Category A Project Proposal:
(Funding Group I)

Telemetry to Conserve Water by the La Feria Irrigation District in the Lower Rio Grande Valley of South Texas

Submitted July 28, 2022 Via Grants.Gov

by the:

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    4. Sebastian Municipal Utility District (municipal customer)
    5. Johnson Farms (farmer customer)

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[1] Submitted separately as Attachments in Grants.gov.

I. EXECUTIVE SUMMARY

A. Date of Application Submission
July 28, 2022

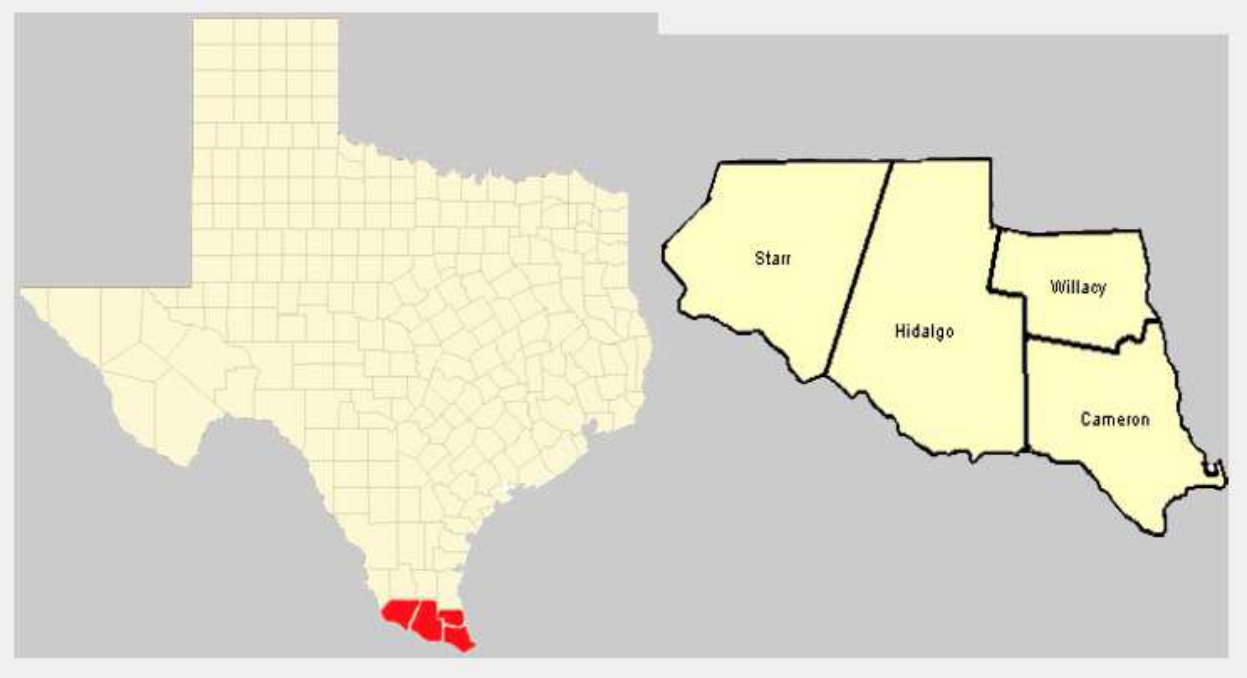
B. Eligible Applicant
The applicant is the La Feria Irrigation District Cameron County No. 3 ("District") located at 300 Main Street in La Feria, Texas in Cameron County. It qualifies as a Category A Applicant as an irrigation district with water delivery authority. The District is applying under Funding Group I.

C. Eligible Project
The District is proposing a water conservation project. We propose to install a telemetry water flow measurement system to reduce water spills and losses and to remotely monitor water and irrigation delivery system conditions (e.g., flow rates and water elevations).

D. Project Summary
The La Feria Irrigation District Cameron County No. 3 is located in the Lower Rio Grande Valley of South Texas in Cameron County on the Texas-Mexico border. It pumps water from the Rio Grande River to supply water to two small cities, a rural municipal utility district, farmers, and others totalling 4,080 accounts. The District is implementing a directive from its Water Conservation Plan to put in place a monitoring system to evaluate and reduce water loss in the District operation. The District proposes a one-year project to purchase and install a solar-powered SCADA telemetry system at ten (10) spillway sites to manage discharges, reduce water losses, capture more timely flow and water level data, and ensure proper water levels and distribution flow. Currently, a manual system is used to monitor excess water loss at the spillways using District personnel. The District estimates that 2,618 acre-feet of water will be conserved on an annual basis. The project is not located on a federal facility; the project would be implemented wholly on district-owned property. The estimated project cost is $212,908. The District is proposing a 50%/50% cost share budget with the Bureau of Reclamation.

E. Project Location
Below is Map 1 showing the location of the Lower Rio Grande Valley in South Texas. This Texas-Mexico border region is comprised of four counties: Cameron, Willacy, Hidalgo, and Starr Counties. The irrigation district is exclusively located within Cameron County (which borders the Mexican State of Tamaulipas). However, it also benefits Willacy County through the supply of water to the Sebastian MUD that is located in that county.

Map 1. Lower Rio Grande Valley in Southernmost Texas



Map Source: Center for Community Health Development, Texas A&M University (cchd.us).

Below is a map showing the location of the District in relation to other water districts in the Lower Rio Grande Valley. The District on this map is labeled as No. 3. As shown, the district is located in the geographic center of this South Texas region that is known as *the Valley* in Texas. The southern boundary points of the District extend to the Rio Grande River where the District pumps water from two pump stations.

Map 2. Irrigation Districts in the Lower Rio Grande Valley

CURRENT IRRIGATION DISTRICTS OF THE LOWER RIO GRANDE VALLEY

Illustration based on map of irrigation districts from Texas A&M University

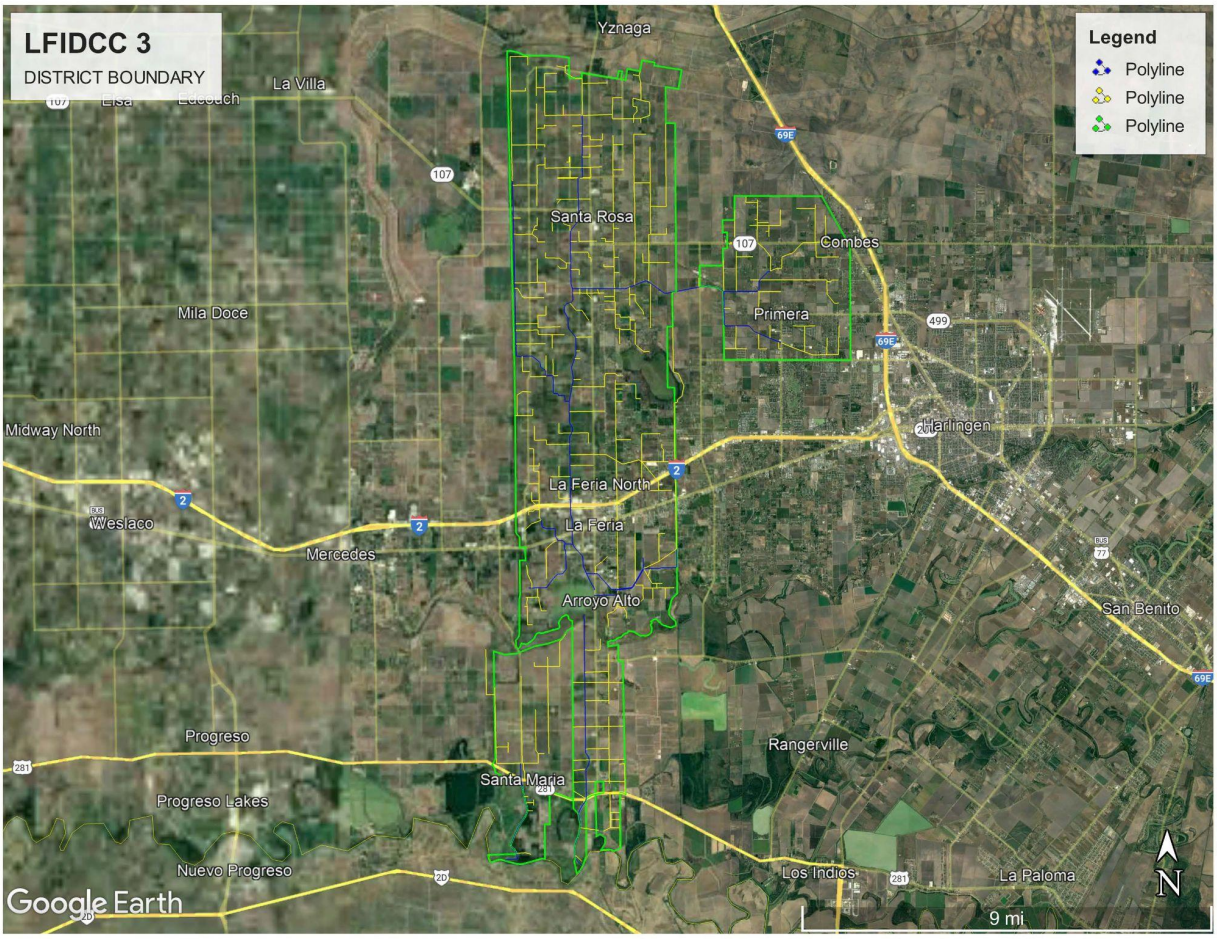
Source: Knight, Lila. A Field Guide to Irrigation in the Lower Rio Grande Valley, Texas Department of Transportation, Environmental Affairs Division, Historical Studies Branch (Historical Studies Report No. 2009-01) (Prepared by Knight & Associates), p. 6.

The latitude and longitude locations of each of the 10 spillways are provided on Exhibit 2 in the following Technical Project Description section.

II. Technical Project Description

The District currently operates 22.5 miles of concrete-lined canals that were constructed due to the Reclamation investment in the 1960s. The District has 21.3 miles of unlined canals that were installed from 1914 into the 1920s and that are in fair condition. In addition, it has 120 miles of pipelines. The District's boundaries are shown below along with the system of canals and pipelines.

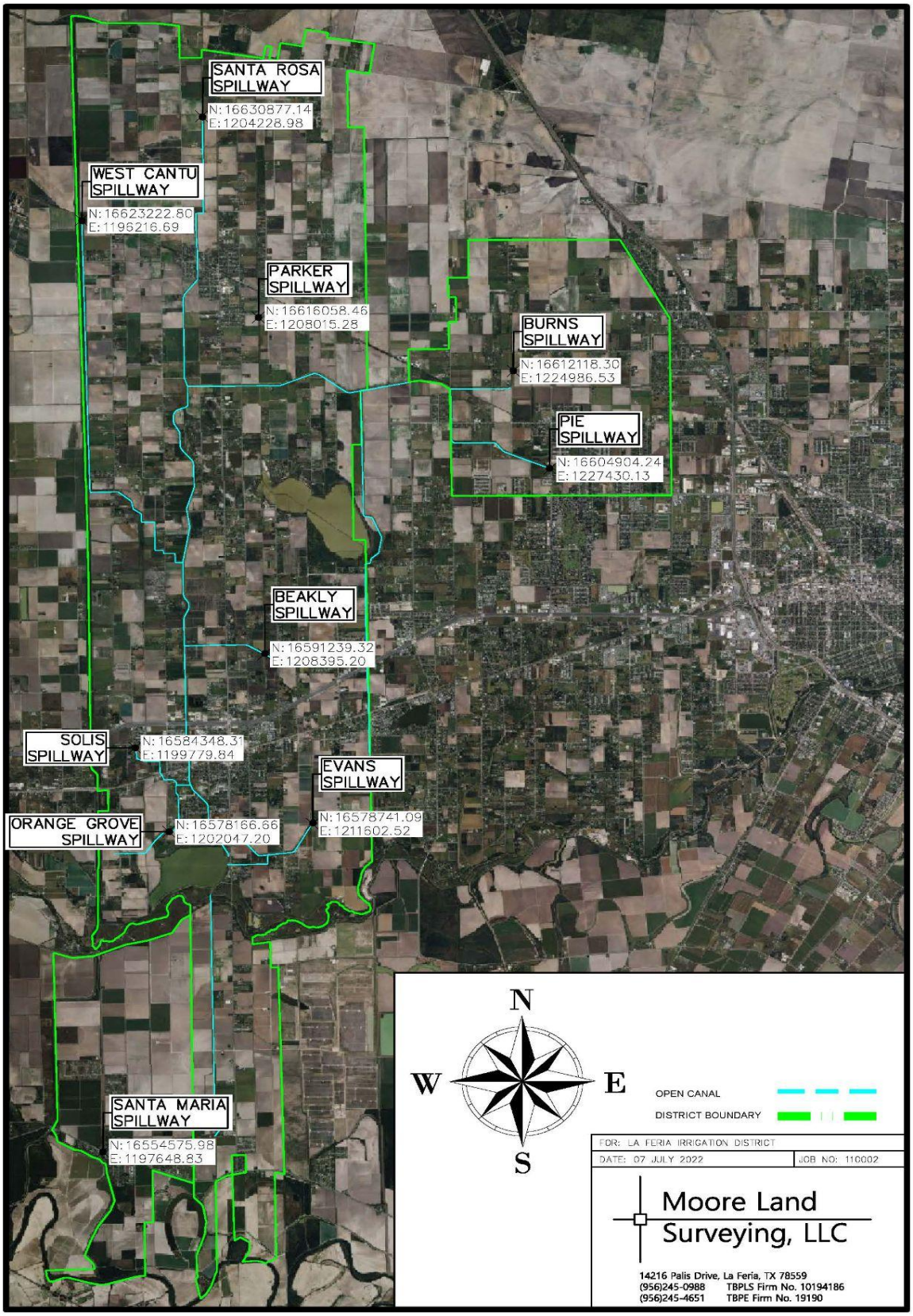
Exhibit 1. District Boundaries



Source: Moore Land Surveying, LLC, La Feria, Texas

Included in this system are the 10 spillways that are manually managed by the district to control or manipulate water supplies to match demand and supply as efficiently as possible. This manual method is not optimal and has resulted in water losses every year. The District proposes to invest in telemetry monitoring infrastructure to improve management of the amount of water it stores and conveys.

Below is Exhibit 2. Spillway Locations showing the proposed locations where the doppler telemetry monitors would be installed. Attachment A Spillway Locations enhances this visual description with photographs of each of the sites.


SANTA ROSA SPILLWAY
N: 16630877.14
E: 1204228.98
WEST CANTU SPILLWAY
N: 16623222.80
E: 1196216.69
PARKER SPILLWAY
N: 16616058.46
E: 1208015.28
BURNS SPILLWAY
N: 16612118.30
E: 1224986.53
PIE SPILLWAY
N: 16604904.24
E: 1227430.13
BEAKLY SPILLWAY
N: 16591239.32
E: 1208395.20
SOLIS SPILLWAY
N: 16584348.31
E: 1199779.84
EVANS SPILLWAY
N: 16578741.09
E: 1211602.52
ORANGE GROVE SPILLWAY
N: 16578166.66
E: 1202047.20
SANTA MARIA SPILLWAY
N: 16554575.98
E: 1197648.83
N
W
E
S
OPEN CANAL
DISTRICT BOUNDARY
FOR: LA FERIA IRRIGATION DISTRICT
DATE: 07 JULY 2022
JOB NO: 110002
Moore Land Surveying, LLC
14216 Palis Drive, La Feria, TX 78559
(956)245-0988 TBPLS Firm No. 10194186
(956)245-4651 TBPE Firm No. 19190

Current Method: Manual Monitoring

The District's employees — three canal riders — monitor and control irrigation operations along these canals. They manually operate the control gates and valves at two Rio Grande River pump stations and a large 2,000-acre ft reservoir pump station located south of La Feria to regulate headgates, turnouts, and diversions and ensure water is delivered to growers within the designated time frame.

Along these open canals the District's 10 spillways divert water to drainage ditches before the canal can overtop and breach when the supply to these canals becomes greater than the diversions to outlets in fields. Once a canal rider discovers that these spillways are dumping water they have to manually manipulate a series of gates that then have to bring the system to an equilibrium so that water is not discharging at the spillway. This is a delicate process that takes experience and time to manage. In the meantime, large amounts of water are being lost through diversions via the spillways.

During irrigation operations, canal riders average one round of visual inspections on the canals, pipelines, and fields within their territory approximately every 24 hours. If a farmer shuts off a valve without giving the canal rider notification so that they can adjust the system ahead of time, then the flow rate that was being delivered to the field is diverted to the spillway until the canal rider identifies the spillage and gets the system balanced.

Total diversions per year are estimated to be 2,618 ac ft of water. (More details below on how this loss figure was derived.)

Proposed Action Plan and Investment

The District is proposing to install doppler meters with telemetry at the spillways to be able to alert canal riders in real-time of discharges and then be able to calculate an exact amount of water lost/saved throughout the year. This would enable the District's water accounting program to be more accurate. The District can begin to work on increasing the system's efficiency as water becomes more critical to the area, especially as drought conditions persist and the binational water release demands increase on both sides of the Rio Grande River/Rio Bravo.

District personnel will adjust the spillways to ensure that there is a uniform measure when discharging so that the doppler meters can get an accurate measurement of the flow in them. The District will also monitor progress and perform all reporting for the project. The adjustments will be made by a three-man construction crew and it is estimated that they will spend 20 hours per spillway making the adjustments. A foreman will oversee the sites and will spend approximately 10 hours per site, and the General Manager will provide high level supervision and monitoring with an estimated 5 hours per site.

The construction crew will be utilizing an excavator, crew truck and backhoe during the site preparation phase. The installation of the meters and telemetry will be subcontracted to a subcontractor and will be publicly bid and awarded to the lowest qualified bidder. The District's consultant engineer will prepare site plans for each site in order to give the District direction on what adjustments to make at each spillway. The District's engineer will work with the telemetry subcontractor to develop the formulas for the spillway flow and volume calculations.

The total estimated project cost is $212,908 including subcontractor fees, consultant fees, and District personnel and equipment in-kind costs. Further below in this narrative is the breakdown of the District's personnel and equipment fee schedule and the breakdown of the total project cost estimate. The equipment rates were taken from the FEMA published equipment rates, the engineer's fees and telemetry subcontractors fees are estimates based on the proposed scope of work and discussions with local telemetry and monitoring contractors.

Product Description

The product evaluated is used by a neighboring irrigation district (Harlingen Irrigation District) with good performance. It was provided by Awblair Engineering, an Austin, Texas-based engineering firm. It is a low cost remote telemetry unit (LCRTU) monitoring system for water level and flow measurement. It would be customized by the vendor for the system of the District to fit our needs and conveyances infrastructure.

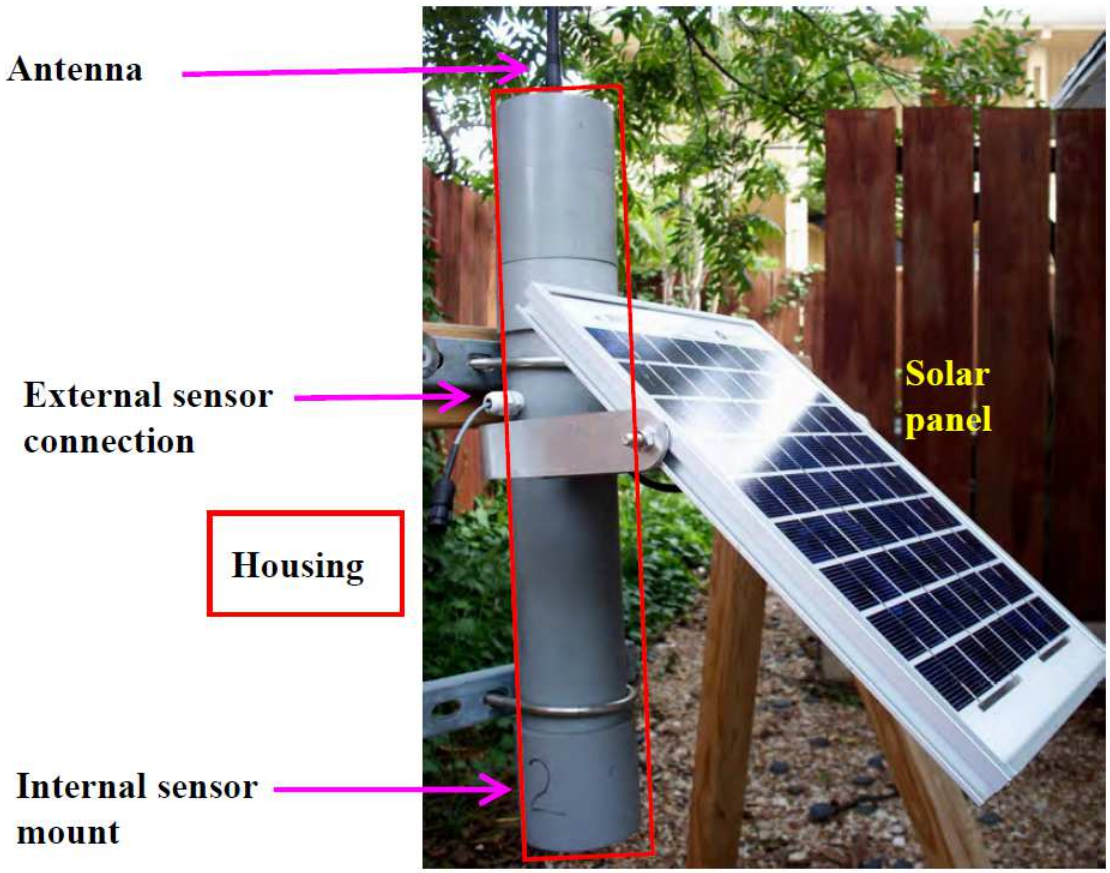
The system is designed to make and transmit frequent measurements of values such as the depth of canal water. Key features include a solar-powered panel, the ability to measure voltage/current and digital SDI-12 signals, and good radio range.[2]

The major system components are:

1. The enclosure/housing
2. The power supply system
3. The electronic circuits to read signals and transmit data.

Exhibit 3. Telemetry Monitoring Unit below illustrates the design of each monitoring unit:

[2] Awblair Engineering, Low Cost RTU for Water Level Measurement Prepared for the Harlingen Irrigation District (Austin, Texas, September 27, 2010), p. 1. (https://www.awblair.com/).



Source: Awblair Engineering.

Below are highlights of the system parts. Detailed specifications for each component are available at https://www.awblair.com/.

Housing/Enclosure

- Electronic components and the power supply in the form of a rechargeable lead/acid battery. The material used protects the components from deterioration from sunlight, rainfall and temperature variation. The material is UV resistant 40 PVC electrical conduit pipe and fittings, and various non UV resistant PVC plumbing fittings if they are not exposed to sunlight.

Pipe and Pipe Fittings

- The main enclosure body is constructed from a 3-inch (internal diameter) conduit pipe.
- Various standard fittings are used to fabricate the top and bottom of the housing/enclosure.

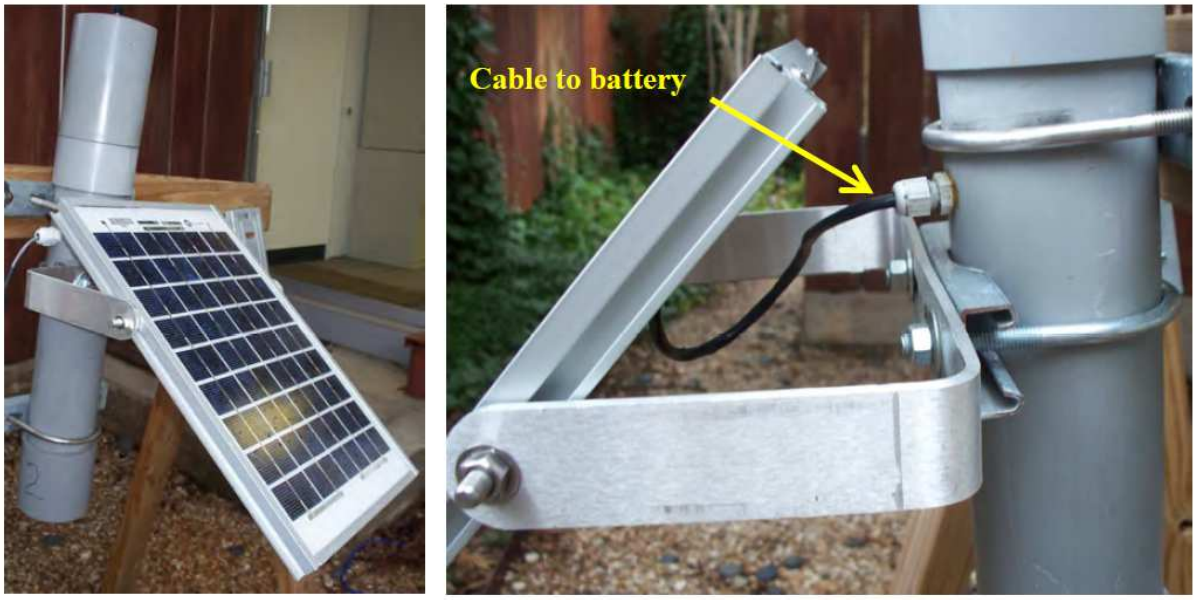
Power Supply System

- The system requires a 12V dc power supply. This power is generated using an external solar panel to recharge the battery system located inside the housing/enclosure.

Solar Panel

- The panel is rated at 10 watts. It is held by an aluminum bracket using bolts that fit into an aluminum channel on each side of the frame. The panel angle depends on latitude and can be adjusted using the bolts. A cable passing through an access port connects the solar panel to the battery pack inside the enclosure. See Exhibit 4 below showing the cable connection.

Exhibit 4. Solar Panel-Cable Connection



Source: Awblair Engineering.

III. EVALUATION CRITERIA

Evaluation Criterion A—Quantifiable Water Savings (28 points)

Up to 28 points may be awarded for this criterion. This criterion prioritizes projects that will conserve water and improve water use efficiency, supporting the goals of E.O. 14008. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to give greater consideration to projects that are expected to result in more significant water savings.

1) **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. Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.

Inefficiencies and Water Losses due to Current Manual Methodology

Based on conversations with District personnel, during the three-month peak irrigation season from April to July these spillways activate approximately twice a week, and will run for approximately 24 hours each time. The remainder of the year these spillways activate approximately once every two weeks and run for approximately 24 hours each occurrence.

Each valve in a field has a standard estimated flow rate of 3 CFS or 1 Head of water. If this flow rate is lost at the spillway for 24 hours, that equates to 5.95 Ac-Ft of water lost per occurrence. If this happens twice a week at each spillway for twelve weeks during peak irrigation this equates to 1,428 Ac-Ft. During the rest of the year it's estimated to occur once every two weeks which results in 1,190 Ac-Ft of water lost. The total estimated water lost at the spillways for the District is 2,618 Ac-Ft. Below is a breakdown showing the estimated water losses.

SPILLWAY WATER LOSS ESTIMATES

CANAL OVERFLOW	AVERAGE FLOW RATE AT SPILLWAY (CFS)	AVERAGE OVERFLOW TIME (HRS) (PEAK IRRIGATION)	AVERAGE OVERFLOW TIME (HRS) (NORMAL IRRIGATION)	VOLUME LOST (AC-FT) (PEAK IRRIGATION)	VOLUME LOST (AC-FT) (NORMAL IRRIGATION)	TOTAL ESTIMATED WATER LOSSES (AC-FT)
BURNS	3	576	480	143	119	***262***
PIE	3	576	480	143	119	***262***
PARKER	3	576	480	143	119	***262***
SANTA ROSA	3	576	480	143	119	***262***
WEST CANTU	3	576	480	143	119	***262***
BEAKLEY	3	576	480	143	119	***262***
SOLIS CANAL	3	576	480	143	119	***262***
ORANGE GROVE	3	576	480	143	119	***262***
EVANS	3	576	480	143	119	***262***
SANTA MARIA	3	576	480	143	119	***262***
TOTAL:		**5760**	**4800**	**1428**	**1190**	**2618**

Source: Moore Land Surveying LLC

The average flow rate at each spillway was estimated using the average delivery to an irrigation turn-out. The District strives and accounts for a flow of 3 CFS per turnout. If this volume was no longer being used to irrigate, then it was assumed it was all lost to the spillway.

Average overflow time during peak and normal irrigation seasons was assumed based on conversations with District personnel and their experience.

Volume was calculated by the equation: **V = Q*T*3600/43560** with the volume factors representing the following:

V = Volume (Ac-Ft) **Q = Flow CFS** **T = Overflow Time (HR)**

3600 = Conversion from hours to seconds

43560 = Conversion from Cubic Feet to Ac-Ft

Water lost through the spillways is currently being diverted into District ditches and is not being used for any beneficial purpose. From the ditches, the water gets conveyed to the Arroyo Colorado or the IBWC Floodway.

The Arroyo Colorado is a natural waterway and carries flood waters east to the Laguna Madre, the bay on the Texas coast located between the coastline and the barrier island of South Padre Island.. The Arroyo also carries municipal treated water to the Laguna Madre. The IBWC Floodway is a man-made regional channel that was constructed to alleviate excess water levels from the Rio Grande River and to alleviate local flooding. The destination of IBWC water is also the Laguna Madre.

Consequently, District water diverted through its 10 spillways is lost into these floodways indefinitely and not recoverable for other uses.

Evaluation Criterion B—Renewable Energy (20 points)
Up to 20 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency and reduced greenhouse gas emissions.

> ***Subcriterion No. B.2: Increasing Energy Efficiency in Water Management***
> *Up to 10 points may be awarded for projects that address energy demands and reduce greenhouse gas emissions by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.*

- *Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).*

The telemetry system being considered for this project uses solar energy to operate. Estimated energy generation per doppler monitor is 58.4 kw/hour calculated as follows:

10 W * 16 Hours * 365 Days / Year = 58,400 W-H / 1000 = 58.4 KW-H

The product evaluated and used in a neighboring irrigation district uses a 10-watt solar panel. Assuming 16 hrs of daylight each day, for 365 days this amounts to 58.4 KW-H per site.

The project proposes 10 installed units. This would amount to a total of 580.4 KW-H for a one-year period.

Evaluation Criterion C—Sustainability Benefits (20 points)
Up to 20 points may be awarded under this criterion. This criterion prioritizes projects that address a specific water and/or energy sustainability concern(s), including enhancing drought resilience, addressing the current and future impacts of climate change, and resolving water related conflicts in the region. In addition, this criterion is focused on the benefits associated with the project, including benefits to tribes, ecosystem benefits, and other benefits to water and/or energy supply sustainability.

Enhancing drought resiliency. *In addition to the separate WaterSMART Environmental Water Resources Projects NOFO, this NOFO places a priority on projects that enhance drought resiliency, through this section and other sections above, consistent with the SECURE Water Act. Please provide information regarding how the project will enhance drought resilience by benefitting the water supply and ecosystem.*

Enhanced Water Supply
The District will improve service to water users by eliminating estimated annual water losses of 2,618 acres-feet. It will strengthen its ability to meet future water needs with its allotted diversions from the Rio Grande River since our water supply will remain longer in its storage facilities, canals, and conveyances. The improved data of the District's water flow to be generated by the telemetry system will help to sustain appropriate water levels. Consequently, the District will reduce the likelihood of wasteful discharges and alert field personnel early of any problems to prevent excess waste.

More Efficient Water Management

The District will increase the efficiency of its operations through better management of its water supply. Mismatches between diversions, storage, and deliveries can occur for various reasons. One cause is the manual monitoring of water levels. This has resulted in inadequate planning and responses on a more timely basis when water flow and water levels are not appropriate for irrigation orders and needs. The real-time collection of data on water level and flow will minimize the wasteful release of water through the 10 spillways.

Water Conservation Plan

The District operates under the guidance of its Water Conservation Plan and Drought Contingency Plan to comply with the Texas Water Code. Attachment B to this application is a copy of the Plan.

The District is operating at the current time within a 5-year period of Water Conservation Goals to achieve an overall system efficiency of 65%. Its current and past rate has averaged 60%. To meet or exceed this goal, it will have to implement a series of conservation strategies. The reduction or elimination of water losses is key to that success. The plan states that the District is investigating funding for design and implementation of a monitoring system to better evaluate water loss in the District system.[3] Eventually, this improvement will enable the District to provide water delivery assurances to its customers with better storage of its river allotment.

This proposal for a telemetry monitoring system is a direct result of the District commitment to achieve such efficiency. It has completed that review and has identified the monitoring technology it requires. This application to the Bureau of Reclamation for financial assistance is the result of such a determination.

Drought Contingency Plan

The District has a special concern and responsibility to assure continued delivery of water to municipal suppliers. In this case, the small cities of La Feria and Santa Rosa in Cameron County and the small community of Sebastian in Willacy County rely on the District to meet public water needs. To ensure continued delivery when no Rio Grande River water is being released due to low levels at the Falcon and Amistad Reservoirs upriver during drought conditions, the District must be excellent stewards of its stored water supply. Protecting public health and safety are paramount concerns. Accordingly, the District has a plan in place that has been used during such times to manage resources when no river diversions are forthcoming.[4] This enables the District to continue to provide water to its municipal customers during such serious periods when river diversions are prohibited.

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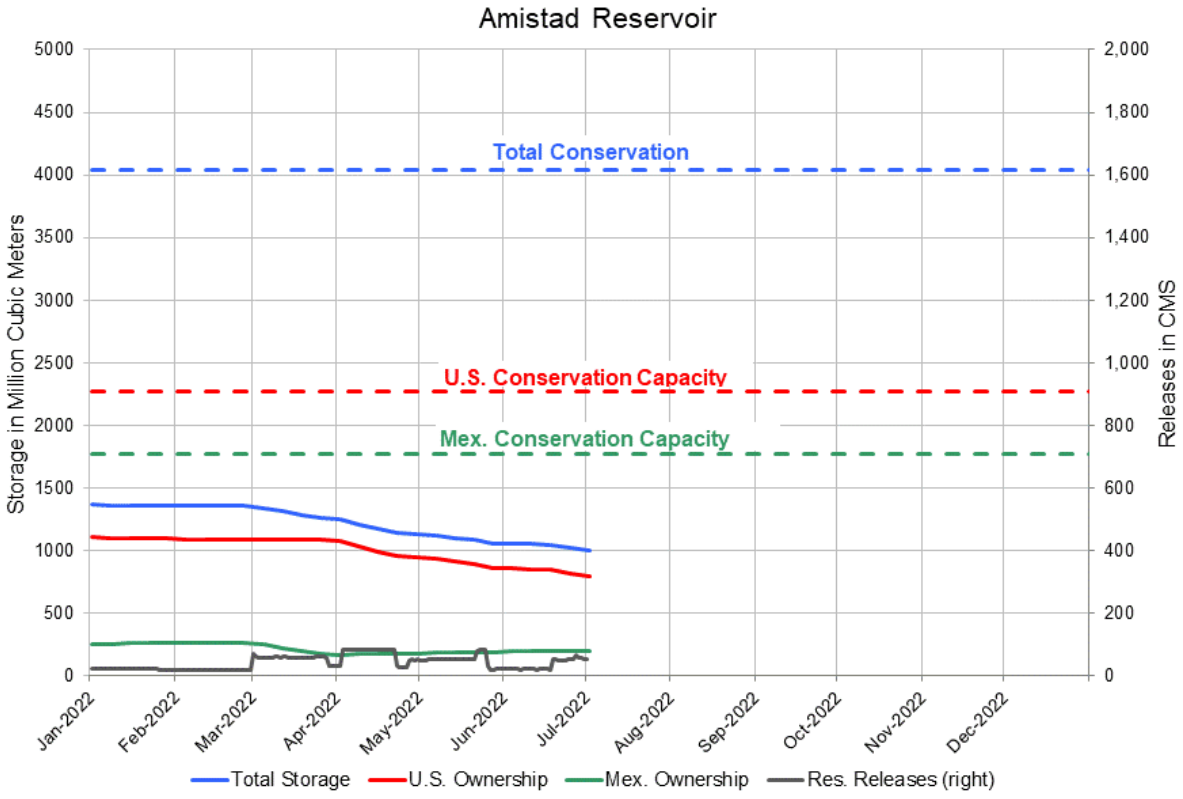
[3] La Feria Irrigation District Cameron County No. 3, Water Conservation and Drought Contingency Plan (Adopted May 2012, Amended May 2019), p. 6.

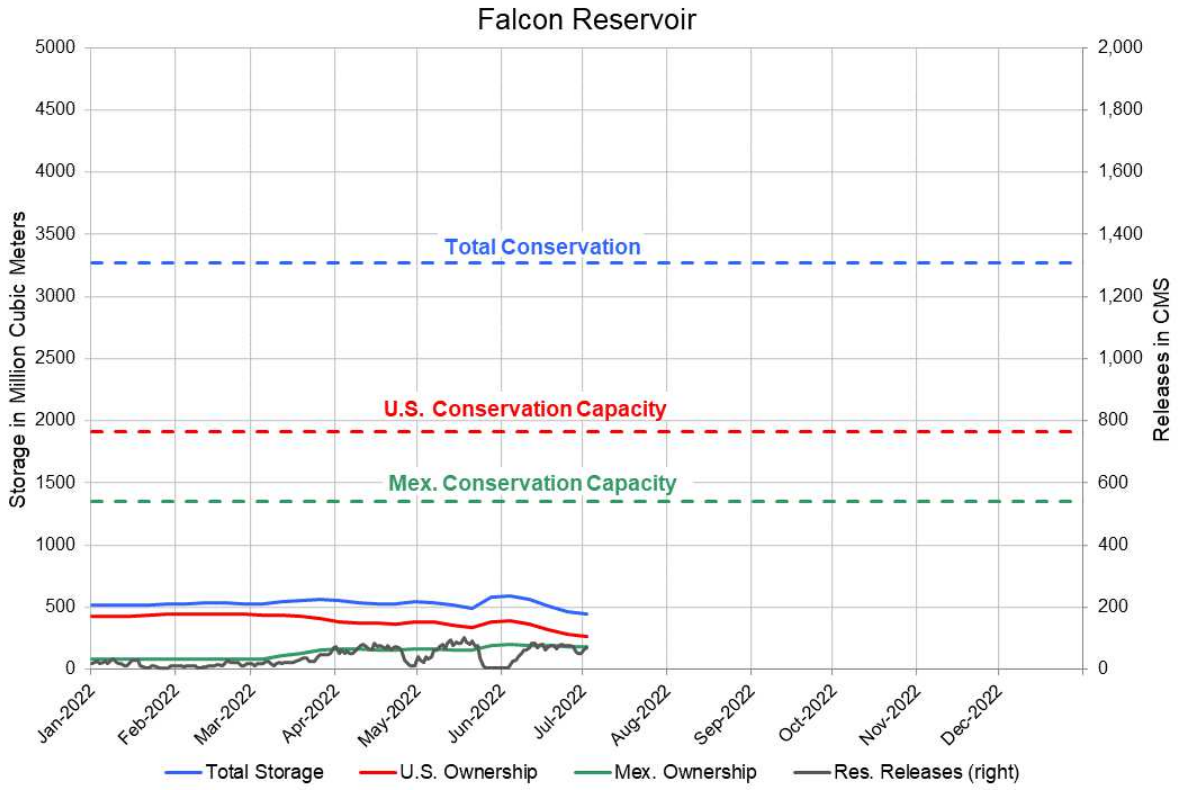
[4] La Feria Irrigation District Cameron County No. 3, Water Conservation and Drought Contingency Plan (Adopted May 2012, Amended May 2019), p. 13.

The telemetry system has been proven in other applications to eliminate water losses. That is the outcome we anticipate. As a result, the District would have water stored longer for more efficient delivery to priority users such as the cities.

The current storage levels at the Falcon and Amistad Reservoirs are approaching historic low levels. In addition, the trend for further discharges to river water users is downward. It shows continued lowering of the future amount to be made available for users downstream from the reservoir, including the entire Lower Rio Grande Valley where the District is located.

Exhibit 6. Amistad and Falcon Reservoirs Storage Capacity





Source: International Boundary & Water Commission, https://www.ibwc.gov/Water_Data/Reports/RG_Storage_Conditions.htm#

Climate Change Benefits

We anticipate two advantages from this project that will benefit efforts to protect our climate. Both involve the reduction of greenhouse gas emissions.

One will be the use of solar energy to power the monitoring units to be placed at the spillways. No new electrical power lines will have to be installed, thus reducing the need for electricity from power companies that burn fossil fuels to generate it.

Second, the monitoring benefits of the telemetry system mean that the number of visits by District trucks to the spillway sites will be reduced. Currently, three canal riders conduct routine manual inspections. The data sent to the District by the telemetry system will advise canal riders when they need to visit the spillways, drastically reducing the number of trips of gasoline-powered District trucks.

Economically Disadvantaged Hispanic Population

The District's population is predominantly Hispanic with an economically distressed profile. The entirety of the District geographically – municipal, unincorporated, and agricultural — is located in an area of persistent poverty. Both Cameron and Willacy County were designated by the US Department of Agriculture as persistent poverty counties.[5]

The percentage of people living below the poverty rate in the District communities is 32%.[6] In comparison, the rate is 26% in the neighboring city of Harlingen, 24% for the entire Cameron County, and 13% for the State of Texas.[7] The median household income for the District communities is $29,417. The income levels are significantly lower than the neighboring city of Harlingen at $43,003, Cameron County at $41,200, and the State of Texas at $63,826.[8]

Attachment C to this narrative is a profile of each of the small communities in the District followed by a compilation of US Census demographic information customized by the District for this population that is served by the District.

Diverse Water Customers

The District services 3,606 accounts and 31,665 acres of irrigated cropland and supplies raw water to the small Cameron County cities of La Feria and Santa Rosa and Sebastian in Willacy County as municipal wholesale users. It meets water orders on an as needed basis for flood irrigation to cropland. Furrow irrigation comprises 80% of the irrigation served by the District. It serves accounts for orchards and other operations on drip or micro emitter systems. The District services annual permits on 474 accounts that include lawn watering, parks, schoolyards, and ponds. This makes total accounts serviced at 4,080.

Crops benefiting from District water include: cotton, grain sorghum, food corn, feed corn, seed corn, sugar cane, pastures, citrus, cabbage, onions, peppers, cucurbits varieties, specialty vegetables, and nurseries and trees.

Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)

This section is not applicable.

Evaluation Criterion E—Planning and Implementation (8 points)

Up to 8 points may be awarded for these subcriteria.

[5] https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=101781

[6] Using individual city US Census data, the District calculated this poverty rate and the median household income level for the combined population of the three small cities that it serves.

[7] U.S. Census QuickFacts.

[8] Ibid.

Subcriterion E.1— Project Planning
Points may be awarded for proposals with planning efforts that provide support for the proposed project.

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study? *Please self-certify or provide copies of these plans where appropriate to verify that such a plan is in place. Including a specific excerpt or a link to the planning document may also be considered where appropriate.*

Water Conservation Plan
The District operates under the guidance of its Water Conservation Plan and Drought Contingency Plan to comply with the Texas Water Code. Attachment B to this application is a copy of the Plan.

The District is operating at the current time within a 5-year period of Water Conservation Goals to achieve an overall system efficiency of 65%. Its current and past rate has averaged 60%. To meet or exceed this goal, it will have to implement a series of conservation strategies. The reduction or elimination of water losses is key to that success. The plan states that the District is investigating funding for design and implementation of a monitoring system to better evaluate water loss in the District system.[9] Eventually, this improvement will enable the District to provide water delivery assurances to its customers with better storage of its river allotment.

This proposal for a telemetry monitoring system is a direct result of that District directive. It has conducted such a review and has identified the monitoring technology it requires to conserve its water supply.

Drought Contingency Plan
The District has a special concern and responsibility to assure continued delivery of water to municipal suppliers. In this case, the small cities of La Feria and Santa Rosa in Cameron County and the small community of Sebastian in Willacy County rely on the District to meet public water needs. To ensure continued delivery when no Rio Grande River water is being released to it due to low levels at the Falcon and Amistad Reservoirs upriver during drought conditions, the District must be excellent stewards of its stored water supply. Protecting public health and safety are paramount concerns. Accordingly, the District has a plan in place that has been used during such times to manage resources when no river diversions are forthcoming.[10] This plan enables the District to continue to provide water to its municipal customers.

[9] La Feria Irrigation District Cameron County No. 3, Water Conservation and Drought Contingency Plan (Adopted May 2012, Amended May 2019), p. 6.
[10] La Feria Irrigation District Cameron County No. 3, Water Conservation and Drought Contingency Plan (Adopted May 2012, Amended May 2019), p. 13.

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The current storage levels at the Falcon and Amistad Reservoirs are approaching historic low levels. The trend for further discharges to river water users is downward. It shows continued lowering of the future amount to be made available for users downstream from the reservoir, including the entire Lower Rio Grande Valley where the District is located.

Lower Rio Grande Basin Study (December 2013)
This Reclamation-funded project was funded under the authority of the SECURE Water Act (Public Law 111-11, Subtitle F) (Great Plains Region, Oklahoma-Texas Area Office.[11] The study was prepared to evaluate the impact of climate variability and change on water supply imbalances within an eight-county region (State of Texas Water Planning Region M) on the Texas-Mexico border in South Texas. This included the two counties that the District serves (Cameron and Willacy County).

A principal finding was that the region studied will face a deficit of 592,084 ac-ft/yr by the year 2060. Climate change is likely to increase that deficit by 86,438 ac-ft/yr. This would result in 35% of water demands being unmet. The population in the eight-county region was expected to grow from 1.7 million in 2010 to 4.0 million in 2060.[12] This reality will mean less reliable deliveries to all users dependent on Rio Grande River water via irrigation systems such as that operated by the District. It should be noted that the study's planning objective was developed to address the regional shortfall within the context of several requirements, including concentrating on Cameron, Willacy, and Hidalgo County needs.[13] As noted above, the District operates in two of these priority counties.

The study set a planning objective to define the parameters of action plans to address the projected water supply deficit. Specifically, the study set that to alleviate the imbalances it was advised to develop one or more alternatives in Cameron, Willacy, and Hidalgo Counties that will, among other requirements, provide a minimum of 86,438 acre-feet of water year round by 2060 and include actions that are with the reasonable control of local entities.[14]

[11] Lower Rio Grande Basin Study, p. S.1.
[12] Ibid., p. 1-2.
[13] Ibid., pp. S-3 and S-4.
[14] Ibid., p. S-5.

Among the water management strategies identified, Irrigation Conveyance System Conservation was one of the top two recommended actions to take to contribute solutions for greater water supplies. (The other was On-Farm Water Conservation).[15] The proposed action to install solar-powered telemetry monitoring to save an estimated 2,618 acre-feet of water is consistent with this water management strategy. The study noted that irrigation districts are upgrading conveyance infrastructure for irrigation with the assistance of the Bureau of Reclamation. The District wishes to contribute to this regional effort to make improvements to meet the serious projected water supply deficit for the eight-county border region analyzed for the Basin Study.[16]

Subcriterion E.2— Readiness to Proceed

Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement. Please note, if your project is selected, responses provided in this section will be used to develop the scope of work that will be included in the financial assistance agreement.

The District will be ready to proceed the day after an award notification is received. We propose the following project timeline:

6/1/23	Begin Environmental NEPA Clearance (THC, TPWD, TCEQ, USFWS) Begin Site Surveys and Design of Spillway Improvements
8/1/23	Obtain Environmental NEPA Clearance Complete Site Surveys and Design of Spillway Improvements
8/15/23	Begin Construction on Spillway Improvements
10/1/23	Complete Spillway Improvements
11/1/23	Begin Telemetry Public Advertisements
12/1/23	Award Telemetry Project to contractor
1/1/24	Begin Telemetry Installation
5/1/24	Complete Telemetry Installation

As shown in Attachment D. District Financial Ledger, the District maintains good financial standing to meet its 50% share of the project cost.

[15] Ibid., p. S-6.
[16] Ibid., p. 5-26.

Evaluation Criterion F—Collaboration (6 points)

Up to 6 points may be awarded for projects that promote and encourage collaboration among parties in a way that helps increase the sustainability of the water supply.

The District gained from our neighboring district, the Harlingen Irrigation District, information on the value of the proposed telemetry system. This sharing of information and experience with a vendor's product enables the District to streamline its ability to undertake the proposed project.

The District's respective experience to be gained with the telemetry system will enable personnel to document improvements in efficiency in operations and reduction of water losses. We intend to share that experience with our principal customer base – farmers – to encourage them to evaluate similar monitoring technologies for their own operations as they access water from the District's conveyances.

The letters of support (Attachment E) demonstrate support from the District's municipal customers and from the farmer community. The value of the city support is that this project opens another avenue for discussion on how municipalities can collaborate with the District to encourage water conservation practices, as were recommended by Reclamation in its Lower Rio Grande Basin Study. Similarly, the study made a strong case for the need of farmers to invest in on-farm and irrigation system water conservation. The District plans to share our experience with telemetry to then do outreach with farmers toward this end.[17]

Our project is also strongly supported by U.S. Senator John Cornyn. We intend this project to be the means to have a new conversation with the federal senator who has always been a supporter of both irrigation districts and Rio Grande Valley agriculture. We plan to conduct similar outreach to the yet-to-be determined new U.S. House Representative for District 34, as well as the new state representative and state senator all of which will be determined in the November 2022 election. This interaction will enable the District to expand access to other existing public programs that could help it make even more investments in other parts of the system operations that require an upgrade. We also plan to be in more frequent consultation with our legislators regarding future state or federal funding opportunities.

Evaluation Criterion G— Additional Non-Federal Funding (4 points)

This section is not applicable. We are requesting a 50%/50% cost share funding plan.

[17] Bureau of Reclamation, U.S. Department of the Interior and Rio Grande Regional Water Authority, Lower Rio Grande Basin Study (Denver, Colorado, December 2013), pp. 3.8-3.11.

Evaluation Criterion H— Nexus to Reclamation (4 Points)
Up to 4 points may be awarded if the proposed project is connected to a Reclamation project or Reclamation activity. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity.

Our project is connected to two Reclamation projects.

Lower Rio Grande Basin Study (December 2013)
This Reclamation-funded project was funded under the authority of the SECURE Water Act (Public Law 111-11, Subtitle F) (Great Plains Region, Oklahoma-Texas Area Office).[18] The study was prepared to evaluate the impact of climate variability and change on water supply imbalances within an eight-county region (State of Texas Water Planning Region M) on the Texas-Mexico border in South Texas. This included the two counties that the District serves (Cameron and Willacy County).

A principal finding states that the region studied will face a deficit of 592,084 ac-ft/yr by the year 2060. Climate change is likely to increase that deficit by 86,438 ac-ft/yr. This would result in 35% of water demands being unmet. The population in the eight-county region was expected to grow from 1.7 million in 2010 to 4.0 million in 2060.[19] This reality will mean less reliable deliveries to all users dependent on Rio Grande River water via irrigation systems such as that operated by the District. It should be noted that the study's planning objective was developed to address the regional shortfall within the context of several requirements, including concentrating on Cameron, Willacy, and Hidalgo County needs.[20] As noted above, the District operates in two of these priority counties.

The study set a planning objective to define the parameters of action plans to address the projected water supply deficit. Specifically, the study set that to alleviate the imbalances it was advised to develop one or more alternatives in Cameron, Willacy, and Hidalgo Counties that will, among other requirements, provide a minimum of 86,438 acre-feet of water year round by 2060 and include actions that are with the reasonable control of local entities.[21]

[18] Lower Rio Grande Basin Study, p. S.1.
[19] Ibid., p. 1-2.
[20] Ibid., pp. S-3 and S-4.
[21] Ibid., p. S-5.

Among the water management strategies identified, Irrigation Conveyance System Conservation was one of the top two recommended actions to take to contribute solutions for greater water supplies. (The other was On-Farm Water Conservation).[22] The proposed action to install solar-powered telemetry monitoring to save over 2,000 acre-feet of water is consistent with this water management strategy. The study noted that irrigation districts are upgrading conveyance infrastructure for irrigation with the assistance of the Bureau of Reclamation. The District wishes to contribute to this regional effort to address the serious projected water supply deficit identified by the study in collaboration with other water districts in the eight-county region..[23]

Lower Rio Grande Rehabilitation Project (late 1950s-1960s)

The Bureau of Reclamation made significant financial investments in District improvements in the late 1950s and into the 1960s. The District subsequently repaid the multiple loans. Below is a summary of this major public works project that benefitted the District and since then has continued to sustain the agricultural sector, which remains our principal customer of Rio Grande River water.

In 1959 the District entered into a contract with the U.S. Department of the Interior to repay $5,750,000 of construction costs to rehabilitate its water conveyance system.[24] First, though, Reclamation loaned $12,500 to prepare a definite construction plan report to verify the need for significant expenditures to improve the efficiency of operations and maintenance of water delivery works. The District then did advance work on the rehabilitation of the Second Lift and Tio Cano Pumping Plants that Reclamation later reimbursed for $180,000.[25] The final loan amount to be repaid over 35 years was $5,774,453.[26]

Rehabilitation work included the purchase and installation of new pumps as well as the rehabilitation of existing pumps and rehabilitation of the main canal and laterals. The main canal was dug out, trimmed, and lined with concrete. The work on the laterals included embankment operations, trimming, lining, and placement of concrete pipe at some locations. Reclamation's loan also funded rehabilitation of drains and drain control structures and construction of the Second Lift Pumping Plan building and a new shop building.[27]

More specifically, rehabilitation of the diversion and distribution facilities involved lining 21 miles of canals and laterals, repairing 35.1 miles of formerly unlined canals and laterals, placing 54.5 miles of pipeline, including replacing 9.6 miles of lined laterals in poor condition with pipeline, repairing or replacing structures, repairing or replacing pumping installations, enlarging

[22] Ibid., p. S-6.
[23] Ibid., p. 5-26.
[24] Rogers, Jedediah S., Lower Rio Grande Rehabilitation Project (Bureau of Reclamation, Historic Reclamation Projects, 2009) (Reprinted by Andrew H. Gahan, September 2013), p. 10.
[25] Ibid., p. 14.
[26] Ibid., pp. 16-17.
[27] Ibid., pp. 14-15.

the existing reservoir storage basin to 2,000 acre-feet capacity, cleaning vegetative growth from all unlined canals and laterals, and providing for maintenance roads.[28]

Drainage system work included reconstruction of the drainage pumping plant, cleaning and clearing all drains and ditches, enlarging or replacing some drainage structures, and providing maintenance roads along 153 miles of drainage system to allow for the use of mechanical maintenance equipment instead of manual labor.[29]

Typical operation and maintenance involved cleaning and clearing the canals and drains of weeds and woody plants. The District discontinued use of pesticides to eradicate weeds and woody plants and used shredders and draglines instead. In 1978, for example, the district cleared 158 miles of drains, 50 miles of pipelines, and 48 miles of canals at an annual cost of $20,913.[30]

Reclamation's investment in the District and neighboring irrigation districts can take credit for sustaining water delivery systems that in turn sustained the significant agricultural production of the Rio Grande Valley. Modern improvements in operations such as that proposed under this request represent the District's aim to preserve the value of such past federal investments. Conservation of water resources was then and continues to be a high priority for the District as well as to strive to make continued improvements.

IV. PERFORMANCE MEASURES

After installation of the proposed telemetry system, the District will be able to be alerted to spills and correct them sooner. As the District's three canal riders get more experience with the technology and managing the spills at an earlier rate, the water lost will significantly decrease. Additionally, all spills will be quantified and can be totaled and compared against current estimates. After several years, there will not be any further estimates, and hard numbers will be able to be compared in regards to water savings.

V. PROJECT BUDGET

The District is proposing a 50%/50% cost share budget. As shown below in Table 1, no other federal entity would contribute to the costs.

[28] https://www.usbr.gov/projects/index.php?id=344
[29] Ibid.
[30] Rogers, p. 17.

Table 1. Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. La Feria Irrigation District Cameron County No. 3	$106,454
Non-Federal Subtotal	$106,454
REQUESTED RECLAMATION FUNDING	$106,454

Table 2. Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$106,454
Costs to be paid by the applicant	$106,454
Value of third-party contributions	$0
REQUESTED RECLAMATION FUNDING	$106,454

Attached is Attachment A-Budget Detail Form and a separate Budget Narrative. The latter provides text explanations of each proposed cost.

VI. PRE-AWARD COSTS

This section is not applicable.

VII. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

The District proposes to indicate to the appropriate regulatory agencies that we do not anticipate any impact that would trigger any directives or compliance actions in order to allow the proposed project to proceed. All work proposed is in previously disturbed areas that are controlled by the District. We will submit clearance request letters to ensure NEPA compliance to all of the applicable entities including: the Texas Historic Commission (State Historic Preservation Office designee in Texas), the Texas Commission on Environmental Quality (TCEQ), USFWS, and the Texas Parks & Wildlife Department.

VIII. REQUIRED PERMITS OR APPROVALS

The District will be consulting with the approved vendor whether any permits are required or advisable for a custom-designed telemetry system. Final determinations will be made after consultation with the relevant federal and state agencies.

IX. OVERLAP OR DUPLICATION OF EFFORT STATEMENT

There is no overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel. This proposal submitted for consideration does not in any way duplicate any proposal or project that has been or will be submitted for funding consideration to any other federal or non-federal funding source.

X. CONFLICT OF INTEREST DISCLOSURE STATEMENT

The District does not see or foresee any actual or potential conflict of interest.

XI. UNIFORM AUDIT REPORTING STATEMENT

This section is not applicable.

XII. OFFICIAL RESOLUTION

Attachment F is the draft of the resolution that the District Board will review and approve at its next regularly scheduled meeting on August 12.

**** *End of Proposal* ****