WATERSMART WATER AND ENERGY EFFICIENCY GRANTS FOR FY 2019
FUNDING OPPORTUNITY ANNOUNCEMENT NO. BOR-DO-19-F004

LA UNION EAST CANAL CONCRETE LINING PROJECT

TOTAL PROJECT COST: $925,298

Applicant
El Paso County Water Improvement District No. 1
13247 Alameda Avenue, Clint, Texas 79836

Project Manager
Dr. Al W. Blair, PE, District Engineer
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I EXECUTIVE SUMMARY

Applicant Information

Date:	March 15, 2019
Applicant Name:	El Paso County Water Improvement District No. 1
City, County, State:	El Paso, El Paso County, Texas
Project Name:	La Union East Canal Concrete Lining Project
Project Manager:	Dr. Al Blair, P.E., District Engineer
Telephone:	512-394-1011
E-mail:	awblair@awblair.com
Project Funding Request:	The total project cost is $925,298 and the District is requesting $300,000 in federal funds.

Project Summary

The La Union East Canal Lining Project consists of constructing 4,500 feet of reinforced concrete on an earthen-lined portion of the La Union East Canal and make improvements to an existing check structure for sediment control. The properly designed and constructed system will support the efficient management of water resources by reducing water losses due to seepage and by reducing maintenance operations caused by sediment buildup. Additional benefits to existing and planned water infrastructure can also be achieved as part of the proposed project. The estimated amount of water to be saved after completion of the project is 231 acre-feet at a cost of $80.11 per acre-foot.

This proposal is being submitted as a Funding Group I project under the category Water Conservation Projects: Canal Lining/Piping.

Estimated Completion Schedule

The construction of the project will take twenty four months from the date of funding authorization, which is assumed to be in January of 2020 or earlier. Concrete lining work will need to take place outside of the irrigation season (typically March 15 to October 15) and is expected to be completed by December of 2021. Final report preparation will take an additional month. The project completion date is January 2022. The project will be accomplished within the two-year allowance.

Federal Facility

El Paso County Water Improvement District No. 1 lies within Reclamation's Upper Colorado Region and relies on storage and conveyance facilities that are part of the Rio Grande Project.

II BACKGROUND DATA

A. Source of Water Supply

The District obtains water by annual allocation from the United States Bureau of Reclamation's Rio Grande Project. The District's diversion right of water during a full allocation year during the primary irrigation season is 376,860 acre-feet per year.

B. Relationship with Reclamation

The United States Reclamation Act passed on June 17, 1902 initiated formal development of the large-scale irrigation system in the El Paso Valley. The Rio Grande Reclamation Act of February 25, 1905 provided for the construction of Elephant Butte Dam and Reservoir, which was completed in 1916. Major canals and drains were constructed under the Rio Grande Reclamation Project from 1915 to 1925 and a second impoundment, the Caballo Dam and Reservoir, was completed in 1938. The United States Bureau of Reclamation maintained the dams, reservoirs, canals and drains until 1980, when the maintenance responsibilities were assumed by the District. The District assumed actual ownership of all canals, drains, laterals and waterways in the Texas portion of the Rio Grande Project on January 22, 1996.

The District has worked with Reclamation on many projects over the years since, including:

Table 1 – Recent Projects Funded by Grants from Reclamation

Program	FOA No.	Year	Grant Amount
Riverside Concrete Lining Project	BOR-DO-18-F006	2018	$ 1,000,000
Ysla Lateral Concrete Lining Project	BOR-DO-18-F009	2018	$ 75,000
Designing Improvements to the Franklin Canal and Franklin Feeder Canal	BOR-UC-18-F001	2018	$ 75,000

C. Water Rights, Current Water Uses, and Water Users Served

Rio Grande Project water is released from storage in Elephant Butte Reservoir and regulated through Caballo Reservoir. The methodology for determining diversions for the District, Elephant Butte Irrigation District (EBID), and the Republic of Mexico is described in the Operating Agreement and Operating Manual that the two districts and Reclamation negotiated and approved in 2008.

The District provides water from the Rio Grande for 69,010 acres of water rights lands. The District serves more than 30,000 water user accounts. Irrigation users include approximately 325 large farms and 4,500 irrigated tracts of five acres or less. Irrigated crops include cotton, alfalfa, pecan trees, sorghum, chilies, wheat, onions, corn, vegetables, pasture grass, and family gardens.

The City of El Paso currently has water rights for approximately 70,000 acre-feet per year from Rio Grande Project Water in contracts and from leasing water rights from holders. Rio Grande Project water is used to meet municipal demand for a population of over 800,000. The amount of water attainable by the City of El Paso is subject to availability and is dependent on the District's total diversion rights and prior appropriations.

D. Water Delivery and Distribution System

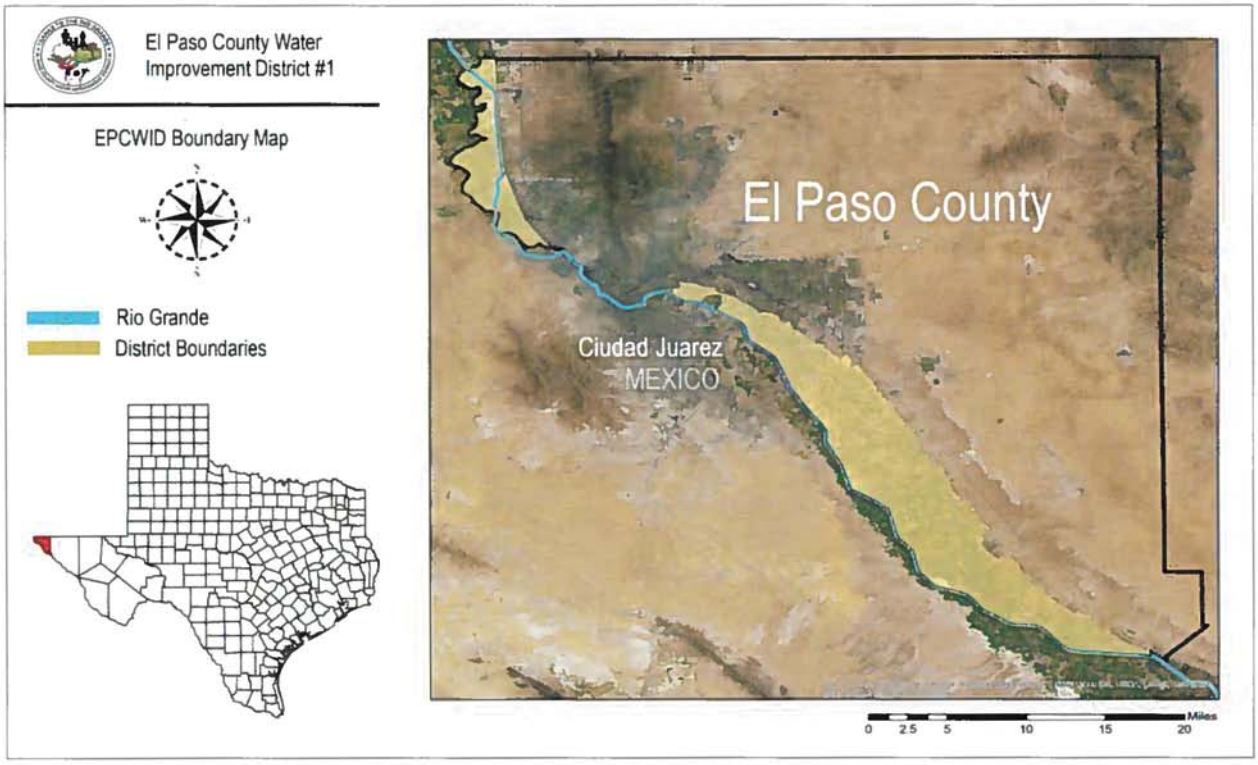
The District delivers water to an average of 49,000 acres of cropland using 350 miles of canals, 269 miles of drains, 60 wells, and over 2,200 turnouts.

- 62 miles of concrete lined canals and laterals
- 163 miles of unlined canals and laterals
- 1.52 miles of enclosed canals and pipelines
- 30 miles of canals and laterals that are lined intermittently

The District delivers river water for municipal use to the City of El Paso at the W.E. Robertson/Umbenhauer Water Treatment Plant located in downtown El Paso and at the Jonathan W. Rogers Water Treatment Plant located in the El Paso Lower Valley.

The District currently operates 83 telemetry sites that are monitored by the District's central dispatch office. The District also operates a near real-time flow telemetry data portal using these sites, which can be viewed remotely by farmers and stakeholders at https://epcwid.org/telemetry.

Figure 1 – District Boundaries



E. Current and Projected Water Demand

The El Paso region has an arid climate and receives an average annual rainfall of about 8 inches with net evaporation exceeding 70 inches. The region faces unique water challenges characterized by an agricultural system that is a century old, prolonged drought conditions, a growing population and a growing sister city in Mexico with shared groundwater and surface water supplies, interstate and international treaties, and interstate litigation that may impact the District's water supply from the Rio Grande.

Municipal Water Demand

The 2017 Texas State Water Plan estimates that the total water demand in El Paso County is 406,422 acre-feet of water per year. By 2070, water demand is expected to increase to 476,929 acre-feet of water per year. The population in El Paso County is expected to nearly double to over 1.5 million by 2070. Irrigation currently accounts for over 60% of water use in El Paso County, and a significant portion of future municipal water needs are projected to be supplied using increasing amounts of water previously allocated for irrigation. Municipal water demand projections in the 2017 Texas State Water Plan are based on current and projected future per capita consumption and are therefore susceptible to any variations in actual population increases.

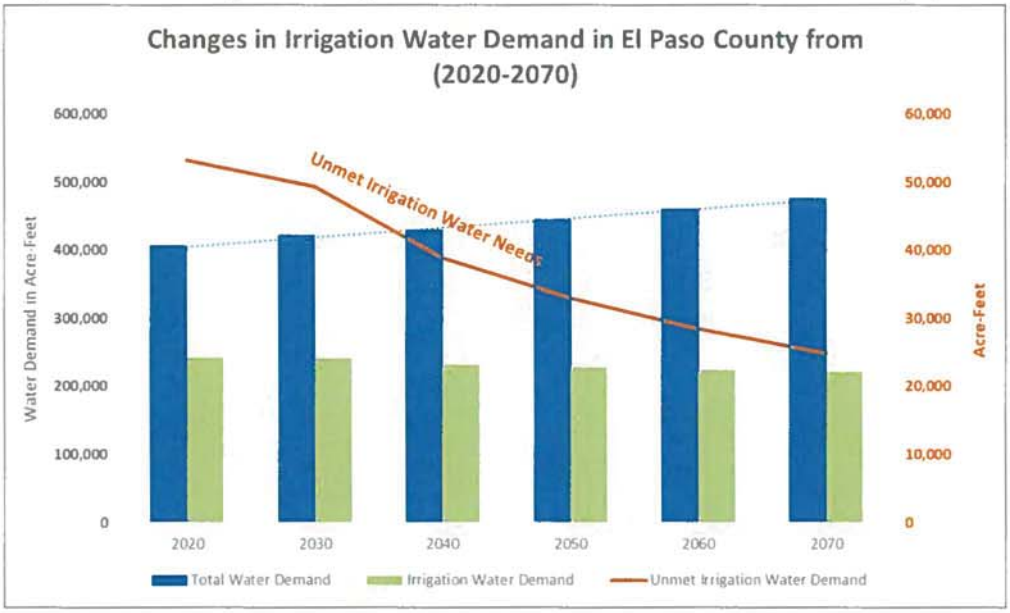
One such variation is the continued expansion of Fort Bliss as a result of the U.S. Army's Base Realignment and Closure (BRAC) program, which from 2005 to 2011 brought 24,000 additional military personnel and over 20,000 dependents (Fort Bliss Garrison 2011). Increasing the military value of Fort Bliss is one of the top economic development priorities for the City of El Paso, opening the possibility of future increases in military personnel (City of El Paso 2012). Fort Bliss received approximately 26% of its water supply from the City of El Paso in 2017 (Gonzalez 2017) and additional water can be supplied via emergency interconnections by El Paso Water Utilities in the event that the Fort Bliss Water Supply Corporation water systems are incapable of providing sufficient supply (FBWSC 2017).

Another variable is the increasing water demand in Ciudad Juarez, Mexico, which is located across the Rio Grande from the City of El Paso. Ciudad Juarez is 100% dependent on groundwater to satisfy all of its municipal and industrial water demands, according to the *Junta Municipal de Agua y Saneamiento de Juárez* (JMAS), Ciudad Juarez's potable water utility. According to Mexico's Consejo Nacional de Poblacion 2010 – 2030 population projections (CONAPO 2012), the current population of Ciudad Juarez is estimated at over 1.4 million and is expected to grow by over 9% by 2030. In 2014, 144,213 acre-feet of water were pumped from the Hueco Bolson aquifer, following a 15-year trend of average annual increases in pumping of 1,289 acre-feet since 2000 (FWTWPG 2016). The City of El Paso shares the Hueco Bolson with Ciudad Juarez and is used to meet anywhere from 28-61% of municipal and industrial water needs in El Paso, depending on the availability of Rio Grande Project water.

Irrigation Water Demand

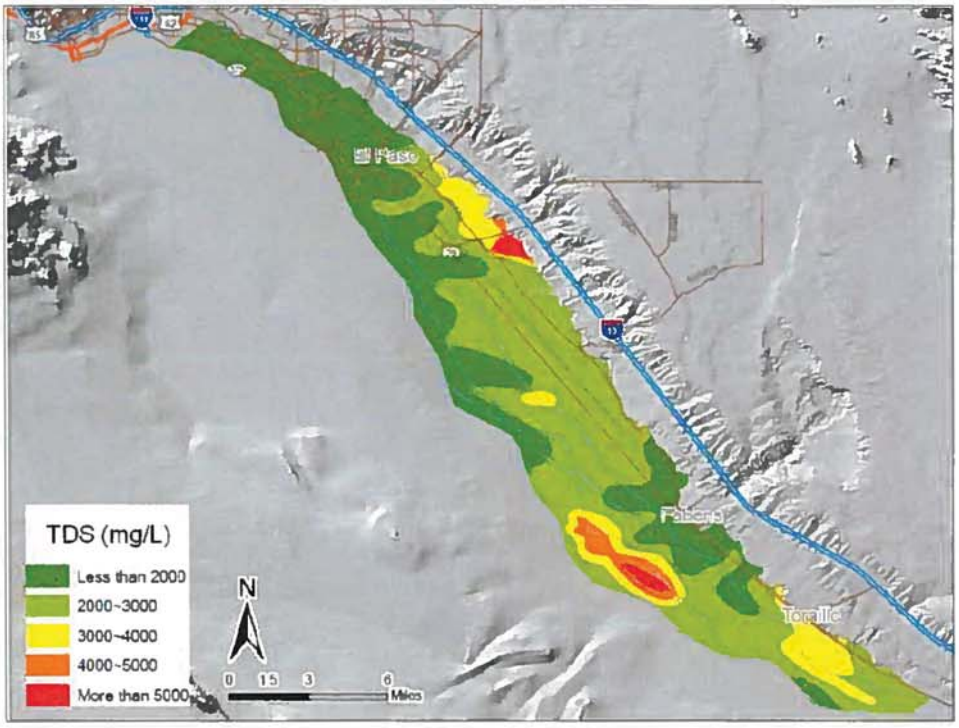
The Texas State Water Plan estimates that during drought-of-record conditions, there are 53,202 acre-feet of annual unmet water needs for irrigation in El Paso County. The growing imbalance between supply and demand is expected to lead to greater reliance on non-renewable groundwater resources used by farmers in the El Paso region.

Figure 2 – Changes in Irrigation Water Demand in El Paso County (FWTWPG 2016)



Only a portion of the agricultural land in El Paso County has access to private irrigation wells of which a majority of the wells produce water with total dissolved solids (TDS) of greater than 1,000 mg/l (many in excess of 2,500 mg/l) with significant sodium content. The high salt content limits the amount of groundwater that can be used to grow irrigated crops. Consequently, many farmers rely on blending surface water from the Rio Grande with groundwater to meet their water quality needs or use surface water exclusively. During years of drought, many agricultural operations are fallowed or deficit irrigated.

Figure 3 –TDS in the Rio Grande Alluvial Aquifer (CH2MHILL 2011; Hibbs and Merino 2006)



Water Management Strategies

Water conservation estimates in the 2017 Texas State Water Plan indicate that 50,000 acre-feet of water per year can be saved by concrete lining several of the District's canals, including the La Union East Canal. According to a Texas A&M University report sponsored by the Texas Water Development Board (TWDB) titled *Evaluation of Irrigation Efficiency Strategies for Far West Texas: Feasibility, Water Savings and Cost Considerations* (Michelsen, Chavez, Lacewell, Gilley, and Sheng 2009), there are very limited opportunities for water conservation in Far West Texas irrigated agriculture outside of making improvements to the District's conveyance system. The reasons for this can be summarized by: the most cost-effective best management practices in irrigation have already been implemented and associated water savings realized, there are limitations to gravity flow used by the irrigation system, and water conservation implementation costs for a number of practices exceed the agricultural value and benefits of any water saved.

Conservation via concrete lining is a more cost effective option to meet future water demands compared to other projects proposed in the 2017 Texas State Water Plan, including meeting municipal water demands via desalination, advanced purification, and the importation of water from outside El Paso County. A report by El Paso Water Utilities (Gonzalez 2017) compared drinking water quality treatment costs per acre-feet, determining that treatment costs for surface river water are the second least expensive option at $200-$300 per acre-foot, while costs for desalination are $508 per acre-foot, costs for advanced purification are $1,370 per acre foot, and costs for long-distance importation are $2,840 per acre foot.

The proposed concrete lining of the La Union East Canal is among the most cost-effective projects for the District to continue providing the water necessary to sustain farming operations and provide additional water to the City of El Paso under its contracts with the District. As water demand is met by a more efficient system, the District can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

F. Potential Shortfalls in Water Supply and Drought

Water Losses

The number one potential shortfall for the District is water losses due to seepage. A report from the United States Geological Survey (USGS) investigated cumulative seepage losses along a 64-mile reach of the Rio Grande from below Leasburg Dam in Leasburg, New Mexico to above the American Dam in El Paso, Texas (USGS 2015). This report determined that the cumulative seepage losses in 2015 were approximately 17.3 cubic feet per second (12,524 acre-feet per year) and are a result of seepage in the Rio Grande streambed, evaporation from the water surface, and transpiration by vegetation along the river banks. These inevitable losses and additional losses further upstream starting from Elephant Butte Reservoir must also be accounted as part of the District's water delivery operations and drought planning.

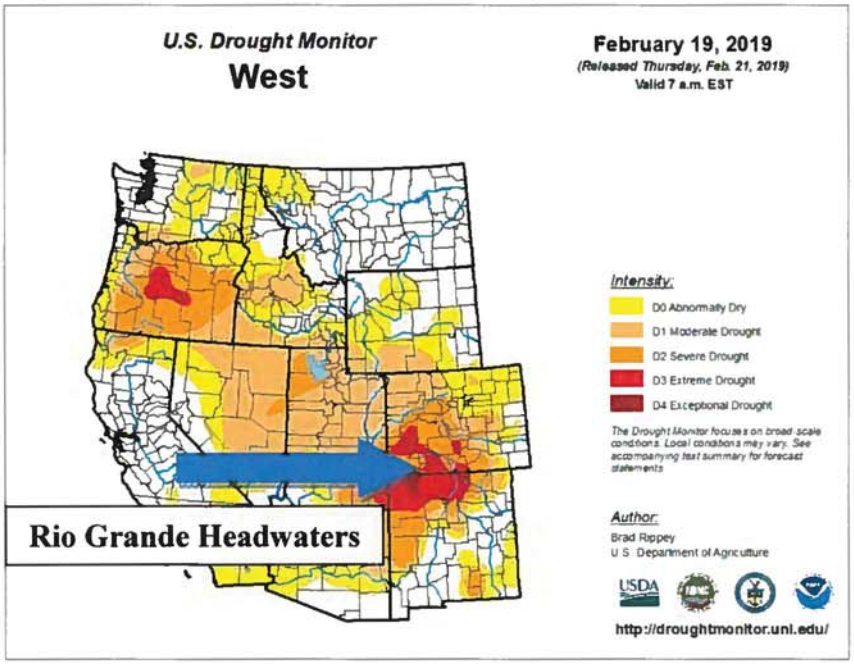
Because the District has limited ability to address losses upstream, the District continuously invests in projects within its jurisdiction that increase efficiency and reduce losses due to seepage. The District's ability to develop water conservation projects is partially dependent on revenues derived from water orders sourced by the District's annual allocation of Rio Grande Project water. In drought years, District revenues decrease. When possible, the District partners

with the Texas Water Development Board, the U.S. Bureau of Reclamation, the International Boundary and Water Commission (IBWC), the Texas Department of Transportation, the City of El Paso, and other local entities to cost-share many of its water conservation and drought mitigation projects.

Prolonged Drought and Near Drought-of-Record Conditions

Surface water users in the El Paso region are currently experiencing near record-of-drought conditions. The westernmost part of Texas, as well the headwaters of the Rio Grande in Colorado and New Mexico from which the District's water supply originates, have been in drought for much of the past two decades, with only 2005, 2008, 2016, and 2017 experiencing average or above-average spring runoff into Elephant Butte Reservoir. In 2018, Elephant Butte Reservoir reached near-record-low levels at about 3% capacity, with just 62,573 acre-feet of water in storage as of September (total conservation capacity is 1,973,358 acre-feet). About 45,000 acre-feet (70%) of the September 2018 storage is attributed to water conserved and carried over by the District in 2017.

Figure 4 – U.S. Drought Monitor Drought Intensity in the Western United States



Elephant Butte and Caballo Reservoirs have been near or below 20% of the combined storage capacity of 2.23 million acre-feet since 2010, also reaching three percent capacity in 2013. 2013 was the shortest irrigation season in El Paso (less than six weeks) and supplied the least amount of water in the almost 100 year history of the Rio Grande Project. To meet municipal water demands, the City of El Paso drilled new groundwater wells and operated its desalination plant at maximum capacity with per acre-foot costs that are higher than surface water treatment (EPWU 2014). Climactic and water supply indicators published by the National Oceanic and Atmospheric Administration (NOAA) show trends in 2019 that indicate possible surface water drought-of-record conditions comparable to those in 2013 (USDA NRCS Basin Data Reports 2013, 2018).

Figure 5 –Landsat 8 Images of Elephant Butte Reservoir in 1994 and 2013

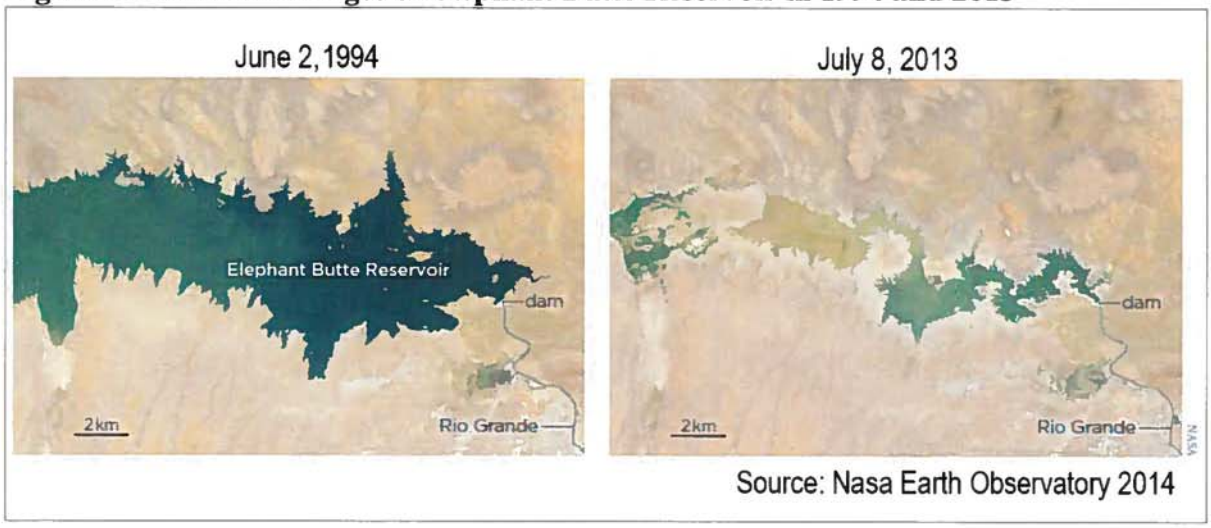
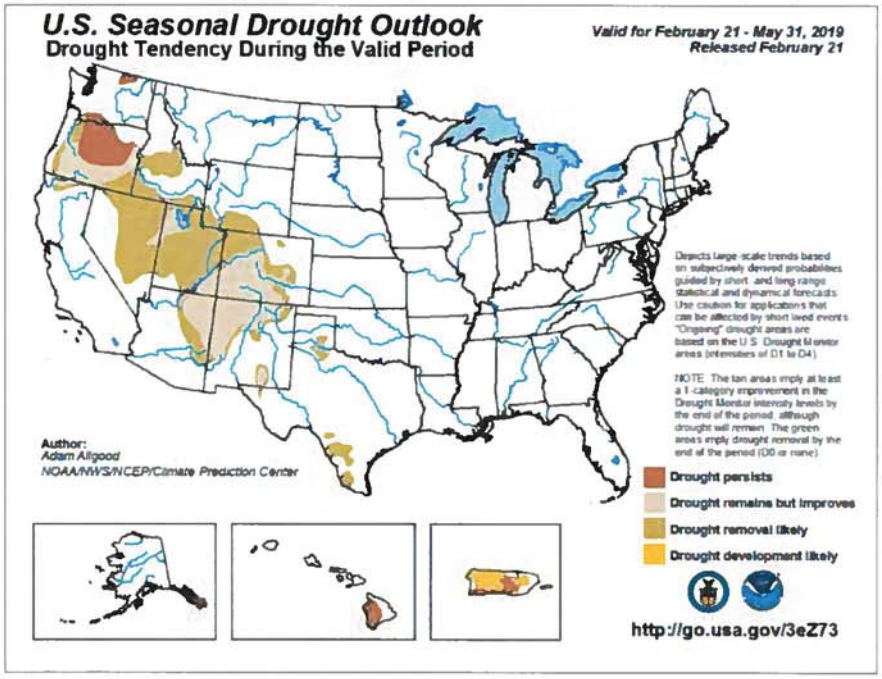


Figure 6 –U.S. Seasonal Drought Outlook for February 21, 2019 – May 31, 2019



Projected Reductions in Snowpack and Snow Water Equivalence

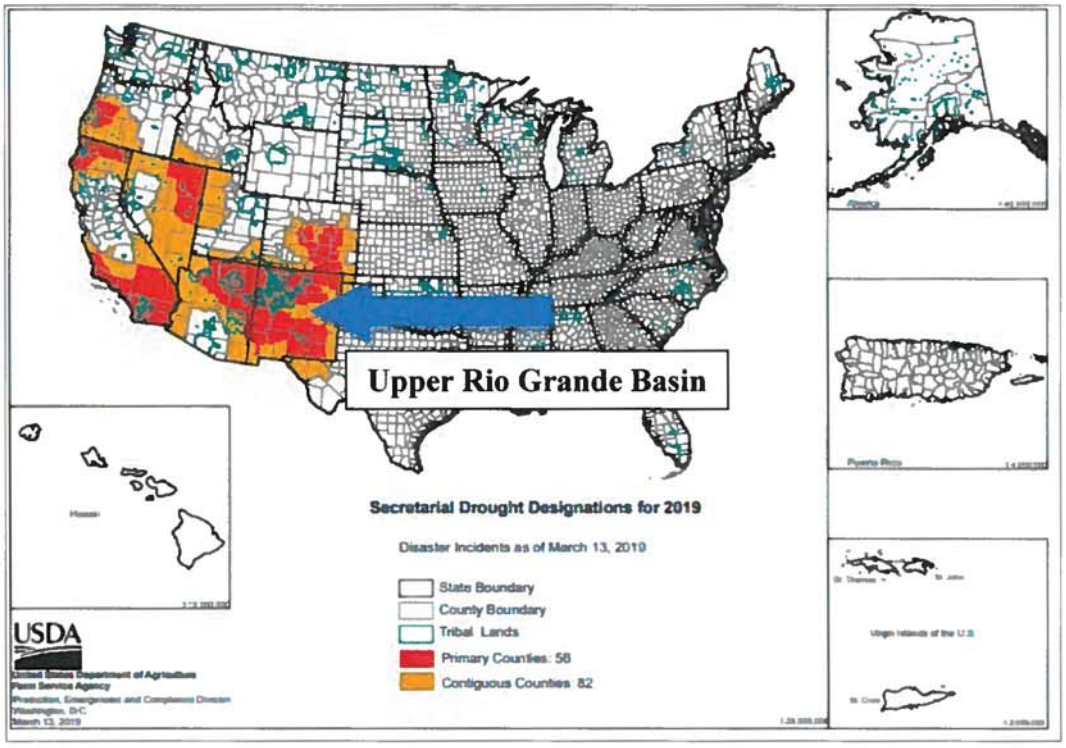
A *Review of Observed and Projected Climate Changes* (2013) by the U.S. Bureau of Reclamation noted that projected reductions in snowpack, declines in snow water equivalence, and advanced snowmelt resulting from increased temperatures will lead to a 10% to 30% reduction of water flow in the Rio Grande in the next 50 to 70 years. The Rio Grande at El Paso observed flows for 2001 through 2010 that were about 23% lower than the period from 1941 through 2000. Assessed annual and monthly changes in streamflow volume and surface climate variables near the headwaters of the Rio Grande River suggest that snow water equivalent has decreased by approximately 25% from 1958 – 2015 in part due to temperature increases,

although small increases in precipitation have reduced the impact of declining snowpack on streamflow (Shaleene & Gutzler 2018). Consequently, water users in the Rio Grande watershed will need to continue making investments in water conservation to adapt to projected reductions in surface water supply.

The Impact of Drought on the Local Economy

Beneficial use and conservation of water is critical to the El Paso economy. A TWDB study on the socioeconomic impacts of projected water shortages in El Paso County determined that, if unmet, water shortages would have a negative economic impact of $3.45 billion by 2070 and include almost 25,000 jobs lost (TWDB 2015). The economic impact of unmet irrigation water demands directly contributes to the slowing or reversal of job growth in areas where the economy benefits from agricultural revenues. Estimates from Texas A&M University determined that $150 million in agricultural sales were lost due to irrigation water reductions from drought conditions in 2011-2015 (TAMU 2015). The Upper Rio Grande Basin, including El Paso County, have received drought designations by the USDA.

Figure 7 – 2019 Secretarial Drought Designations – March 13, 2019

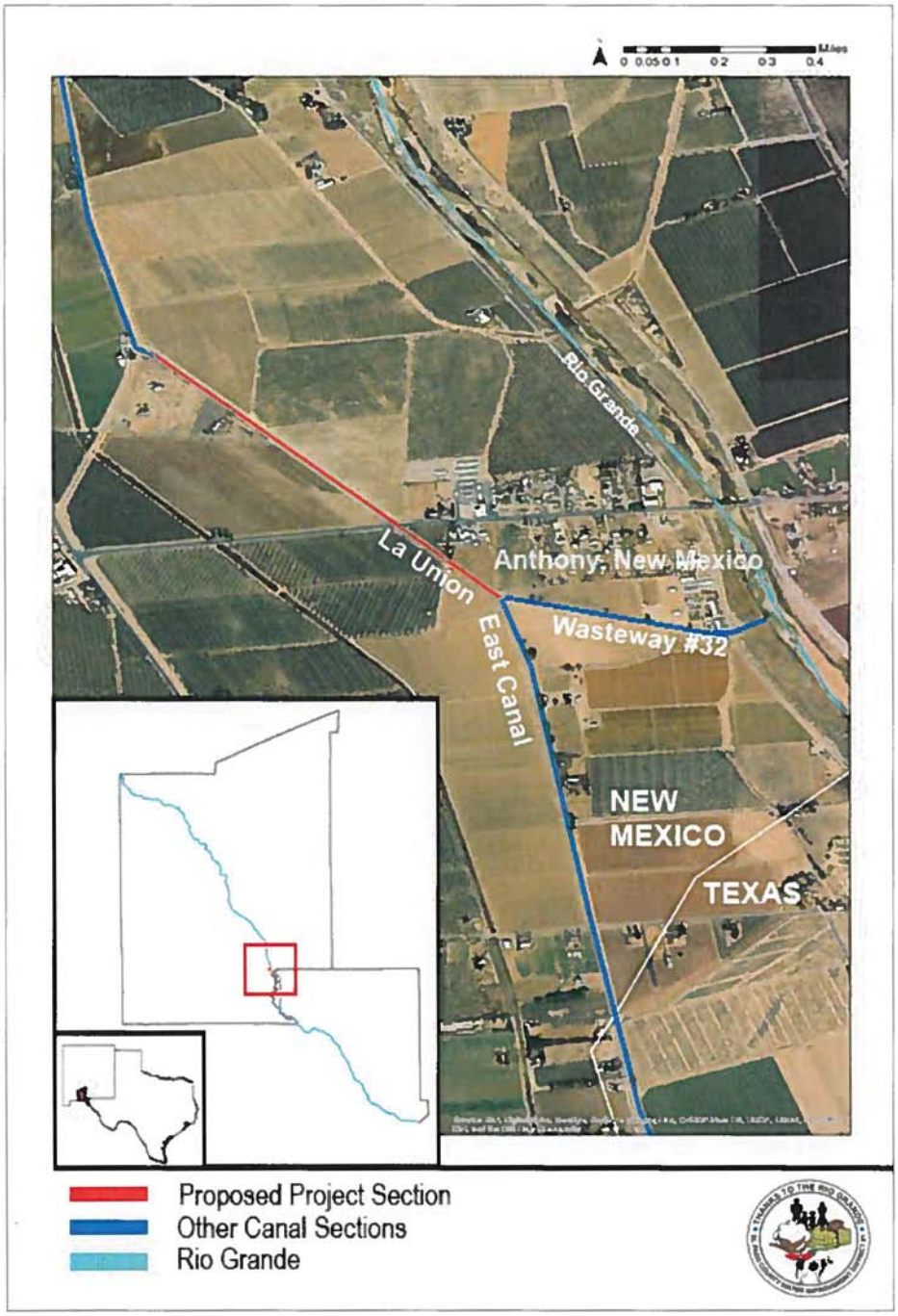


Economic activity in other sectors can also be impacted by water shortages. According to the 2014 Southern New Mexico and El Paso Joint Land Use Study, water source diversification efforts have allowed Fort Bliss to augment its water supplies by purchasing water and developing emergency interconnections with the City of El Paso, thereby positively impacting the military value of the base. 1 in 5 jobs in the El Paso region are linked to military installations. The Texas Comptroller estimates that Fort Bliss contributed $24.1 billion to the Texas economy in 2015 (Texas Comptroller 2016).

III PROJECT LOCATION

The La Union East Lining Project is located in Doña Ana County, New Mexico, approximately 2,300 feet west of the Rio Grande and 4,000 feet northwest of the Texas-New Mexico border and west of Anthony, Texas and Anthony, New Mexico. The project is located at the irrigation system's northernmost point and is fed by canals owned by Elephant Butte Irrigation District (EBID). The project linear length begins at latitude *32°00'16.9"N* and longitude *106°39'11.9"W* and ends at latitude *31°59'46.9"N* and longitude *106°38'33.1"W*. A location map can be referenced in Figure 8.

Figure 8 – Project Location Map



IV TECHNICAL PROJECT DESCRIPTION

The technical project description should describe the work in detail, including specific activities that will be accomplished. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.

A. Project Tasks and Milestones

The La Union East Canal is a major water conveyance channel serving the District's Unit 6B to about 9,700 acres of farmland and delivers irrigation water to users in both Doña Ana County, New Mexico and El Paso County, Texas. The estimated total water volume conveyed in a full allocation year at the La Union East Canal can reach 35,000 acre feet.

Water losses in the La Union East Canal are lost primarily by seepage. The proposed project will conserve water by concrete lining the canal and address sedimentation issues by upgrading a check structure that will allow sediment-loaded water to be released into the Rio Grande using Wasteway #32. The estimated project completion schedule assumes that funds will be available for reimbursement by January of 2020 or earlier.

Task 1: Final Engineering Design
The purpose of this task to incorporate completed preliminary design work and complete final engineering and design work necessary to concrete line the proposed section of the La Union East Canal and to make upgrades to a check structure located at the tail end of the project site. Work includes but is not limited to:

1.1 Developing a project plan and study
1.2 Developing construction plans and specifications for canal sections, and
1.3 Developing construction plans and specifications for upgrades to the check structure

Task 2: Environmental and Regulatory Compliance
The purpose of this task is to perform environmental review and cultural compliance work necessary to complete the concrete lining project. Work includes but is not limited to:

2.1 Working with Reclamation to meet federal environmental and regulatory compliance requirements, including National Environmental Policy Act (NEPA) compliance
2.2 Working with the New Mexico State Historical Preservation Office (SHPO), Archaeological Records Management Section at the New Mexico Historical Preservation Division, and coordinating with the Historical Cultural Property Inventory to meet compliance requirements specified in the New Mexico Cultural Properties Act, New Mexico Cultural Properties Protection Act, and the New Mexico Prehistoric and Historic Sites Preservation Act
2.3 Reviewing findings from environmental, cultural, and historical compliance work and developing any additional documents and modifications necessary to adhere to federal, state, and local laws, regulations, and codes

Task 3: Concrete Lining Construction
The purpose of this task is to perform all necessary concrete lining construction work, which includes but is not limited to:

3.1 Performing seepage tests before and after construction work
3.2 Performing field engineering work, including construction surveying, geotechnical construction services, and quality assurance and quality control monitoring
3.3 Performing earth work, including fleet mobilization and demobilization, excavation, dirt hauling, soil compaction, grading, and alignment
3.4 Installing geofabric liner, steel formwork, and expansion joints, and spraying and curing shotcrete, and performing final grading

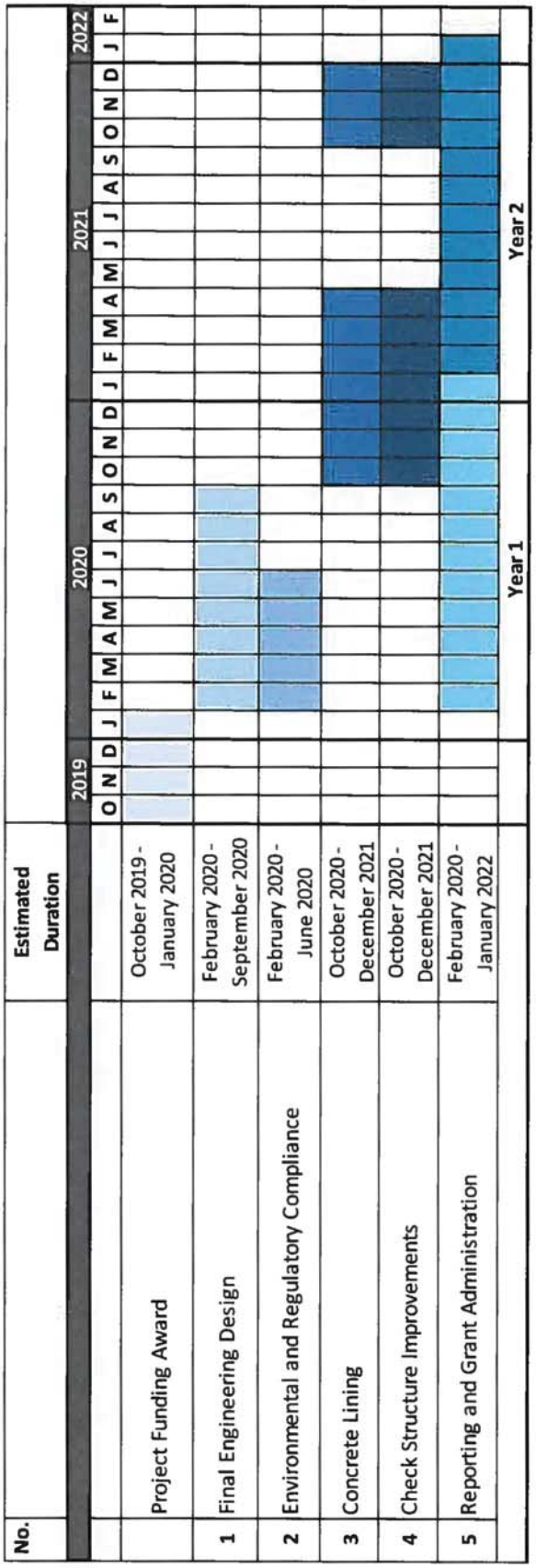
Task 4: Check Structure Improvements Construction
The purpose of this task is to perform all necessary check structure upgrade construction work, which includes but is not limited to:

4.1 Measuring end-of-irrigation-season sediment levels before and after construction work
4.2 Performing field engineering work such as quality assurance and quality control monitoring
4.3 Installing steel formwork, brackets, railing, waterstops, and slide gates, and setting and curing concrete
4.4 Replacing and/or modifying a culvert at Wasteway #32

Task 5: Reporting and Grant Administration
The purpose of this task is to perform grant administration, periodic reporting, and technical assistance work necessary to complete the project. Work includes but is not limited to:

5.1 Developing SF-425 Federal Financial Reports on a semi-annual basis and a final financial performance report as specified in Section F.3.1. of the FY2019 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation
5.2 Developing Interim Performance Reports as specified in Section F.3.2. of the FY2019 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation
5.3 Developing a Final Performance Report as specified in Section F.3.3. of the FY2019 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation

B. Figure 9 - Estimated Project Schedule



V EVALUATION CRITERIA

A. Evaluation Criterion A: Quantifiable Water Savings (30 Points)

Describe the amount of estimated water savings. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

Approximately 231 acre-feet of water per year will be conserved as a result of the proposed project.

Describe current losses: *Please explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

Water conserved by the proposed project is currently lost to seepage.

Describe the support/documentation of estimated water savings: *Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.*

As part of the District's internal System Optimization Review (SOR) process, the District performed multiple efficiency and water loss prevention studies across the irrigation system. The District worked with Texas A&M University to perform additional inflow-outflow seepage studies across the District's system in Sheng and Brown (2002), Sheng et al. (2003), Sheng and King (2006), and Sheng et al. (2013). Although a seepage test was not performed at the proposed project site, the provided water savings estimates are based on seepage tests performed in canals with similar hydrologic and hydraulic features throughout the Rio Grande Valleys in the El Paso-Las Cruces Region.

Specifically, water savings estimates are derived from seepage tests performed for the Franklin Canal in Sheng and King (2006) and are available for reference in Appendix D. Studies in Sheng and King (2006) determined that water losses at the Franklin Canal are from 150 to 362 acre-feet per mile per year based on soil type and hydraulic conditions. Seepage losses were determined to be higher in the Rio Grande Upper Valley due to the high permeability of soil. The Franklin Canal is hydrologically comparable to the La Union East Canal and can be used as a baseline to estimate seepage losses at the La Union East Canal. From these determinations, it is estimated that seepage losses at the La Union East Canal are at least 272 acre-feet of water per mile per year.

Water savings estimates are consistent with seepage estimates in Al Haddad (2005) in the Rio Grande Upper and Mesilla Valleys. Following Al Haddad's methodology, seepage losses for the canals with similar features in Doña Ana County were determined using Vedernikov's method (Vedernikov 1934) to estimate the steady-state seepage loss per unit length during operation. According to estimates in Al Haddad (2005), an average of 385 acre feet of water per mile per year are lost to seepage in select canals in Doña Ana County.

Water savings estimates are also consistent with findings of Michelsen et al. (2009), which estimated that seepage from select unlined canals in El Paso County, including the Rio Grande

Upper Valley where the La Union East Canal is located, averaged 0.495 cubic feet per mile per second (358 acre-feet per mile per year).

Water savings comparisons among canals with similar hydrologic features use measured terminal seepage-rates with permeability ranges derived from the NRCS Soil Survey of the El Paso area (Jaco and Lockwood 1971). A subsequent study performed by Texas A&M University (Miyamoto 2000) in collaboration with the U.S. Bureau of Reclamation El Paso Field Office (USBR Grant No. 1425-97FC-40-21650) analyzed permeability of soils found near the proposed project site (Valley – 2: sandy loam over sandy sediments). The study cataloged soil profile and permeability and is used to compare water losses in canals with similar hydrologic features within the District boundaries.

(1) ***Canal Lining/Piping:*** *Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:*

a) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

It is estimated that 272 acre-feet of water per mile per year are lost due to seepage at the La Union East Canal. The following calculations are used to determine annual water savings from the proposed project:

4,500 feet = 0.8522 miles →
272 acre-feet per mile per year * 0.8522 miles = 231.7984 acre-feet per year

b) How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.

As previously stated, a seepage test has not been performed at the proposed project site. The provided water savings estimates are based on seepage tests performed in canals with similar hydrologic and hydraulic features throughout the Rio Grande Valleys in the El Paso-Las Cruces Region. The estimated water savings provided herein are consistent with seepage rate estimates developed in multiple studies performed throughout canal systems in the El Paso-Las Cruces region.

c) What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?

The proposed concrete lining construction is expected to eliminate virtually all seepage losses. The canal will remain an open channel that is susceptible to some evaporation. Current evaporation losses at the La Union East Canal are expectedly higher than post-construction

losses. Reductions in surface area / cross-section length resulting from concrete lining will likely reduce evaporation losses.

d) What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

Current Annual Transit Loss:
272 acre-feet per mile per year * 0.8522 miles (project length) = 231.7984 acre-feet per year

e) How will actual canal loss seepage reductions be verified?
A seepage test will be performed as part of the proposed project and will be compared with estimated water savings.

f) Include a detailed description of the materials being used.
The proposed concrete lining construction provides a durable canal surface with excellent hydraulic properties that is stable and easier to maintain than earth-lined canals. The concrete will be applied in the field as 4000psi shotcrete. Steel panel reinforcement contributes to the strength and life expectancy of the concrete.

The District used this construction approach in previous concrete lining projects at the Franklin Canal in 2018 in sections of the canal that are similar to the La Union East Canal. The projects were performed in collaboration with the Texas Department of Transportation (TXDOT) and have a life expectancy of 50 years.

The proposed improvements have a cost of about $80.11 per acre-foot of water conserved. The following calculations were used to determine costs per acre-foot:

231 AF/Y *50 years = 11,550 AF →
$925,298 / 11,550 AF = 80.11 $/AF

B. Evaluation Criterion B: Water Supply Reliability (18 Points)

1. Will the project address a specific water reliability concern? Please address the following:

- ***Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries. Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?***

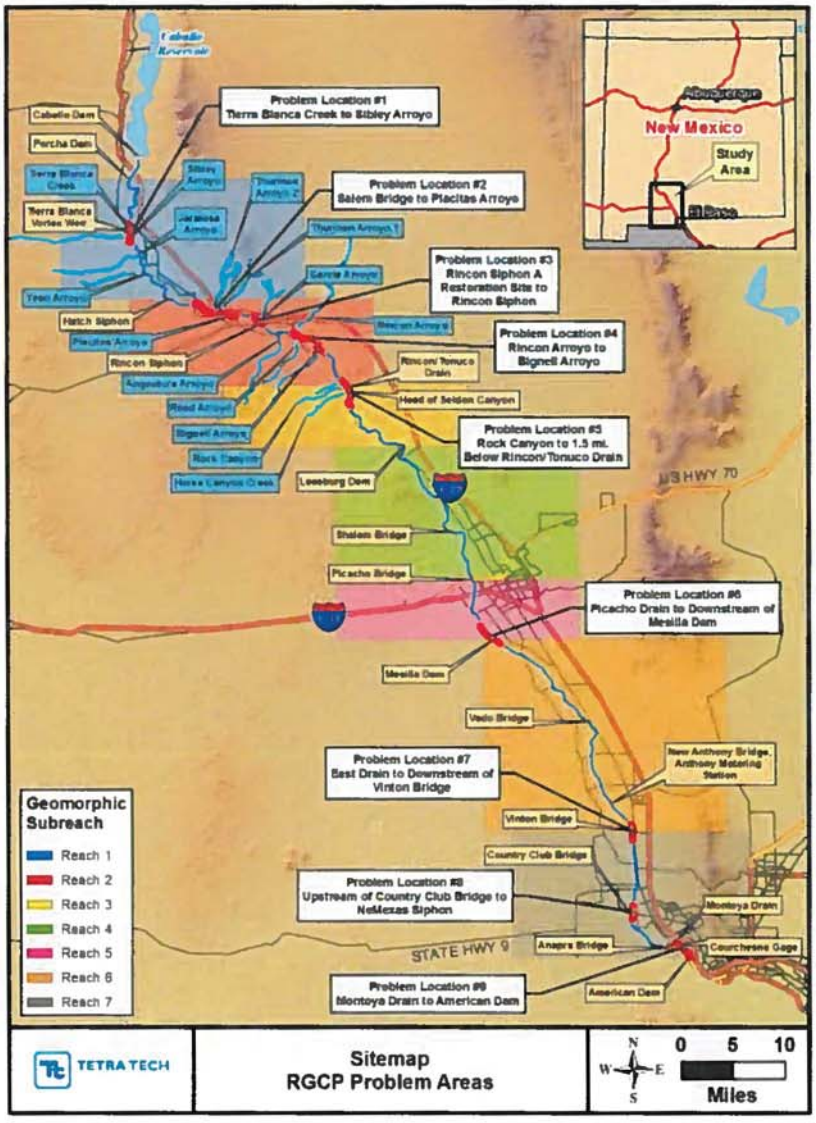
Shortages from Prolonged and Near Drought-of-Record Conditions
As previously stated in Section II.F, Rio Grande Project water users in the El Paso region are currently experiencing near drought-of-record conditions. Storage levels in Elephant Butte Reservoir reached near-record-low levels at about 3% capacity in 2018, and water supplies have been experiencing drought conditions for much of the past two decades, with only 2005, 2008, 2016, and 2017 experiencing average or above average spring runoff. Projected reductions in snowpack and snow water equivalence described in USBR (2013) suggest a 10% to 30% reduction in water flow in the Rio Grande in the next 50 to 70 years.

Rio Grande Project water users will need to continue making investments in water conservation to mitigate the impact of the existing near drought-of-record conditions and projected reductions in water supply.

Reducing Sediment

In addition to conserving limited water supplies as a result of concrete lining, the proposed check structure improvements will allow the District to reduce sedimentation at the La Union East Canal via Wasteway #32, further reducing maintenance costs and increasing efficiency. Ongoing sediment delivery from tributary arroyos located upstream of the La Union East Canal result in sediment plugs, increased water-surface elevations, and reductions in channel and drain return efficiencies. As such, the United States Section of the International Boundary and Water Commission (USIBWC) embarked in the Rio Grande Canalization Project (RGCP) and in 2015 completed a channel maintenance alternatives and sediment transport study (IBWC 2015). The proposed project site and Wasteway #32 are located within Reach 6 and sediment control measures are considered for the entire reach.

Figure 10 – Rio Grande Canalization Project Sediment Problem Locations (IBWC 2015, p4)



Texas v New Mexico Supreme Court Litigation Regarding the Rio Grande Compact
The District is located in an area considered to be of "Substantial Potential for Conflict" as defined in the U.S. Bureau of Reclamation's Technical Memorandum 86-68251-11-01 (2011).

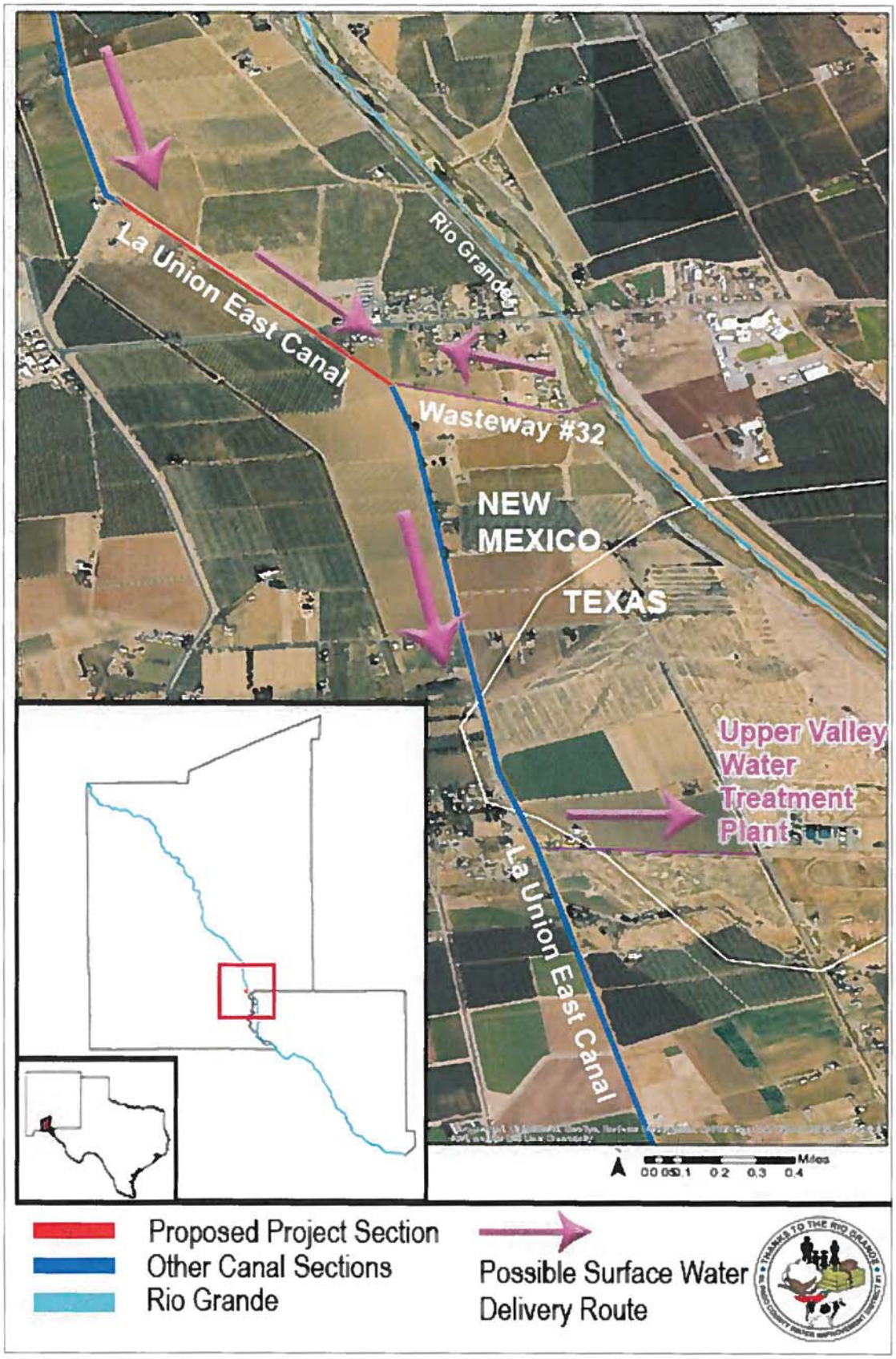
High Levels of Arsenic in Groundwater in Upper Valley
In 2006, the Environmental Protection Agency (EPA) reduced the maximum amount of arsenic allowable in U.S. Drinking water from 50 parts per billion (ppb) to 10 ppb. In order to comply with that standard with regards to the Mesilla Bolson Aquifer, where El Paso obtains 19% of its water, El Paso Water Utilities designed and constructed the $77 million Upper Valley Water Treatment Plant.

The Record of Decision for the El Paso-Las Cruces Regional Sustainable Water Project, a planning initiative led by the Texas-New Mexico Water Commission with the U.S. Section of the International Boundary and Water Commission and El Paso Water Utilities as lead agencies (Reinert et al. 2001), selected a Preferred Alternative that called for treating up to 80 million gallons per day (MGD) (89,611 acre-feet of water per year) of Rio Grande Project Water by 2030.

Although the Upper Valley Water Treatment Plant does not currently treat surface water, El Paso Water Utilities already receives Rio Grande Project water at two other treatment plants. In collaboration with El Paso Water Utilities, an intake structure and pump can be constructed approximately 7,650 feet downstream from the proposed project site and use water conveyed via the La Union East Canal. This alternative is a short-term project that is possible using an existing diversion point at Mesilla Dam located 18 miles upstream from the proposed project. Another alternative would be creating a diversion point at Wasteway #32 in order to deliver Rio Grande Project water directly to the Upper Valley Water Treatment Plant.

The proposed sediment control structure and check upgrade would enhance water quality and improve the District's ability to manage water using Wasteway #32. Accordingly, the future improvements to the La Union East Canal and Wasteway #32 would lead to a decreased reliance on non-renewable groundwater resources in the Mesilla Bolson Aquifer and allow Rio Grande Project water to be used by El Paso Water Utilities to meet federal regulations. Figure 11 below shows possible diversion points and the possible route for an intake structure and pumps that would provide Rio Grande Project water to the Upper Valley Water Treatment Plant.

Figure 11 – Possible Surface Water Diversion and Delivery Route for UVWTP



- ***Describe how the project will address the water reliability concern? In your response, please address where the conserved water will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.***

As previously stated, conserving water via concrete lining irrigation canals is among the most cost-effective water management strategies available in the El Paso region (Michelsen et al. 2009). As irrigation water demand is met by a more efficient system, the District can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

Currently, the La Union East Canal receives water from diversions at Mesilla Dam located 18 miles upstream. Subsequent improvements to the La Union East system would advance the development of a new diversion point and would allow the District to leave water currently diverted water in the Rio Grande for an additional 18 miles, benefiting existing riparian vegetation and wildlife.

- ***Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.***

Water conserved as a result of the proposed project will continue to use Rio Grande Project storage and conveyance systems.

- ***Indicate the quantity of conserved water that will be used for the intended purpose.***

All water conserved as a result of the proposed project will be stored or used as needed to address water reliability concerns within the District boundaries.

2. Will the project make water available to achieve multiple benefits or to benefit multiple water users? Consider the following:

- ***Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?***

Water conserved as a result of the proposed project will benefit the agriculture and municipal water users in EWl and will be used to meet existing water demand across multiple users, including:

- An average of 49,000 acres of agricultural lands
- Approximately 50% of municipal water demand for a population of over 800,000 in El Paso County

Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.

The proposed project is not expected to adversely affect species.

- ***Will the project benefit a larger initiative to address water reliability?***

The proposed project is the first phase of multiple planned projects that will make delivering surface water for treatment possible at the El Paso Water Utilities Upper Valley Water Treatment Plant. Additional information about this initiative is available in pages 21 and 22 of this document.

- ***Will the project benefit Indian tribes?***

Water conserved as a result of the proposed project will benefit all Rio Grande Project water served by the District, including the Ysleta del Sur Pueblo, a federally recognized tribe. The District delivers water to the Ysleta del Sur Pueblo Reservation for agriculture and for two of the Ysleta del Sur Pueblo's most important ceremonial processions: *St. Anthony of Padua Feast Day* and *Dia de Los Santos Reyes*.

- ***Will the project benefit rural or economically disadvantaged communities?***

Although the proposed project benefits water users in both Texas and New Mexico, the project site is located at the Texas-New Mexico border in Doña Ana County, New Mexico. The area is primarily rural and the project site is surrounded by farmland. The proposed project will improve water reliability in an area impacted by prolonged drought conditions and reduce maintenance costs to both the District and other water users by reducing sediment levels.

According to the *December 2018 StatsAmerica Distress Criteria Statistical Report* by the U.S. Economic Development Administration (EDA), Doña Ana County is considered economically disadvantaged. Unemployment stands at 6.31% (compared to 4.12% in the U.S.) and per capita income is at 67.52% of the U.S. average. The proposed project site is located less than a mile from Anthony, New Mexico, and Anthony, Texas. The area is primarily rural and the economy benefits from agricultural revenues.

- ***Describe how the project will help to achieve these multiple benefits. In your response, please address where the conserved will go and where it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.***

The economic impact of unmet irrigation water demands directly contributes to the slowing or reversal of job growth in areas where the economy benefits from agricultural revenues. Estimates

from Texas A&M University determined that $150 million in agricultural sales were lost due to irrigation water reductions from drought conditions in 2011-2015 (TAMU 2015). The proposed project will increase water delivery efficiency and reduce maintenance costs for water users that receive water via the La Union East Canal. The proposed project will also make more water available to District members and is expected to lead to reduced reliance on non-renewable groundwater resources used by farmers in the El Paso region.

3. Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?

- ***Is there widespread support for the project?***

Multiple stakeholders issued statements of support for the proposed project, which can be referenced in Appendix B and are listed below:

- Congresswoman Veronica Escobar (USTX-16)
- Far West Texas Water Planning Group
- El Paso Water Utilities
- Doña Ana County District 2 Commissioner
- Elephant Butte Irrigation District (EBID)

- ***What is the significance of the collaboration/support?***

The process of requesting support from political subdivisions and elected officials includes explaining project details and water conservation benefits to leadership (e.g., elected officials and staff, County Judge and Commissioners, City Council, Board of Trustees), informing leadership of any resulting awards from funding agencies such as Reclamation and completed projects, and working with respective administrations to make necessary arrangements to complete projects. Informing political subdivisions of water conservation projects often leads to increased communication and project information dissemination with their respective constituents and the general public.

Increasing public awareness of regional water issues in order to incentivize conservation is included as water management strategy E-10 in the 2017 Texas State Water Plan and is necessary to meet projected increases in water demand.

- ***Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?***

The proposed project is the first phase of multiple planned projects that will make delivering surface water for treatment possible in the Upper Valley region. Additional information about this initiative is available in pages 21 and 22 of this document.

- ***Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?***

Texas v New Mexico Supreme Court Litigation Regarding the Rio Grande Compact
The District is located in an area considered to be of "Substantial Potential for Conflict" as defined in the U.S. Bureau of Reclamation's Technical Memorandum 86-68251-11-01 (2011).

4. Will the project address water supply reliability in other ways not described above?
The proposed project is the first phase of multiple planned projects that will make delivering surface water for treatment possible at the El Paso Water Utilities Upper Valley Water Treatment Plant. Additional information about this initiative is available in pages 19 and 20 of this document.

The La Union East Canal is currently fed at the Mesilla Dam located 18 miles upstream from the proposed project site. Future improvements will allow the District to develop a new diversion point from the Rio Grande using pumps and the existing right-of-way at Wasteway #32. A new diversion point would add a second conveyance option that can be used to deliver Rio Grande Project water to about 9,700 acres of agricultural acreage and the Upper Valley Water Treatment Plant. Developing a new diversion point would leave water currently diverted at the Mesilla Dam in the Rio Grande for an additional 18 miles, benefiting existing riparian vegetation.

C. Evaluation Criterion C: Implementing Hydropower (18 Points)

The proposed project does not implement hydropower.

D. Evaluation Criterion D: Complementing On-Farm Irrigation Improvements (10 Points)

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

- ***Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.***

The District has a history of collaboration with the Natural Resources Conservation Service (NRCS) program and periodically hosts local work group management meetings at the District offices. The Environmental Quality Incentives Program (EQIP) 2018 Texas Local Resource Team Priorities for El Paso County include practices that can enhance water availability and efficient irrigation systems. This is due to insufficient surface water available for irrigation in the region. The proposed project advances NRCS priorities by conserving water. A Letter of Support for a recent concrete lining project in 2019 from the El Paso NRCS office with additional information can be referenced in Appendix B.

In addition to conserving water, the proposed project will reduce sediment levels and decrease maintenance costs for about 9,700 agricultural acreage that receive water via the La Union East Canal. In March of 2019, the District informed the office of the local NRCS District Conservationist of the proposed canal lining project and recommended approaching the owners to consider applying to the NRCS EQIP program. Previous concrete lining projects performed by the District facilitated NRCS EQIP-eligible improvements such as the installation of turnout flow

meters, the concrete lining of private irrigation ditches, and installing low-cost, on-farm soil moisture sensors. In some cases, these types of improvements are not feasible due to sediment levels at the La Union East Canal, as sediment can affect the accuracy of meter sensors and cause rapid wear and tear.

- ***Provide a detailed description of the on-farm efficiency improvements.***

Figure 12 – Upgraded Release Gates and Concrete Lining Affected by Sediment

Some farmers in the Upper Valley that receive water via the La Union East Canal have opted to upgrade gates and concrete line irrigation ditches to conserve water lost to seepage and evapotranspiration and to facilitate the blending of Rio Grande Project water with groundwater. Sediment loads found in water conveyed via the La Union East Canal often lead to increased maintenance costs for farmers. Figure 12 above shows sand buildup in improved irrigation ditches that receive water from the La Union East Canal.

- ***Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?***

In March of 2019, the District informed the office of the local NRCS District Conservationist of the proposed canal lining project and recommended approaching farmers serviced by the La Union East Canal to consider applying to the NRCS EQIP program.

- ***If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.***

The local USDA NRCS office has historically supported the District's concrete lining efforts. A letter of support for a recent concrete lining project in 2019 with additional details on how concrete lining supports USDA NRCS priorities is available reference in Appendix B.

- ***Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how?***

In addition to conserving water, the proposed project will reduce sediment levels and decrease maintenance costs for farms that receive water via the La Union East Canal. Farmers seeking to upgrade irrigation ditches will benefit from reduced maintenance and more efficient irrigation water deliveries.

- ***Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?***

As irrigation water demand is met by a more efficient system, the District can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water to farmers in drought years when unmet water demands are highest.

E. Evaluation Criterion E: Department of Interior Priorities (10 Points)

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt

d. Review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;

The El Paso region faces unique water challenges characterized by an agricultural system that is a century old, prolonged drought conditions, a growing population and a growing sister city in Mexico with shared groundwater and surface water supplies, interstate and international treaties, and interstate litigation that may impact the District's water supply from the Rio Grande. As previously stated, the District is involved in the Texas v New Mexico Supreme Court litigation regarding the Rio Grande Compact. The District is located in an area considered to be of "Substantial Potential for Conflict" as defined in the U.S. Bureau of Reclamation's Technical Memorandum 86-68251-11-01 (2011).

The proposed project will increase the efficiency of the District's distribution system and conserve water. As irrigation water demand is met by a more efficient system, the District can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

3. Restoring trust with local communities

b. Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.

As previously stated, several stakeholders representing communities in the region issued statements of support for the proposed project which can be referenced in Appendix B. The process of requesting support from political subdivisions and elected officials includes explaining project details and water conservation benefits to leadership (e.g., elected officials and staff, County Judge and Commissioners, City Council, Board of Trustees), informing leadership of any resulting awards from funding agencies such as Reclamation and completed projects, and working with respective administrations to make necessary arrangements to complete projects. Informing political subdivisions of water conservation projects often leads to increased communication and project information dissemination with their respective constituents and the general public. The District previously informed the aforementioned political subdivisions and elected officials of multiple projects funded by Reclamation in 2018 and their achieved water savings and benefits to agricultural and municipal water supplies.

Increasing public awareness of regional water issues in order to incentivize conservation is included as water management strategy E-10 in the 2017 Texas State Water Plan and is necessary to meet projected increases in water demand.

4. Striking a Regulatory Balance

a. Reduce the administrative and regulatory burden imposed on U.S. industry and the public

As previously stated, the successful completion of the proposed project will advance the District's ability to create a new diversion point at the Rio Grande using the existing right-of-way of Wasteway #32. In 2017, a similar project was completed upstream by Elephant Butte Irrigation District at Wasteway #18. Currently, the La Union East Canal receives water from diversions at Mesilla Dam located 18 miles upstream. The project will open the possibility of providing surface water to the Upper Valley Water Treatment Plant in collaboration with El Paso Water Utilities to meet federal regulations of arsenic levels currently present in groundwater. As an added benefit, the development of a new diversion point would allow the District to convey additional water at the Rio Grande for an additional 18 miles, which benefits riparian vegetation and wildlife.

5. Modernizing our infrastructure

b. Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs

The El Paso-Ciudad Juarez, Mexico region is the one of the largest manufacturing centers in North America, characterized by production-sharing manufacturing and logistics operations employing over 210,000 individuals and over $90 billion in annual trade at ports of entry (Borderplex Alliance 2019). Projected growth in advanced manufacturing and logistics is concentrated at the El Paso Upper Valley. So much so that in 2018, the U.S. Department of Commerce awarded El Paso Water Utilities a $1 million grant to support a $5.6 million project to develop water and wastewater improvements necessary to provide the additional capacity needed for the area.

Developing a new diversion point at Wasteway #32 will allow the District to more efficiently manage Rio Grande project water at the Upper Valley. As previously stated, the project will open the possibility of providing surface water to the Upper Valley Water Treatment Plant in collaboration with El Paso Water Utilities to meet federal regulations of arsenic levels currently present in groundwater. It will also decrease dependency on non-renewable groundwater supplies and will advance El Paso Water Utilities' ability to meet growing industrial water demand in the Upper Valley.

F. Evaluation Criterion F: Implementation and Results (6 Points)

Subcriterion F.1. – Project Planning

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? *Please self-certify or provide copies of these plans where appropriate to verify that such a plan is in place.*

A draft copy of the 2017 update to the WCP was submitted to Reclamation's El Paso Field Office as part of a review process beginning in January of 2018 and is available for reference at https://www.epcwid1.org. The WCP includes an internal System Optimization Review (SOR) summary, a 10-year plan prioritizing conservation and efficiency projects, and historical and current water use data.

Provide the following information regarding project planning:

1. Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.

2016 Water Conservation Plan

The proposed lining of the La Union East Canal is a planned conservation and efficiency improvement included in the District's 2016 Water Conservation Plan (WCP). The District has partnered with the Texas Water Development Board, the U.S. Bureau of Reclamation, the International Boundary and Water Commission (IBWC), Texas Department of Transportation, the City of El Paso, and other local entities to cost-share many of its water conservation and drought mitigation projects. Select projects are listed in Table 2:

Table 2 – Select 5 Year Projects from the EPCWID#1 2016 Water Conservation Plan

Project	Date Start	Date End	Estimated Costs ($)	*ac-ft/yr	Status
Riverside Canal Lining Reach A	2014	2016	$612,000	758	Completed
Riverside Canal Lining Reach B	2018	2021	$2,145,700	4,087	In Progress
Riverside Canal Lining Reach C	2015	2016	$550,000	621	Completed
Riverside Canal Lining Reach D, E, F	2018	2023	$8,800,000	8,650	Engineering Design
Franklin Canal Lining	2017	2020	$3,772,000	1,323	In Progress
(Other) - La Union East Lining	**2019**	**TBD**	**$925,298**	**231**	**Funding Request**
Telemetry Upgrades	2018	2021	$275,000	120	In Progress

*Water conservation estimates may vary by year, use, and water supply availability

2017 Texas State Water Plan and 2016 Far West Texas Water Plan

The proposed project is listed under Water Management Strategy (WMS) E-45 in the 2017 Texas State Water Plan. The State Water Plan is developed at the state level by the Texas Water Development Board (TWDB) with input from local water users and historical water use data. Improvements in the District's delivery system in WMS E-45 are estimated to conserve an aggregated 50,000 acre-feet of water per year. The proposed project is also included as part of a Recommended Water Management Strategy in the 2016 Region E Far West Texas Water Plan, which is developed by the Far West Texas Water Planning Group (FWTWPG). Projects prioritized in these water plans are eligible for state funding from the TWDB. A Letter of Support from the FWTWPG is included in Appendix B.

2. Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).
Concrete lining the La Union East Canal will complete one of the projects listed in the District's 2016 Water Conservation Plan and advance Water Management Strategy E-45 in the 2017 Texas State Water Plan.

Subcriterion F.2 – Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved).

Water Savings
The primary performance measure that will be used is water savings per year. Annual water savings will be documented and reported to Reclamation as required by an award contract.

Sediment Reduction
The District will measure end-of-season sediment levels before and after construction work. Sediment levels will be documented and reported to Reclamation as required by an award contract.

Subcriterion F.3 – Readiness to Proceed

- ***Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.***

Please refer to **Section IV Technical Project Description** for additional details on major tasks and milestones. The proposed project includes 4 major components:

1. Final Engineering Design
2. Environmental and Regulatory Compliance
3. Concrete Lining
4. Check Structure Upgrades

Grant administration and reporting will begin as soon as the District receives notice of a funding award from Reclamation. The District has experience in developing and implementing grant award funding and project contracts with Reclamation and expects to complete this process by January of 2020 or earlier. Periodic and final reporting work will be performed throughout the project and will be completed by January of 2022 or earlier.

Assuming that Reclamation funding is reimbursable by January of 2020 or earlier, [1] final engineering design work will be performed starting in February of 2020. Preliminary engineering design has been performed and is available for reference in Appendix C.

[2] Environmental and regulatory compliance work is expected to begin in February of 2020. Based on consultations with Reclamation staff, it is expected that completing a Categorical

Exclusion Checklist will be sufficient to meet environmental compliance requirements. The District will work with applicable cultural and historical resources agencies in New Mexico to finalize compliance work. Additional information about cultural and historical resource compliance necessary for the proposed project is available in **Section VII Environmental and Cultural Compliance.**

[3] Concrete lining construction and [4] construction of sediment control upgrades to the existing check structure will begin after final design and compliance work have been completed. All construction work will begin at the end of the irrigation season, which is normally from October 15 to April 15. As such, it is expected that construction work will begin on October of 2020. It is expected that seven months are sufficient to finalize construction. However, an additional three months are provided at the end of the 2021 irrigation season to accommodate any delays.

Please refer to Figure 9 on Section IV Technical Project Description for additional details on the project's estimated project schedule. The project will be completed within the two-year allowance.

Copy of Figure 9

No.		Estimated Duration	2019			2020											2021												2022	
			O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
	Project Funding Award	October 2019 - January 2020																													
1	Final Engineering Design	February 2020 - September 2020																													
2	Environmental and Regulatory Compliance	February 2020 - June 2020																													
3	Concrete Lining	October 2020 - December 2021																													
4	Check Structure Improvements	October 2020 - December 2021																													
5	Reporting and Grant Administration	February 2020 - January 2022																													
						Year 1												Year 2													

- ***Describe any permits that will be required, along with the process for obtaining such permits.***

The project activities will be confined to existing right-of-way access and are within operational and maintenance agreements with Elephant Butte Irrigation District. It is not expected that any other permits or approvals will be necessary for the project as proposed.

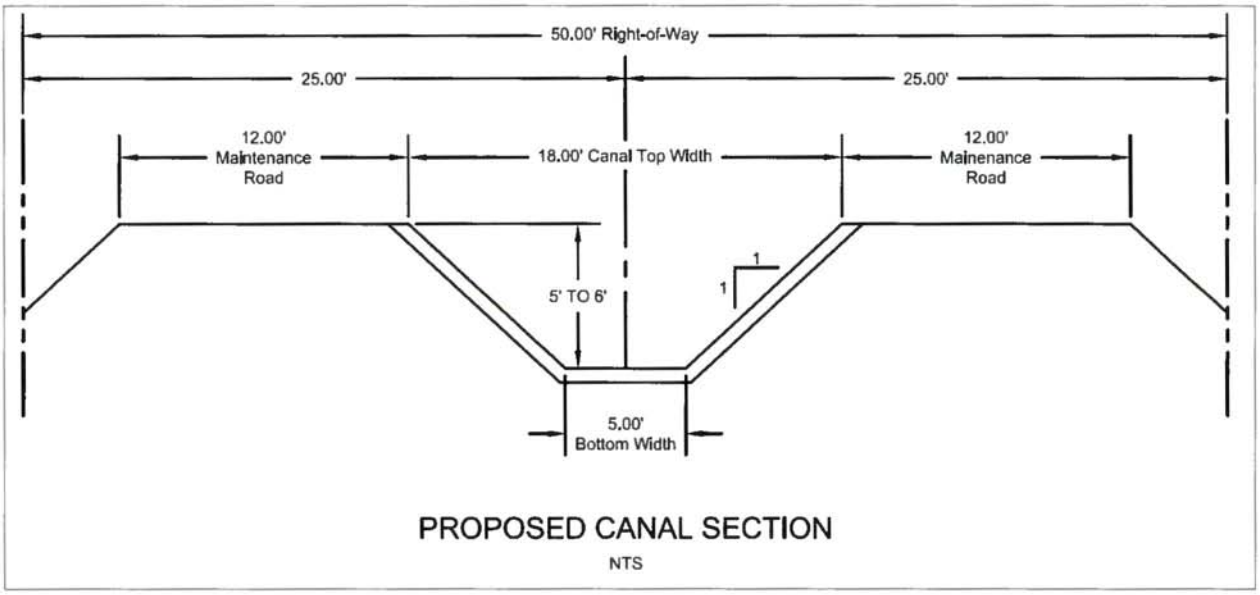
- ***Identify and describe any engineering or design work performed specifically in support of the proposed project.***

Proposed concrete lining work at the La Union East Canal is based on preliminary design specifications developed by District engineers. Preliminary engineering design specifications are available for reference in Appendix C.

The La Union East Canal is a trapezoidal canal with a flow capacity of 150 cubic feet per second. About 4 feet of accumulated sediment must be removed at the end of every irrigation season to return the canal to its designed flow capacity. Once concrete lined, the La Union East

Canal will have a 5 foot bottom, 1:1 bank slopes, a varying depth between 5-6 feet, and will keep a flow capacity of 150 cubic feet per second.

Figure 13 – Proposed Channel Cross-Section at the La Union East Canal



The proposed project will also make upgrades to the existing check structure at Wasteway #32, including the addition of a 3-4 foot sand weir that will allow the capturing of bottom-flow sediment to be released at Wasteway #32. Sediment will thereafter be managed along the 2,150-foot length of Wasteway #32 and at the Rio Grande, where sediment is settled and cleared in collaboration with the United States Section of the International Boundary and Water Commission (IBWC).

Figure 14 – Sediment Buildup at La Union East Canal after 2018 Irrigation Season

- ***Describe any new policies or administrative actions required to implement the project.***

No new policies or administrative actions are required to implement the proposed project.

- ***Describe how the environmental compliance estimate was developed. Has the compliance cost been discussed with the local Reclamation office?***

Environmental compliance cost and time estimates were developed via email exchange on February 14, 2019 with staff from Reclamation's Albuquerque Area Office and support from staff from the El Paso Field Office. Reclamation staff indicated that based on aerial images, it is likely that performing a Categorical Exclusion Checklist is adequate for environmental compliance work and costs could be $1,000 or less.

G. Evaluation Criterion G: Nexus to Reclamation Project Activities (4 Points)

Is the proposed project connected to Reclamation project activities? If so, how? Please consider the following:

- **Does the applicant receive Reclamation project water?**

The District obtains water by annual allocation from the United States Bureau of Reclamation's Rio Grande Project.

- ***Is the project on Reclamation project lands or involving Reclamation facilities?***

Significant major canals and drains were constructed under the Rio Grande Reclamation Project, and Reclamation maintained the dams, reservoirs, canals and drains until 1980, when the maintenance responsibilities were assumed by the District and subsequent ownership in 1996. The District has worked with Reclamation on several improvement projects over the years since.

- ***Is the project in the same basin as a Reclamation project or activity?***

The proposed project lies within the Rio Grande Basin.

- ***Will the proposed work contribute water to a basin where a Reclamation project is located?***

The proposed project will contribute water via conservation and efficiency improvements to delivery operations for Rio Grande Project water users. The El Paso region is considered by Reclamation to be of "Substantial Potential for Conflict" as defined in Reclamation's 2011 Technical Memorandum 86-68251-11-01.

- ***Will the project benefit any tribe(s)?***

Water conserved as a result of the proposed project will benefit all Rio Grande Project water users in El Paso County, including the Ysleta del Sur Pueblo, a federally recognized tribe. The District delivers water to the Ysleta del Sur Pueblo Reservation for agriculture and for two of the Ysleta del Sur Pueblo's most important ceremonial processions: *St. Anthony of Padua Feast Day* and *Dia de Los Santos Reyes*.

H. Evaluation Criterion H: Additional Non-Federal Funding (4 Points)

Non-Federal Funding	$625,298	=	68 %
Federal Funding	$300,000	=	32 %
Total Project Cost	$925,298		100%

VI PROJECT BUDGET

A. Funding Plan and Letters of Commitment

How will you make your contribution to the cost-share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant.

The District has sufficient revenues to provide a 68% cost share for the project. The District's funding commitment will be established via Resolution from the District Board of Directors, which will meet on Wednesday, April 10, 2019, at which time the Resolution will be adopted. The Resolution will be sent to Reclamation as an additional attachment as permitted by Section D.2.2.8 of Reclamation's FY2019 WaterSMART Water and Energy Efficiency Grants FOA No. BOR-DO-19-F004. A draft Resolution is available for reference in Appendix A.

There are no additional funding partners for this project.

The proposed project includes budgeted costs that are representative of actual construction costs for concrete lining projects that are similar to the proposed section of the La Union East Canal.

Describe any donations or in-kind costs incurred before the anticipated project start date that you seek to include as project costs.

There are no donations or in-kind costs that will be included as part of the proposed project budget.

B. Budget Proposal

Table 3. Total Project Cost Table

FUNDING SOURCES	AMOUNT
Cost to be reimbursed with the requested Federal funding	$ 300,000
Cost to be paid by the applicant (EPCWID#1)	$ 625,298
Value of third party contributions	$ -
TOTAL PROJECT COSTS	**$ 925,298**

Table 4. - Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	EPCWID#1 Funding	Reclamation Funding	TOTAL COST
	$/unit	Quantity				
Salaries and Wages						
Maintenance Manager	$39.48 /hour	300	Labor	$ 11,844	$ -	$ 11,844
Equipment Operator I / Labor	$11.93 /hour	960	Labor	$ 11,451	$ -	$ 11,451
Equipment Operator II	$14.04 /hour	960	Labor	$ 13,478	$ -	$ 13,478
Equipment Operator III	$17.02 /hour	600	Labor	$ 10,210	$ -	$ 10,210
Equipment Operator III (2)	$19.28 /hour	600	Labor	$ 11,570	$ -	$ 11,570
Warehouse Parts Specialist	$18.28 /hour	120	Labor	$ 2,193	$ -	$ 2,193
Welder	$19.54 /hour	120	Labor	$ 2,344	$ -	$ 2,344
IT Specialist (contract compliance and reporting)	$29.84 /hour	300	Labor	$ 8,952	$ -	$ 8,952
					Subtotal	**$ 72,043**
Fringe Benefits						
Maintenance Manager	$9.98 /hour	300	Labor	$ 2,995	$ -	$ 2,995
Equipment Operator I / Labor	$3.00 /hour	960	Labor	$ 2,880	$ -	$ 2,880
Equipment Operator II	$3.56 /hour	960	Labor	$ 3,421	$ -	$ 3,421
Equipment Operator III	$4.31 /hour	600	Labor	$ 2,585	$ -	$ 2,585
Equipment Operator III (2)	$4.85 /hour	600	Labor	$ 2,909	$ -	$ 2,909
Warehouse Parts Specialist	$4.60 /hour	120	Labor	$ 552	$ -	$ 552
Welder	$4.91 /hour	120	Labor	$ 589	$ -	$ 589
IT Specialist (contract compliance and reporting)	$7.46 /hour	300	Labor	$ 2,238	$ -	$ 2,238
					Subtotal	**$ 18,169**
Equipment (Rates from 2016 US-ACE USACE EP1110-1-8 District VI Expense Schedule)						
Pickup (5 each)	$25.20 /day	130	Equipment	$ 3,276	$ -	$ 3,276
Dump Truck	$113.46 /day	75	Equipment	$ 8,510	$ -	$ 8,510
Excavator	$720.26 /day	75	Equipment	$ 54,020	$ -	$ 54,020
Welder Rig	$46.16 /day	75	Equipment	$ 3,462	$ -	$ 3,462
Dozer	$345.36 /day	60	Equipment	$ 20,722	$ -	$ 20,722
Grader	$623.64 /day	75	Equipment	$ 46,773	$ -	$ 46,773
Sheeps Foot Roller	$822.80 /day	75	Equipment	$ 61,710	$ -	$ 61,710
Water Truck	$497.12 /day	75	Equipment	$ 37,284	$ -	$ 37,284
Rubber Tire Excavator	$723.88 /day	75	Equipment	$ 54,291	$ -	$ 54,291
Compactor	$134.70 /day	75	Equipment	$ 10,103	$ -	$ 10,103
Loader	$347.64 /day	75	Equipment	$ 26,073	$ -	$ 26,073
Shotcrete Machine (2 each)	$259.38 /day	60	Equipment	$ 15,563	$ -	$ 15,563
Compressor (2 each)	$330.78 /day	60	Equipment	$ 19,847	$ -	$ 19,847
Telescopic Boom (2 each)	$950.50 /day	60	Equipment	$ 57,030	$ -	$ 57,030
					Subtotal	**$ 418,662**
Supplies and Materials						
Concrete - 4000psi shotcrete (lining)	$120.00 /cy	1450	cubic yards	$ -	$ 174,000	$ 174,000
Curing Compound	$63.00 /5 gal	100	5 gallons	$ -	$ 6,300	$ 6,300
Steel Tie-in and Transitions	$0.90 /lb	5000	lb/pound	$ -	$ 4,500	$ 4,500
Steel Panels	$4.00 /sf	15000	square feet	$ -	$ 60,000	$ 60,000
GeoFabric	$0.40 /sf	90000	square feet	$ -	$ 36,000	$ 36,000
Concrete - 4000psi (check structure)	$120.00 /cy	120	cubic yards	$ -	$ 12,000	$ 12,000
Slide Gates	$10,000.00 /ea	4	each	$ 40,000	$ -	$ 40,000
72" CMP Culvert	$12,000.00 /ea	1	each	$ 12,000	$ -	$ 12,000
Steel (Threaded rods, H-Beams)	$0.90 /lb	6000	lb/pound	$ 5,400	$ -	$ 5,400
4x4 Angle Brackets, Wheel Stems, Railing, Waterstops	$1.00 /lot	10000	varies	$ 10,000	$ -	$ 10,000
Form Lumber, Ties, and Misc. Construction Items	$1.00 /lot	8000	varies	$ 8,000	$ -	$ 8,000
					Subtotal	**$ 368,200**
Contractual/Construction						
Final Engineering Design	$200.00 /hr	60	hours	$ 12,000	$ -	$ 12,000
Field Engineering	$200.00 /hr	35	hours	$ 7,000	$ -	$ 7,000
Construction Surveying	$120.00 /hr	60	hours	$ 7,200	$ -	$ 7,200
Construction Services Geotechnical and Lab	$200.00 Test	25	cylinders	$ 5,000	$ -	$ 5,000
Construction Services Geotechnical Density	$75.00 Test	25	Tests	$ 1,875	$ -	$ 1,875
QA/QC Monitoring	$120.00 /hr	35	hours	$ 4,200	$ -	$ 4,200
Travel (airfare, 2 nights hotel and per diem)	$750.00 /hr	5	Trips	$ 3,750	$ -	$ 3,750
					Subtotal	**$ 41,025**
Enrionmental and Regulatory Compliance						
Adminstration and Management	$45.00 /hr	120	Costs	$ -	$ 5,400	$ 5,400
Environmental and Regulatory Compliance	$45.00 /hr	40	Costs	$ -	$ 1,800	$ 1,800
					Subtotal	**$ 7,200**
TOTAL ESTIMATED PROJECT COSTS				**$ 625,298**	**$ 300,000**	**$ 925,298**

C. Budget Narrative

Salaries and Wages (in-kind)

The following District personnel will be involved in this project. The perspective roles and value of their in-kind services is described as follows:

All Project Tasks:
Pete Rodriguez is the District Maintenance Supervisor and has successfully led the construction of dozens of District canal concrete lining projects. Mr. Rodriguez will be responsible for the oversight of all construction work personnel. It is expected that Mr. Rodriguez will contribute 300 hours to the project at a rate of $39.48.

The IT Specialist will be responsible for completing periodic and final reporting work necessary to fulfill contractual obligations as required by Reclamation. Contract compliance work shall include but not be limited to developing program performance reports as specified in Sections F.3.1, F.3.2, and F.3.3 of the 2019 WaterSMART Water and Energy Efficiency Grants FOA.

Project Tasks 3: Concrete Lining Construction | Project Task 4: Check Structure Upgrades

The Equipment Operator I will be responsible for the operation of construction equipment necessary for the completion of Task 1 – Canal Lining. The Equipment Operator I will contribute 960 hours to the project at a rate of $11.93.

The Equipment Operator II will be responsible for the operation of construction equipment necessary for the completion of Task 1 – Canal Lining. Each Equipment Operator II will contribute 960 hours to the project at a rate of $14.04.

The Equipment Operator III will be responsible for the operation of construction equipment necessary for the completion of Task 1 – Canal Lining. The Equipment Operator III will contribute 600 hours to the project at a rate of $17.02.

The Equipment Operator III (2) will be responsible for the operation of construction equipment necessary for the completion of Task 1 – Canal Lining. The Equipment Operator IV will contribute 600 hours to the project at a rate of $19.28.

The Warehouse Parts Specialist will be responsible for the distribution and delivery of supplies and material necessary for the completion of Task 1 – Canal Lining. The Warehouse Parts Specialist will contribute 120 hours to the project at a rate of $18.28.

The Welder will be responsible for metalwork necessary for the completion of Task 1 – Canal Lining. The Welder will contribute 120 hours to the project at a rate of $19.54.

Fringe Benefits (in-kind)
The in-kind fringe benefits for District personnel involved in this project were computed on a "Fringe" basis and were derived by subtracting the hourly salary rate for designated District personnel from the loaded value per hour.

Certification of Labor Rates
The labor rates of identified personnel included herein are representative of the actual labor rates of personnel bearing the same title. Additional verification is available as needed pursuant to an award contract with Reclamation.

Travel
No travel will be necessary.

Equipment
The District owns all of the equipment that will be used in the proposed project. The District is proposing to use equipment usage time estimates that are based on similar concrete lining projects. The proposed usage cost rates are based of costs outlined by the United States Army Corps of Engineers (USACE) Construction Equipment Ownership and Operating Expense Schedule (EP1110-1-8) for District VI, which includes the State of Texas. Equipment cost rates can be referenced in Table 3:

Table 5. Equipment Costs

Equipment	Category Number	Horsepower/ Specification	EP1110-1-8 Rates (daily)
Pickup	Section III.2.7	Section III.2.7	$25.20
Dump Truck	T45	22.5 CY	$113.46
Excavator	H25	320EDL	$720.26
Welder Rig	W35	23 HP	$46.16
Dozer	T15	70 HP / D-3	$345.36
Grader	T15	185 HP / 770G	$623.64
Sheeps Foot Roller	R45	145 HP / D-off	$822.80
Water Truck	T40	2,000 gal + 28,000 GCW Truck	$497.12
Rubber Tire Excavator	H30	174 HP	$723.88
Compactor	C10	10 HP	$134.7
Loader	L40	95 HP	$347.64
Shotcrete Machine	P45	60 HP / 50 CY/HR	$259.38
Compressor	A15	173 HP	$330.78
Telescopic Boom	C75	173 HP / 80 feet	$950.50

The sum of average (10 hours) and standby (14 hours) hourly rates is used to determine daily costs from the USACE EP1110-1-8 District VI Expense Schedule.

Materials and Supplies
The proposed costs and itemization for materials and supplies are representative of costs and quantities from comparable concrete lining construction projects performed by the District.

Contractual
Contracted engineering services are necessary to provide design, planning, construction, and reporting services necessary for the completion of the proposed project. The District uses a qualifications-based method for selection of a qualified and experienced engineering firm. Budgeted costs are representative of costs from concrete lining projects similar to the proposed project.

Environmental and Regulatory Compliance Costs
The proposed costs for environmental and regulatory compliance costs are representative of costs from similar concrete lining projects. Per conservations with Reclamation staff, it is estimated that completing a Categorical Exclusion Checklist (CEC) is sufficient to meet environmental and cultural compliance requirements. Costs for any additional environmental activities will be determined pursuant to an award contract with Reclamation.

Indirect Costs
Indirect costs are not included as part of the project.

Total Amount of Project Costs
The total cost of the project is $925,298. The Bureau of Reclamation requested share is $300,000. The District contribution will be $625,298 as in-kind contributions and cash.

VII ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

Will the proposed project impact the surrounding environment? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

Post-construction environmental impacts will be positive. There will be a reduction in wind-borne dust from the earth-lined channel, which will be concrete-lined over a 4,500-foot reach adjacent to farmland and ranch houses. District maintenance activities will be reduced by approximately 80%, thereby reducing dust generation, equipment noise and fuel consumption.

Special attention will be given to the following items during the construction phase:

- Dust abatement
- Noise impacts
- No clearing will be done except clearing brush within right-of-way of the District
- Mechanical compaction of the earth to prevent any damage to adjacent property from earth movement

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

There are no anticipated impacts to threatened and endangered species by the proposed project.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" if so, please describe and estimate any impacts the proposed project may have.

There are no surface waters inside the project boundaries that fall under CWA jurisdiction.

When was the water delivery system constructed?

Major canals and drains in the water delivery system were constructed under the Rio Grande Reclamation Project from 1915 to 1925. The La Union East Canal was constructed in 1919.

Will the proposed project result in any modification of or effects to individual features of an irrigation system? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

Irrigation system features such as headings and turnouts are continuously modified as part of maintenance operations. No adverse impacts to individual features of the irrigation system are anticipated as part of the proposed project.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

The proposed section of the La Union East Canal is in New Mexico and is owned by Elephant Butte Irrigation District (EBID), which is listed in the National Register of Historic Places under National Register Information System ID 97000822. As part of the proposed project (Task 2: Environmental and Regulatory Compliance), the El Paso County Water Improvement District No. 1 will work the New Mexico State Historical Preservation Office (SHPO), Archaeological Records Management Section at the New Mexico Historical Preservation Division, and coordinate with the Historical Cultural Property Inventory to meet compliance requirements specified in the New Mexico Cultural Properties Act, New Mexico Cultural Properties Protection Act, and the New Mexico Prehistoric and Historic Sites Preservation Act.

Are there any known archeological sites in the proposed project area?

There are no known archeological sites in the proposed project area.

Will the proposed project have a disproportionally high and adverse effect on low income or minority population?

There are no anticipated negative impacts on minority populations or low-income communities. The proposed project is likely to have a beneficial impact on the economy of the City of Anthony, New Mexico which is located about a mile away from the project site.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

There are no anticipated limits to access to and ceremonial use of Indian sacred sites or adversely impact tribal lands.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

There are no anticipated contributions to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

VIII REQUIRED PERMITS OR APPROVALS

The project activities will be confined to existing right-of-way access and operational and maintenance agreements with Elephant Butte Irrigation District. No conflicts with existing utilities or facilities requiring State of New Mexico or Doña Ana County approval are anticipated. It is not expected that any other permits or approvals will be necessary for the project as proposed.

IX UNIQUE ENTITY IDENTIFIER AND SYSTEM FOR AWARD MANAGEMENT

System for Award Management (SAM) Registration
The El Paso County Water Improvement District No. 1 maintains an active SAM registration and all information is up to date.

EIN Number: 74-1505167

Department of Treasury Automated Standard Application for Payments (ASAP)
The District is currently enrolled in ASAP and is ready to engage in active financial assistance agreements with Reclamation.

DUNS Number: 128044773

X APPENDIX

A. Official Resolution

A draft Resolution meeting the requirements of this application is shown on the following page. The El Paso County Water Improvement District No. 1 Board of Directors will meet on Wednesday, April 10, 2019, at which time the Resolution will be adopted. The Resolution will be sent to Reclamation as an additional attachment as permitted by Section D.2.2.8 of Reclamation's FY2019 WaterSMART Water and Energy Efficiency Grants FOA No. BOR-DO-19-F004.

Draft Board Resolution for the La Union East Concrete Lining Project

RESOLUTION OF THE BOARD OF DIRECTORS

El Paso County Water Improvement District No.1

El Paso County Water Improvement District No. 1 resolves to authorize the General Manager or the District Engineer to submit and take any Administrative Action required to complete an application to the United States Bureau of Reclamation WaterSMART Water and Energy Efficiency Grants program for a Grant totaling $300,000 to conserve water and improve the District's water use efficiency by concrete lining a portion of the La Union East Canal.

Whereas, the El Paso County Water Improvement District No.1 (the District) is a political subdivision of the State of Texas and was organized under Chapter 59, Article 16 of the Texas Constitution and operates under Chapter 55 and Chapter 49, in part, of the Texas Water Code;

Now Therefore, the Board of Directors of the District hereby resolve to support the District's application for a Grant and authorizes the General Manager or the District Engineer to submit and take any administrative action required to complete applications to the United States Bureau of Reclamation, including working with Reclamation to meet established deadlines for entering into a grant or cooperative agreement, and if the District is selected to receive a Grant, to negotiate an agreement to be approved by the District's Board of Directors. The District has the capability to provide the amount of funding and/or in-kind contributions specified in the Funding Plan in the application.

El Paso County Water Improvement District No.1

_____

By: Johnny Stubbs, President

B. Letters of Support

Letter of Support from Congresswoman Veronica Escobar (USTX-16)

VERONICA ESCOBAR
16TH DISTRICT, TEXAS

HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON MILITARY PERSONNEL
SUBCOMMITTEE ON READINESS

HOUSE JUDICIARY COMMITTEE
SUBCOMMITTEE ON THE CONSTITUTION, CIVIL RIGHTS AND CIVIL LIBERTIES
SUBCOMMITTEE ON IMMIGRATION AND CITIZENSHIP

WASHINGTON OFFICE:
1505 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-4831

EL PASO OFFICE:
221 N. KANSAS STREET, SUITE 1500
EL PASO, TX 79901
(915) 541-1400

http://escobar.house.gov

Congress of the United States
House of Representatives
Washington, DC 20515

March 12, 2019

Mr. Darren Olson
Financial Assistance Support Section
United States Bureau of Reclamation
P.O. Box 25007, MS 84-27814
Denver, CO 80225

Dear Mr. Olson,

I am writing on behalf of the El Paso County Water Improvement District No. 1 (EPCWID) request for funding under the WaterSMART Water and Energy Efficiency Grants program for Fiscal Year 2019. I understand the EPCWID is proposing to concrete line a section of the La Union East Canal that will help the District conserve significant quantities of water lost to seepage and evaporation.

The El Paso region has an arid climate and receives an average rainfall of about 8 inches. Irrigation, municipal, and industrial water use as well as international and interstate treaties all place significant demands on the limited water resources in the area. The City of El Paso meets approximately 50% of its water demand using water from the Rio Grande River. To meet the increasing demand of water for the next 50 years, additional water supplies are being developed in the area in projects that are increasing in cost, including water desalination, the importation of water, and advanced purification. Conservation is a more viable and cost-effective approach to meet the area's growing water demand.

I appreciate your full, fair, and prompt consideration of the application submitted by the El Paso County Water Improvement District No. 1 to this important grant program.

Sincerely,

Veronica Escobar

Veronica Escobar
Member of Congress

Letter of Support from the Far West Texas Water Planning Group

February 27, 2019

Mr. Darren Olson
Financial Assistance Support Section
United States Bureau of Reclamation
P.O. Box 25007, MS 84-27814
Denver, CO 80225

RE: Support for La Union East Canal Lining Project

Dear Mr. Olson:

The El Paso County Water Improvement District No. 1 (EPCWID1) is seeking to apply for funding under the WaterSMART Water and Energy Efficiency Grants program for fiscal year 2019. EPCWID1 is proposing to make canal lining improvements to the La Union East Canal that will help the District conserve significant quantities of water lost to seepage and evaporation.

The Far West Texas Water Planning Group pursuant to the State of Texas Water Code §16.05 is designated to develop the Region E Far West Texas Regional Water Plan with support from the Texas Water Development Board (TWDB). The Far West Texas Water Planning Group is composed of voting members from 7 counties in West Texas representing 15 water use interest categories and non-voting representatives of public stakeholder agencies, including the U.S. Bureau of Reclamation.

The Region E Far West Texas Regional Water Plan includes water management strategies that, when implemented, would develop, deliver, or treat additional water supply volumes or conserve water. The project proposed by EPCWID1 is a recommended water management strategy in the 2017 Texas State Water Plan and can be referenced using Water Management Strategy ID E-45.

As such, the Far West Texas Water Planning Group supports the water conservation project proposed by the El Paso County Water Improvement District No. 1 and recommends its funding.

Scott Reinert, P.E., P.G.
Vice-Chair

Letter of Support from the U.S. Department of Agriculture National Resources Conservation Service (NRCS) for a Recent Concrete Lining Project in 2019

USDA

United States Department of Agriculture

November 8, 2018

Cameron G. Turner
Manager, Agricultural Water Conservation
Texas Water Development Board
1700 N. Congress Ave.
Austin, Texas 78711-3231
CC: David Carter, TWDB Contract Administration

RE: Support for the Franklin Feeder Canal Improvement Project

Dear Mr. Turner:

The El Paso County Water Improvement District No. 1 (EPCWID1) is applying for funding under the TWDB Agricultural Water Conservation Program for FY2019. EPCWID1 is proposing to concrete line a section of the Franklin Feeder Canal that will help the District conserve significant quantities of water lost to seepage and evaporation.

The El Paso region has an arid climate and receives an average rainfall of about 8 inches. Irrigation, municipal, and industrial water use as well as international and interstate treaties all place significant demands on the limited water resources in the area. While most of Texas has recovered from drought, El Paso has remained in perpetual drought conditions for the last 20 years. Consequently, many agricultural operations in the area have been fallowed or deficit-irrigated.

The U.S. Department of Agriculture EQUIP Program supports agricultural producers with financial resources and technical support. County-level investment priorities are determined in collaboration with local stakeholders. In El Paso County, the 2018 EQIP program priorities are focused on making investments benefiting irrigated cropland that address insufficient water and more efficient irrigation systems.

The project proposed by EPCWID1 will support local farmers by conserving El Paso's limited water supply and will advance the 2018 EQUIP program priorities. As such, the funding of this project is recommended.

Please contact my office at 915-855-0884 x3 should you have any questions.

Francisco Molinar, PhD
Res. Team Leader
USDA, NRCS
11940 Don Haskins Ave.
El Paso, TX 79936

Natural Resources Conservation Service
EL PASO SERVICE CENTER
11940 DON HASKINS AVE
EL PASO, TX 79936
Phone: (915) 855 - 0884 Fax: (915) 857 - 7283
USDA is an equal opportunity provider, employer, and lender.

Letter of Support from Doña Ana County Commissioner District 2

February 27, 2019

Mr. Darren Olson
Financial Assistance Support Section
United States Bureau of Reclamation
P.O. Box 25007, MS 84-27814
Denver, CO 80225

RE: Support for the La Union East Canal Lining Project

Dear Mr. Olson:

The El Paso County Water Improvement District No. 1 (EPCWID1) is applying for funding under the WaterSMART Water and Energy Efficiency Grants program for Fiscal Year 2019. EPCWID1 is proposing to concrete line a section of the La Union East Canal that will help the District conserve significant quantities of water lost to seepage. The project will also make improvements that will lead to reductions of sediment in irrigation water conveyed at the La Union East Canal.

The El Paso-Las Cruces region has an arid climate and receives an average rainfall of about 8 inches. Irrigation, municipal, and industrial water use as well as international and interstate treaties all place significant demands on the limited water resources in the area. The region has remained in perpetual drought conditions for the last 15 years and storage levels in Elephant Butte Reservoir are at near drought-of-record levels. Consequently, many agricultural operations in the area have been fallowed or deficit-irrigated.

The two irrigation districts in the region, Elephant Butte Irrigation District (EBID) and EPCWID1, work collaboratively to supply Rio Grande Project water stored in Elephant Butte and Caballo Reservoirs to farmers in Southern New Mexico and Far West Texas. Conservation projects are necessary to ensure the continued delivery of irrigation water to farmers in the region. As such, I support the project proposed by EPCWID1 and recommends its funding.

Please do not hesisate to contact my office at 915-479-2685 with any further questions.

Ramón S. Gonzalez

Ramon S. Gonzalez
Commissioner – District 2
Doña Ana County

Letter of Support from Elephant Butte Irrigation District (EBID)

The Board of Directors of Elephant Butte Irrigation District considered and approved the La Union East Canal Lining Project on 3/13/2019. A statement of support will be mailed to Reclamation separately and is expected to arrive prior to the submission deadline.

Elephant Butte Irrigation District
Board of Directors' Meeting
March 13, 2019
8:00 am

Duration	From	To	Item # - Item Description	Presenter	Page
OPEN SESSION			**REGULAR SCHEDULED BOARD MEETING**		
08:00		0815			
			1. Mtg called to order		
			2. Invocation		
			3. Pledge of Allegiance		
			4. Roll Call		
PURSUANT TO SECTION 10-15-1-H, NMSA OF THE NEW MEXICO OPEN MEETINGS ACT, THE FOLLOWING TOPICS SHALL BE DISCUSSED IN CLOSED SESSION:					
Motion to go into CLOSED SESSION					
1.5	0815	0930	5. Legal Update	- Attorneys	
			A. NM ex. rel. OSE vs. EBID CV 96-888 (Stream Adj.)		
			1. Lower Rio Grande Water User Group Activity/Status of ongoing discussions		
			2. General Update		
			B. Texas v. NM (USSC)		
			1. General Update		
			C. EBID Protests		
			1. CRRUA, Nos. LRG-3150-B, 3150-E & 9356 (2010 Protests)		
			2. CRRUA - Application Nos. LRG-3695 POD 6 and LRG-3150 POD 48.		
			3. CRRUA, No. LRG-3150-POD49		
			4. Doak Application No. LRG-10290-1 into 17266		
			5. Cloverleaf Protest, No. HS -1131		
			D. Pending lawsuits/Tort Claims		
			1. Pioneer Bank v. Mooney, et. al		
			E. NM Copper Corporation proposed mine litigation		
			F. Motion to come out of closed session		
OPEN SESSION			**REGULAR SCHEDULED BOARD MEETING**		
.15	0930	0945	6. Introduction of Guests		
			7. Approval of Board Minutes 02/13/19		3
			8. Calendar of Events		8

	03/01/2018	03/01/2019
Elephant Butte	483,692	170,780
Caballo	43,229	27,738
Total Storage	526,921	198,518

.30	0945	1015	9. Engineering/Maintenance	Z. Libbin/ L. Barrett	
			A. Maintenance Update		
			B. Special Use Permits		10
			1. 2019-L-008 New Mexico Gas Company		
			2. 2019-L-010 City of Las Cruces		
			3. 2019-L-011 City of Las Cruces		
			4. 2019-L-012 New Mexico Gas Company		
			5. 2019-L-013 City of Las Cruces		
			6. 2019-L-014 City of Las Cruces		
			7. 2019-L-015 El Paso Electric		
			8. 2019-L-016 Trails End Neighborhood Assoc.		
			9. 2019-L-017 Century Link		
			C. Garfield MDWCA Permit Fees Request		
			D. Approval of sale portion of the Leasburg Drain to Quail Hollow Farms		
			E. LRGPWWA Request for lift station Hess Spur Drain	10	
			F. Kinder Morgan Spill Update		
			G. Tire Dumping Abatement Update		
.30	1015	1045	10. Water Resource	P. King/J. Narvaez	
			A. Weather/Runoff Forecast		
			B. Irrigation Season 2019 Start Up		
			C. Growers Meetings		
			D. Dynamic Statewide Budget for New Mexico		
.15	1045	1100	11. Legal Update	Attorneys	
			A. LRR 469- Lower Rio Grande Water User Group Activity		
			B. Litigation Update- SB		
			C. Graduate Assistant Agreement		

D. LRR 476 Roads MOU with DAC

.15	1100	1115	12. General & Administrative	G. Norvell	
			A. Financial Report		
			B. Renewal Contracts:		
			1. Materials Testing-Advance Testing and Materials Inc.		
			2. Materials Testing- Wood Environmental & Infrastructure Solutions Inc.		
			3. Surveying Services- Moy Surveying Inc.		
			4. Heating & Cooling Services- Stadjuhars Heating & Cooling Inc.		
			5. Engineering Services- Henry Magallanez		
			C. New Contracts:		
			1. Professional Legal Services (General)		
			2. Corrugated Pipe and Accessories		
			D. Disposal of Assets		
.15	1115	1130	13. Managers Update	G. Esslinger/	
			A. EBID support for La Union East Canal Lining Project		11
			B. Law of the Rio Grande April 11-12th, Santa Fe, NM		12
			C. Rio Grande Compact Mtg. April 3rd – 4th		15
			D. US-Mexico Border Water Summit 2019 April 23-25th Farm & Ranch		16
			E. NWRA Washington, DC Sponsorship		
			F. Years of service recognition		
.15	1130	1145	14. Legislative Update		
			A. NM Legislative Brief		
			B. NWRA Federal Affairs House Passage of S.47		19
			C. FFA Monthly Briefing		
			D. Water Strategies Report		
			STAFF REPORT		41
.45	1200	1245	Lunch Break		

OPEN SESSION

19. CONTINUATION PURSUANT TO SECTION 10-15-1-H (see regular schedule 6-14 if necessary)

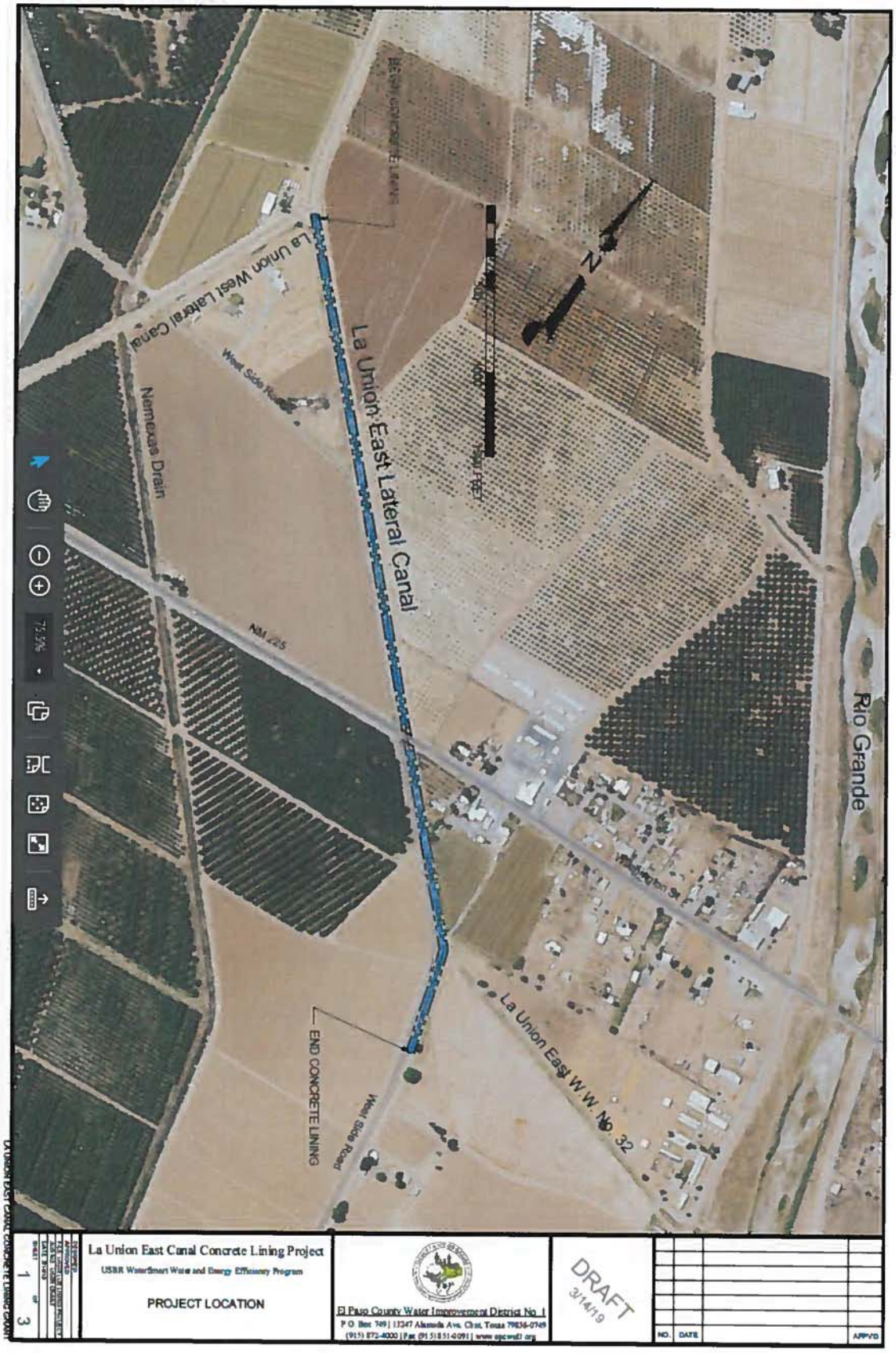
CLOSED SESSION

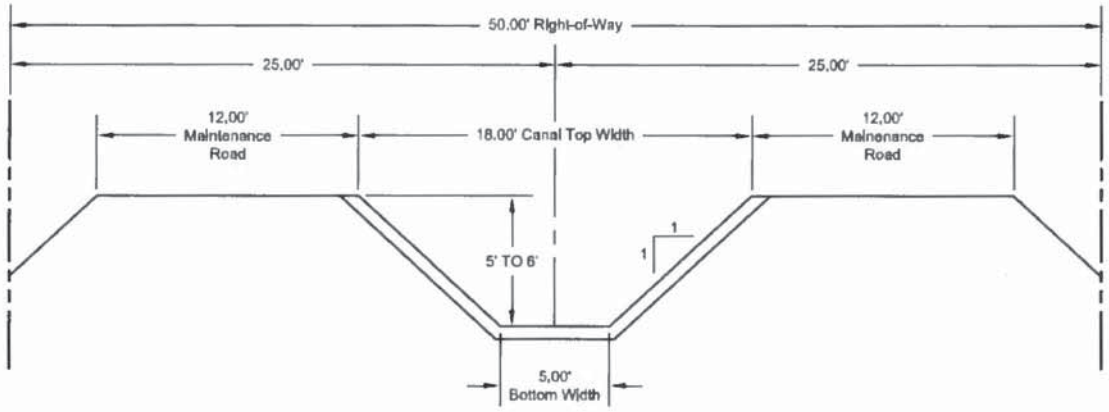
20. CONTINUATION PURSUANT TO SECTION 10-15-1-H (see legal update 5A-5G if necessary)

ADJOURNMENT

In accordance with the Elephant Butte Irrigation District resolution directing compliance with Open Meetings Act, a final version of the agenda will be available 72 hours in advance of the meeting at the EBID office at 530 S Melendres, Las Cruces, NM; and will be emailed to persons making a specific request for the final agenda by calling EBID's office 575-526-6671 ext. 402.

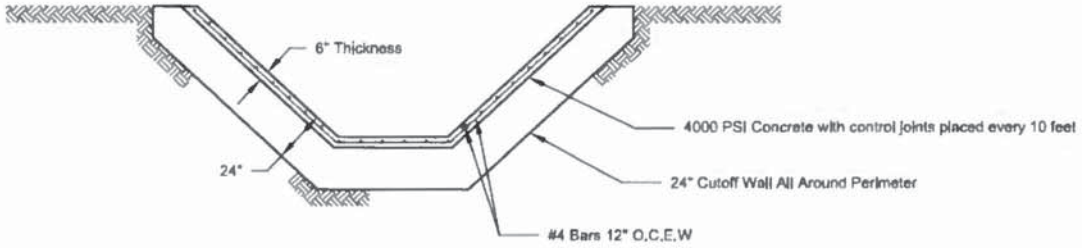
C. Preliminary Engineering Design





PROPOSED CANAL SECTION

NTS



Cutoff walls placed at canal beginning, end, and where concrete lining abuts concrete irrigation structures.

TYPICAL CONCRETE LINING DETAIL

NTS

APPVD

NO. DATE

DRAFT
3/14/19

El Paso County Water Improvement District No. 1
P.O. Box 7411 | 13247 Alameda Ave. Clint, Texas 79836-0744
(915) 872-4000 | Fax (915) 851-4001 | www.epcwid1.org

La Union East Canal Concrete Lining Project
USBR Water Smart Water and Energy Efficiency Program

CANAL SECTION AND
TYPICAL CONCRETE LINING DETAIL

DESIGNED
APPROVED
DRAWN
JOB NO. LA UNION GRANT
DATE 3/14/19
SHEET 2 OF 3

LA UNION EAST CANAL CONCRETE LINING GRANT

GENERAL CONSTRUCTION NOTES

1. All construction shall be in accordance with adopted specifications.

2. Prior to beginning construction, the owner or his authorized representative shall convene a Pre-Construction Conference between the government, consulting engineer and contractor.

3. Any existing pavement, curbs, and/or sidewalks or other structures damaged or removed will be repaired by the contractor at his expense before acceptance of the project.

4. All drain pipes to be Class IV RCP unless noted otherwise.

5. Cast bronze survey markers shall be placed in concrete in permanent, accessible locations at the time of construction. The location of the markers shall be indicated on the construction plans.

6. For slopes or trenches greater than five feet in depth: All construction operations shall be accomplished in accordance with applicable regulations of the U.S. Occupational Safety and Health Administration.

7. All site work must also comply with Environmental requirements.

8. The contractor shall not dispose of surplus excavated material from the site without notifying the government at least 24 hours prior to the spoils removal.

9. This notification shall include the disposal location. The contractor shall uncover and verify the depths and horizontal location of all existing utilities to be extended to, altered or subject to damage or inconvenience by this project prior to commencing construction. No separate pay.

10. The location and elevation of all existing utilities to be connected to shall be confirmed prior to the installation of any utility line. The contractor shall confirm with the Engineer the grade of the final segment of connecting pipe as necessary to meet the flowline elevation of the existing pipe. No separate pay.

11. The Contractor shall provide all trench safety as necessary and in strict accordance with the State and OSHA requirements.

12. The Contractor shall provide all traffic control as necessary for construction vehicles entering and exiting the site. No separate pay.

13. The contractor is responsible for assuring that all permits necessary to legally perform the work have been obtained prior to commencing construction. Required permits that can be issued to the Contractor only will be obtained at the Contractor's expense.

14. All steel shall conform to the requirements of ASTM A615 Grade 60.

15. All reinforcing steel laps shall be a minimum length of 30 bar diameters unless otherwise specified.

16. Expansion joint dowels shall be supported as necessary during pouring to assure that dowels are horizontal and plumb.

17. All reinforcing steel laps shall be made in a plane horizontal to the concrete surface to maintain minimum cover.

18. All construction joints shall be sealed as indicated on the plans. 18.

19. Prior to hauling to the site, contractor must obtain approval of the engineer for any fill material to be utilized for the project.

20. Contractor is responsible for protecting all concrete work from rain and flooding.

21. All canal lining concrete shall have a minimum compressive strength of 3000 psi at 28 days unless otherwise noted. All structural concrete shall have a minimum compressive strength of 3600 psi at 28 days unless otherwise noted. High early strength mix designs may be proposed by the contractor but will require the approval of the engineer.

22. In the event of a conflict between the requirements of the plans and the requirements of the specifications, the more restrictive requirement shall govern. The Engineer shall determine which requirement is more restrictive.

23. The unit cost for all excavation shall include removal and transport of material within the project site or specified borrow location to the point of final placement.

24. Concrete debris may be placed below finished grade in the location indicated on the typical section detail. Concrete must be placed in a manner that will allow the placement of surrounding earthen fill in a manner the will not encourage future consolidation.

25. No more than two longitudinal construction joints made be placed in the canal concrete in any given transverse section. Construction joints shall be sealed in accordance with the construction joint detail. Construction joints shall be considered a subsidiary item to Concrete Canal Paving. The cost of construction joints proposed by the contractor shall be included in the unit cost for Concrete Canal Paving. No transverse construction joints will be allowed in the Concrete Canal Paving.

26. The Contractor shall conduct work in a manner that allows all pours to end at a proposed expansion joint. In the event it is necessary to terminate a pour at a location other than a planned expansion joint, the Contractor shall install an additional expansion joint at no cost to the Owner.

27. The unit cost for Concrete Canal Paving shall apply for all slab thicknesses including the standard 4-inch slab and thickened sections at canal ladders, expansion joints and end joints.

28. The contractor shall incorporate existing and proposed levee pipe penetrations into the Concrete Canal Paving. No separate pay. Such work may include mitering pipes and final grouting penetrations. Required pipe extensions will be performed by others.

29. The contractor may adjust the receding "finished grade" slope east of the eastern levee to a accommodate cut and fill quantities. Such slope adjustments shall provide for positive drainage away from the levee and shall maintain slopes between 1.5 and 5.0 percent.

30. The unit cost for embankment shall apply to the construction of the formal channel embankment and for the construction of the receding slopes outside of the channel embankments.

31. Geotechnical bore locations indicated on the plans are approximate.

32. The cost of demolition of structures indicated on the plans to be removed shall be included in the unit cost of excavation. No separate pay.

33. Erosion controls shall be installed in locations directed by the Engineer.

34. Contractor shall provide all traffic control as necessary and in accordance with the specifications. No separate pay.

35. Contractor shall provide all construction staking and cut sheets as necessary and in accordance with the adopted specifications. No separate pay.

36. Contractor shall verify the location and elevation of all existing facilities prior to construction of proposed facilities. No separate pay.

37. Final payment shall require acceptance of facilities by the Owner prior to payment.

38. Contractor shall give notice to all authorized inspectors, superintendents, or persons in charge of utilities affected by his operations prior to commencement of work and assure himself that all construction permits have been obtained. Required permits that can only be issued to the contractor will be obtained at his expense.

39. Contractor to remove and lawfully dispose all excess spoil materials from the construction site. No separate pay.

40. Water stops shall be installed in all cold joints, construction joints and keyways within ten vertical feet of the flowline of all linings and/or structures.

41. Alternate doweling systems and/or methods may be proposed by the contractor but will require the approval of the engineer.

CONSTRUCTION SEQUENCING

1. Notify the government a minimum of 48 hours prior to beginning any work or as required in bid specifications.
2. Arrange for all existing utility lines to be marked.
3. Commence earth work.
4. Grade all areas to be paved to subgrade.
5. Place concrete.
6. Final grade areas surrounding pavement.
7. Install gates, electrical system, gate hoists and fencing.
8. Repeat steps 3 through 7 for subsequent segments.
9. Complete final dress.
10. Schedule and attend preliminary walk through.
11. Correct punch list items.
12. Project engineer inspects job and writes concurrence letter and submits the letter to the District. Final inspection is scheduled upon the receipt of the concurrence letter.

BENCHMARK INFORMATION

BENCHMARK NO. 1

Bureau of Reclamation brass cap on top of weir, left side, Enriquez Check
La Union East Lateral Canal Station 51+51
Elevation = 3753.46 U.S.B.R. Datum

BENCHMARK NO. 2

Bureau of Reclamation brass cap on top of catwalk, left side, Rowley Check
La Union East Lateral Canal Station 73+83
Elevation = 3751.07 U.S.B.R. Datum

OWNER INFORMATION

Owner: EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1
Phone #: (915) 872-4000
Mailing Address: P.O. BOX 0749, CLINT, TEXAS 79836-0749
Physical Address: 13247 ALAMEDA AVE., CLINT, TEXAS 79836

Owner's representative responsible for plan alterations:
AW BLAIR, P.E.
Phone #: (915) 872-4000

Engineer: AW BLAIR, P.E., EPCWID1 DISTRICT ENGINEER
Phone #: (915) 872-4000
Mailing Address: P.O. BOX 0749, CLINT, TEXAS 79836-0749
Physical Address: 13247 ALAMEDA AVE., CLINT, TEXAS 79836

Surveyor:
Phone #:
Address:

NO. DATE APPVD

DRAFT
3/13/19

El Paso County Water Improvement District No. 1
P.O. Box 749 | 13247 Alameda Ave. Clint, Texas 79836-0749
(915) 872-4000 | fax (915) 851-4099 | www.epcwid1.org

La Union East Canal Concrete Lining Project
USBR Water Smart Water and Energy Efficiency Program

GENERAL CONSTRUCTION NOTES

DESIGNED
APPROVED
DRAWN
CHECKED
DATE
SHEET 2 OF 3

D. Referenced Reports

Sheng, Z. and J.P. King. 2006. Efficient measures for controlling irrigation canal losses in the Rio Grande Project area, at the U.S. Department of Agriculture – CSREES National Water Conference. San Antonio, TX. February 5 – 9 [abstract], [Invited Presentation].

Texas A&M AgriLife Research Center at El Paso

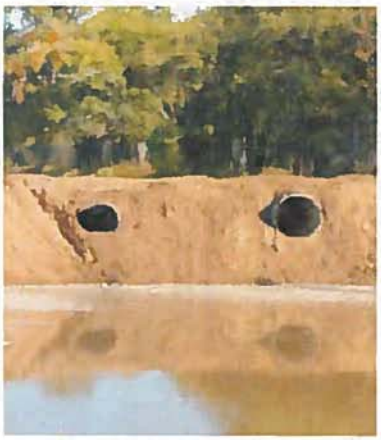
TAMU and NMSU Scientists Help Irrigation Districts in Water Conservation

Dr. Zhuping Sheng, Texas A&M AgriLife Research
Dr. Phillip J. King, Department of Civil Engineering, NMSU

Support provided by: El Paso County Water Improvement District No. 1, Elephant Butte Irrigation District, Hudspeth County Conservation and Reclamation District No. 1, U.S. Bureau of Reclamation El Paso Field Office, USDA-NIFA, Rio Grande Basin Initiative, Texas AgriLife Research, New Mexico State University, and Texas Water Resources Institute

BACKGROUND

- Surface water from the Rio Grande is delivered for agricultural and urban use in our region by about 700 miles of canals and laterals maintained by two irrigation districts.
- An unknown quantity of the water delivered by these canals is lost through natural seepage and evaporation.
- Texas AgriLife Research and New Mexico State University scientists are working together to conduct studies to quantify canal seepage losses and opportunities for water conservation through lining canals in irrigation districts in Texas and New Mexico.



Canal seepage loss ponding test, Franklin Canal, El Paso, Texas

OBJECTIVES

- To determine water losses from canal seepage.
- To assess potential water savings by lining canals and delivery system improvements.
- To help irrigation districts prioritize canal lining and optimize the design of lined canals.
- To conserve water and increase available water supplies.

Water flow measurement in the Franklin Canal, El Paso, Texas

FINDINGS AND BENEFITS

- Research results from the canals tested show seepage losses ranging from 10% to 30% of the total amount of water delivered.
- Losses vary significantly from location to location due to different soil types and hydraulic conditions. The results show higher seepage loss rates in the upper valley than in the lower valley probably due to high permeability of soil.
- Two different methods are being used to measure seepage losses. Ponding test results show water seepage rates from 160 acre-feet to 362 acre-feet per mile along a portion of the Franklin Canal. Another method, current meter inflow-outflow measurements, show even higher seepage losses ranging from 884 acre-feet to 1,986 acre-feet per mile during the irrigation season.
- Average savings from lining 10 miles of canals could provide water for as much as 1,000 acres of crops or 8,000 households.
- Canal lining is expensive. The results from this study are assisting irrigation districts in targeting canals that will result in the highest water conservation.
- Substantial quantities of water can be saved by reducing canal seepage losses. This research is being used to increase water delivery efficiency and extend our limited water supplies.

TEXAS A&M AGRILIFE RESEARCH

Texas A&M AgriLife Research Center at El Paso
1380 A&M Circle, El Paso, Texas 79927
Phone: (915) 859-9111, Fax: (915) 859-1078
http://elpaso.tamu.edu/Research 3/2/2015

Texas Water Resources Institute · USDA · NM State University · Reclamation

Other Referenced Reports

Al Haddad, Sami. 2005. Estimating Seepage from Irrigation Canals in the Elephant Butte Irrigation District, New Mexico. Masters Thesis, New Mexico State University, Department of Civil and Geological Engineering.

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