calculations involve county-aquifer units or GMA-aquifer units.

The old GAM had a regular grid where all cells were 640 acres, or one square mile. Averaging drawdowns with the old GAM was a relatively simple calculation of summing all drawdown results over a defined area and dividing the sum by the number of cells.

The new GAM has a variable grid that is refined near streams, and the cell sizes range from 10 acres to 640 acres. Thus, averaging drawdown must be weighted by the cell size. Appendix A contains summary tables of cell counts, areas, and average cell size for each county-aquifer unit for outcrop, downdip and total areas. Appendix A also presents bar graphs of the average cell size for each county-aquifer unit. Data for these tables and graphs was developed using a FORTRAN code that read the grid file of the new GAM. All data associated with the tables and graphs in Appendix A are contained in the directory named *GridFile* on the share site.

3.3.2 Average Drawdown Calculations

Average drawdown calculations were performed using a FORTRAN post-processor named *CalibDD.exe* (for the calibration period) and *PredDD.exe* (for the predictive period). The post-processor reads the simulation output file (a *hds* file) and the files with acreage totals for each unit (county-aquifer and GMA13-aquifer). Drawdowns for each cell are calculated based on a starting point of 2017 (the last stress period of the calibration period). The cell drawdown values are then multiplied by the cell acreage (drawdown-acreage product). The sum of all drawdown-acreage products for a particular unit (county-aquifer or GMA13-aquifer) are then divided by the total acreage of that unit to obtain an average drawdown.

The source code, executable and all files associated with these calculations are contained in the directory *CalibDD* (for the calibration period) and the directory *PredDD* (for the predictive period) on the share site. Please note that the directory *PredDD* also includes the results from the pumping sensitivity simulations that are the subject of Technical Memorandum 2.

The overall GMA 13 drawdown files are contained in the directory *AllAqGMA13* on the share site. A post-processor named *TotPredDD.exe* was developed to read the GMA 13 files from the predictive simulations and calculate overall average drawdowns for all aquifers (Sparta, Queen City, and Carrizo-Wilcox).

3.3.3 Volumetric/Saturated Thickness Calculations

The current DFC for GMA 13 includes a "Primary" DFC that covers the Sparta, Queen City, and Carrizo-Wilcox aquifers in GMA 13: "75 percent of the saturated thickness in the outcrop at the

end of 2012 remains at the end of 2080". It was noted that this DFC could not be simulated with the old GAM. One of the key objectives of this update was to improve the GAM so that this type of calculation could be completed.

As part of this model evaluation in the context of predictive simulations that are similar to those that might be used by GMA 13 in the future, calculations using model output were completed to demonstrate that the new GAM can provide results that would be useful in the next round of joint planning. These calculations involved a volumetric analysis to provide additional context to saturated thickness calculations. The volume of groundwater in each model cell was calculated as:

Volume (Acre-feet) = Saturated Thickness (ft) * Cell Area (acres) * Specific Yield (dimensionless)

The files associated with these calculations are provided on the share site under the directory *SatThick*. A FORTRAN post-processor named *SatThick.exe* was developed to read the model grid file, read the starting heads and predictive heads, and calculate volumes for each aquifer's outcrop area for all of GMA 13. These results were then imported into an Excel file named *VolumeSummary.xlsx* that contains the volumetric calculations for each aquifer (and total) and calculates the percentage remaining volume using 2017 as the baseline for each aquifer (and total).

4.0 Methods and Results

4.1 Average Drawdown

The calculated average drawdowns for the calibration period and the predictive period are contained in files for each county-aquifer unit (or county-GMA13) are contained in files with 12 columns of results organized as follows:

- Column 1 = County Code
- Column 2 = County Name
- Column 3 = Year
- Column 4 = Sparta Aquifer drawdown from 2017 (outcrop area)
- Column 5 = Sparta Aquifer drawdown from 2017 (downdip area)
- Column 6 = Sparta Aquifer drawdown from 2017 (total area)
- Column 7 = Queen City Aquifer drawdown from 2017 (outcrop area)
- Column 8 = Queen City Aquifer drawdown from 2017 (downdip area)
- Column 9 = Queen City Aquifer drawdown from 2017 (total area)
- Column 10 = Carrizo-Wilcox Aquifer drawdown from 2017 (outcrop area)
- Column 11 = Carrizo-Wilcox Aquifer drawdown from 2017 (downdip area)
- Column 12 = Carrizo-Wilcox Aquifer drawdown from 2017 (total area)

Names of the calibration period files start with the base name *CalibDD* and are followed by the county name (or GMA13). Names of the predictive period files start with a *r* (for recharge

scenarios) and the year of the base pumping (either 2011 or 2017) and the recharge scenario (*scen1* to *scen5*) followed by the county (or GMA13).

The overall predictive drawdown files for GMA 13 are named with a *r* (for recharge scenarios) and the year of the base pumping (either 2011 or 2017) and the pumping scenario (*s1* to *s5*) followed by *tot*. These files have four columns: the year followed by the outcrop area drawdown, the downdip area drawdown, and the total area drawdown. The calibration period overall drawdown file is named *bigavgcaldd.dat*. The columns of the calibration file are the same as the predictive files.

Appendix B presents the hydrographs of average drawdown for the Sparta, Queen City, and Carrizo-Wilcox aquifers for GMA 13. Included are hydrographs of the outcrop area, the downdip area, and the total area. The calibration period is presented along with the results of the five simulations using 2011 as the base pumping and with the results of the five simulations using 2017 as the base pumping.

Note that, generally, drawdown stabilizes after some initial adjustment period, either as an overall rise or decline in average groundwater level depending on the amount of pumping. This suggests that the model is suitable for use in evaluating alternative pumping scenarios related to the joint planning process, even in the outcrop area. Also, please note that the sensitivity to recharge is greater in the outcrop area than it is in the downdip area.

4.2 Remaining Volume in the Outcrop Area

As noted above, the results of the model were processed, and the Excel file named *VolumeSummary.xlsx* contains the volumetric calculations for each aquifer (and total) and calculates the percentage remaining volume using 2017 as the baseline for each aquifer (and total).

Figure 1 presents the initial (2017) outcrop area volume for the Sparta, Queen City, Carrizo-Wilcox aquifer, a total of the three aquifers, and the 75 percent of the total (the primary DFC). Please note that the Queen City Aquifer initial storage is significantly higher than the initial storage in the Sparta and Carrizo-Wilcox aquifers.

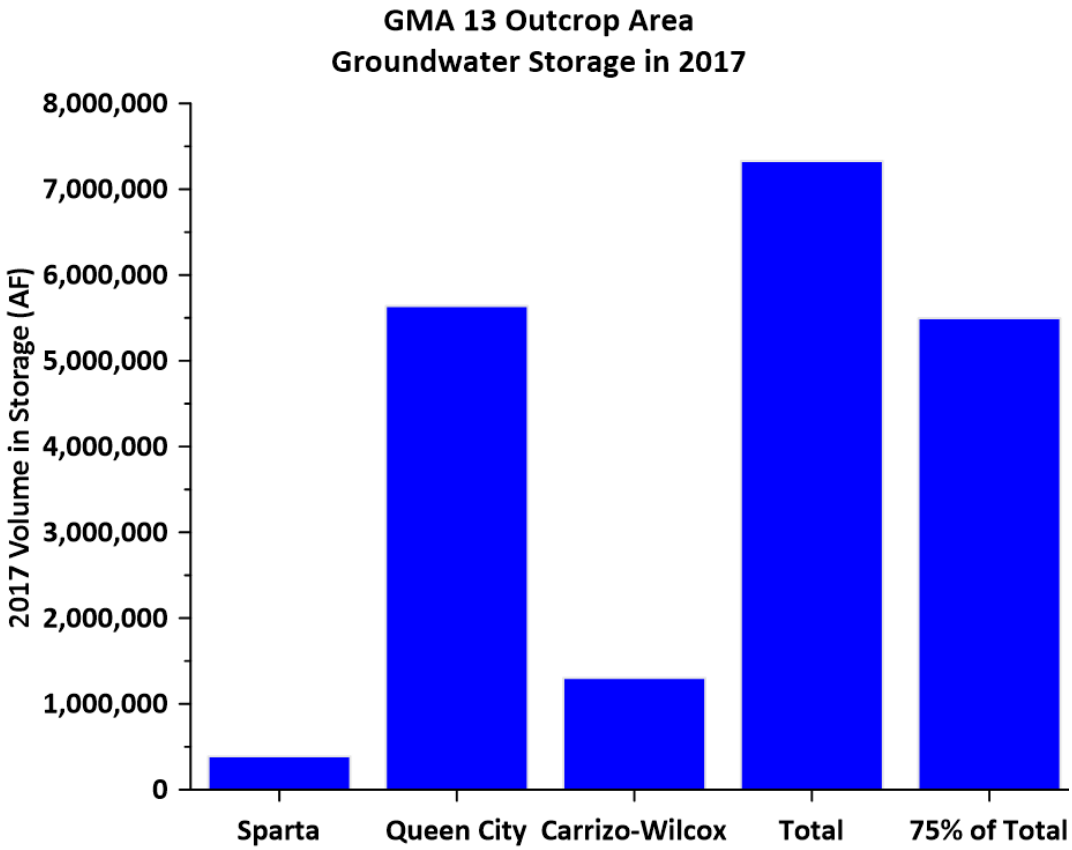


Figure 1. GMA 13 Outcrop Area Groundwater Storage in 2017

Appendix C presents the hydrographs of the volume remaining. Please note that the worst-case scenario (80 percent of average annual recharge with 2011 base pumping) in the Carrizo-Wilcox yields a volume remaining of 84 percent in 2080 as compared to 2017 in the outcrop area. At the other end of the spectrum, a 120 of average annual recharge with 2017 pumping results in about an increase in outcrop groundwater storage in the Carrizo-Wilcox (104 percent of 2017 storage) in 2080. These ranges suggest that the new GAM is a suitable tool to evaluate volume remaining in the outcrop area in the joint planning process.

5.0 Limitations

The simulations using two alternative base pumping levels and five variations in recharge are not particularly realistic. Recharge would not rise or fall and remain constant for decades. These simulations were intended to demonstrate the stability of the model under controlled conditions to assess its utility in future simulations of prolonged drought conditions, if needed by GMA 13. These simulations demonstrate that the limitations associated with the old GAM have been corrected.

Appendix A

Grid Cell County and Acreage by County and Aquifer

Outcrop Area

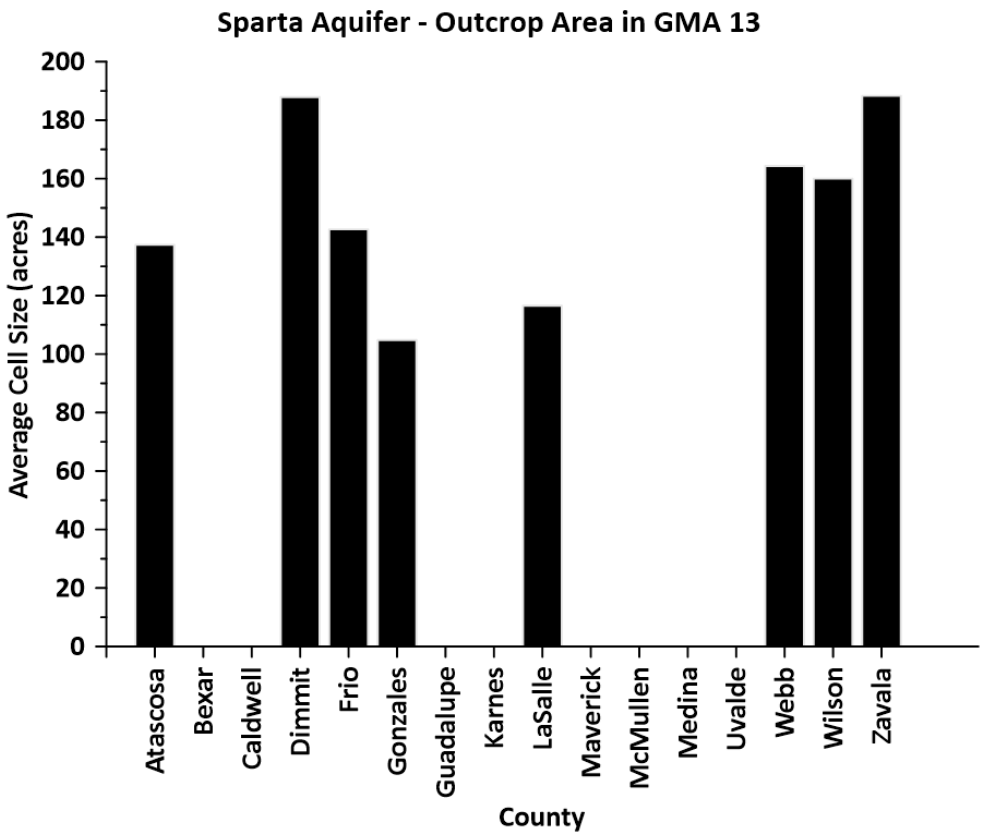
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	233	1,229	540	32,000	113,000	78,720	137	92	146
11	Bastrop	21	45	1,156	3,840	24,480	126,400	183	544	109
13	Bee	0	0	0	0	0	0	0	0	0
15	Bexar	0	0	2,022	0	0	207,360	0	0	103
28	Caldwell	0	90	1,615	0	10,560	205,600	0	117	127
59	DeWitt	0	0	0	0	0	0	0	0	0
64	Dimmit	417	3,759	991	78,360	477,480	157,000	188	127	158
75	Fayette	8	0	0	1,400	0	0	175	0	0
82	Frio	1,045	2,467	163	149,080	279,040	13,480	143	113	83
89	Gonzales	287	922	115	30,080	90,280	11,800	105	98	103
94	Guadalupe	0	4	1,125	0	640	218,880	0	160	195
128	Karnes	0	0	0	0	0	0	0	0	0
139	LaSalle	1,047	0	0	122,040	0	0	117	0	0
143	Lavaca	0	0	0	0	0	0	0	0	0
149	LiveOak	0	0	0	0	0	0	0	0	0
159	Maverick	0	0	1,180	0	0	130,120	0	0	110
162	McMullen	0	0	0	0	0	0	0	0	0
163	Medina	0	0	1,850	0	0	207,200	0	0	112
232	Uvalde	0	0	887	0	0	88,280	0	0	100
240	Webb	469	3,130	276	77,080	492,040	18,840	164	157	68
247	Wilson	148	967	662	23,680	140,560	85,760	160	145	130
254	Zavala	636	4,426	1,489	119,760	421,240	147,760	188	95	99
255	Mexico	237	323	890	57,720	59,960	152,720	244	186	172
999	GMA 13	4,485	17,204	13,062	686,520	2,078,480	1,629,360	153	121	125

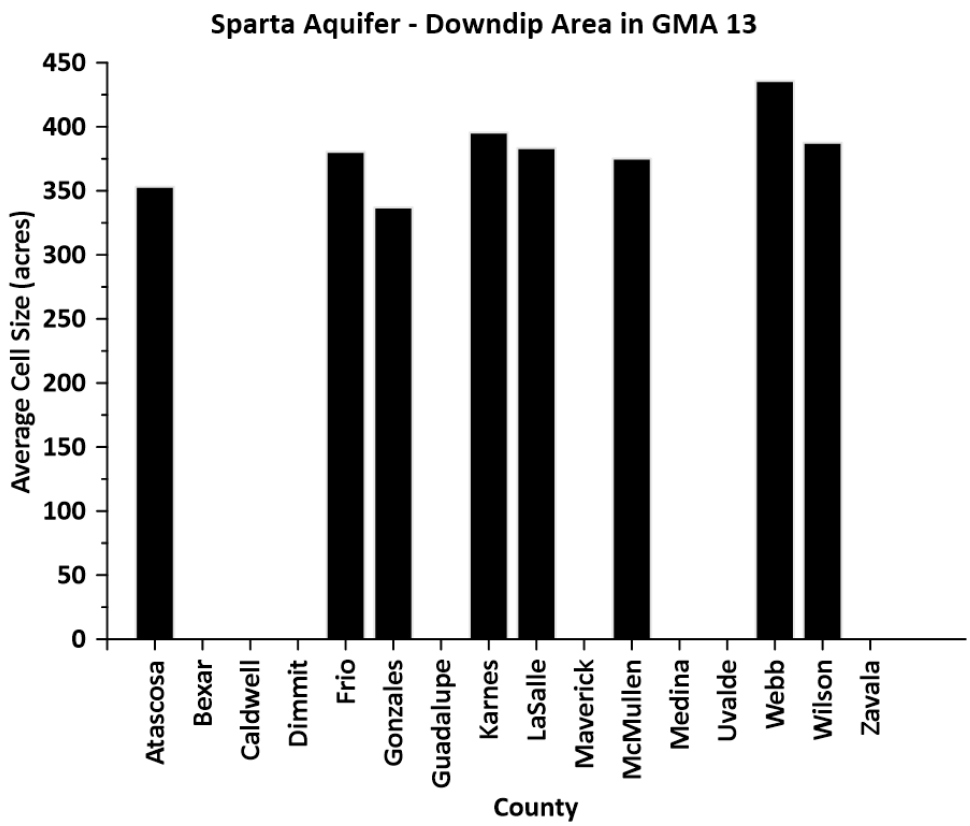
Downdip Area

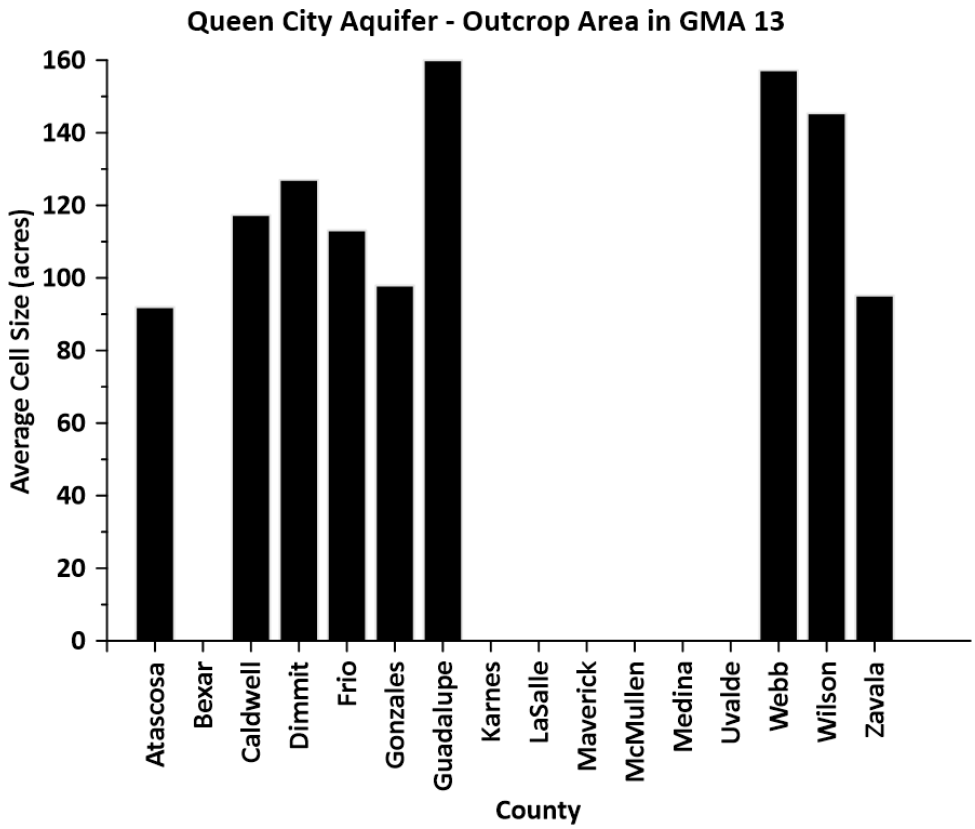
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	1,307	862	3,348	461,600	507,040	2,067,840	353	588	618
11	Bastrop	6	19	497	3,840	11,200	249,920	640	589	503
13	Bee	103	64	192	41,920	40,960	122,880	407	640	640
15	Bexar	0	0	239	0	0	96,320	0	0	403
28	Caldwell	0	0	537	0	0	231,840	0	0	432
59	DeWitt	883	543	1,629	350,080	347,520	1,042,560	396	640	640
64	Dimmit	0	192	3,473	0	104,640	2,091,200	0	545	602
75	Fayette	153	125	372	78,240	79,520	238,080	511	636	640
82	Frio	331	680	3,213	125,920	339,200	1,995,360	380	499	621
89	Gonzales	1,321	850	3,029	445,120	500,320	1,891,040	337	589	624
94	Guadalupe	0	0	330	0	0	160,800	0	0	487
128	Karnes	974	599	1,797	385,280	383,360	1,150,080	396	640	640
139	LaSalle	2,050	1,403	4,203	785,920	896,960	2,689,920	383	639	640
143	Lavaca	763	455	1,365	292,480	291,200	873,600	383	640	640
149	LiveOak	626	329	987	213,920	210,560	631,680	342	640	640
159	Maverick	0	0	140	0	0	41,120	0	0	294
162	McMullen	1,515	882	2,646	568,320	564,480	1,693,440	375	640	640
163	Medina	0	0	465	0	0	165,600	0	0	356
232	Uvalde	0	0	157	0	0	41,440	0	0	264
240	Webb	1,370	1,109	5,601	596,960	684,800	3,531,840	436	617	631
247	Wilson	443	394	2,201	171,680	217,600	1,322,240	388	552	601
254	Zavala	0	258	3,607	0	151,680	2,074,720	0	588	575
255	Mexico	597	664	3,130	294,720	414,400	1,890,880	494	624	604
999	GMA 13	8,770	7,071	35,498	3,338,560	4,240,800	21,479,360	381	600	605

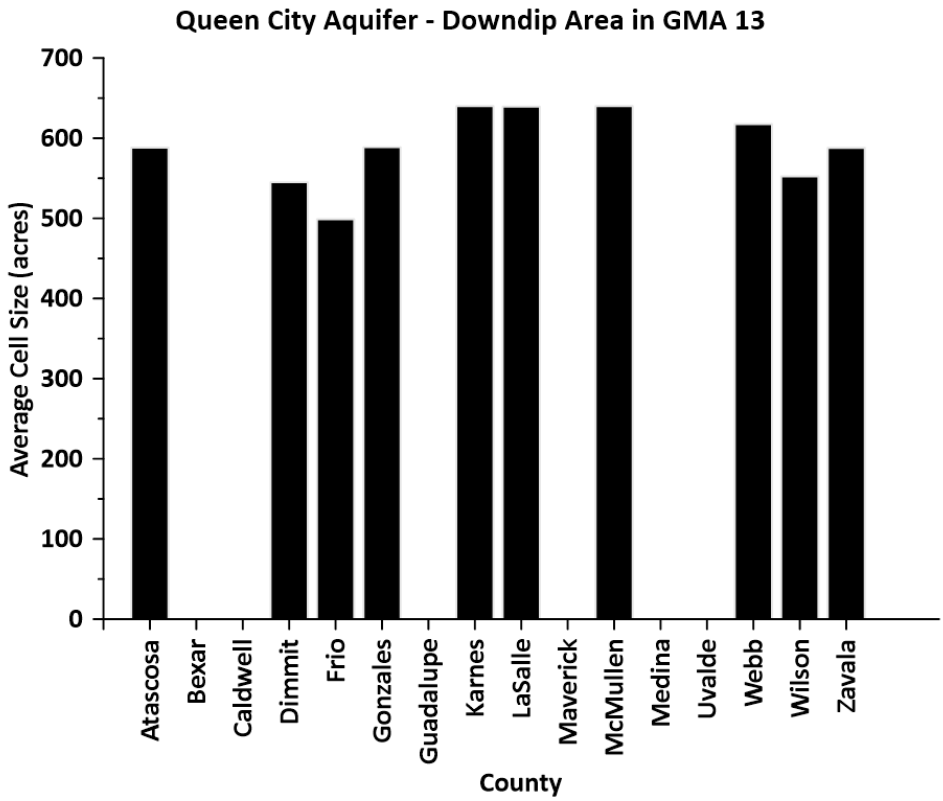
Total Area

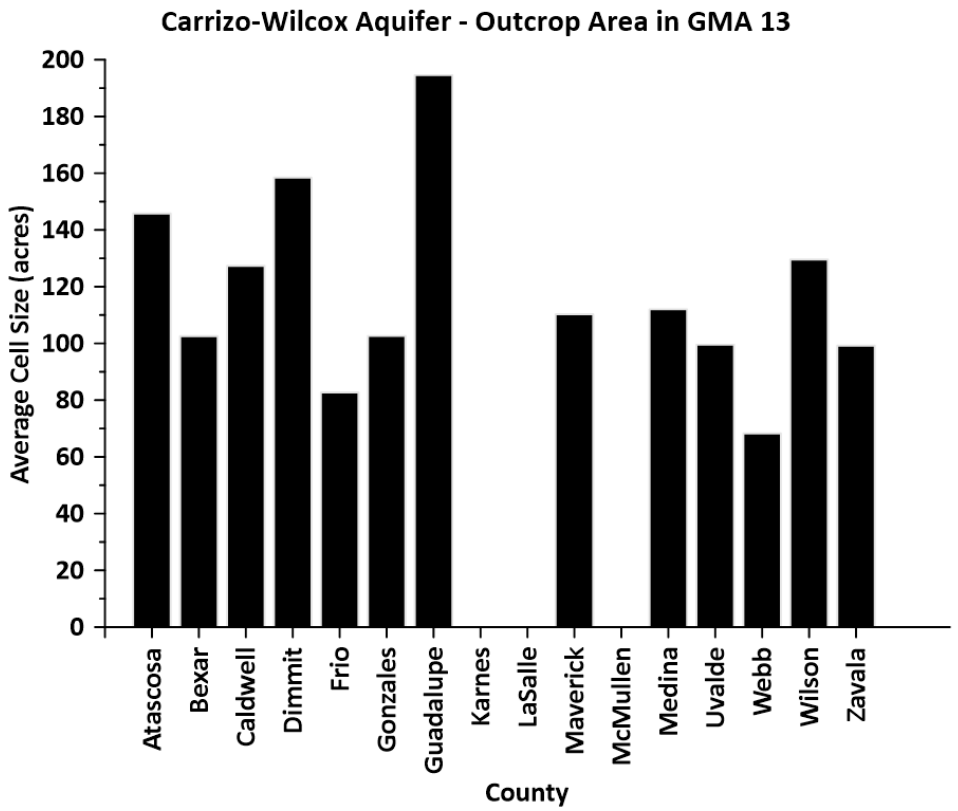
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	1,540	2,091	3,888	493,600	620,040	2,146,560	321	297	552
11	Bastrop	27	64	1,653	7,680	35,680	376,320	284	558	228
13	Bee	103	64	192	41,920	40,960	122,880	407	640	640
15	Bexar	0	0	2,261	0	0	303,680	0	0	134
28	Caldwell	0	90	2,152	0	10,560	437,440	0	117	203
59	DeWitt	883	543	1,629	350,080	347,520	1,042,560	396	640	640
64	Dimmit	417	3,951	4,464	78,360	582,120	2,248,200	188	147	504
75	Fayette	161	125	372	79,640	79,520	238,080	495	636	640
82	Frio	1,376	3,147	3,376	275,000	618,240	2,008,840	200	196	595
89	Gonzales	1,608	1,772	3,144	475,200	590,600	1,902,840	296	333	605
94	Guadalupe	0	4	1,455	0	640	379,680	0	160	261
128	Karnes	974	599	1,797	385,280	383,360	1,150,080	396	640	640
139	LaSalle	3,097	1,403	4,203	907,960	896,960	2,689,920	293	639	640
143	Lavaca	763	455	1,365	292,480	291,200	873,600	383	640	640
149	LiveOak	626	329	987	213,920	210,560	631,680	342	640	640
159	Maverick	0	0	1,320	0	0	171,240	0	0	130
162	McMullen	1,515	882	2,646	568,320	564,480	1,693,440	375	640	640
163	Medina	0	0	2,315	0	0	372,800	0	0	161
232	Uvalde	0	0	1,044	0	0	129,720	0	0	124
240	Webb	1,839	4,239	5,877	674,040	1,176,840	3,550,680	367	278	604
247	Wilson	591	1,361	2,863	195,360	358,160	1,408,000	331	263	492
254	Zavala	636	4,684	5,096	119,760	572,920	2,222,480	188	122	436
255	Mexico	834	987	4,020	352,440	474,360	2,043,600	423	481	508
999	GMA 13	13,255	24,275	48,560	4,025,080	6,319,280	23,108,720	304	260	476

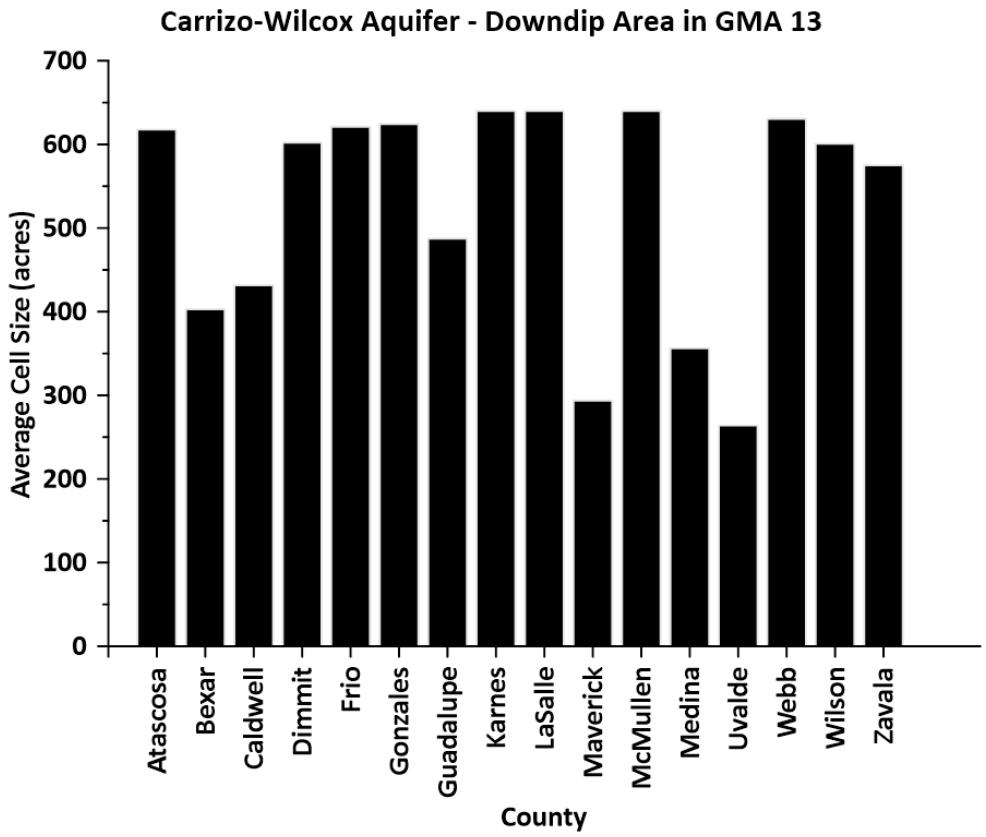

Sparta Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
180
200
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County


Sparta Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
50
100
150
200
250
300
350
400
450
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County


Queen City Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

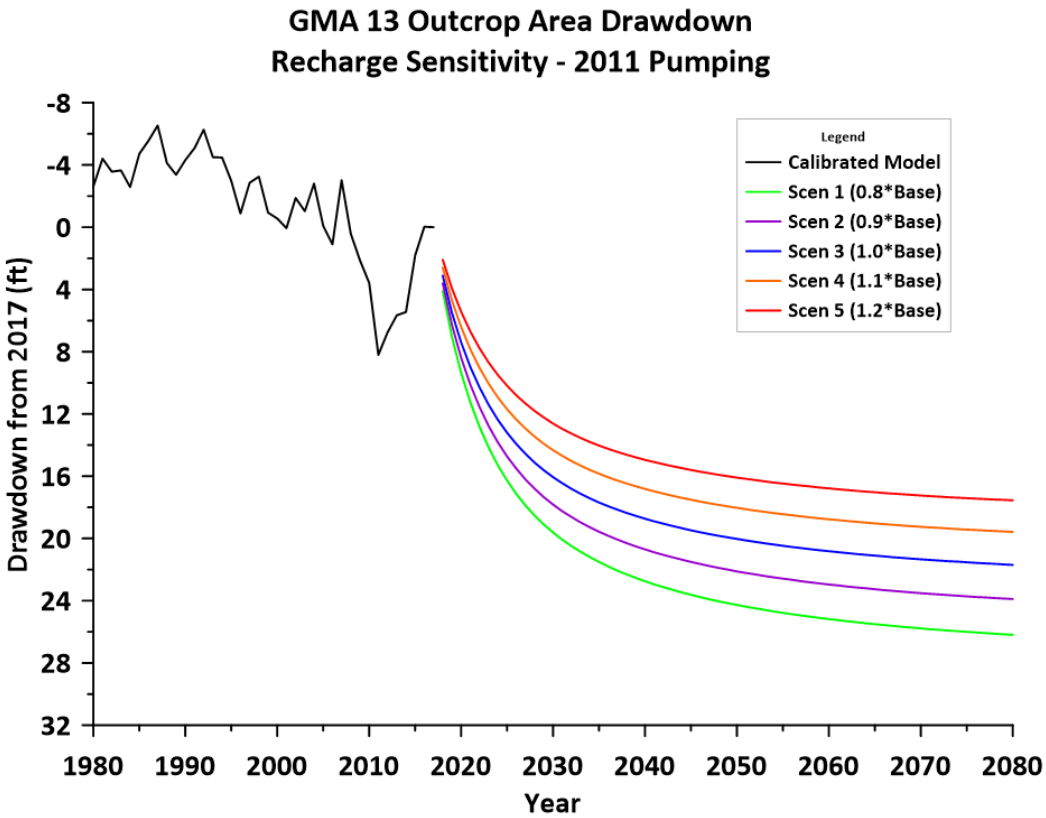

Queen City Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
100
200
300
400
500
600
700
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

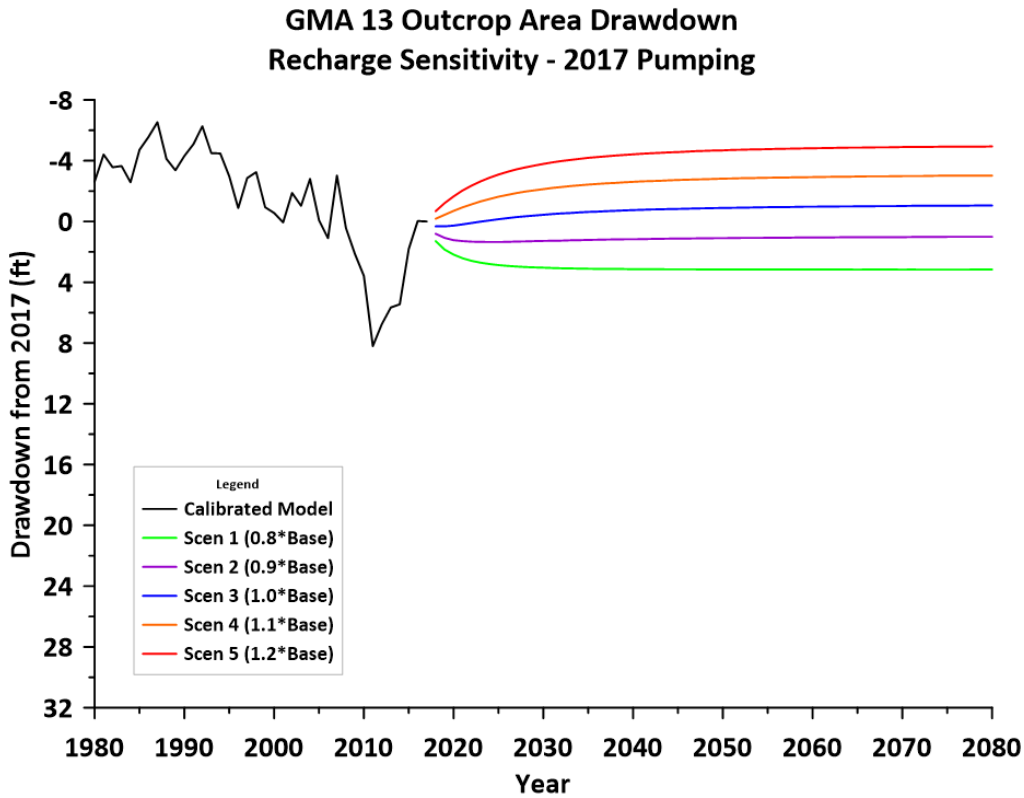

Carrizo-Wilcox Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
180
200
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

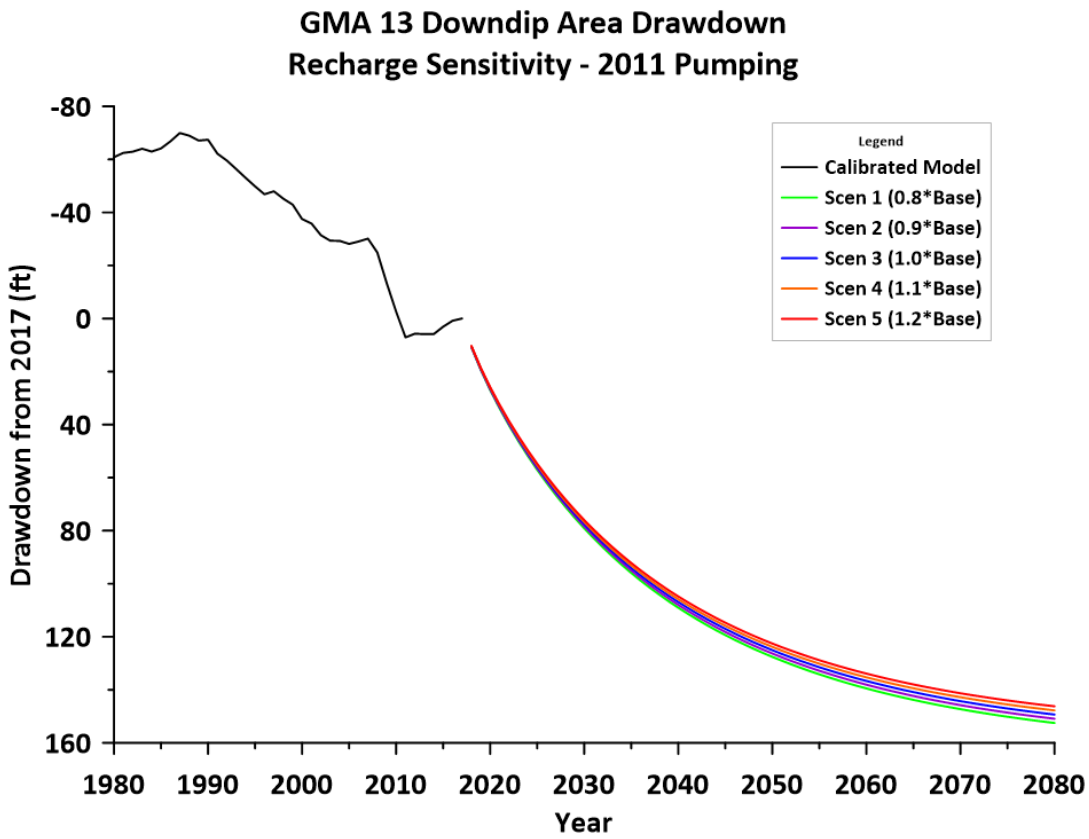

Carrizo-Wilcox Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
100
200
300
400
500
600
700
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

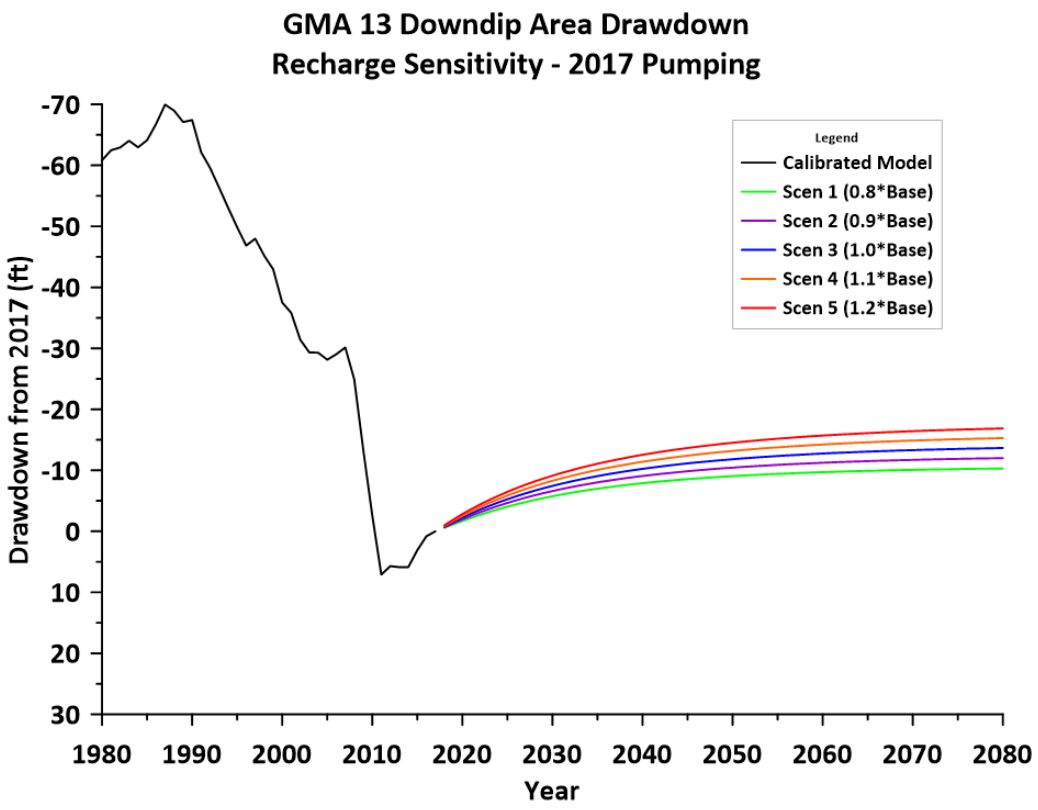
Appendix B

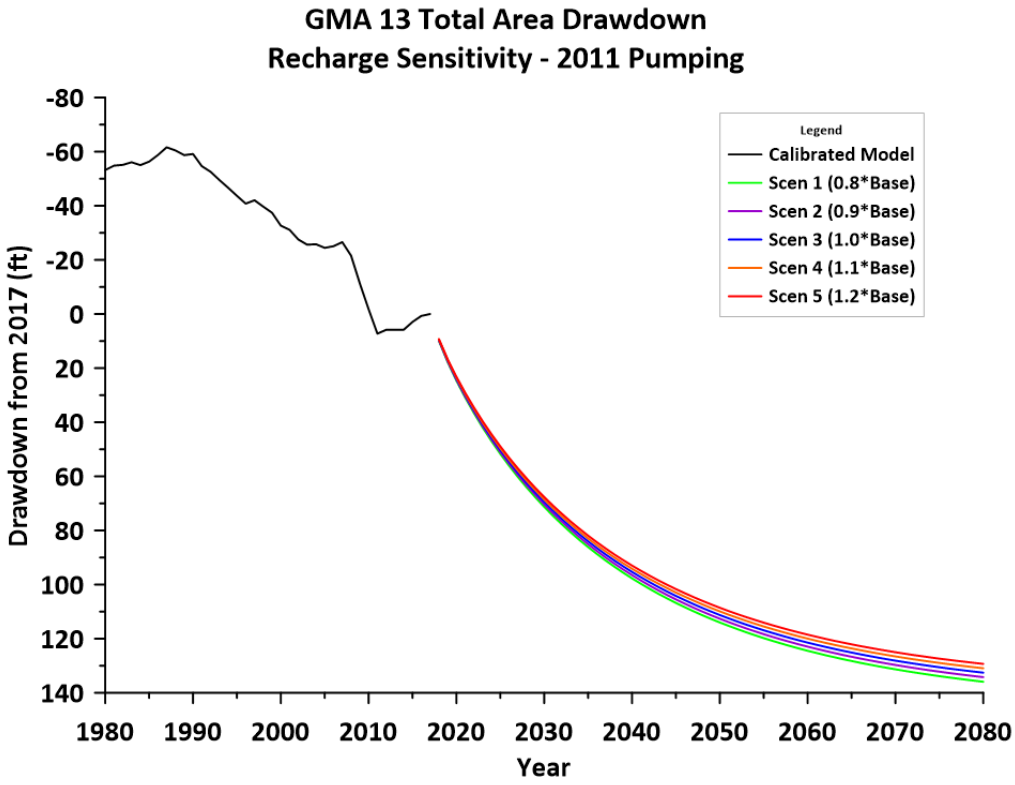
Overall Average Drawdown Hydrographs of Pumping Sensitivity Scenarios

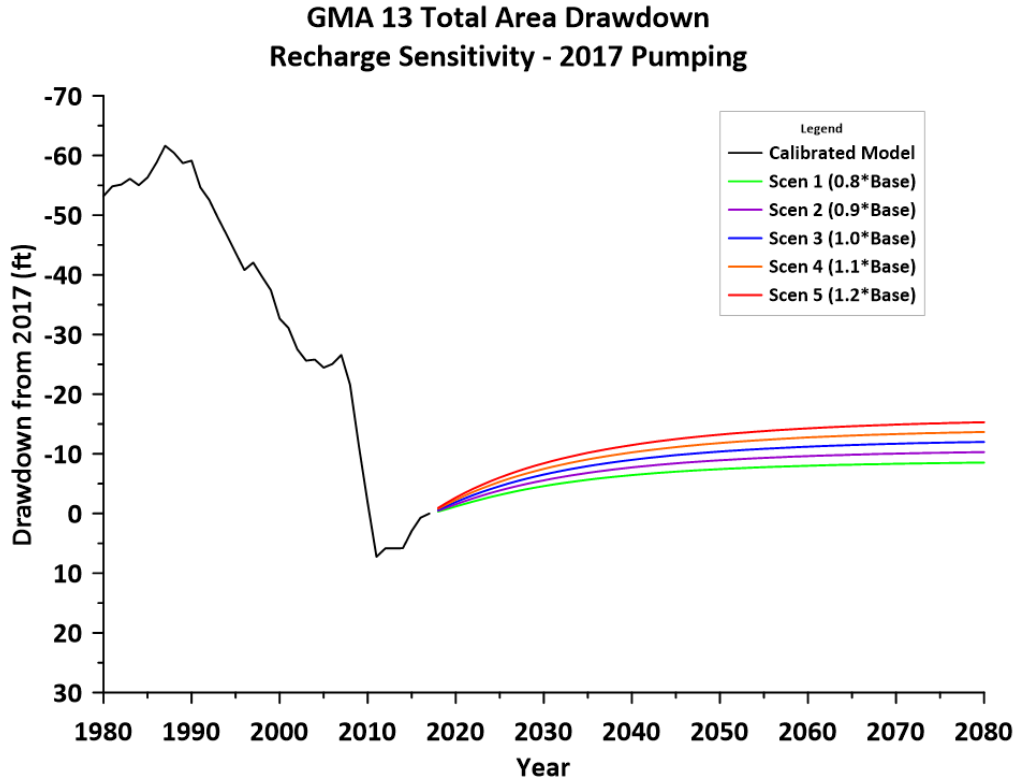

GMA 13 Outcrop Area Drawdown
Recharge Sensitivity - 2011 Pumping
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Outcrop Area Drawdown
Recharge Sensitivity - 2017 Pumping
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Downdip Area Drawdown
Recharge Sensitivity - 2011 Pumping
Drawdown from 2017 (ft)
-80
-40
0
40
80
120
160
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

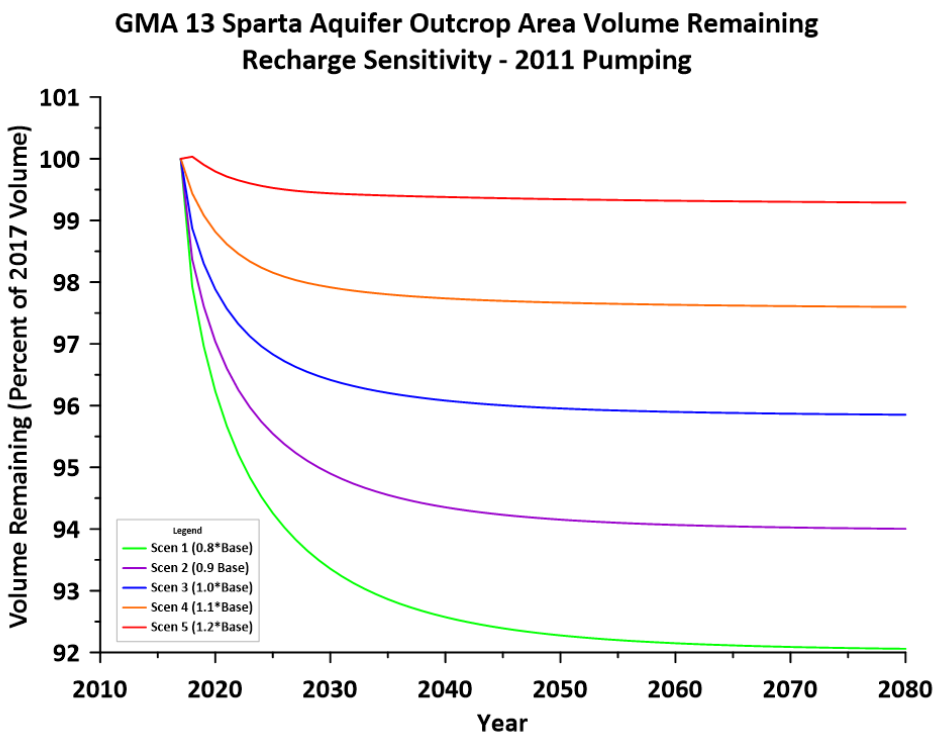

GMA 13 Downdip Area Drawdown
Recharge Sensitivity - 2017 Pumping
Drawdown from 2017 (ft)
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

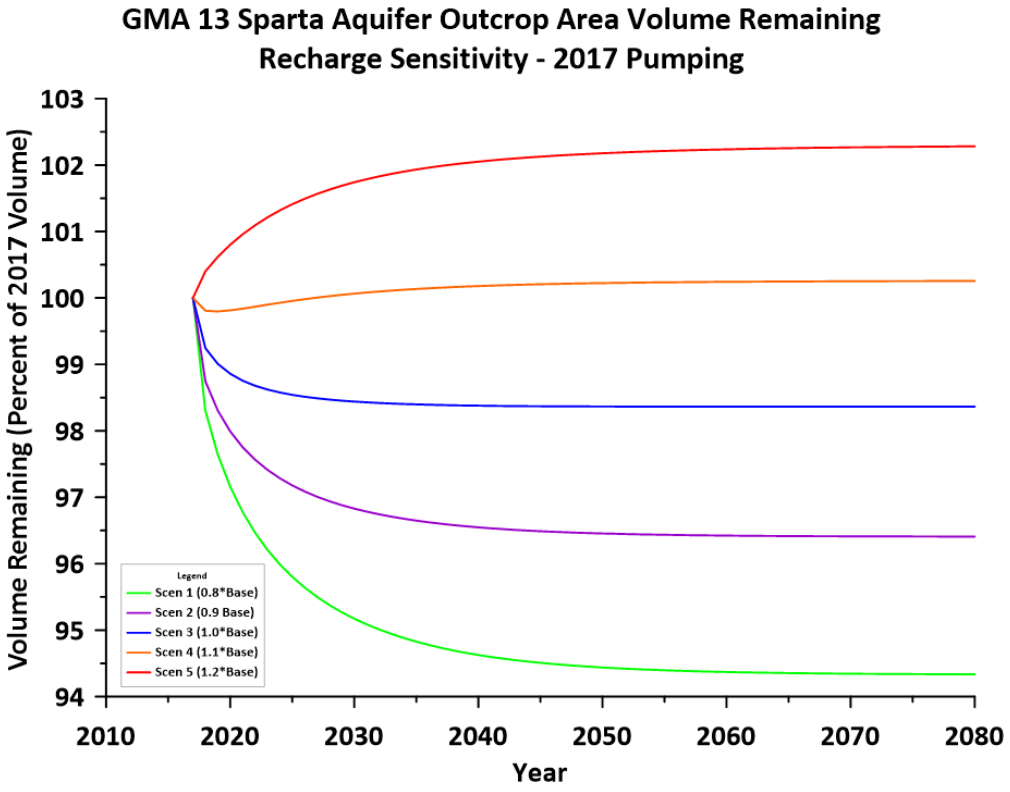

GMA 13 Total Area Drawdown
Recharge Sensitivity - 2011 Pumping
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

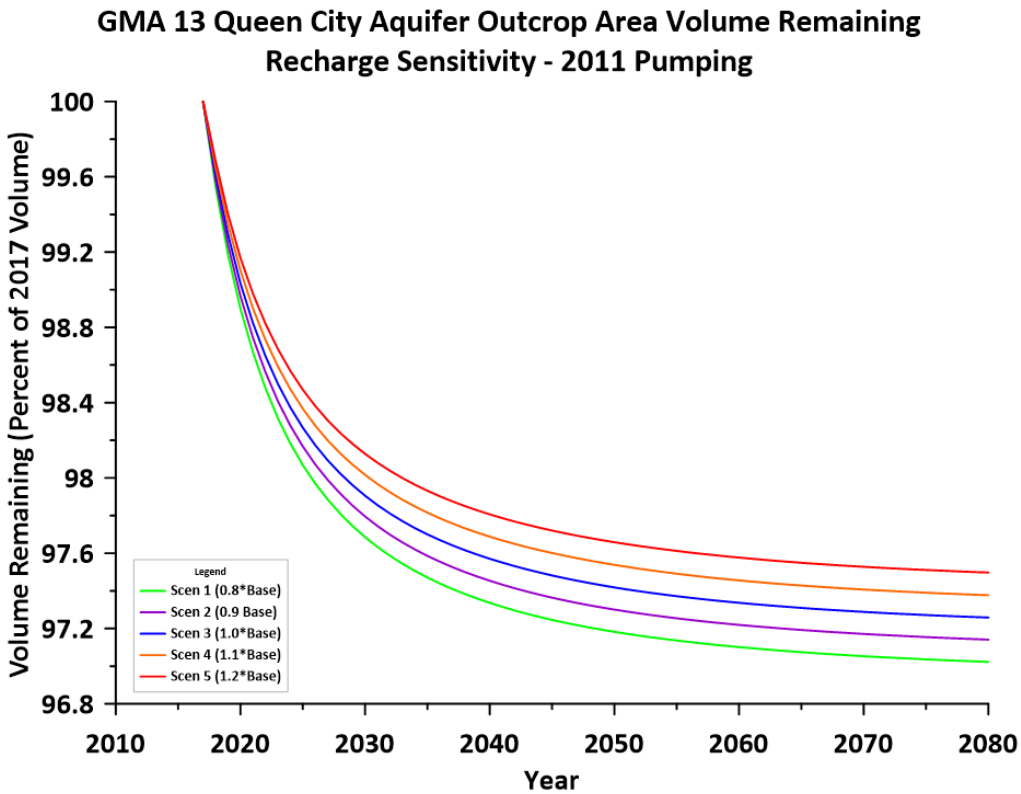

GMA 13 Total Area Drawdown
Recharge Sensitivity - 2017 Pumping
Drawdown from 2017 (ft)
Year
Legend
Calibrated Model
Scen 1 (0.8*Base)
Scen 2 (0.9*Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

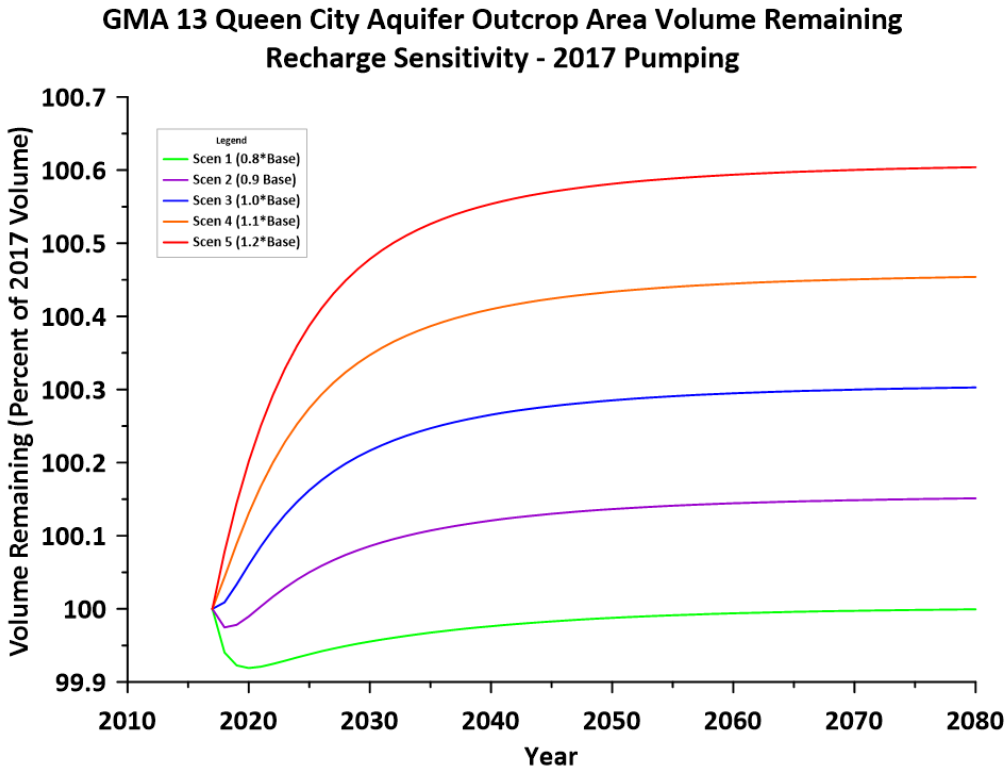
Appendix C

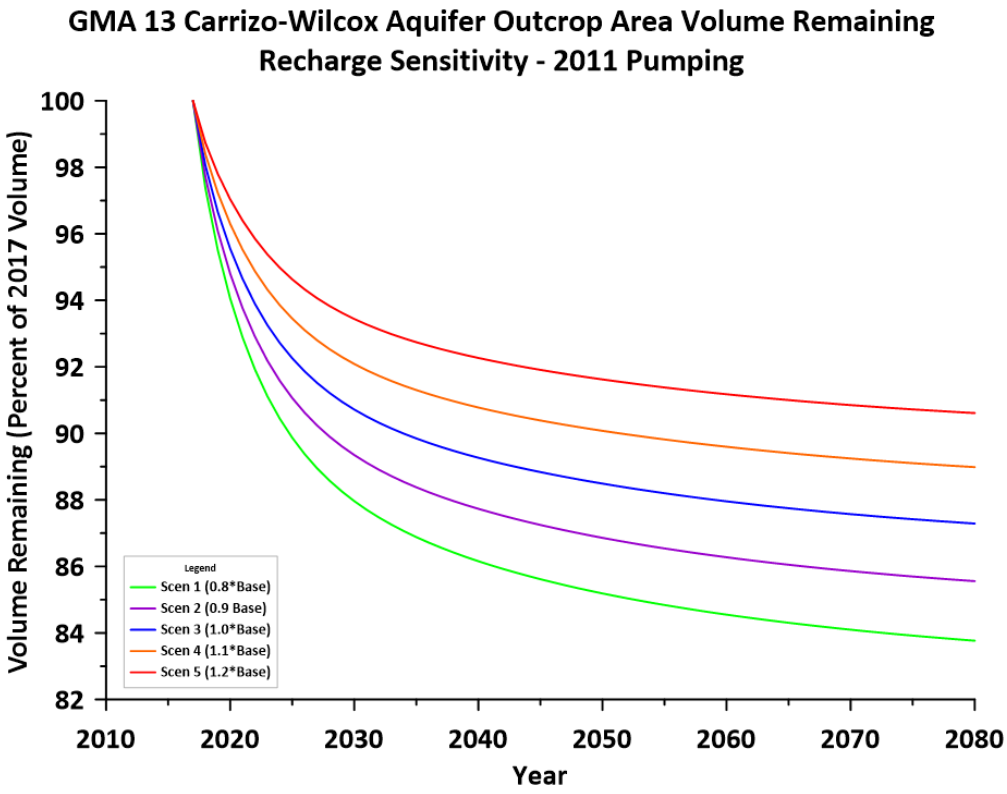
Outcrop Volume Remaining Hydrographs

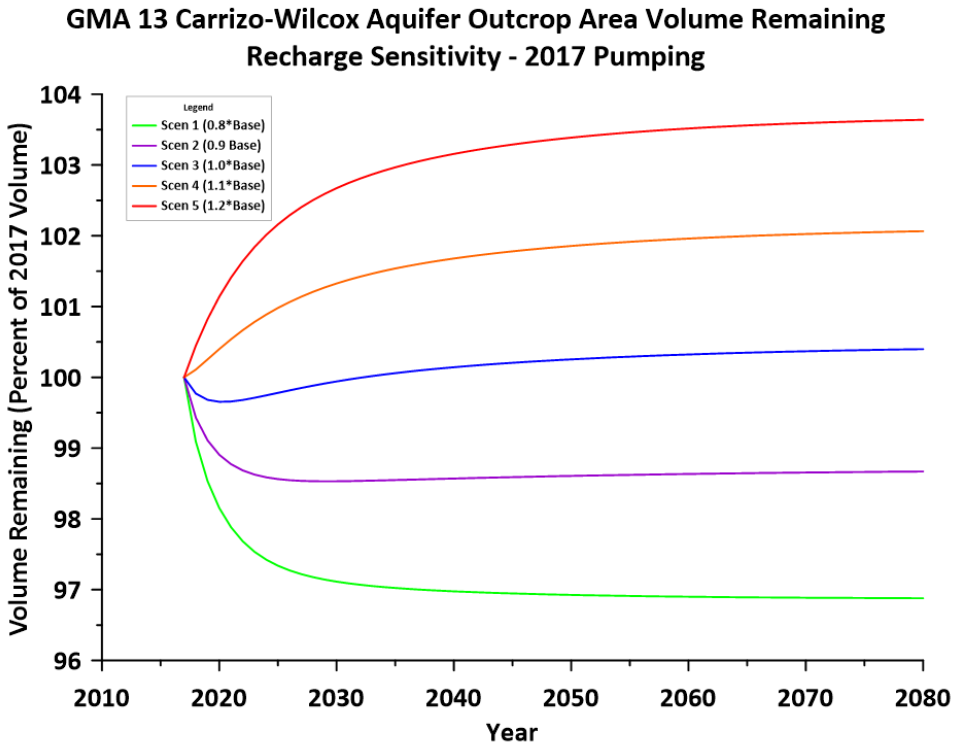

GMA 13 Sparta Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2011 Pumping
Volume Remaining (Percent of 2017 Volume)
101
100
99
98
97
96
95
94
93
92
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

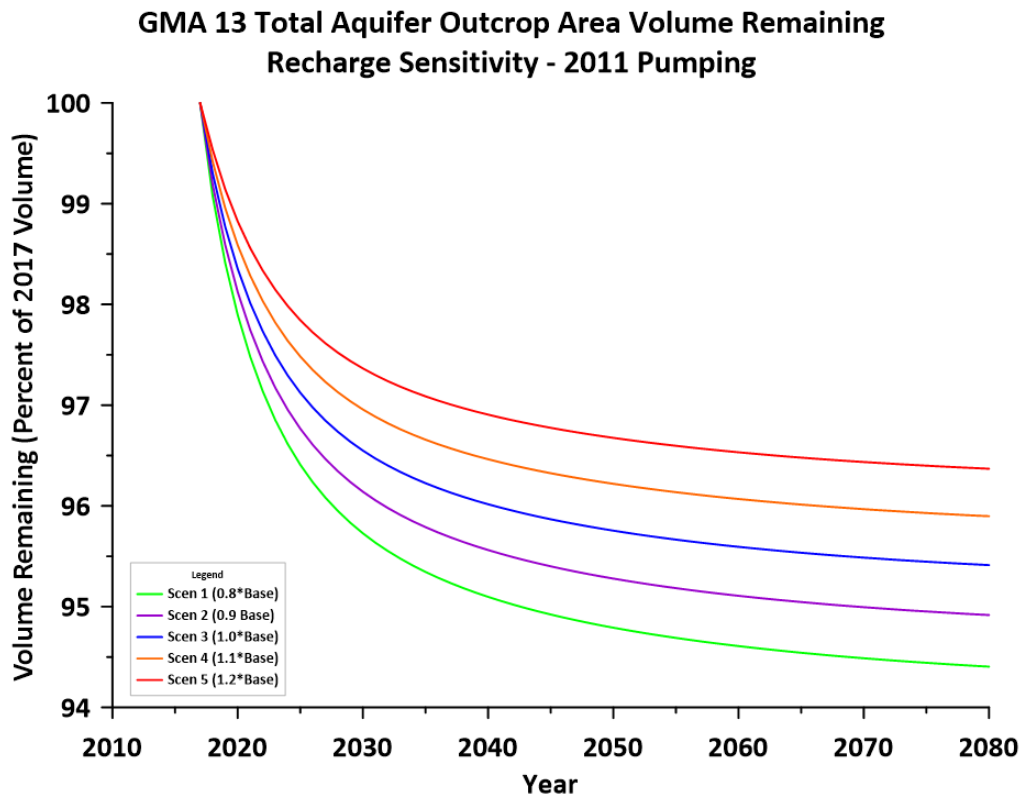

GMA 13 Sparta Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2017 Pumping
Volume Remaining (Percent of 2017 Volume)
103
102
101
100
99
98
97
96
95
94
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

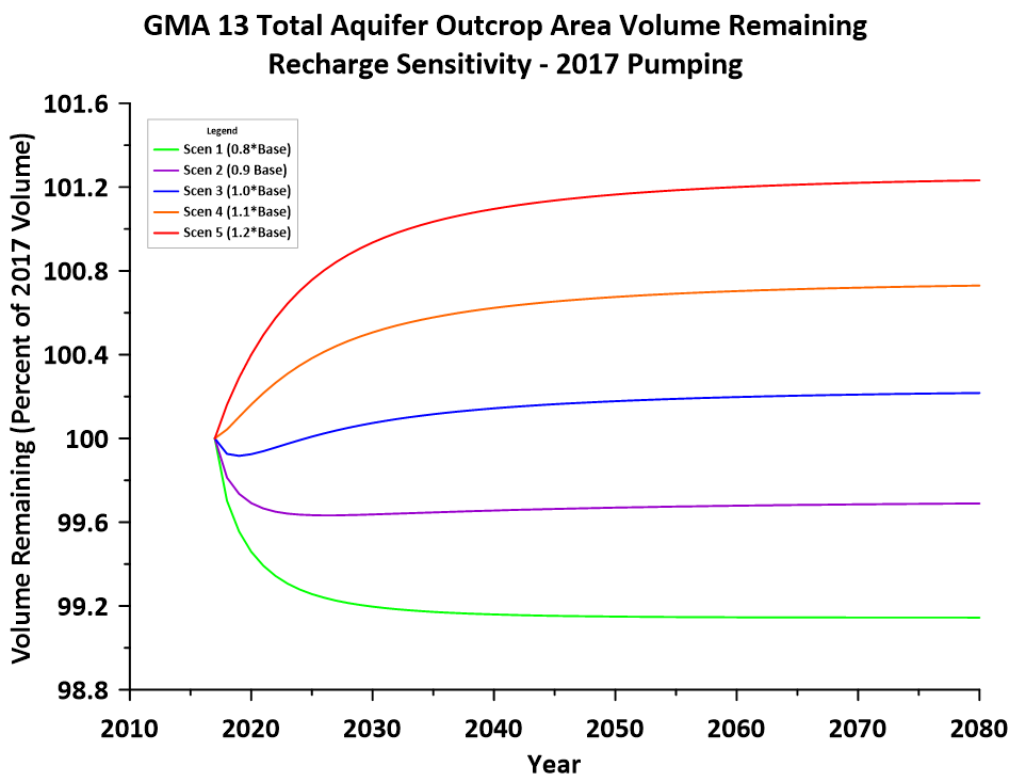

GMA 13 Queen City Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2011 Pumping
Volume Remaining (Percent of 2017 Volume)
100
99.6
99.2
98.8
98.4
98
97.6
97.2
96.8
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Queen City Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2017 Pumping
Volume Remaining (Percent of 2017 Volume)
100.7
100.6
100.5
100.4
100.3
100.2
100.1
100
99.9
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Carrizo-Wilcox Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2011 Pumping
Volume Remaining (Percent of 2017 Volume)
100
98
96
94
92
90
88
86
84
82
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Carrizo-Wilcox Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2017 Pumping
Volume Remaining (Percent of 2017 Volume)
104
103
102
101
100
99
98
97
96
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Total Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2011 Pumping
Volume Remaining (Percent of 2017 Volume)
100
99
98
97
96
95
94
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)


GMA 13 Total Aquifer Outcrop Area Volume Remaining
Recharge Sensitivity - 2017 Pumping
Volume Remaining (Percent of 2017 Volume)
101.6
101.2
100.8
100.4
100
99.6
99.2
98.8
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Scen 1 (0.8*Base)
Scen 2 (0.9 Base)
Scen 3 (1.0*Base)
Scen 4 (1.1*Base)
Scen 5 (1.2*Base)

Technical Memorandum 4

Calculation of Drawdown from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model

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January 31, 2023

Professional Engineer and Professional Geoscientist Seals

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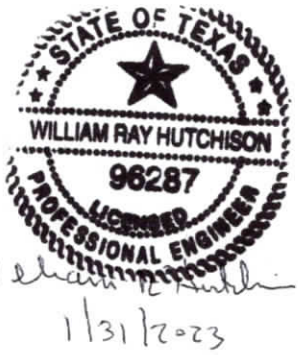

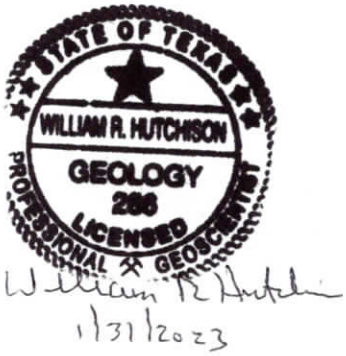

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Appendices

A – Modeled Available Groundwater for the Sparta, Queen City, and Carrizo-Wilcox Aquifers by County
B – Comparison of County-Aquifer Pumping Estimates: 2020 and 2080, MAG Report (Wade, 2022), Spreadsheet Calculations, WEL File Pre-Processor
C – Grid Cell Count and Acreage by County and Aquifer
D – Output Pumping Comparisons (MAG, Scen2020, and Scen2080) with Current MAG

1.0 Executive Summary

This technical memorandum summarizes the calculation of average drawdown from existing modeled available groundwater (MAG) using the updated groundwater availability model. The existing MAG for GMA 13 was developed using a "project-centric" approach rather than an approach that emphasized aquifer availability. Consequently, pumping in some counties increase during the simulation period (2011 to 2080). Also, some pumping decreased during the simulation period. These pumping decreases may have been specified in response to a limitation of the old GAM (i.e. persistently declining groundwater elevations even with pumping reductions).

The simulations with the new GAM consisted of two pumping endmembers: one where input pumping was specified at the 2020 MAG amounts (Scen2020), and one where input pumping was specified at the 2080 MAG amounts (Scen2080). Both simulations were run for the period 2018 to 2080.

The results generally show:

- The new GAM provides consistent results in that pumping increases (as compared to 2017 pumping) result in drawdown and pumping decreases (as compared to 2017 pumping) result in groundwater elevation recoveries.
- The new GAM drawdowns are generally less than the old GAM.
- At some of the pumping locations, input pumping cannot be sustained due to declining groundwater elevations. However, once the pumping rates are initially reduced over a period of a few years, pumping for the last several decades of the simulation is sustainable.
- Specified pumping decreases (compared to 2017 pumping) in several counties result in groundwater elevation recoveries that may need to be evaluated by districts in GMA 13, depending on their management objectives.
- The simulation results demonstrate vertical connection in some areas (i.e. cross formational flow and drawdown impacts).
- The simulations results demonstrate the potential for drawdown impacts across county lines/district boundaries.

2.0 Background

One of the uses of the updated Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers documented in the main report will be to support the Joint Planning Process that leads to the adoption of desired future conditions by the groundwater conservation districts in Groundwater Management Area 13 and the calculation of the modeled available groundwater by TWDB. As part of the work associated with developing the updated Groundwater Availability Model, five technical memoranda appear in the Appendix of the report:

- Technical Memorandum 1: Pumping Comparisons
- Technical Memorandum 2: Pumping Sensitivity
- Technical Memorandum 3: Recharge Sensitivity
- Technical Memorandum 4: Calculation of Drawdown from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model
- Technical Memorandum 5: Calculation of Future Pumping from Existing Desired Future Conditions Using Updated Groundwater Availability Model

This technical memorandum summarizes the calculation of average drawdown from existing modeled available groundwater using the updated groundwater availability model.

3.0 Parameters and Assumptions

3.1 Modeled Available Groundwater

Wade (2022) reported the modeled available groundwater associated with the desired future conditions adopted by the groundwater conservation districts in Groundwater Management Area 13. Modeled Available Groundwater values for the Sparta, Queen City, and Carrizo-Wilcox aquifers by county and decade are presented in Appendix A (also saved in the Excel file named *GMA13MAGsbyCounty_2021.xlsx*). The modeled available groundwater values for all of Groundwater Management Area 13 (as reported in Wade, 2022) are graphically summarized as follows:

- Figure 1: Sparta Aquifer
- Figure 2: Queen City Aquifer
- Figure 3: Carrizo-Wilcox Aquifer

Please note that for the Sparta and Queen City aquifers, there is an initial decline from 2020 to 2030, then a smaller, but discernable decline from 2030 to 2080. In the Carrizo-Wilcox Aquifer, there is a drop in modeled available groundwater from 2020 to 2030, then an increase from 2030 to 2070, and finally a small drop from 2070 to 2080. The existing MAG for GMA 13 was developed using a "project-centric" approach rather than an approach that emphasized aquifer availability.

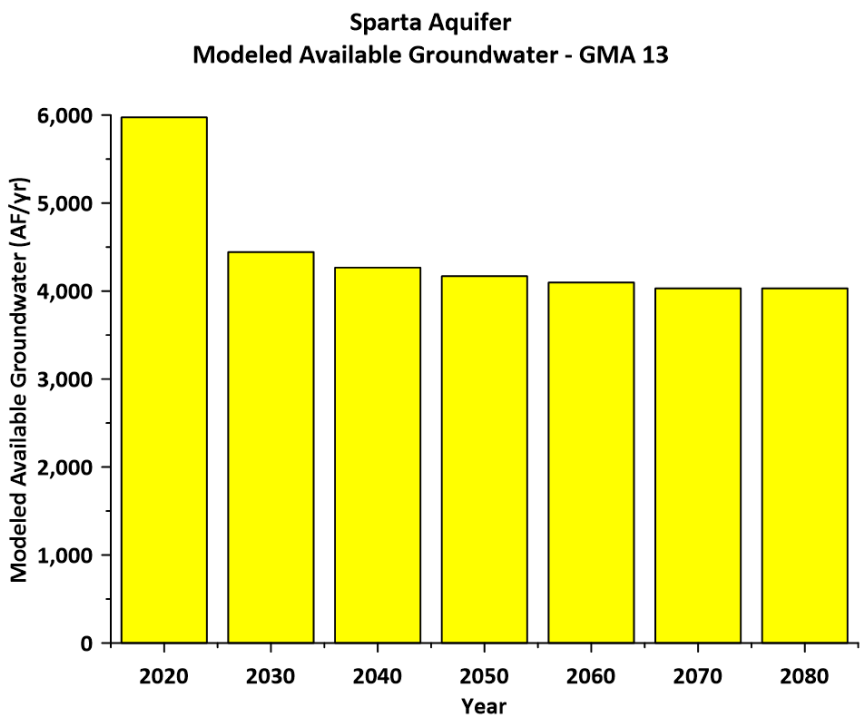


Figure 1. Sparta Aquifer Modeled Available Groundwater

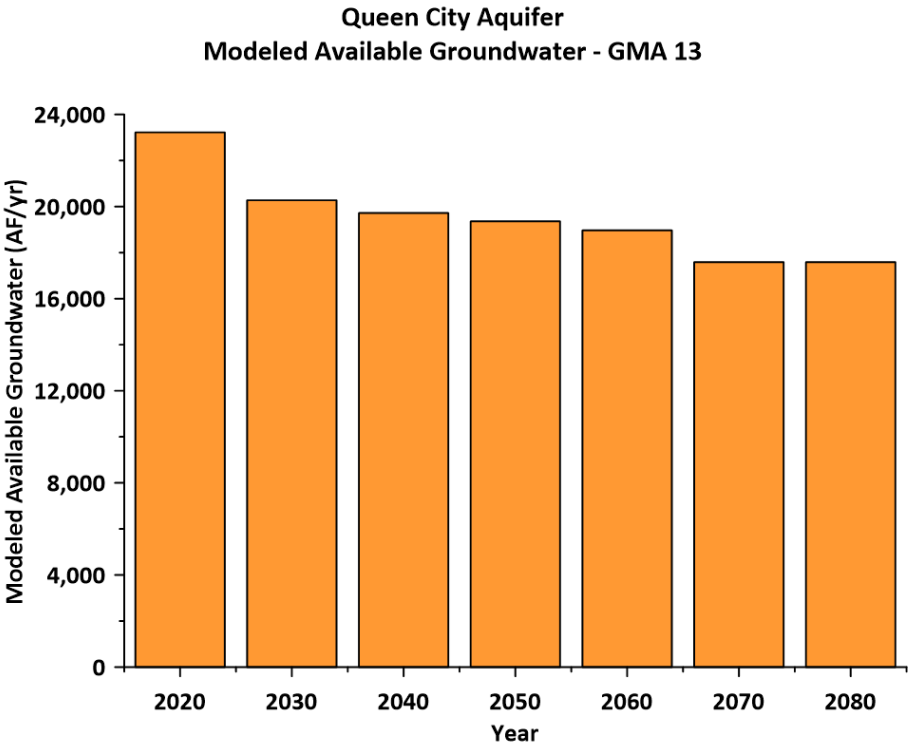


Figure 2. Queen City Aquifer Modeled Available Groundwater

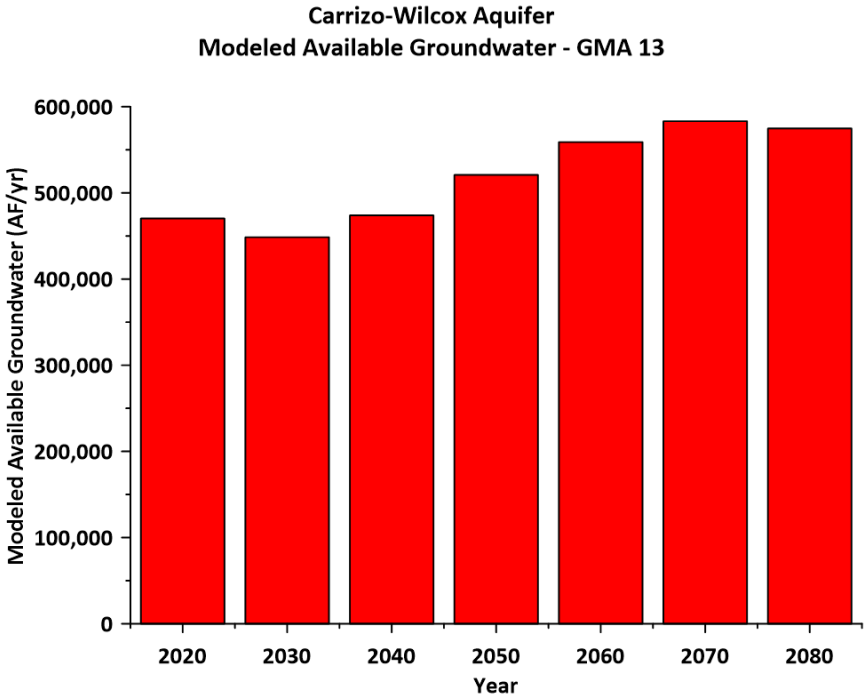


Figure 3. Carrizo-Wilcox Aquifer Modeled Available Groundwater

3.2 Analysis of WEL Cell Pumping Changes in MAG Run

The objective of the analyses contained in this Technical Memorandum is to calculate the average drawdowns using the existing modeled available groundwater values with the new Groundwater Availability Model. The model files used by Wade (2022) for the modeled available groundwater calculations were used to characterize various changes made in the assumptions of pumping after 2018.

Total model pumping from the files used by Wade (2022) is summarized in Figure 4. Please note that there is a significant increase in pumping in 2019. Thus, for the purposes of this analysis, the pumping in 2018 represents "historic" pumping and pumping from 2019 to 2080 represents "future" pumping. Analyses were completed that compared 2018 pumping with 2020 pumping and compared 2018 pumping with 2080 pumping to better develop a procedure to simulate "future" pumping with the new Groundwater Availability Model.

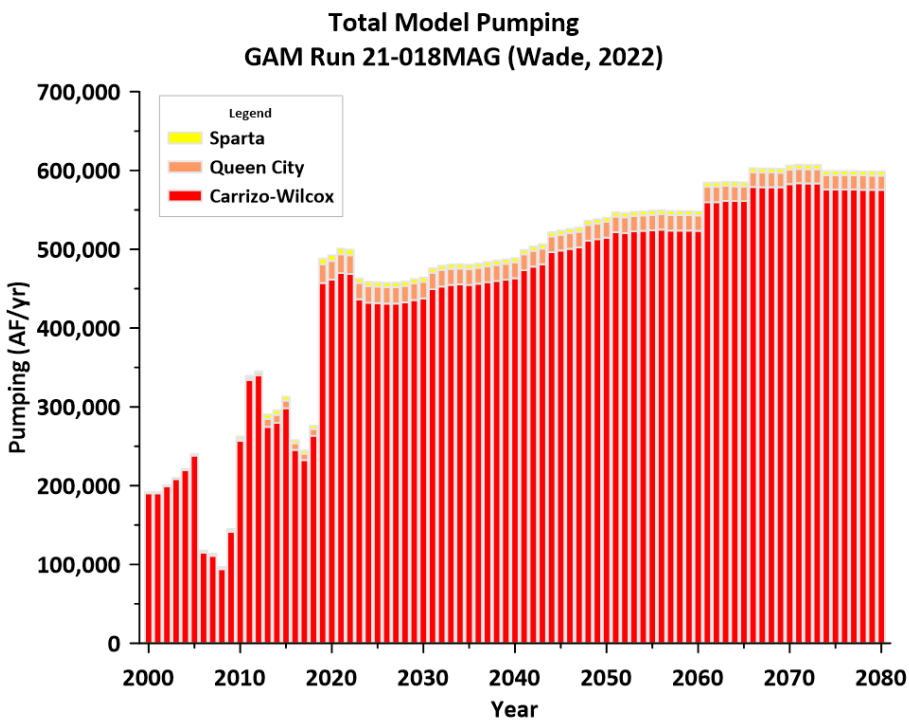


Figure 4. Total Model Pumping: 2000 to 2080

3.2.1 Pumping in 2018, 2020, and 2080

For the purposes of this analysis, the pumping output from the model run (i.e. derived from the *cbb* file) was extracted for the years 2018 (the last year before general increases above the historic pumping were observed), 2020 (the first year of the modeled available groundwater report), and 2080 (the final year of the modeled available groundwater report). The FORTRAN program named *PumpList.exe* was written to extract the individual years cell-by-cell pumping. The output

file was named *pumpcompare201820202080.dat*, and included the layer, row, column, and county of each cell with pumping in 2018, 2020, and 2080.

The FORTRAN program named *PumpCellNewGrid.exe* was written to add the x- and y-coordinates of each of the cells. The output file was named *PumpList.dat*.

Finally, the FORTRAN program named *PumpNewGrid.exe* was written to assign the model cell number from the new Groundwater Availability Model. This was accomplished by finding the new GAM cell that was closest to the center of the old GAM cell and assigning the appropriate layer in the new GAM. Output was named *pumplistnewgrid.dat*.

3.2.2 Characterizing 2020 and 2080 Pumping in Comparison to 2018 Pumping

The output file *pumplistnewgrid.dat* from the final step above was imported to an Excel file named *MAG Analysis.xlsx* in the tab named *All*. Through various sorting routines, the other tabs in *MAG Analysis.xlsx* contain the following sets of WEL cells:

- *New Locations* (cells with no pumping 2018 that have pumping specified in either 2020 or 2080)
- *Old Locations All* (cells with pumping in 2018 and pumping in either 2020 or 2080)
- *Old Loc 2020 zero* (cells with pumping in 2018, but no pumping in 2020)
- *Old Loc 2020 Reduc* (cells with pumping in 2020 that is lower than 2018 pumping)
- *Old Loc 2020 Same* (cells with pumping in 2020 that is the same as 2018 pumping)
- *Old Loc 2020 Inc* (cells with pumping in 2020 that is higher than 2018 pumping)
- *Old Loc 2080 zero* (cells with pumping in 2018, but no pumping in 2080)
- *Old Loc 2080 Reduc* (cells with pumping in 2080 that is lower than 2018 pumping)
- *Old Loc 2080 Same* (cells with pumping in 2080 that is the same as 2018 pumping)
- *Old Loc 2080 Inc* (cells with pumping in 2080 that is higher than 2018 pumping)

The following bar charts summarize the data associated with the 2020 and 2080 pumping as compared with 2018 pumping:

- Summary of New Locations, Zero Pumping, Pumping Reductions, Same Pumping, Pumping Increases:
    - Figure 5 (2020)
    - Figure 6 (2080)
- Summary of Distribution of Pumping Reductions
    - Figure 7 (2020 compared to 2018)
    - Figure 8 (2080 compared to 2018)
- Summary of Distribution of Pumping Increases
    - Figure 9 (2020 compared to 2018)
    - Figure 10 (2080 compared to 2018)

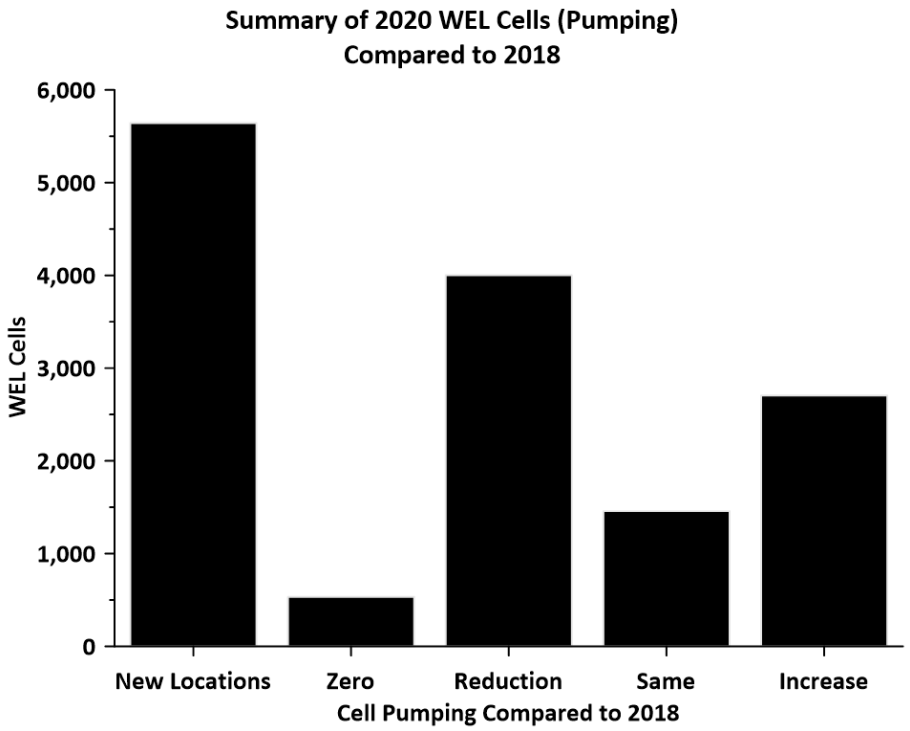


Figure 5. Characterization of WEL Cells in 2020 Compared to 2018

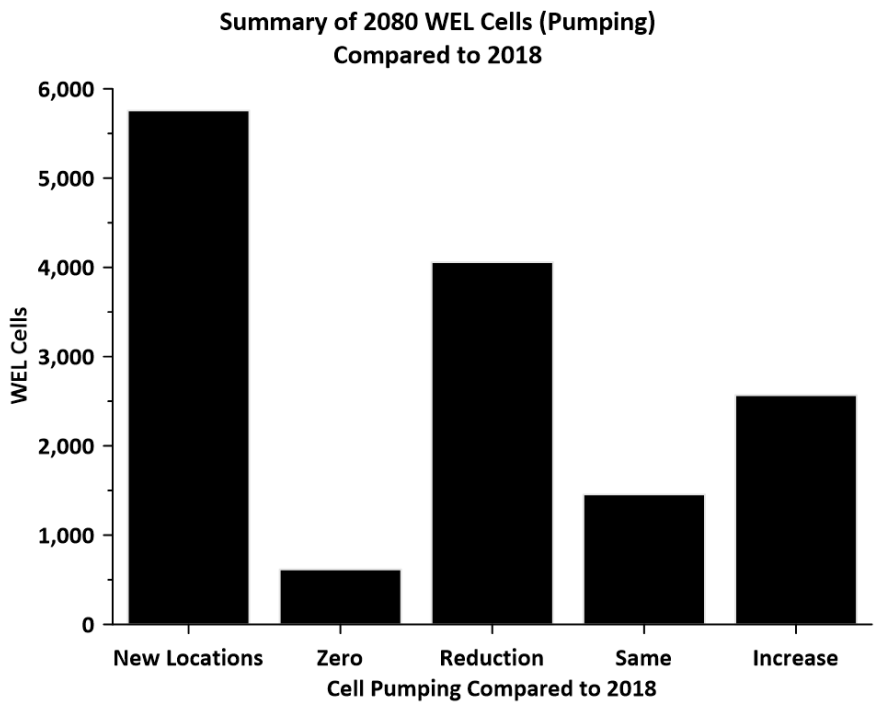


Figure 6. Characterization of WEL Cells in 2080 Compared to 2018

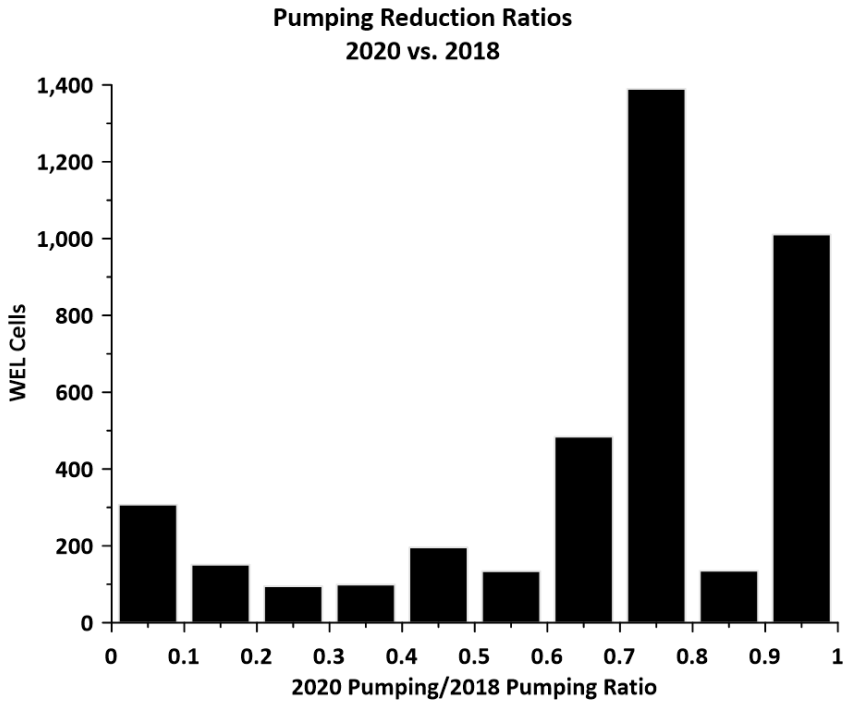


Figure 7. Pumping Reduction Ratios: 2020 vs. 2018

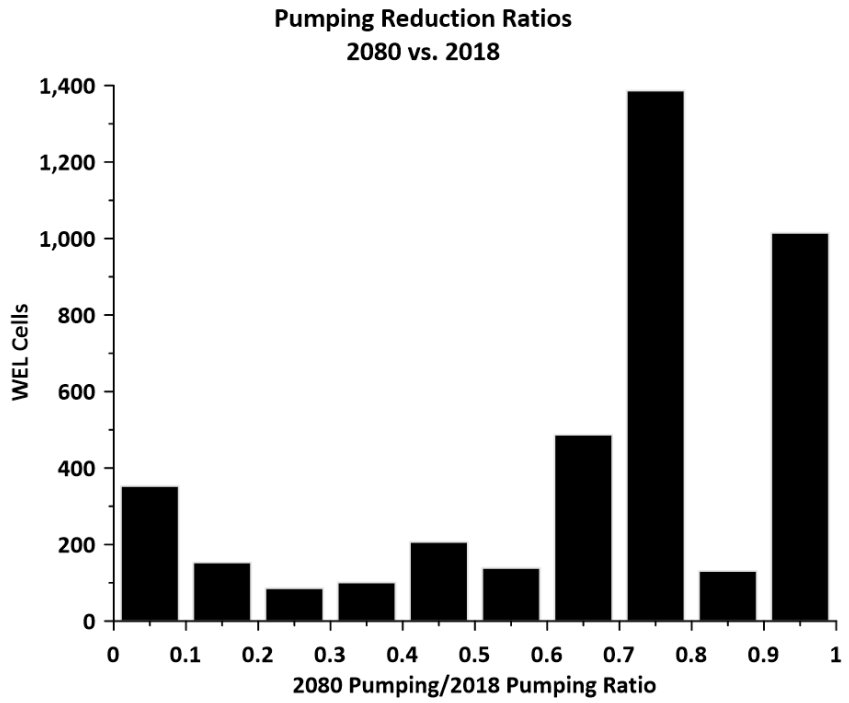


Figure 8. Pumping Reduction Ratios: 2080 vs. 2018

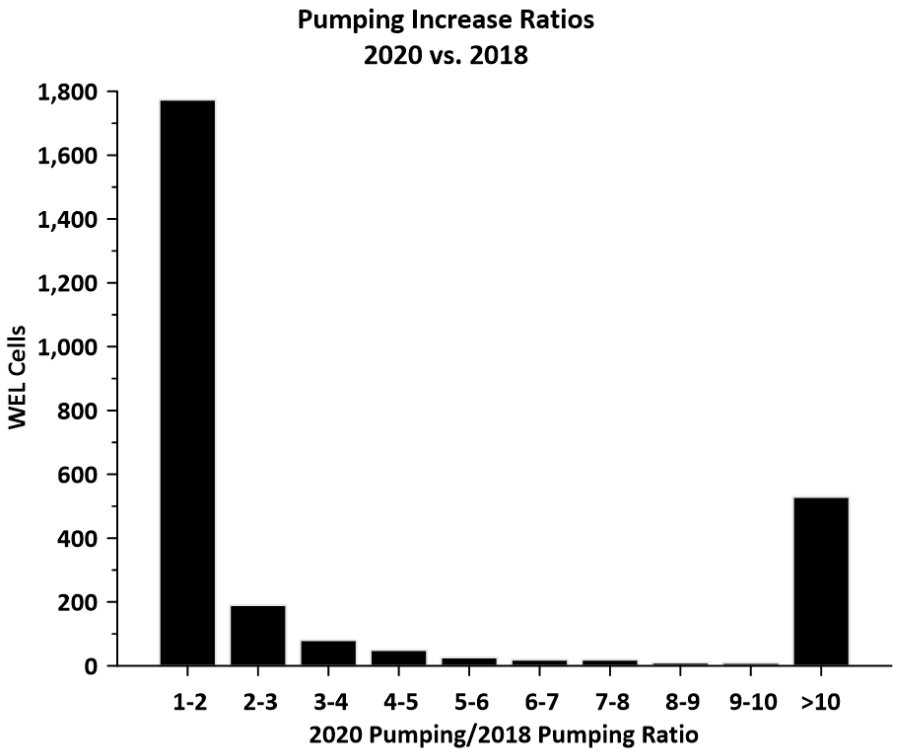


Figure 9. Pumping Increase Ratios: 2020 vs. 2018

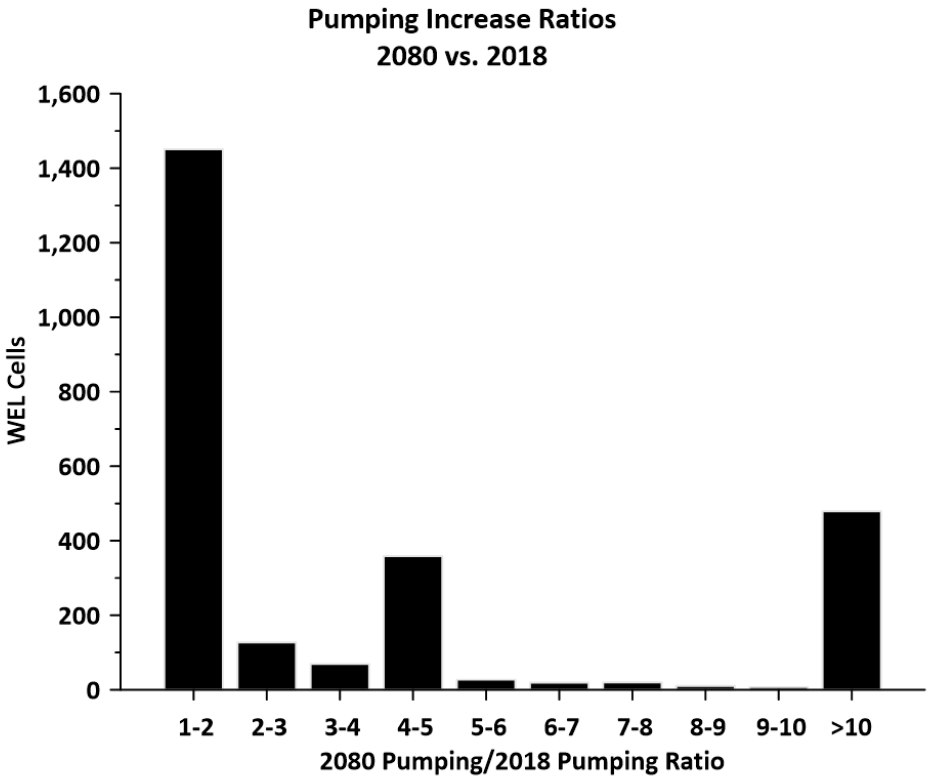


Figure 10. Pumping Increase Ratios: 2080 vs. 2018

3.3 New GAM 2017 Pumping

The new Groundwater Availability Model is calibrated through 2017, so the pumping in 2017 is the logical starting point to apply increases (or decreases) for future scenarios at existing pumping locations.

The output file named *2017pumpout.dat* from the analysis presented in Technical Memorandum 2 was used as input to a FORTRAN program named *Pump2017.exe* to summarize pumping on a county-model layer basis. Output from this program is named *Pump2017sum.dat*.

3.4 Applying Pumping from MAG Run to New GAM

As documented above, the old location pumping in 2020 and 2080 in the MAG run (using the existing GAM) has a significant number of cells that are increased, decreased, unchanged, and set to zero as compared to 2018. Coupled with the change in grid, strict adherence to every cell-by-cell change in the pumping file of the ”future” portion of the MAG simulation, many of which are undocumented, presents difficulties.

3.4.1 Old Locations

For purposes of this analysis, it was assumed that the 2017 pumping in the new GAM could be adjusted on a county-model layer basis to match pumping at the old locations on a county-model layer basis in the existing GAM used to complete the MAG simulation. To fully test the concept, the procedure was applied to MAG pumping in 2020 and 2080.

As documented above, the spreadsheet named *MAG Analysis.xlsx* included a tab named *Old Locations All* that included MAG simulation pumping in 2020 and 2080 for 8,698 cells. This tab was extracted and saved as *MAGoldloc.csv*, which was the input to a FORTRAN program named *OldLocations.exe*. The two output files from this program are named *pump2020old.dat* and *pump2080old.dat*.

County-model layer pumping for 2017 from the new GAM, and the county-model layer 2020 and 2080 pumping from the MAG run using the existing GAM were imported as individual tabs in the Excel file *Fac2020and2080.xlsx*. Factors were calculated and are presented in the *pump2020old* and *pump2080old* tabs to the right of the pumping data. These represent the multiplication factors to adjust (on a county-model layer basis) the 2017 pumping of the new GAM to match “old location” pumping in the MAG run.

Please note that the pumping is calculated for all counties, even those outside of GMA 13. Also, since the old GAM did not include any pumping from Mexico and the new GAM did include some assumed pumping from Mexico, the Mexican pumping from the new GAM is included.

3.4.2 New Locations

As documented above, the spreadsheet named *MAG Analysis.xlsx* included a tab named *New Locations* that included MAG simulation pumping in 2020 and 2080 for 5,766 cells at locations where pumping was zero in 2018. This tab was extracted and saved as *MAGnewloc.csv*, which was the input to a FORTRAN program named *NewLocations.exe*. The two output files from this program are named *pump2020new.dat* and *pump2080new.dat*.

The new location pumping output files were added to the Excel file *Fac2020and2080.xlsx* described above in the old locations section as tabs named *pump2020new* and *pump2080new*.

3.4.3 Combined Old Location and New Location Pumping

The tabs named *PumpScen2020* and *PumpScen2080* represent the county-model layer and county-aquifer pumping totals for the scenarios based on 2020 MAG pumping and 2080 MAG pumping using the new GAM.

To the right of the county-model layer pumping calculations are county-aquifer pumping sums. Layer 3 is the Sparta Aquifer, Layer 4 is the Queen City Aquifer, and the Carrizo-Wilcox Aquifer pumping is the sum of pumping in Layers 7, 8, and 9.

The tab named *Compare with MAG Report* uses the county-aquifer values in the *PumpScen2020* and *PumpScen2080* tabs and the MAG report values described earlier and presented in Appendix A. This tab is presented as Table 1.

Minor differences between the MAG values and the results of this analysis can be seen in Table 1, but overall, the calculations using the old and new location approach described above reasonably represents the MAG report pumping of Wade (2022).

Table 1. Comparison of County-Aquifer Calculated Pumping with MAG Report

County	Aquifer	2020 Pumping (AF/yr)		2080 Pumping (AF/yr)	
		MAG Report	This Analysis	MAG Report	This Analysis
Atascosa	Sparta	1,218	1,219	932	935
Frio	Sparta	897	931	534	556
Gonzales	Sparta	3,524	3,552	2,451	2,488
La Salle	Sparta	0	986	0	986
McMullen	Sparta	0	0	0	0
Wilson	Sparta	335	462	114	156
Atascosa	Queen City	4,070	4,072	4,285	4,299
Caldwell	Queen City	4,842	5,113	3,977	4,261
Frio	Queen City	6,702	6,755	3,927	3,971
Gonzales	Queen City	4,973	5,063	4,500	4,604
Guadalupe	Queen City	0	0	0	0
LaSalle	Queen City	1	12	1	12
McMullen	Queen City	3	0	3	0
Wilson	Queen City	2,631	2,778	892	944
Atascosa	Carrizo-Wilcox	51,924	51,780	59,982	59,982
Bexar	Carrizo-Wilcox	69,727	69,537	67,849	67,849
Caldwell	Carrizo-Wilcox	18,180	18,169	49,594	49,633
Dimmit	Carrizo-Wilcox	3,895	4,125	3,885	4,125
Frio	Carrizo-Wilcox	114,827	114,009	79,131	78,784
Gonzales	Carrizo-Wilcox	60,431	57,069	96,161	96,562
Guadalupe	Carrizo-Wilcox	55,637	50,352	41,659	40,519
Karnes	Carrizo-Wilcox	693	708	1,043	1,061
La Salle	Carrizo-Wilcox	6,554	6,536	6,536	6,536
Maverick	Carrizo-Wilcox	547	545	276	276
McMullen	Carrizo-Wilcox	7,789	7,768	4,854	4,854
Medina	Carrizo-Wilcox	2,635	2,658	2,628	2,647
Uvalde	Carrizo-Wilcox	0	0	0	0
Webb	Carrizo-Wilcox	912	909	910	909
Wilson	Carrizo-Wilcox	38,229	38,119	125,670	126,361
Zavala	Carrizo-Wilcox	38,303	38,440	34,540	34,634

3.5 Scenario Pumping

The FORTRAN program *scenpump.exe* was written to create two WEL files: one based on the 2020 MAG values, and one based on the 2080 MAG values. The program:

- Reads the list of county codes and names
- Reads the pumping factors (by county-model layer) for old locations from *pumpfac2020.csv* and *pumpfac2080.csv*
- Reads the old location cells and pumping, calculates 2020 and 2080 pumping based on the county-model layer factors and increments the appropriate pumping arrays
- Readds the new location cells and pumping for 2020 and 2080, and increments the appropriate pumping arrays
- Converts pumping in AF/yr to ft^3/day (for model input)

- Fills the county-model layer summary arrays with pumping (in AF/yr)
- Writes county-model layer summary files
- Writes the lists for 2020 and 2080 pumping scenarios (cell and pumping in ft^3/day)

The actual WEL files were then created by hand by adding the appropriate headers (*scen2020.wel* and *scen2080.wel*).

The summary files with scenario pumping (2020 and 2080) by county-model layer were imported into *FAC2020and2080.xlsx* Excel file under the tabs named *WEL input 2020* and *WEL input 2080*. An additional comparison tab (*Compare with MAG and WEL*) was also created to compare the WEL input values with the MAG Report values and spreadsheet calculation values (previously presented as Table 1). The full comparison table is presented in Appendix B.

3.6 Other Model Files

The directory on the share site named *BaseFiles* contains all model files for the simulations other than the simulated pumping files described earlier

3.6.1 Files Unchanged from Calibrated Model

Table 2 presents the model files that were unchanged from the calibration run of the model.

Table 2. Model Files Unchanged from Calibrated Model

File Name	File Date	Description
GMA13_Historical_Period_Calibration._kx	5/10/2022	Horizontal hydraulic conductivity
GMA13_Historical_Period_Calibration._kz	5/10/2022	Vertical hydraulic conductivity
GMA13_Historical_Period_Calibration._ss	5/10/2022	Specific storage
GMA13_Historical_Period_Calibration._sy	5/10/2022	Specific yield
GMA13_Historical_Period_Calibration.dis	5/10/2022	Discretization
GMA13_Historical_Period_Calibration.hfb	5/10/2022	Horizontal fflow barrier
GMA13_Historical_Period_Calibration.ims	5/10/2022	Solver
GMA13_Historical_Period_Calibration.npf	5/10/2022	Node property flow

3.6.2 Files Modified from the Calibrated Model

Table 3 presents the model files that were modified from the calibration run of the model in order to run the predictive simulations. The pumping files were discussed earlier.

Table 3. Model Files Modified from the Calibrated Model

File Name	File Date	Description
calsp39hds.dat	5/27/2022	Starting heads
mfsim.nam	5/27/2022	Simulation name file
pred.evt	5/25/2022	Evapotranspiration
pred.ghb	5/25/2022	General head boundary
pred.ic6	5/27/2022	Initial condition file
pred.oc6	5/26/2022	Output control
pred.riv	5/25/2022	River
pred.sto	5/25/2022	Storage
pred.tdis	5/25/2022	Time discretization
predbase.nam	5/26/2022	GWF Model name file

The modifications were generally associated with using the final stress period from the calibrated model and holding all parameters constant for the sensitivity simulation, which was run from 2018 to 2080 (63 stress periods). Modifications also included updating the file names for the simulations.

Please note that no recharge file is listed above. It was not part of the general group of modified files and not included in this directory. The recharge file for both scenarios was the average annual recharge as defined in the steady state version of the calibration model (*scen3.rch*) as documented in Technical Memorandum 3.

3.7 Average Drawdown Calculation

3.7.1 Grid Counts and Acreage

Model output includes groundwater elevation results for each model cell. Drawdown can be calculated by subtracting the groundwater elevation in a specific cell over two different time periods. Average drawdown can be calculated by averaging the drawdown results in multiple cells. Typical average drawdown calculations involve county-aquifer units or GMA-aquifer units.

The old GAM had a regular grid where all cells were 640 acres, or one square mile. Averaging drawdowns with the old GAM was a relatively simple calculation of summing all drawdown results over a defined area and dividing the sum by the number of cells.

The new GAM has a variable grid that is refined near streams, and the cell sizes range from 10 acres to 640 acres. Thus, averaging drawdown must be weighted by the cell size. Appendix C contains summary tables of cell counts, areas, and average cell size for each county-aquifer unit for outcrop, downdip and total areas. Appendix C also presents bar graphs of the average cell size for each county-aquifer unit. Data for these tables and graphs was developed using a FORTRAN code that read the grid file of the new GAM. All data associated with the tables and graphs in Appendix C are contained in the directory named *GridFile* on the share site.

3.7.2 Average Drawdown Calculations

Average drawdown calculations were performed using a FORTRAN post-processor named *PredDD.exe*. The post-processor reads the simulation output file and the files with acreage totals for each unit (county-aquifer and GMA13-aquifer). Drawdowns for each cell are calculated based on a starting point of 2017 (the last stress period of the calibration period). The cell drawdown values are then multiplied by the cell acreage (drawdown-acreage product). The sum of all drawdown-acreage products for a particular unit (county-aquifer or GMA13-aquifer) are then divided by the total acreage of that unit to obtain and average drawdown.

4.0 Methods and Results

As noted above, two predictive simulations were completed to test the capabilities of the new GAM in the context of evaluating alternative desired future conditions:

- Scen2020 used the 2020 MAG values as the input for all stress periods
- Scen2080 used the 2080 MAG values as the input for all stress periods

Model input and output files for these simulations are contained in the directories named *Pump2020Scen* and *Pump2080Scen*.

4.1 Simulation Pumping

The development of the input data sets for pumping were previously described. Output from the simulations included actual pumping after reductions were applied on a cell-by-cell basis for each stress period to reflect declining groundwater levels that are not consistent with maintaining the "requested" level of pumping.

Table 4 presents a summary by GMA 13 county of the calibrated maximum pumping from 1980 to 2017, the year in which the maximum pumping occurred, the calibrated model pumping in 2017 (to provide context for how it changed in the predictive simulations), the simulated output pumping for 2020 (for both Scen2020 and Scen2080), and the simulated output pumping for 2080 (for both Scen2020 and Scen2080).

Table 4. Summary of Output Pumping

County	1980 to 2017 Maximum Pumping (AF/yr)	Year of Maximum Pumping	Calibrated Model Pumping (2017)	Simulated 2020 Pumping (AF/yr)		Simulated 2080 Pumping (AF/yr)	
				Scen2020	Scen2080	Scen2020	Scen2080
Atascosa	103,705	2010	38,745	54,632	62,592	54,593	62,563
Bexar	24,971	2010	2,424	44,134	41,722	42,843	40,291
Caldwell	6,835	2010	4,303	19,874	52,479	19,612	51,872
Dimmit	11,650	2012	6,439	4,121	4,121	4,123	4,124
Frio	202,782	2010	94,084	116,658	80,328	116,861	80,561
Gonzales	39,627	2015	36,111	65,670	103,635	65,669	103,633
Guadalupe	10,374	2010	3,271	29,325	28,556	27,590	25,830
Karnes	1,865	1982	1,332	691	1,043	691	1,043
LaSalle	16,281	2009	7,861	7,534	7,534	7,534	7,534
Maverick	3,346	1992	45	531	268	531	269
McMullen	1,804	1998	289	7,767	4,853	7,767	4,853
Medina	15,080	1984	1,835	2,611	2,611	2,607	2,611
Uvalde	4,047	1980	7	0	0	0	0
Webb	2,408	2009	425	954	954	954	954
Wilson	32,674	2010	23,956	39,228	118,057	39,213	118,043
Zavala	93,305	2011	50,607	38,427	34,631	38,439	34,634
GMA 13	-	-	271,734	432,157	543,384	570,754	570,754

Figure 11 presents the total pumping in GMA 13 (Sparta, Queen City, and Carrizo-Wilcox aquifers) for the calibrated model, the two predictive scenarios (Scen2020 and Scen2080), and, for

comparison, the calibrated model period. Please note that while the intent was to set pumping at either 2020 levels of the MAG (Scen2020) or 2080 levels of the MAG (Scen2080), the model reduces the "requested" pumping to a level that is consistent with groundwater elevations that can sustain that amount of pumping. Appendix D presents similar hydrographs of individual counties in GMA 13.

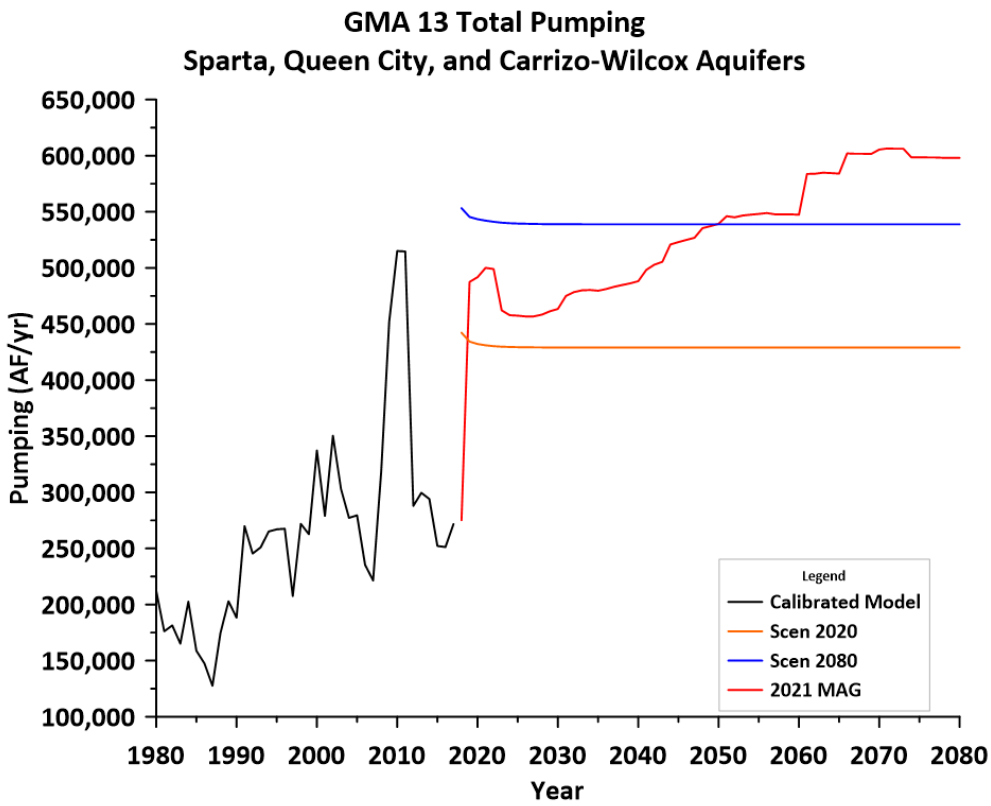


Figure 11. GMA 13 Total Pumping Comparison

The MAG simulation with the old GAM is characterized by a sharp increase in 2019, 2020, and 2021 (as compared with 2018 pumping) followed by a rapid decline after 2021 for the next 5 to 6 years.

Note after a few years for Scen2020 and Scen2080 pumping, the reductions are relatively small in the first few years of the simulations, and pumping is essentially sustainable for most of the simulations. However, more detailed examination of the results are needed to specifically identify the areas where pumping reductions were imposed.

The actual reductions are saved in output files named *Scen2020_wel_reduce.csv* and *Scen2080-wel_reduce.csv*. These files were subsequently processed to sum the total reductions for each stress period and saved as Excel files (*Scen2020_wel_reduce.xlsx* and *Scen2080_welreduce.xlsx*). These annual reductions from the input pumping (i.e. the WEL file) are presented in Figure 12.

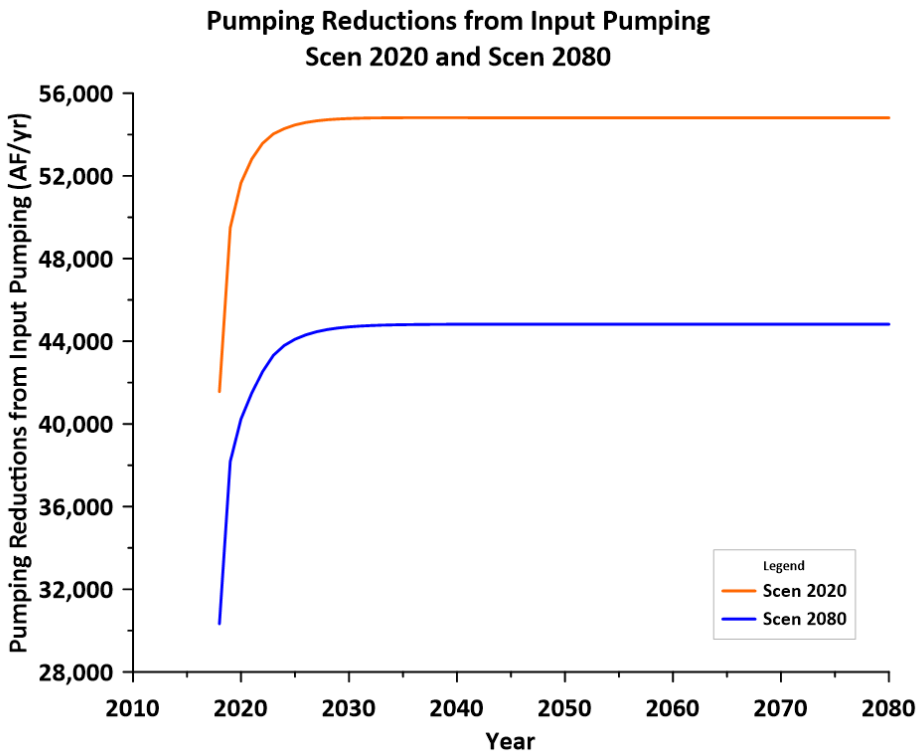


Figure 12. Pumping Reductions for Scen2020 and Scen2080

4.2 Average Drawdown

4.2.1 Desired Future Condition Average Drawdown

GMA 13 adopted a "secondary" DFC for the Sparta, Queen City, and Carrizo-Wilcox aquifers in GMA 13: average drawdown of 49 feet (+/- 5 feet) for all of GMA 13. The drawdown is calculated from the end of 2012 conditions through the year 2080. Furnans and Keester (2022, pp. 14-15) reported that the desired future condition is consistent with simulation "GMA13_2019_001" summarized during a meeting of Groundwater Management Area 13 members on March 19, 2021.

Documentation from Furnans (2022) inconsistently reported the starting date for drawdown calculations as 2000 and 2012, and only reported drawdowns through 2070. Furnans and Keester (2022) reported the drawdown calculations as 2012, and only reported drawdowns through 2070. Wade (2022) subsequently clarified that the intent was to use 2011 as the starting point for drawdown calculations but did not report the drawdown values for 2080 as part of her MAG report.

In order to have a consistent set of drawdown calculations through 2080 that used 2011 as a starting point to compare with the drawdown calculations of the predictive simulations, the FORTRAN program *getdd.exe* was written to calculate average drawdowns for county-model layer and county-aquifer units through 2080 using the output from Furnans (2022) and Furnans and Keester

(2022) designated as "GMA13_2019_001". A summary of 2011 to 2080 average drawdown is presented in Table 5, which provides some additional information (i.e. average drawdowns for each county-aquifer unit) that can be useful to evaluate the predictive drawdowns from the new GAM with similar pumping assumptions.

Table 5. Summary of Average Drawdown in feet (2011 to 2080) for DFC Simulations

County	Sparta	Queen City	Carrizo-Wilcox	Overall Aquifer	Overall*
Atascosa	15.28	24.11	131.87	104.63	94.93
Bexar	-	0.00	109.04	109.04	107.92
Caldwell	-	91.79	52.82	53.59	51.55
Dimmit	-	-	-4.63	-4.63	-4.60
Frio	5.37	-1.97	56.00	46.89	43.51
Gonzales	21.29	26.57	169.56	144.34	127.35
Guadalupe	0.00	**	143.92	143.72	139.24
Karnes	0.00	0.00	202.53	202.53	185.58
LaSalle	2.40	17.90	16.24	16.11	17.43
Maverick	-	-	-12.36	-12.36	-12.16
McMullen	26.24	39.64	46.11	45.34	48.00
Medina	-	-	30.75	30.75	30.68
Uvalde	-	-	15.79	15.79	15.79
Webb	-	-	-4.28	-4.28	-4.90
Wilson	11.58	19.89	241.79	204.79	178.64
Zavala	-	-	13.45	13.45	10.23
GMA13	14.38	19.41	62.29	58.54	53.57

* Overall includes Weches and Reklaw aquitards

** Queen City in Guadalupe County is only one cell in new GAM, calculations ignored

The overall average drawdown estimate that includes the two aquitard units is consistent with the documentation provided in Wade (2022). Please note that the overall average drawdown for GMA 13 from this calculation is about 54 feet, which is consistent with the "secondary" DFC of 49 feet (+/- 5 feet) as adopted by GMA 13.

4.2.2 Predictive Scenario Average Drawdown

Average drawdown from 2017 to 2080 for the county-aquifer units in GMA 13 are presented below as:

- Table 6 and Figure 13: Scen2020 (input pumping set equal to 2020 MAG pumping, as described above)
- Table 7 and Figure 14: Scen2080 (input pumping set equal to 2080 MAG pumping, as described above)

Please note that these summaries include breakdowns for the outcrop area, downdip area, and overall area of each GMA 13 county.

Table 6. Average Drawdowns (2017 to 2080) for: Scen2020

County	Outcrop Area Drawdown (ft)			Downdip Area Drawdown (ft)			Overall Drawdown (ft)		
	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
Atascosa	23.63	16.39	11.69	1.96	13.93	30.80	3.36	14.37	30.10
Bexar	-	-	20.58	-	-	43.99	-	-	28.00
Caldwell	-	10.23	19.53	-	-	24.06	-	10.23	21.93
Dimmit	0.96	0.29	-6.10	-	0.11	-30.25	0.96	0.26	-28.56
Frio	3.94	13.17	-1.02	1.41	3.93	20.29	2.78	8.10	20.15
Gonzales	6.04	4.04	31.96	0.44	3.73	37.83	0.79	3.78	37.79
Guadalupe	-	-	51.61	-	-	63.03	-	-	56.45
Karnes	-	-	-	0.39	1.96	28.18	0.39	1.96	28.18
LaSalle	0.98	-	-	-0.01	0.39	45.80	0.13	0.39	45.80
Maverick	-	-	-3.40	-	-	-19.45	-	-	-7.26
McMullen	-	-	-	0.05	0.96	84.73	0.05	0.96	84.73
Medina	-	-	2.82	-	-	7.03	-	-	4.69
Uvalde	-	-	-4.82	-	-	-9.18	-	-	-6.21
Webb	1.10	0.92	5.07	0.06	0.14	46.87	0.18	0.47	46.65
Wilson	8.35	14.20	6.59	1.19	4.63	26.58	2.06	8.39	25.37
Zavala	-14.84	-1.16	-14.12	-	-0.89	-66.46	-14.84	-1.09	-62.98
GMA13	0.13	4.17	11.82	0.51	3.15	22.29	0.45	3.49	21.56

Table 7. Average Drawdowns (2017 to 2080) for: Scen2080

County	Outcrop Area Drawdown (ft)			Downdip Area Drawdown (ft)			Overall Drawdown (ft)		
	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
Atascosa	24.87	10.58	11.05	1.89	11.45	24.08	3.38	11.29	23.60
Bexar	-	-	21.48	-	-	48.74	-	-	30.13
Caldwell	-	12.95	30.50	-	-	106.99	-	12.95	71.04
Dimmit	0.96	0.20	-12.13	-	-0.10	-76.68	0.96	0.15	-72.17
Frio	2.47	-17.71	-28.82	-0.35	-1.24	-57.16	1.18	-8.67	-56.97
Gonzales	5.88	8.38	51.97	0.38	7.44	96.83	0.73	7.58	96.55
Guadalupe	-	-	82.50	-	-	148.93	-	-	110.63
Karnes	-	-	-	0.67	3.65	50.27	0.67	3.65	50.27
LaSalle	0.97	-	-	-0.01	0.08	-59.66	0.12	0.08	-59.66
Maverick	-	-	-5.89	-	-	-32.66	-	-	-12.32
McMullen	-	-	-	0.03	0.51	15.30	0.03	0.51	15.30
Medina	-	-	-1.99	-	-	-3.52	-	-	-2.67
Uvalde	-	-	-8.33	-	-	-15.39	-	-	-10.59
Webb	1.09	0.65	1.95	0.06	0.06	-15.00	0.17	0.31	-14.91
Wilson	15.11	22.94	21.81	2.29	9.47	98.18	3.85	14.75	93.53
Zavala	-14.91	-1.23	-23.92	-	-1.68	-111.14	-14.91	-1.34	-105.34
GMA13	0.09	0.35	15.80	0.50	3.03	-12.91	0.43	2.15	-10.88

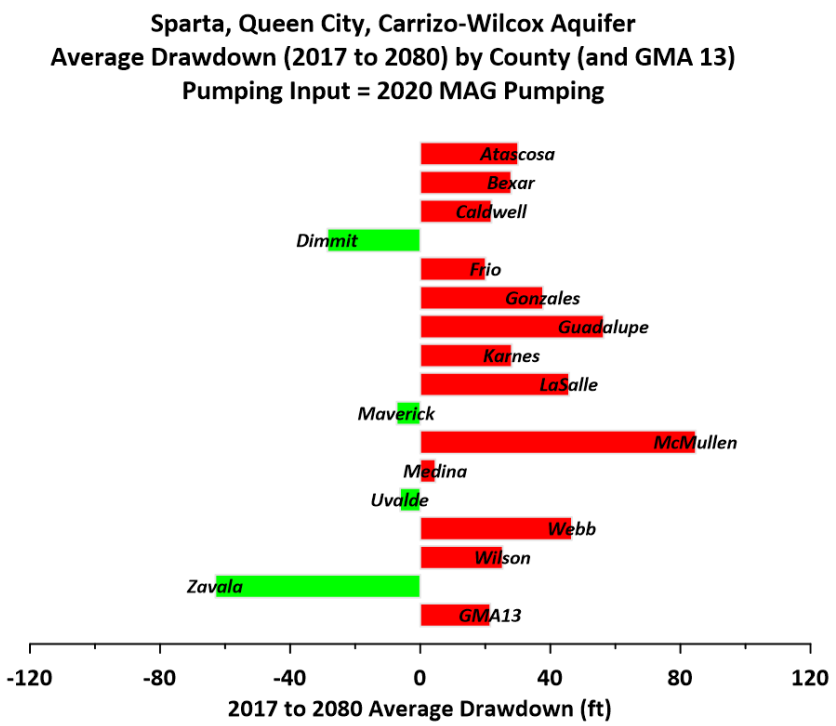


Figure 13. Average Drawdowns (2017 to 2080) for Scen2020

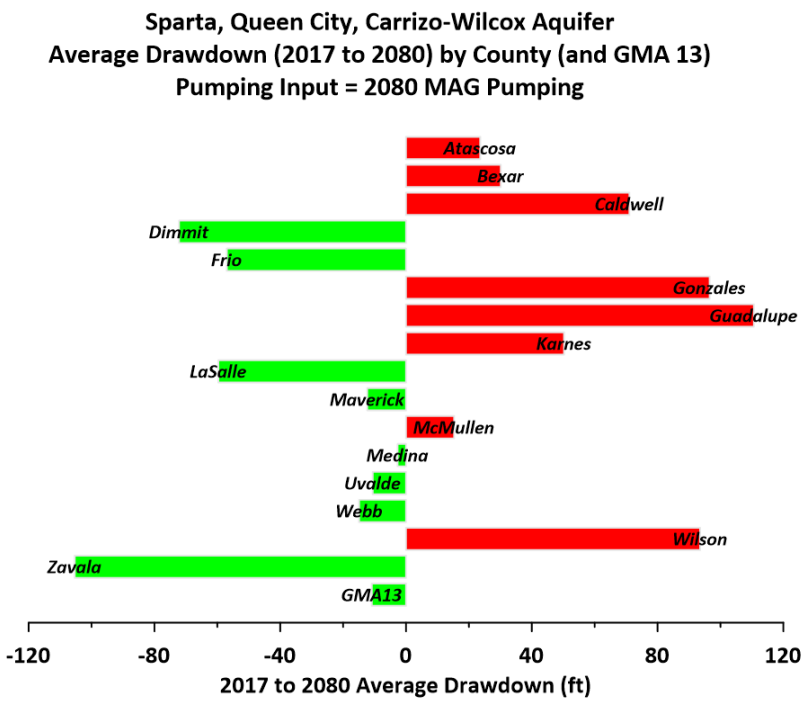


Figure 14. Average Drawdowns (2017 to 2080) for Scen2080

Please note that the average drawdown in each county is impacted by whether the overall pumping during the scenario is generally higher than 2017 pumping or less than 2017 pumping. To provide some context for these relationships, Table 8 and Figure 15 are presented.

Table 8. Summary of Pumping Differences and Average Drawdown

County	County Code on Figure	Calibrated Model Pumping (2017)	Simulated 2080 Pumping (AF/yr)		Pumping Differences (AF/yr)		2017 to 2080 Simulated Drawdown (ft)	
			Scen2020	Scen2080	Scen2020 - 2017	Scen2080 - 2017	Scen2020	Scen2080
Atascosa	AT	38,745	54,593	62,563	15,848	23,818	30.10	23.60
Bexar	BE	2,424	42,843	40,291	40,419	37,867	28.00	30.13
Caldwell	CA	4,303	19,612	51,872	15,309	47,569	21.93	71.04
Dimmit	DI	6,439	4,123	4,124	-2,316	-2,315	-28.56	-72.17
Frio	FR	94,084	116,861	80,561	22,777	-13,523	20.15	-56.97
Gonzales	GO	36,111	65,669	103,633	29,558	67,522	37.79	96.55
Guadalupe	GU	3,271	27,590	25,830	24,319	22,559	56.45	110.63
Karnes	KA	1,332	691	1,043	-641	-289	28.18	50.27
LaSalle	LA	7,861	7,534	7,534	-327	-327	45.80	-59.66
Maverick	MA	45	531	269	486	224	-7.26	-12.32
McMullen	MC	289	7,767	4,853	7,478	4,564	84.73	15.30
Medina	ME	1,835	2,607	2,611	772	776	4.69	-2.67
Uvalde	UV	7	0	0	-7	-7	-6.21	-10.59
Webb	WE	425	954	954	529	529	46.65	-14.91
Wilson	WI	23,956	39,213	118,043	15,257	94,087	25.37	93.53
Zavala	ZA	50,607	38,439	34,634	-12,168	-15,973	-62.98	-105.34

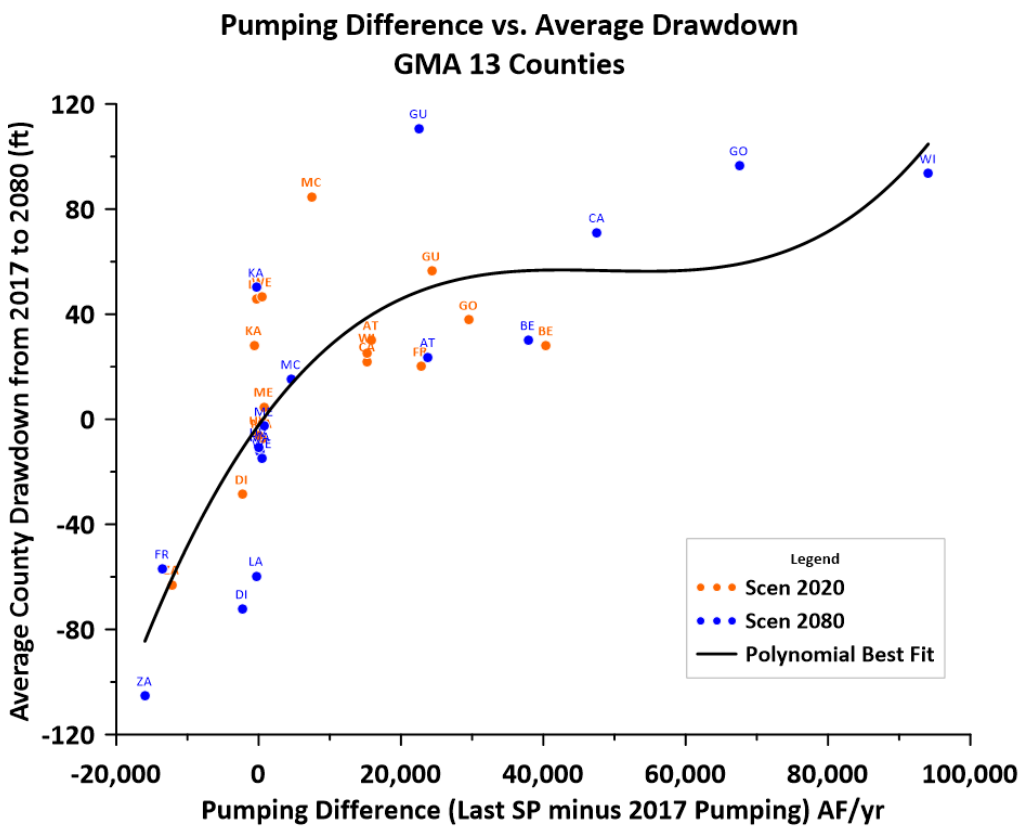


Figure 15. Summary of Pumping Differences and Average Drawdown

The results presented in Table 8 and Figure 15 generally demonstrate that when pumping increases from 2017 levels, drawdowns increase. Conversely, when pumping decreases from 2017 levels, groundwater recovery is calculated (negative average drawdowns). For example, pumping in Zavala County in both Scen2020 and Scen2080 is lower than 2017 pumping, and average drawdowns are negative, which represents a groundwater elevation recovery is calculated by the model. Please recall that the DFC drawdown for Zavala County is about 10 feet. This may the result of the limitation of the old GAM where groundwater declines persisted, even with reductions in pumping. From a conceptual standpoint, the new GAM correctly calculates a groundwater elevation recovery when pumping is reduced.

Another example is Wilson County. Please note that Scen2020 pumping (about 39,000 AF/yr) is lower than Scen2080 pumping (about 118,000 AF/yr). The average drawdown from 2017 to 2080 in Scen2020 is about 25 feet, while the average drawdown from 2017 to 2080 is about in Scen2080 is about 94 feet. The relative pumping in Caldwell County (about 20,000 in Scen2020 and about 52,000 in Scen2080) has the same effect on average drawdown (22 feet in Scen2020 and 71 feet in Scen2080). These relationships also are observed in Gonzales County (pumping increases from about 66,000 AF/yr to about 104,000 AF/yr and average drawdown increases from about 38 feet to 97 feet).

The results can also be used to observe impacts across county line. The most prominent example is Guadalupe County. Pumping in Scen2020 is about 28,000 AF/yr, while pumping in Scen2080 is slightly lower (about 24,000 AF/yr). Average drawdown in Guadalupe County, however, in Scen2020 is about 56 feet, and is about 111 feet in Scen2080. It appears that the pumping increases in Caldwell, Gonzales, and Wilson counties may be explanations to the increased drawdowns in Guadalupe County between Scen2020 and Scen2080 since the pumping in Guadalupe County is essentially the same between the two scenarios.

4.2.3 Comparison of Average Drawdowns

The average drawdowns for each county-aquifer unit for the DFC simulation using the old GAM and the predictive scenario simulations using the new GAM were compared to gain some additional insight on the performance of the new GAM. These results are presented as:

- Figure 16: Sparta Aquifer
- Figure 17: Queen City Aquifer
- Figure 18: Carrizo-Wilcox Aquifer

For these plots, the average drawdown for the DFC simulation using the old GAM are plotted on the x-axis, and the average drawdown for the two predictive simulations (Scen2020 and Scen2080) were plotted on the y-axis. A one-to-one line was also included to divide the plot into two areas:

- Points to the right or below the one-to-one line are counties where the old GAM average drawdown is greater than the new GAM average drawdown.
- Points to the left or above the one-to-one line are counties where the old GAM average drawdown is less than the new GAM average drawdown.

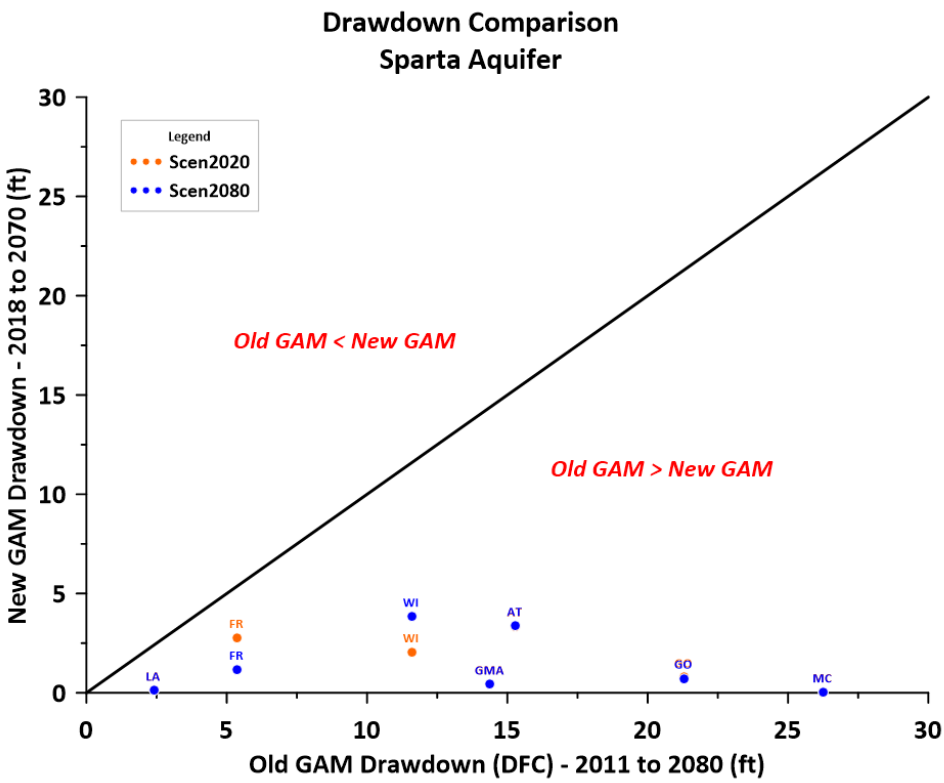


Figure 16. Drawdown Comparison: Sparta Aquifer

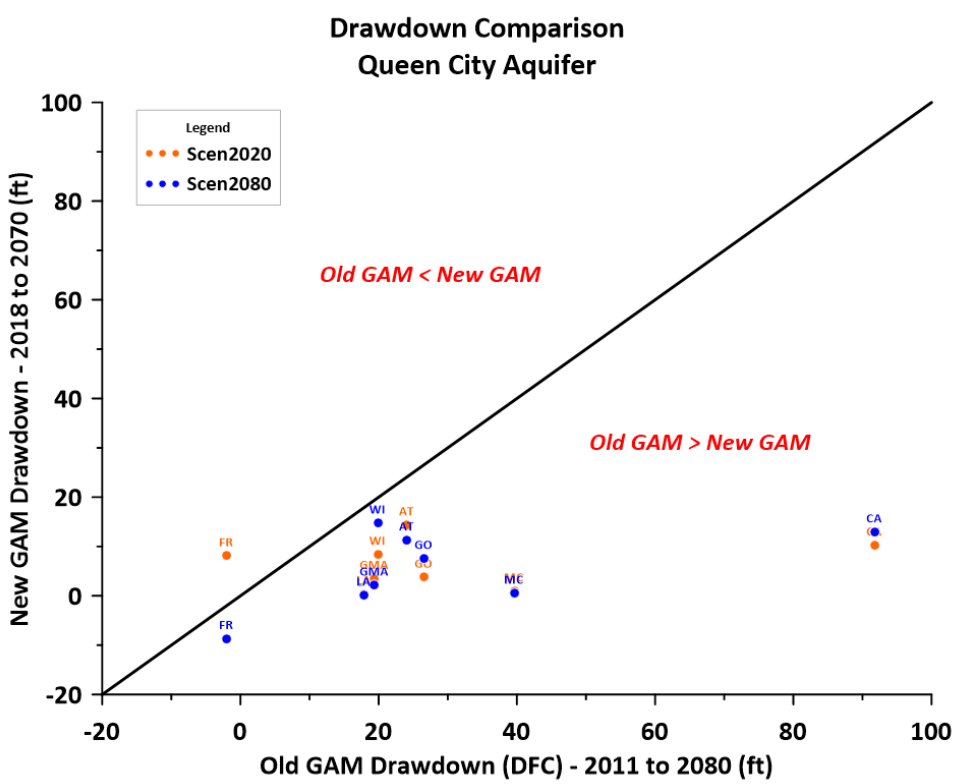


Figure 17. Drawdown Comparison: Queen City Aquifer

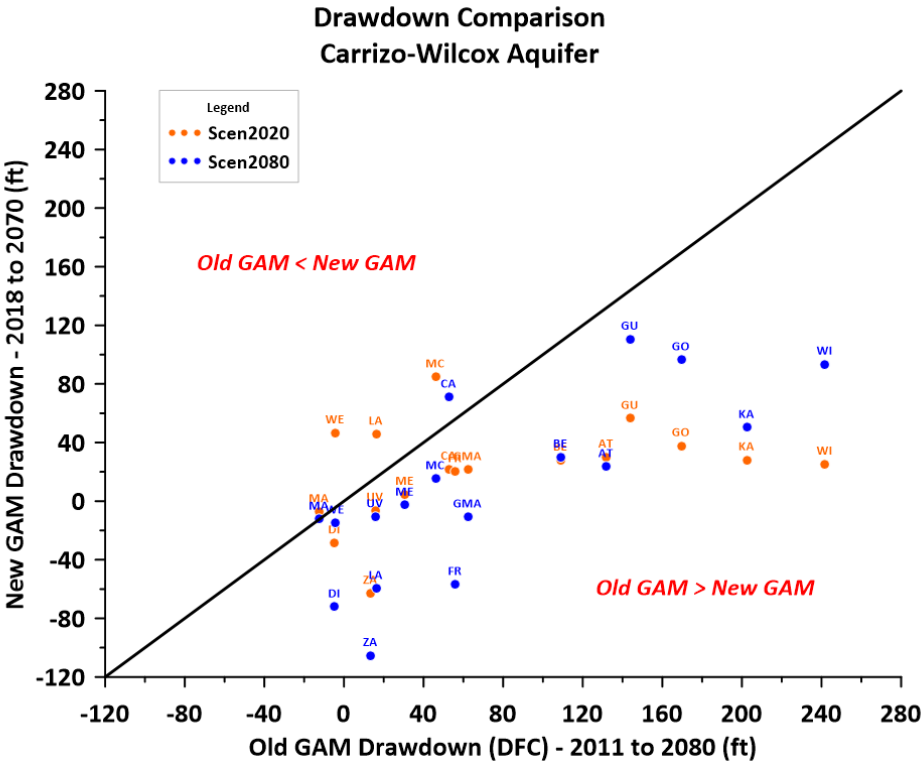


Figure 18. Drawdown Comparison: Carrizo-Wilcox Aquifer

Please note that for the Sparta Aquifer, all points lie to the right and below the one-to-one line, which means that the new GAM generally predicts higher drawdowns than the old GAM. For the Queen City Aquifer, only one point is to the left and above the one-to-one line (Frio County for Scen2020). For Scen2080, the point is to the right and below the one-to-one line. Pertinent pumping information for the Queen City pumping in Frio County needed to interpret these results is:

- MAG pumping: 6,755 AF/yr in 2020, decreasing to 3,970 AF/yr in 2080, leading to a groundwater level recovery of about 2 ft (DFC)
- 2017 pumping from calibrated model is 1,060 AF/yr
- Scen2020 pumping: 5,728 AF/yr in 2018 decreasing to 5,680 AF/yr, leading to a drawdown of about 8 feet.
- Scen2080 pumping: 3,493 AF/yr decreasing to 3,526 AF/yr in 2080, leading to a groundwater level recovery of about 9 feet.

The fact that pumping in Scen2020 and Scen2080 are both well above the 2017 pumping suggests that there should be a drawdown in the Queen City Aquifer in Frio County. However, the results suggest that the Queen City Aquifer is also impacted by the underlying Carrizo-Wilcox Aquifer. Please note that in Scen2020, there is about 20 feet of drawdown in the Carrizo-Wilcox in Frio County and there is about 57 feet of groundwater elevation recovery in the Carrizo-Wilcox in Frio County in Scen2080. This is due to:

- 2017 pumping in the Carrizo-Wilcox pumping in Frio County is about 92,000 AF/yr
- Scen2020 pumping in the Carrizo-Wilcox pumping in Frio County is about 110,000 AF/yr
- Scen2080 pumping in the Carrizo-Wilcox pumping in Frio County is about 76,000 AF/yr

Thus, it is clear that the increase in pumping simulated in Scen2020 (as compared to the 2017 pumping) results in drawdown in the Carrizo-Wilcox Aquifer in Frio County of about 20 feet, while a decrease in pumping simulated in Scen2080 (as compared to the 2017 pumping) results in a recovery of about 57 feet. The results in the Queen City suggest that the new GAM simulates cross-formational impacts between the Queen City and Carrizo-Wilcox in Frio County.

The Carrizo-Wilcox Aquifer drawdown comparison demonstrates that, in general, the old GAM drawdowns are greater than the new GAM drawdowns. Of note are the simulated groundwater recoveries in Scen2020 (Dimmit, Maverick, Uvalde, and Zavala counties) and in Scen2080 (Dimmit, Frio, LaSalle, Maverick, Uvalde, Webb, and Zavala). These are all associated with reductions in pumping as compared to 2017 pumping. As described earlier, these pumping amounts are based on the current MAG values, which may have been set based on reliance on the old GAM.

Please recall that the old GAM had a limitation with respect to persistently declining groundwater elevations, even with pumping reductions. It is possible that in order to achieve a desired future condition of a few feet of drawdown, pumping was reduced in the simulations to achieve the desired results. The following are the drawdowns in the Carrizo-Wilcox associated with the DFC simulation for these counties:

- Dimmit: -4.63 ft
- Frio: 47 ft
- LaSalle: 16 ft
- Maverick: -12 ft
- Uvalde: 16 ft
- Webb: -4 ft
- Zavala: 13 ft

This information will be useful to GMA 13 as they move forward in the next round of joint planning using the new GAM which appropriately simulates the effects of pumping increases and decreases (i.e. drawdown and recovery of groundwater elevations).

5.0 Limitations

The simulations, Scen2020 and Scen2080 were designed to the calculate drawdown from 2017 to 2080 with the new GAM that are similar to the DFC simulation that used the old GAM. Choosing to use a constant input pumping for these two scenarios is a limitation to a full comparison. Neither scenario fully matched the actual DFC/MAG simulation with the various increases and decreases that were included in the MAG report. The constant input approach was chosen to also evaluate the impacts of the WEL package's pumping reduction feature to better understand the limitations associated with impacts of declining groundwater elevations on pumping and gain a better understanding of the possibility to better simulate sustainable pumping scenarios.

As with all GAM simulations of this nature, the results are primarily useful for regional analyses (i.e. county-aquifer or GCD-aquifer scale). Smaller scale analyses should proceed with caution given the objectives of model development and calibration.

6.0 References

Furnans, J., 2022. Groundwater Availability Modeling Technical Elements, 2021 Joint Planning. Technical Memorandum to Groundwater Management Area 13. January 14, 2022, 5p.

Furnans, J. and Keester, M., 2020. 2021 Joint Planning Desired Future Conditions Explanatory Report. Prepared by Groundwater Management Area 13 Joint Planning Committee with technical assistance by Jordan Furnans and Michael Keester, LRE Water. January 14, 2022, 510p.

Wade, S.C., 2022. GAM Run 21-018MAG: Modeled Available Groundwater for the Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson Aquifers in Groundwater Management Area 13. Texas Water Development Board, Groundwater Division, Groundwater Availability Modeling Department. July 25, 2022, 32p.

Appendix A

Modeled Available Groundwater for the Sparta, Queen City, and Carrizo-Wilcox Aquifers by County

Sparta Aquifer Modeled Available Groundwater by County
Groundwater Management Area 13
from Wade (2022)

County	2020	2030	2040	2050	2060	2070	2080
Atascosa	1,218	1,187	1,043	998	961	932	932
Bexar							
Caldwell							
Dimmit							
Frio	897	623	603	576	557	534	534
Gonzales	3,524	2,451	2,457	2,451	2,451	2,451	2,451
Guadalupe							
Karnes							
La Salle	0	0	0	0	0	0	0
Maverick							
McMullen	0	0	0	0	0	0	0
Medina							
Uvalde							
Webb							
Wilson	335	182	163	144	128	114	114
Zavala							
Total GMA 13	5,974	4,443	4,266	4,169	4,097	4,031	4,031

Queen City Aquifer Modeled Available Groundwater by County
Groundwater Management Area 13
from Wade (2022)

County	2020	2030	2040	2050	2060	2070	2080
Atascosa	4,070	4,525	4,537	4,495	4,390	4,285	4,285
Bexar							
Caldwell	4,842	4,829	4,557	4,545	4,545	3,977	3,977
Dimmit							
Frio	6,702	4,533	4,380	4,231	4,066	3,927	3,927
Gonzales	4,973	4,960	4,973	4,960	4,960	4,500	4,500
Guadalupe	0	0	0	0	0	0	0
Karnes							
La Salle	1	1	1	1	1	1	1
Maverick							
McMullen	3	3	3	3	3	3	3
Medina							
Uvalde							
Webb							
Wilson	2,631	1,423	1,267	1,123	1,000	892	892
Zavala							
Total GMA 13	23,222	20,274	19,718	19,358	18,965	17,585	17,585

Carrizo-Wilcox Aquifer Modeled Available Groundwater by County
Groundwater Management Area 13
from Wade (2022)

County	2020	2030	2040	2050	2060	2070	2080
Atascosa	51,924	54,397	55,329	56,828	58,406	59,982	59,982
Bexar	69,727	68,451	68,928	68,739	67,653	67,849	67,849
Caldwell	18,180	24,877	32,775	42,514	45,688	49,635	49,594
Dimmit	3,895	3,885	3,895	3,885	3,885	3,885	3,885
Frio	114,827	86,995	85,143	82,950	81,018	79,131	79,131
Gonzales	60,431	76,265	90,788	102,373	102,747	103,707	96,161
Guadalupe	55,637	39,563	41,668	43,315	42,118	42,199	41,659
Karnes	693	758	843	931	1,001	1,043	1,043
La Salle	6,554	6,536	6,554	6,536	6,536	6,536	6,536
Maverick	547	545	547	545	545	276	276
McMullen	7,789	7,768	4,867	4,854	4,854	4,854	4,854
Medina	2,635	2,628	2,635	2,628	2,628	2,628	2,628
Uvalde	0	0	0	0	0	0	0
Webb	912	910	912	910	910	910	910
Wilson	38,229	38,284	43,604	68,609	105,947	125,670	125,670
Zavala	38,303	36,675	35,399	35,204	35,006	34,831	34,540
Total GMA 13	470,283	448,537	473,887	520,821	558,942	583,136	574,718

Appendix B

Comparison of County-Aquifer Pumping Estimates: 2020 and 2080, MAG Report (Wade, 2022), Spreadsheet Calculations, WEL File Pre-Processor

Appendix B
Comparison of County-Aquifer Pumping Estimates: 2020 and 2080
MAG Report (Wade, 2020), Spreadsheet Calculations, WEL File Pre-Processor

County	Aquifer	2020 Pumping (AF/yr)			2080 Pumping (AF/yr)		
		MAG Report	Spreadsheet	WEL Input	MAG Report	Spreadsheet	WEL Input
Atascosa	Sparta	1,218	1,219	1,236	932	935	953
Frio	Sparta	897	931	944	534	556	569
Gonzales	Sparta	3,524	3,552	3,551	2,451	2,488	2,488
La Salle	Sparta	0	986	986	0	986	986
McMullen	Sparta	0	0	0	0	0	0
Wilson	Sparta	335	462	472	114	156	167
Atascosa	Queen City	4,070	4,072	4,129	4,285	4,299	4,356
Caldwell	Queen City	4,842	5,113	5,123	3,977	4,261	4,271
Frio	Queen City	6,702	6,755	6,790	3,927	3,971	4,007
Gonzales	Queen City	4,973	5,063	5,062	4,500	4,604	4,603
Guadalupe	Queen City	0	0	0	0	0	0
LaSalle	Queen City	1	12	12	1	12	12
McMullen	Queen City	3	0	0	3	0	0
Wilson	Queen City	2,631	2,778	2,814	892	944	980
Atascosa	Carrizo-Wilcox	51,924	51,780	52,995	59,982	59,982	61,196
Bexar	Carrizo-Wilcox	69,727	69,537	69,535	67,849	67,849	67,847
Caldwell	Carrizo-Wilcox	18,180	18,169	18,169	49,594	49,633	49,632
Dimmit	Carrizo-Wilcox	3,895	4,125	4,125	3,885	4,125	4,125
Frio	Carrizo-Wilcox	114,827	114,009	116,754	79,131	78,784	81,529
Gonzales	Carrizo-Wilcox	60,431	57,069	57,068	96,161	96,562	96,560
Guadalupe	Carrizo-Wilcox	55,637	50,352	50,369	41,659	40,519	40,523
Karnes	Carrizo-Wilcox	693	708	732	1,043	1,061	1,085
La Salle	Carrizo-Wilcox	6,554	6,536	6,536	6,536	6,536	6,536
Maverick	Carrizo-Wilcox	547	545	531	276	276	269
McMullen	Carrizo-Wilcox	7,789	7,768	7,767	4,854	4,854	4,853
Medina	Carrizo-Wilcox	2,635	2,658	2,660	2,628	2,647	2,649
Uvalde	Carrizo-Wilcox	0	0	0	0	0	0
Webb	Carrizo-Wilcox	912	909	910	910	909	910
Wilson	Carrizo-Wilcox	38,229	38,119	38,926	125,670	126,361	127,168
Zavala	Carrizo-Wilcox	38,303	38,440	38,440	34,540	34,634	34,634

Appendix C

Grid Cell Count and Acreage by County and Aquifer

Outcrop Area

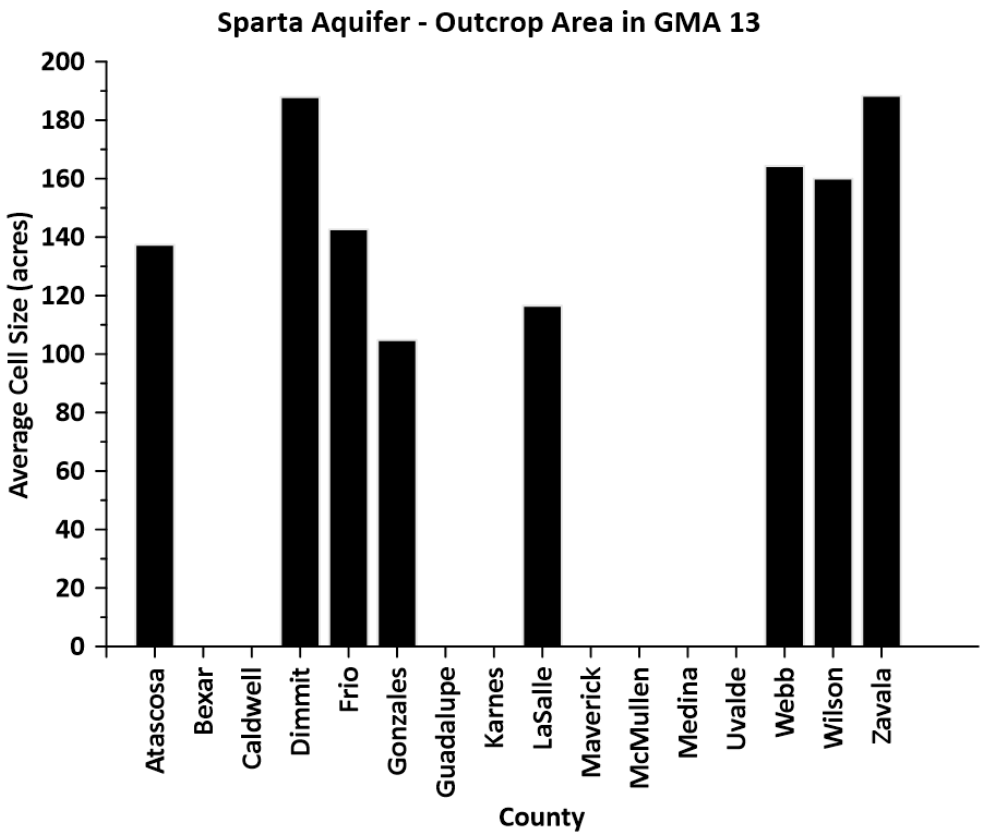
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	233	1,229	540	32,000	113,000	78,720	137	92	146
11	Bastrop	21	45	1,156	3,840	24,480	126,400	183	544	109
13	Bee	0	0	0	0	0	0	0	0	0
15	Bexar	0	0	2,022	0	0	207,360	0	0	103
28	Caldwell	0	90	1,615	0	10,560	205,600	0	117	127
59	DeWitt	0	0	0	0	0	0	0	0	0
64	Dimmit	417	3,759	991	78,360	477,480	157,000	188	127	158
75	Fayette	8	0	0	1,400	0	0	175	0	0
82	Frio	1,045	2,467	163	149,080	279,040	13,480	143	113	83
89	Gonzales	287	922	115	30,080	90,280	11,800	105	98	103
94	Guadalupe	0	4	1,125	0	640	218,880	0	160	195
128	Karnes	0	0	0	0	0	0	0	0	0
139	LaSalle	1,047	0	0	122,040	0	0	117	0	0
143	Lavaca	0	0	0	0	0	0	0	0	0
149	LiveOak	0	0	0	0	0	0	0	0	0
159	Maverick	0	0	1,180	0	0	130,120	0	0	110
162	McMullen	0	0	0	0	0	0	0	0	0
163	Medina	0	0	1,850	0	0	207,200	0	0	112
232	Uvalde	0	0	887	0	0	88,280	0	0	100
240	Webb	469	3,130	276	77,080	492,040	18,840	164	157	68
247	Wilson	148	967	662	23,680	140,560	85,760	160	145	130
254	Zavala	636	4,426	1,489	119,760	421,240	147,760	188	95	99
255	Mexico	237	323	890	57,720	59,960	152,720	244	186	172
999	GMA 13	4,485	17,204	13,062	686,520	2,078,480	1,629,360	153	121	125

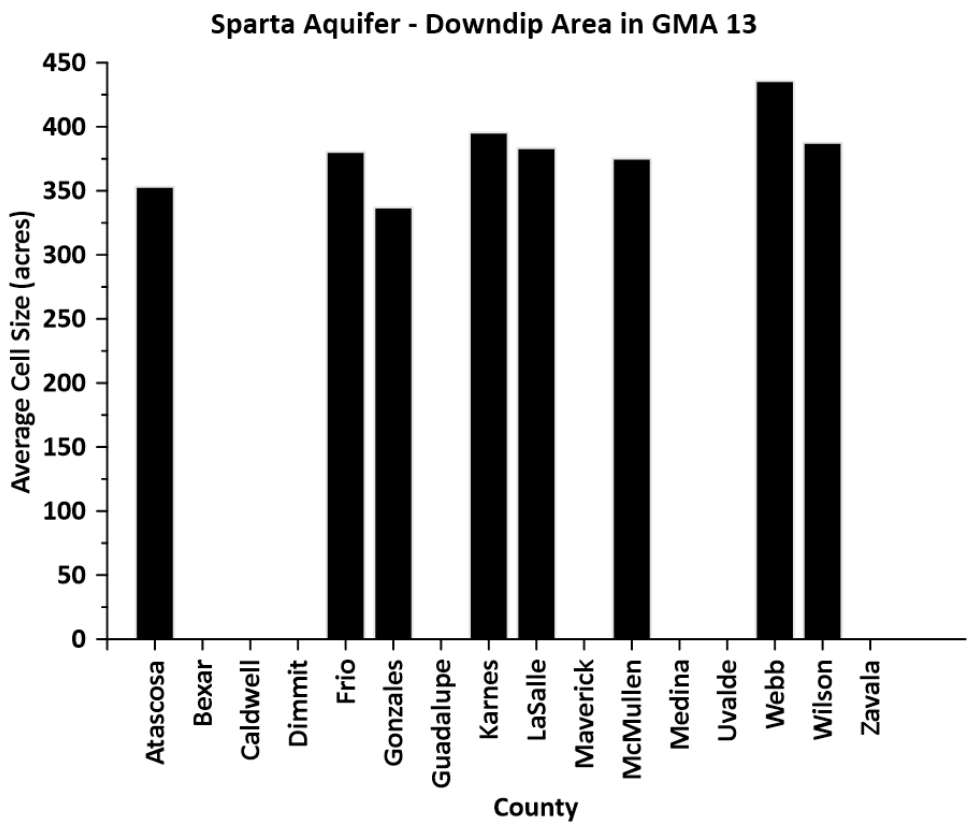
Downdip Area

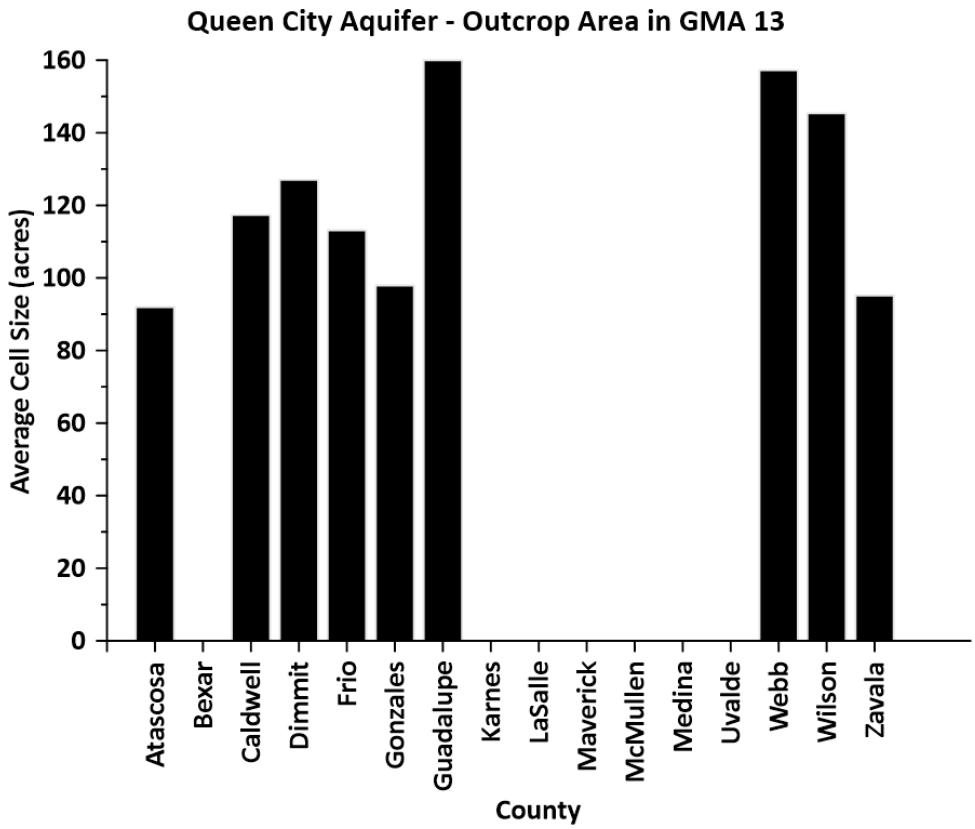
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	1,307	862	3,348	461,600	507,040	2,067,840	353	588	618
11	Bastrop	6	19	497	3,840	11,200	249,920	640	589	503
13	Bee	103	64	192	41,920	40,960	122,880	407	640	640
15	Bexar	0	0	239	0	0	96,320	0	0	403
28	Caldwell	0	0	537	0	0	231,840	0	0	432
59	DeWitt	883	543	1,629	350,080	347,520	1,042,560	396	640	640
64	Dimmit	0	192	3,473	0	104,640	2,091,200	0	545	602
75	Fayette	153	125	372	78,240	79,520	238,080	511	636	640
82	Frio	331	680	3,213	125,920	339,200	1,995,360	380	499	621
89	Gonzales	1,321	850	3,029	445,120	500,320	1,891,040	337	589	624
94	Guadalupe	0	0	330	0	0	160,800	0	0	487
128	Karnes	974	599	1,797	385,280	383,360	1,150,080	396	640	640
139	LaSalle	2,050	1,403	4,203	785,920	896,960	2,689,920	383	639	640
143	Lavaca	763	455	1,365	292,480	291,200	873,600	383	640	640
149	LiveOak	626	329	987	213,920	210,560	631,680	342	640	640
159	Maverick	0	0	140	0	0	41,120	0	0	294
162	McMullen	1,515	882	2,646	568,320	564,480	1,693,440	375	640	640
163	Medina	0	0	465	0	0	165,600	0	0	356
232	Uvalde	0	0	157	0	0	41,440	0	0	264
240	Webb	1,370	1,109	5,601	596,960	684,800	3,531,840	436	617	631
247	Wilson	443	394	2,201	171,680	217,600	1,322,240	388	552	601
254	Zavala	0	258	3,607	0	151,680	2,074,720	0	588	575
255	Mexico	597	664	3,130	294,720	414,400	1,890,880	494	624	604
999	GMA 13	8,770	7,071	35,498	3,338,560	4,240,800	21,479,360	381	600	605

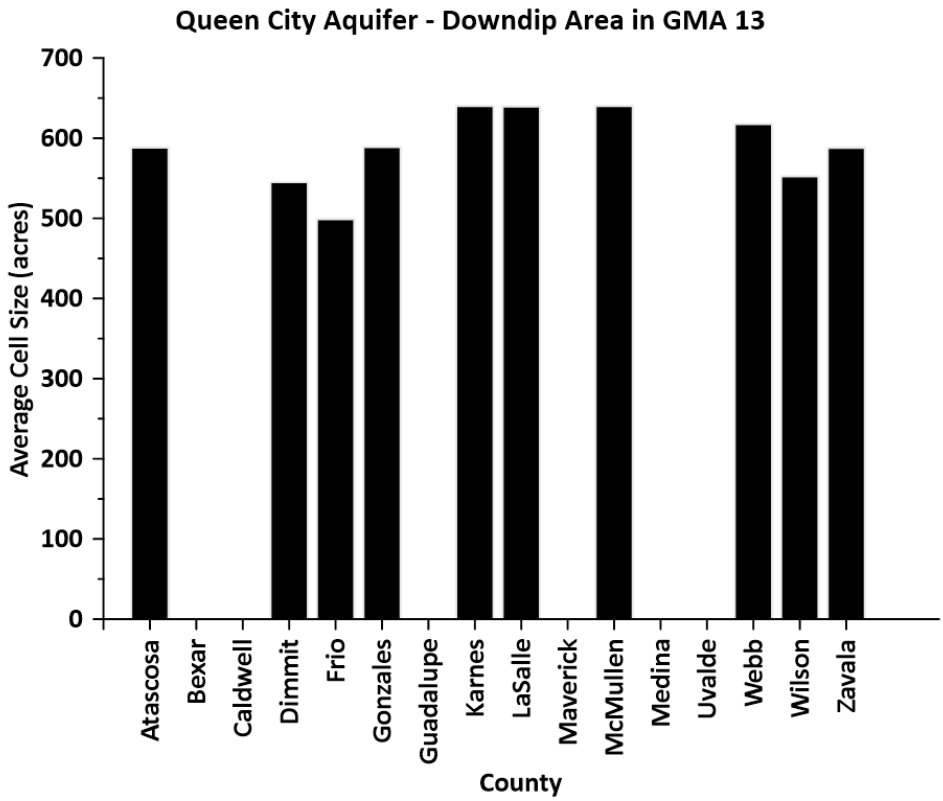
Total Area

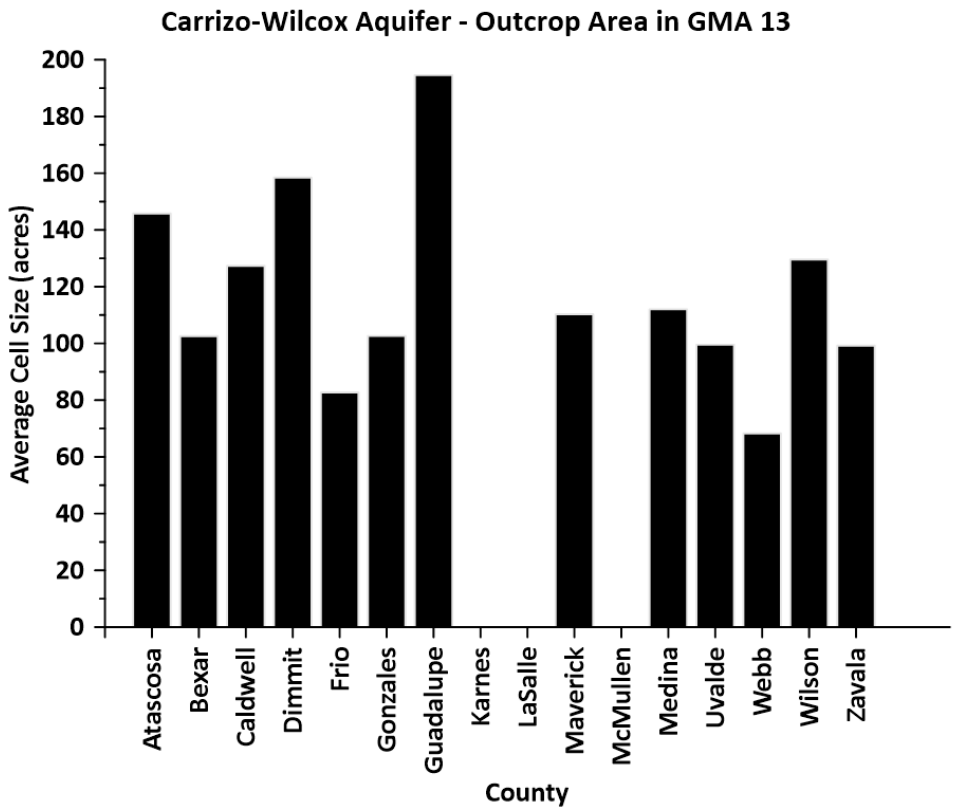
County Code	County Name	Cell Count			Area (Acres)			Average Cell Size (acres)		
		Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox	Sparta	Queen City	Carrizo-Wilcox
7	Atascosa	1,540	2,091	3,888	493,600	620,040	2,146,560	321	297	552
11	Bastrop	27	64	1,653	7,680	35,680	376,320	284	558	228
13	Bee	103	64	192	41,920	40,960	122,880	407	640	640
15	Bexar	0	0	2,261	0	0	303,680	0	0	134
28	Caldwell	0	90	2,152	0	10,560	437,440	0	117	203
59	DeWitt	883	543	1,629	350,080	347,520	1,042,560	396	640	640
64	Dimmit	417	3,951	4,464	78,360	582,120	2,248,200	188	147	504
75	Fayette	161	125	372	79,640	79,520	238,080	495	636	640
82	Frio	1,376	3,147	3,376	275,000	618,240	2,008,840	200	196	595
89	Gonzales	1,608	1,772	3,144	475,200	590,600	1,902,840	296	333	605
94	Guadalupe	0	4	1,455	0	640	379,680	0	160	261
128	Karnes	974	599	1,797	385,280	383,360	1,150,080	396	640	640
139	LaSalle	3,097	1,403	4,203	907,960	896,960	2,689,920	293	639	640
143	Lavaca	763	455	1,365	292,480	291,200	873,600	383	640	640
149	LiveOak	626	329	987	213,920	210,560	631,680	342	640	640
159	Maverick	0	0	1,320	0	0	171,240	0	0	130
162	McMullen	1,515	882	2,646	568,320	564,480	1,693,440	375	640	640
163	Medina	0	0	2,315	0	0	372,800	0	0	161
232	Uvalde	0	0	1,044	0	0	129,720	0	0	124
240	Webb	1,839	4,239	5,877	674,040	1,176,840	3,550,680	367	278	604
247	Wilson	591	1,361	2,863	195,360	358,160	1,408,000	331	263	492
254	Zavala	636	4,684	5,096	119,760	572,920	2,222,480	188	122	436
255	Mexico	834	987	4,020	352,440	474,360	2,043,600	423	481	508
999	GMA 13	13,255	24,275	48,560	4,025,080	6,319,280	23,108,720	304	260	476

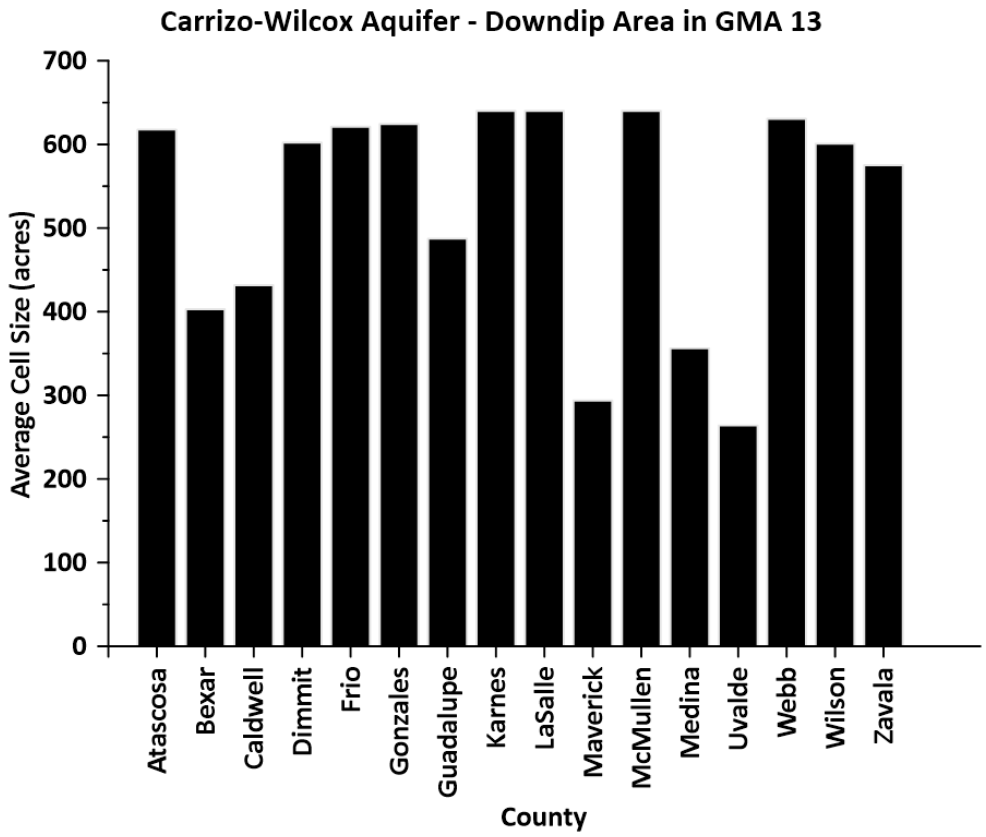

Sparta Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
180
200
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County


Sparta Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
50
100
150
200
250
300
350
400
450
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County


Queen City Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

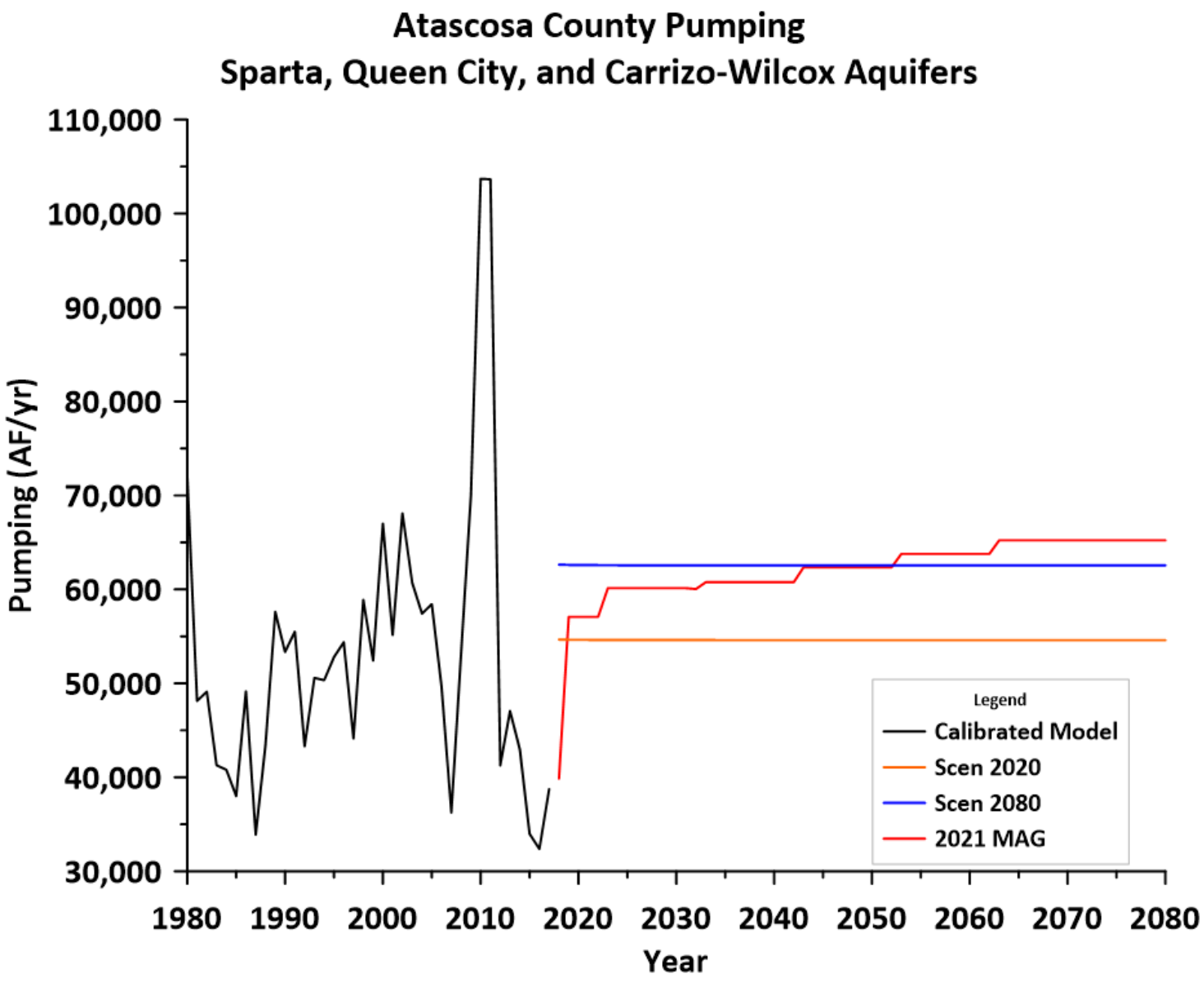

Queen City Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
100
200
300
400
500
600
700
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

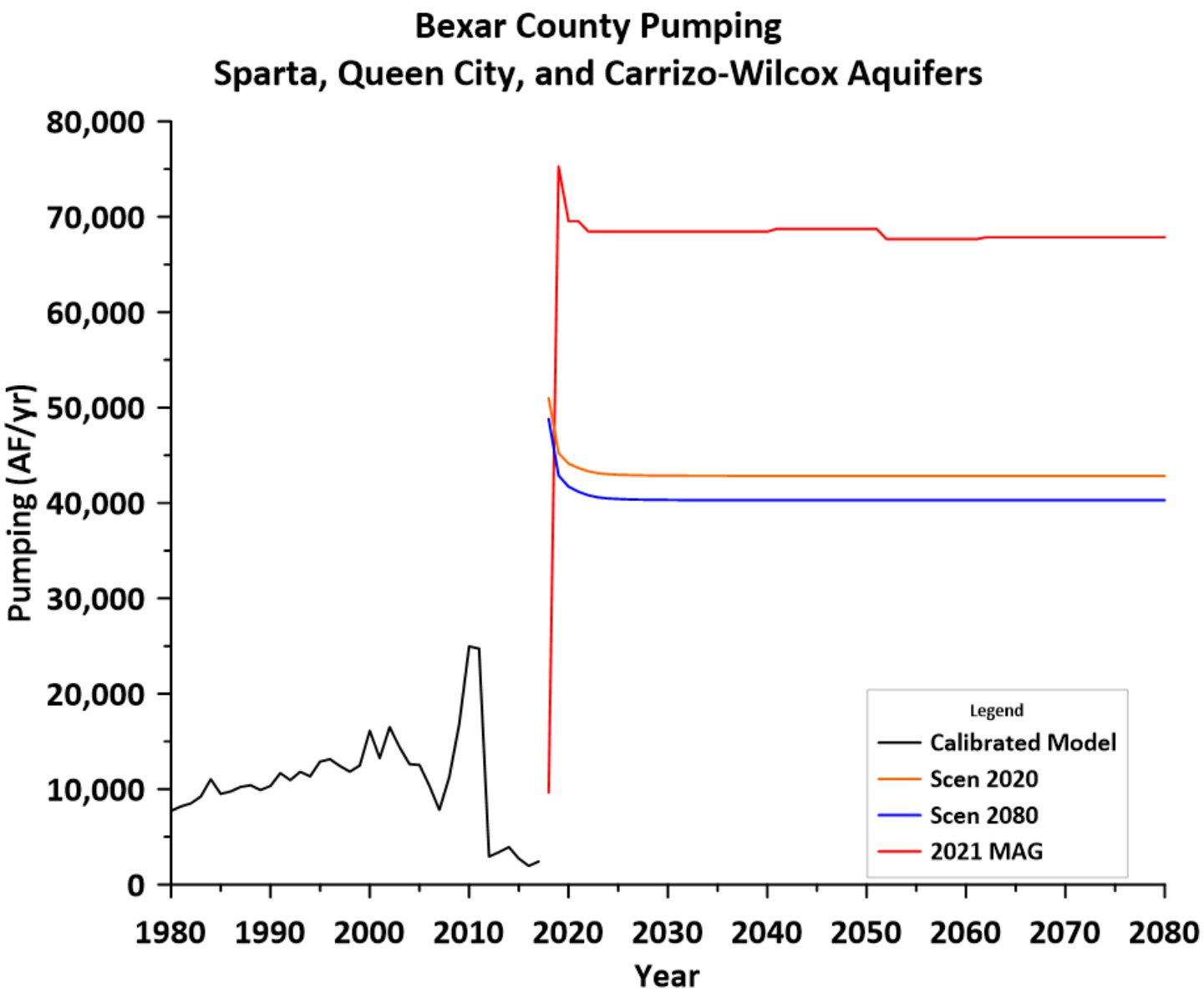

Carrizo-Wilcox Aquifer - Outcrop Area in GMA 13
Average Cell Size (acres)
0
20
40
60
80
100
120
140
160
180
200
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

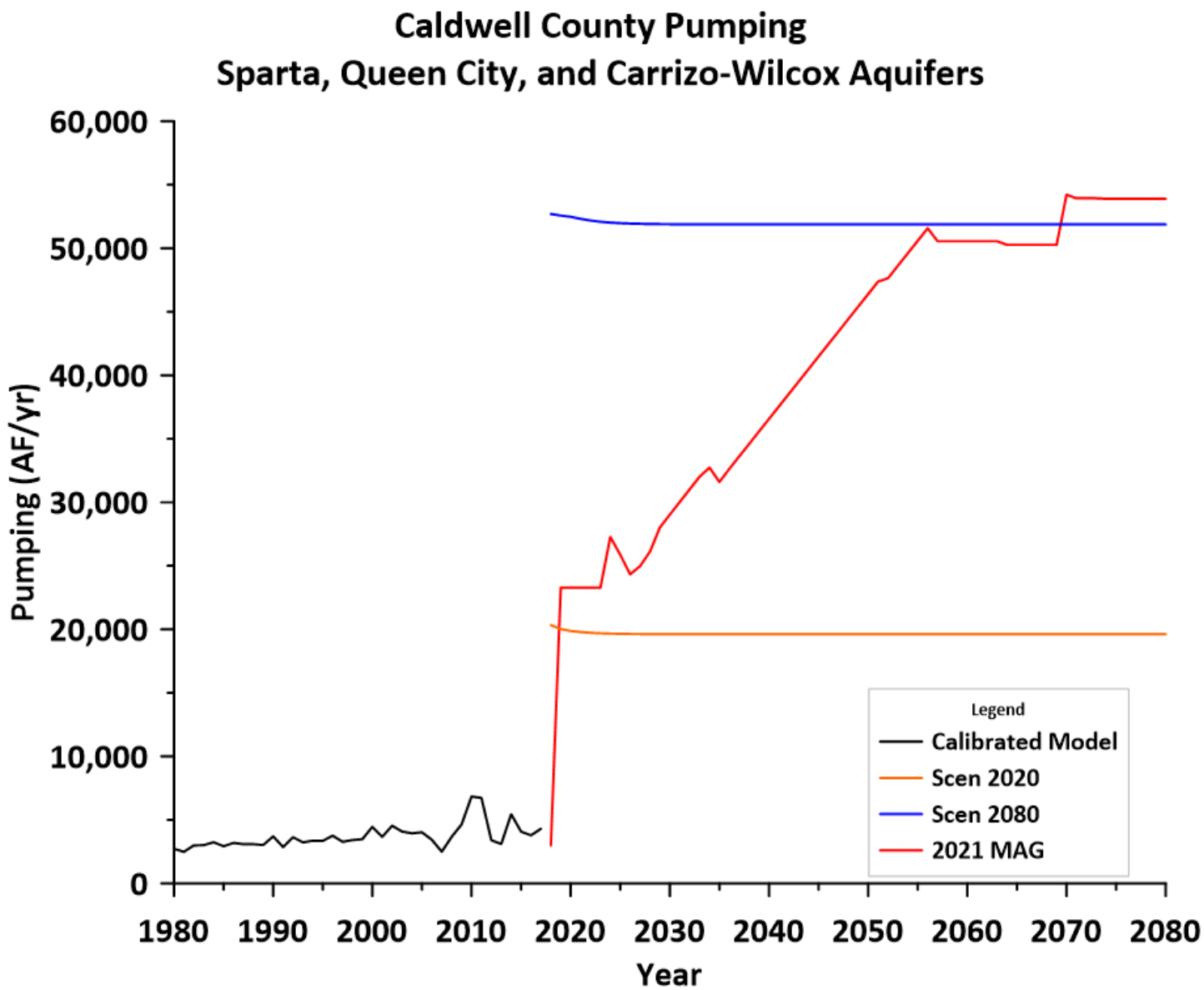

Carrizo-Wilcox Aquifer - Downdip Area in GMA 13
Average Cell Size (acres)
0
100
200
300
400
500
600
700
Atascosa
Bexar
Caldwell
Dimmit
Frio
Gonzales
Guadalupe
Karnes
LaSalle
Maverick
McMullen
Medina
Uvalde
Webb
Wilson
Zavala
County

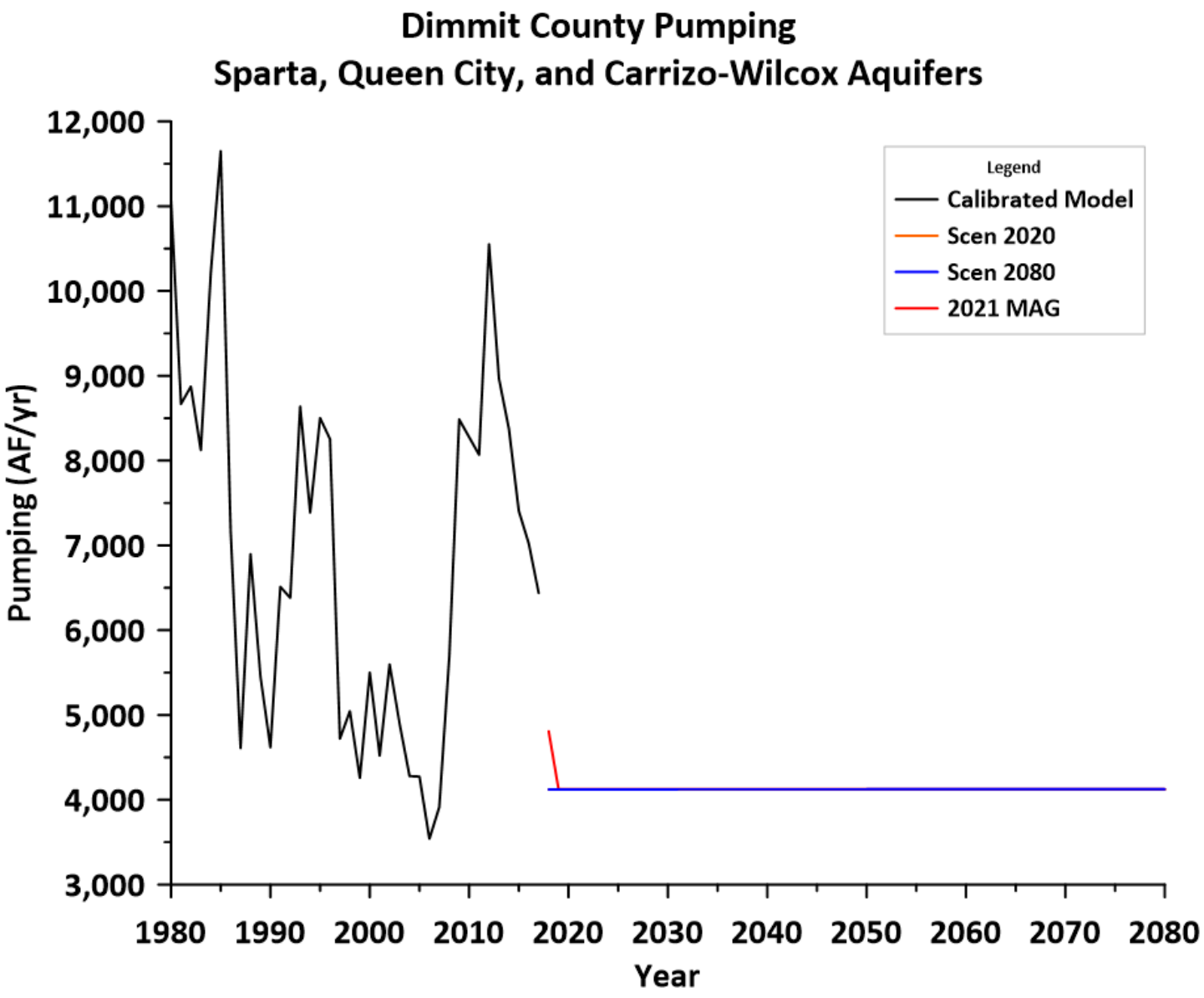
Appendix D

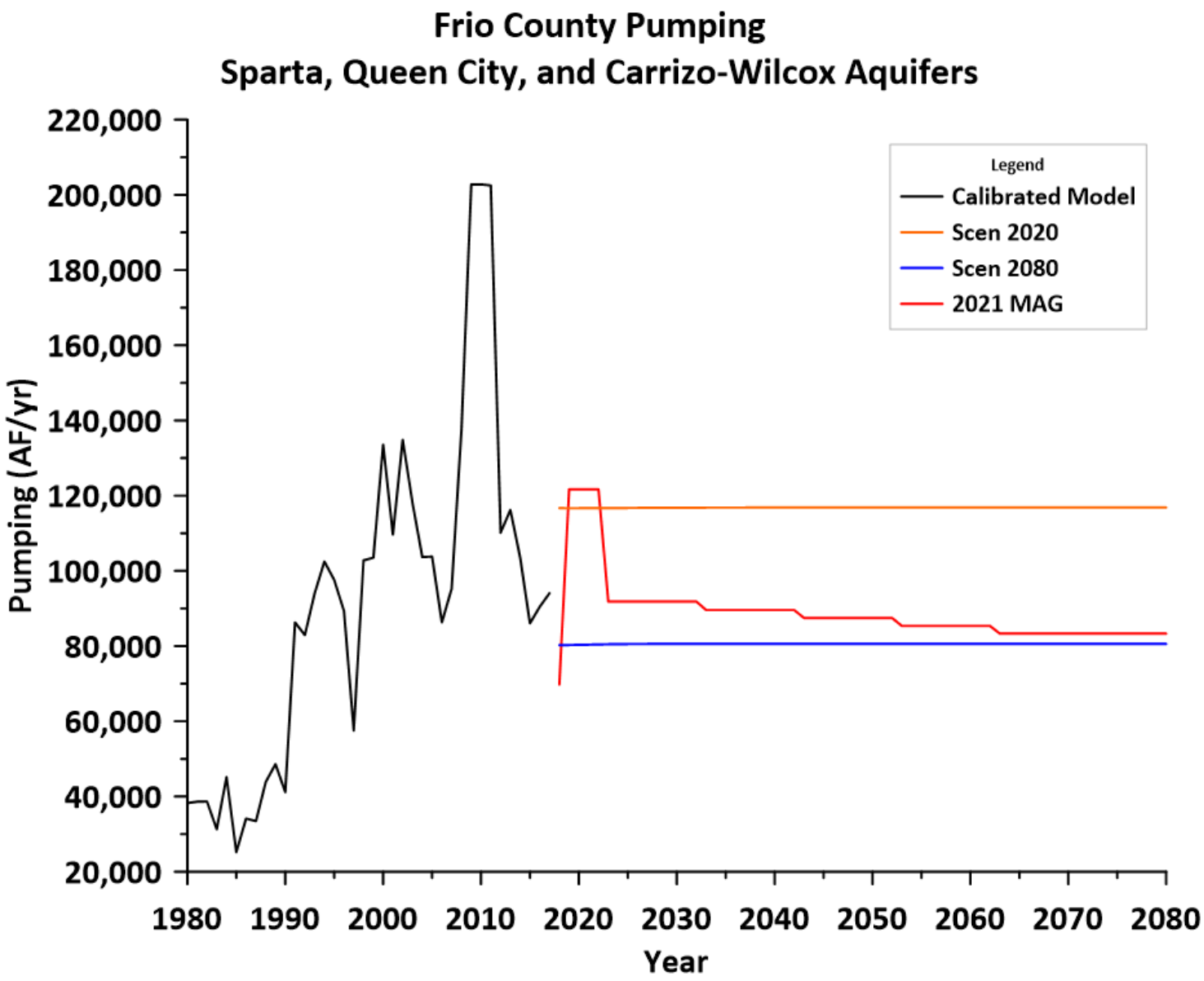
Output Pumping Comparisons (MAG, Scen2020, and Scen2080) with Current MAG

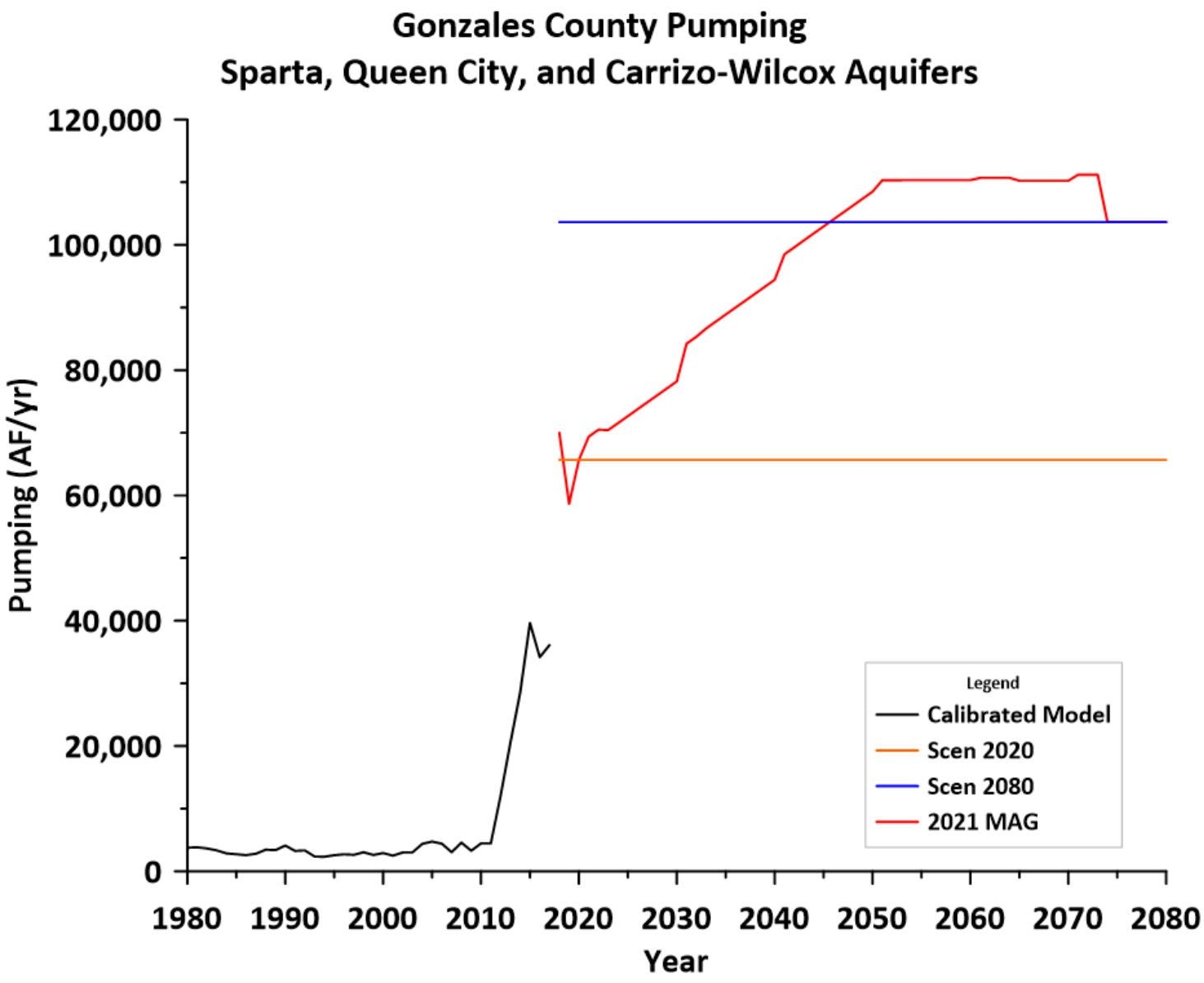

Atascosa County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG

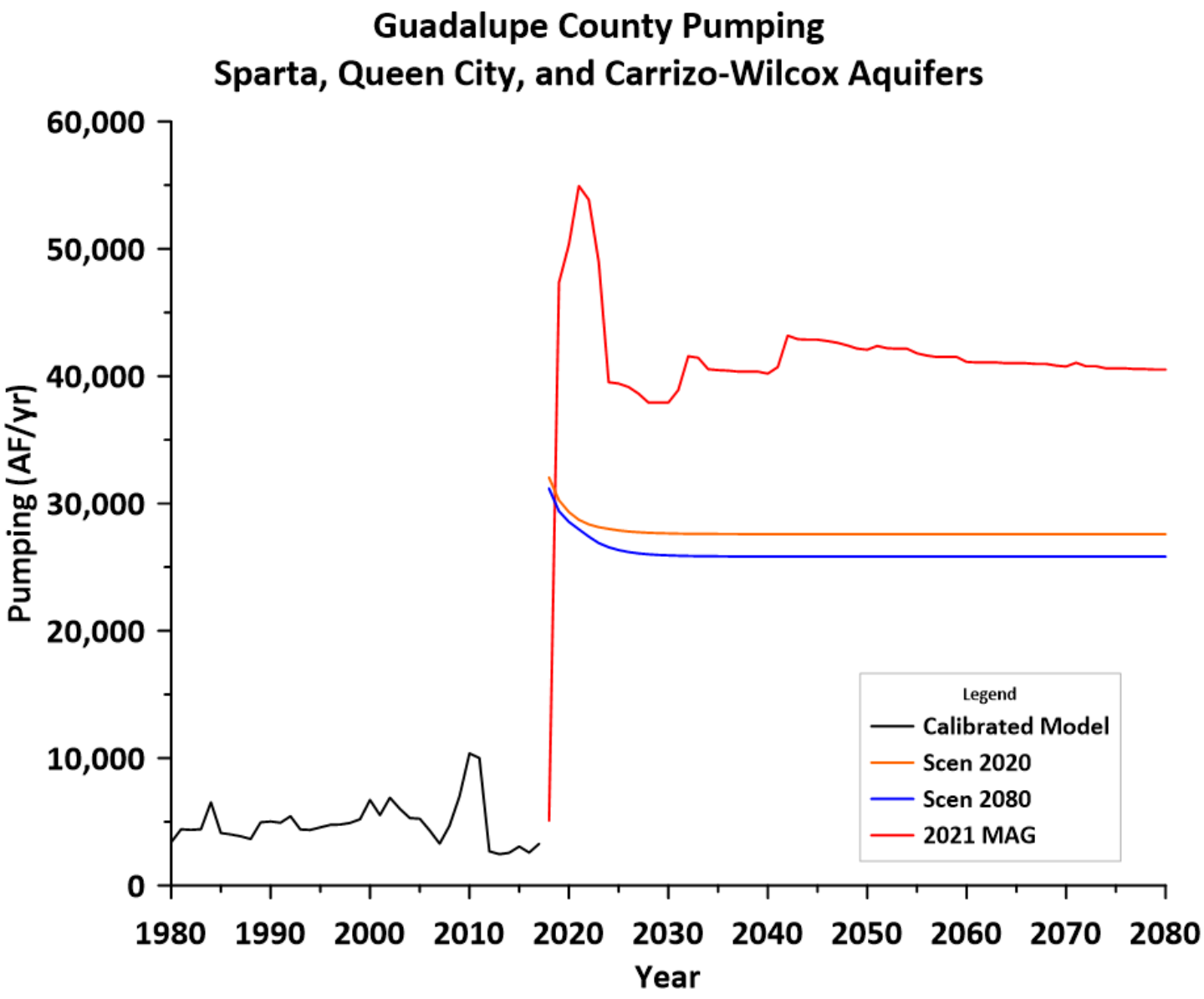

Bexar County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG

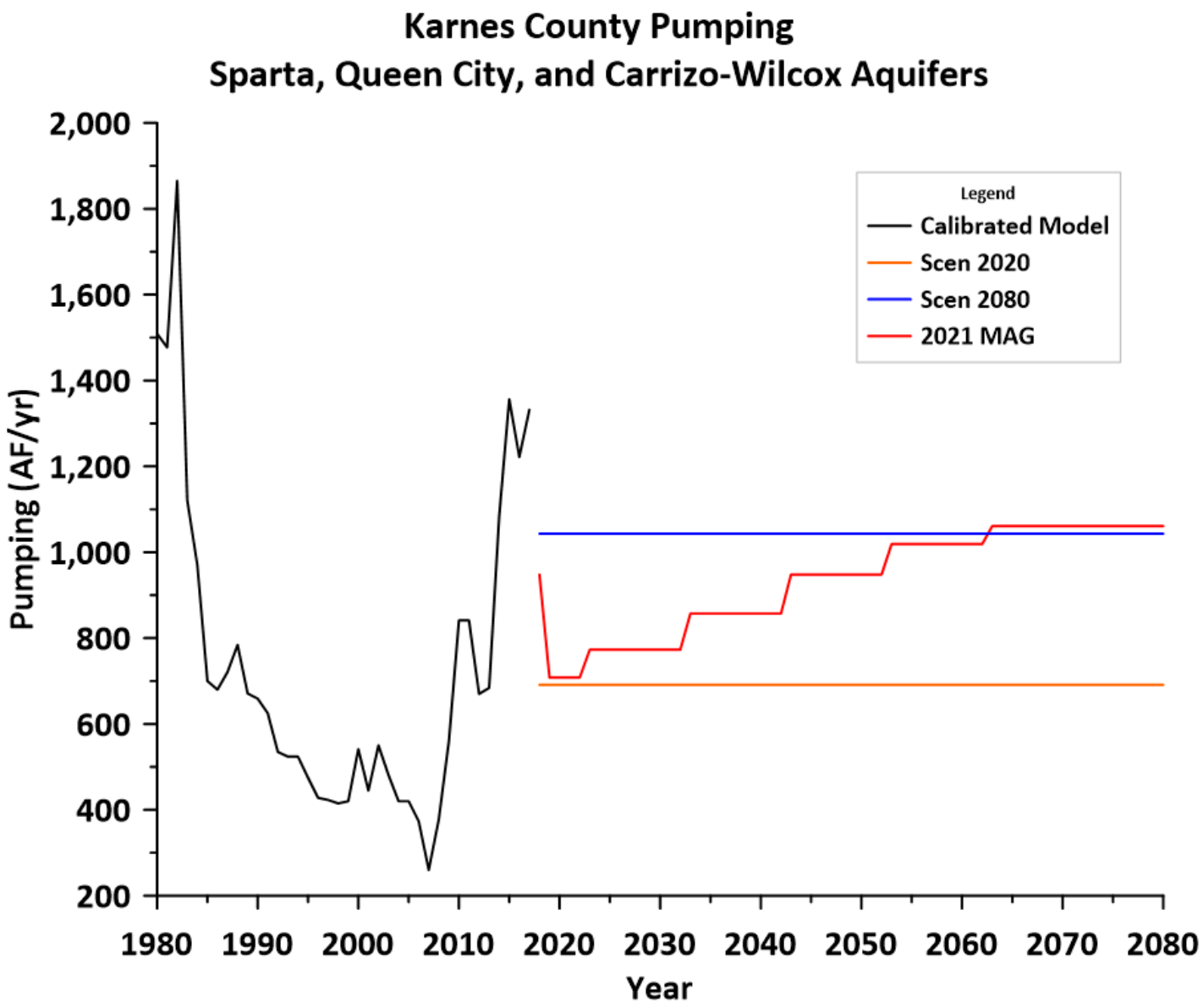

Caldwell County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
60,000
50,000
40,000
30,000
20,000
10,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG

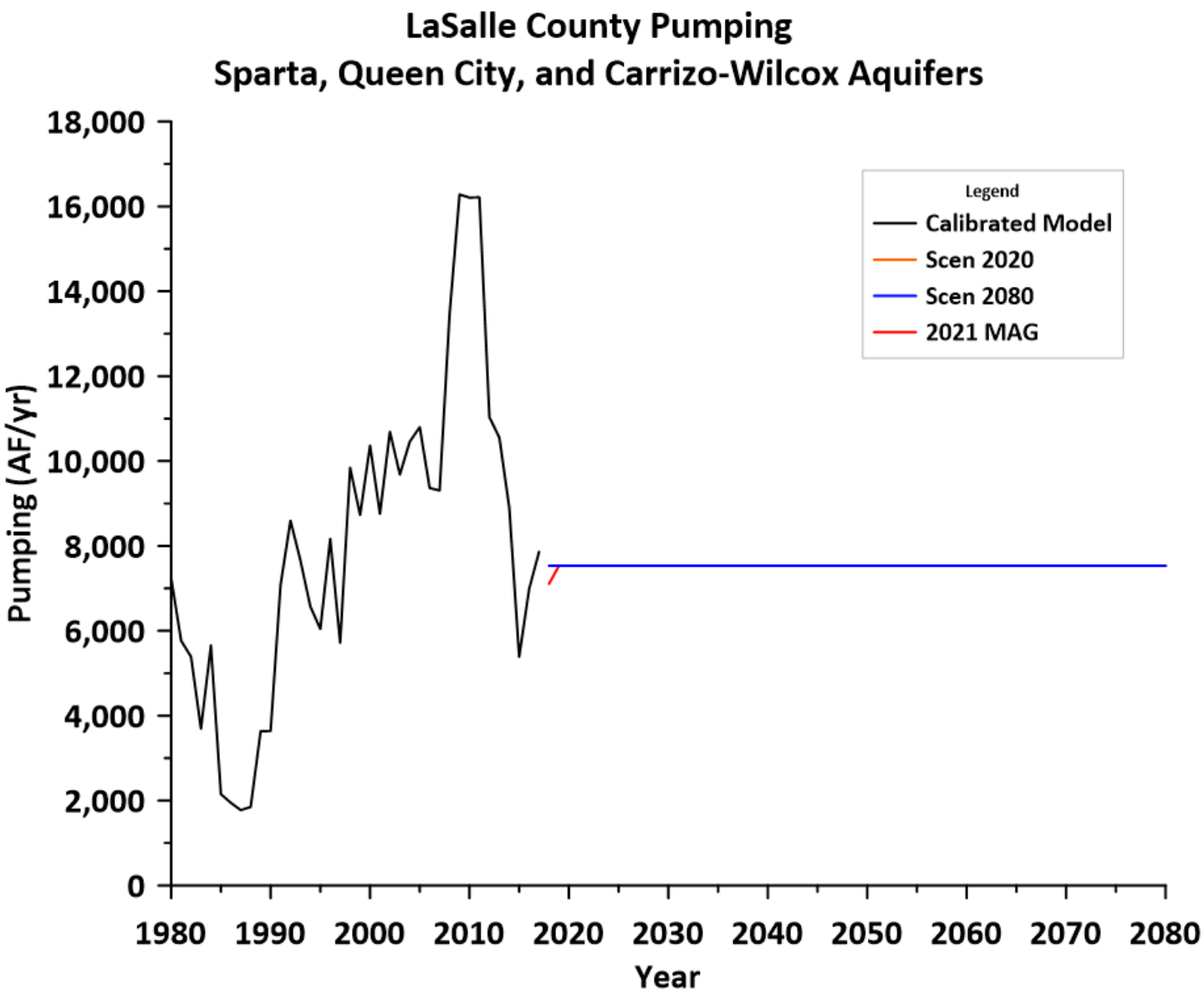

Dimmit County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG

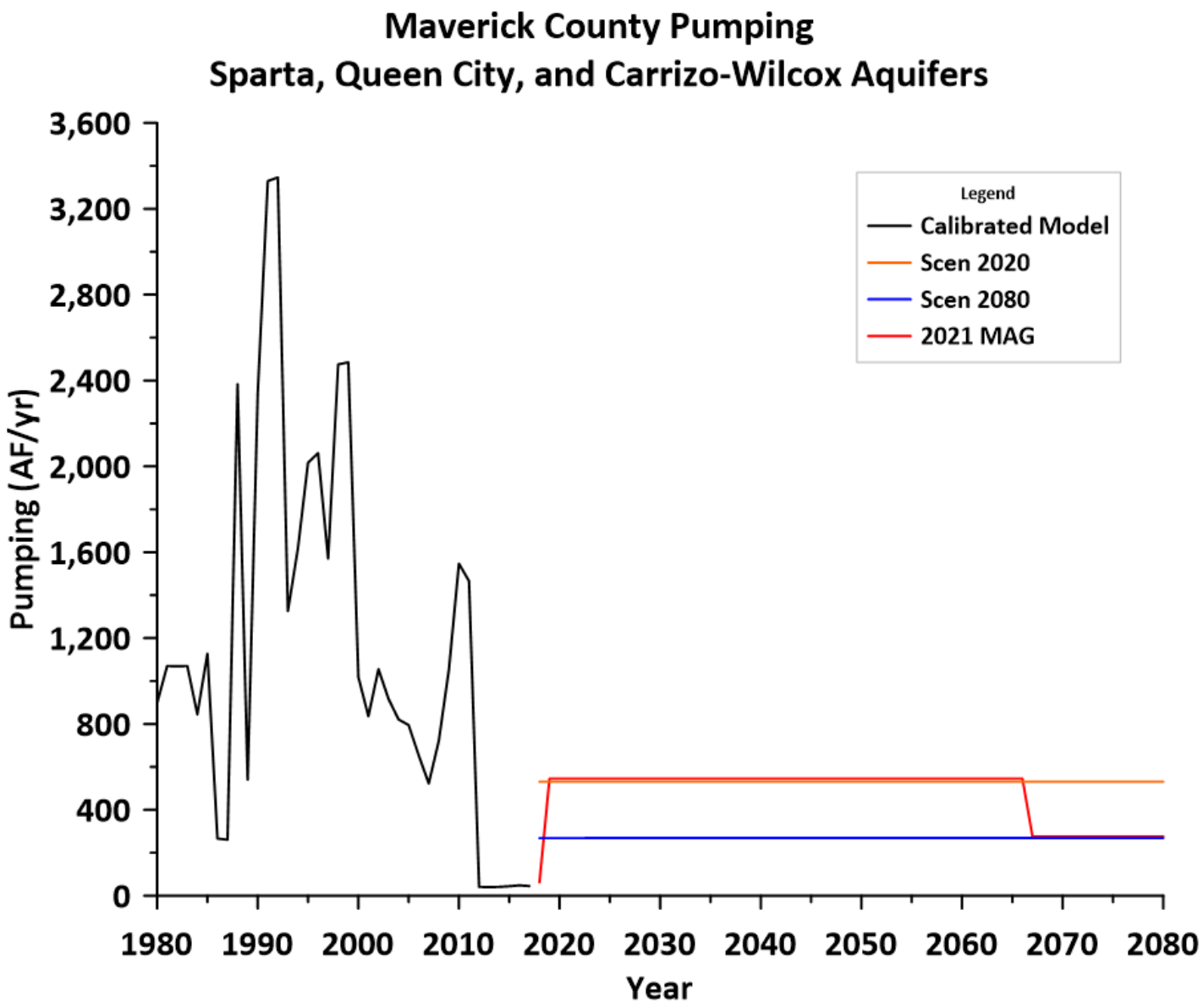

Frio County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
220,000
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG

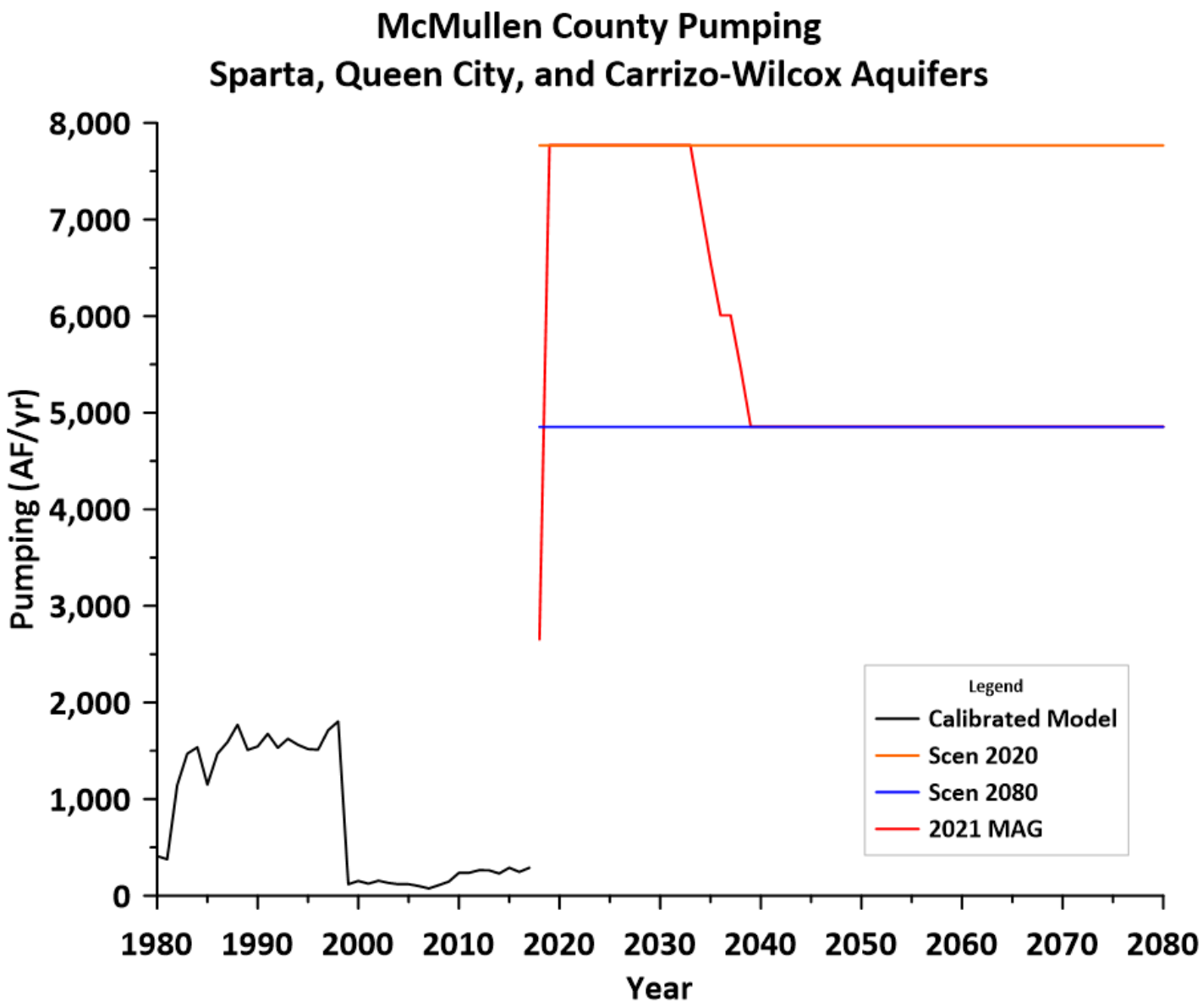

Gonzales County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
120,000
100,000
80,000
60,000
40,000
20,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG

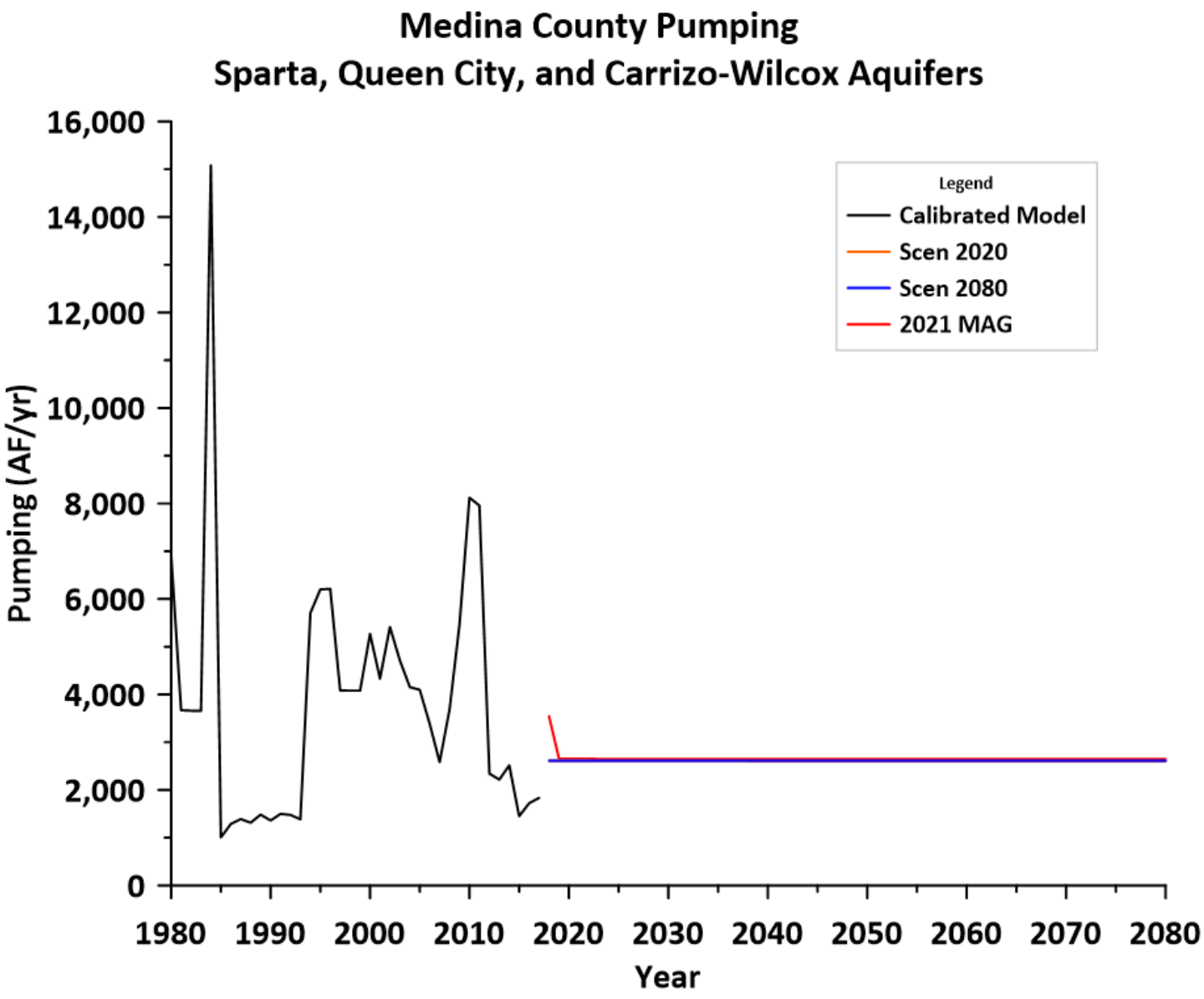

Guadalupe County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
60,000
50,000
40,000
30,000
20,000
10,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Karnes County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


LaSalle County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Maverick County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
3,600
3,200
2,800
2,400
2,000
1,600
1,200
800
400
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


McMullen County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Medina County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
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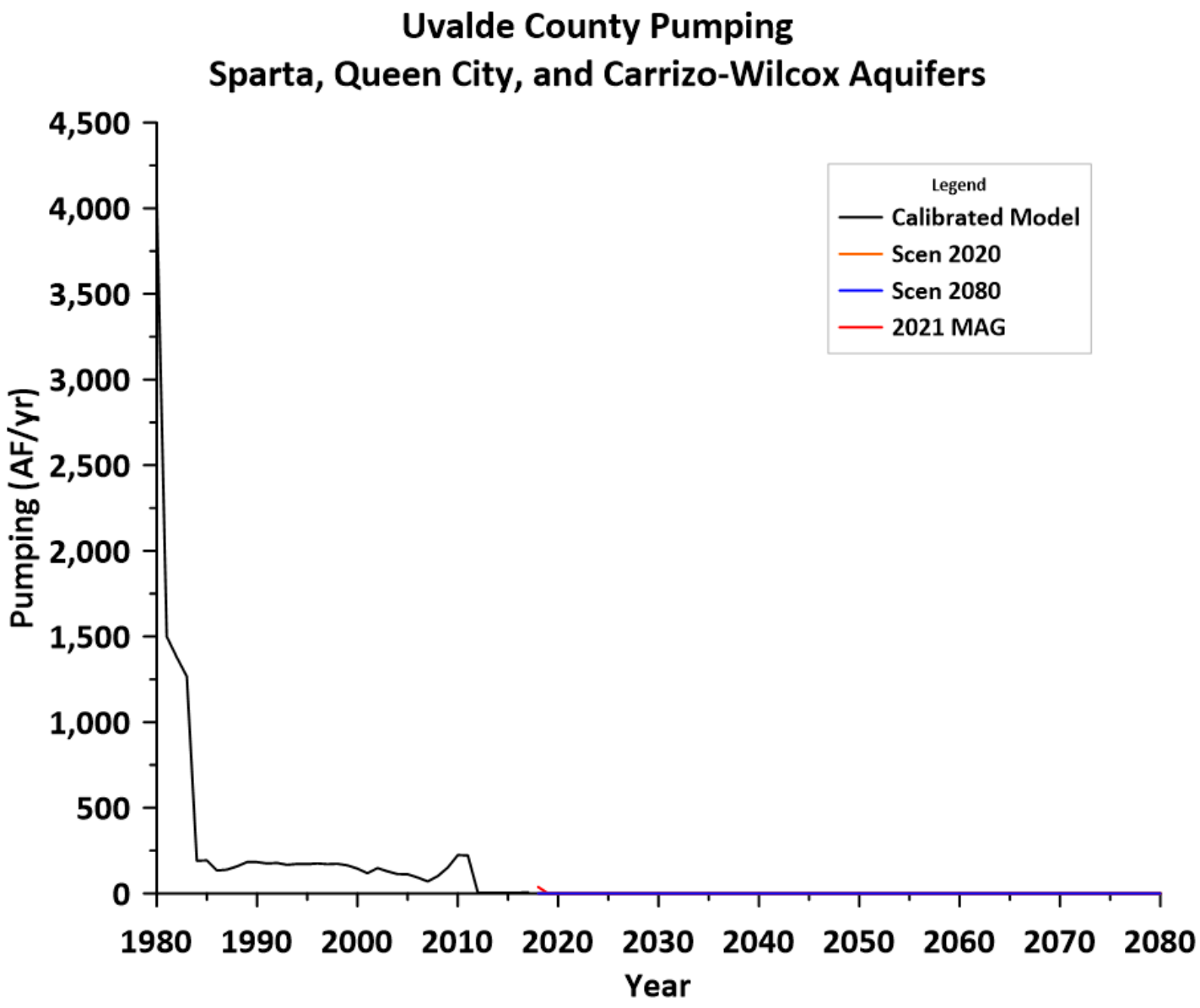
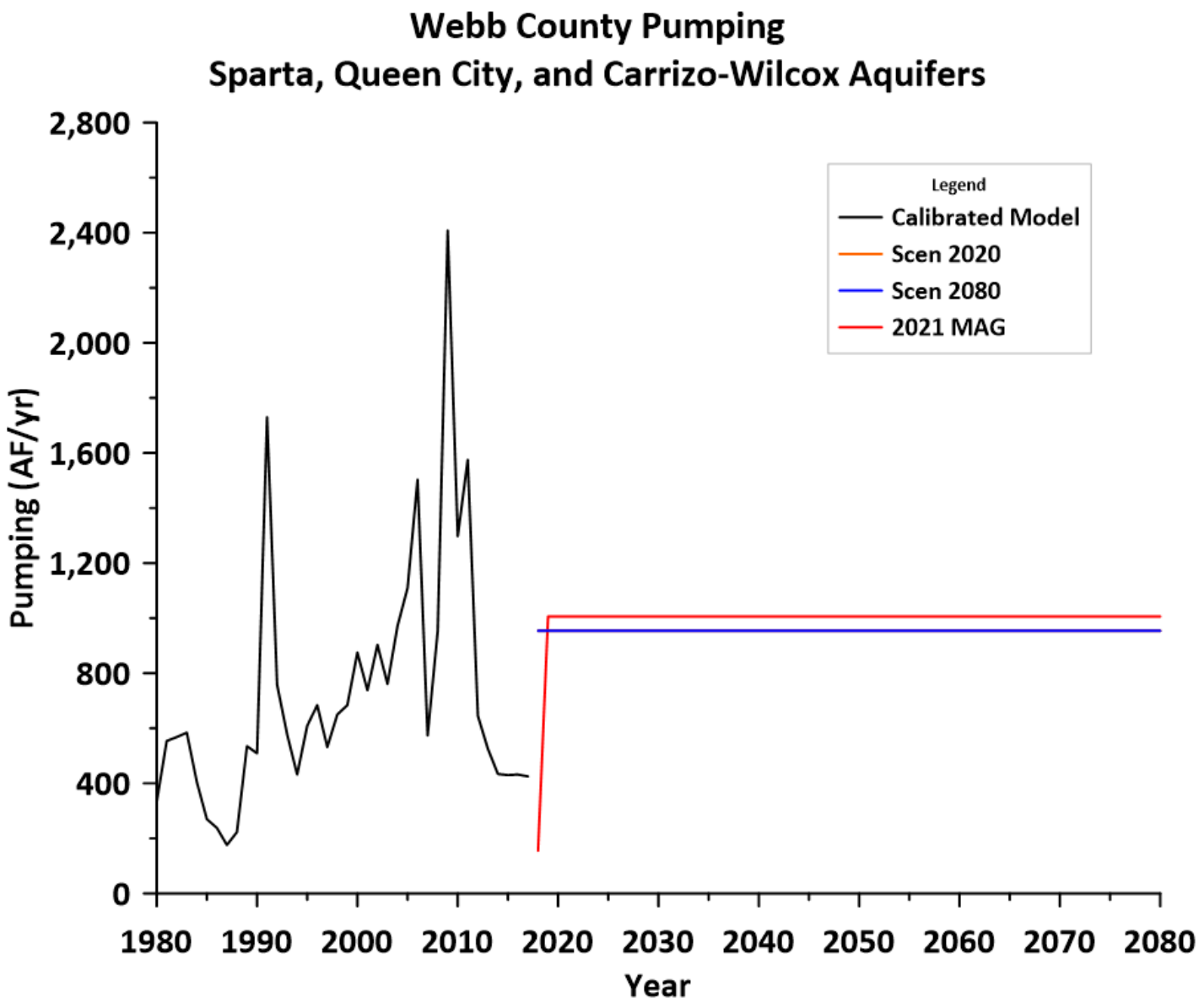
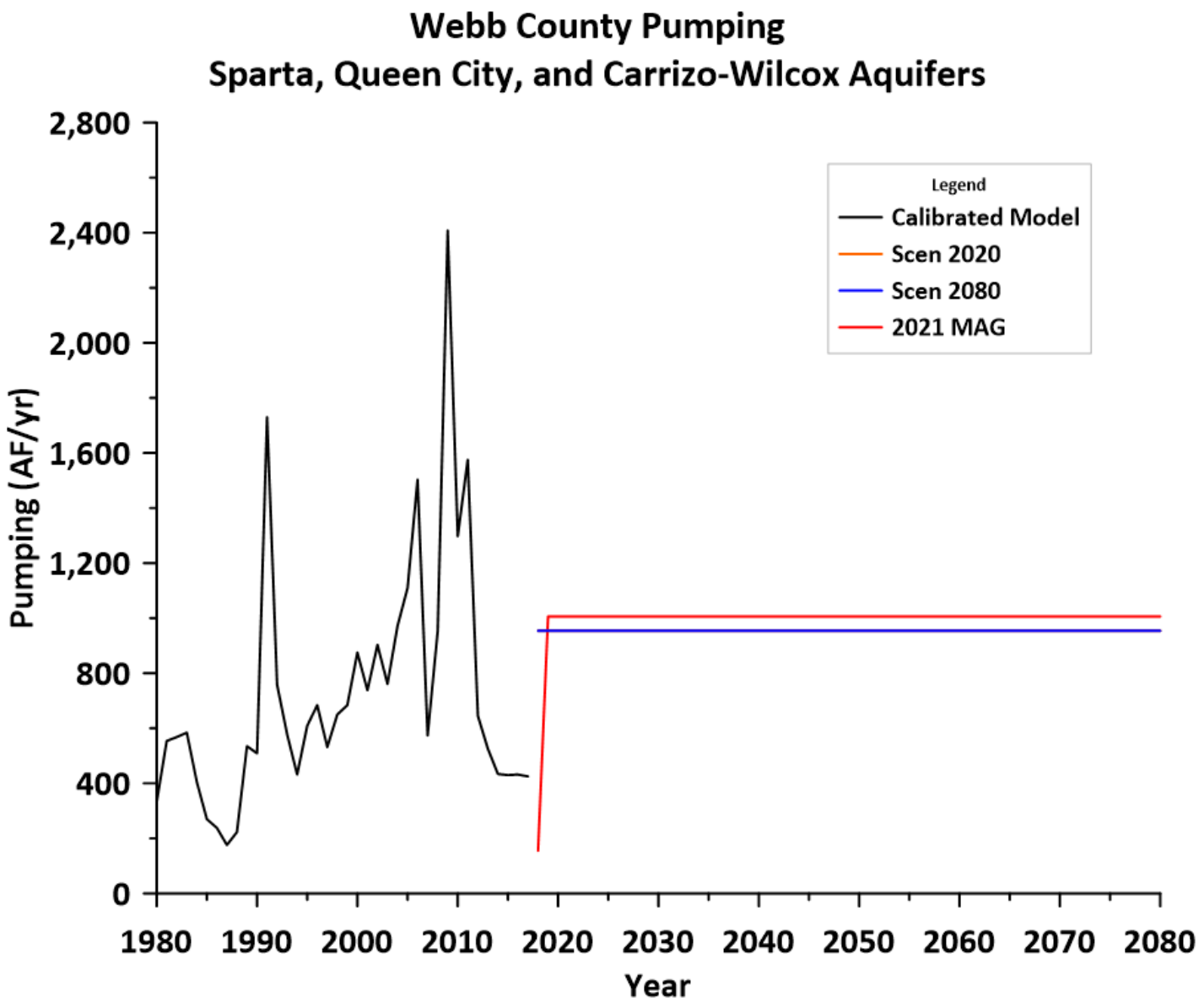
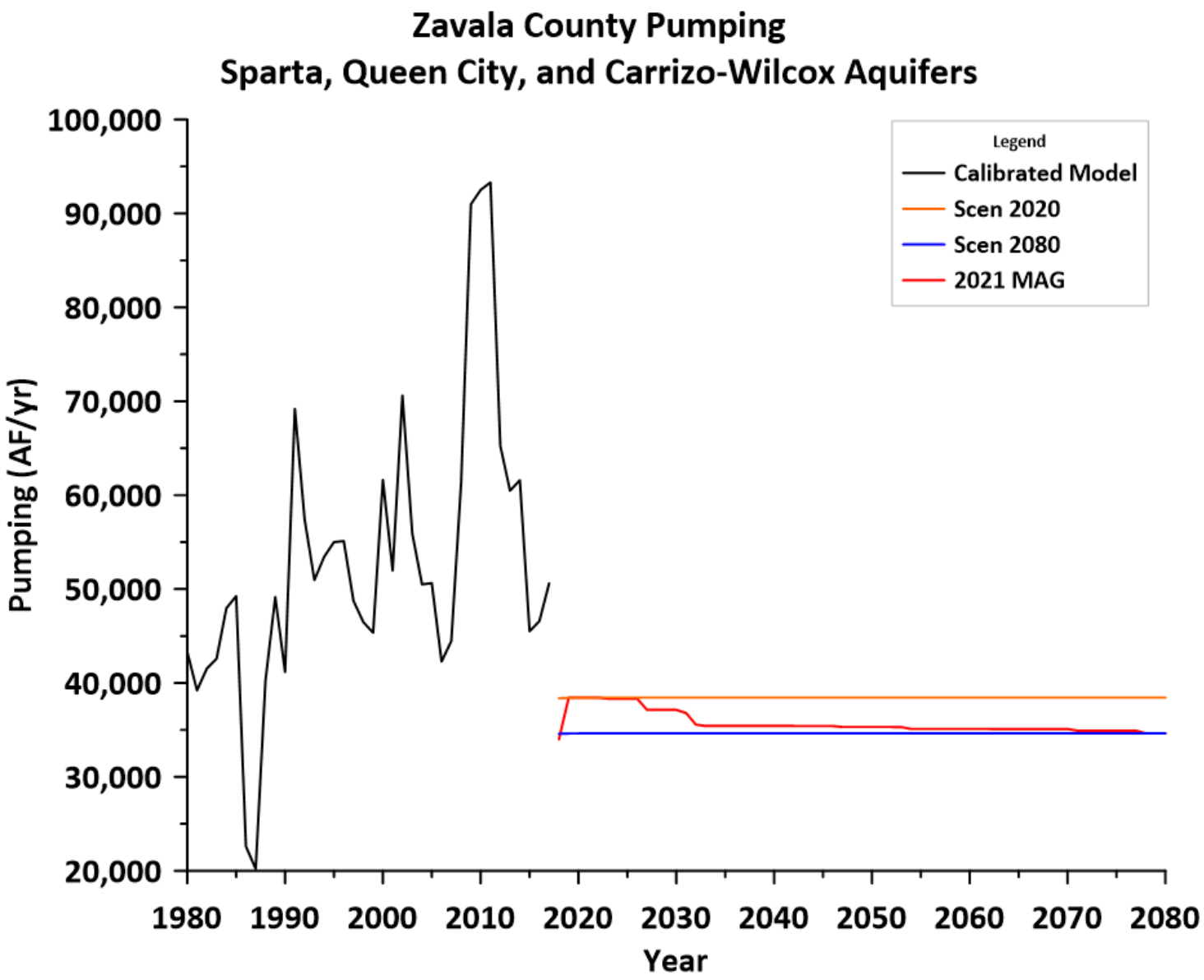
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Uvalde County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Webb County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
2,800
2,400
2,000
1,600
1,200
800
400
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Webb County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Pumping (AF/yr)
2,800
2,400
2,000
1,600
1,200
800
400
0
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG


Zavala County Pumping
Sparta, Queen City, and Carrizo-Wilcox Aquifers
Legend
Calibrated Model
Scen 2020
Scen 2080
2021 MAG
Pumping (AF/yr)
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year

Technical Memorandum 5

Calculation of Future Pumping from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model

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January 31, 2023

Professional Engineer and Professional Geoscientist Seals

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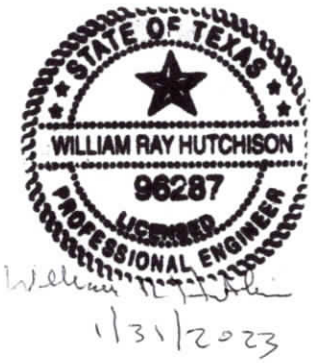

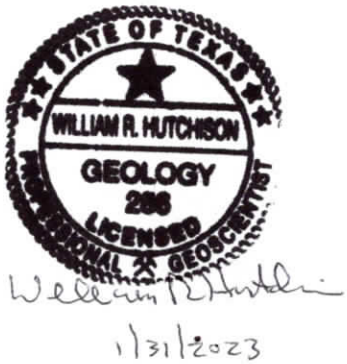

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1.0 Executive Summary

The simulations completed for this technical memorandum involved adjusting pumping to achieve a target set of drawdowns. Initial pumping was the MAG calculated from the most recent joint planning process. The target drawdowns were calculated from the DFC run of the simulation used to set the secondary DFC of GMA 13. Adjustments to pumping were completed on a county-aquifer basis using PEST (parameter estimation software that is an industry standard application).

In general, and as expected given the results of the simulations documented in Technical Memorandum 4, the new GAM suggests that the pumping higher than the existing MAG is required to meet the secondary DFC drawdown. Quantitatively matching the drawdowns leads to potentially unreasonable pumping amounts, which may point more to the limitations of the old GAM than to potential limitations of the new GAM. Please recall that the calculated pumping increases in PEST Simulation 4f were not as high the calculated pumping increases in PEST Simulation 3f. This was largely due to the elimination of Sparta and Queen City aquifer pumping adjustments in PEST Simulation 4f.

As discussed in the evaluation of Scenarios 3f and 4f, it appears that the persistent lowering of groundwater levels in the old GAM led to DFC drawdowns in some counties to be unreasonably low. However, initial public comments received on the new GAM include potential issues with:

- Calibration period pumping in some counties
- Transmissivity values in some areas
- Storativity/specific yield values in some areas

The results of these simulations (and the simulations associated with Technical Memorandum 4) are not dispositive with respect to addressing these issues. However, the results of these simulations are consistent with pointing to a potential issue with calibration pumping in the southwestern counties, and aquifer parameters in the Queen City Aquifer.

Additional analyses are needed to address the initial public comments, but these simulations provide a solid foundation for understanding the dynamics between variations in pumping and the resulting variation in groundwater levels.

The results of the simulations also point to the limitations of evaluating alternative DFCs in using a "project-centric" approach and provide a means to complete simulations in a "aquifer-availability" approach. It is recognized that the "project-centric" approach evolved during a time when DFCs and MAGs had different statutory meanings than they do today. Given the capabilities of the new GAM, it would be advisable to focus more on "aquifer-availability" simulations similar to those documented in the technical memorandum in the future.

2.0 Background

One of the uses of the updated Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers documented in the main report will be to support the Joint Planning Process that leads to the adoption of desired future conditions by the groundwater conservation districts in Groundwater Management Area 13 and the calculation of the modeled available groundwater by TWDB. As part of the work associated with developing the updated Groundwater Availability Model, five technical memoranda appear in the Appendix of the report:

- Technical Memorandum 1: Pumping Comparisons
- Technical Memorandum 2: Pumping Sensitivity
- Technical Memorandum 3: Recharge Sensitivity
- Technical Memorandum 4: Calculation of Drawdown from Existing Modeled Available Groundwater Using Updated Groundwater Availability Model
- Technical Memorandum 5: Calculation of Future Pumping from Existing Desired Future Conditions Using Updated Groundwater Availability Model

This technical memorandum summarizes the calculation of pumping necessary to achieve desired future conditions drawdown using the updated groundwater availability model.

3.0 Parameters and Assumptions

The simulations completed for this technical memorandum involved adjusting pumping to achieve a target set of drawdowns. Initial pumping was the MAG calculated from the most recent joint planning process. The target drawdowns were calculated from the DFC run of the simulation used to set the secondary DFC of GMA 13.

Adjustments to pumping were completed on a county-aquifer basis using PEST (parameter estimation software that is an industry standard application). Documentation of the approach to adjust pumping follows the documentation on the target drawdowns used and the calculation of drawdowns from the simulations.

3.1 Drawdown Calculations

3.1.1 Desired Future Condition Average Drawdown

GMA 13 adopted a "secondary" DFC for the Sparta, Queen City, and Carrizo-Wilcox aquifers in GMA 13: average drawdown of 49 feet (+/- 5 feet) for all of GMA 13. The drawdown is calculated from the end of 2012 conditions through the year 2080. Furnans and Keester (2022, pp. 14-15) reported that the desired future condition is consistent with simulation "GMA13_2019_001" summarized during a meeting of Groundwater Management Area 13 members on March 19, 2021.

Documentation from Furnans (2022) inconsistently reported the starting date for drawdown calculations as 2000 and 2012, and only reported drawdowns through 2070. Furnans and Keester (2022) reported the drawdown calculations as 2012, and only reported drawdowns through 2070. Wade (2022) subsequently clarified that the intent was to use 2011 as the starting point for drawdown calculations but did not report the drawdown values for 2080 as part of her MAG report.

In order to have a consistent set of drawdown calculations through 2080 that used 2011 as a starting point to compare with the drawdown calculations of the predictive simulations, the FORTRAN program *getddtarget.exe* was written to calculate average drawdowns for county-model layer and county-aquifer units through 2080 using the output from Furnans (2022) and Furnans and Keester (2022) designated as "GMA13_2019_001". A summary of 2011 to 2080 average drawdown is presented in Table 1, which provides some additional information (i.e. average drawdowns for each county-aquifer unit) that can be useful to evaluate the predictive drawdowns from the new GAM with similar pumping assumptions.

The overall average drawdown estimate that includes the two aquitard units is consistent with the documentation provided in Wade (2022). Please note that the overall average drawdown for GMA 13 from this calculation is about 54 feet, which is consistent with the "secondary" DFC of 49 feet (+/- 5 feet) as adopted by GMA 13.

Table 1. Summary of Average Drawdown in feet (2011 to 2080) for DFC Simulations

County	Sparta	Queen City	Carrizo-Wilcox	Overall Aquifer	Overall*
Atascosa	15.28	24.11	131.87	104.63	94.93
Bexar	-	0.00	109.04	109.04	107.92
Caldwell	-	91.79	52.82	53.59	51.55
Dimmit	-	-	-4.63	-4.63	-4.60
Frio	5.37	-1.97	56.00	46.89	43.51
Gonzales	21.29	26.57	169.56	144.34	127.35
Guadalupe	0.00	**	143.92	143.72	139.24
Karnes	0.00	0.00	202.53	202.53	185.58
LaSalle	2.40	17.90	16.24	16.11	17.43
Maverick	-	-	-12.36	-12.36	-12.16
McMullen	26.24	39.64	46.11	45.34	48.00
Medina	-	-	30.75	30.75	30.68
Uvalde	-	-	15.79	15.79	15.79
Webb	-	-	-4.28	-4.28	-4.90
Wilson	11.58	19.89	241.79	204.79	178.64
Zavala	-	-	13.45	13.45	10.23
GMA13	14.38	19.41	62.29	58.54	53.57

* Overall includes Weches and Reklaw aquitards

** Queen City in Guadalupe County is only one cell in new GAM, calculations ignored

3.1.2 Scenario Drawdown

The program named *getddpest.exe* was written to calculate county-aquifer drawdowns in 2080 that were used to compare with the targets. Output from this FORTRAN program is named *scen2020ddlist.dat* and is compared to the DFC drawdown targets in accordance with the PEST instruction file named *scendd.ins*.

Table 2 presents *scenddlist.dat* plus additional identifying information for each county-aquifer unit pertinent to this analysis:

- County Code (used by TWDB in model grid file)
- County Name
- Aquifer (i.e. Sparta, Queen City, or Carrizo-Wilcox)
- New GAM Layers (please note that Carrizo-Wilcox is covered by three layers)
- PEST Observation Number (used in PEST to identify target drawdown)
- Plotting Code (consists of first two letters of county name followed by aquifer designation of either one or two letters). These are used to assist in the interpretation of cross-plots of drawdown (DFC vs scenario).

Table 2. County-Aquifer Drawdown Summary Information

County Code	County Name	Aquifer	New GAM Layers	PEST Obervation Number	Plotting Code
7	Atascosa	Sparta	3	o1	ATS
7	Atascosa	Queen City	5	o2	ATQ
7	Atascosa	Carrizo-Wilcox	7, 8, and 9	o3	ATCW
15	Bexar	Carrizo-Wilcox	7, 8, and 9	o4	BECW
28	Caldwell	Queen City	5	o5	CAQ
28	Caldwell	Carrizo-Wilcox	7, 8, and 9	o6	CACW
64	Dimmit	Queen City	5	o7	DIQ
64	Dimmit	Carrizo-Wilcox	7, 8, and 9	o8	DICW
82	Frio	Sparta	3	o9	FRS
82	Frio	Queen City	5	o10	FRQ
82	Frio	Carrizo-Wilcox	7, 8, and 9	o11	FRCW
89	Gonzales	Sparta	3	o12	GOS
89	Gonzales	Queen City	5	o13	GOQ
89	Gonzales	Carrizo-Wilcox	7, 8, and 9	o14	GOCW
94	Guadalupe	Queen City	5	o15	GUQ
94	Guadalupe	Carrizo-Wilcox	7, 8, and 9	o16	GUCW
128	Karnes	Queen City	5	o17	KAQ
128	Karnes	Carrizo-Wilcox	7, 8, and 9	o18	KACW
139	LaSalle	Sparta	3	o19	LAS
139	LaSalle	Queen City	5	o20	LAQ
139	LaSalle	Carrizo-Wilcox	7, 8, and 9	o21	LACW
159	Maverick	Carrizo-Wilcox	7, 8, and 9	o22	MACW
162	McMullen	Sparta	3	o23	MCS
162	McMullen	Queen City	5	o24	MCQ
162	McMullen	Carrizo-Wilcox	7, 8, and 9	o25	MCCW
163	Medina	Carrizo-Wilcox	7, 8, and 9	o26	MECW
232	Uvalde	Carrizo-Wilcox	7, 8, and 9	o27	UVCW
240	Webb	Queen City	5	o28	WEQ
240	Webb	Carrizo-Wilcox	7, 8, and 9	o29	WECW
247	Wilson	Sparta	3	o30	WIS
247	Wilson	Queen City	5	o31	WIQ
247	Wilson	Carrizo-Wilcox	7, 8, and 9	o32	WICW
254	Zavala	Queen City	5	o33	ZAQ
254	Zavala	Carrizo-Wilcox	7, 8, and 9	o34	ZACW

3.2 Pumping

3.2.1 2080 Output Pumping from Scen2020

As documented in Technical Memorandum 4, two pumping scenarios were evaluated, one with that was based on MAG pumping from 2020 (Scen2020) and one that was based on MAG pumping from 2080 (Scen2080). For this analysis, the 2080 pumping from Scen2020 was used as the base pumping that was adjusted to match DFC targets.

The FORTRAN program *s2020pump.exe* was written to read the output pumping from 2080 pumping from Scen2020 (*2080pumpout.dat*) and summarize the county-layer pumping in both list format (*sumpump2080list.dat*) and array format (*sumpump2080array.dat*). Table 3 presents the output in array format.

Table 3. 2080 County-Layer Pumping from Scen2020

County Code	County Name	Pumping (AF/yr)				
		Layer 3	Layer 5	Layer 7	Layer 8	Layer 9
7	Atascosa	900	3,770	48,590	154	1,180
15	Bexar	0	0	17,132	56	25,655
28	Caldwell	0	3,726	439	3,625	11,823
64	Dimmit	0	0	3,880	205	38
82	Frio	791	5,680	110,390	0	0
89	Gonzales	3,551	5,058	47,514	9,547	0
94	Guadalupe	0	0	7,366	2,782	17,442
128	Karnes	0	0	691	0	0
139	LaSalle	986	12	6,536	0	0
159	Maverick	0	0	527	2	2
162	McMullen	0	0	7,767	0	0
163	Medina	0	0	512	1,247	847
232	Uvalde	0	0	0	0	0
240	Webb	44	0	909	1	0
247	Wilson	442	2,552	34,690	113	1,417
254	Zavala	0	0	34,502	3,610	328

3.2.2 Scenario Pumping Adjustments

The FORTRAN program *ScenWEL.exe* was written to adjust the base pumping and write an updated WEL file. The program:

- Reads a list of county names (and codes)
- Reads the factors that adjust pumping on a county-layer basis (PEST updates the factors during the simulations)

- Reads the 2080 output pumping from Scen2020 (*2080pumpout.dat*) and applies the adjustment factors to each cell based on the county-layer factors
- Writes an updated list of base pumping and adjusted pumping on a county-layer basis (*pumporigadj.dat*)
- Reads the text portion of the WEL file
- Writes a WEL file (*ScenMAG.wel*)

The baseline *pumporigadj.dat* file is presented in Table 4.

Please note that these values are the input pumping that may be reduced during the simulation as a result of inadequate saturated thickness. Details of the output pumping are provided in the results section.

Table 4. Baseline *pumporigadj.dat* File

County Code	County Name	Layer	Base Pumping (AF/yr)	Adjustment Factor	Scenario Pumping (AF/yr)
7	Atascosa	3	900	1.00	900
7	Atascosa	5	3,770	1.00	3,770
7	Atascosa	7	48,590	1.00	48,590
7	Atascosa	8	154	1.00	154
7	Atascosa	9	1,180	1.00	1,180
15	Bexar	7	17,132	1.00	17,132
15	Bexar	8	56	1.00	56
15	Bexar	9	25,655	1.00	25,655
28	Caldwell	5	3,726	1.00	3,726
28	Caldwell	7	439	1.00	439
28	Caldwell	8	3,625	1.00	3,625
28	Caldwell	9	11,823	1.00	11,823
64	Dimmit	7	3,880	1.00	3,880
64	Dimmit	8	205	1.00	205
64	Dimmit	9	38	1.00	38
82	Frio	3	791	1.00	791
82	Frio	5	5,680	1.00	5,680
82	Frio	7	110,390	1.00	110,390
89	Gonzales	3	3,551	1.00	3,551
89	Gonzales	5	5,058	1.00	5,058
89	Gonzales	7	47,514	1.00	47,514
89	Gonzales	8	9,547	1.00	9,547
94	Guadalupe	7	7,366	1.00	7,366
94	Guadalupe	8	2,782	1.00	2,782
94	Guadalupe	9	17,442	1.00	17,442
128	Karnes	7	691	1.00	691
139	LaSalle	3	986	1.00	986
139	LaSalle	5	12	1.00	12
139	LaSalle	7	6,536	1.00	6,536
159	Maverick	7	527	1.00	527
159	Maverick	8	2	1.00	2
159	Maverick	9	2	1.00	2
162	McMullen	7	7,767	1.00	7,767
163	Medina	7	512	1.00	512
163	Medina	8	1,247	1.00	1,247
163	Medina	9	847	1.00	847
240	Webb	3	44	1.00	44
240	Webb	7	909	1.00	909
240	Webb	8	1	1.00	1
247	Wilson	3	442	1.00	442
247	Wilson	5	2,552	1.00	2,552
247	Wilson	7	34,690	1.00	34,690
247	Wilson	8	113	1.00	113
247	Wilson	9	1,417	1.00	1,417
254	Zavala	7	34,502	1.00	34,502
254	Zavala	8	3,610	1.00	3,610
254	Zavala	9	328	1.00	328

3.3 Model Files

3.3.1 Files Unchanged from Calibrated Model

Table 5 presents the model files that were unchanged from the calibration run of the model.

Table 5. Model Files Unchanged from Calibrated Model

File Name	File Date	Description
GMA13_Historical_Period_Calibration._kx	5/10/2022	Horizontal hydraulic conductivity
GMA13_Historical_Period_Calibration._kz	5/10/2022	Vertical hydraulic conductivity
GMA13_Historical_Period_Calibration._ss	5/10/2022	Specific storage
GMA13_Historical_Period_Calibration._sy	5/10/2022	Specific yield
GMA13_Historical_Period_Calibration.dis	5/10/2022	Discretization
GMA13_Historical_Period_Calibration.hfb	5/10/2022	Horizontal fflow barrier
GMA13_Historical_Period_Calibration.ims	5/10/2022	Solver
GMA13_Historical_Period_Calibration.npf	5/10/2022	Node property flow

3.3.2 Files Modified from the Calibrated Model

Table 6 presents the model files that were modified from the calibration run of the model in order to run the predictive simulations. The pumping files were discussed earlier.

Table 6. Model Files Modified from the Calibrated Model

File Name	File Date	Description
calsp39hds.dat	5/27/2022	Starting heads
mfsim.nam	5/27/2022	Simulation name file
pred.evt	5/25/2022	Evapotranspiration
pred.ghb	5/25/2022	General head boundary
pred.ic6	5/27/2022	Initial condition file
pred.oc6	5/26/2022	Output control
pred.riv	5/25/2022	River
pred.sto	5/25/2022	Storage
pred.tdis	5/25/2022	Time discretization
predbase.nam	5/26/2022	GWF Model name file

The modifications were generally associated with using the final stress period from the calibrated model and holding all parameters constant for the sensitivity simulation, which was run from 2018 to 2080 (63 stress periods). Modifications also included updating the file names for the simulations.

Please note that no recharge file is listed above. It was not part of the general group of modified files and not included in this directory. The recharge file for both scenarios was the average annual recharge as defined in the steady state version of the calibration model (*scen3.rch*) as documented in Technical Memorandum 3.

4.0 Methods and Results

As noted above, the objective of the simulations documented in this technical memorandum was to use PEST to adjust pumping in an attempt to match drawdowns on a county-layer basis to the DFC drawdowns. PEST calculates the difference between a simulation county-layer drawdown and a DFC drawdown for the same county-layer unit. The difference is squared for each target, and the sum of all the squared differences (i.e. all county-layer units) is the PEST "objective function" called *phi*.

The PEST simulations completed for this effort are documented below. All files are included in the directory *Model*.

4.1 PEST Simulation 1

The initial simulation PEST input file is named *MAGSim01.pst*. The initial pumping adjustment factors were all set to 1.0, with a variation rage set between 0.0001 and 10.00. Please note that prior to running the first simulation, a test run with zero PEST iterations was run to verify that all file connections and names were correct (*MAGSim01-0.pst*). The number of adjustable county-layer pumping factors for this simulation was 41, and there were 34 target drawdowns.

After a single PEST iteration, it was noticed that the Sparta Aquifer pumping in Webb County had no impact on the simulation. Also, an input error in the initial factor for the layer 7 factor in Bexar County was discovered. Consequently, the simulation was terminated after one PEST iteration.

The initial *phi* was 194,764. After a single PEST iteration, the *phi* was lowered to 59,389. The summary output file for this simulation is *magsim01.rec*.

4.2 PEST Simulation 2

Simulation 2 (*MAGSim02.pst*) used the factors from Simulation 1 as input and fixed the factor for Layer 3 in Webb County at 1.0. Thus, the number of adjustable county-layer pumping factors for this simulation was 40, and there were 34 target drawdowns. The initial *phi* for this simulation was 59,921 (slightly different than the end *phi* of Simulation1 due to corrections to the input file noted earlier).

After five PEST iterations and 416 model runs, *phi* had been reduced to 37,903. However, the pumping adjustment factor for several county-layer units had reach the pre-defined limit of 10, suggesting that pumping needed to be higher in order to better match the target drawdowns. The simulation was terminated after the fifth PEST iteration to modify the pumping factor limits. The summary output for this simulation is *magsim02.rec*.

4.3 PEST Simulation 3

Simulation 3 (*MAGSim03.pst*) used the final factors from Simulation 2 as input. Pumping limits were also increased to 100 for eight county-layer units based on the results of Simulation 2. As in

PEST simulation 2, the number of adjustable county-layer pumping factors for this simulation was 40, and there were 34 target drawdowns. The initial *phi* for this simulation was 37,904 (essentially the same as the end *phi* of Simulation 2 considering rounding errors associated with factor specification in the input file).

After four PEST iterations and 333 model runs, the *phi* had lowered to 30,546. Pumping factors were at the limits for five county-aquifer units. The minor lowering of *phi* suggested that further improvement in *phi* with additional factor limit adjustments would not be useful, especially given the fact that pumping amounts in some county-layer units were potentially unreasonable.

The PEST simulation was terminated after four PEST iterations. The summary output for this simulation is *magsim03.rec*.

4.4 PEST Simulation 3f

To obtain a clean set of output files, a final run of PEST Simulation 3 (*MAGSim03f.pst*) was run using the pumping factors from the fourth PEST iteration of Simulation 3. The PEST input file was modified to complete zero iterations to obtain the drawdown comparison with pumping adjustments at the end of PEST Simulation 3. The output file for this simulation is *magsim03f.rec*.

The initial (and final) *phi* for this simulation was 30,643 (essentially the same as the end *phi* of Simulation 3 considering rounding errors associated with factor specification in the input file).

4.4.1 Drawdown Results

Drawdown calculations for this simulation were obtained from the FORTRAN program *getdd3f.exe*. Summary drawdown results are summarized in Table 7 and Figure 1. Please note that the county-aquifer plotting code in Table 7 appears as point labels in Figure 1 to denote the county-aquifer unit represented by each point. Also please note that a one-to-one line is plotted to facilitate comparison of the average drawdowns between the two simulations:

- A point that lies on the line represents the same average drawdown in both simulations
- A point that lies above or to the left of the line represents an average drawdown in Scenario 3f that is higher than the DFC average drawdown
- A point that lies below or to the right of the line represents an average drawdown in Scenario 3f that is lower than the DFC average drawdown

Please note that most of the points that are furthest away from the line are in the Queen City Aquifer. Because the Carrizo-Wilcox Aquifer has a higher significance in the context of the groundwater planning and management to the groundwater conservation districts in Groundwater Management Area 13, these results suggested that an additional simulation that focused only on the Carrizo-Wilcox may be useful to provide further insight.

Table 7. Drawdown Comparison: DFC and Scenario 3f

County Code	County Name	Aquifer	New GAM Layers	PEST Obervation Number	Plotting Code	Drawdown (ft)	
						DFC	Scenario 3f
7	Atascosa	Sparta	3	o1	ATS	21	28
7	Atascosa	Queen City	5	o2	ATQ	86	93
7	Atascosa	Carrizo-Wilcox	7, 8, and 9	o3	ATCW	127	115
15	Bexar	Carrizo-Wilcox	7, 8, and 9	o4	BECW	107	107
28	Caldwell	Queen City	5	o5	CAQ	24	32
28	Caldwell	Carrizo-Wilcox	7, 8, and 9	o6	CACW	45	49
64	Dimmit	Queen City	5	o7	DIQ	-4	0
64	Dimmit	Carrizo-Wilcox	7, 8, and 9	o8	DICW	-5	-7
82	Frio	Sparta	3	o9	FRS	6	6
82	Frio	Queen City	5	o10	FRQ	36	49
82	Frio	Carrizo-Wilcox	7, 8, and 9	o11	FRCW	53	34
89	Gonzales	Sparta	3	o12	GOS	23	20
89	Gonzales	Queen City	5	o13	GOQ	85	61
89	Gonzales	Carrizo-Wilcox	7, 8, and 9	o14	GOCW	181	176
94	Guadalupe	Queen City	5	o15	GUQ	6	111
94	Guadalupe	Carrizo-Wilcox	7, 8, and 9	o16	GUCW	147	106
128	Karnes	Queen City	5	o17	KAQ	118	19
128	Karnes	Carrizo-Wilcox	7, 8, and 9	o18	KACW	214	221
139	LaSalle	Sparta	3	o19	LAS	11	0
139	LaSalle	Queen City	5	o20	LAQ	23	4
139	LaSalle	Carrizo-Wilcox	7, 8, and 9	o21	LACW	11	6
159	Maverick	Carrizo-Wilcox	7, 8, and 9	o22	MACW	-13	1
162	McMullen	Sparta	3	o23	MCS	33	0
162	McMullen	Queen City	5	o24	MCQ	64	6
162	McMullen	Carrizo-Wilcox	7, 8, and 9	o25	MCCW	34	53
163	Medina	Carrizo-Wilcox	7, 8, and 9	o26	MECW	31	34
232	Uvalde	Carrizo-Wilcox	7, 8, and 9	o27	UVCW	18	5
240	Webb	Queen City	5	o28	WEQ	-7	1
240	Webb	Carrizo-Wilcox	7, 8, and 9	o29	WECW	-4	18
247	Wilson	Sparta	3	o30	WIS	20	25
247	Wilson	Queen City	5	o31	WIQ	88	91
247	Wilson	Carrizo-Wilcox	7, 8, and 9	o32	WICW	269	249
254	Zavala	Queen City	5	o33	ZAQ	-5	-1
254	Zavala	Carrizo-Wilcox	7, 8, and 9	o34	ZACW	14	17

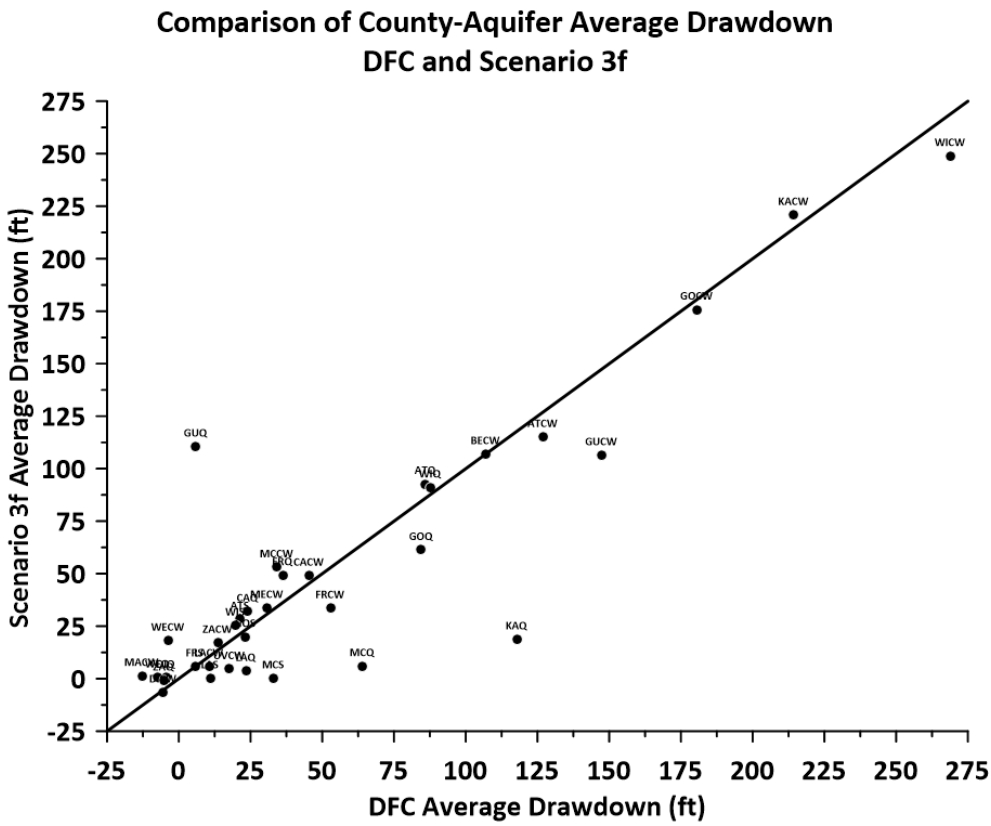


Figure 1. Drawdown Comparison: DFC and Scenario 3f

4.4.2 Pumping Results

Output pumping calculations for this simulation were obtained from the FORTRAN program *getpump3f.exe*. Summary pumping results are summarized in Table 8 and Figure 2. Please note that, for purposes of this summary, all pumping (Sparta, Queen City, and Sparta) is included in the summary table, although the detailed output from *getpump3f.exe* includes detailed pumping for the outcrop area, downdip area, and total pumping for each aquifer.

Please note that the pumping in Figure 2 is plotted on a logarithmic scale to facilitate comparisons across all counties. A comparison plot using linear axes clusters low pumping counties near the origin and makes it difficult to visualize where pumping is above or below the one-to-one line. The one-to-one line can be used compare MAG pumping and scenario pumping as follows:

- A point that lies on the line represents the same pumping in both simulations
- A point that lies above or to the left of the line represents scenario pumping higher than MAG pumping
- A point that lies below or to the right of the line represents scenario pumping lower than MAG pumping

Table 8. Pumping Comparison: MAG and Scenario 3f

County	Plotting Code	Pumping (AF/yr)	
		MAG	Scenario 3f
Atascosa	AT	65,217	147,815
Bexar	BE	67,849	306,953
Caldwell	CA	53,893	18,359
Dimmit	DI	4,124	1,218
Frio	FR	83,311	152,468
Gonzales	GO	103,653	801,185
Guadalupe	GU	40,519	33,472
Karnes	KA	1,061	14,631
LaSalle	LA	7,534	1,425
Maverick	MA	276	123
McMullen	MC	4,856	30
Medina	ME	2,646	10,537
Uvalde	UV	0	0
Webb	WE	1,006	64
Wilson	WI	127,461	375,541
Zavala	ZA	34,634	60,466
GMA 13	GMA	598,040	1,924,287

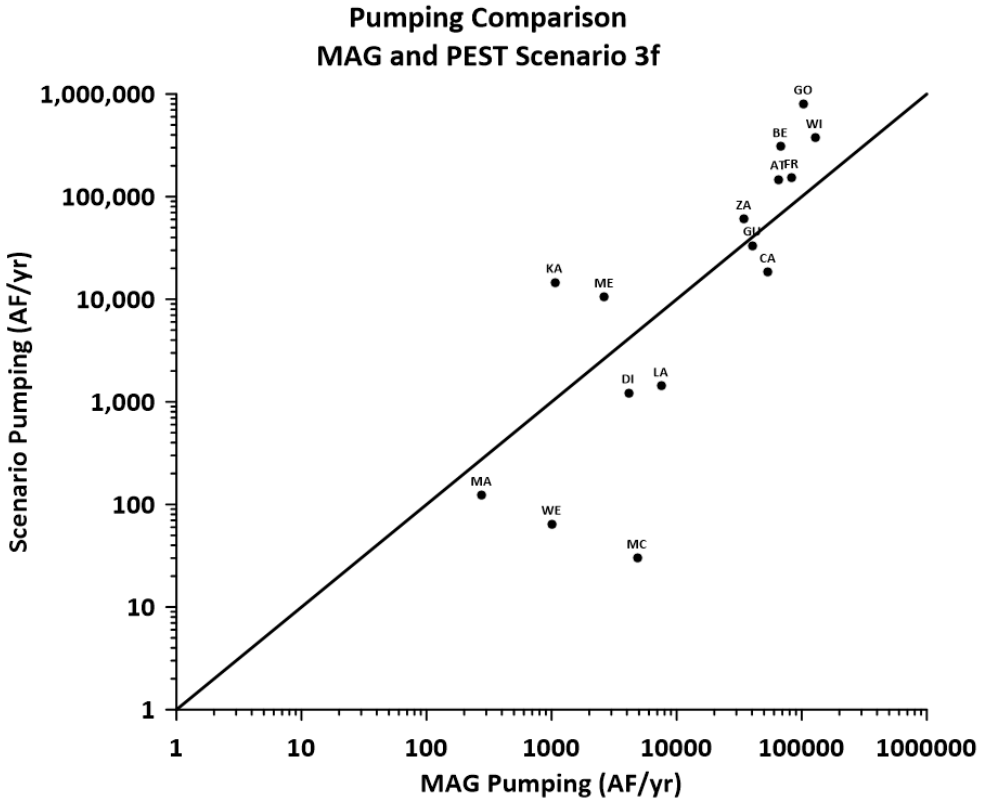


Figure 2. Pumping Comparison: MAG and Scenario 3f

Please note that scenario pumping in some counties (e.g. Atascosa, Bexar, Gonzales, and Wilson counties) are significantly higher than the MAG pumping. Some of these pumping amounts might be considered unreasonable. It should be noted that the adjustments to pumping in this scenario were made with the objective of matching DFC drawdowns in these counties. To the extent that the DFC drawdowns were derived from the previous GAM which had a known limitation of persistently declining groundwater levels, even under scenarios of reduced pumping, it would be unreasonable to take the results literally. It is far more valuable to interpret the results that the large drawdowns associated with the current DFC may need reevaluation.

GMA 13 used a "project-centric" approach to establishing the DFCs beginning in the first round of joint planning (i.e. 2005 to 2010). GMA 13 continued this basic approach during the second and third rounds of joint planning. This approach involved identifying potential locations and amounts of future pumping, then running the model to estimate the average drawdown over county-aquifer, county-layer, district-aquifer, or district-layer units as well as over all of GMA 13. Critics of this approach have labeled it "reverse engineering" the DFCs. An alternative to this approach is develop simulations that focus more on a "aquifer-availability" approach. The new GAM appears to be more capable to complete aquifer-availability scenarios than the old GAM because the limitation of persistently lowering groundwater levels has been addressed in the new GAM.

One other related issue are the public comments received to date about perceived issues and/or errors of the new GAM related to specified transmissivity and storativity values. These simulations are useful, but not dispositive in resolving this issue. Although the drawdowns and pumping results demonstrate that the new GAM has less drawdown than the old GAM for a given pumping, it is not possible to clearly state that it represents a flaw in the new GAM. The results of Scenario 4f are useful to explore this issue further.

4.5 PEST Simulation 4

This simulation limited the drawdown to Carrizo-Wilcox Aquifer units and allowed pumping variations to the MAG only in Carrizo-Wilcox Aquifer units. From a drawdown target perspective, the weight to all Sparta Aquifer and Queen City Aquifer targets was set to 1.0E-06 to effectively remove them from the objective function. Pumping in all Sparta Aquifer and Queen City Aquifer county-layer units were fixed to MAG values. Thus, only Carrizo-Wilcox pumping was adjusted in an attempt to match Carrizo-Wilcox drawdown targets.

Simulation 4 (*MAGSim04.pst*) reset all initial pumping factors to 1.0. All pumping factor upper limits were set to 10. The number of adjustable county-layer pumping factors for this simulation was 30, and there were 34 target drawdowns with weighting adjusted as described above. The initial *phi* for this simulation was 154,374, which is different than the initial *phi* for Simulation 1 due to the effects of different weighting.

After four PEST iterations and 245 model runs, the *phi* had lowered to 10,350. Most of the improvement in *phi* was realized in the first PEST iteration. The minor lowering of *phi* in the last three PEST iterations suggested that further improvement in *phi* with additional factor limit

adjustments would not be useful. Therefore, the PEST simulation was terminated after four PEST iterations. The summary output for this simulation is *magsim04.rec*.

4.6 PEST Simulation 4f

To obtain a clean set of output files, a final run of PEST Simulation 4 (*MAGSim04f.pst*) was run using the pumping factors from the fourth PEST iteration of Simulation 4. The PEST input file was modified to complete zero iterations to obtain the drawdown comparison with pumping adjustments at the end of PEST Simulation 4. The output file for this simulation is *magsim04f.rec*.

The initial (and final) *phi* for this simulation was 10,220 (essentially the same as the end *phi* of Simulation 4 considering rounding errors associated with factor specification in the input file).

4.6.1 Drawdown Results

Drawdown calculations for this simulation were obtained from the FORTRAN program *getdd4f.exe*. Please recall that this simulation pumping adjustments and drawdown targets only focused on Carrizo-Wilcox units. Summary results for the Carrizo-Wilcox units are presented in Table 9 and Figure 3.

Please note that the county-aquifer plotting code in Table 9 appears as point labels in Figure 3 to denote the county-aquifer unit represented by each point. Also please note that a one-to-one line is plotted to facilitate comparison of the average drawdowns between the two simulations:

- A point that lies on the line represents the same average drawdown in both simulations
- A point that lies above or to the left of the line represents an average drawdown in Scenario 4f that is higher than the DFC average drawdown
- A point that lies below or to the right of the line represents an average drawdown in Scenario 4f that is lower than the DFC average drawdown

Please note that in Figure 3, all but three of the points are near the one-to-one line. The exceptions are LaSalle, McMullen, and Webb counties. These point fall above the one-to-one line which means that the Scenario 4f drawdown is higher than the DFC drawdown. This observation is discussed further after presenting the pumping comparison for this simulation.

Table 9. Drawdown Comparison: DFC and Scenario 4f

Included in Objective Function

County Code	County Name	Aquifer	New GAM Layers	PEST Observation Number	Plotting Code	Drawdown (ft)	
						DFC	Scenario 4f
7	Atascosa	Carrizo-Wilcox	7, 8, and 9	o3	ATCW	127	134
15	Bexar	Carrizo-Wilcox	7, 8, and 9	o4	BECW	107	102
28	Caldwell	Carrizo-Wilcox	7, 8, and 9	o6	CACW	45	43
64	Dimmit	Carrizo-Wilcox	7, 8, and 9	o8	DICW	-5	5
82	Frio	Carrizo-Wilcox	7, 8, and 9	o11	FRCW	53	58
89	Gonzales	Carrizo-Wilcox	7, 8, and 9	o14	GOCW	181	175
94	Guadalupe	Carrizo-Wilcox	7, 8, and 9	o16	GUCW	147	140
128	Karnes	Carrizo-Wilcox	7, 8, and 9	o18	KACW	214	204
139	LaSalle	Carrizo-Wilcox	7, 8, and 9	o21	LACW	11	61
159	Maverick	Carrizo-Wilcox	7, 8, and 9	o22	MACW	-13	1
162	McMullen	Carrizo-Wilcox	7, 8, and 9	o25	MCCW	34	97
163	Medina	Carrizo-Wilcox	7, 8, and 9	o26	MECW	31	40
232	Uvalde	Carrizo-Wilcox	7, 8, and 9	o27	UVCW	18	4
240	Webb	Carrizo-Wilcox	7, 8, and 9	o29	WECW	-4	49
247	Wilson	Carrizo-Wilcox	7, 8, and 9	o32	WICW	269	270
254	Zavala	Carrizo-Wilcox	7, 8, and 9	o34	ZACW	14	9

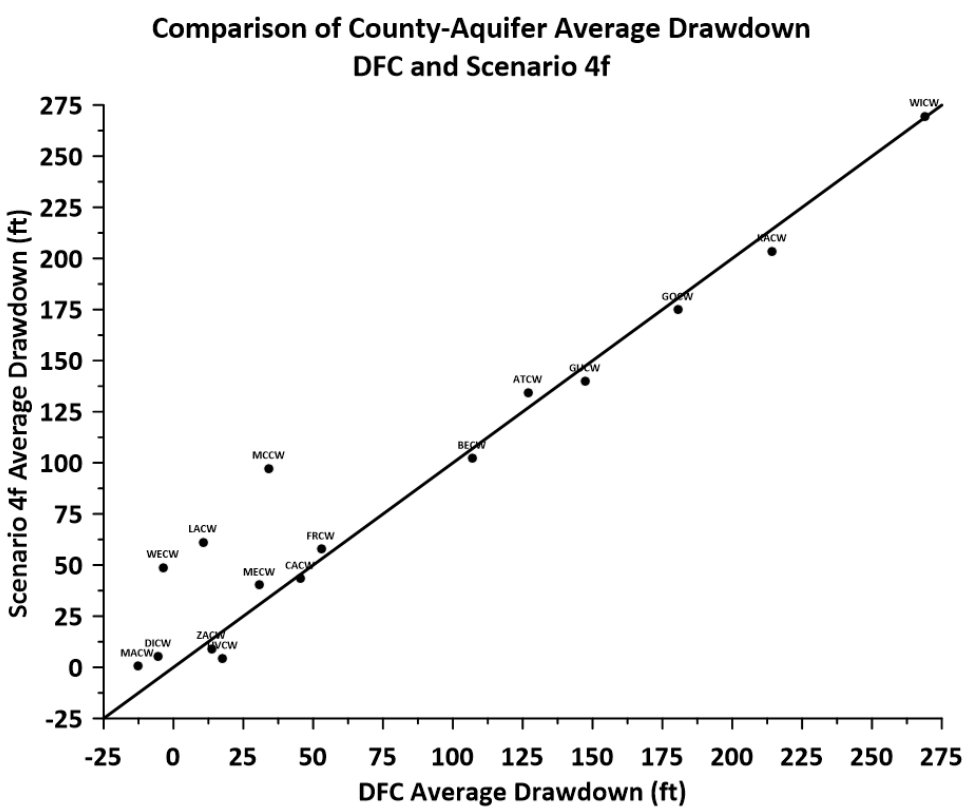


Figure 3. Drawdown Comparison: DFC and Scenario 4f

4.6.2 Pumping Results

Output pumping calculations for this simulation were obtained from the FORTRAN program *getpump4f.exe*. Summary pumping results are summarized in Table 10 and Figure 4. Please note that, for purposes of this summary, all pumping (Sparta, Queen City, and Sparta) is included in the summary table, although the detailed output from *getpump4f.exe* includes detailed pumping for the outcrop area, downdip area, and total pumping for each aquifer.

Please note that the pumping in Figure 4 is plotted on a logarithmic scale to facilitate comparisons across all counties. A comparison plot using linear axes clusters low pumping counties near the origin and makes it difficult to visualize where pumping is above or below the one-to-one line. The one-to-one line can be used compare MAG pumping and scenario pumping as follows:

- A point that lies on the line represents the same pumping in both simulations
- A point that lies above or to the left of the line represents scenario pumping higher than MAG pumping
- A point that lies below or to the right of the line represents scenario pumping lower than MAG pumping

Table 10. Pumping Comparison: MAG and Scenario 4f

County	Plotting Code	Pumping (AF/yr)	
		MAG	Scenario 4f
Atascosa	AT	65,217	138,141
Bexar	BE	67,849	283,306
Caldwell	CA	53,893	23,924
Dimmit	DI	4,124	1,351
Frio	FR	83,311	123,398
Gonzales	GO	103,653	170,220
Guadalupe	GU	40,519	56,555
Karnes	KA	1,061	6,909
LaSalle	LA	7,534	1,042
Maverick	MA	276	107
McMullen	MC	4,856	423
Medina	ME	2,646	9,240
Uvalde	UV	0	0
Webb	WE	1,006	51
Wilson	WI	127,461	335,691
Zavala	ZA	34,634	55,874
GMA 13	GMA	598,040	1,206,232

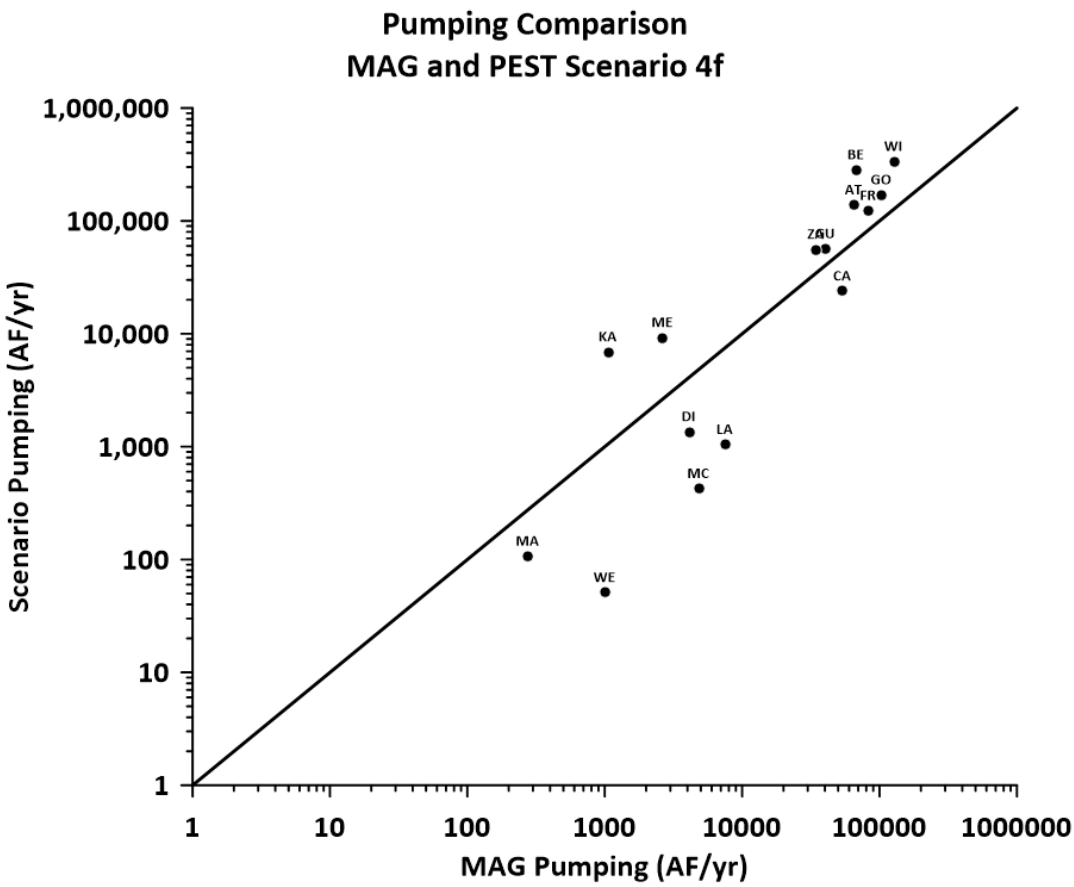


Figure 4. Pumping Comparison: MAG and Scenario 4f

Please note that the points for the five counties in the (Dimmit, LaSalle, Maverick, McMullen, and Webb) are below and to the right of the one-to-one line. This means that Scenario 4f pumping is lower than the MAG pumping. However, the drawdown in three of these counties (LaSalle, McMullen, and Webb) were significantly higher than the DFC drawdown. Thus, scenario pumping is lower than the MAG, yet the scenario drawdown is higher than the DFC. This suggests that another public comment received on the draft model related to calibration period pumping may have played a role during calibration to erroneously lower hydraulic conductivity values to match observed declines in groundwater elevation targets. Additional work is needed to confirm this possibility.

Similar to the results of Scenario 3f, there are several counties (Atascosa, Bexar, Gonzales, Medina, and Wilson) where pumping in Scenario 4f is significantly higher than the MAG pumping in order to obtain a good match to the drawdown. However, please note, for example, that the pumping in Gonzales County is 170,220 AF/yr in Scenario 4f, which is higher than the MAG pumping (103,653 AF/yr), but considerably less than the pumping in Scenario 3f (801,185 AF/yr). Please recall that Scenario 4f only considered Carrizo-Wilcox pumping, while Scenario 3f also involved adjusting pumping to hit targets in the Sparta and Queen City aquifers. These results may suggest that evaluation of the transmissivity values raised in the public comments for the Carrizo-Wilcox Aquifer should be also extended to the Queen City Aquifer.

4.7 Discussion of Results

In general, and as expected given the results of the simulations documented in Technical Memorandum 4, the new GAM suggests that the pumping higher than the existing MAG is required to meet the secondary DFC drawdown. Quantitatively matching the drawdowns leads to potentially unreasonable pumping amounts, which may point more to the limitations of the old GAM than to potential limitations of the new GAM. Please recall that the calculated pumping increases in PEST Simulation 4f were not as high the calculated pumping increases in PEST Simulation 3f. This was largely due to the elimination of Sparta and Queen City aquifer pumping adjustments in PEST Simulation 4f.

As discussed in the evaluation of Scenarios 3f and 4f, it appears that the persistent lowering of groundwater levels in the old GAM led to DFC drawdowns in some counties to be unreasonably low. However, initial public comments received on the new GAM include potential issues with:

- Calibration period pumping in some counties
- Transmissivity values in some areas
- Storativity/specific yield values in some areas

The results of these simulations (and the simulations associated with Technical Memorandum 4) are not dispositive with respect to addressing these issues. However, the results of these simulations are consistent with pointing to a potential issue with calibration pumping in the southwestern counties, and aquifer parameters in the Queen City Aquifer.

Additional analyses are needed to address the initial public comments, but these simulations provide a solid foundation for understanding the dynamics between variations in pumping and the resulting variation in groundwater levels.

The results of the simulations also point to the limitations of evaluating alternative DFCs in using a "project-centric" approach and provide a means to complete simulations in a "aquifer-availability" approach. It is recognized that the "project-centric" approach evolved during a time when DFCs and MAGs had different statutory meanings than they do today. Given the capabilities of the new GAM, it would be advisable to focus more on "aquifer-availability" simulations similar to those documented in the technical memorandum in the future.

5.0 Limitations

The simulations completed as part of this Technical Memorandum were designed to the calculate drawdown from 2017 to 2080 with the new GAM and compare the results with the DFC simulation that used the old GAM. Choosing to use a constant input pumping for these scenarios is a limitation to a full comparison. Neither scenario fully matched the actual DFC/MAG simulation with the various increases and decreases that were included in the MAG report.

The constant input approach was chosen to also evaluate the impacts of the WEL package's pumping reduction feature to better understand the limitations associated with impacts of declining groundwater elevations on pumping and gain a better understanding of the possibility to better simulate sustainable pumping scenarios.

As with all GAM simulations of this nature, the results are primarily useful for regional analyses (i.e. county-aquifer or GCD-aquifer scale). Smaller scale analyses should proceed with caution given the objectives of model development and calibration.

6.0 References

Furnans, J., 2022. Groundwater Availability Modeling Technical Elements, 2021 Joint Planning. Technical Memorandum to Groundwater Management Area 13. January 14, 2022, 5p.

Furnans, J. and Keester, M., 2020. 2021 Joint Planning Desired Future Conditions Explanatory Report. Prepared by Groundwater Management Area 13 Joint Planning Committee with technical assistance by Jordan Furnans and Michael Keester, LRE Water. January 14, 2022, 510p.

Wade, S.C., 2022. GAM Run 21-018MAG: Modeled Available Groundwater for the Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson Aquifers in Groundwater Management Area 13. Texas Water Development Board, Groundwater Division, Groundwater Availability Modeling Department. July 25, 2022, 32p.

APPENDIX L

Response to Comments on Interim Deliverable of Model Design

Appendix L

Interim Deliverable of Model Design text comments:

General comments to be addressed on Model Design (Chapter 3) text:

1. Section 3.4.2, page 169, first paragraph, Section 2.9, page 161, second paragraph, and Figure 2-80, page 163: Text in Sections 2.9 and 3.4.2 references Figure 2-80 and mentions that the model contains 9 numerical layers; however, Figure 2-80 shows only 8 numerical model layers. Also, Figure 2-80 mentions that younger units are not included in the model. However, Table 3-4 lists younger units as layer 2 and page 181 discusses younger units in the model. Please update Figure 2-80 to be consistent with the model files and the text in Sections 2.9 and 3.4.2.

> GSI Response: Montgomery and Associates updated this figure, now numbered Figure 2-82, in Section 2.10 for the June 2022 deliverable. The figure does not show the quaternary alluvium as before but indicates model layers 2 through 9. The alluvium (layer 1) exists only in proximity of the river channels and the interaction with the aquifers is indicated conceptually in the figure.

2. Section 3.4.2, page 169, third paragraph, last sentence: The text notes that the model grid consists of 382,388 cells. Please clarify that this is the active cell count for all layers.

> GSI Response: The report text has been updated to clarify that the model grid cell count refers to the active cell count for all layers.

3. Figure 3.2, Page 173: Please discuss how the isolated cells in layer 2 younger units will be modeled in Section 3.4.2 or cross-reference to a section that discusses this".

> GSI Response: The isolated cells in Layer 2 were eliminated after grid pinched cell corrections were made. Since there are no isolated cells, no edits were made to the report text.

4. Figure 3-26, Page 198: The footprint shown in Figure 3-26 for the bottom of the Reklaw is different from the footprint show in Figure 3-25 for the top of the Reklaw, the footprint shown in Figure 3-27 for the thickness of the Reklaw and the footprint shown in Figure 3-6 showing active cells in the Reklaw layer. Please verify and update Figure 3-26 if appropriate.

> GSI Response: Figure 3-26 was corrected to show the Reklaw Formation.

5. Section 3.5, page 218: Per contract Appendix A: GAM Standards, Attachment 2: Numerical Model checklist, page 9 of 15, checklist item 3.3 Layer-property flow package or equivalent (Node Property Flow Package), in the draft final model report please provide maps showing the flow property values (hydraulic conductivity) for each layer.

GSI Response: The TWDB confirmed via email on December 7, 2021, that maps showing the flow property values (hydraulic conductivity) for each layer will show calibrated model results. These maps are presented as figures in Chapter 4, the Model Calibration section, of the report.

6. Section 3.5, page 218: Please provide a table of the values used for the parameterization of hydraulic conductivity of sand (Ks) and clay (Kc) for each model layer in the draft final numerical model report.

GSI Response: The final calibrated model did not use sand fractions to simulate hydraulic conductivity. Instead, pilot points were used to estimate calibrated horizontal and vertical hydraulic conductivity values for each model layer. However, the sand fraction values from the conceptual model design and the resulting hydraulic conductivities are provided in Table 4-2 for comparison to the calibrated hydraulic conductivity values of the model in Table 4-3. The calibration process is described in Section 4.1.2 of the model report.

7. Section 3.5, page 219, second paragraph: The text states that the specific storage and specific yield are estimated as uniform for the model domain. Please clarify in the text whether that means uniform by layer or uniform across all layers. Please consider varying storage properties vertically so that aquitards and productive aquifers don't have the same storage properties. Please clarify how storage properties will vary vertically in the model in the text.

GSI response: The specific storage and specific yield values were uniform within each layer. The discussion of values used was removed from Section 3.7. Instead, the calibrated specific storage and specific yield values are discussed in the Calibration Section of the report (Section 4.1.3) and values for each layer are shown in Table 4-4.

8. Section 3.6, page 219: Per contract Appendix A: GAM Standards, Attachment 2: Numerical Model checklist, page 9 of 15, checklist item 3.3 Layer-property flow package or equivalent (Storage Package), in the draft final model report please provide maps showing the storage values (specific yield and specific storage) for each layer.

GSI Response: The TWDB confirmed via email on December 7, 2021, that these maps are intended to show calibrated model results; the specific yield and specific storage are not spatially variable and are presented as a table in Chapter 4.

9. Section 3.8, page 234, paragraph 3: The text suggests that model layers 3 through 9 all have a GHB on the southern boundary of the model; however, Figure 3-56 and the groundwater vistas file do not show a GHB in model layers 2 and 4 on the southern boundary. Please clarify in the text that the GHB is not present on the southern boundary in layers 2 and 4 if that is the intent.

GSI Response: The draft calibration submitted to TWDB in January 2022 had GHB conditions in Layers 4 and 6 along the eastern model boundary only. These GHBs

were removed during the final calibration such that, in addition to Layer 2 being a GHB, a GHB is present in Layers 3, 5, 7, 8 and 9 along the southern and eastern boundaries. The text reflects this distribution of GHBs and Figure 3-57, Modeled General Head Boundary Conditions, shows the updated GHBs.

10. Section 3.9, page 234: Per contract Exhibit B, page 41of 53 (Response to RFQ page 6-8) "The advanced stream package (SFR) will be used to represent significant surface water features." Please explain in the text why the SFR package was not used after all for significant surface water features and the river package was used instead.

GSI Response: The SFR package does not provide any more accuracy on an annual stress period basis considering that flow measurements and baseflow computations are also highly approximate. Since the SFR package slowed down computations and is more prone to convergence or mass balance issues, the RIV package was used in the simulations.

11. Section 3.10, page 238, last paragraph, second to last sentence: Text states "…initial recharge values for years 1980 through 2013 in the model." Please revise to "…initial recharge values for years 1980 through 2017 in the model."

GSI Response: The text has been corrected.

12. Section 3.11: Per contract Appendix A: GAM Standards, Attachment 2: Numerical Model checklist, page 10 of 15, checklist item 3.9 Evapotranspiration (ET) package, please provide a table show average root depths for vegetation types.

GSI Response: The 2022 Groundwater Availability Model update used the evapotranspiration conditions from the previous Groundwater Availability Model developed by Kelley and others (2004) for the southern portion of the Queen City and Sparta aquifers. For that Groundwater Availability Model, the United States Department of Agriculture's Soil Water Assessment Tool was used to estimate groundwater evapotranspiration and evapotranspiration extinction depth which ranges from less than 1 foot to 7.2 feet. Root depths were not evaluated in this model update.

Suggestions for Model Design (Chapter 3) text:

13. Section 3.9, page 238, first paragraph: Text states rivers generally flow from north to south. The flow direction is closer to "from northwest to southeast" for most Texas rivers. We suggest updating the text with that change.

GSI Response: The text has been updated.

14. Section 3.8, page 234, paragraph 2: The text states that model layer 2 contains a GHB to represent flow from the younger units to the Sparta Aquifer. The groundwater vistas file shows that some active cells in layer 2 do not include GHB conditions (see Figure 1 below). Are these missing GHBs an oversight or were they intentional? If the omission is

intentional, please clarify the reason in the text. Otherwise please update the model files as appropriate.

> GSI Response: The cells in Layer 2 have been corrected. All cells in Layer 2 are GHB cells in the final model.

15. There is an issue with the way the GHB cells are displayed in layer 2 in the steady-state groundwater vistas file. In the quad-tree mesh cells only one of the refined cells per parent cell is colored to indicate that it is a GHB cell (see Figure 2 below). However, the lower left dialogue of groundwater vistas and the model files suggest that all of the refined cells from the parent cell are GHB cells. This issue does not seem to exist in the transient groundwater vistas file.

> GSI Response: This issue is a display issue in Groundwater Vistas with the grid refinement. GHB conditions exist even where they are not displayed in Layer 2.

16. [Comment bullet number 16 is blank in the TWDB comments provided; this was confirmed by TWDB staff.]

17. Per Contract Appendix A, Attachment 4, Guidelines for Authors Submitting Contract Reports: Please follow the report format specifications in the author guidelines. For example, figures should be embedded within the text after being called out in the report. Please place tables and figures in order of citation. In some cases, tables occur before figures that were cited earlier.

> GSI Response: Figures and tables will be numbered in the order in which they appear.

18. Please consistently refer to this project as the Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers. In some locations in the report, it is referred to as Groundwater Availability Model for the Southern Portions (plural) of the Queen City, Sparta, and Carrizo-Wilcox Aquifers, For example caption for Figure 2-80 and throughout Sections 2.9 and 2.10.

> GSI Response: The project name will be referred to as "Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers."

19. Per Contract Section II Article III number 10, please ensure that the final report complies with Texas Administrative Code Chapters 206 and 213 (related to Accessibility and Usability of State Web Sites).

> GSI Response: The final report will comply with Texas Administrative Code Chapters 206 and 213 (related to Accessibility and Usability of State Web Sites).

20. Per Contract Appendix A, Attachment 4, Guidelines for Authors Submitting Contract Reports: Please do not use acronyms except for TWDB once introduced. For example: GMA in Section 2.1.3.1 first paragraph and AF is used 32 times.

GSI Response: Acronyms have been updated and are not used except for MODFLOW package names.

21. Report refers to a report by Meyers and others (2019, unpublished). This report was released December 2020 as TWDB Report 385 (http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/R385/report385.asp), Please update the report as appropriate.

GSI Response: The reference has been updated.

APPENDIX M

Response to Comments on Interim Deliverable of Draft Transient Model

Appendix M

Interim Deliverable of Draft Transient Model comments:

General comments on Framework text:

1. Section 4.1.2, page 256, paragraph 1 last line and Section 7.0 References: Meyers and others (2020) should be Meyer and others (2020).

> GSI Response: The reference has been corrected throughout the report.

Comments on Geodatabases:

1. Per the Contract Section II, Article III, item 3 on Page 2 of 16, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata explaining what information is contained in the GT field is missing for the Geology/HSU_StructurePts_All feature class. Please resubmit geodatabase with metadata.

> GSI Response: A revised conceptual geodatabase with metadata is included in the June 2022 deliverable.

2. Per the Contract Section II, Article III, item 3 on Page 2 of 16, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata explaining what information is contained in the Geology/HSUOutcrop_Carrizo_Wilcox feature class is missing. Please resubmit geodatabase with metadata.

> GSI Response: A revised conceptual geodatabase with metadata is included in the June 2022 deliverable.

3. Per the Contract Section II, Article III, item 3 on Page 2 of 16, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata explaining what information is contained in the SubSurfaceHydro/TWDB_Groundwater feature class is missing. Please resubmit geodatabase with metadata.

> GSI Response: A revised conceptual geodatabase with metadata is included in the June 2022 deliverable.

4. Per the Contract Section II, Article III, item 3 on Page 2 of 16, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata for Field Descriptions is missing for most feature classes in the submitted geodatabase. Please resubmit geodatabase with metadata.

> GSI Response: A revised conceptual geodatabase and revised numerical model geodatabse with metadata are included in the June 2022 deliverable.

5. Per the Contract Section II, Article III, item 3 on Page 2 of 15, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata explaining what information is contained in each of the rasters is missing for the GeomorphologyDEM Raster Catalog. Please resubmit geodatabase with metadata.

GSI Response: A revised conceptual geodatabase with metadata is included in the June 2022 deliverable.

6. Per the Contract Section II, Article III, item 3 on Page 2 of 15, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata explaining what information is contained in each of the rasters is missing for the GeologyGrids Raster Catalog. Please resubmit geodatabase with metadata.

GSI Response: A revised conceptual geodatabase with metadata is included in the June 2022 deliverable.

7. Per the Contract Section II, Article III, item 3 on Page 2 of 15, the interim Framework deliverables will submit geodatabase with metadata. Per our review of the files submitted, metadata explaining what information is contained in each of the rasters is missing for the ClimateGrids Raster Catalog. Please resubmit geodatabase with metadata.

GSI Response: A revised conceptual geodatabase with metadata is included in the June 2022 deliverable.

8. The boundary of the Groundwater Availability Model does not match the official aquifer boundary. In some cases, these appear to be unintentional slivers. If intentional, please explain in the text why that is, or fix the boundary of the Groundwater Availability model to encompass the official aquifer.

GSI Response: The numerical model boundaries match and were constructed using the conceptual model hydrostratigraphic extents, presented in Section 2.1.

General comments to be addressed on Draft Transient Calibrated Model (Section 4) text:

1. Section 4.4.5, pages 335, 336, and 337, Figures 4-65, 4-66, and 4-67: Per Contract Appendix A, Attachment 2: Numerical Model Checklist, page 11 of 15, please include flow directions on the water level contour maps.

GSI Response: Groundwater flow direction arrows have been added to Figures 4-67 through 4-69 (formerly 4-65 through 4-67) and Figures 4-26 through 4-28.

2. Section 4.3, page 340 through 342, figures 4-69 through 4-71 and page 338 last paragraph: Please cite Figure numbers from Section 2.4.1 showing the location of the gauges in figures 4-69 through 4-71.

GSI Response: Citations referring to Chapter 2 figures have been added to this section.

3. Section 4.1.1, page 253, second paragraph: Interim report text states "Upon importing the pumping rate information to Groundwater Vistas, pumping was not assigned to areas of the refined grid for layers 3, 5, and 7 through 9. Thus, the reduction in Table 4-1 is not due to the autoflow reduce option that occurs as part of the simulation discussed in Section 3.7. The final version of the model will resolve this issue, and with the revision, scaling of pumping in Zavala, Frio, La Salle, and Dimmit Counties will be reassessed." Please clarify whether the pumping discrepancy affects other calibration information reported in this

interim report. Please also clarify whether all of the figures, tables, and statistics will be updated when the pumping is corrected for the draft final report.

> GSI Response: The importing errors of the draft calibration have been resolved and input pumping into the model match the conceptual pumping as discussed in the report. The pumping discrepancy in the refined cells did not impact the calibration significantly; however, we further calibrated the model for the pumping correction, and performed other corrections such that the final model is better calibrated than the one in the interim report. The shortcoming of pumping discrepancy in La Salle and Dimmit Counties is still present and we have noted its significance in the calibration, sensitivity and future work sections of the report. Figures, tables, and statistics have been updated for the corrected and recalibrated model.

4. Section 4.0, page 250: Please spell out complete package names when they are first introduced in this section (for example RIV, GHB, and HFB). Although they have already been introduced in Section 3 it would be helpful for the reader to do it in this section as well.

> GSI Response: Modflow packages are reintroduced using full names then abbreviations in Chapter 4.

5. Section 4.1.2, page 256, paragraph 1 last line and Section 7.0 References: There is a citation for Jones and others (2004) but there is no Jones and others (2004) listed in the reference section. Maybe it should be Kelley and others (2004) which is the model report for the Queen City and Sparta Groundwater Availability Models. Please verify and update if necessary.

> GSI Response: This reference has been corrected to "Kelley and others, 2004."

6. The Interim draft report contains a few cases of missing words or incorrect verb tense. Please carefully proofread the draft final model report.

> GSI Response: The report was proof-read and checked for correct grammar prior to submittal to TWDB.

7. Section 4.1.2, page 256, last paragraph: Please provide a summary description of the pilot point procedure and please discuss how pilot point locations were selected.

> GSI Response: Horizontal and vertical hydraulic conductivity pilot points were initially assigned their locations in a spatially even pattern using Groundwater Vistas' quick pilot point tool. Pilot point minimum and maximum values, as well as their initial values, were assigned to maintain consistency with respective aquifer and aquitard data that is presented as part of the conceptual groundwater model. Greater pilot point density was assigned in layers 5 through 9 since the aquifers in these units contain the majority of the groundwater elevation targets and the parameterization of intervening aquitards was found to be important to calibration. Pilot points were used in Layer 1 and Layers 3 through 9.

After the first complete PEST simulation, the calibration was reviewed, and pilot points were manually relocated to achieve greater density in areas where calibration proved more difficult. This process was iterative until the final calibration was achieved.

8. Section 4.1.2, page 267, Figure 4-9: The lower end of the range of values in the legend (0.0059 feet per day) is greater than the next level (0.005 feet per day) and the figure seems to only include three ranges rather than four. Please check the legend for this figure and update as appropriate.

GSI Response: This figure is currently Figure 4-11 and has been updated with revised hydraulic conductivity values of the calibrated model. The legend values are ordered from lowest to highest value.

9. Section 4.4 (4.2) Model Simulated Versus Measured Heads, page 280: This section is numbered as Section 4.4, but it should be Section 4.2 because it follows Section 4.1 and precedes Section 4.3. Please update as appropriate.

GSI Response: The section number has been corrected.

10. Section 4.4.2 (should be 4.2.2), page 291, first paragraph: Text states "Table 4-6 shows the summary for weighted head calibration statistics for the remaining stress periods representing 1980 and 2017 conditions." Should this say "…representing 1981 through 2017…"? Please verify and update text as appropriate.

GSI Response: The title of Table 4-6 has been corrected to say "1980 to 2017."

11. Figure 4-30, page 295, Cross-plot of Sparta Aquifer Targets: The results from Groundwater Vistas targets for layer 3 do not seem to match Figure 4-30 (See Figure 1 below). Please verify and revise if necessary.

GSI Response: TWDB did not provide a Figure 1 for Comment 11, illustrating the issues TWDB observed with the Sparta Aquifer plot. However, Figure 4-32 (formerly 4-30) showing observed versus simulated water level elevations in the Sparta Aquifer has been updated for the June 2022 calibration results. The plot shown on Figure 4-32 matches the Groundwater Vistas target data.

12. Section 4.4.3, page 300 and Appendix H, Table 1, Weighted Residual Column: Text states that the Table in Appendix H lists the residual values (observed water level – simulated water level); however, the column heading says it is the Weighted Residual. It appears that the values are the un-weighted residual values as stated in the text. Please verify and update the table column heading as appropriate.

GSI Response: Appendix H Table 1 has been revised to show the correct simulated water level elevations and their corresponding weighted residual.

13. Appendix J, Detailed Water budgets per Texas Groundwater Conservation District or County: There appears to be a zone assignment mismatch or some other processing error for the detailed water budgets for groundwater conservation districts and counties. The

groundwater conservation districts (or counties) include flows to and from areas not directly adjacent. For example, Live Oak UWCD lists flow from Fayette County GCD, Pecan Valley GCD and Lost Pines GCD, none of which are adjacent to Live Oak County. Gonzales County UWCD lists flow from Bee County, McMullen County, and Maverick County, none of which are adjacent to Gonzales County. There are multiple other examples. Please review the detailed water budgets processing and results and update as necessary.

> GSI Response: The water budget processing included misidentification of some District or County names. The error has been corrected in the new Appendix J water budget tables.

Suggestions for Draft Transient Calibrated Model (Section 4) text:

14. Section 4.4.4, Figures 4-44 through 4-48: The resolution of the hydrographs images on the composite figures is fairly low and the labels are difficult to read. Please consider increasing the resolution of the charts before adding them to the figures for the Figures in the main part of the text (4-44 through 4-48).

> GSI Response: The fonts and image resolution were increased for charts used in Figures 4-46 through 4-50 (previously, Figures 4-44 through 4-48).

Interim Deliverable of Draft Transient Calibrated Model Groundwater Vistas and model files comments:

1. The MODFLOW 6 executable, mf6_IoBuff_Flush_AFRW.exe was provided with the model files, but there does not appear to be any explanation of why a modified version of the code was required. Please add discussion to Section 3 of the draft final report of how the MODFLOW 6 code was revised and why the modification was necessary.

> GSI Response: This MODFLOW 6 executable include two modifications to the source code that were not incorporated into the official USGS MODFLOW 6 executable at the time. Neither of these modifications change the simulated results of a model, but instead these modifications were intended to provide some model execution performance improvements and improve model output reporting. “IoBuff_Flush” indicates that the compiler switches and source code were modified to use input/output (I/O) buffering to allow more efficient writing of output files to disk along with ensuring that the I/O buffer is “flushed” (i.e., data is written to disk at appropriate points during model execution). “AFWR” indicates that the source code was modified to add a new option to the WEL package to allow reporting of simulated well pumping reductions due to the “AUTO_FLOW_REDUCE” option only when, and only at model nodes where WEL package pumping reductions are simulated. Previously, all simulated WEL package flows needed to be reported as observations, with significant disk space and additional post-processing time required to determine the simulated well pumping reductions.
>
> Note that both of these changes have been incorporated into the most recent official USGS MODFLOW 6 executable (version 6.3.0), though with some minor modifications from the source code used in the “mf6_IoBuff_Flush_AFRW.exe” executable.

2. The Groundwater Vistas file appears to show some dry cells in all layers along the updip edge of layers 2 through 9 (bright yellow cells in Figures 2 and 3 are examples for layers 4 and 7). The Groundwater Vistas file also seems to show dry cells in many river channels in layer 1. Per Contract Attachment 2: Numerical Guidelines, Section 2 page 5 of 13 "There shall be an accounting of the number of cells that go dry during a simulation if applicable". If these cells have gone dry please discuss. If the cells have not gone dry please explain why Groundwater Vistas is displaying them as though they are dry.

> GSI Response: The upstream weighting and Newton Raphson linearization approach was used to run the model. With this approach, dry cells are physically so because the water level is below their simulated bottom and not due to numerical reasons as is the case with the MODFLOW 2005 and prior "Wet/Dry" schemes. We have mentioned this in the report. The calibrated model simulated groundwater elevations are below the level of river cells and the bottom of the thin layer within some parts of the Quaternary Alluvium resulting in those cells to be dry. Dry cells also occur in limited areas of unconfined portions of the model where deeper aquifers and aquitards (Layers 3 through 8) are thinner and gradually pinch out. Again, this is not a numerical condition that alters the physics of the modeled system.

APPENDIX N

Response to Comments on Draft Final Numerical Model Report: Update to the Groundwater Availability Model

for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

GSI ENVIRONMENTAL

January 31, 2023

Jean Perez
Hydrologist – Groundwater Technical Assistance
Texas Water Development Board (TWDB)
1700 North Congress Ave.
Austin, Texas 78711

RE: Comments on the Draft Final Numerical Model Report: Update to the Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

Dear Mr. Perez:

We appreciate the comments from R.W. Harden & Associates, Inc. (RWH&A), Gonzales County Underground Water Conservation District, Wintergarden Groundwater Conservation District, Plum Creek Conservation District, and Guadalupe County Groundwater Conservation District on the draft report of the Southern Carrizo-Wilcox-Queen City-Sparta Groundwater Availability Model (GAM) recently submitted by GSI Environmental Inc (GSI, 2022). Detailed comments were provided by RWH&A and the other Districts reflected those.

The model does have its deficiencies, primarily due to data deficiencies, and these have been explained in the report. The comments provide us an opportunity to better explain what may not have been clear in the report.

The first comment is titled "Extreme Transmissivity" of layer 7 (the Carrizo-Upper Wilcox unit). Transmissivity is a derived property and is a product of the hydraulic conductivity and the aquifer thickness. Thus, there are two basic properties to address here – aquifer thickness, and hydraulic conductivity. Also, there are two different regions where hydraulic conductivity was of concern, to the east in southern Gonzales and Wilson Counties, and to the west in La Salle County.

Aquifer thickness evaluations were provided by stratigraphic interpretations based on the methodology used by Meyer and others (2020) which defines the top of the Carrizo-Upper Wilcox interval as the "top of the massive Carrizo Formation sands" while the bottom contact is the "base of the first significant sharp-based sand superjacent to a regional marine shale marker equivalent to the top of the Middle Wilcox". This information has been shown on Figure 2-12 of the report and the modeled thickness has been shown on Figure 3-30 of the report. These are reproduced here as Plate 1, and it is noted that the modeled thickness is the same as that of the conceptual model after being transferred onto the numerical model grid.

Hydraulic conductivity estimates and their measurement locations are presented on Figure 2-48 of the GAM report and shown on Plate 2. The concerns regarding values to the east and values to the west are addressed separately.

In the eastern part of the model domain in southern Gonzales and Wilson Counties, the measured estimates of hydraulic conductivity are noted to be as high as 950 feet per day. Simulated maximum hydraulic conductivities in Wilson County are less than 500 feet per day and in Gonzales County are less than 280 feet per day which is well within the range of hydraulic conductivity values measured in the region. Thus, regionally, the modeled hydraulic conductivity values are representative of measurements in southern Gonzales and Wilson Counties, which is appropriate for a regional model. Local values measured by RWH&A may not match values at that location in the model, but that is to be expected in a regional model designed for long-term planning purposes and not for localized evaluations at pumping wells. Furthermore, transmissivity is a derived property and measurements may be affected by estimation technique, well clogging, and partial penetration of open (or screened) interval among other factors that may give lower estimates than the actual transmissivity of the entire aquifer thickness.

In the western part of the model, the simulated hydraulic conductivity value is above 1,000 feet per day in central La Salle County and is as high as 1,400 feet per day in one location. As noted in the model report, these high conductivity estimates in this region are most likely an artifact of incorrect pumping distribution estimates. Specifically, there is very little simulated pumping in this high hydraulic conductivity region; however, there are extremely large drawdowns. Therefore, the high hydraulic conductivity provides a connection between the high pumping locations and the monitoring wells with large drawdowns.

This issue of large drawdowns in La Salle County between 2007 and 2012 with little to no pumping data in the region was discussed with TWDB during the calibration process. Scaling the pumping values by a multiplication factor was not effective in addressing the issue because there was very little pumping in the region in the first place. We realized that the missing pumping data is related to oil and gas operations in the Eagle Ford but did not get any additional information. Assuming pumping locations and pumping rates would not be appropriate since the resulting hydraulic conductivity values would depend on the pumping data and would be just as uncertain. We therefore elected to retain the calibration as presented, with indications that this is an area of concern. We still restricted the PEST calibrated hydraulic conductivity values to be less than 1,000 feet per day as was noted in the data. The kriging between pilot points can cause overshooting of this limit which was noted in one location.

During and after the stakeholder meeting, it was pointed out that a possible source of this data could be a company called Enverus that collects pumping information from

the railroad commission. This was also reflected in the comments provided by Brandon Davis. The data is not publicly available but can be accessed for a reasonable cost. The GSI team could investigate this further as an amendment to the current work or as a separate contract. If there is additional reliable pumping data in the region, we can assimilate the information and recalibrate the model to provide greater reliability of results in the central La Salle County region.

The second comment is titled "Unreasonable Specific Yield". Literature values noted for specific yield of sandy aquifer materials is higher than that used in the GMA13 model. However, that is because the specific yield of the aquifer (as compared to that of the aquifer material), is the storage provided from unconfined and confined / semiconfined impacts to the water level fluctuations over its entire thickness. Productive portions of the aquifer units in the model consist of beds of unconsolidated quartz sand and deeper portions of the aquifer unit may be under semi-confined or confined conditions. Figure 2-51 of the draft report shows the storage coefficient measurements compiled by Myers (1969) and is reproduced here as Plate 3. This data also indicates that storage coefficients for the aquifer unit can be extremely low in outcrop areas. The specific yield of the different units in the model was a uniform average value that best fits the data with some wells showing an underprediction of water level fluctuations and some depicting an overprediction.

We hope we have addressed the concerns posed by RWH&A.

Sincerely,

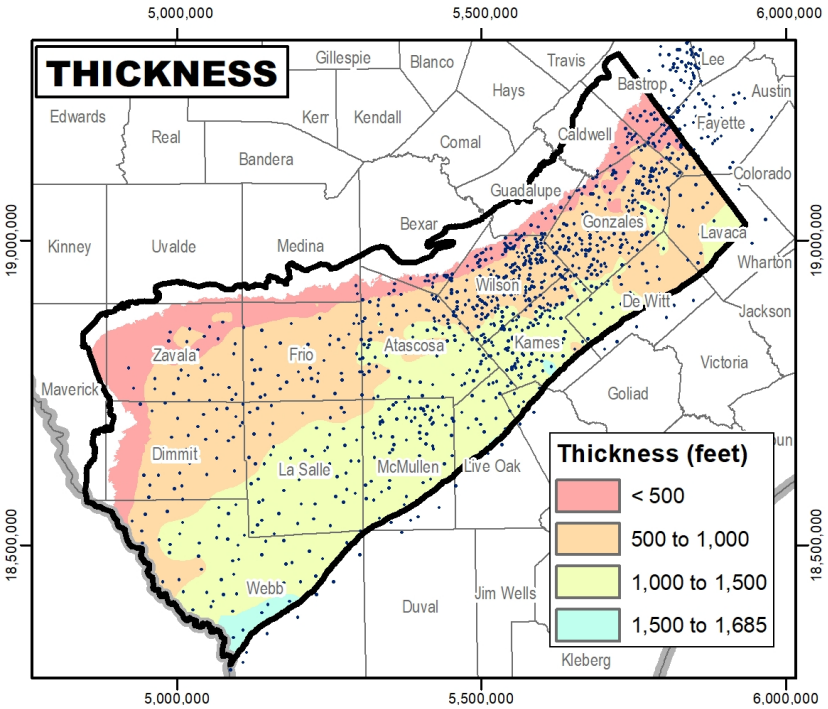
Sorab Panday

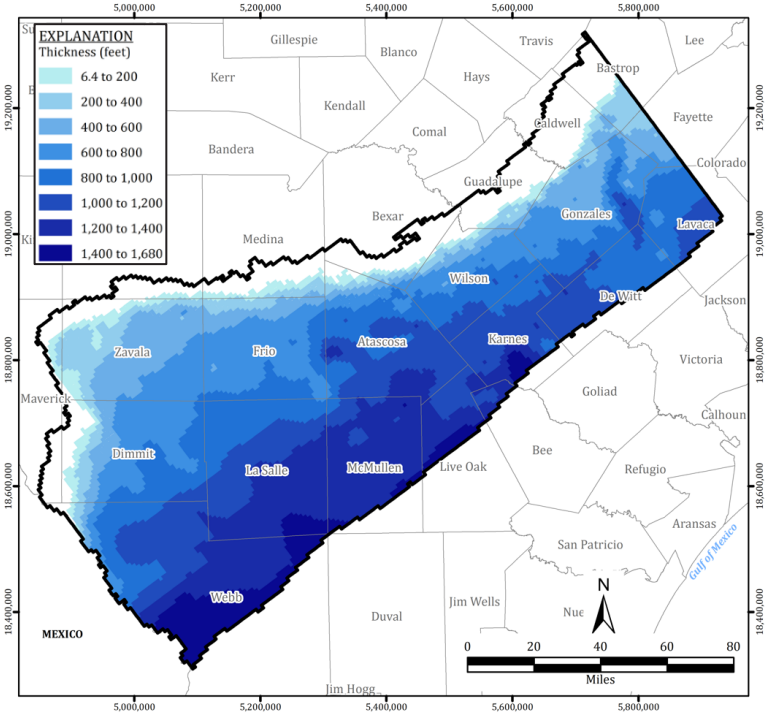
Sorab Panday, PhD
GSI Environmental Inc.

Attachment:

Attachment A – Comments on Draft Final Numerical Model Report: Update to the Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

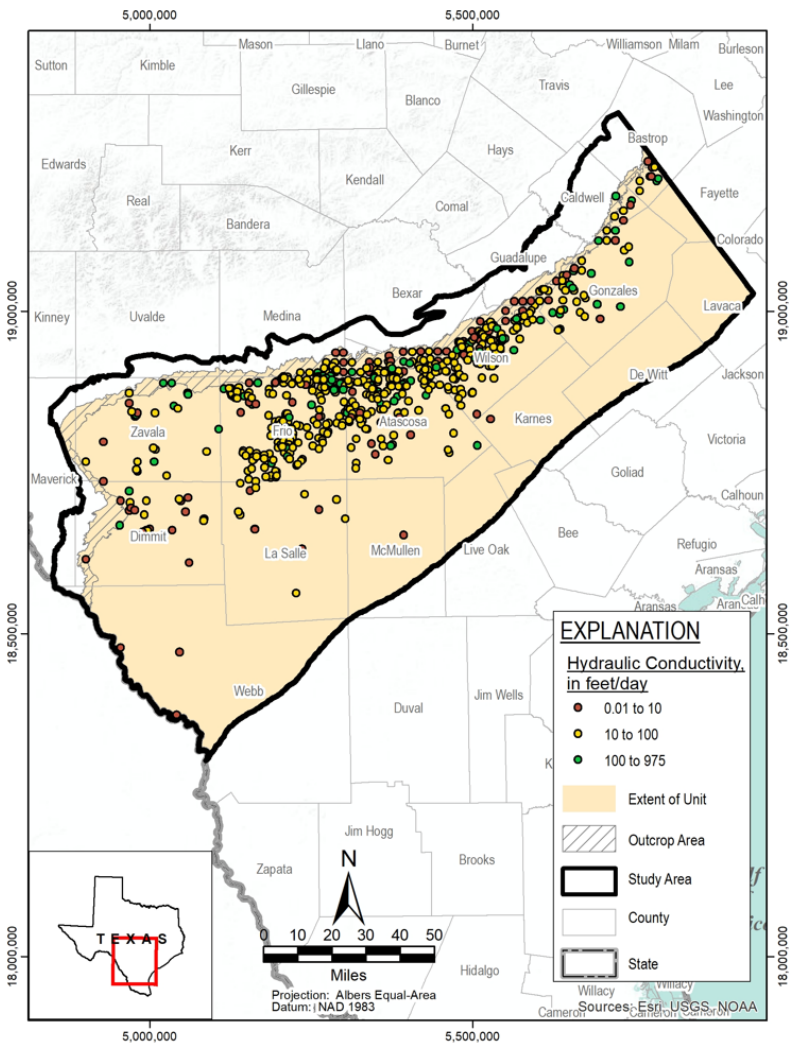
Plate 1: Conceptual and Numerical Model Thickness of the Carrizo-Upper Wilcox Unit





GSI ENVIRONMENTAL

Plate 2: Hydraulic Conductivity Measurements for the Carrizo-Upper Wilcox Unit



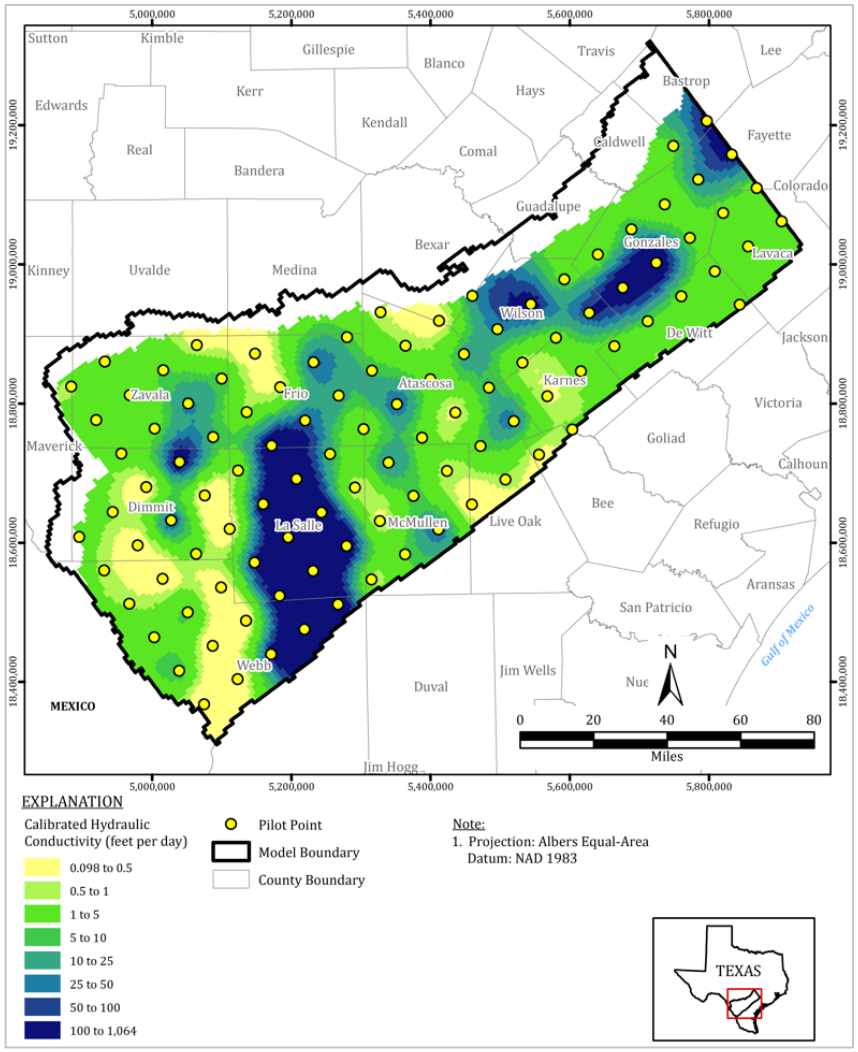
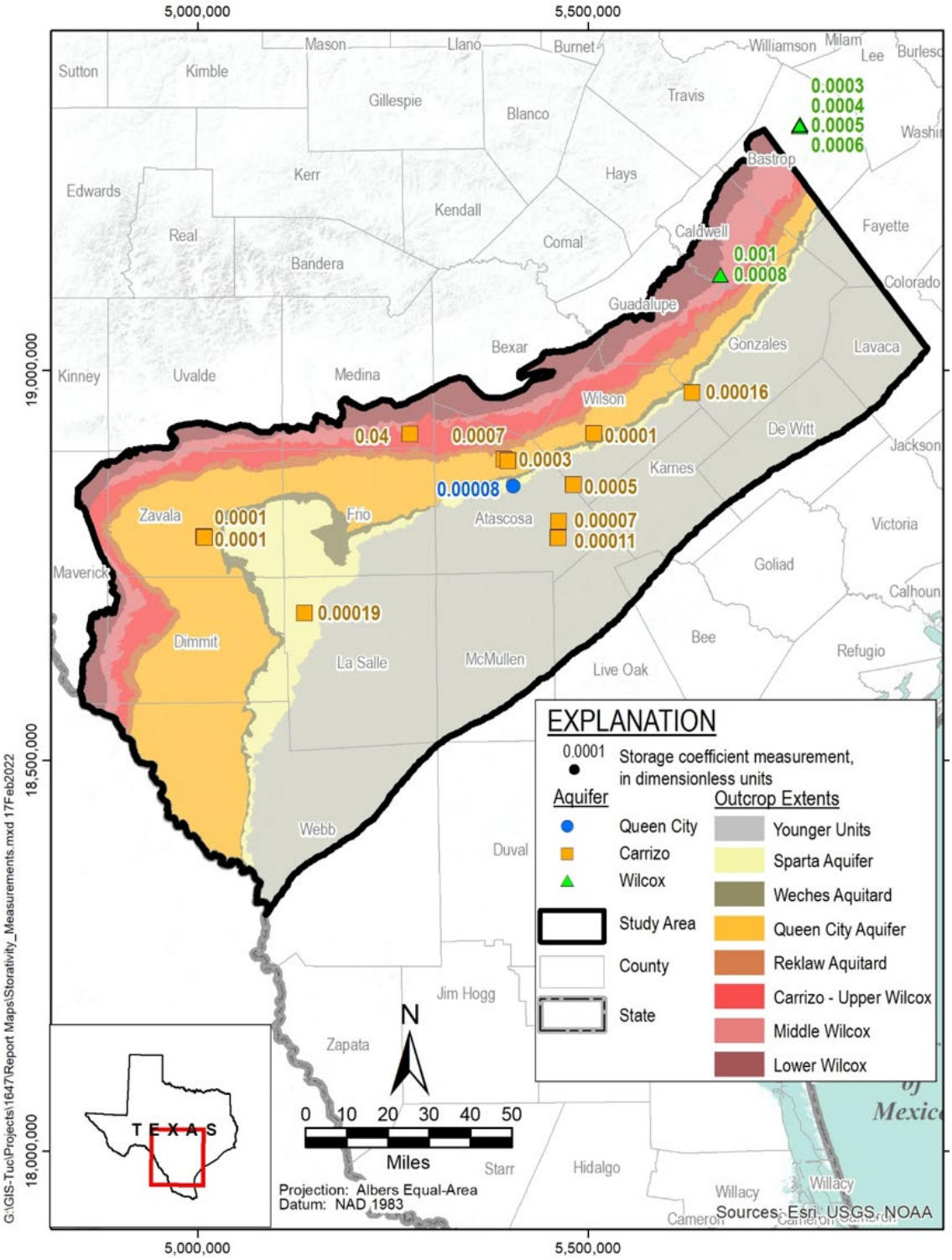


Plate 3: Storage Coefficient Measurements for Aquifers in the Study Area



ATTACHEMENT A

Comments on Draft Final Numerical Model Report: Update to the Groundwater Availability Model for the Southern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers

From: Brandon Davis
To: Jean Perez
Subject: Drilling Data
Date: Tuesday, July 26, 2022 10:04:59 AM

External: Beware of links/attachments.

Jean,

I attended the model meeting last Friday for GAM 13 and wanted to just share with you a possible source for more pumping data.

There is a company called Enverus https://www.enverus.com/ that collects all this data and has tools that you can dump that data however you'd like to see it.

I believe they get all their information from the railroad commission. At the moment the eagleford is producing roughly 1 million barrels of oil per day. I'd imagine there is a fairly significant amount of water being pumped up as well.

It could help explain some of the steep drop offs in certain areas. The information that enverus collects includes latitude and longitude of each well, also county, dates, etc.. They should have data that dates all the way back to 1980 in fact.

Only reason I bring them up is that I use this tool for my job and it's not expensive at all. I think it adds up to about $100/month, but if y'all called them and told them what you are after they'd probably dump the data for you for a flat fee.

Just a thought as it's very concerning to me the steep drop off in the 4 counties and basically no explanation why.

The drilling has drastically slowed though and I think we are at "peak production" so it's possible the data still works out correctly. I doubt another major eagle ford boom kicks off, but it could also mean that if production declines that our pumping would also decline so I can see this information being potentially useful far into the future.

Or we could find out the pumping is insignificant and we have another problem in the 4 counties with the steep drops.

Thank You,

Brandon Davis

R W HARDEN &ASSOCIATES INC
GROUNDWATER RESOURCE PROFESSIONALS
9009 Mountain Ridge Dr • Suite 100 • Austin Texas 78759 • ph (512) 345-2379 • fax (512) 338-9372

August 16, 2022

Jean Perez
Hydrologist – Groundwater Technical Assistance
Texas Water Development Board (TWDB)
1700 North Congress Ave.
Austin, Texas 78711

Re: Comments on the Draft Southern Carrizo Groundwater Availability Model

Dear Mr. Perez,

R. W. Harden & Associates, Inc. (RWH&A) has performed a preliminary evaluation of the draft Southern Carrizo-Wilcox-Queen City-Sparta Groundwater Availability Model (GAM) recently submitted by the model development team led by GSI Environmental Inc. RWH&A provides comments herein associated with the findings of our evaluation of the model files posted on the TWDB website (https://www.twdb.texas.gov/groundwater/models/gam/czwx_s/czwx_s.asp). Please note that the comments expressed herein are limited to our initial evaluation of the draft model report and input files only; no supporting data was available for download or review that we are aware of at this time.

RWH&A would like to acknowledge the efforts of the modeling team. Groundwater flow model construction and calibration is a laborious and highly technical process that requires modelers to identify the key aspects driving flow in an aquifer system through compilation, review, and interpretation of diverse datasets. RWH&A recognizes that model construction is also inherently subjective; modelers must make numerous judgements and assumptions regarding the application of available data to model inputs and results.

However, while some differences of opinion regarding data interpretation and application are to be expected, RWH&A has identified two significant aspects of the draft GAM that are not consistent with fundamental hydrogeological concepts and/or real-world data. The following discussions provide a brief overview of the issues identified with Layer 7 of the GAM, which represents the Carrizo Formation and upper Wilcox Group.

- **Extreme Transmissivity** – RWH&A calculated the transmissivity of Layer 7 from structure and horizontal hydraulic conductivity data extracted from the raw MODFLOW input files. The mapped values showed that there are several regions of Layer 7 that exceed reasonable transmissivity values for the Carrizo-Wilcox. Plates 1 and 2 are contour plots of the transmissivity of the eastern and western portions of the model domain, respectively. The contours identify transmissivity distribution in gallons per day per foot (gal/day/ft), which is approximately 7.48 times the transmissivity in units of square feet per day (ft^2/day).

The Carrizo is a heavily utilized aquifer that has been tested at well sites throughout southern Central Texas. The draft GAM report provides a discussion of the various datasets used to derive the hydraulic properties assigned to the model. Maximum Carrizo transmissivity values derived from aquifer test results range up to approximately 150,000 to 200,000 gal/day/ft. As shown on Plates 1 and 2, there several regions that significantly exceed the documented maximum transmissivity values for the Carrizo aquifer. Most concerning are two regions with assigned transmissivities that are many times greater than the highest transmissivity values calculated from pump test data.

In southern Gonzales and Wilson counties, areas with transmissivity values ranging up to about 3.5 million gal/day/ft are included in the model inputs. Plate 2 shows an even more extreme assignment of transmissivity, with values of up to approximately 10 million gal/day/ft applied to a large portion of LaSalle and Webb counties. This value is more than 50 times greater than the highest documented transmissivity derived from Carrizo aquifer test results.

The excessive transmissivity values currently assigned to GAM Layer 7 are not consistent with recorded hydrogeologic data and will result in extreme underprediction of drawdown if/when pumpage is applied to these regions.

- **Unreasonable Specific Yield** – One of the Desired Future Conditions (DFCs) adopted by Groundwater Management Area No. 13 (GMA-13) limits acceptable saturated thickness declines in aquifer outcrop areas. The poor accuracy of the current GAM's predictions of water levels in outcrop zones was the primary motivation for replacing the current GAM. Consequently, ensuring that the new, updated GAM can accurately predict changes in future outcrop water levels is critical for proper regional water planning efforts.

  Specific yield is closely related to porosity and is the amount of water that will drain under gravity from a volume of aquifer materials. Stated another way, specific yield is the porosity of a given material minus the amount of water that adheres to the aquifer sediments and is not drained by gravity. Specific yield is a fundamental aquifer property and is important to modeling because it represents the majority of the volume of groundwater contained in an aquifer. For this reason, the assignment of proper specific yield values to model cells that simulate unconfined (water table) hydrogeologic conditions is critical for accurate prediction of future impacts to aquifer outcrop zones.

  Specific yield is typically expressed as a unitless fraction of the total volume of aquifer materials. The range of potential values associated with various sediment types is extensively documented and the draft GAM report provides a discussion of specific yield that includes references to previous publications discussing aquifer storage coefficients. In addition to the references included in the draft GAM report, most hydrogeologic textbooks include discussions of specific yield and appropriate values for various sediment types.

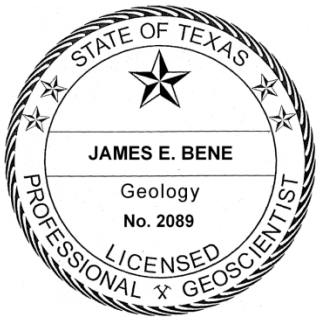
  All the productive portions of the aquifer units included in the GAM are primarily comprised of beds of unconsolidated quartz sand. Appropriate specific yield values for sandy aquifer materials typically average from about 0.2 to 0.25 (20% to 25%). The GAM

development team applied a constant value of 0.005 (0.5%) to all aquifer layers in the GAM. Consequently, the volume of water assigned to the GAM aquifer layers is approximately 1/40th of the volume that is described by documented, appropriate values of specific yield. Because the GAM simulates only a fraction of the available groundwater volume, overprediction of water table drawdown through time must result where pumpage is applied to aquifer outcrop areas and where artesian pumpage results in dewatering of outcrop areas.

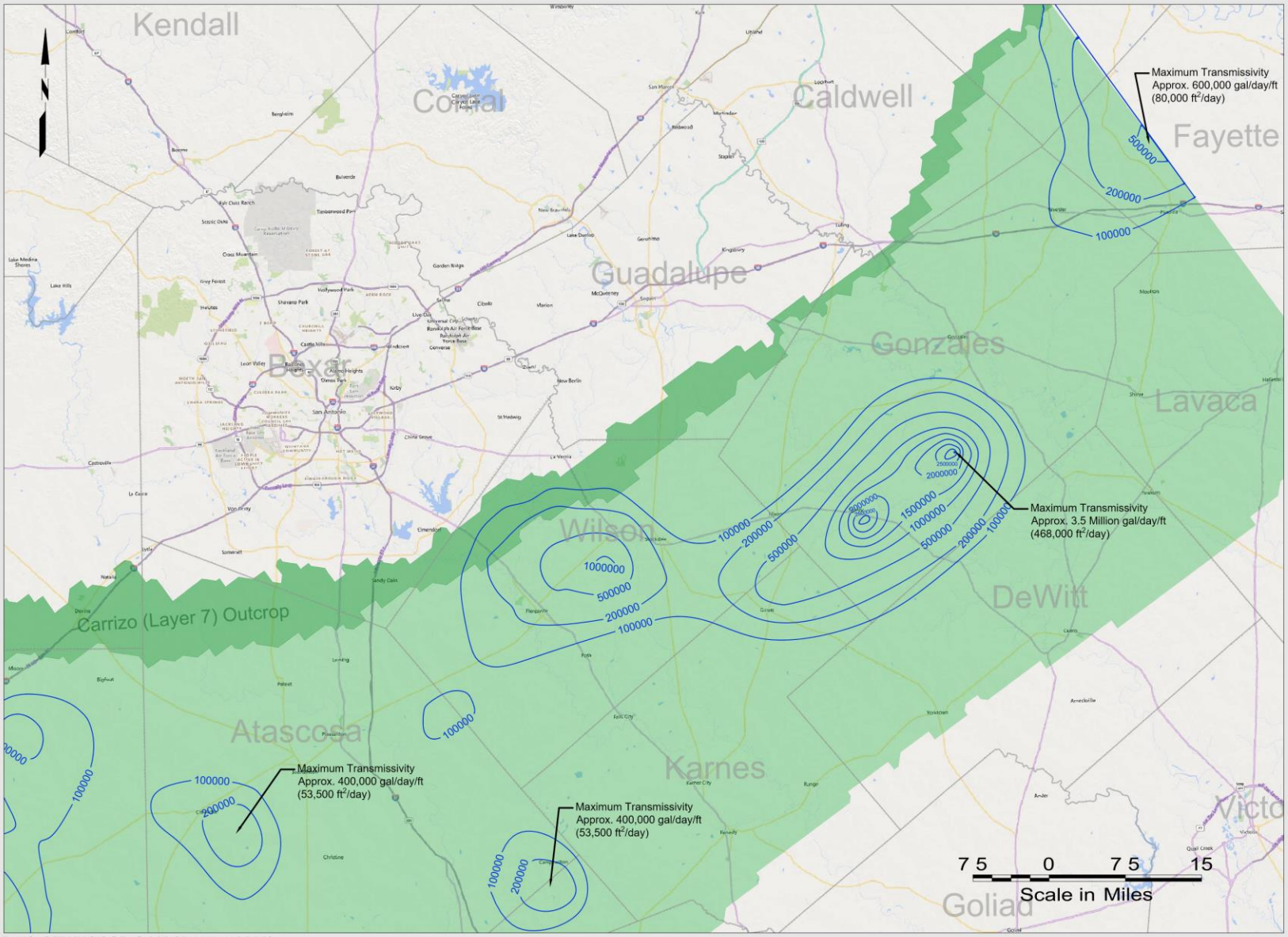
RWH&A thanks you for the opportunity to review and provide comments on the draft GAM. We hope that our observations and the feedback you receive from others will help TWDB reviewers focus on the aspects of the GAM that need improvement and directly impact its effectiveness in future regional planning. Please let us know if you have questions or would like clarification of the issues discussed above.

Sincerely,

James Bené, P.G.
R. W. Harden & Associates, Inc.



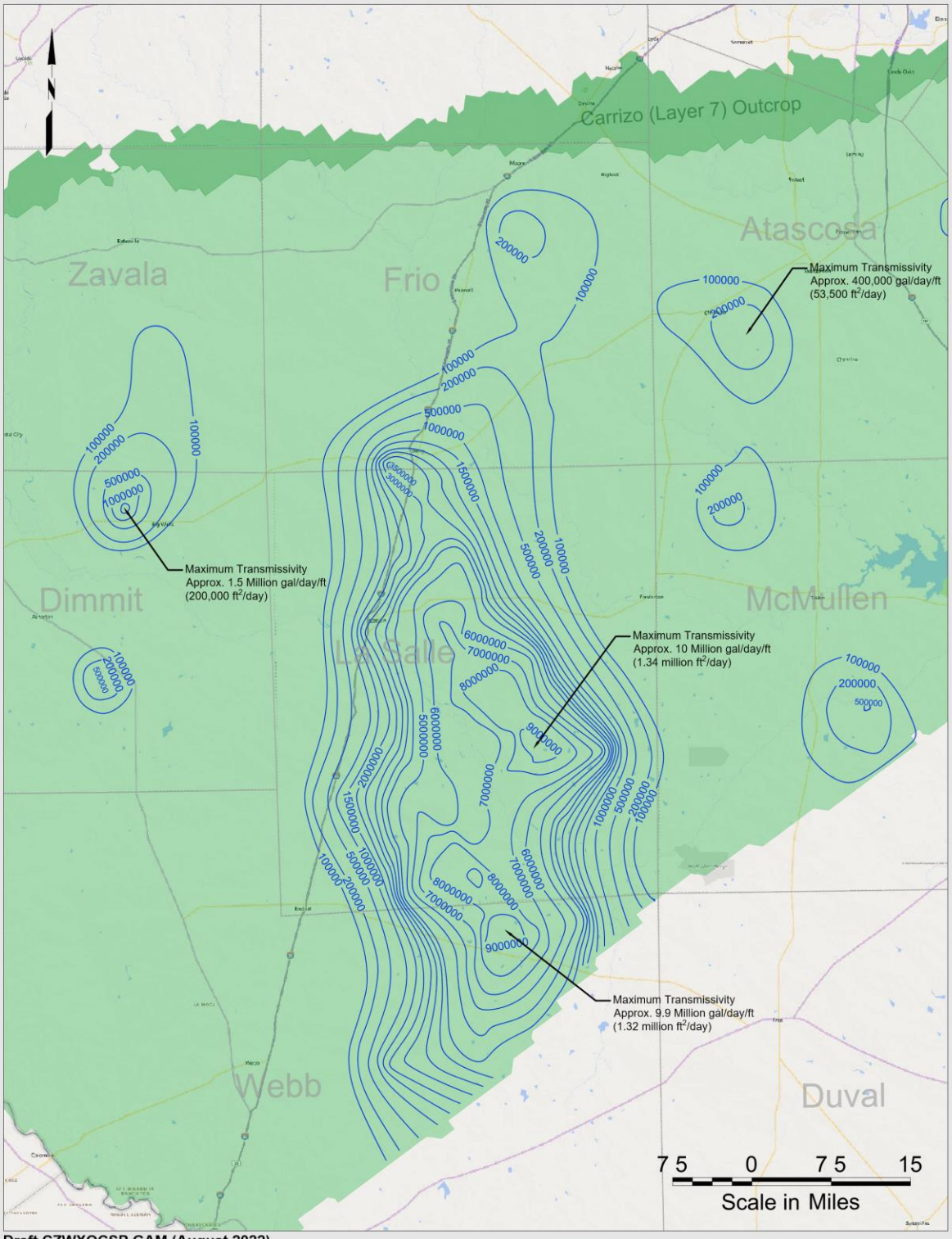
The seal appearing on this document was authorized by James E. Bené, P.G. 2089 on August 16, 2022. R.W. Harden & Associates, Inc. TBPG Firm No. 50033.



Draft CZWXQCSP GAM (August 2022)

Plate 1: Eastern Layer 7 Transmissivity Contours (Gal/Day/Ft)

R W HARDEN &ASSOCIATES, INC
GROUNDWATER RESOURCE PROFESSIONALS



Draft CZWXQCSP GAM (August 2022)

Plate 2 - Western Layer 7 Transmissivity Contours (Gal/Day/Ft)

R W HARDEN &ASSOCIATES INC
GROUNDWATER RESOURCE PROFESSIONALS

Gonzales County Underground Water Conservation District

522 Saint Matthew
P.O. Box 1919
Gonzales, Texas 78629
Phone 830.672.1047

September 13, 2022

Jean Peres
Hydrologist II, Groundwater Technical Assistance
Contract Manager, Texas Water Development Board
1700 N. Congress Ave.
Austin, Tx 78711

RE: Request for additional review and input necessary of data

Dear Mr. Perez:

Greetings. On behalf of the Gonzales County Underground Water Conservation District (GCUWCD), member of Groundwater Management Area 13 (GMA13), upon review of the draft Groundwater Availability Model (GAM) for the Southern portion of the Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson Aquifers we are requesting additional time be spent on the model to bring the model into a more complete draft, a meeting to discuss all public comments received, and a discussion on additional funding to complete the draft, if necessary.

It is my understanding that the transmissivity numbers used in the model are higher than local area aquifer tests indicate, which is resulting in an under prediction of drawdown. Additionally, the specific yield rates are too low and is resulting in over-prediction of the water table drawdown in the outcrop areas.

As stewards of the aquifers a working, accurate model is necessary in the planning process. It is the request of the GCUWCD, as a member of GMA13, to take the necessary actions to complete the model.

Sincerely,

Laura Martin
General Manager
GMA 13 Representative

Bruce Tieken
GCUWCD Board President

Kermit Thiele Jr.
GCUWCD Vice President

Barry Miller
GCUWCD Board Secretary/Treasurer

Mark Ainsworth
GCUWCD Director

Mike St. John
GCUWCD Director

Wintergarden Groundwater Conservation District
P. O. Box 1433
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www.wgcd.net (Email wgcd@wgcd.net)
"An Equal Opportunity Employer"

October 24, 2022

Ms. Kelley Cochran, Administrator
Groundwater Management Area 13
P. O. Box 1221
Seguin, TX 78156

Dear Kelley:

The Board of Directors of the Wintergarden Groundwater Conservation District (the "District") held their meeting on Wednesday, October 12, 2022, at the District Office, 2881 Hwy. 277 West, Carrizo Springs, Texas.

As per Agenda Item 9, "Discussion and appropriate action to propose Groundwater Management Area 13 (GMA 13) Planning Committee public comment on the Texas Water Development Board draft of the Groundwater Availability Model (GAM) for the southern portion of Queen City, Sparta, and Carrizo-Wilcox Aquifers," Vice-President J. R. Ramirez made a motion to request that the GMA 13 Planning Committee include in its public comment to be submitted to the Texas Water Development Board that the updated GAM prepared by GSI should be modified and recalibrated to insure that calibrated hydraulic properties of the Carrizo-Upper Wilcox Aquifer align with values documented in the technical record. The basis for this recommendation is that the values for transmissivity in the GSI model (as calculated from the assigned thickness of the Carrizo-Upper Wilcox Aquifer and the calibrated values for hydraulic conductivity) are excessively high. As noted in RW Harden's letter of concern, by having excessively high values for transmissivity in the model, the predicted drawdown will be underpredicted if/when pumpage is applied to these regions. As a consequence, the Modeled Available Groundwater (MAG) quantities that would be calculated by Texas Water Development Board staff using the updated GSI GAM would be greater than reasonable if the District were to achieve the Desired Future Conditions (DFCs). Director Lott Whitwell seconded the motion, and the motion passed unanimously.

It is the District's request that this communication be included in the public comment to be submitted to the Texas Water Development Board by the GMA 13 Planning Committee.

Regards,

Debbie Farmer

Debbie Farmer,
General Manager

From: daniel.meyer@pccd.org
To: Jean Perez
Cc: Feather Wilson
Subject: PCCD - Draft Numerical Model Southern Carrizo- Comments
Date: Thursday, October 27, 2022 10:28:33 AM

External: Beware of links/attachments.

Hello Jean,

Below are the comments from PCCD concerning the draft numerical model for the Sothern Portion of the Carrizo-Wilcox, Queen City, and Sparta Aquifers:

The new revised report expresses Transmissivity in terms of Hydraulic Conductivity or just HC. To obtain the Transmissivity one must multiply the thickness of the formation or lithology thickness by the HC.
The upper end of the Carrizo sand facies for a 500' section would result in a Transmissivity of 16,250 Ft2/Day.
This upper end would just be a loose sand with no cement nor intercalated clay, but not impossible but improbable.

I have seen 500-feet of Carrizo calculated with the Cooper-Jacob method with a hand drawn straight line as high as 75,000 Ft2/Day which is highly improbable if not impossible. I have never seen this high number calculated with the full Theis computer generated calculus method.

Thus, the modeler may have been using a reported biased hand drawn Copper-Jacob slope which will often inflate the Hydraulic Conductivity and calculated Transmissivity without utilizing an extremely low and impossible Storage Coefficient.

In addition, the omission of screen details coupled to the lack of geophysical logs without the crucial benefit of detailed sample and petrographic details which was probably beyond the scope of the study almost always places limits on any regional study.

Thus, I am less critical of statements that the reported Transmissivity was excessive if not impossible. The HC histograms tell a reasonable hydrogeological story.

Overall, I think the report was an ***excellent update***.

My only other criticism has to do with the paleo environments of deposition at the local or semi-regional level of interpretation, as well C-14 and paleontological age date correlations. As one moves south and west of Atascosa County, these interpretations become less clear and

remain outside the limits of most hydrogeological studies.

GMA-13 paleo environments of deposition changes near the western boundary of Atascosa County and should be designated and studied as a separate GMA. The shallow water bay area is quite complex considering the varied facies and sources from Mexico and West Central Texas. The same comments can also be attributed to the underlying Wilcox which should be separated from the Carrizo all together.

Please contact me if you have any questions.
Regards,

Daniel Meyer
Executive Manager
Plum Creek Conservation District
1101 W. San Antonio St.
Lockhart, TX 78644
512-398-2383

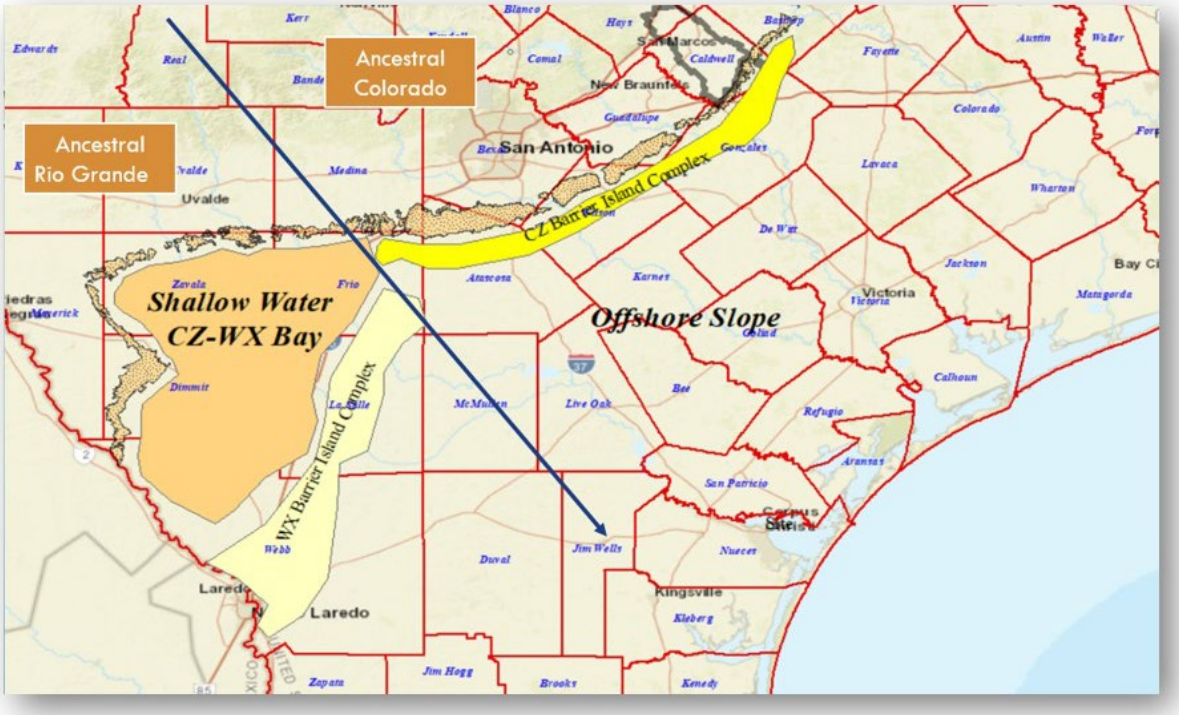
From: daniel.meyer@pccd.org
To: Jean Perez
Cc: Feather Wilson; rbarron@pccd.org; Alan Burklund; Kelley@gcgcd.org
Subject: FW: GMA 13 DIFFERENT SOURCES DIFFERENT GEOLOGICAL SEDIMENTARY SYSTEMS SHOULD AT LEAST BE ZONED OR SEPARATED
Date: Tuesday, November 1, 2022 8:29:47 AM

External: Beware of links/attachments.

Hello Jean,
I know the cutoff for submitting comments concerning the GMA 13 model was yesterday, but our geologist thought it would be imperative to send the geological map below as a reference to our comments we had sent a couple of days ago.
Thanks

Daniel Meyer
Executive Manager
Plum Creek Conservation District
1101 W. San Antonio St.
Lockhart, TX 78644
512-398-2383

From: featherg@hctc.net [mailto:featherg@hctc.net]
Sent: Tuesday, November 1, 2022 6:43 AM
To: daniel.meyer@pccd.org; Bob Wilson; aburklund@pccd.org; rbarron@pccd.org; Cody Draper
Subject: GMA 13 DIFFERENT SOURCES DIFFERENT GEOLOGICAL SEDIMENTARY SYSTEMS SHOULD AT LEAST BE ZONED OR SEPARATED



Strata Geological Services
Wm Feathergail Wilson PG 21, CPG 3566, CPG 1840
B.A., B.S., M.A. University of Texas @ Austin
Strata Geological Services
13505 FM 462
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Email: featherg@hctc.net

Guadalupe County
Groundwater Conservation District

Jean Perez
Hydrologist II, Groundwater Technical Assistance
Contract Manager, Texas Water Development Board
1700 N. Congress Ave.
Austin, Texas 78711-3231

Re: Public Comment to QCSCW GAM October 31, 2022

Dear Mr. Perez,

Groundwater Management Area 13 (GMA 13) met on October 14, 2022 to discuss submission of a public comment related to the draft Groundwater Availability Model (GAM) for the Southern portion of the Queen City, Sparta, and Carrizo-Wilcox aquifers.

In my capacity as Administrator, the planning group members directed me to submit comments on behalf of GMA 13 to the TWDB for consideration prior to finalization of the updated GAM.

As presented to the public at the Stakeholder Advisory Forum meeting July 22, 2022, the draft of the model showed extremely high transmissivity values for GAM Layer 7 (Carrizo), which would result in a major under-prediction of drawdown. Additionally, the values reported for specific yield in the outcrop region were too low.

An accurate Groundwater Availability Model is a valuable tool, essential for planning. Therefore, the members of GMA 13 respectfully request consideration be given to recalibrating the model to correct the over/under estimations of transmissivity and specific yield values prior to finalization.

Thank you for your time and consideration.

Sincerely,

Kelley Cochran

Kelley Cochran
GMA 13 Administrator

Enclosed: Letters from the Gonzales UWDC and Wintergarden GCD

830-379-5969 • gcgcd@gcgcd.org • www.gcgcd.org
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