

FERRIS, FLINN & MEDINA, LLC

Engineers

Surveyors

1405 N. Stuart Place Rd.

Palm Valley, TX 78552

Ph: (956) 364-2236 Fax (956)364-1023

Letter of Transmittal

Date: 2/1/16

Attention: SWIFT Abridged Application

Project: Off Channel Storage Facility

Job #: 202-039

Texas Water Development Board

Address: 1700 N. Congress, 6th Floor

Austin, TX 78701

Email:

Ph. #: 512-936-0802

<input type="checkbox"/> Shop Drawings	<input type="checkbox"/> Attached	<input type="checkbox"/> Change Order
<input type="checkbox"/> Plans	<input type="checkbox"/> Submittals	<input type="checkbox"/> Survey
<input type="checkbox"/> Specs	<input type="checkbox"/> Copy of letter	<input type="checkbox"/> Under separate cover via:
The Following items:	Other: SWIFT Application	

# of Copies	Date	Number	Description
2	2/1/16	202-039	2 Hard copies of the SWIFT Abridged Application for United Irrigation District – Off Channel Storage Facility


These are transmitted as checked below:

<input type="checkbox"/> For Approval	<input type="checkbox"/> Reviewed	<input type="checkbox"/> Resubmit	<input type="checkbox"/> Copies for Approval
<input type="checkbox"/> For Your Use	<input type="checkbox"/> Reviewed; See Comments	<input checked="" type="checkbox"/> Submit	<input type="checkbox"/> Copies for Distribution
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<input type="checkbox"/> For Review	<input type="checkbox"/> For Review & Comments	<input type="checkbox"/> Prints after loan to us	

Comments: via FedEx Priority Overnight (775542087834)

Copy to: File (1)
Mike Warshak – General Manager, UID

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Signed/Submitted By: 
 Received by: _____



Abridged Application

Due February 5, 2016 by 5:00pm

SWIFT@twdb.texas.gov

By submitting this abridged application, you understand and confirm that the information provided is true and correct to the best of your knowledge and further understand that the failure to submit a complete abridged application by the stated deadlines, or to respond in a timely manner to additional requests for information, may result in the withdrawal of the abridged application without review.

GENERAL INFORMATION

Name of Entity	County	Regional Water Planning Area
United Irrigation District	Hidalgo	M-Rio Grande

Entity Contact Information

Contact Person	Name	Frank Ferris, PE		
	Title	District Engineer		
Mailing Address	1006 Mile 2 North			
	Mission, TX 78572			
Phone Number	956-364-2236	Fax Number	956-364-1023	
Email Address	f.ferris@ferrisandflinn.com			

PROJECT DESCRIPTION

Name of Project <i>(As it appears in the 2016 regional water plan)</i>	Off Channel Storage Facility			
Where can the project be found in the most recent Regional Water Plan?	Project described on page:	5 - 136	Capital costs listed on page:	5 - 138

Please attach a list of all water systems served by the proposed project.

Phase(s) Applied For	<input type="checkbox"/> Planning	<input checked="" type="checkbox"/> Acquisition	<input checked="" type="checkbox"/> Design	<input checked="" type="checkbox"/> Construction
Population Served When Fully Operational	232,000			

Description of Proposed Project

Off Channel Storage Facility to better manage pumping of water ordered from the Rio Grande Watermaster to significantly reduce river losses. Storage capacity is 620 Acre Feet. See attached information.



Abridged Application

Due February 5, 2016 by 5:00pm

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Emergency <i>(select all that apply)</i>	<input type="checkbox"/> Applicant/entity's water supply will last less than 180 days. <input type="checkbox"/> Water supply need occurs earlier than anticipated in the State Water Plan. <input type="checkbox"/> Applicant has received or applied for Federal emergency funding. <input checked="" type="checkbox"/> None of the above.
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Agricultural Efficiency Project?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Efficiency improvement achieved by implementing the project <i>(Please provide an attachment showing the basis for your calculation.)</i>
		<input type="checkbox"/> <1% <input type="checkbox"/> 10%-13.9% <input type="checkbox"/> 1%-1.9% <input type="checkbox"/> 14%-17.9% <input checked="" type="checkbox"/> 2%-5.9% <input type="checkbox"/> ≥18% <input type="checkbox"/> 6%-9.9%

Household Cost Factor
(Household Cost Factor for SWIFT prioritization is calculated by dividing the service area's average residential water bill by its annual median household income. For regional projects, these should represent the combined service areas of all participating entities.)

Estimated average annual residential water bill:	N/A	Annual Median Household Income:	N/A
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The proposed project addresses:	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Water Loss <input type="checkbox"/> N/A	Annual Volume of Water Produced/Conserved by the Project <i>(in acre-feet per year)</i>	2,000
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Readiness to Proceed <i>(select all that apply)</i>	<input checked="" type="checkbox"/> Preliminary planning or design work (30% of total project) has been completed or is not required. <input checked="" type="checkbox"/> Applicant is prepared to begin implementation or construction within 18 months of application deadline. <input checked="" type="checkbox"/> Applicant has acquired all water rights associated with the proposed project, or none will be required.
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ESTIMATED COSTS		
Estimated Project Costs	Low-interest Loan	\$ 8,090,000
	Deferred Loan	\$ 0
	Board Participation	\$ 0
	Local Contribution	\$ 0
	Other: N/A	\$ 0
	Total Estimated Project Costs	\$ 8,090,00

Anticipated Commitments <i>Attach proposed schedule for multi-year commitments</i>	<input checked="" type="checkbox"/> One-Time Commitment <input type="checkbox"/> Multi-Year Commitments
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Public Water Systems Served by the Project:
 City of Mission PWS
 City of McAllen PWS
 Sharyland WSC PWS

In addition, the City of Mission and Sharyland WSC have additional rights that United pumps for them. Table 1 provides a tabulation of the diversion by UID over the past 31 years. Also included in the table is the overall delivery efficiency that has improved substantially over time.

In recent years, UID has delivered more municipal water but has also become more efficient through completion of various water conservation projects funded by the Bureau of Reclamation. The current delivery efficiency of the District is about 85%.

UID also manages Hidalgo County Irrigation District No. 16 (D16) that diverts water upstream of the UID First Lift Pump Station. D16 serves about 12,000 acres of irrigated farmland and is authorized to divert up to 31,624 acre feet under Certificate of Adjudication Number 802-000.

3. Conservation

The UID boundary is shown in Figure 1 along with Water Certificates of Convenience and Necessity (CCN) Boundaries of its PWS customers. Figure 2 displays UID's First Lift Pump Station along the Rio Grande and the Proposed Storage Facility site. Other than the canal between the First Lift and the Second Lift Pump Stations, UID has no other off-channel storage. The storage capacity of this section of canal is about 80 acre feet. UID orders water from the Rio Grande Watermaster at least 48 hours prior to the time it plans to divert the water from the Rio Grande. The Watermaster releases the water from Falcon Lake according to the order schedule and 48 hours represents the time needed to execute the order and the time for the water to travel from Falcon to the UID First Lift Pump Station. Once an order is released from Falcon it cannot be stopped, so the diverter must divert the water on time or it is lost downriver to the Gulf of Mexico. TCEQ Chapter 303, Operation of the Rio Grande, dictates the procedures for ordering and diverting water and the Watermaster accounting methods. The Watermaster charges the Diverter's water right account the higher of the actual amount of water diverted or 90% of the order. UID typically orders water one week in advance and may amend the order two days in advance as required. During times of unpredicted wet weather, predicted irrigation and municipal demand can be significantly reduced resulting in UID's inability to divert ordered water. The Watermaster will charge 90% of the original order.

Table 1
Water Diversions for Agricultural and Municipal Customers

Fiscal Year	Total Diversions (Acre-Feet)	Agriculture In-Dist (Acre-Feet)	Agriculture Out-Dist (Acre-Feet)	Sharyland WSC (Acre-Feet)	City of Mission (Acre-Feet)	City of McAllen (Acre-Feet)	In District Lost Water (Acre-Feet)	Total Accounted Water (Acre-Feet)	In District Water Loss (Percent)	River Losses (Acre-Feet)	River Losses (Percent)	Overall Efficiency (Percent)
1984	44,452	20,515	2,520	1,656	3,156	0	16,605	27,847	37.4%	1,695	3.7%	59.0%
1985	34,006	12,007	2,192	1,099	3,213	0	15,495	18,511	45.6%	1,296	3.7%	50.8%
1986	42,101	15,031	2,050	1,449	4,339	0	19,232	22,869	45.7%	1,605	3.7%	50.6%
1987	39,451	16,599	1,202	2,097	4,242	0	15,311	24,140	38.8%	1,504	3.7%	57.5%
1988	52,234	24,940	2,582	2,909	5,238	0	16,565	35,669	31.7%	1,991	3.7%	64.6%
1989	66,596	29,942	3,917	4,104	6,459	0	22,174	44,422	33.3%	2,539	3.7%	63.0%
1990	57,560	24,318	3,134	5,261	5,685	0	19,162	38,398	33.3%	2,194	3.7%	63.0%
1991	34,105	15,308	1,088	5,313	6,769	0	5,627	28,478	16.5%	1,300	3.7%	79.8%
1992	36,903	13,446	301	5,360	6,686	0	11,110	25,793	30.1%	1,407	3.7%	66.2%
1993	41,209	14,756	845	5,157	6,846	0	13,605	27,604	33.0%	1,571	3.7%	63.3%
1994	37,710	14,495	1,506	4,384	7,311	0	10,014	27,696	26.6%	1,438	3.7%	69.8%
1995	40,830	17,439	358	4,566	8,037	0	10,430	30,400	25.5%	1,557	3.7%	70.8%
1996	52,163	21,093	1,684	3,340	8,834	0	17,212	34,951	33.0%	1,989	3.7%	63.3%
1997	41,914	16,078	1,052	3,833	8,967	0	11,984	29,930	28.6%	1,598	3.7%	67.7%
1998	41,118	17,044	526	4,386	7,509	0	11,653	29,465	28.3%	1,568	3.7%	68.0%
1999	32,911	10,811	1,148	5,044	7,775	0	8,133	24,778	24.7%	1,255	3.7%	71.6%
2000	39,694	14,081	1,018	5,627	8,924	0	10,044	29,650	25.3%	1,513	3.7%	71.0%
2001	32,503	11,898	372	5,150	8,485	0	6,598	25,905	20.3%	1,239	3.7%	76.0%
2002	38,712	18,447	256	5,372	8,277	0	6,360	32,352	16.4%	1,476	3.7%	79.9%
2003	25,667	8,166	144	5,022	8,413	0	3,922	21,745	15.3%	979	3.7%	81.0%
2004	23,573	6,675	267	4,207	7,184	955	4,285	19,288	18.2%	899	3.7%	78.1%
2005	37,667	12,026	626	4,406	11,280	5,347	3,982	33,685	10.6%	1,436	3.7%	85.8%
2006	44,659	13,968	533	5,210	9,452	5,317	10,179	34,480	22.8%	1,703	3.7%	73.5%
2007	30,432	6,595	254	4,755	9,431	4,250	5,147	25,285	16.9%	1,160	3.7%	79.4%
2008	36,831	13,910	700	5,312	10,895	3,602	2,412	34,419	6.5%	1,182	3.1%	90.3%
2009	43,042	15,910	775	5,312	11,520	6,222	3,303	39,739	7.7%	1,308	3.0%	89.4%
2010	32,525	7,907	225	5,026	10,043	5,641	3,683	28,842	11.3%	2,630	7.5%	81.2%
2011	53,085	15,987	751	5,411	12,239	7,734	10,963	42,122	20.7%	1,044	1.9%	77.4%
2012	48,762	14,181	500	5,251	14,616	9,225	4,989	43,773	10.2%	1,453	2.9%	86.9%
2013	57,243	23,147	434	5,682	14,585	9,253	4,141	53,102	7.2%	2,182	3.7%	89.1%
2014	47,727	17,929	49	4,745	13,421	7,657	3,927	43,800	8.2%	1,820	3.7%	88.1%
2015	31,730	4,349	26	3,591	11,863	6,840	5,061	26,669	16.0%	1,640	4.9%	79.1%
33 Year Average	41,222	15,281	1,032	4,376	8,490	2,251	9,791	31,431	23.8%	1,568	3.7%	72.6%
Recent 15 Year Average	38,944	12,740	394	4,963	10,780	4,803	5,264	33,680	13.5%	1,477	3.8%	82.7%
Recent 5 Year Average	47,709	15,119	352	4,936	13,345	8,142	5,816	41,893	12.2%	1,628	3.4%	84.4%

Note: River Losses were analyzed for years 2008-2012 & 2015. The five year average of 3.7% was then applied to all other years.

The difference between the Watermaster charge and the order are "River Losses" and represent an estimate of the amount of water charged to the Diverter's account that actually flows downstream to the Gulf of Mexico. The purpose of this storage facility is to provide a place to store water that has been ordered and will be charged to UID's account.

Table 2 provides the amount of water UID lost downriver for the five calendar years from 2008-2012. The Table is based upon UID's records of the amount of water ordered each week and the amount of water diverted. The difference between 90% of the order and the actual amount pumped, if positive, is the river loss. In general, over the five year period, UID has lost approximately 1,500 acre feet per year, or 3.7% of the amount diverted, downriver to the Gulf of Mexico.

There are times when No Charge Water is available in the Rio Grande, and UID can utilize the reservoir to store No Charge water when it is available. There is less opportunity for No Charge water above the Anzalduas Dam where the UID First Lift is located because the Watermaster is able to make adjustments at Anzalduas. In addition, there are times when UID may not be able to divert ordered water because of power or equipment failures at the river. Assuming these two events offset each other, UID will conserve approximately 1,500 acre feet per year by construction of the storage facility. The storage facility will be located on UID's Main Canal between the First and Second Lift Pumping Facilities. Water stored in the facility will be diverted under UID's Certificate Adjudication No. A847-001. The Diversion point and the place of use will not change.

4. Hidalgo County Irrigation District No. 16

UID manages Hidalgo County Irrigation District No. 16 (D16). D16 is located on the Rio Grande about 14 river miles upstream of the UID facility. During times when D16 cannot divert ordered water due to wet weather, water ordered by both Districts can be amended such that UID can divert D16's water and store it in the proposed facility. Table 3 outlines D16's river losses based on water ordered and water pumped for the period from 2008-2012. Typically, D16 loses about 1,000 acre feet per year.

Table 2
United Irrigation District
River Losses

Calendar Year	River Losses (Acre Feet)
2008	1,182
2009	1,308
2010	2,630
2011	1,044
2012	1,453
Average	1,523

Table 3
District No. 16
River Losses

Calendar Year	River Losses (Acre Feet)
2008	802
2009	229
2010	211
2011	2,436
2012	1,181
Average	972

UNITED IRRIGATION DISTRICT

Irrigation District Conservation

United ID has a conveyance system of approximately 150 miles of primarily open canals, and minimal storage. This district delivers to irrigation water users, Sharyland WSC and the cities of Mission and McAllen.

Table 5-110 United ID Conservation WMS Cost Projections

<i>Cost Estimate Summary United Irrigation District Irrigation District Conservation</i>	
<i>Item</i>	<i>Estimated Costs for Facilities</i>
Canal Lining Main Canal	\$12,000,000
TOTAL COST OF PROJECT	\$12,000,000
ANNUAL COST	
Debt Service (5.5 percent, 20 years)	\$951,803
O&M Cost (based on reduced pumping and canal rider costs)	-\$4,486
TOTAL ANNUAL COST	\$947,317
Available Project Yield (acft/yr)	7093
Annual Cost of Water (\$ per acft)	\$134
Annual Cost of Water (\$ per 1,000 gallons)	\$0.41

Off-Channel Reservoir

Project Source

This strategy was submitted by United Irrigation District to the RWPG.

Description

This strategy is for an off-channel storage reservoir between the diversion point from the Rio Grande and the first pumping station in the United Irrigation District system. There is a delay between the time that the users in the district request water and the time when the Irrigation Districts can divert that water from the river because of the distance that the water must travel. Water is ordered 2-8 days in advance based on forecasted needs. In the time (generally 2-3 days) between when water is released and when it is diverted, rainfall in the district can fill the available storage space in the main canals and reduce demands. When this happens, the District has nowhere to store the water they have requested but their water right holder account is charged with 90% of the volume that was released for them. United ID has quantified these losses annually from 2008 to 2012, estimating an average of 3.7% of their annual diversions is lost as a result of insufficient storage.

A storage reservoir is proposed between the pump station at the Rio Grande and the first pump station within the ID canal network which would have a 640 AF storage capacity, as opposed to the estimated 80 AF capacity of their main canal. This would allow for general operational improvements within the district, but will also yield an estimated additional 2,000 AF of supply in a drought of record scenario without any additional water rights.

United ID also manages Hidalgo County Irrigation District No. 16, which is upriver from United. With the approval of the Watermaster, United would be able to pump and store any water that HCID No. 16 is unable to divert as a result of their limited storage and periodic equipment failures. HCID No. 16 is estimated to lose 5% of their annual diversions.

A map with the location of the United ID Reservoir is shown in Figure 5-11.

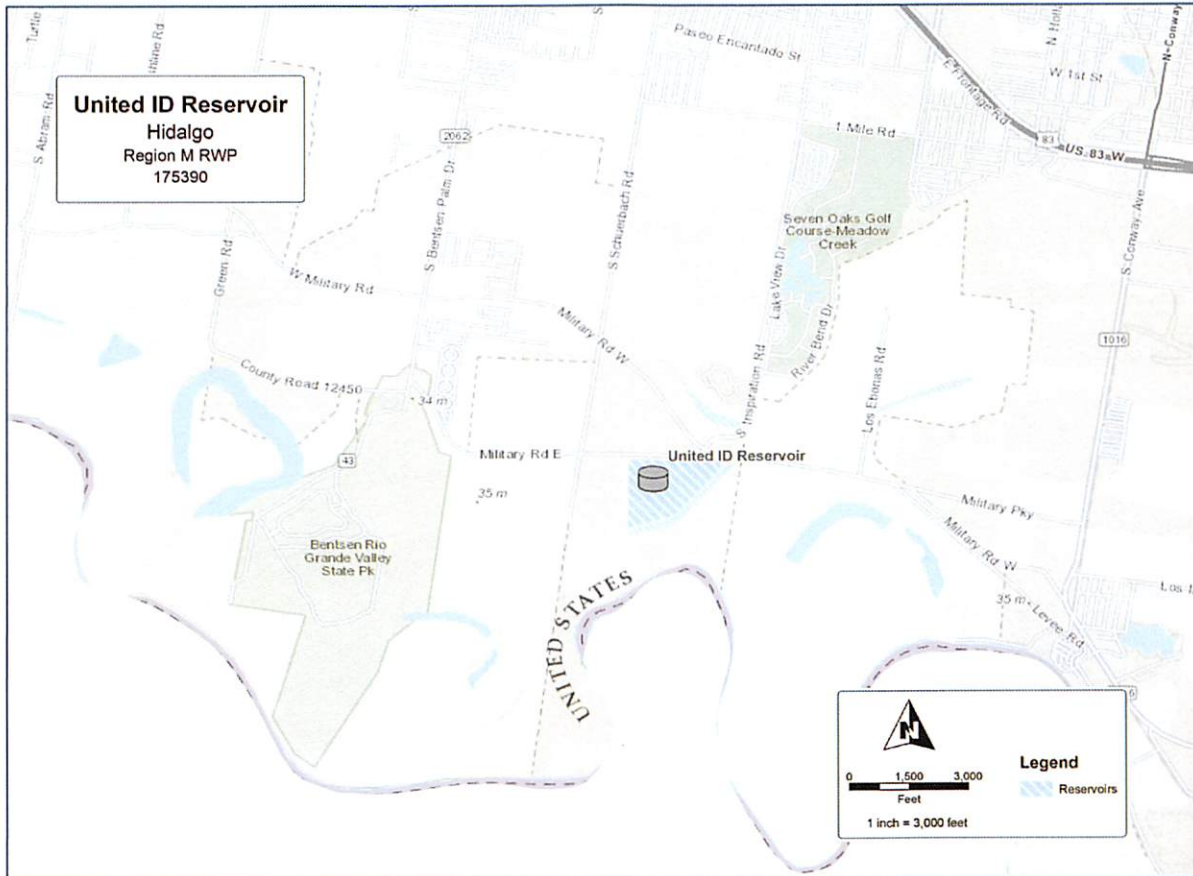


Figure 5-11 United ID Off-Channel Reservoir

Available Supply

In order to estimate the supplies available with this strategy, the loss estimates from inability to divert were applied to the diversion projections for drought of record conditions. Over the planning horizon, the United ID losses are estimated at 2,000 AF and the HCID No. 16 losses were estimated at 900. Taking into consideration that these losses may not be 100% eliminated, and for a conservative estimate, 1,500 AF and 500 AF were estimated for United and HCID 16, respectively for a total increase in supplies of 2,000 AF.

Environmental Issues

Construction of this reservoir would require inundation of 45 acres of land, currently used as farmland. Temporary environmental impacts may be seen during construction activities, such as increased air and noise pollution which are typical of any construction project. There would be a reduction in water left in the channel of the Rio Grande equivalent to the firm yield of the

project, estimated at 2,000 acre-ft./year. There are no dry-year environmental subsistence flow requirements for the portion of the Rio Grande downstream of United ID's diversion point. Reservoirs constructed entirely on dry land require no federal 404 permit. Other typical environmental issues include impacts that may be seen during construction activities, such as increased air and noise pollution, and land disturbance activities.

Engineering and Costing

The Unified Cost Model was used to estimate the costs of construction and maintenance for the reservoir (Table 5-111). Because a site has been identified, costs were included directly.

Table 5-111 United ID Off-Channel Reservoir Project Requirements and Costs

<i>Cost Estimate Summary Water Supply Project Option United Irrigation District - Off-Channel Reservoir</i>	
<i>Item</i>	<i>Estimated Costs for Facilities</i>
Off-Channel Storage/Ring Dike (Conservation Pool 620 acft, 45 acres)	\$4,372,000
TOTAL COST OF FACILITIES	\$4,372,000
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	\$1,530,000
Environmental & Archaeology Studies and Mitigation	\$953,000
Land Acquisition and Surveying (50 acres)	\$1,271,000
Interest During Construction (4% for 1 years with a 1% ROI)	<u>\$286,000</u>
TOTAL COST OF PROJECT	\$8,412,000
ANNUAL COST	
Debt Service (5.5 percent, 20 years)	\$3,000
Reservoir Debt Service (5.5 percent, 40 years)	\$522,000
Operation and Maintenance	
Dam and Reservoir (1.5% of Cost of Facilities)	\$66,000
Pumping Energy Costs (47137 kW-hr @ 0.09 \$/kW-hr)	\$4,000
TOTAL ANNUAL COST	\$595,000
Available Project Yield (acft/yr), based on a Peaking Factor of 1	2,000
Annual Cost of Water (\$ per acft)	\$298
Annual Cost of Water (\$ per 1,000 gallons)	\$0.91

Implementation Issues

No additional water rights are required. The District will divert water under its existing rights; Certificate of Adjudication No. A847-001. However, pumping water rights owned by HCID No. 16 will require approval by the watermaster. Construction permitting will be required.