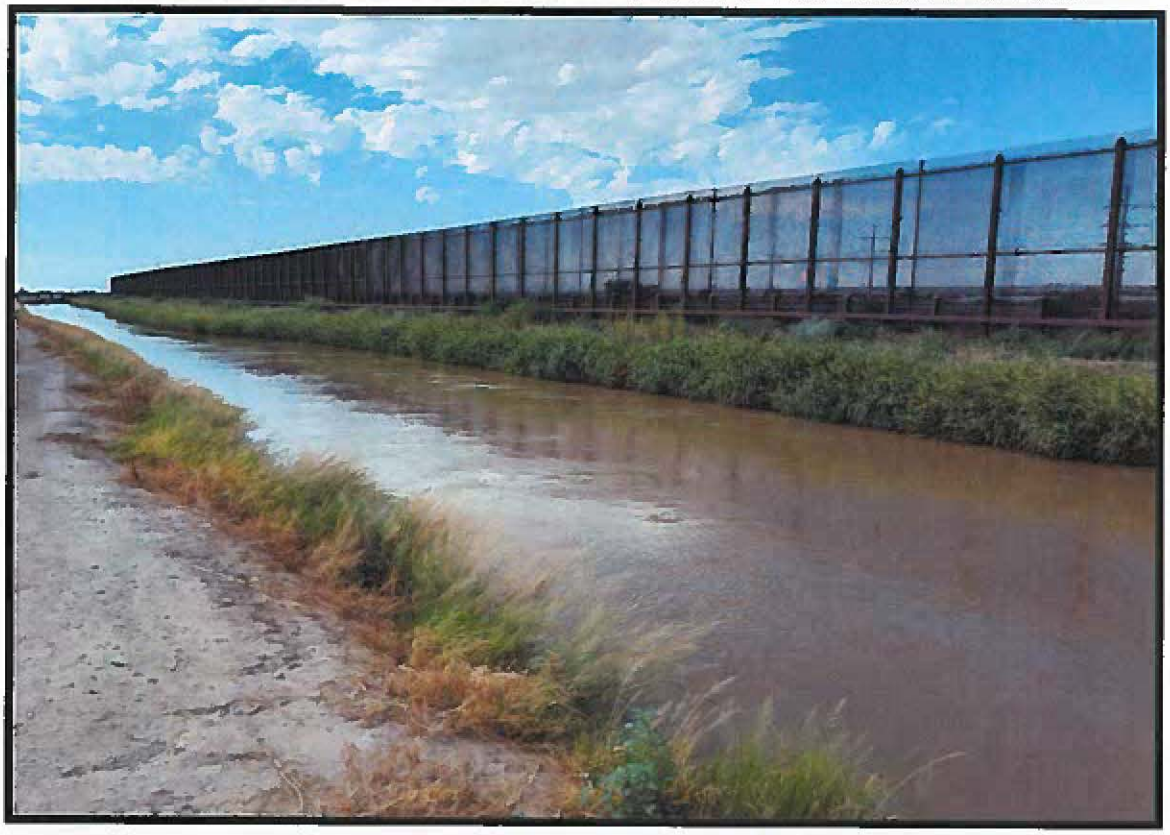
WATERSMART WATER AND ENERGY EFFICIENCY GRANTS FOR FY 2020
FUNDING OPPORTUNITY ANNOUNCEMENT NO. BOR-DO-20-F001



RIVERSIDE CANAL
CONCRETE LINING PROJECT – PHASE 3

TOTAL PROJECT COST: $2,039,504

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

Project Manager
Dr. Al W. Blair, PE, District Engineer
P.O. BOX 4615, Austin Texas 78765
awblair@awblair.com 512-394-1011

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I EXECUTIVE SUMMARY

Applicant Information

Date:	September 30, 2019
Applicant Name:	El Paso County Water Improvement District No. 1
City, County, State:	Clint, El Paso County, Texas
Project Name:	Riverside Canal Concrete Lining Project – Phase 3
Project Manager: Telephone: E-mail:	Dr. Al Blair, P.E., District Engineer 512-394-1011 awblair@awblair.com
Project Funding Request:	The total project cost is $2,039,504 and the District is requesting $1,000,000 in federal funds.

Project Summary

The Riverside Canal Concrete Lining Project – Phase 3 consists of constructing 6,600 feet of steel-panel reinforced concrete on an earthen-lined section of the Riverside Canal. This is the third phase of planned improvements to the Riverside Canal System. Survey and engineering design work has been finalized and the project is ready for construction. The estimated amount of water to be saved after completion of the project is 3,675 acre-feet per irrigation year (February 15 to October 15) on a full allocation (4 acre-feet per acre) at an initial cost of $554.97 per acre-foot conserved. With a life expectancy of 50 years, the return-on-conservation investment is $11.10 per acre-foot.

The project advances the goals of FOA No. BOR-DO-20-F001 by reducing quantifiable water losses due to seepage and evaporation. Additional benefits to existing and planned infrastructure can also be achieved as part of the proposed project, including: [1] advancing the development of a regulating reservoir that is adjacent to the project site; [2] stabilizing the canal banks on which the U.S.-Mexico border wall is constructed and facilitating access and use of the banks for U.S. Customs and Border Protection operations and; [3] supporting the agricultural operations of the Ysleta del Sur Pueblo, a federally-recognized tribe.

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

Estimated Completion Schedule

The construction of the project will take thirty six months (or less) from the date of funding authorization, which is assumed to be in June of 2021 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 March of 2024. Final report preparation will take an additional month. The project completion date is April 2024. The project will be accomplished within the three-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	Contract	Year	Grant Amount
Riverside Canal Concrete Lining Project	R18AP00193	2018	$ 1,000,000
Ysla Lateral Concrete Lining Project	R18AP00261	2018	$ 75,000
Designing Improvements to the Franklin Canal and Franklin Feeder Canal	R18AP00142	2018	$ 75,000
La Union East Concrete Lining Project	R19AP00150	2019	$ 300,000
Montoya Main and Montoya A Lining Project	R19AP00208	2019	$ 75,000
AMI Upgrades to Well Meters Project	R19AP00207	2019	$ 75,000
La Union East Canal Concrete Lining Design Project (selected for award)	BOR-DO-19-F001	2019	$ 75,000

Total water conservation for these collaborative projects after full implementation (or subsequent construction) is estimated at 7,455 acre-feet per irrigation year (February 15 to October 15) on a full allocation (4 acre-feet per acre).

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) in New Mexico, 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 divided into 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 approximately 50% of 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

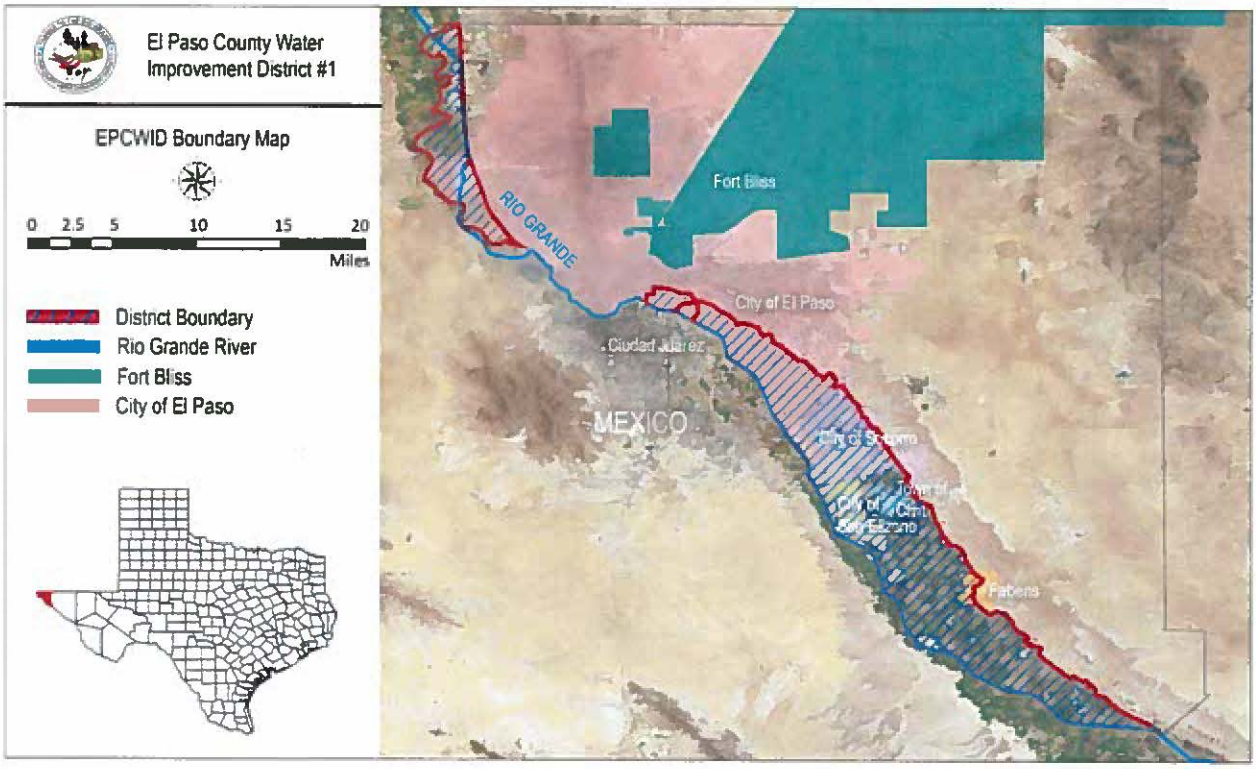
The District delivers water to an average of 49,000 acres of cropland using 350 miles of canals, 269 miles of drains, 60 wells, and over 2,200 turnouts.

- 63 miles of concrete lined canals and laterals
- 162 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 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 and is scheduled to bring online 60 additional well metering sites starting in 2020. 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 Project.

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 that is not entirely accounted for in water supply and use projections is the increasing water demand in Ciudad Juarez, Mexico, which is located across the Rio Grande from the City of El Paso. The City of El Paso shares the Hueco Bolson aquifer with Ciudad Juarez, which 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. Historical groundwater overdraft in El Paso and Ciudad Juarez has caused large groundwater drawdowns, deterioration of groundwater quality, and land subsidence in the Hueco Bolson, although some shared measures have been taken to control the groundwater use (Sheng 2013).

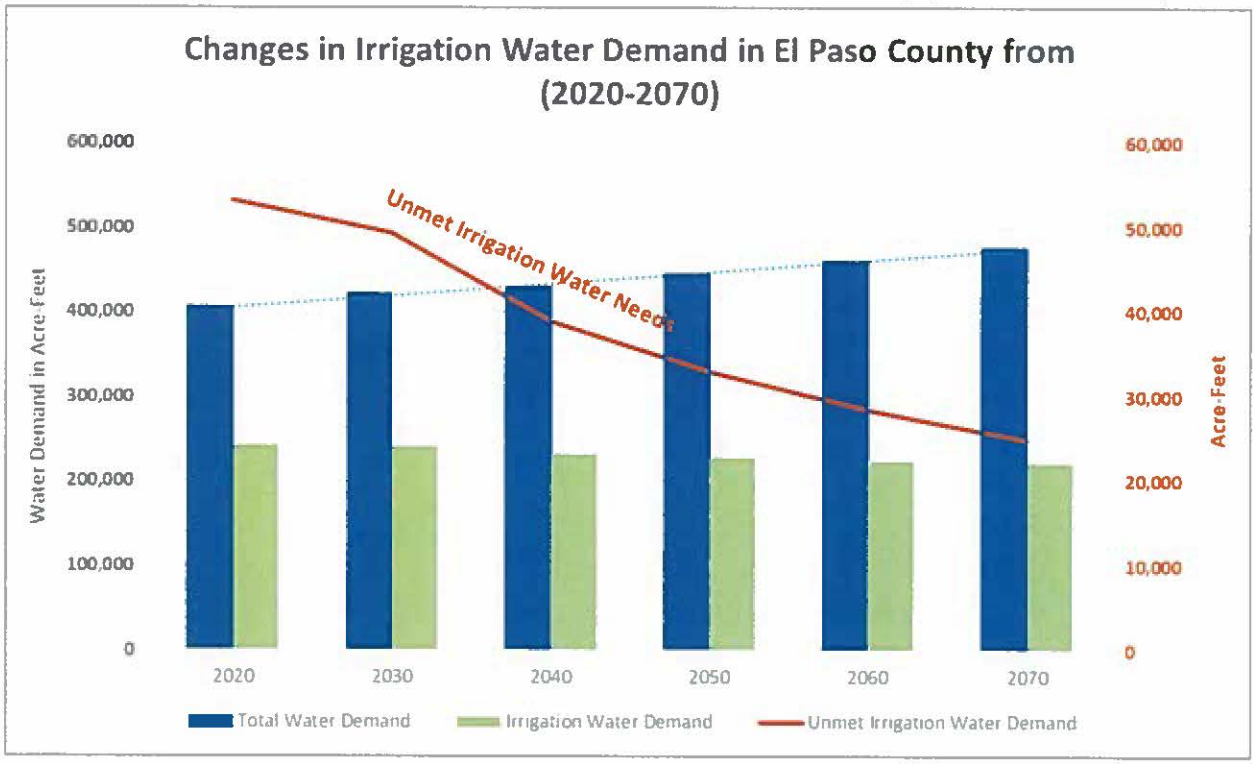
Ciudad Juarez is currently 100% dependent on groundwater to satisfy all of its municipal and industrial water demands, according to the *Junta Municipal de Agua y Saneamiento de Juárez* (JMAS), Ciudad Juarez's potable water utility. In 2014, 144,213 acre-feet of water were pumped from the Hueco Bolson aquifer, following a 15-year trend of average annual increases in pumping of 1,289 acre-feet since 2000 (FWTWPG 2016). In 2018, water use in Ciudad Juarez was approximately 162,142 acre-feet and 30 additional wells were brought online to meet peak summer demand (JMAS 2019). The population of Ciudad Juarez is estimated at over 1.4 million (CONAPO 2012). Water demand projections published by JMAS recommend a series of projects necessary to meet demand for a population of 1.7 million by 2030 (JMAS 2013).

According to the 2012-2030 Master Plan (JMAS 2013), JMAS expects to begin constructing two surface water treatment plants for potable use in 2020 and 2025 to treat up to 38,375 acre-feet of Rio Grande Project water per year. This project is expected to be partially funded by the North American Development Bank (NADBANK), a binational financial institution established by the governments of the United States and Mexico to provide financing to support the development and implementation of infrastructure projects along the U.S.-Mexico border.

Irrigation Water Demand

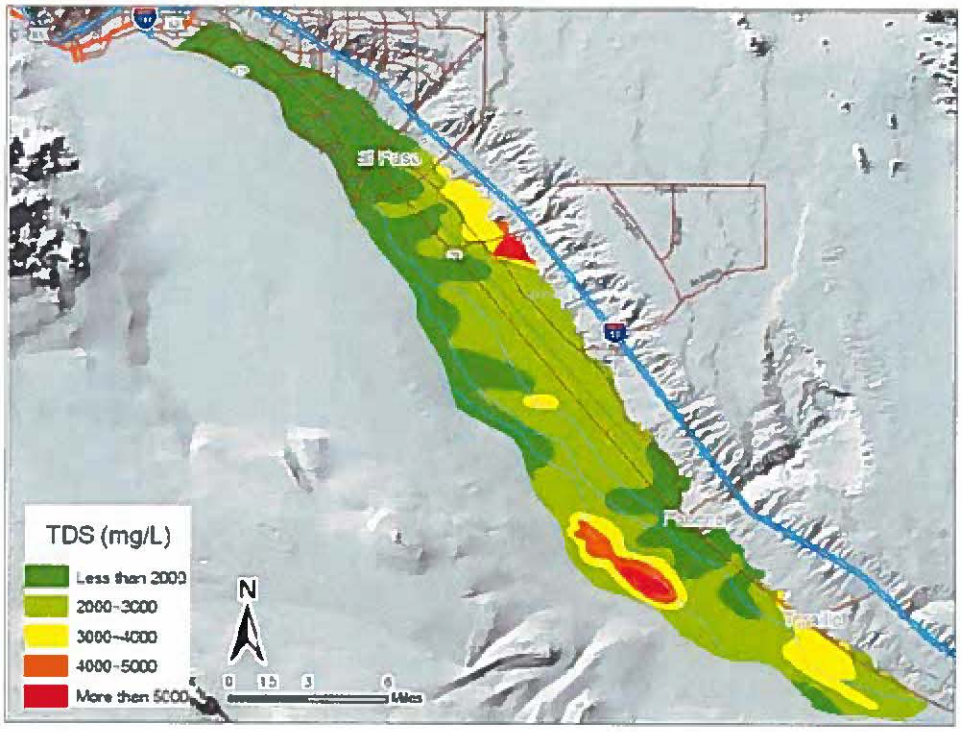
There are approximately 53,202 acre-feet of annual unmet water needs for irrigation in El Paso County during drought-of-record conditions (2017 Texas State Water Plan). The growing imbalance between supply and demand is expected to lead to greater reliance on non-renewable groundwater resources used 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 and implementation strategies in the 2017 Texas State Water Plan determined that approximately 50,000 acre-feet of water per year can be saved by concrete lining several of the District's canals, including the Riverside Canal. According to a Texas A&M University report sponsored by the Texas Water Development Board (TWDB), there are very limited opportunities for water conservation in Far West Texas irrigated agriculture outside of making improvements to the District's conveyance system (Michelsen et al. 2009). 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, sediment and salinity levels limit the use of pressure piping and drip-irrigation systems, 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 most 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. Surface water is one of the few renewable water resources available to the El Paso region. For this reason, the District is developing planning (via the 2022 Texas State Water Plan), engineering, and design work necessary to deliver Rio Grande Project water for the first time to the Upper Valley Water Treatment Plant in collaboration with El Paso Water Utilities. Two projects that advanced this

effort were funded by Reclamation as part of the 2019 WaterSMART Water and Energy Efficiency Grants Program (R19AP00150) and 2019 Water Conservation Field Services Program (BOR-DO-19-F001).

The proposed concrete lining of the Riverside 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 (a drought year) were approximately 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. Measured seepage losses are higher during wet years, and these 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 a limited ability to address losses upstream, the District continuously invests in projects within its jurisdiction that increase efficiency and reduce losses. 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, 2017, and 2019 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 58,240 acre-feet of water in storage as of September (total conservation capacity is 1,973,358 acre-feet).

Above-average snowpack and late spring storms in 2019 improved drought conditions throughout the Western United States, including the Rio Grande watershed. However, water levels at Elephant Butte Reservoir did not exceed 30%, highlighting the effects of long-term drought and the continued need for investments in water conservation.

Figure 4 – U.S. Drought Monitor Intensity for the Upper Rio Grande from 2000 - 2019

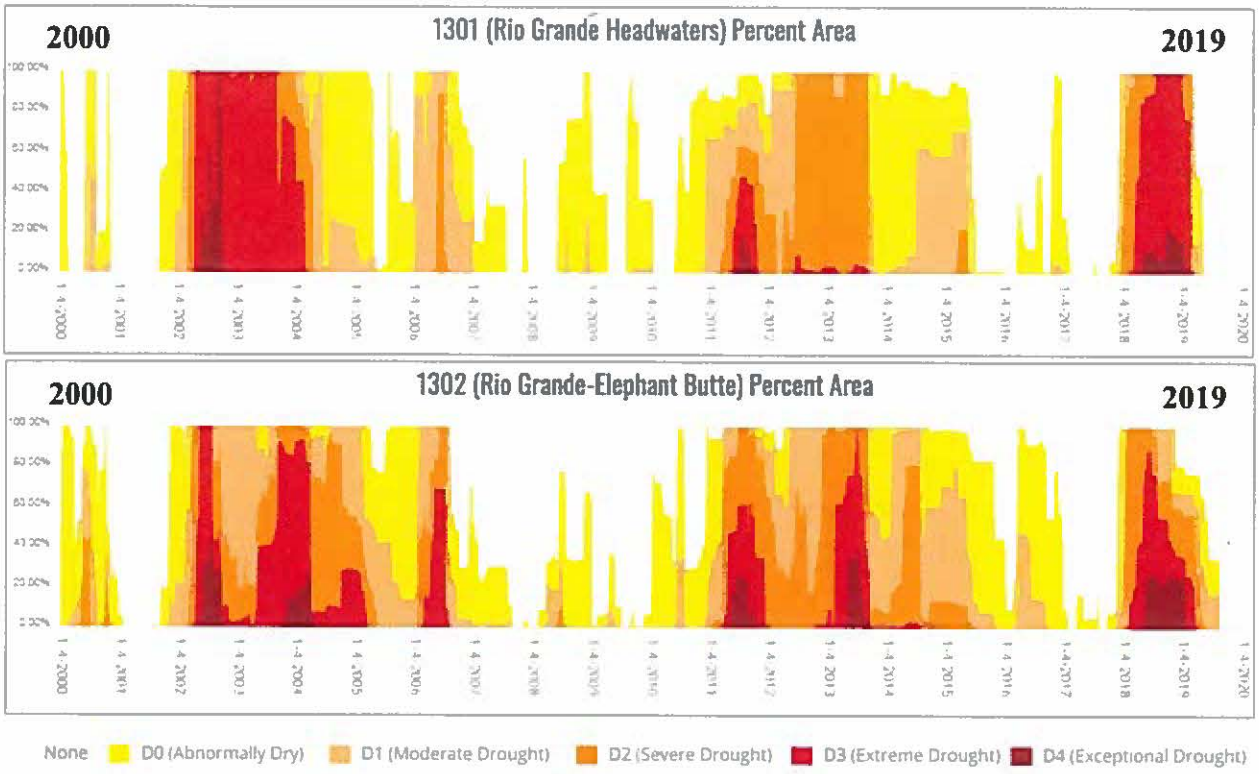


Figure 5 – Storage and Level Thresholds at Elephant Butte Reservoir from 1999 - 2019

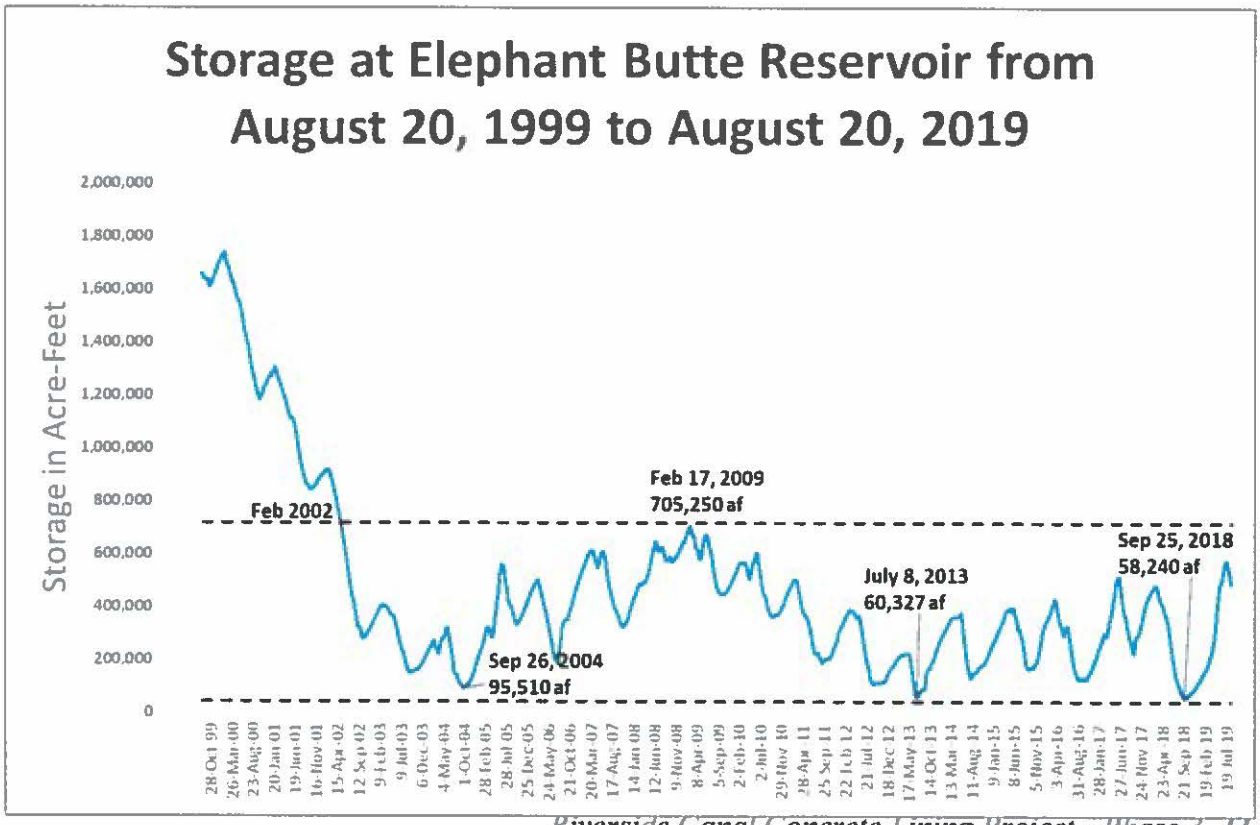
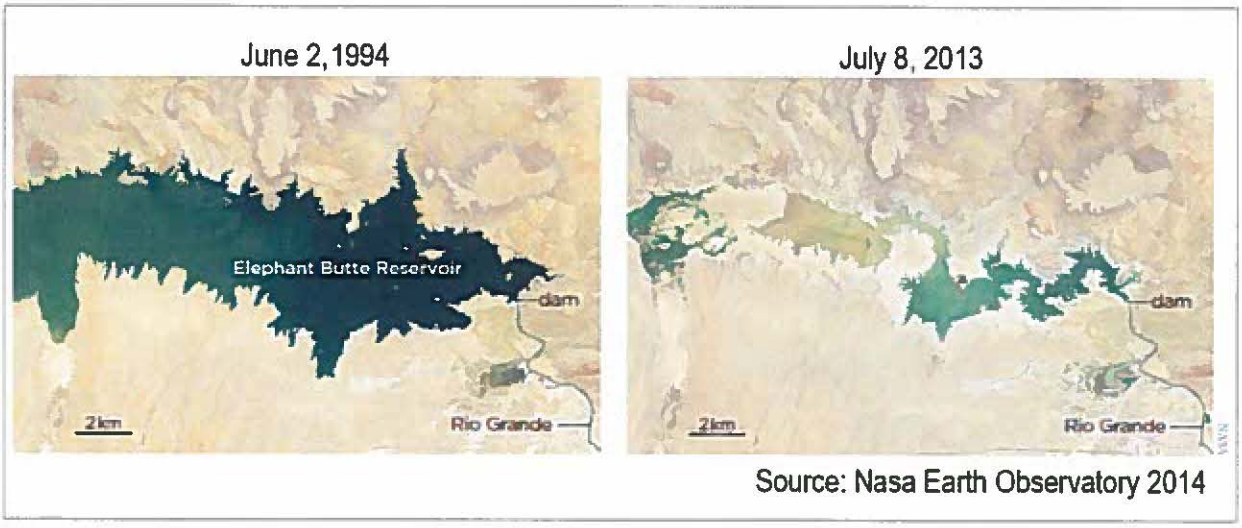


Figure 6 –Landsat 8 Images of Elephant Butte Reservoir in 1994 and 2013



Storage levels in Elephant Butte Reservoir in 2018 were similar to drought conditions 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. As shown in Figure 5, storage levels in Elephant Butte Reservoir have only been at or below the 2013 and 2018 levels three times: during the drought-of-record from 1951-1957, in 1963-1964, and in 1971-1972.

To meet municipal water demands in 2013, 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). These new near drought-of-record conditions prompted changes to water availability and supply projections modeled by the Texas Water Development Board (TWDB) for the 2022 Texas State Water Plan. Preliminary water availability model revisions developed by the TWDB in 2019 suggest that investments in water conservation and drought mitigation will have to be accelerated for water users in El Paso County to meet projected water supply needs by 2070.

Projected Reductions in Snowpack, Snow Water Equivalence, and Overall Water Supply
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 usable, manageable water supply is projected to decline in the Upper Rio Grande, where supplies over the course of the 21st century are projected to decrease by about one-fourth in the Colorado portion of the basin and by about one-third in the New Mexico portion (USBR 2016). The Rio Grande at El Paso observed flows for 2001 through 2010 that were about 23% lower than the period from 1941 through 2000 (Chavarria & Gutzler 2018). 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 (Chavarria & Gutzler 2018). Reservoir evaporation

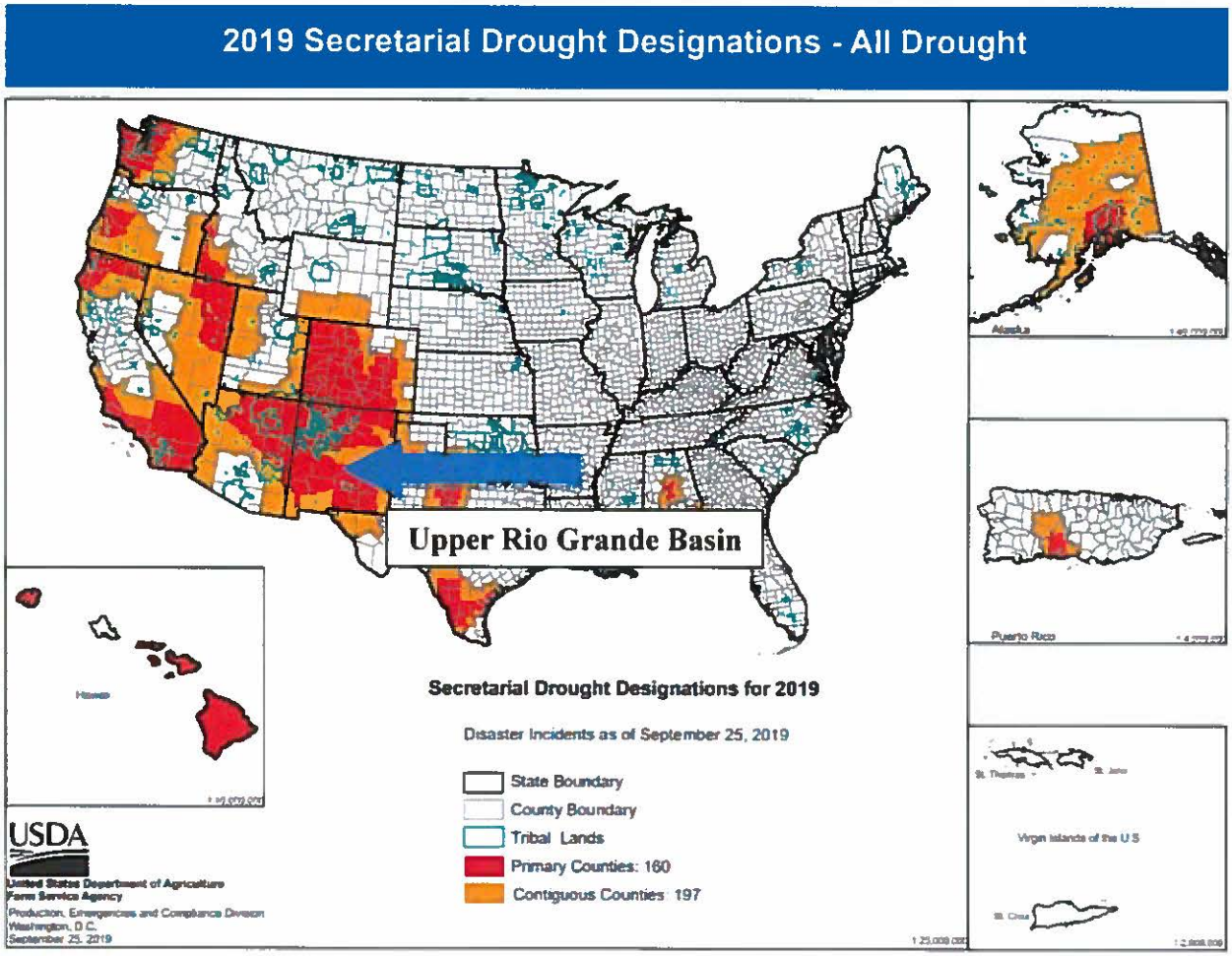
at Elephant Butte Reservoir, the reservoir with the highest evaporative losses in the Upper Rio Grande Basin, is projected to increase by up to 10 percent as a result of projected increases in temperature. Decreasing runoff and streamflow also threaten Mexican irrigation, and food production, and Treaty-obligated deliveries to the Rio Grande (USBR 2016).

In order to sustain the local agricultural economy and population growth, 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 entire Upper Rio Grande Basin has received drought designations by the USDA, including El Paso County.

Figure 7 – 2019 Secretarial Drought Designations – September 25, 2019

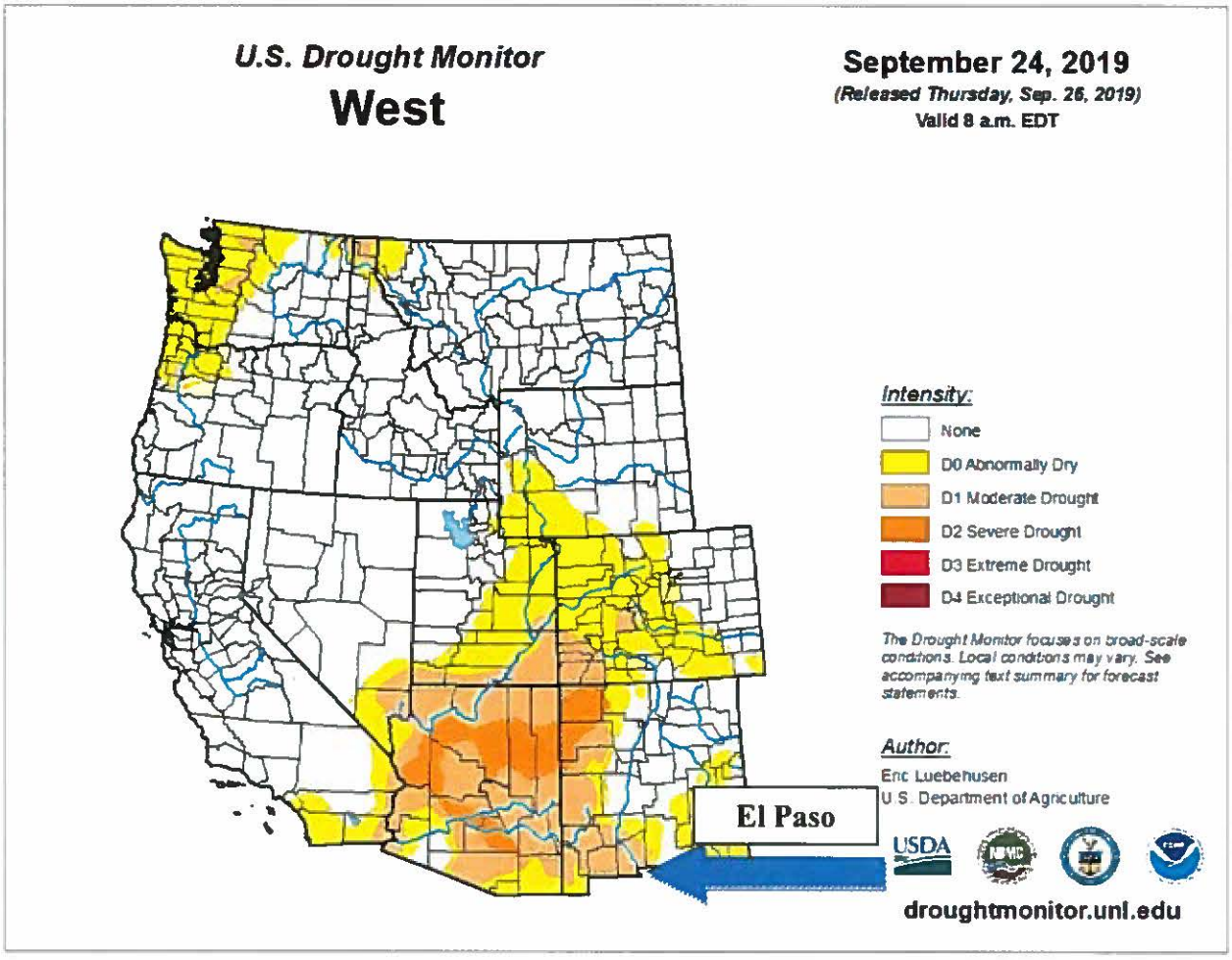


Economic activity in other sectors can also be impacted by water shortages. According to the 2014 Southern New Mexico and El Paso Joint Land Use Study (JLUS 2015), water source diversification efforts have allowed Fort Bliss to augment its water supplies by purchasing water and developing emergency interconnections 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).

Continuing Drought Patterns

The headwaters and the lower Rio Grande Basin south of Elephant Butte Reservoir are experiencing abnormal to moderate drought conditions as of September 24, 2019.

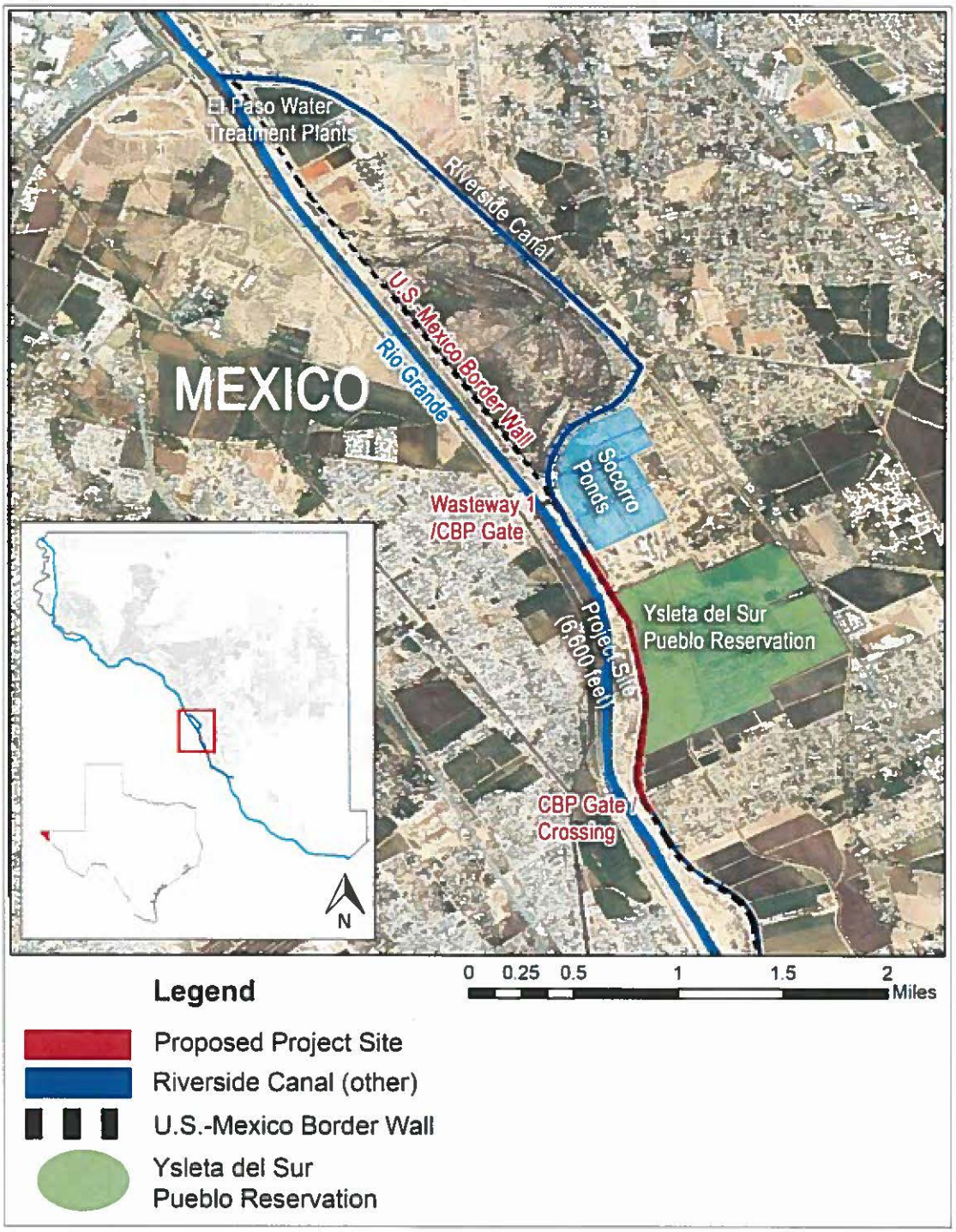
Figure 8 – U.S. Drought Monitor for the West – September 24, 2019



III PROJECT LOCATION

The Riverside Canal Concrete Lining Project – Phase 3 is located in El Paso County, Texas, along the Rio Grande and the U.S.-Mexico Border. The project linear length begins at latitude *31°37'26.3"N* and longitude *106°18'11.9"W (31.626228, -106.304655)* and ends at latitude *31°36'29.3"N* and longitude *106°18'00.2"W (31.607897, -106.299910)*. A project site map can be referenced in Figure 9.

Figure 9 – 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 Riverside Canal is a major water conveyance channel serving the District's Units 8B and 9B. The estimated total water volume conveyed in a full allocation year at the Riverside Canal can reach 130,000 acre feet. Water losses at the Riverside Canal are lost primarily by seepage and evaporation. The proposed project will conserve water currently lost to seepage by concrete lining 6,600 feet of the earthen canal and reduce evaporation losses by reducing the cross-sectional width of the channel.

The estimated project completion schedule assumes that funds will be available for reimbursement by June of 2021 or earlier. Concrete lining construction will have to be performed outside of the irrigation season (normally from October to March of any given year).

Task 1: Environmental and Regulatory Compliance (June 2021-September 2021)
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 Texas Historical Commission (THC) to meet historical and cultural compliance requirements
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

Expected Deliverables: [1] Categorical Exclusion (CEC), [2] THC Compliance Report

Task 2: Concrete Lining Construction (October 2021 – March 2024)
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 Bidding and purchasing of materials
3.3 Performing field engineering work, including construction surveying, geotechnical construction testing, and quality assurance and quality control monitoring
3.4 Performing earth work, including fleet mobilization, excavation, dirt hauling, soil compaction, grading, and alignment
3.5 Installing geofabric liner, steel formwork, and expansion joints, and spraying and curing shotcrete, performing final grading, and fleet demobilization

Expected Deliverables: [1] Seepage test data, [2] geotechnical soil density test and [3] concrete test data, [4] summary of bid proposals received for supplies and materials, and construction records for [5] equipment use and [6] labor

Task 3: Reporting and Grant Administration (June 2021 – April 2024)

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:

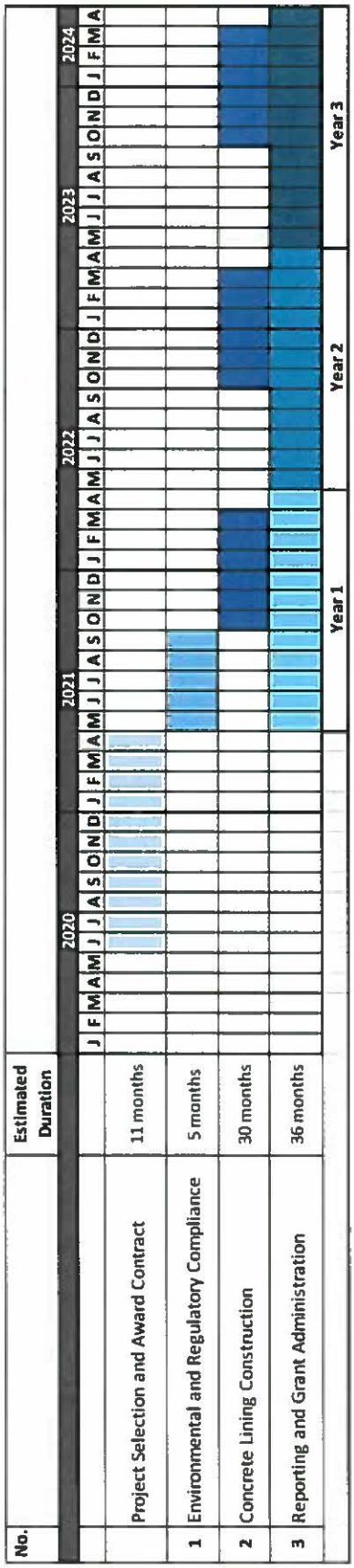
5.1 Developing SF-425 Federal Financial Reports on a semi-annual basis and a final financial performance report as specified in Section F.3.1. of the FY2020 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation

5.2 Developing Interim Performance Reports as specified in Section F.3.2. of the FY2020 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 FY2020 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation

5.4 Completing project closing requirements as specified in a resulting contract with Reclamation

B. Figure 10 - 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 3,675 acre-feet of water per irrigation year (February 15 to October 15) 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 primarily lost to seepage and evaporation.

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

The District performed a hydrostatic test on approximately the first 2.25 miles of the Riverside Canal up to the Partidor Check in 1988. This area is located approximately 7,000 feet upstream from the proposed project site. The results of the test indicated that approximately 3,000 acre-feet of water can be conserved annually as a result of concrete lining a mile of the Riverside Canal. The proposed section of the Riverside Canal is similar in size and capacity to the canal section where the seepage test was performed. Measurements are shown in the report titled *Salvage of Water in El Paso County Water Improvement District No. 1 Canal System* in Appendix D.

Riverside Project Annual Acre-feet Savings per Mile Equation

$$4.21 \text{ cfs} \left| \frac{60 \text{ sec}}{\text{min}} \right| \frac{60 \text{ min}}{\text{hr}} \left| \frac{24 \text{ hr}}{\text{day}} \right| \frac{30 \text{ day}}{\text{mo}} \left| \frac{12\text{mo}}{\text{yr}} \right| \frac{5280 \text{ ft}}{1 \text{ mile}} \Bigg| = 3{,}047.75 \text{ af/mile/yr}$$

Water savings estimates were rounded down for ease of use. These estimates are consistent with estimates used in the preparation of the 2009 Finding of No Significant Impact (FONSI) and Final Environmental Assessment for the Riverside Canal Improvement Project by Reclamation, which covers the aforementioned upstream section of the Riverside Canal. A section of the FONSI and Final Environmental Assessment can be referenced in Appendix D.

These water loss estimates are also consistent with historical inflow-outflow measurements in studies performed by Reclamation, the United States International Boundary and Water Commission (IBWC), the Texas Water Development Board, and the United States Geological Survey. References to these studies are shown in Appendix D.

*(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 3,675 acre-feet of water per mile per irrigation year (February 15 to October 15) are lost due to seepage at the Riverside Canal during a full allocation year (4 acre-feet per acre allocation). The following calculations are used to determine annual water savings for the proposed project:

Table 2 – Water Conservation Calculations – Seepage on a Full Allocation (4 af/acre)

Existing Condition Losses (per irrigation year) – Earthen-Lined Canal							
	Seepage	1.25	miles	@	3000	ac-ft/mile/yr	3,750.00 ac-ft
Proposed Condition Losses (per irrigation year) – Concrete-Lined Canal							
	Seepage	1.25	miles	@	60	ac-ft/mile/yr	75 ac-ft
Total Water Conserved (per irrigation year)							**3,675.00 ac-ft**

b) How have average annual canal seepage losses been determined?

The seepage losses in the proposed project will be reduced by 3,675 acre feet of water per irrigation year by concrete lining 1.25 miles of earthen lined canal. Although concrete lining provides excellent hydraulic properties, it is estimated that 75 acre-feet of water per year will be lost due to seepage in the project area. As previously stated, the estimated average annual water savings were determined by previous hydrostatic testing on sections of the Riverside Canal located upstream from the proposed project length and can be referenced in Appendix D.

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 District currently has 4 telemetry sites at the 3-mile section of the Riverside Canal from the start of the Riverside Canal up to Waste Way 1. These sites are located only in canal sections that have been previously concrete lined. Currently, it is possible to roughly estimate transit losses by comparing meter readings from one site to a second site. It is estimated that 60 acre-feet of water per mile per year are lost to seepage in concrete-lined sections of the Riverside Canal based on observations of meter readings, which were generally below 0.1 cubic feet per second (cfs) per mile. The estimated average post-project seepage losses are 0.08 cfs per mile and the following formula was used to determine post-project seepage losses for the proposed project:

0.08 cfs/mile = ~0.159 acre-feet/day/mile → 0.159 * 365 (year) = 58.04 acre feet/year/mile

Estimated seepage losses were rounded up to 60 acre-feet per mile per year for ease of use.

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:
3000 acre-feet per mile per year * 1.25 miles (project length) = 3,750 acre-feet per year

Future Annual Transit Loss:
3,750 acre-feet per year (current losses) - 75 acre-feet per year (post-lining losses)
=3,675 acre-feet per year

How will actual canal loss seepage reductions be verified?
A seepage test will be performed as part of the proposed project. This data will then be analyzed and compared to evaluate the provided water loss estimates. Results will be included in the final project report submitted to Reclamation.

e) 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.

Bid Specifications for Reinforced Concrete for Shotcrete Application
(Used in Contracts No. R18AP00193 and R18AP00261 with Reclamation)

Concrete batching and delivery shall meet requirements and specifications ASTM C94 and ACI304R as applicable, and the following specifications:

a. Application: Pumpable mix for shotcrete application of 2 or more inches of canal pavement
b. Cement: 7 sack minimum Type I/II low alkali cement content per cubic yard
c. Fly Ash: Class F fly ash content of 20% to 30% per cubic yard
d. Specified Strength: 4,000 PSI at 28 days
e. Fiber: 3 lbs per yard of 3/4" fibrillated polypropylene fiber
f. Superplasticizer: 1 to 2%
g. Application: Pumpable mix for shotcrete application to include super plasticizer
h. Air Entrainment: 6% air plus or minus 1.5%
i. Slump: Maximum of 5 inch and determined at the time of pour
j. Final mix design to be submitted to the engineer for approval 48 hours prior to delivery

The proposed project will reconstruct a 6,600-foot section of the Riverside Canal using similar materials and construction techniques used in Contract No. R18AP100193 in 2018 with Reclamation, which called for concrete lining 7,190 feet of the Riverside Canal upstream from the proposed project site. Construction work involves the movement and compaction of approximately 390,000 cubic yards of canal bank and sealing 6,600 feet with a 4-5 inch layer of shotcrete reinforced by steel panel framework.

The District also used this construction approach in previous concrete lining projects at the Franklin Canal in 2017, 2018, and 2019 as part of transportation enhancement projects. The projects were performed in collaboration with the Texas Department of Transportation (TXDOT) and have a life expectancy of 50 years (see Figure 11). The District has since adopted this construction technique in concrete lining projects where it is cost-effective.

Figure 11 – Steel Panel Framework Reinforcement used at the Franklin Canal in 2019

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 and Climate Change
As stated previously 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, 2017, and 2019 experiencing average or above average spring runoff. The usable, manageable water supply is projected to decline in the Upper Rio Grande, where supplies over the course of the 21st century are projected to decrease by about about one-third (USBR 2016). 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.

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).

Increased Municipal Water Demand in Ciudad Juarez, Mexico
As stated previously in Section II.E, increased water demand in Ciudad Juarez, Mexico resulting from population growth will require increases in groundwater extractions from the Hueco Bolson aquifer, from which the City of El Paso sources up to 61% of its water supply. JMAS, Ciudad Juarez's water utility, has plans to develop surface water treatment plants to treat Rio Grande Project water to meet growing water demand (JMAS 2013). Significant collaboration and conservation investments are needed in both nations to address current and future challenges facing the region's limited water supplies.

- ***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.

- ***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 (3,675 acre-feet per irrigation year) 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, 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 will advance the development of an existing 300-acre ponding site that is located along the Riverside Canal. The "Socorro Ponds" are a planned regulating reservoir included in the 2017 Texas State Water Plan (Water Management Strategy E-21). The development of the Socorro Ponds Regulating Reservoir is a planned collaborative project between the District and El Paso Water Utilities (EPWU) to jointly utilize available and possibly new water diversion collection features. The Socorro Ponds can be used for the collection and temporary storage and distribution of a combination of agricultural drain waters, treated water, stormwater runoff, and overflow of surface Rio Grande Project water. The District owns and jointly operates portions of the drainage system with EPWU that captures much of the stormwater within the boundaries of the City of El Paso. The combination of these water sources can amount to as much as 20,000 acre-feet per year (EPWU 2008), which could be divided mutually between the District and EPWU for agricultural, municipal, and other shared uses.

The District's portion of such collected and stored water is hydraulically dependent on a release structure located within the proposed project length, as shown in Figure 13. An intake structure was constructed at the Partidor Check Structure as part of a project funded by Reclamation in 2010 (Contract No. R09AC62396) that would allow the filling of the regulating reservoir using gravity flow. The proposed project includes the channel level grading necessary to use existing water release infrastructure to operate the reservoir in the near future, as shown in Figure 12.

Figure 12 – Existing Release Structure at the Riverside Canal

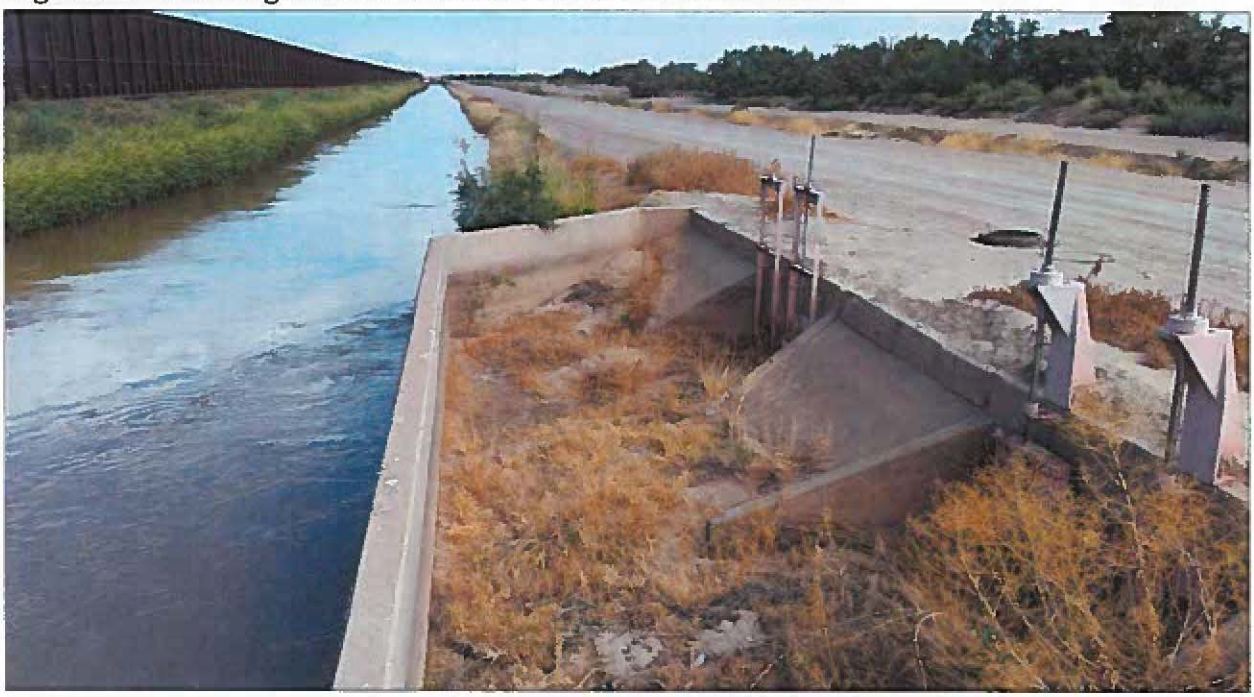
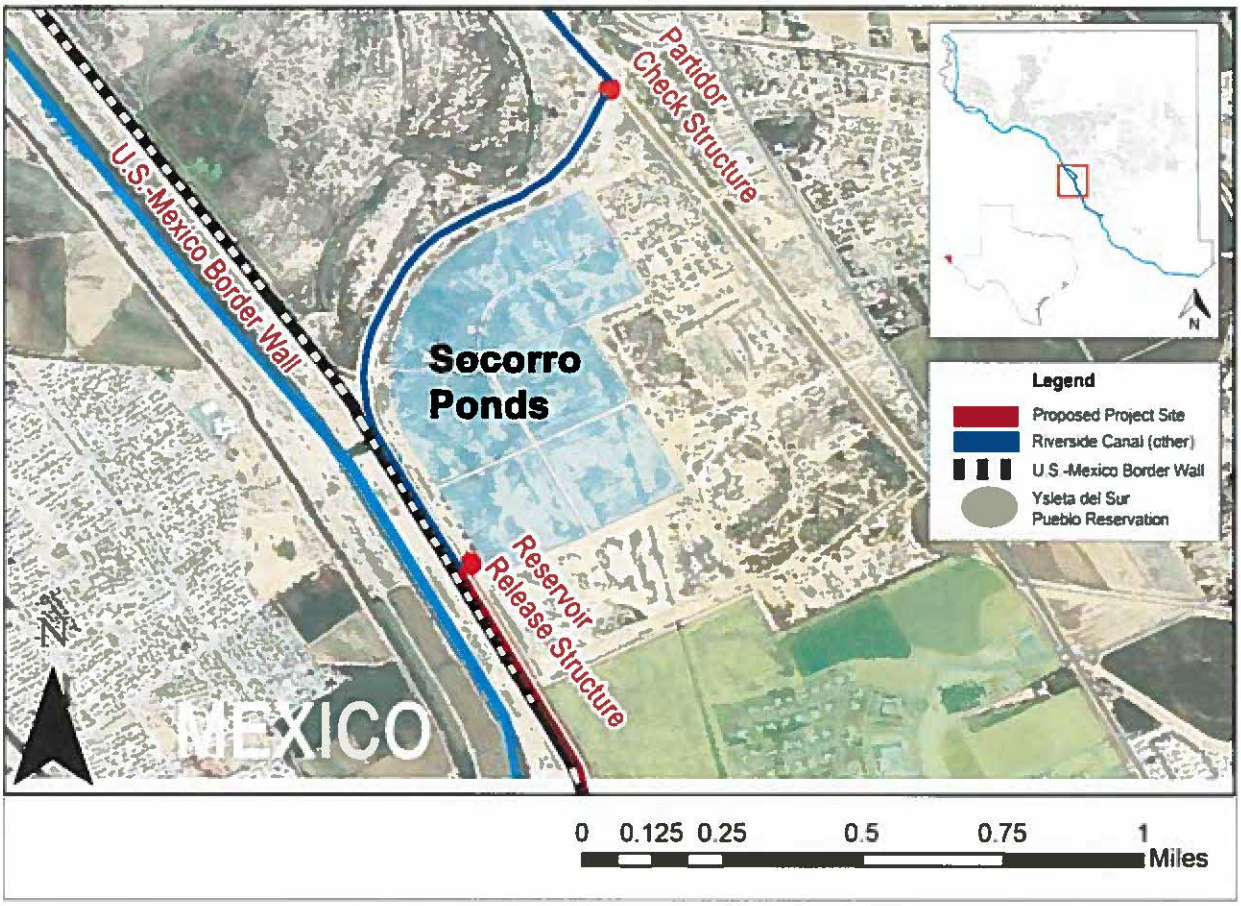


Figure 13 – Future Site of the Socorro Ponds Regulating Reservoir



- ***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*. The District met with representatives of the Ysleta del Sur Pueblo on September 12, 2019 to review the proposed project. **A letter of support was requested from the Ysleta del Sur Pueblo but was not received in time for the submission of this proposal. The District will mail the letter separately if received before the deadline established in the FY2020 FOA or at the request of Reclamation if received past the deadline.** Additional details on how the project benefits agricultural operations at the Ysleta del Sur Pueblo Reservation is explained further in this document in Section D. Additional details on how the proposed project does not adversely impact the Ysleta del Sur Pueblo reservation or ceremonial processions is explained further in Section G.

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

The proposed project will improve water reliability in an area impacted by prolonged drought conditions. According to the *August 2019 StatsAmerica Distress Criteria Statistical Report* by the U.S. Economic Development Administration (EDA), the City of Socorro is considered economically disadvantaged. The Median Household Income is $33,464, which is 58% lower

than the U.S. average. The poverty rate stands at 29.1% (compared to 14.6% in the U.S.). The area is rural but rapidly urbanizing and the economy still benefits from agricultural revenues. A letter of support from the City of Socorro is available for reference in Appendix B.

- ***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 proposed project will increase water delivery efficiency and reduce maintenance costs for water users that receive water via the Riverside Canal, including the Ysleta del Sur Pueblo tribe.. 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. For this reason, the proposed project is also 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)
- Congressman Will Hurd (USTX-23)
- Texas Water Development Board
- City of Socorro, Texas

- ***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, 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.

The proposed project will also bring benefits to U.S. Customs and Border Protection (CBP) operations at the U.S.-Mexico border, which are further described in a section found later in this document.

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

The successful implementation of the Riverside Canal Concrete Lining Project – Phase 3, as proposed, will support the combined efforts of the District and El Paso Water Utilities (EPWU) to diversify the local water supply while improving efficiency and flexibility during water shortages. As previously stated, the proposed project will advance the development of the Socorro Ponds Regulating Reservoir, a planned collaborative project between the District and EPWU to jointly utilize available and possibly new water diversion collection features.

In fiscal year 2015, Reclamation awarded EPWU with funding to perform a feasibility study under the WaterSMART Title XVI, Water Reclamation and Reuse Program (FOA No. R14AS00030) titled *Collection, Storage, Recharge, and Recovery Source Waters for Advanced Purified Treatment (APT) of Reclaimed Water*. Part of the study focused on developing the Socorro Ponds Regulating Reservoir with the possibility of pumping water from the ponds for treatment. In 2019, Reclamation awarded $3.5 million to EPWU as part of Title XVI Water Reclamation and Reuse program to complete a pilot and final design work necessary to construct an advanced water purification facility at the same site.

- ***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?
Sections of the U.S.-Mexico Border Wall are constructed on the banks of the Riverside Canal. Figure 14 illustrates the typical placement of the U.S.-Mexico Border Wall with respect to the Riverside Canal. The proposed project will improve the continued reliability of the canal system, stabilize infrastructure build on the canal banks, and enhance the flexibility of U.S. Customs and Border Protection (CBP) to operate along the Riverside Canal. CBP already uses the banks of canals to access areas along the U.S.-Mexico border that are blocked off due to existing infrastructure and natural features. The proposed project would narrow the cross-sectional width of the Riverside Canal, increasing the size of the banks where CBP could operate motor vehicles, reinforce existing infrastructure, and carry out other activities.

The District reviewed the project with the CBP Officer in Charge of the Ysleta Station and the Officer in Charge of the Clint Station in September 17, 2019, and the El Paso District Special Projects Officer in September 19, 2019 in an effort to accommodate access and use requests. Accommodations recommended by CBP included wider and more stable access roads for CBP and emergency response vehicles and the ability to access the channel for rescue operations (via ingress and egress points normally used for sediment cleanup). Additionally, concrete lining will reduce vegetation growth, which will also reduce CBP's maintenance costs to clear vegetation growing on the bank of the Riverside Canal on which the U.S.-Mexico Border Wall was constructed. **A letter of support was requested from CBP to include along with this proposal but was not received in time for the submission of this application. The District will mail**

the letter separately if received before the deadline established in the FY2020 FOA or at the request of Reclamation if received past the deadline.

The District has a history of collaboration with CBP and has previously completed shared-infrastructure improvements along the U.S.-Mexico border and at ports of entry. Currently, the District is working with CBP for the lining of 1,040 feet of the Riverside Canal located immediately upstream from the proposed project length and is also adjacent to the U.S.-Mexico Border Wall (part of Contract no. R18AP00193 with Reclamation). Also, the District is currently reconstructing the Riverside Canal Wasteway II in collaboration with the U.S. Section of the International Boundary and Water Commission. Figure 15 below illustrates part of the engineering drawings for Wasteway II that include a gravel access road that will facilitate the operation of a CBP entry gate at the U.S.-Mexico Border Wall.

Figure 14 – Riverside Canal and the U.S.-Mexico Border Wall

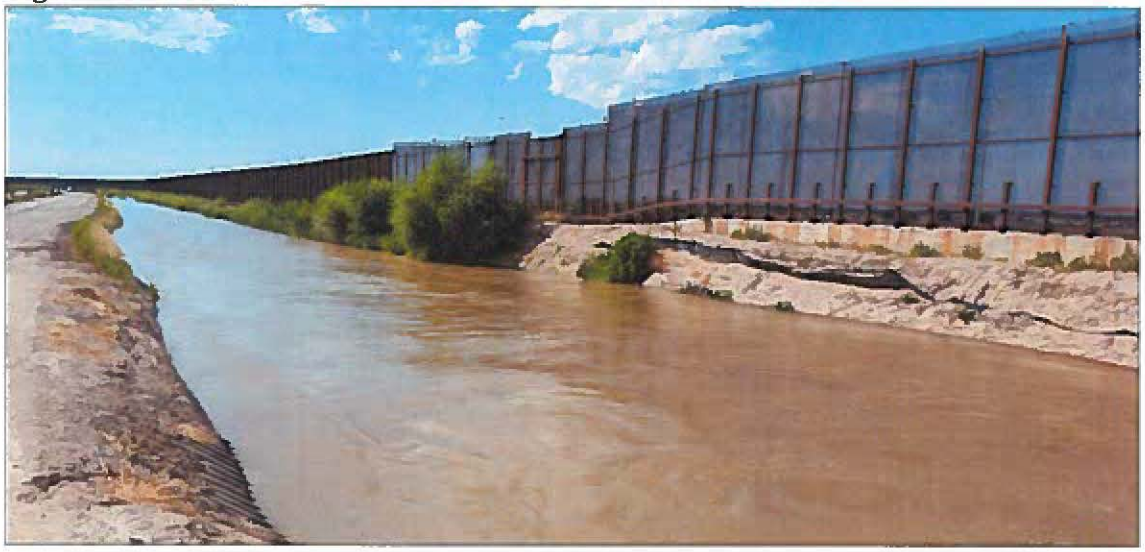


Figure 15 – Design Drawings (p5 of 25) for Riverside Canal Wasteway II

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) 2020 El Paso District Priorities include practices that can enhance water availability and efficient irrigation systems.

Cropland Priority 1	**Excess/Insufficient Water - Inefficient use of irrigation water**
Irrigated Cropland Priority 1	**Excess/Insufficient Water - Inefficient use of irrigation water**

The proposed project advances NRCS priorities by conserving water and improving efficiency. In addition to conserving water, the proposed project will reduce sediment levels and decrease maintenance costs for agricultural acreage that receives water via the Riverside Canal. In August of 2019, the District informed the office of the local NRCS District Conservationist of the proposed canal lining project and recommended approaching the Ysleta del Sur Pueblo to consider expanding their previous NRCS EQIP project. 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.

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

Figures 16 and 17 below illustrate part of the agricultural operations of the Ysleta del Sur Pueblo. Figure 16 shows an irrigation ditch where Rio Grande Project water is blended with groundwater from a well. A high tunnel and other structures at this site were constructed using NRCS EQIP funding (USDA NRCS 2015a; USDA NRCS 2015b; USDA NRCS 2015c).

- ***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 August of 2019, the District informed the office of the local NRCS District Conservationist of the proposed canal lining project and recommended approaching the Ysleta del Sur Pueblo and other farmers serviced by the Riverside Canal to consider expanding their recent NRCS EQIP project.

- ***Will the proposed WaterSMART project directly facilitate the on-farm improvement?***

In addition to conserving water, the proposed project will reduce sediment levels, thereby decreasing maintenance costs for farms that receive water via the Riverside Canal, including the Ysleta del Sur Pueblo. As previously stated, 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. These

types of improvements may not be currently feasible due to sediment levels at the Riverside Canal, as sediment can affect the accuracy of meter sensors and cause rapid wear and tear.

Figure 16 – Agricultural Operations of YDSP as seen from Riverside Intercepting Drain

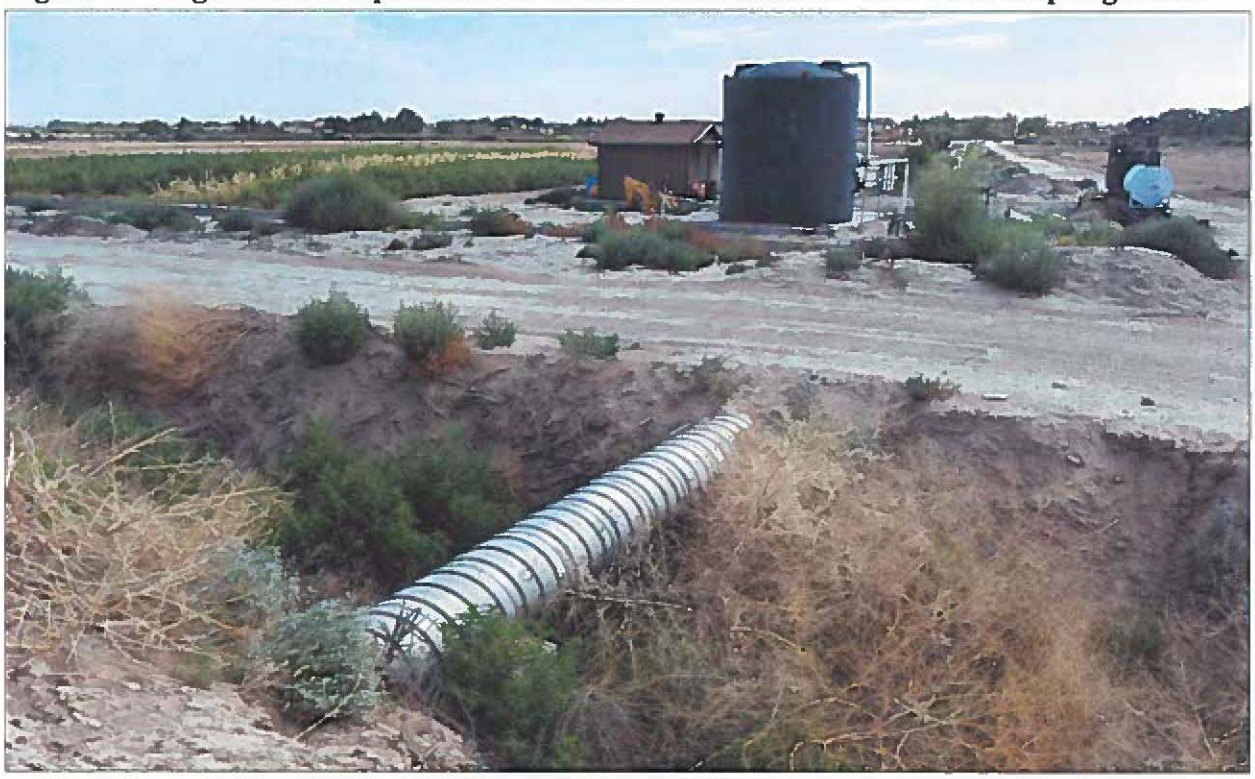


Figure 17 – Agricultural Operations of YDSP as seen from Riverside Canal Banks

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

The proposed project advances NRCS priorities by conserving water and improving efficiency. 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, City Council, Board of Trustees), informing leadership of any resulting awards from funding agencies such as Reclamation, 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 political subdivisions and elected officials supporting the proposed project of the

multiple projects funded by Reclamation in 2018 and 2019 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 implementation of the Riverside Canal Concrete Lining Project – Phase 3 will support the combined efforts of the District and El Paso Water Utilities to diversify the local water supply, including the development of the Socorro Ponds Regulating Reservoir and the use of the reservoir for the storage of treated wastewater from the Roberto R. Bustamante Wastewater Treatment Plant (WWTP). Approximately 27,000 acre-feet of water per year of treated wastewater is currently used for irrigation purposes and is blended with Rio Grande Project water during the irrigation season.

The Roberto R. Bustamante WWTP was designed for a treatment capacity of 39 MGD in 1991. The Texas Commission on Environmental Quality (TCEQ) requires the planning of an extension of a WWTP once 75% of the plant's capacity is exceeded for three consecutive months. The Bustamante WWTP flows were close to exceeding this limit in the summer of 2019, prompting the start of an expansion in August of 2019 (EPWU 2019). The need to increase wastewater treatment capacity is due in part by residential and commercial development in the El Paso Lower Valley, which is serviced by the Bustamante WWTP.

The proposed project site is located approximately 3.75 miles from the El Paso Ysleta Port of Entry. 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). Northwest of the proposed project site and the Socorro Ponds Regulating Reservoir is the Riverside Industrial Park, which provides supporting infrastructure, warehousing, and industrial space for international trade with Mexico. An expansion to the El Paso Ysleta Port of Entry and a planned expansion of the Riverside Industrial Park resulting from the implementation of Unified Cargo Processing (UCP) between U.S. Customs and Border Protection and Mexico's Tax Administration Service (CBP 2018) is expected to increase the need for additional water and wastewater treatment capacity in the area.

5. Modernizing our infrastructure

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

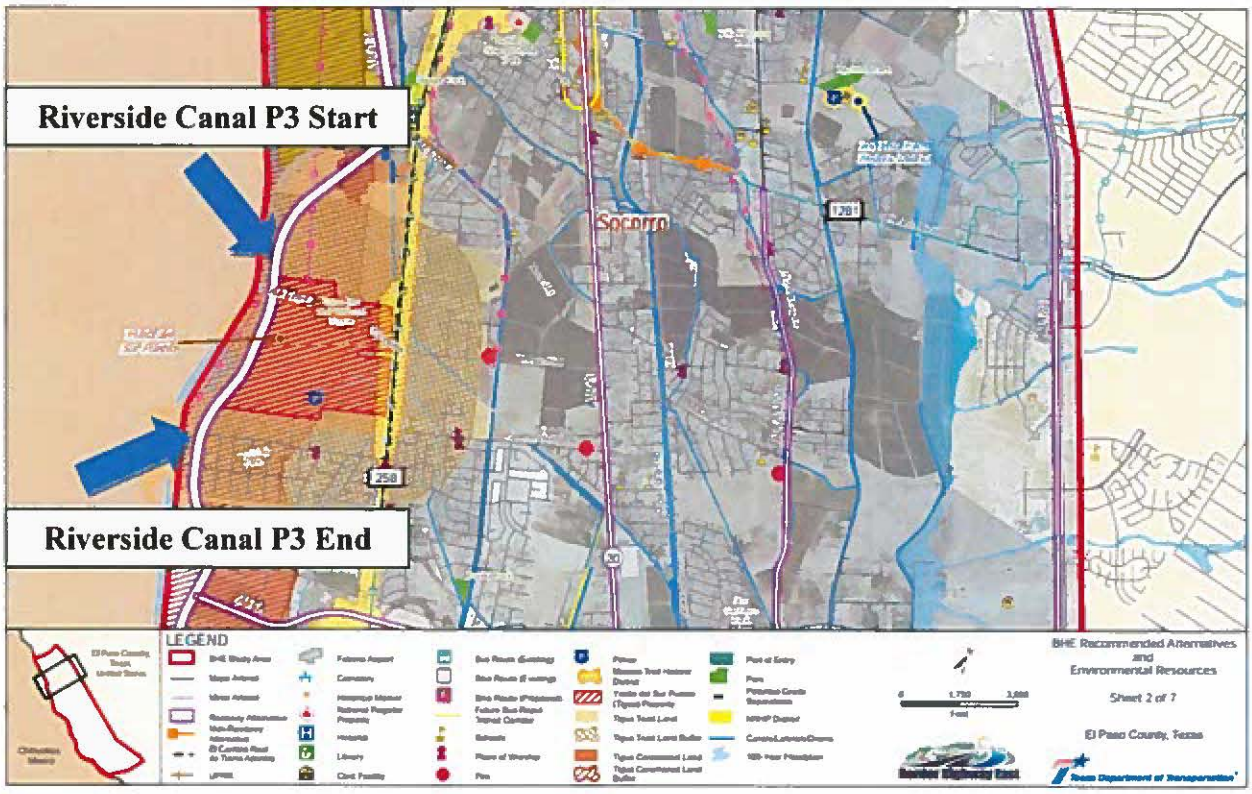
The successful completion of the proposed project will facilitate the future development of the Border Highway East, a project that is expected to be funded and constructed by the Texas Department of Transportation (TXDOT). Many major transportation projects in Texas are financed by toll revenue backed by private investments. Recent local toll projects include a lane expansion in the Texas 375 Loop and the construction of the new Border West Expressway. According to the El Paso Metropolitan Planning Organization's Destino 2045 Metropolitan

Transportation Plan Transportation Conformity Report (El Paso MPO 2018), $50 million in toll revenue is expected to be generated from the first 10 years of operation of the Border West Expressway.

The District previously supported road infrastructure expansions, including Texas 375 Loop in Downtown El Paso which required the piping and concrete lining of sections of the Franklin Canal. The successful completion of the proposed project will likewise facilitate the development of the Border Highway East by reducing the width of the Riverside Canal, enhancing the durability of canal banks, and reducing operational and maintenance activities.

The construction of the 4-lane Border Highway East is projected to begin in 2028 with a total cost of $711.6 million, and will likely require right-of-way access at the Riverside Intercepting Drain and at the section of the Riverside Canal currently being proposed for lining improvements (El Paso MPO 2018). A reference map of phase 2 of the Border Highway East project is shown in Figure 18.

Figure 18 – Planned Route for the Border Highway East (TXDOT 2014)



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.*

The District Board of Directors approved an update to the District's Water Conservation Plan (WCP) in 2019 and the WCP is available for reference at https://www.epcwid1.org. The WCP incorporates findings from an internal System Optimization Review (SOR) and prioritizes conservation and efficiency projects.

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 Riverside Canal is a planned conservation and efficiency improvement included in the District's 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 3 – Select Water Conservation Projects Prioritized in Internal SOR

Project	Date Start	Date End	Estimated Costs ($)	*ac-ft/yr	Status
Riverside Canal Lining Phase 1A	2014	2016	$612,000	758	Completed
Riverside Canal Lining Phase 2	2019	2022	$2,000,000	4,087	In Progress
Riverside Canal Lining Phase 1B	2015	2016	$550,000	621	Completed
Riverside Canal Lining Phase 3	**2020**	**2023**	**$2,039,504**	**3,675**	**Funding Req.**
Riverside Canal Lining Phase 4	2021	2024	$6,600,000	12,259	Engineering
Franklin Canal Lining (multiple)	2017	2020	$4,223,316	874	In Progress
Franklin Feeder Lining Project Phase 2	2019	2021	$1,113,360	376	In Progress
La Union East Lining	2019	2022	$925,298	231	In Progress
Telemetry / Well Meter / GIS Upgrades	2018	2021	$275,000	120	In Progress

*Water conservation estimates may vary by year, use, allocation, 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 state-approved 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 Texas Water Development Board with additional details 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).
The engineering design and pre-environmental work for the proposed project was funded by the TWDB as part of their 2018 Agricultural Water Conservation Grants program. The project was selected based on its water conservation potential, expected return on conservation investment, and overall contribution to WMS E-45. Concrete lining the Riverside 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.

The initial cost per acre-foot is $554.97. The following calculations were used to determine initial cost per acre-foot:

$2,039,504 / 3,675 AF = 585.0881 $/AF → 554.97 $/AF

The proposed improvements have a return on conservation investment cost of $11.10 per acre-foot of water conserved. The following calculations were used to determine return on conservation investment:

3,675 AF/Y *50 years = 183,750 AF →
$2,039,504 / 183,750 AF = 11.0993 $/AF → 11.10 $/AF

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.

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 3 major tasks and key milestones are outlined below:

Table 4 – Estimated Project Task Schedule

Task	Estimated Start Date	Estimated End Date
1. Environmental and Regulatory Compliance	**May 2021**	**Sept 2021**
1.1 Categorical Exclusion Checklist (USBR)	May 2021	Sept 2021
1.2 Cultural Compliance (Texas Historical Commission)	May 2021	Sept 2021
2. Concrete Lining Construction	**Oct 2021**	**May 2024**
2.1 Materials procurement	Oct 2021	Dec 2024
2.2 Field engineering and site environmental compliance (TCEQ)	Oct 2021	May 2024
2.3 Equipment fleet mobilization	Oct 2021	Oct 2024
2.4 Dirt hauling and fill compaction	Oct 2021	Dec 2024
2.5 Concrete lining construction and testing	Oct 2021	Dec 2024
2.6 Fleet demobilization	April 2024	April 2024
3. Grant Administration and Project Closing	**May 2021**	**April 2024**
2.1 Performance and Financial (SF-425) Interim Reporting	May 2021	Oct 2024
2.2 Final report and project closing	Feb 2021	April 2024

[1] Environmental and regulatory compliance work is expected to begin in May of 2021. 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 the Texas Historical Commission to ensure cultural and historical compliance requirements are met. Additional information about cultural and historical resource compliance necessary for the proposed project is available in Section VII Environmental and Cultural Compliance.

[2] All construction work will begin at the end of the irrigation season, which is normally from October 15 to April 15. It is expected that construction work will begin on October of 2021. 18 months are allocated to for construction between irrigation seasons across the 3-year project performance period. If awarded, the District stands ready to begin construction upon receiving notification to proceed.

[3] 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 April of 2021 or earlier. Periodic and final reporting work will be performed throughout the project and all reporting will be completed by April of 2024 or earlier.

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

The project activities will be confined to the District's right-of-way and property. No 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.***

Survey, engineering design, and preliminary environmental work was completed as part of a grant-awarded project by the Texas Water Development Board (TWDB) 2018 Agricultural Water Conservation Grant program. A letter of support from the TWDB is included in Appendix B with additional details.

The Riverside Canal is a trapezoidal canal with a flow capacity of 700 cubic feet per second. Once concrete lined, the Riverside Canal will have a 45- to 60-foot cross-section, 1:1.5 bank slopes, and varying depth. A summary of completed engineering design specifications are included in Attachment C. The full set of engineering drawings are available upon request from the District.

- ***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 August 8, 2020 with staff from Reclamation's Albuquerque Area Office and site visits from staff from the El Paso Field Office. Reclamation staff indicated that 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*.

The District met with representatives of the Ysleta del Sur Pueblo on September 12, 2019 to review the proposed project. **A letter of support was requested from the Ysleta del Sur Pueblo but was not received in time for the submission of this proposal. The District will mail the letter separately if received before the deadline established in the FY2020 FOA or at the request of Reclamation if received past the deadline.** There are no anticipated limits to access to and ceremonial use of Indian sacred sites or adverse impacts to tribal lands. The proposed concrete lining work will not impact the District's existing agreement with the Ysleta del Sur Pueblo and the Kickapoo Traditional Tribe of Texas (from Eagle Pass, Texas) allowing the harvesting of native plants from the Rio Grande growing in the District drain system. A statement summarizing the agreement is available for reference in Appendix B.

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

Non-Federal Funding	$1,039,504	=	51 %
Federal Funding	$1,000,000	=	49 %
Total Project Cost	$2,039,504		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 51% cost share for the project. The District's funding commitment was established via Resolution from the District Board of Directors and 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 and are similar in scope to the proposed section of the Riverside Canal. Specifically, rates and estimates used in Contract No. R18AP100193 with Reclamation are used as a basis for cost estimates.

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.

As previously stated, engineering and design work for the proposed project was funded in part by the Texas Water Development Board (TWDB) for an 8-mile section of the Riverside Canal in FY2018 and the grant project will be closed in early 2020 (before an award contract with Reclamation is completed). The total cost of the design project was $100,000. The proposed project length encompasses only 15.6% of the full length of the design work. A part of the funds for the TWDB design grant project were expended before the July 1, 2019 date threshold listed in the FY2020 FOA. For this reason, it is the preference of the District to not include engineering and design costs as pre-award costs for the current proposal with Reclamation.

B. Budget Proposal

Table 5. Total Project Cost Table

FUNDING SOURCES	AMOUNT
Cost to be reimbursed with the requested Federal funding	$ 1,000,000
Cost to be paid by the applicant (EPCWID#1)	$ 1,039,504
Value of third party contributions	$ -
TOTAL PROJECT COSTS	**$ 2,039,504**

Table 5. - Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	EPCWID1 Funding	Reclamation Funding	TOTAL COST
	$/unit	Quantity				
Salaries and Wages						
Maintenance Manager	$57.86 /hour	400	Labor	$ 23,144	$ -	$ 23,144
Maintenance Supervisor	$30.06 /hour	600	Labor	$ 18,036	$ -	$ 18,036
Maintenance Supervisor	$26.41 /hour	600	Labor	$ 15,846	$ -	$ 15,846
Equipment Operator I / Labor	$13.00 /hour	850	Labor	$ 11,050	$ -	$ 11,050
Equipment Operator II	$18.11 /hour	850	Labor	$ 15,394	$ -	$ 15,394
Equipment Operator III	$19.52 /hour	850	Labor	$ 16,592	$ -	$ 16,592
Equipment Operator III (2)	$20.27 /hour	850	Labor	$ 17,230	$ -	$ 17,230
Warehouse Parts Specialist	$23.57 /hour	180	Labor	$ 4,243	$ -	$ 4,243
Welder	$23.07 /hour	180	Labor	$ 4,153	$ -	$ 4,153
Grant Writer (Administration and Reporting)	$29.86 /hour	400	Labor	$ 11,944	$ -	$ 11,944
					Subtotal	**$ 137,630**
Fringe Benefits (28% rate)						
Maintenance Manager	$16.20 /hour	400	Labor	$ 6,480	$ -	$ 6,480
Maintenance Supervisor	$8.42 /hour	600	Labor	$ 5,050	$ -	$ 5,050
Maintenance Supervisor	$7.39 /hour	600	Labor	$ 4,437	$ -	$ 4,437
Equipment Operator I / Labor	$3.64 /hour	850	Labor	$ 3,094	$ -	$ 3,094
Equipment Operator II	$5.07 /hour	850	Labor	$ 4,310	$ -	$ 4,310
Equipment Operator III	$5.47 /hour	850	Labor	$ 4,646	$ -	$ 4,646
Equipment Operator III (2)	$5.68 /hour	850	Labor	$ 4,824	$ -	$ 4,824
Warehouse Parts Specialist	$6.60 /hour	180	Labor	$ 1,188	$ -	$ 1,188
Welder	$6.46 /hour	180	Labor	$ 1,163	$ -	$ 1,163
Grant Writer (Administration and Reporting)	$8.36 /hour	400	Labor	$ 3,344	$ -	$ 3,344
					Subtotal	**$ 38,536**
Equipment (Rates from 2016 US-ACE USACE EP1110-1-8 District VI Expense Schedule)						
Pickup (5)	$18.16 /hour	3200	Equipment	$ 58,112	$ -	$ 58,112
Dump Truck (4) (12/15 CY)	$28.73 /hour	2600	Equipment	$ 74,698	$ -	$ 74,698
Dump Truck (6) (6 CY)	$22.74 /hour	2600	Equipment	$ 59,124	$ -	$ 59,124
Excavator 1	$44.51 /hour	650	Equipment	$ 28,932	$ -	$ 28,932
Excavator 2	$44.51 /hour	650	Equipment	$ 28,932	$ -	$ 28,932
Excavator 3	$53.91 /hour	650	Equipment	$ 35,042	$ -	$ 35,042
Excavator 4	$53.91 /hour	650	Equipment	$ 35,042	$ -	$ 35,042
Excavator 5	$53.91 /hour	650	Equipment	$ 35,042	$ -	$ 35,042
Welding Rig (2)	$4.82 /hour	1300	Equipment	$ 6,266	$ -	$ 6,266
Dozer	$37.95 /hour	650	Equipment	$ 24,668	$ -	$ 24,668
Grader	$48.77 /hour	650	Equipment	$ 31,701	$ -	$ 31,701
Sheeps Foot Roller	$65.20 /hour	650	Equipment	$ 42,380	$ -	$ 42,380
Water Truck (2)	$41.43 /hour	1300	Equipment	$ 53,859	$ -	$ 53,859
Rubber Tire Excavator	$50.36 /hour	650	Equipment	$ 32,734	$ -	$ 32,734
Steel Roller Compactor	$43.23 /hour	650	Equipment	$ 28,100	$ -	$ 28,100
Loader	$36.72 /hour	650	Equipment	$ 23,868	$ -	$ 23,868
Shotcrete Machine (2)	$20.66 /hour	1300	Equipment	$ 26,858	$ -	$ 26,858
Compressor (2)	$9.69 /hour	1300	Equipment	$ 12,597	$ -	$ 12,597
Telescopic Boom 1	$78.31 /hour	650	Equipment	$ 50,902	$ -	$ 50,902
Telescopic Boom 2	$45.53 /hour	650	Equipment	$ 29,595	$ -	$ 29,595
					Subtotal	**$ 718,447**
Supplies and Materials						
Concrete 4000 psi	$125.00 /cy	5063	cubic yards	$ -	$ 632,875	$ 632,875
Curing Compound	$5.00 /gal	2025	5 gallons	$ -	$ 10,125	$ 10,125
Steel (Tie in and Transitions)	$0.90 /lb	23100	lb/pound	$ 20,790	$ -	$ 20,790
Steel Panel Formwork	$0.90 /sf	396000	square feet	$ 400	$ 356,000	$ 356,400
GeoFabric	$0.15 /sf	396000	square feet	$ 59,400	$ -	$ 59,400
					Subtotal	**$ 1,079,590**
Contractual/Construction						
Field Engineering	$200.00 /hr	70	Hours	$ 14,000	$ -	$ 14,000
Construction Surveying	$120.00 /hr	70	Hours	$ 8,400	$ -	$ 8,400
Construction Services Geotechnical and Lab	$450.00 Test	50	Tests	$ 22,500	$ -	$ 22,500
Construction Services Geotechnical Density	$50.00 Test	100	Tests	$ 5,000	$ -	$ 5,000
QA/QC Monitoring	$120.00 /hr	120	Hours	$ 14,400	$ -	$ 14,400
					Subtotal	**$ 64,300**
Other						
Environmental Compliance	$25.00 /hr	200	Other	$ -	$ 1,000	$ 1,000
					Subtotal	**$ 1,000**
TOTAL ESTIMATED PROJECT COSTS				**$ 1,039,504**	**$ 1,000,000**	**$ 2,039,504**

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, including projects funded by Reclamation. Mr. Rodriguez will be responsible for the oversight of all construction work personnel, project management tasks, planning and coordination, quality control, and cost and equipment use reporting. It is expected that Mr. Rodriguez will contribute 400 hours to the project at a rate of $57.86.

Omar Martinez is the District Grant Writer and will be responsible for project management tasks, planning and coordination, grant reporting and reimbursement, and a series of technical assistance tasks including seepage data collection and analysis, site photography, historical and cultural compliance work, equipment GPS and usage tracking, and site monitoring. Mr. Martinez has experience in managing federal and state grant-funded projects, including projects funded by Reclamation. It is expected that Mr. Martinez will contribute 400 hours to the project at a rate of $29.86.

Project Tasks 3: Concrete Lining Construction
The Maintenance Supervisor will be responsible for project supervision, quality control, safety, operating of equipment, other labor contributions to construction work, and generating cost and use data necessary for reporting. The Maintenance Supervisor will contribute 600 hours to the project at a rate of $30.06.

Maintenance Supervisor (2) will be also responsible for project supervision, quality control, safety, operating of equipment, other labor contributions to construction work, and generating cost and use data necessary for reporting. The Maintenance Supervisor (2) will contribute 600 hours to the project at a rate of $26.41.

The Equipment Operator I will be responsible for the operation of construction equipment and various manual labor tasks necessary for the completion of Task 2 – Concrete Lining Construction. The Equipment Operator I will contribute 850 hours to the project at a rate of $13.00.

The Equipment Operator II will be responsible for the operation of construction equipment and various manual labor tasks necessary for the completion of Task 2 – Concrete Lining Construction. Each Equipment Operator II will contribute 850 hours to the project at a rate of $18.11.

The Equipment Operator III will be responsible for the operation of construction equipment and various manual labor tasks necessary for the completion of Task 2 – Concrete Lining Construction. The Equipment Operator III will contribute 600 hours to the project at a rate of $19.52.

The Equipment Operator III (2) will be responsible for the operation of construction equipment and various manual labor tasks necessary for the completion of Task 2 – Concrete Lining Construction. The Equipment Operator III (2) will contribute 600 hours to the project at a rate of $20.27.

The Warehouse Parts Specialist will be responsible for the distribution and delivery of supplies and material necessary for the completion of Task 2 – Concrete Lining Construction. The Warehouse Parts Specialist will contribute 120 hours to the project at a rate of $23.57.

The Welder will be responsible for metalwork necessary for the completion of Task 2 – Canal Lining. The Welder will contribute 120 hours to the project at a rate of $23.07.

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. A rate of 28% was used to approximate fringe costs.

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 per employee assigned to the project 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 hourly usage time estimates that are based on similar concrete lining projects, and the provided estimates were used in Contracts No. R18AP100193 and R18AP00261 with Reclamation. The proposed usage cost rates are based on 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. There have been no updates to EP1110-1-8 since 2016. Equipment cost rates used in the aforementioned contracts with Reclamation can be referenced in Table 6.

Table 6. Proposed Equipment Rates

EP1110-1-8 Equipment	Category Number	EP1110-1-8 ID No	Horsepower/ Specification	District Vehicle	Year	EP1101-1-8 Rates (average hr)	DEPR	FCCM	Ownership Rate (DEPR+FCCM)	Overage Mult	Adjusted Ownership Rate	(Final) Adjusted Hourly
Pickup (x5)	T50	T50XX004	4x4, 1/2 ton, gas pickup	F-350 / 2500 HD	Varies	$18 16	$3 10	$0 20	$3.30	1	$3.30	$18.16
Dump Truck 1	T50	T50XX032	10-13 CY Dump	2017 PETERBILT 348 T-10 (12/15 YD Dump)	2017	$28 73	$5 50	$0 53	$6.03	1.07	$6.45	$29.15
Dump Truck 2	T50	T50XX032	10-13 CY Dump	2017 PETERBILT 348 T11 (12/15 YD Dump)	2017	$28 73	$5 50	$0 53	$6.03	1.07	$6.45	$29.15
Dump Truck 3	T50	T50XX032	10-13 CY Dump	2001 FREIGHLINER T6 (12/15 YD Dump)	2001	$28 73	$5 50	$0 53	$6.03	0.84	$5.07	$27.77
Dump Truck 4	T50	T50XX032	10-13 CY Dump	2001 STERLING T7 (12/15 TD Dump)	2001	$28 73	$5 50	$0 53	$6.03	0.84	$5.07	$27.77
Dump Truck 5	T40	T40OX002	8 CY Dump Option	2008 FORD F750 6YD DUMP TRUCK T9	2008	$1 84	$1 04	$0 06	$1.10	0.93	$1.02	$1.76
	T50	T50XX025	30,000 GVW Truck			$20 90	$6 71	$0 54	$7.25	0.87	$6.31	$19.96
Dump Truck 6	T40	T40OX002	8 CY Dump Option	2008 FORD F750 6YD DUMP TRUCK T8	2008	$1 84	$1 04	$0 06	$1.10	0.93	$1.02	$1.76
	T50	T50XX025	30,000 GVW Truck			$20 90	$6 71	$0 54	$7.25	0.87	$6.31	$19.96
Dump Truck 7	T40	T40OX002	8 CY Dump Option	2007 FORD F750 6YD DUMP TRUCK T2	2007	$1 84	$1 04	$0 06	$1.10	0.93	$1.02	$1.76
	T50	T50XX025	30,000 GVW Truck			$20 90	$6 71	$0 54	$7.25	0.87	$6.31	$19.96
Dump Truck 8	T40	T40OX002	8 CY Dump Option	2006 F750 6YD DUMP TRUCK T-1	2006	$1 84	$1 04	$0 06	$1.10	0.93	$1.02	$1.76
	T50	T50XX025	30,000 GVW Truck			$20 90	$6 71	$0 54	$7.25	0.87	$6.31	$19.96
Dump Truck 9	T40	T40OX002	8 CY Dump Option	1997 GMC 6YD DUMP TRUCK T-5	1997	$1 84	$1 04	$0 06	$1.10	0.93	$1.02	$1.76
	T50	T50XX025	30,000 GVW Truck			$20 90	$6 71	$0 54	$7.25	0.87	$6.31	$19.96
Dump Truck 10	T40	T40OX002	8 CY Dump Option	1995 GMC 6YD DUMP T-4	1995	$1 84	$1 04	$0 06	$1.10	0.93	$1.02	$1.76
	T50	T50XX025	30,000 GVW Truck			$20 90	$6 71	$0 54	$7.25	0.87	$6.31	$19.96
Excavator 1	H25	H25CA022	153 HP / 1 56 CY bucket	EC210BLR-1 VOLVO EXCAVATOR (159 HP, 1 5yd bucket, long-stick)	2008	$44 51	$16 08	$1 64	$17.72	0.96	$17.01	$43.80
Excavator 2	H25	H25CA022	153 HP / 1 56 CY bucket	EC210BLR-2 VOLVO EXCAVATOR (159 HP, 1 5yd bucket, long-stick	2008	$44 51	$16 08	$1 64	$17.72	0.96	$17.01	$43.80
Excavator 3	H25	H25CA023	Cat 320DL	320DL-EXC CATERPILLAR E-9 (148 HP, 80 CY, long-stick)	2008	$53 91	$21 50	$2 19	$23.69	0.93	$22.03	$52.25
Excavator 4	H25	H25CA023	Cat 320DL	320DL-EXC CATERPILLAR E-10 (148 HP, 80 CY, long-stick)	2008	$53 91	$21 50	$2 19	$23.69	0.93	$22.03	$52.25
Excavator 5	H25	H25CA023	128 HP, 80 CY bucket	320A -EXC CATERPILLAR E-7 (138 HP, 1 CY, long-stick)	2008	$53 91	$21 50	$2 19	$23.69	0.93	$22.03	$52.25
Welding Rig (x2)	W35	W35XX022	(250 amp)	Utility Truck + Ranger 250 GTX (250 amp)	2012	$4 82	$0 56	$0 04	$0.60	1	$0.60	$4.82
Dozer	T15	T15JD007	JD 650K / 101 HP	JOHN DEERE 700K XLT DOZER (97 HP)	2017	$37 95	$11 86	$1 13	$12.99	1.04	$13.51	$38.47
Grader	G15	G15JD010	JD 770G	2009 JD 770D MOTOR GRADER G-6 (160 HP)	2009	$48 77	$15 50	$1 96	$17.46	0.79	$13.79	$45.10
Sheeps Foot Roller	R45	R45CA010	145 HP / D-off	CAT CP563 ROLLER RL-2 (145 HP)	2007	$65 20	$21 61	$1 39	$23.00	0.94	$21.62	$63.82
Water Truck	T50	T50XX029	30,000+ GCW Truck	2007 Freightliner	2007	$35 73	$7 35	$0 72	$8.07	0.84	$6.78	$34.44
	T40	T40RS002	4,000 gal tank	4000 gal Water Tank Add-on	2007	$5 70	$3 17	$0 22	$3.39	0.92	$3.12	$5.43
Water Truck	T50	T50XX029	30,000+ GCW Truck	1995 GMC W2	1995	$35 73	$7 35	$0 72	$8.07	0.84	$6.78	$34.44
	T40	T40RS002	3,000 gal tank	3000 gal Water Tank Add-on	1995	$5 70	$3 17	$0 22	$3.39	0.92	$3.12	$5.43
Rubber Tire Excavator	H30	H30CA001	141 HP, 69 CY bucket	EW170B VOLVO EXCAVATOR (145 HP 3/4 bucket)	2001	$50 36	$22 54	$1 66	$24.20	0.96	$23.23	$49.39
Steel Roller Compactor	R50	R50WG001	132 HP, 83" wide, 21 1 ton	DYNAPAC CA2500 D ROLLER RL-1 (130 HP, 83" wide, 13 ton)	2015	$43 23	$13 69	$1 01	$14.70	1.07	$15.73	$44.26
Loader	L40	L40CA022	CAT 924H	924H CAT LOADER L1 (128 HP, 2 8 YD bucket)	2010	$36 72	$13 39	$1 10	$14.49	0.9	$13.04	$35.27
Shotcrete Machine (x2)	P45	P45AF011	60 HP / 50 CY/HR	SHOTCRETE PUMP REED B50 (50 CY/HR, 110 HP)	2013	$20 66	$6 73	$0 40	$7.13	1	$7.13	$20.66
Compressor (x2)	A15	A15DP001	Doosan P185	DOOSAN AIR COMPRESSOR P185 AC2 (185 CFM 49 HP)	2013	$9 69	$2 44	$0 19	$2.63	1	$2.63	$9.69
Telescopic Boom 1	P40	P40TE022	Genie S105 / 500 lbs / 110 ft	GENIE S-120 2002 LF1 (126 ft telescopic boom, 750 lbs, 78 hp)	2002	$78 31	$36 24	$2 02	$38.26	0.96	$36.73	$76.78
Telescopic Boom 2	P40	P40TE021	500 lbs / 64 ft	JLG 600S SKYPOWER 2008 LF2 (66 ft boom, 750 lbs 78 hp)	2008	$45 53	$19 40	$1 12	$20.52	0.96	$19.70	$44.71

Materials and Supplies
The proposed costs and itemization for materials and supplies are representative of costs and quantities from comparable concrete lining construction projects recently completed by the District, some of which were performed in collaboration with Reclamation. The District will purchase the needed construction materials and supplies by publicly soliciting sealed bids following competitive procurement laws outlined in the Texas Water Code, District purchasing policies, and applicable federal regulations. Historical bid and pricing information is available upon request.

Steel panel framework is manufactured according to the canal specifications and rates vary depending on the size of sheets for the canal bottom, sides, and bends that facilitate the trapezoidal shape. The submitted budget estimates are consistent with prices paid in 2019.

The proposed concrete lining construction requires a variety of low-cost supplies that are purchased and reused as needed. These supplies include about 500 linear feet of form lumber, at least 215 boxes of wattle pins (100 pins per box), and snap ties, plywood, nails, screws, and stakes as needed.

Contractual
Contracted engineering services for construction, quality control, and reporting are necessary for the completion of the proposed project. Procurement and solicitation methods are performed in accordance to state and professional engineering solicitation practices. The District uses a qualifications-based method for the selection of a qualified and experienced engineering firm. Budgeted costs are representative of costs from concrete lining projects similar to the proposed project.

Rates included for geotechnical lab concrete testing and soil density testing are consistent with bid responses received in Phase 1 and Phase 2 of the Riverside Canal Concrete Lining Project and estimates included in Contract No. R18AP100193 (Phase 2) with Reclamation. The rates are also similar to costs for cylinder and field density tests for the El Paso market listed in RS Means, a construction industry costs database used by the District to estimate construction costs.

Environmental and Regulatory Compliance Costs
The proposed costs for environmental and regulatory compliance costs are representative of costs from similar concrete lining projects. Per conversations 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. All costs associated with the project, including administrative costs, are accounted for separately by the District.

Total Amount of Project Costs
The total cost of the project is $2,039,504. The Bureau of Reclamation requested share is $1,000,000. The District share will be $1,039,504 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 6,600-foot reach adjacent to farmland and the U.S.-Mexico border wall. 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 Riverside 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 El Paso County Water Improvement District Number One (the District) is listed in the National Register of Historic Places under National Register Information System ID 97000885. There are no anticipated adverse effects of features listed in the National Register of Historic Places as a result of the proposed project. The District has an agreement with the Texas Historical Commission in regards to which facilities within the District can be concrete lined or placed underground. The proposed project is allowed under this agreement and there are no anticipated adverse effects to historical assets. A copy of the agreement is available from the District.

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?

The proposed project would not have a negative impact on minority populations or low-income communities.

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 and ceremonial use of Indian sacred sites or adverse impact tribal lands. The proposed concrete lining work will not impact the District's existing agreement with the Ysleta del Sur Pueblo and the Kickapoo Traditional Tribe of Texas (from Eagle Pass, Texas) allowing the harvesting of ceremonial native plants from the Rio Grande growing in the District drain system. A statement summarizing the agreement is available for reference in Appendix B.

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 District right-of-way. No conflicts with existing utilities or facilities requiring City or County approval are anticipated. A Storm Water Pollution Protection Plan (WPPP) will be prepared and filed with the Texas Commission on Environmental Quality (TCEQ). It is not expected that any other Environmental 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. The District is currently administering grant awards from Reclamation using ASAP.

DUNS Number: 128044773

X APPENDIX

A. Official Resolution

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 FY2020 Water and Energy Efficiency Grants program for a Grant totaling $1,000,000 to conserve water and improve the District's water use efficiency by concrete lining a section of the Riverside 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: Arthur H. Ivey Jr., Vice-President

B. Letters of Support

Letter of Support from the Texas Water Development Board

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

September 6, 2019

Ms. Janeen Koza
Financial Assistance Support Section
United States Bureau of Reclamation
P.O. Box 25007, MS 84-27814
Denver, CO 80225

Dear Ms. Koza:

The El Paso County Water Improvement District No. 1 (District) is seeking to apply for funding under the WaterSMART Water and Energy Efficiency Grants program for fiscal year 2020. The Riverside Canal Concrete Lining Project (Phase 3) will make improvements to a 1.25-mile section of the Riverside Canal in Socorro, Texas.

The project proposed by the District is a recommended water management strategy in the 2017 Texas State Water Plan. In 2018, the Texas Water Development Board's (TWDB) Agricultural Water Conservation Grant Program awarded the District funding to complete the survey, engineering design, and preliminary environmental work necessary to concrete line eight miles of the Riverside Canal. Additional funding from the United States Bureau of Reclamation would implement the design work through construction improvements to the District's conveyance infrastructure.

If awarded, this project would serve as a great example of cooperative efforts between local, state, and federal agencies to enhance border security, support U.S. agricultural production, and improve vital water conveyance infrastructure. As such, the TWDB supports the water conservation project proposed by the District.

Please do not hesitate to contact my office with any questions.

Sincerely,

Jeff Walker
Executive Administrator

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

VERONICA ESCOBAR
16TH DISTRICT, TEXAS
ASSISTANT WHIP
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

September 12, 2019

Ms. Janeen Koza
Financial Assistance Support Section
United States Bureau of Reclamation
P.O. Box 25007, MS 84-27814
Denver, CO 80225

RE: Support for the Riverside Canal Concrete Lining Project – Phase 3

Dear Ms. Koza:

I am writing to express my support for the El Paso County Water Improvement District No. 1 (EPCWID1) request for funding under the WaterSMART Water and Energy Efficiency Grants program for Fiscal Year 2020. I understand the EPCWID1 is proposing to concrete line a section of the Riverside 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 our region. 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 will continue to be one of the most viable and cost-effective approaches to meet the area's growing water demand.

I appreciate your full and fair consideration, consistent with applicable laws and regulations, to the application submitted by the El Paso County water Improvement District No. 1 for this important grant program.

Sincerely,

Veronica Escobar

Veronica Escobar
Member of Congress

VE:DR

Letter of Support from Congressman Will Hurd (USTX-23)

WILL HURD
23rd District, Texas

COMMITTEE ON APPROPRIATIONS
Subcommittee on Military Construction and Veterans Affairs
Subcommittee on Transportation, Housing and Urban Development

PERMANENT SELECT COMMITTEE ON INTELLIGENCE
Ranking Member, Subcommittee on Intelligence Modernization and Readiness
Subcommittee on Defense Intelligence and Warfighter Support

Congress of the United States
House of Representatives
Washington, DC 20515–4323

317 Cannon House Office Building
Washington, DC 20515
(202) 225-4511

San Antonio Federal Building
727 E. Cesar Chavez Blvd.
San Antonio, TX 78205

1104 West 10th
Del Rio, TX 78840
(830) 422-2040

121 South Monroe
Sonora, TX 76950
(915) 239-6421

100 South Monroe Street
Eagle Pass, TX 78852
(210) 384-5921

El Paso County Courthouse
103 West Callaghan
Fort Stockton, TX 79735
(210) 345-1548

September 16, 2019

Ms. Janeen Koza
Financial Assistance Support Section
United States Bureau of Reclamation
P.O. Box 25007, MS 84-27814
Denver, CO 80225

Dear Ms. Koza,

I am writing to express my support for the El Paso County Water Improvement District No. 1 (EPCWID1) request for funding under the WaterSMART Water and Energy Efficiency Grants program for Fiscal Year 2020. With this funding, EPCWID1 would line a section of the Riverside Canal System with concrete to conserve significant quantities of water currently being 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, but conservation is a more viable and cost-effective approach to meet the area's growing water demand.

I appreciate your swift and thoughtful consideration El Paso County Water Improvement District No. 1 for this important grant program. Should you have any additional questions, please feel free to contact my office at 202-225-4511.

Sincerely,

Will Hurd

Will Hurd
Member of Congress

Letter of Support from the City of Socorro, Texas

Elia Garcia
Mayor

Rene Rodriguez
At Large

Cesar Nevarez
District 1

Ralph Duran
District 2

Victor Perez/Mayor Pro Tem
District 3

Yvonne Colon-Villalobos
District 4

RESOLUTION 584

RESOLUTION IN SUPPORT OF THE EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1'S RIVERSIDE CANAL IMPROVEMENT PROJECT.

WHEREAS, El Paso County has an arid climate, only receives an average rainfall of about 8 inches, and irrigation, municipal, and industrial water use place significant demands on the limited water resources in the region, and the region has been in perpetual drought conditions for the last 15 years; and

WHEREAS, The City of Socorro supports projects that conserve water, mitigate drought, and promote the local agricultural economy; and

WHEREAS, The El Paso County Water Improvement District No. 1 (EPCWID1) is seeking funding from the United States Bureau of Reclamation Water and Energy Efficiency Grants program for Fiscal Year 2020; and

WHEREAS, The project proposed by EPCWID1 for improvements to the Riverside Canal will lead to water conservation, drought mitigation, and will benefit the residents and agricultural businesses of the City of Socorro.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Socorro supports the water conservation project proposed by the EPCWID1.

PASSED and APPROVED this 5th day of September 2019.

CITY OF SOCORRO

Elia Garcia
Mayor

ATTEST:

Olivia Navarro
City Clerk

Agreement with the Ysleta del Sur Pueblo and the Kickapoo Traditional Tribe of Texas for Harvesting of Native Plants within District Drains

EL PASO COUNTY WATER IMPROVEMENT DISTRICT No. 1
P.O. Box 749 | 13247 Alameda Ave. Clint, Texas 79836-0749
(915) 872-4000 | Fax (915) 851-0091 | www.epcwid1.org
TAX OFFICE (915) 872-4009 | DISPATCHER (915) 872-4029

October 2, 2012

Ms. Andrea Alvarez
Ysleta Del Sur Pueblo Tribe
119 S. Old Pueblo
El Paso, TX 79907

Dear Andrea,

As per our telephone conversation on October 1, 2012, I am writing to permit the Ysleta Del Sur Pueblo Tribe and the Kickapoo Tribe to enter into our drains in order to harvest cat tails to be utilized for ceremonial purposes.

If I can be of further assistance, please do not hesitate to call me at the office or Pete Rodriguez, Maintenance Manager at (915)497-2731.

Regards,

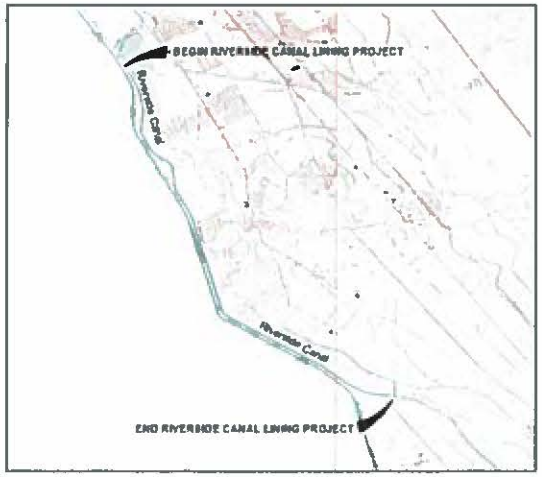
Jesus Reyes
General Manager

DRAWINGS FOR CONSTRUCTION OF

Riverside Canal Lining Project

PREPARED FOR

EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1



PROJECT LOCATION MAP
NTS

APPROVED BY:

for El Paso County Water Improvement District No. 1 — Date

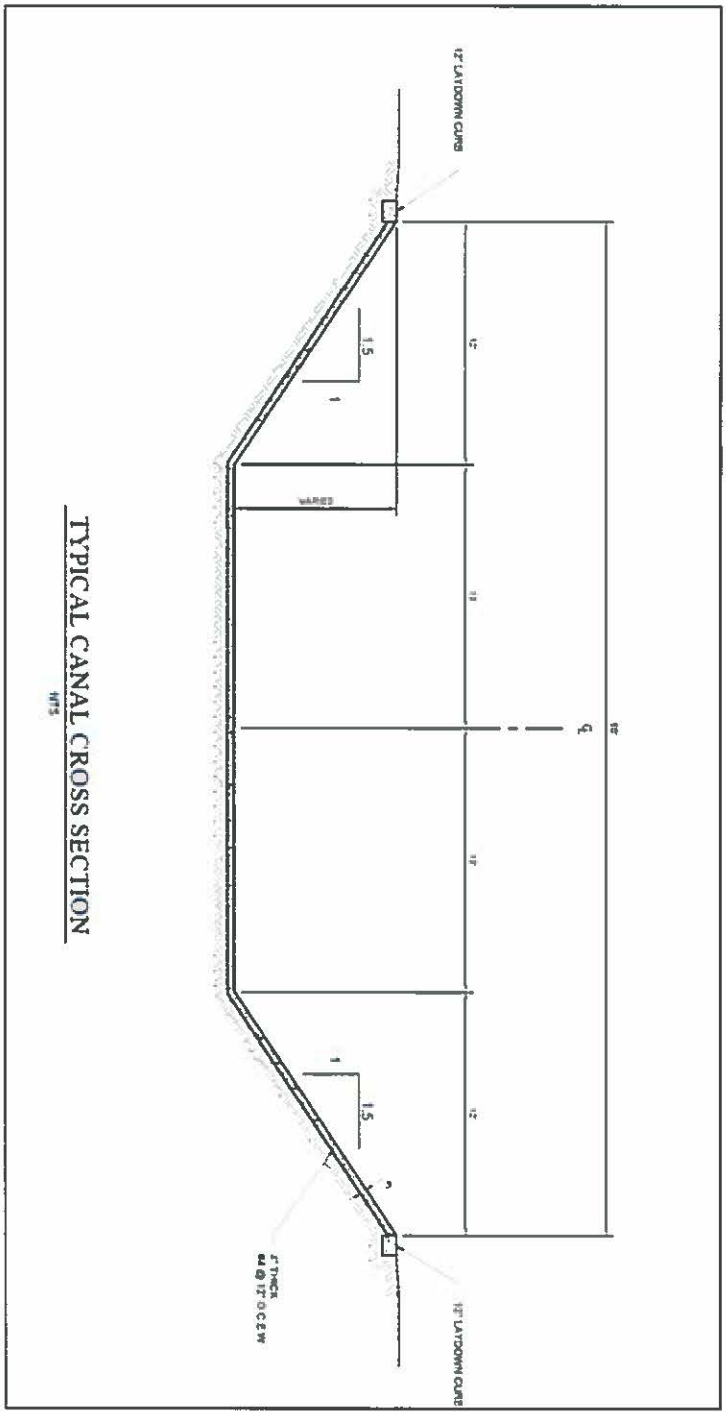
SUBMITTED BY:

A.W. Blair, P.E., Ph.D. — Date
District Engineer

DRAFT
9/12/19

NO	DATE	REVISION	APPVD

El Paso County Water Improvement District No. 1
P.O. Box 749 | 13247 Alameda Ave., Clint, Texas 79836-0749
(915) 872-4000 | Fax (915) 851-0091 | www.epcwid.org



El Paso County Water Improvement District No. 1
Riverside Canal WW2 Check Structure

TYPICAL CANAL CROSS SECTION

D. Referenced Reports

"Salvage of Water in El Paso County Water Improvement District No. 1 Canal System" Pages 1, 9, 12.

Salvage of Water in El Paso County Water Improvement District No. 1 Canal System

Prepared for
El Paso County Water Improvement District No. 1
Draft Report
January 26, 2000

AWBLAIR ENGINEERING
P.O. 1090 Dripping Springs, Texas 78620
Phone: 512-858-1997 Fax: 512-942-8025
Email awblair@texas.net

Table 3 - Meter Calibration Trials

Meter	Meter ID	Run	Trial	Iteration A	Iteration B	Iteration C	Iteration Average	Run Average	Ratio Meter A/B
A	AF-0338	1	1	1.603	1.680	1.622	1.635		
A	AF-0338	1	2	1.583	1.615	1.664	1.621		
A	AF-0338	1	3	1.638	1.505	1.550	1.564	1.607	
A	AF-0338	2	1	5.869	5.834	5.805	5.843		
A	AF-0338	2	2	5.820	5.928	5.859	5.869		
A	AF-0338	2	3	5.657	5.777	5.780	5.738	5.817	
A	AF-0338	3	1	6.415	6.377	6.345	6.379		
A	AF-0338	3	2	6.437	6.415	6.383	6.412		
A	AF-0338	3	3	6.307	6.415	6.415	6.379	6.390	
B	S00676	1	1	1.650	1.684	1.584	1.639		
B	S00676	1	2	1.600	1.660	1.646	1.635		
B	S00676	1	3	1.569	1.672	1.638	1.626	1.634	0.963
B	S00676	2	1	5.643	5.874	5.712	5.743		
B	S00676	2	2	5.712	5.889	5.780	5.794		
B	S00676	2	3	5.751	5.672	5.737	5.720	5.752	1.011
B	S00676	3	1	6.345	6.415	6.399	6.366		
B	S00676	3	2	6.399	6.361	6.421	6.394		
		3	3	6.383	6.399	6.415	6.399	6.393	1.000
							Ratio Average A/B		0.998

Table 4 - ACE Inflow-Outflow Seepage Test

Date	Time	Location	Flow	Meter
11-Apr-99	8:05	ACE Ascarate	366.04	AF-0338
11-Apr-99	8:50	ACE Ascarate	367.64	AF-0338
11-Apr-99	9:40	ACE Ascarate	365.20	AF-0338
11-Apr-99	10:20	ACE Ascarate	368.82	AF-0338
11-Apr-99		Average	366.93	AF-0338
		Depth Correction Ratio	0.993	
		Corrected Flow	364.36	AF-0338
11-Apr-99	11:20	JR WTP	62.04	AF-0338
11-Apr-99	8:40	Riverside Heading	295.95	S00676
11-Apr-99	9:25	Riverside Heading	298.87	S00676
11-Apr-99	10:15	Riverside Heading	300.43	S00676
11-Apr-99	11:10	Riverside Heading	298.50	S00676
11-Apr-99	12:15	Riverside Heading	299.76	S00676
11-Apr-99		Average	298.70	S00676
11-Apr-99		Meter Correction Ratio	0.998	
11-Apr-99		Corrected Flow	298.10	S00676

operational capacity of the canal is approximately 250 cfs and thus a relatively small concrete canal or conduit would be required to replace the earthen canal. However, because the first 10 miles of the Franklin Canal parallels highly urbanized portions of EPCWID, construction cost for lining the canal would be expensive. At the current value of water and based on the potential amount of salvaged water, it is uneconomical to concrete line the Franklin Canal. However, the land occupied by the canal has significant value. Replacing portions of the Franklin Canal with buried conduit would allow joint land use and may generate benefits worth the cost of the project.

G. Riverside Canal

In November 1998, EPCWID performed a hydrostatic test on approximately the first 2.25 miles of the Riverside Canal between Riverside Dam and the Partidor Check. The results of the test indicated that annually, approximately 3,000 acre-feet/mile (year-round) and 2,000 acre-feet/mile (February 15 to October 15), could be salvaged by lining the canal with concrete. Additional hydrostatic tests need to be performed towards the middle and terminus of the Riverside Canal.

H. Riverside Regulating Reservoir

The Riverside Dam is the last diversion dam in the Rio Grande Project. The travel time for water released from Caballo Dam is approximately 3 days. Release from Caballo Reservoir and return flow from numerous canal and lateral spillways, agricultural drains, and wastewater treatment plant discharges contribute to the total flow at Riverside Canal Heading. Reclamation attempts to keep the flow steady and equal to the quantity ordered for the Riverside Canal Heading. Unfortunately, significant flow fluctuations do occur at the Riverside Canal Heading. During 1997, approximately 60,000 acre-feet of flow above order arrived at the Riverside Canal Heading. Approximately half of this flow was captured and used by EPCWID. The remaining 30,000 acre-feet flowed downstream in the Rio Grande. Approximately 20,000 acre-feet of the 30,000 acre-feet could be temporarily stored in a regulating reservoir located near the

Page 15 of 71 from 2009 FONSI by USBR: Reviewing Seepage Losses at Riverside Canal
https://www.usbr.gov/uc/albuq/envdocs/ea/epcwid1/epcwid-1FEA.pdf

run dry and will be severely depleted by 2025. As a result, depleted groundwater will also increase the demand for surface water in the Rio Grande. Therefore, irrigation system improvements, water conservation projects and increased efficiencies are critical to meet this region's growing need for water.

Limited options exist which would satisfy the need to increase the water supply. Of these options, conservation holds the greatest advantage over other potential approaches. Conservation programs allow previously developed, higher quality water sources to be extended, effectively creating new, "good" water sources.

Each year the Canal loses approximately 3,000 acre feet of water per mile through seepage and 55 acre feet per mile due to evaporation (District project report 2003). Therefore, the Canal loses approximately 7,000 to 9,000 acre feet of water per year in the Project area. In addition, diversion, check, and bypass structures along the Project leak water and need to be replaced. As a result, inefficient withdrawal scheduling and excess bypass waste flows exist. Improvements to the Canal would help the District reduce the need to pump water from the Hueco Bolson groundwater aquifer to provide irrigation water.

1.4. Purpose of the Action

In an effort to conserve water, the District proposes to correct weaknesses identified in the Canal. These weaknesses were identified in evaluations of the first 2.25 miles of the Canal (District project report 2003). The following summarizes these weaknesses:

- Seepage of water and evaporation losses from existing earthen canals.
- Excess bypass of water and waste flows resulting from limitations of existing check structures.
- Inefficient withdrawal scheduling in the system.

Therefore, the purpose and objectives of reasonable alternatives to overall increase the water supply, the proposed action would:

1.4.1. Reduce or eliminate seepage losses to the groundwater
1.4.2. Reduce evaporation losses due to the current surface area of the canal
1.4.3. Correct inefficient delivery due to leaky diversion and check structures

1.5. Laws, Regulations, and Environmental Impact Statement (EIS) that affect this EA

The referenced MOA, the Act, and the El Paso-Las Cruces Regional Sustainable Water Project 2001 EIS , dated January 16, 2001, affect this EA. Under the MOA dated June 11, 2003, Reclamation agreed to prepare an EA for the project plan to comply with the National Environmental Policy Act (NEPA). The Act requires that a project plan approved by Reclamation be prepared by the District to qualify for federal funds required for the proposed action. According to the 2001 EIS (see page 4 and 6 of the Record of Decision), the Project or the preferred alternative will strive to deliver water efficiently. In addition, the Project will

Referenced Hydrologic Reports Relevant to the Riverside Canal Lining Project

International Boundary and Water Commission. 1994. U.S. Section of the International Boundary and Water Commission, Gain and Loss Study in the Rio Grande in the Reach between International Dam and Riverside Heading, 1981-1982, pages 1-8.

International Boundary and Water Commission. 1983. U.S. Section of the International Boundary and Water Commission, Gain and Loss Investigation, 1981-1982, pages 1-5.

International Boundary and Water Commission. 1993. U.S. Section of the International Boundary and Water Commission, Final Environmental Assessment – Rio Grande American Canal Extension, pages 26-30.

United States Bureau of Reclamation. 1986. American Canal Extension, White Paper dated October 7, 1986.

United States Geological Survey. 1997. U.S. Geological Survey Water-Resources Investigations Report 97-4263, Hydrology of the Shallow Aquifer and Uppermost Semiconfimed Aquifer Near El Paso, Texas.

United States Geological Survey. 1992. U.S. Geological Survey Water-Resources Investigations Report 92-4037, Results of Simulations by a Preliminary Numerical Model of Land Subsidence in the El Paso, Texas Area.

Other Referenced Reports and Publications

Borderplex Alliance. 2019. Key Industries in the North American Borderplex: Advanced Manufacturing. https://borderplexalliance.org/borderplex/key-industries-in-the-north-american-borderplex/advanced-manufacturing

CH2MHILL. 2011. Alternatives Analysis for the Rio Grande Salinity Management Program: Prepared for U.S. Army Corps of Engineers. http://www.ch2mhillblogs.com/water/2012/05/21/rio-grande-salinity-management-program-using-alternatives-analysis-for-effective-solutions/

Chavarria, Sharleene B. and David S. Gutzler. 2018. Observed Changes in Climate and Streamflow in the Upper Rio Grande Basin."Journal of the American Water Resources Association (JAWRA) 54(3): 644-659. https://doi.org/10.1111/1752-1688.12640

City of El Paso. 2012. Plan El Paso, Comprehensive Plan. 7.2, 7.12, 12.2-12.9. https://www.elpasotexas.gov/~/media/files/coep/city%20development/planning/long%20range/plan%20el%20paso/plan%20el%20paso_vol2_adopted_for%20web.ashx?la=en

Consejo Nacional de Población (CONAPO). 2012. Proyecciones de la Población del Municipio de Juarez 2010-2030. http://www.conapo.gob.mx/es/CONAPO/Proyecciones_Analisis

El Paso Metropolitan Planning Organization. 2018. Metropolitan Transportation Plan: Destino 2045. Staged Improvement Plan 8-10. http://www.elpasofwd.com/files/08.%20Staged%20Improvement%20Plan.pdf

El Paso Water Utilities, William R. Hutchinson. 2008. Conceptual Evaluation of Surface Water Storage in El Paso County. EPWU Hydrogeology Report 08-02. http://www.riocog.org/ENVSVCS/FWTWPG/SurfaceWaterStorEPC.pdf

El Paso Water Utilities. 2014. 2014 EPWU Water Conservation Plan. 1-2. https://epwater.org/UserFiles/Servers/Server_6843404/File/Conservation/Resources/Conservation_Plan_2014.pdf

El Paso Water Utilities. 2019. Public Service Board Regular Meeting on Wednesday, August 14, 2019. https://www.epwater.org/common/pages/DisplayFile.aspx?itemId=15918622

Far West Texas Water Planning Group. 2016. 2016 Far West Texas Water Plan. http://www.twdb.texas.gov/waterplanning/rwp/plans/2016/E/Region_E_2016_RWP.pdf

Felix Kogan & Wei Guo. 2015. 2006–2015 mega-drought in the western USA and its monitoring from space data, Geomatics, Natural Hazards and Risk, 6:8, 651-668, DOI: 10.1080/19475705.2015.1079265.

Fort Bliss Garrison, Directorate of Public Works. 2011. August 8, 2011 Fort Bliss Fact Sheet. https://www.army.mil/e2/c/downloads/216568.pdf

Fort Bliss Water Services, Inc. 2017. Annual Water Quality Report: Water Testing Performed in 2017. 2. http://www.asusinc.org/images/uploads/bases_we_serve/FBWS_CCR_Webready.pdf

Gonzalez, Hector. 2017. Testimony of Hector Gonzalez before the Subcommittee on water Resources and the Environment and the Committee on Transportation and Infrastructure: U.S. House of Representatives; 10:00 a.m., September 26, 2017. https://transportation.house.gov/uploadedfiles/2017-09-26_-_gonzalez_testimony.pdf

Groschen, G.E. 1994. Simulation of ground-water flow and the movement of saline water in the Hueco Bolson aquifer, El Paso, Texas, and adjacent areas: U.S. Geological Survey Open-File Report 92-171.

Hibbs, B. J., and M. Merino. 2006. A geologic source of salinity in the Rio Grande aquifer near El Paso, Texas. New Mexico Journal of Science, v. 46, 165-181.

Lee Wilson and Associates. 1985b. Report 4—Technical framework for evaluation of proposed Hueco Basin appropriations: Prepared for the Public Services Board, City of El Paso, Texas

Michelsen, Chavez, Lacewell, Gilley, and Sheng. 2009. Evaluation of Irrigation Efficiency Strategies for Far West Texas: Feasibility, Water Savings and Cost Considerations. Texas A&M University.

JLUS: Southern New Mexico – El Paso Texas Joint Land Use Study, prepared for Doña Ana County, New Mexico. AECOM Technical Services. Jan 2015.

JMAS Junta Municipal de Agua y Saneamiento de Juarez. 2013. Resumen Ejecutivo 2012-2030. http://www.jmasjuarez.gob.mx/transp/v0/direct/Resumen_Ejecutivo_4_ejes.pdf

JMAS Junta Municipal de Agua y Saneamiento de Juarez. 2019. Plan Estatal Hídrico 2040 del Estado de Chihuaha. Plan: https://www.jmasjuarez.gob.mx/v2018/index.php. Statement in Page 7 of this document references a publication as published in the JMAS Ultimas Noticias page: https://www.jmasjuarez.gob.mx/v2018/mainnews.php

Sheng, Zhuping. 2013. Impacts of Groundwater Pumping and Climate Variability of Groundwater Availability in the Rio Grande Basin. ESA Ecosphere 4(1):5. http://dx.doi.org/10.1890/ES12-00270.1

StatsAmerica Distress Criteria Statistical Report - Census tracts in Socorro, Texas. U.S. August 2019. Economic Development Administration (EDA). http://www.statsamerica.org/distress/distress.aspx

Texas A&M University (TAMU). 2015. Annual Report 2015: Far West Texas Region. 63. https://agrilifecdn.tamu.edu/elpaso/files/2016/02/AgRes-Impacts-Far-West-Texas-Annual-Report-2015.pdf

Texas Comptroller of Public Accounts. 2016. Military Snapshot: Fort Bliss. 98-986-2 (6/16). https://comptroller.texas.gov/economy/economic-data/military/2015/docs/98-986-fort-bliss.pdf

Texas Department of Transportation. 2014. Border Highway East Study CSJ: 0924-06-090. Appendix G Affected Environment Technical Report. http://ftp.dot.state.tx.us/pub/txdot-info/elp/projects/border-highway-east/project-documents/pel-study/appendix-g.pdf

Texas Water Development Board. 2015. Ellis, John R., Cho, Yun, & Kluge, Kevin. Socioeconomic Impacts of Projected Water Shortages for the Region E Regional Water Planning Area. Texas Water Development Board, Water Use Projections and Planning Division.

U.S. Bureau of Reclamation. 2011. "Managing Water Conflict: a Survey of Reclamation Managers and Scientists. Technical Memorandum 86-68251-11-01. https://www.usbr.gov/research/projects/download_product.cfm?id=140

United States Bureau of Reclamation. 2013. U.S. Department of the Interior. "Literature Review of Observed and Projected Climate Changes." Page B-20.

United States Bureau of Reclamation. 2016. U.S. Department of the Interior. "SECURE Water Act Section 9503(c) – Reclamation Climate Change and Water 2016, Chapter 7: Rio Grande Basin. Pages 7-3, 7-5, 7-6, 7-8.

United States Customs and Border Protection. 2018. U.S. CBP and Mexico SAT announce Unified Cargo Processing at the El Paso port of entry. September 28, 2018. https://www.cbp.gov/newsroom/local-media-release/us-cbp-and-mexico-sat-announce-unified-cargo-processing-el-paso-port

United States Department of Agriculture National Resource Conservation Service. 2015a. From the Soil to the Table Brings Food Sovereignty. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/newsroom/stories/?cid=nrcseprd1291429

United States Department of Agriculture National Resource Conservation Service. 2015b. Far West Texans Attend Agriculture Conservation Workshop. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/newsroom/stories/?cid=nrcseprd355469

United States Department of Agriculture National Resource Conservation Service. 2015c. Ysleta del Sur Pueblo begins new growth with the community garden. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/tx/home/?cid=NRCSEPRD355468

United States Geological Survey (USGS). 2015. Seepage Investigation of the Rio Grande From Below Leasburg Dam, Leasburg, New Mexico, to Above American Dam, El Paso Texas, 2015. Scientific Investigations Report 2016-5011.