

WaterSMART: Water and Energy Efficiency Grants for Fiscal Year 2024 – Funding Group II

United Irrigation District

Canal Automation and Metering



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Table of Contents

SF - 424 Application for Federal Assistance	
SF - 424C Budget Information	
SF - 424D Assurances	
Title Page	
Table of Contents	
Technical Proposal	1
(1) Executive Summary.....	1
(2) Project Location.....	2
(3) Technical Project Description.....	2
(4) Evaluation Criteria.....	20
A. Quantifiable Water Savings.....	20
B. Renewable Energy.....	25
C. Other Project Benefits.....	26
D. Disadvantaged Communities and Tribal Benefits.....	30
E. Complementing On-Farm Improvements.....	30
F. Readiness to Proceed.....	30
G. Collaboration.....	33
H. Nexus to Reclamation.....	34
Performance Measures.....	34
Budget Narrative.....	36
Environmental and Cultural Resources Compliance.....	42
Required Permits or Approvals.....	42
Overlap or Duplication of Effort Statement.....	42
Conflict of Interest Disclosure Statement.....	42

List of Figures

Figure 1 – Location Map.....	3
Figure 2 – Proposed Automated Gate & Meter Schematic.....	4
Figure 3.1 – First Lift Metering Gates Site Plan.....	5
Figure 3.2 – First Lift Metering Gates Plan & Profile.....	6
Figure 4.1 – Mission WTP #1 Flow Control & Metering Site Plan.....	7
Figure 4.2 – Mission WTP #1 Flow Control & Metering Plan and Profile.....	8
Figure 5 – Mission WTP #2 Flow Control & Metering.....	9
Figure 6 – Bryan Canal Automated Headgate.....	11
Figure 7 – SWSC WTP #1 Flow Control and Metering.....	12
Figure 8 – Bryan Canal @ Mile 5 Flow Control.....	13
Figure 9 – McAllen WTP #2 Flow Control and Metering.....	14
Figure 10 – Bryan Canal @ Mile 6 Flow Control.....	15
Figure 11 – SWSC WTP #3 Flow Control and Monitoring.....	16

Figure 13 – United Supplied Potable Water Service Areas.....31

Figure 14 – Flow Control Gate..... 22

Figure 15 – Flow Control & Metering Gate with Solar Pedestal..... 23

Figure 16 – Climate and Economic Justice Map..... 32

Figure 17 – Rio Grande River Basin Estimate Volumes Allotted to US.....28

Figure 18 – Amistad-Falcon Percent of Conservation Capacity..... 29

List of Tables

Table 1 – Historical Diversions and Efficiency.....21

Table 2 – Project Budget..... 39

List of Appendices

Appendix A – Budget Documentation.....43

Appendix B – Letters of Project Support..... 68



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Technical Proposal:

(1) Executive Summary

Date: February 22, 2024

Applicant: United Irrigation District, Category A Applicant, Funding Group II
Mission, Hidalgo County, Texas

United Irrigation District (United) is located along the Rio Grande in Hidalgo County, Texas and serves approximately 20,000 acres of land with irrigation and provides raw water to the cities of Mission and McAllen and the Sharyland Water Supply Corporation (SWSC); entities that cumulatively serve a population of about 300,000 with potable water. United proposes to install a total of seven (7) Flow Control & Metering Gates and four (4) Flow Control Gates, all of which will be electronically and remotely operated; and powered by standalone solar-powered batteries. These improvements will allow for the conservation of water by greatly increased efficiency in the control of water flow and the increased accuracy of water flow metering at the District's point of diversion on the Rio Grande, at points of water intake along District canals by potable water suppliers, and to irrigation demands via the District's Mission Main Canal and Bryan Canal. The proposed Flow Control & Metering Gates and Flow Control Gates will benefit both municipal and agricultural users within the District, in addition to all other water users within the Rio Grande system through the conservation of water resulting from the proposed project. The proposed project will result in an annual conservation of 1,537 acre-feet of water and reduce energy consumption at the District's First Lift Pump Station. The conserved water will remain in the Falcon and Amistad Reservoirs for eventual allocation to other users in the Rio Grande System, alleviating pressure on the over-allocated water resource shared with Mexico. The Rio Grande Falcon and Amistad Reservoirs, at the time of this application, are at 21.8% storage capacity, and the region is presently experiencing the worst drought since completion of Falcon Dam in 1954 and Amistad Dam in 1967, both on the Rio Grande, designed to reduce the severity of drought. Of the 25 irrigation districts in South Texas that rely on the dams, about half have no water for irrigation and the other half have initiated their Drought Contingency Plans. The project is consistent with the District's long term Water Conservation Plan and is identified in the "2021 Rio Grande Regional Water Plan." Conservation in the Rio Grande region is especially important, with a storage capacity in Falcon & Amistad reservoirs of 21.8% as of February 10th, 2024. Presently, the meters which the proposed Flow Control & Metering Gates will augment are read manually and require district personnel to drive out to them to do so. The proposed gates will allow for accurate, remote monitoring with the added benefit of reduced fossil fuel consumption by eliminating manual operation and observation of 11 different Flow Control and Flow Control & Metering Gates. The proposed project will serve as a foundation for continued water conservation improvements and continued dedication to better water management by the District and other water users in the Rio Grande system, allowing for more efficient use of water supplies and greater flexibility of water use to water managers in the region. The proposed project start date is January 2025, with an anticipated construction completion date of July 2026, with a final report submitted to the USBR by October 2026.

(2) Project Location

United Irrigation District of Hidalgo County (the District) is located in the Lower Rio Grande Valley Region with its main office in Mission, Texas. Figure 1 shows a location map of United Irrigation District in Hidalgo County and its boundaries. The District boundary encompasses 34,920 acres. The District currently serves approximately 20,000 acres of irrigated farmland where farmers grow citrus, vegetables, sugar cane, sorghum, corn, and hay. Figure 1 also shows a location map for the proposed Flow Control and Flow Control & Metering Gates at the First Lift Pump Station on the Rio Grande, along the District's Mission Main Canal and its Bryan Canal. The project is not located on a Federal facility. The latitude and longitude coordinates of the proposed project component sites are as follows:

- First Lift Pump Station Flow Control & Metering Gates: 26°11'03.39" N, 98°24'15.80" W
- City of Mission Water Treatment Plant No. 1 Flow Control & Metering Gate: 26°12'32.61" N, 98°19'49.36" W
- City of Mission Water Treatment Plant No. 2 Flow Control & Metering Gate: 26°14'10.52" N, 98°20'18.24" W
- Bryan Canal Automated Flow Control Headgate: 26°14'42.98" N, 98°19'53.61" W
- Sharyland Water Supply Corporation Water Treatment Plant No. 1 Flow Control & Metering Gate: 26°16'44.20" N, 98°16'42.41" W
- Bryan Canal at Mile 5 Flow Control Gate: 26°16'53.49" N, 98°16'41.02" W
- City of McAllen Water Treatment Plant No. 2 Flow Control & Metering Gate: 26°17'43.64" N, 98°16'07.63" W
- Bryan Canal at Mile 6 Flow Control Gate: 26°17'51.03" N, 98°16'06.15" W
- Sharyland Water Supply Corporation Water Treatment Plant No. 3 Flow Control & Metering Gate: 26°18'08.88" N, 98°19'54.45" W
- Mission Main Canal at Mile 6 Flow Control Gate: 26°18'27.92" N, 98°19'51.35" W

The above project component sites are located in or near the cities of Mission, Palmhurst, and Alton.

(3) Technical Project Description

The proposed project aims to conserve water and improve water management through modernization of water control and monitoring through the installation and implementation of seven (7) Flow Control & Metering Gates and four (4) Flow Control Gates. The proposed gates are powered by solar-charged standalone batteries and will allow for remote monitoring and operation in real time, greatly improving the precision of water deliveries as well as volume and flow data monitoring/reporting. Figure 2 shows the proposed Automated Flow Control and Flow Control & Metering Gate Schematic along the District's water conveyance system. At the District's First Lift Pump Station on the Rio Grande where water is diverted from, two Flow Control & Metering Gates (Figures 3.1 and 3.2) are proposed. Additionally, Flow Control & Metering Gates are proposed at the City of Mission's Water Treatment Plants No. 1 (Figures 4.1 and 4.2) and Water Treatment Plant No. 2 (Figure 5); one gate at each plant.

FIGURE 1
PROJECT LOCATION MAP

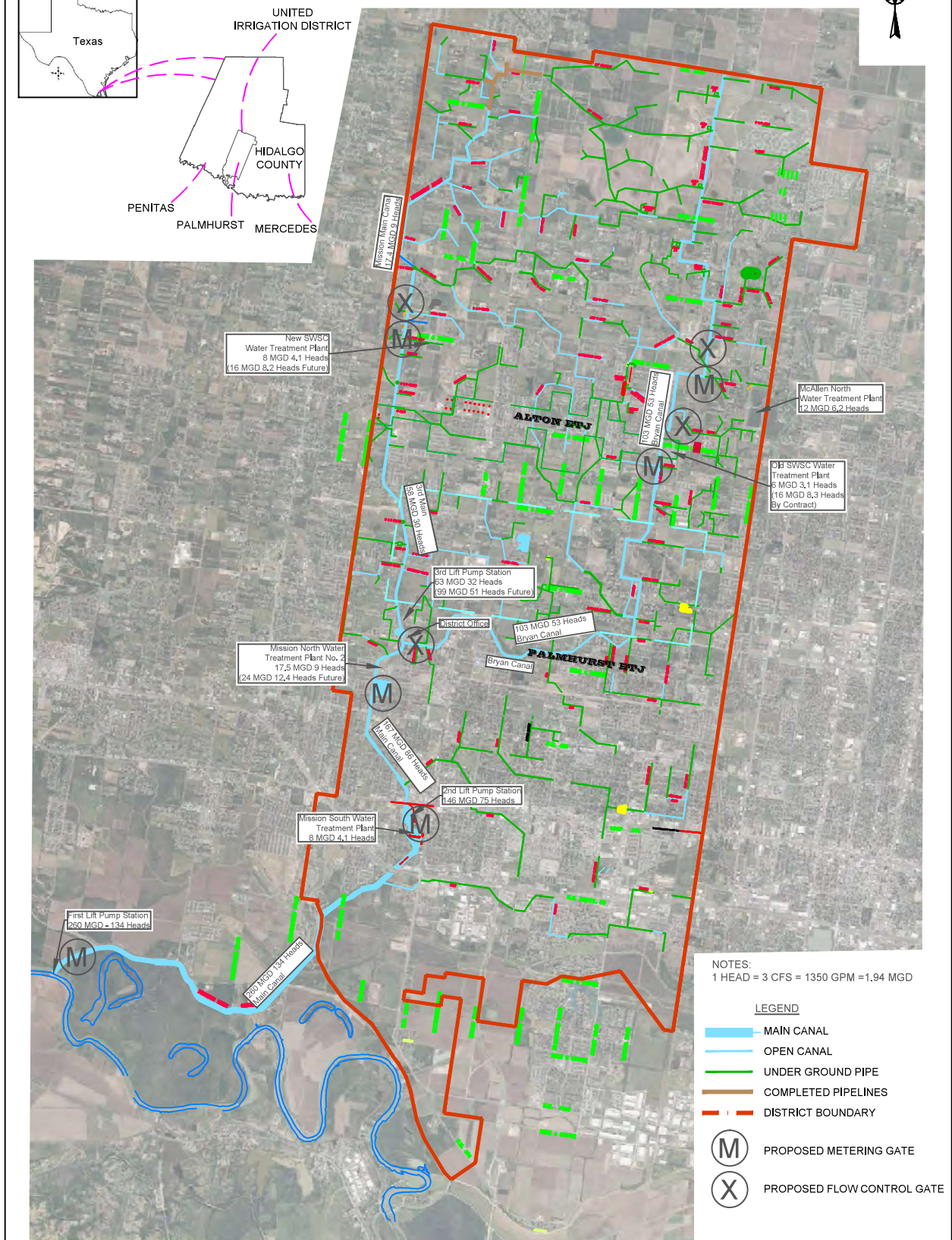
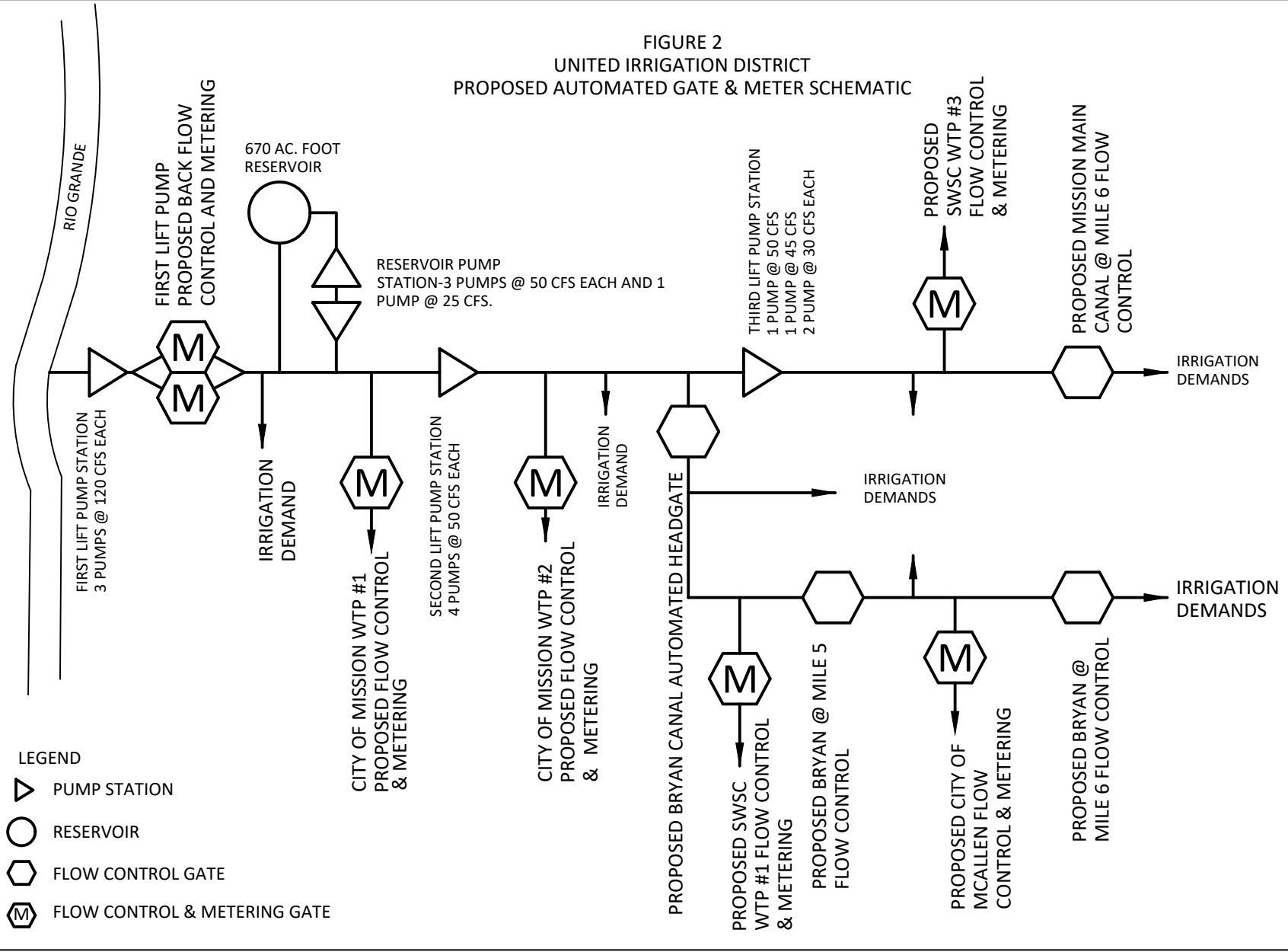
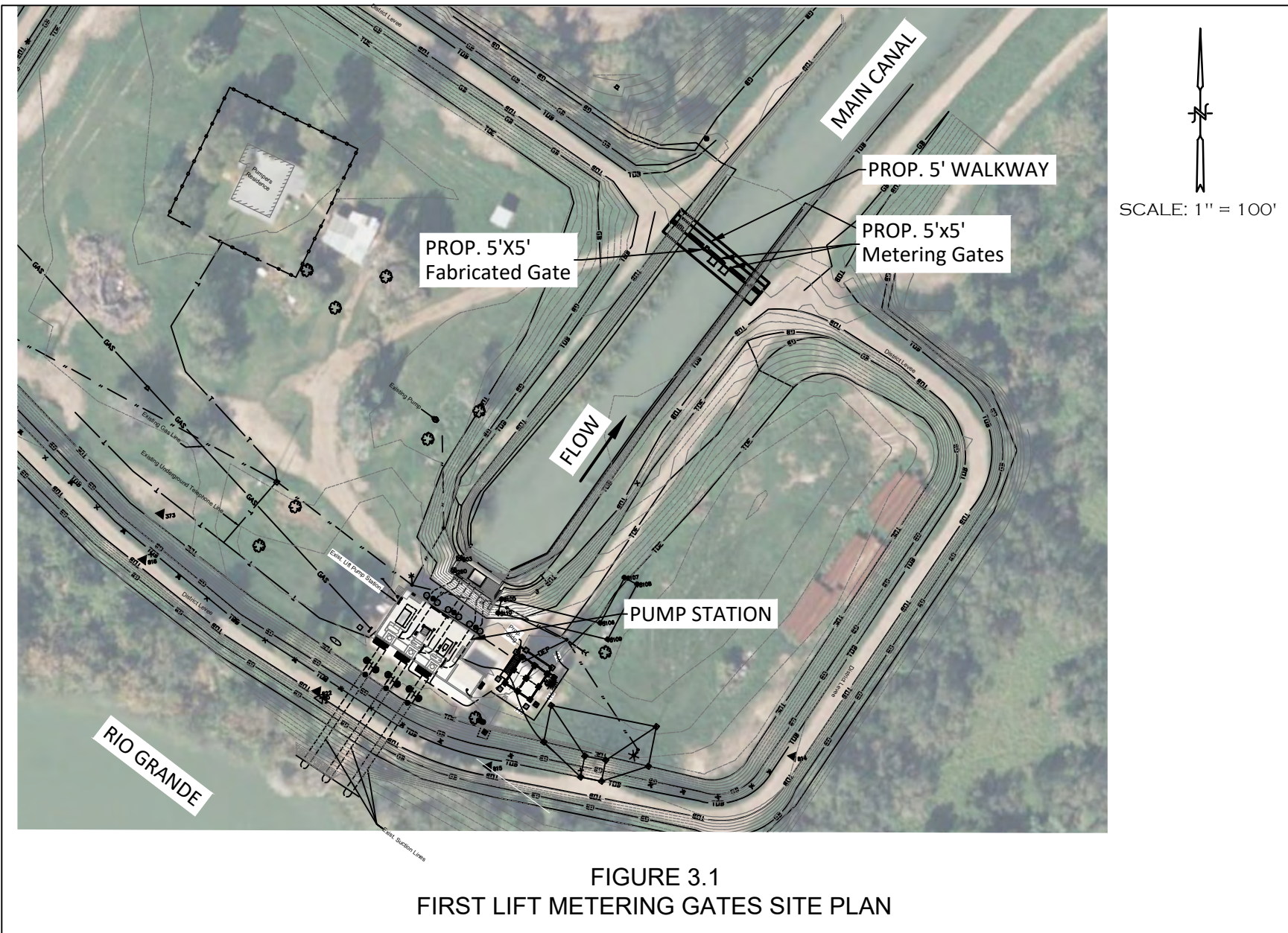
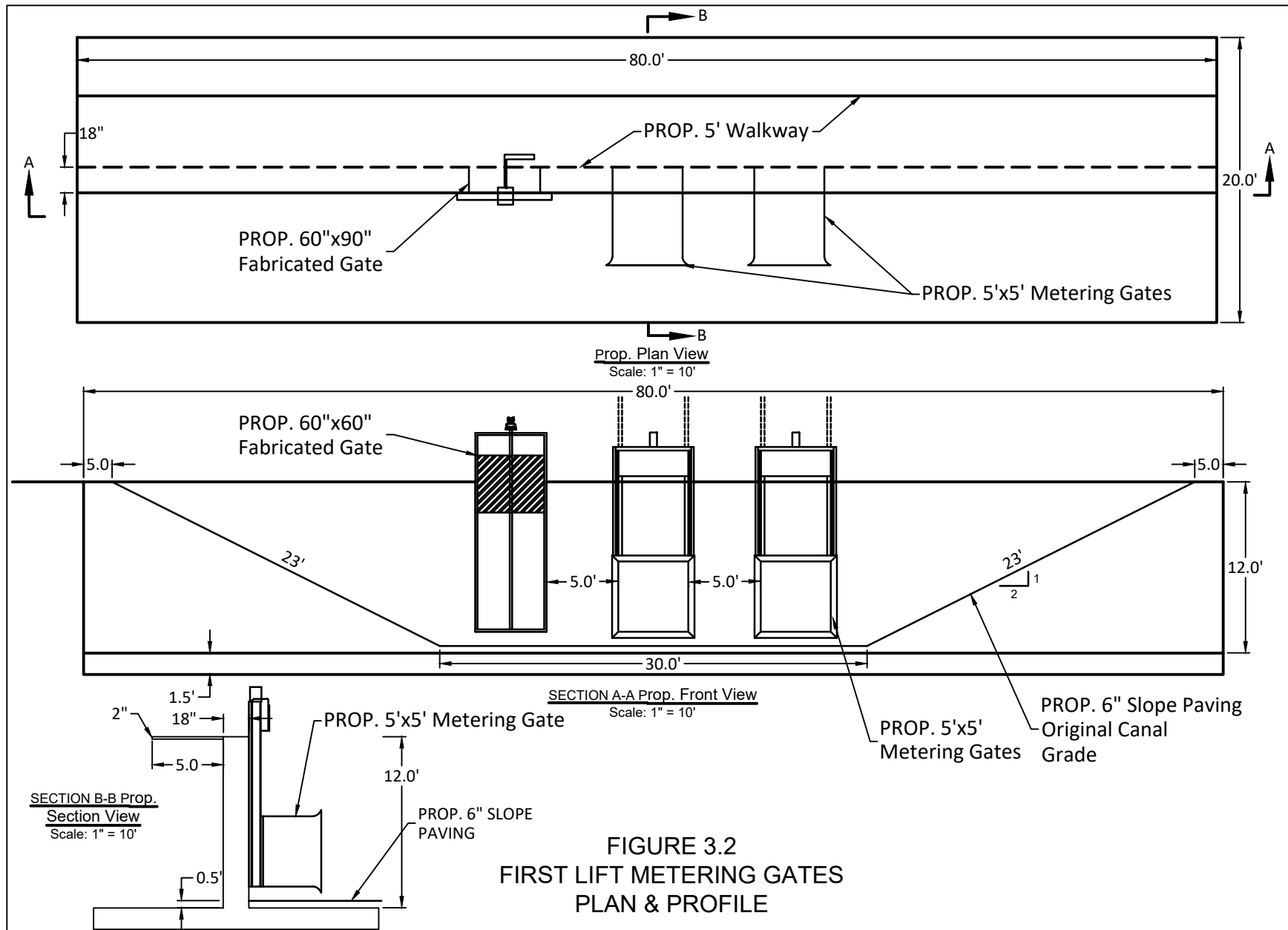
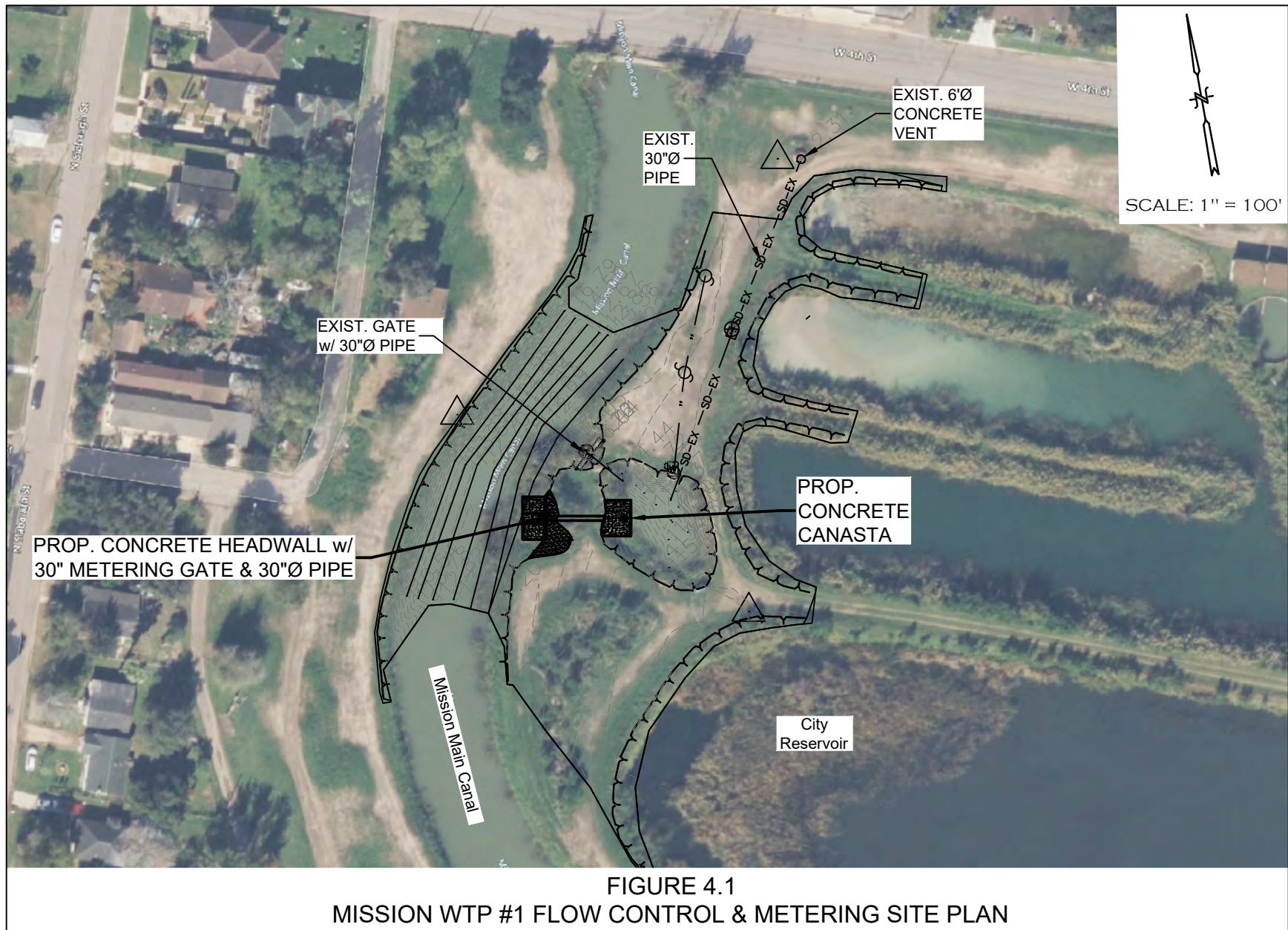


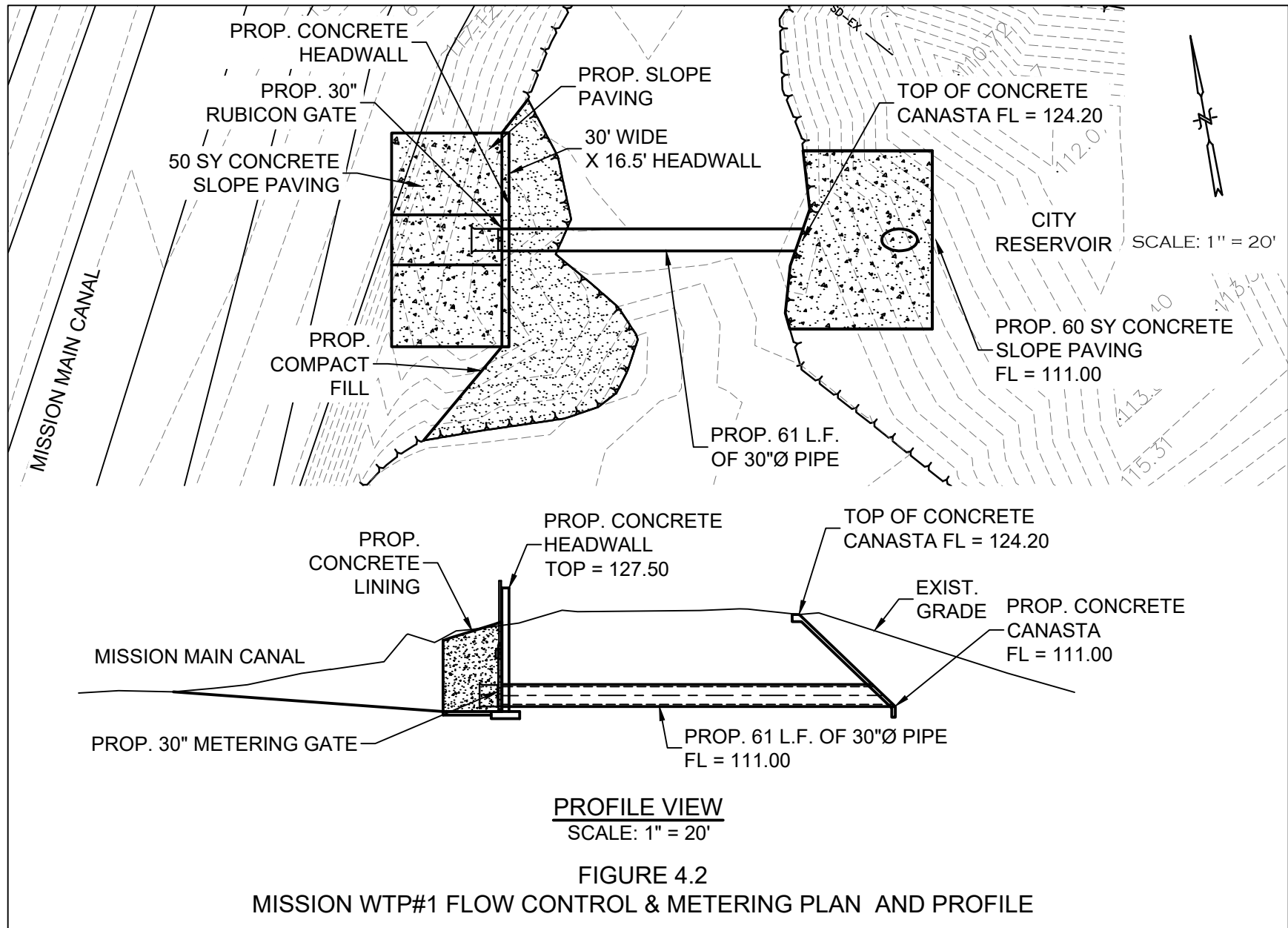
FIGURE 2
UNITED IRRIGATION DISTRICT
PROPOSED AUTOMATED GATE & METER SCHEMATIC











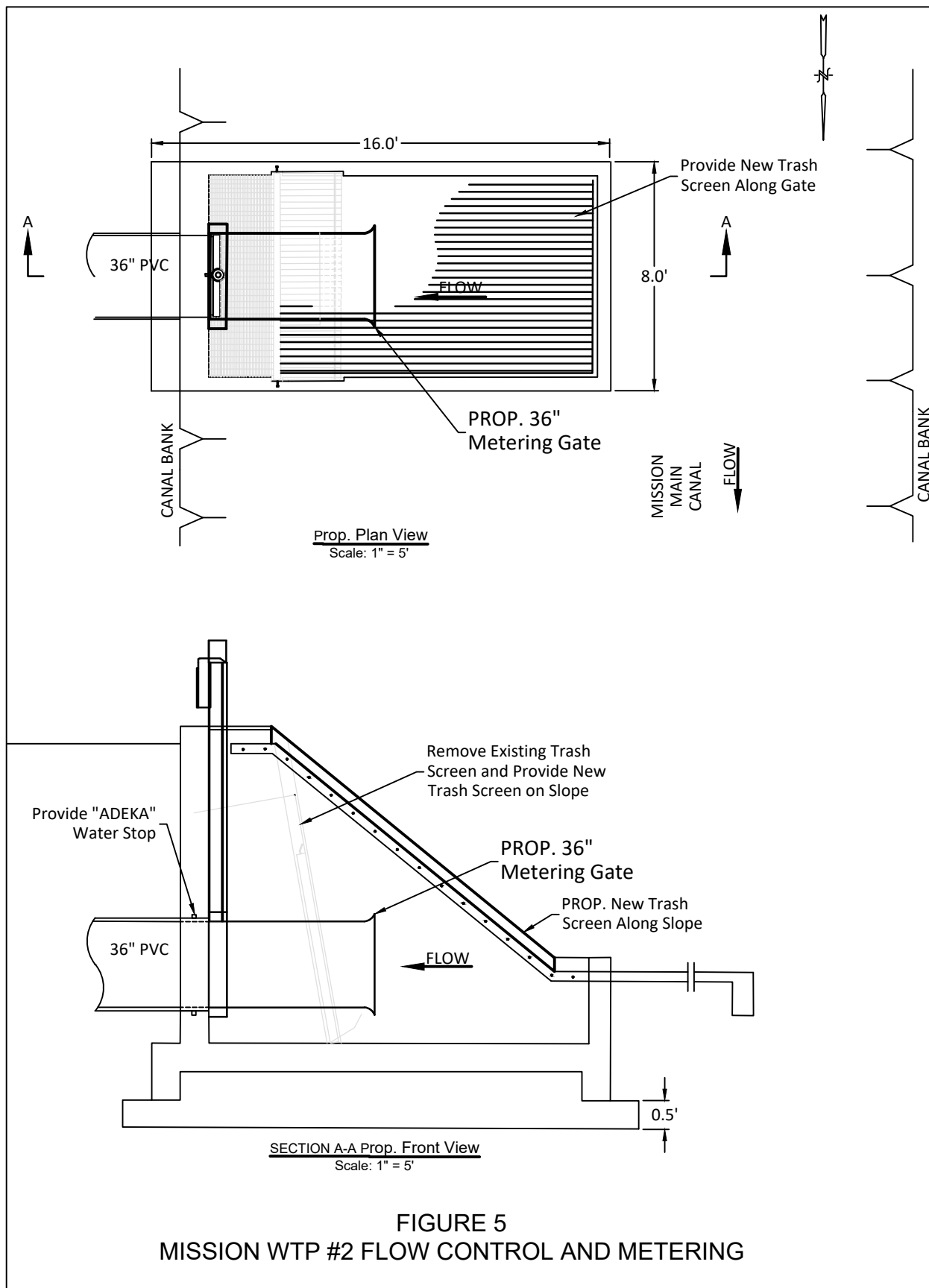


FIGURE 5
 MISSION WTP #2 FLOW CONTROL AND METERING

The District's Second Lift Pump Station is in between the two aforementioned City of Mission Water Treatment Plants.

Moving North, the start of the District's Bryan Canal tees off from the Main Canal. At the beginning of the Bryan Canal, a proposed automated Flow Control Headgate (Figure 6) will improve an existing manually actuated, worn, headgate structure. Following the Bryan Canal east, then north, the Sharyland Water Supply Corporation's Water Treatment Plant No. 1 will have a proposed Flow Control & Metering gate (Figure 7). Just to the north of that plant's intake and proposed gate, will be the proposed Bryan Canal at Mile 5 Flow Control Gate (Figure 8). Approximately one mile north along the Bryan Canal will be the proposed City of McAllen Water Treatment Plant No. 2 Flow Control & Metering Gate (Figure 9). Just north of that proposed gate, along the Bryan canal, will be the proposed Bryan at Mile 6 Flow Control Gate (Figure 10), regulating water flow and improving water management to irrigation demands to the north as well as a future district irrigation pump station further north. Back along the Mission Main Canal, just north of the proposed Bryan Canal automated Flow Control Headgate, lies the District office and the Third Lift Pump Station. North of the Third Lift Pump Station is the proposed Sharyland Water Supply Corporation's Water Treatment Plant No. 3 and the proposed Flow Control & Metering Gate for the plant's intake from the Mission Main Canal (Figure 11). Finally, and just to the north of the proposed SWSC WTP #3 gate, is the proposed Mission Main Canal at Mile 6 Flow Control Gate (Figure 12), which aids in water management in the form of canal flow control to northern irrigation demands as well as water level control south of the Flow Control Gate for the SWSC WTP #3.

The majority of consistently conserved water that is anticipated to result from the proposed project will come from the reduction in river losses by implementing the proposed Backflow Control & Metering Gates at the start of the Mission Main Canal. Just beyond the discharge of the three river pumps into the Mission Main Canal at its beginning, a proposed control structure containing a total of three gates, two (2) of which will be solar-powered Backflow Control & Metering Gates, with an additional third proposed 60"x60" Fabricated Gate. Any one or combination of multiple pumps, of the three river pumps, will flow through the Flow Control & Metering Gates, with the third Fabricated Gate serving as a backup gate. All proposed Flow Control & Metering Gates which will be located at water treatment plants will serve as backup meters in the event of outage or issues with the main meters, as well as allow for remote operation of flow control to the plants. The proposed gates will allow precise control over water delivery to the water treatment plants and maintain data to be used for ensuring that the existing meters are functioning properly and maintaining calibration. With water conveyance through the Mission Main and Bryan Canals serving municipal and agricultural entities/customers, these meters will show real-time water flow through the District and ensure that only the necessary amount of water is ordered from the Rio Grande Watermaster and diverted from the Rio Grande. Should an event arise such as a pipe or canal failure, water theft, or scheduled infrastructure maintenance, the District can use the proposed project components to aid in the identification of these issues and facilitate maintenance such that water loss is minimized or eliminated.

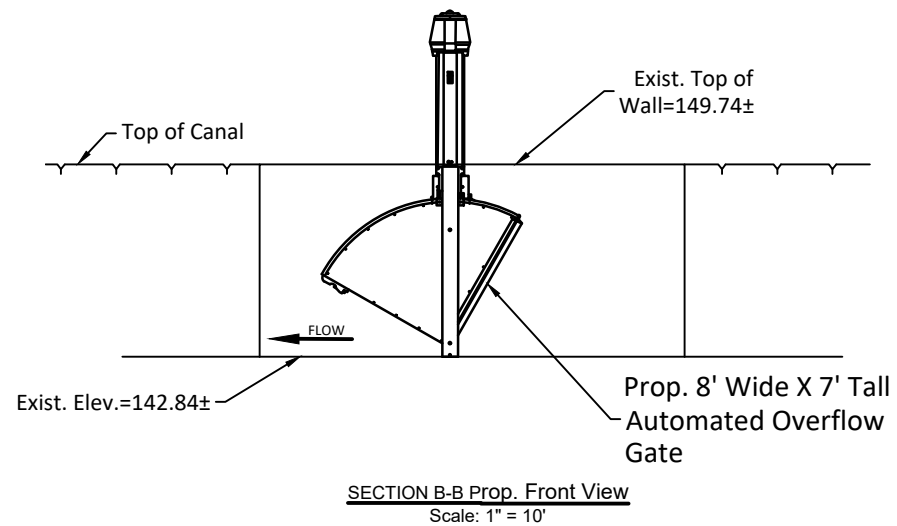
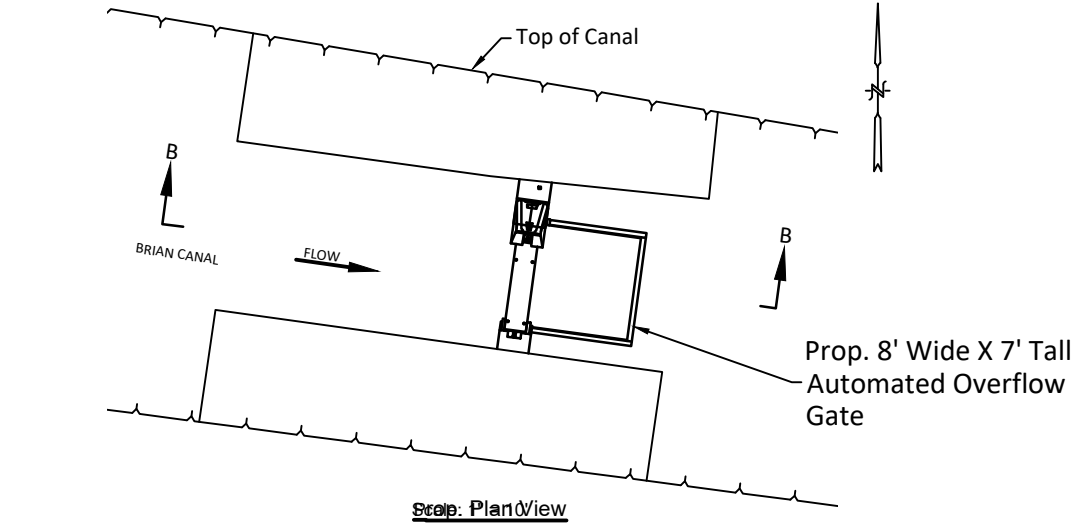


FIGURE 6
BRYAN CANAL AUTOMATED HEADGATE

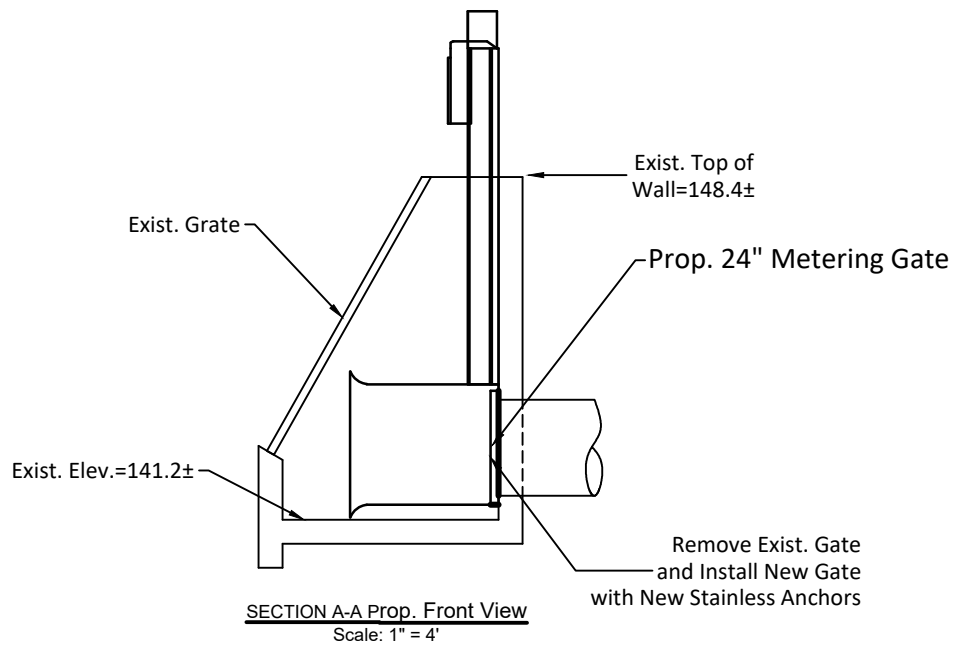
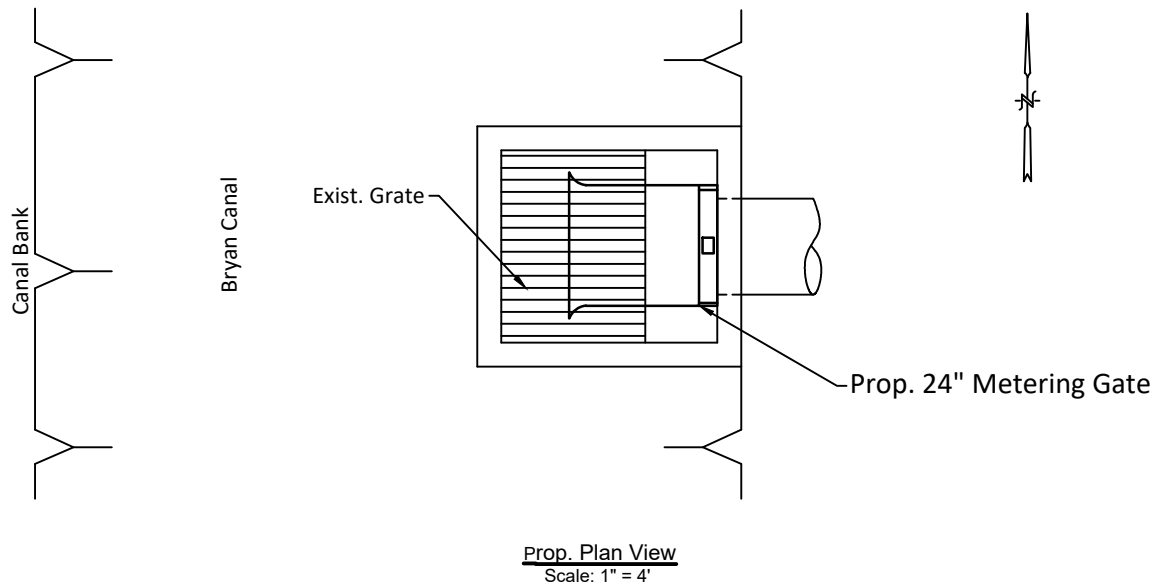
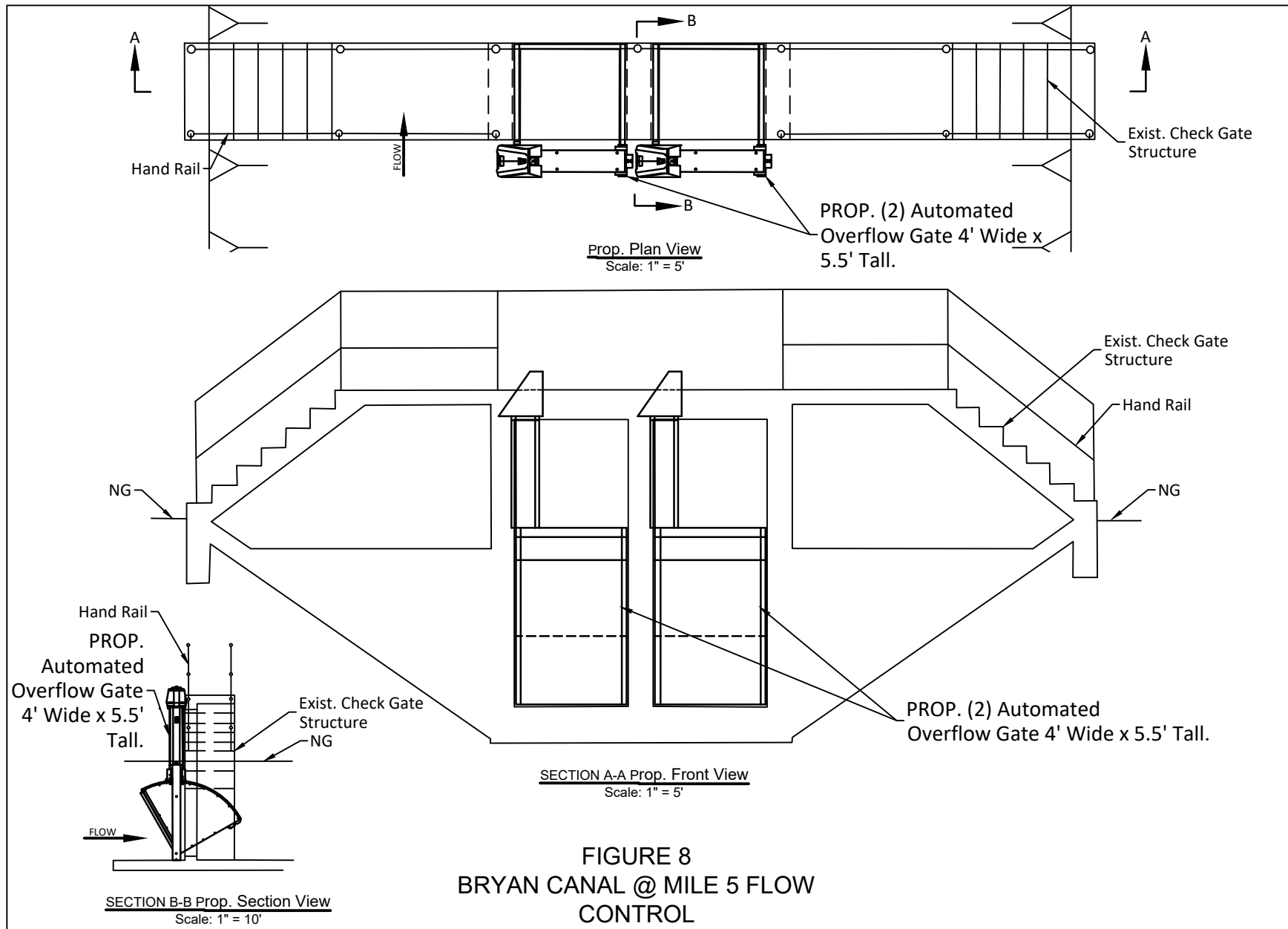
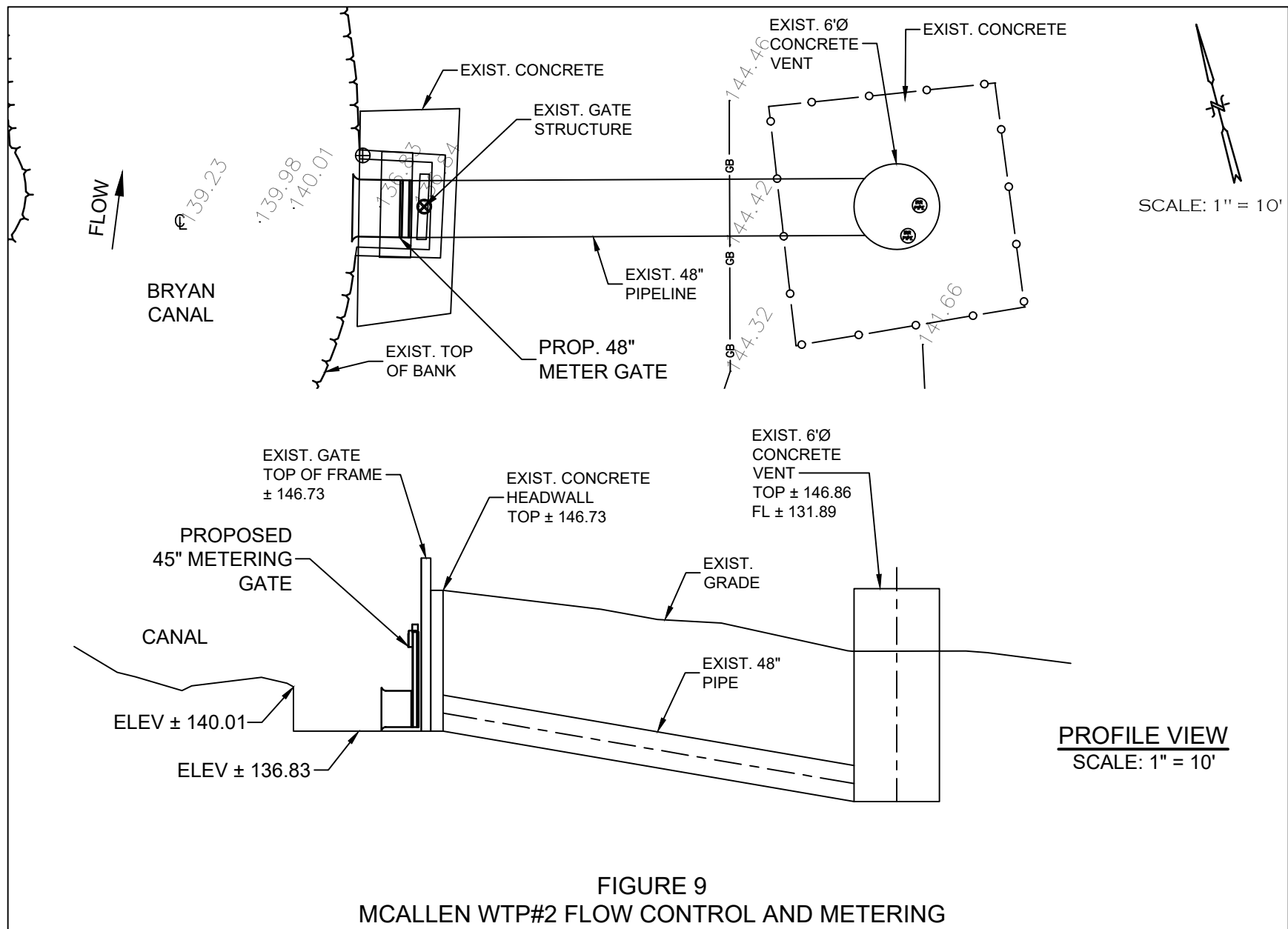
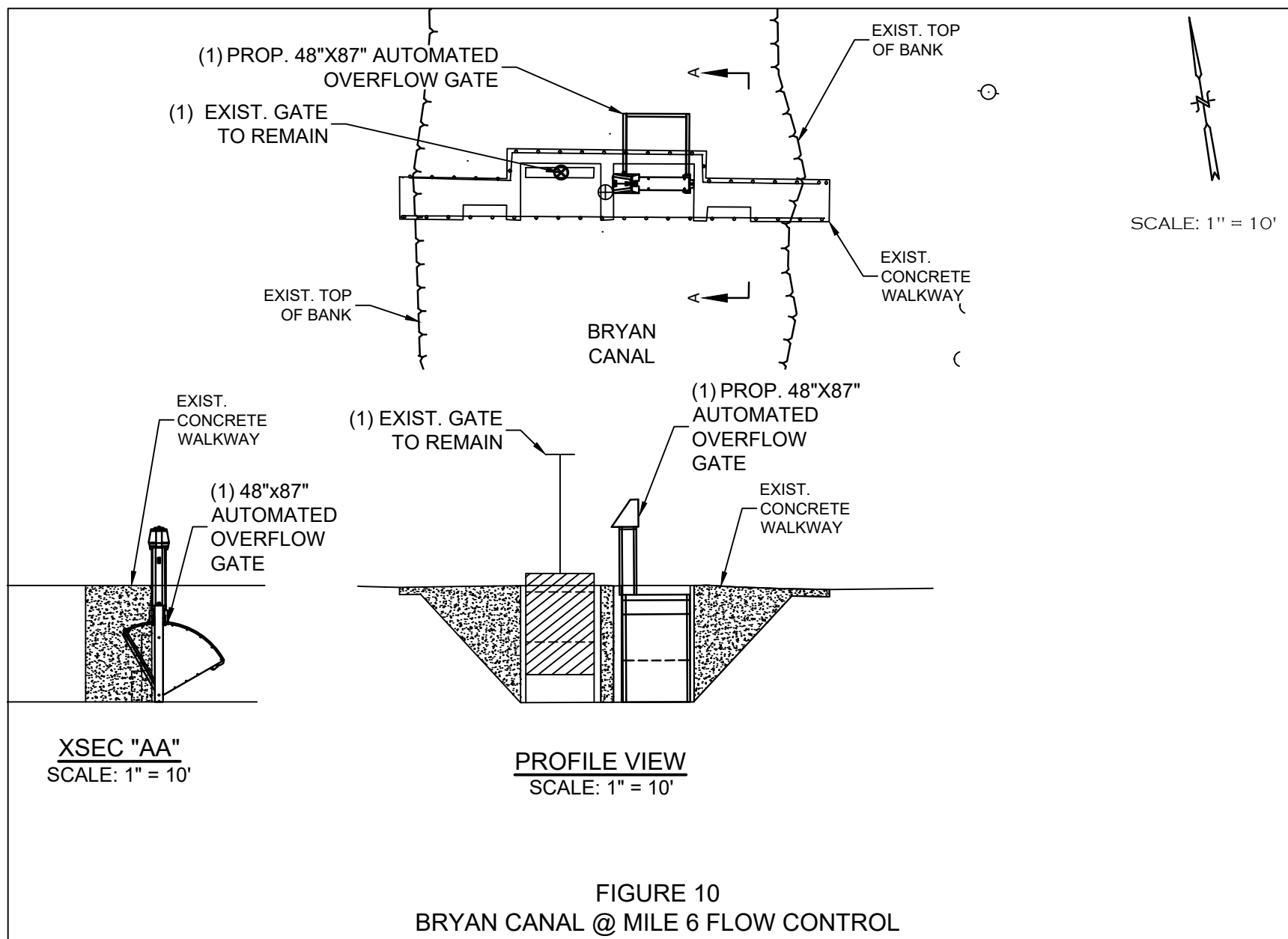
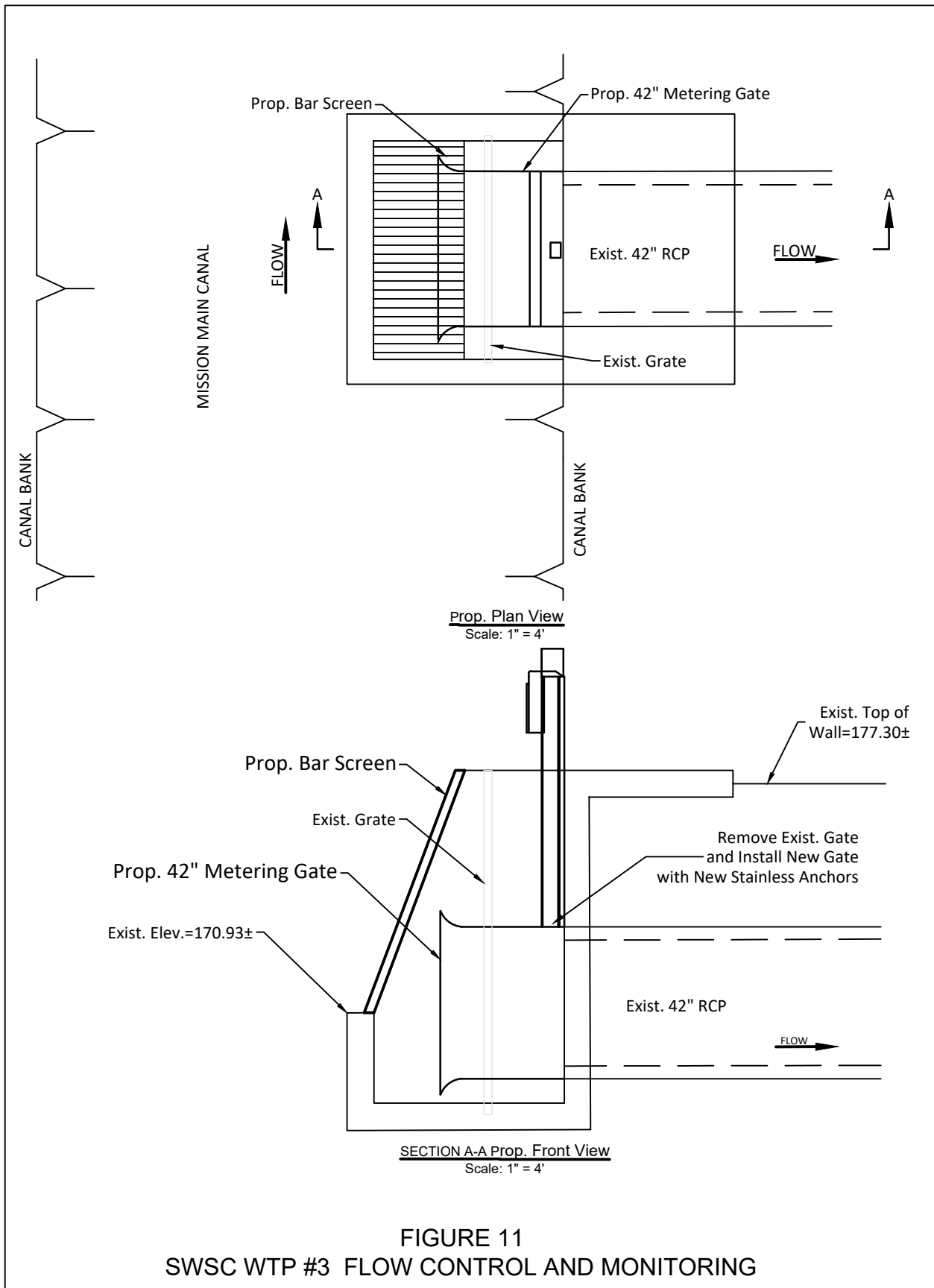


FIGURE 7
SWSC WTP #1 FLOW CONTROL
AND METERING









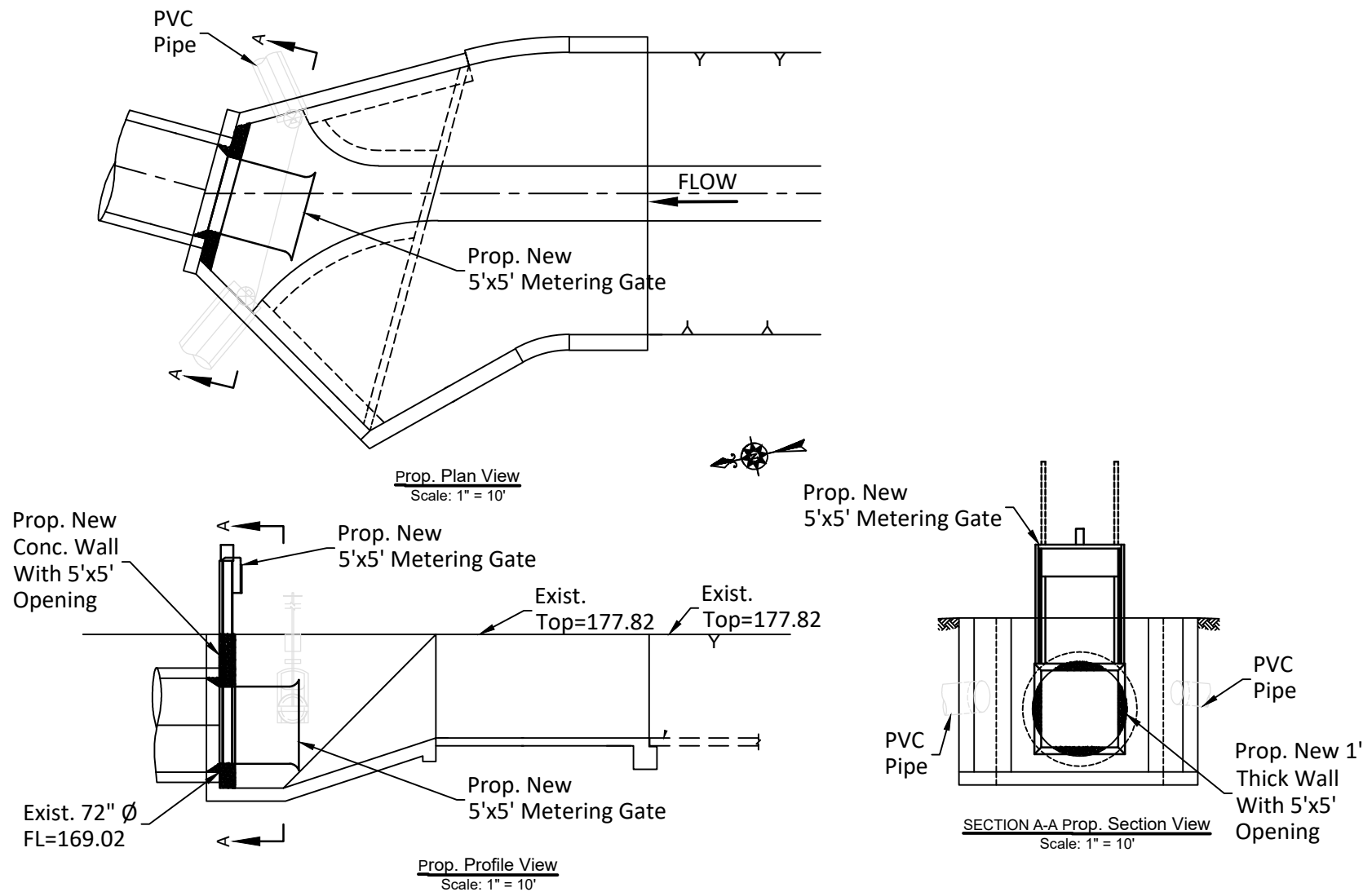


FIGURE 12
MISSION MAIN CANAL @ MILE 6 FLOW CONTROL

The proposed Flow Control Gates and Flow Control & Metering Gates are all located at sites with existing manual gates and meters, with the exception of the two proposed Flow Control & Metering Gates at the First Lift Pump Station at the start of the Mission Main Canal and the proposed Flow Control & Metering Gates at the City of Mission Water Treatment Plant No. 1. The existing gates and meters allow for little to no modification or construction required at these sites other than the adaptation of proposed metering gates to the existing structures and dewatering for installation. The two 60" x 60" Flow Control & Metering Gates at the First Lift Pump Station and the fabricated manual auxiliary gate on the Rio Grande will require the construction of a control structure to mount the three gates and allow for any combination of operating the three river pumps to flow through the structure for ease of use and water flow data observation and analysis. This structure, shown in detail in Figure 3, is 80' wide to span the Mission Main Canal's width, and 20' long for an adequate footing and structural integrity, with 6" of concrete paving following the canal's 2:1 slope, 12' deep from the bottom of the canal to the top of the canal bank. The proposed structure will also have a walkway to facilitate manual actuation of the auxiliary gate and maintenance/inspection of the two Flow Control & Metering Gates. The construction of this structure will involve the placement of dirt dams on either side of the proposed structure's location, dewatering between the dirt dams, and a bypass pumping system to allow for continued pumping operations by the District. This component of the proposed project, while having the largest cost component, also achieves the greatest water conservation benefit and is paramount in the improvement of water management within the District. Equipment involved in the construction of the two project component sites at the First Lift Pump Station and the City of Mission Water Treatment Plant No. 1 will involve the use of an excavator, backhoe, bulldozer, and dump truck and will require concrete, steel reinforcement, a dewatering pump, and geosynthetic impermeable canal liner under concrete slope paving. The District has geosynthetic liner leftover from other improvement projects on hand.

The proposed Mission Water Treatment Plant No. 1 Flow Control & Metering Gate's construction involves the placement of a dirt dam, dewatering, excavation of the proposed headwall area, the construction of a 30' wide by 16.5' tall concrete headwall, and 50 square yards of concrete slope paving on the canal side of the intake, and 50 square yards of concrete on the side of the water treatment plant's pond, with compacted fill behind the headwall. This proposed Flow Control & Metering Gate is not replacing an existing gate, but is being constructed at a location where the canal had been partially excavated on the side of the water treatment plant for a planned intake structure and gate that was not completed. Between the proposed 30" Flow Control & Metering Gate at the headwall on the canal side, and the proposed concrete canasta, or pipe outlet structure on the pond side, will be 61 linear feet of proposed 30" PVC pipe. Dewatering and excavation at the canasta site in the pond will also be required.

The proposed Mission Water Treatment Plant No. 2 Flow Control & Metering Gate's construction involves the removal of the existing, nearly vertical trash screen, which will be replaced prior to completion of new 36" x 36" Flow Control & Metering Gate installation with a trash screen at a more gradual slope, for greater area and more effective filtering of large debris while maintaining water flow. The new Automated Flow Control & Metering Gate will be installed onto the existing structure to improve the existing manually actuated gate.

The proposed Bryan Canal Automated Flow Control Headgate will be an upgrade of the existing manual headgate with a new 96" wide, 87" tall Automated Flow Control Headgate.

The proposed Sharyland Water Supply Corporation Water Treatment Plant No. 1 Flow Control & Metering Gate's construction involves upgrading of the existing manually actuated gate with a proposed 60" x 60" Automated Flow Control & Metering Gate and new stainless-steel anchors.

The proposed Bryan Canal at Mile 5 Flow Control Gates will improve the existing manual check gates on an existing concrete check structure on the Bryan Canal. Two 48" wide, 60" tall Automated Flow Control gates will be installed onto the existing structure with all new mounting hardware.

The proposed McAllen Water Treatment Plant No. 2 Flow Control & Metering Gate's construction involves dewatering of the canal with dirt dams, and upgrading the existing manually actuated gate with a proposed 48" x 48" Automated Flow Control & Metering gate.

The Proposed Bryan Canal at Mile 6 Flow Control simply involves upgrading one of the existing manual gates with a new 48" wide, 87" tall Automated Flow Control Gate.

The proposed Sharyland Water Supply Corporation Water Treatment Plant No. 3 Flow Control & Metering Gate's construction involves the removal of the existing vertical trash screen/grate to be improved with a proposed sloped trash screen due to the increased protrusion from the headwall of the proposed 42" x 42" Automated Flow Control & Metering Gate in comparison to the existing manually actuated gate. The existing manually actuated gate will be removed and upgraded with the proposed metering gate.

The proposed Mission Main Canal at Mile 6 Flow Control involves dewatering, the construction of a concrete headwall at the north end of the open Mission Main Canal, at the point where the canal transitions into an existing 72" pipeline. This concrete wall will serve as the mounting structure for a proposed 60" x 60" Flow Control Gate.

All proposed Flow Control Gates, Flow Control Headgates, and Flow Control & Metering Gates will have a remote mounted pedestal at the top of the canal bank adjacent to the proposed gates.

The remote mounted pedestals will all have a solar panel of approximately 85 watts, an antenna, and house a 56 Amp-hour sealed gel 12 Volt DC battery, as well as all controls and supporting electronics for gate operation and metering data. The remote mounted pedestals will provide remote operation, remote monitoring, and data analysis, all available from District computers and the smartphones of District personnel. The proposed Flow Control & Metering Gates will utilize ultrasonic velocity sensors to measure water velocity and water level as it flows through the Metering Gates for accurate water flowrate and volumetric data monitoring and control, accomplished remotely and greatly increasing District operational efficiency. Figures 14 and 15 show two automated, remotely operated and monitored Flow Control and Flow Control & Metering gates in Hidalgo County Irrigation District No. 2, which have been implemented for years with excellent results in conserving water and improving water management.

(4) Evaluation Criteria

Evaluation Criteria A: Quantifiable Water Savings

Table 1 depicts the historical water diversions and deliveries by United Irrigation District from 2013 to 2023 as well as annual efficiencies both at the point of diversion on the Rio Grande and within the District itself. By installing the proposed backflow control and metering gates at the river, and ordering water from the Rio Grande Watermaster based on real-time demands reported by all the proposed meters, an estimated 75% of current river losses will be eliminated. In 2023, 3,401 acre-feet of water was lost downriver due worn or partially obstructed flap gates at the main canal headwall, and difficulty in managing water and predicting demand due to outdated reporting methods which present delays. This figure for river losses, or water lost downriver, that would have otherwise been diverted from the river by the District into its Mission Main Canal and distributed through District conveyance infrastructure to be delivered to municipal and agricultural users, was an average of 2,049 acre-feet over the last 5 years from 2019 to 2023. By using the proposed project's new meters, real time data will be available to aid in water management through more accurate water demand forecasting and ordering. An estimated 1,537 acre-feet of water will be conserved annually by the proposed project, based on an estimated conservation of 75% of the recent 5-year average river losses. However, this water conservation estimate is conservative, as other water management issues will be addressed by the proposed project, although they are more difficult to quantify. The proposed Flow Control & Metering gates will contain meters which utilize ultrasonic sensors to read velocity and water level through the gates for extremely precise and real-time measurement of water flowrate and total volume from the district office and the smartphones of District personnel. The District maintains a water accounting ledger, updated weekly with each water diversion from the Rio Grande, and each monthly delivery total for all potable water suppliers and municipalities. In addition, the District maintains irrigation ticket sales software which compiles all sold water for agricultural use and yard watering. Annual water use surveys are completed and filed with the Texas Water Development Board, and the District maintains a 5-year Water Conservation Plan as well as a 5-year Drought Contingency Plan.

Table 1
United Irrigation District
Historical Deliveries and Efficiencies

Fiscal Year	Total Pumped Water (Acre-Feet)	Agriculture In-Dist (Acre-Feet)	Agriculture Out-Dist (Acre-Feet)	Sharyland WSC (Acre-Feet)	City of Mission (Acre-Feet)	City of McAllen (Acre-Feet)	In District Lost Water (Acre-Feet)	Total Accounted Water (Acre-Feet)	In District Water Loss (Percent)	River Losses (Acre-Feet)	River Losses (Percent)	Overall Efficiency (Percent)	Rainfall (Inches)
2013	57,243	23,147	434	5,682	14,585	9,253	4,141	53,102	7.2%	2,385	4.0%	88.8%	17.33
2014	47,727	17,929	49	4,745	13,421	7,657	3,927	43,800	8.2%	1,989	4.0%	87.8%	22.66
2015	31,730	4,349	26	3,591	11,863	5,509	6,392	25,338	20.1%	1,640	4.9%	74.9%	29.38
Calendar Year													
2016	41,389	9,024	1,250	7,246	13,951	3,901	6,017	35,372	14.5%	1,497	3.5%	82.0%	17.03
2017	50,959	19,253	1,300	7,538	15,058	7,292	518	50,441	1.0%	1,875	3.5%	95.4%	19.92
2018	40,709	10,416	216	6,157	13,925	5,488	4,508	36,201	11.1%	721	1.7%	87.2%	29.48
2019	45,600	12,274	849	6,068	14,315	7,399	4,695	40,905	10.3%	1,501	3.2%	86.5%	16.52
2020	40,634	11,993	376	5,830	14,042	6,703	1,690	38,944	4.2%	1,971	4.6%	91.2%	25.76
2021	34,421	5,314	163	6,134	13,998	7,393	1,419	33,002	4.1%	3,107	8.3%	87.6%	33.05
2022	40,662	6,229	315	7,815	17,068	6,594	2,641	38,021	6.5%	267	0.7%	92.9%	17.68
2023	40,455	7,610	96	5,987	14,930	4,812	7,021	33,434	17.4%	3,401	7.8%	74.9%	19.01
10 Year Average	41,429	10,439	464	6,111	14,257	6,275	3,883	37,546	9.7%	1,797	4.2%	86.0%	23
Recent 5 Year Average	40,354	8,684	360	6,367	14,871	6,580	3,493	36,861	8.5%	2,049	4.9%	86.6%	22

Adjusted City of Mission to include 2,603 Acre-Feet for meter inaccuracies.

2021 Notes: Adjusted Sharyland WSC to include 202 Acre-Feet for meter inaccuracies.

Due to meter problems at the river, river losses were likely lower while in district losses were likely higher. Overall efficiency would remain unchanged.

2022 Notes: Meter inaccuracies resulted in a correction to total water pumped.

Figure 14
Flow Control Gate



Figure 15 – Flow Control & Metering Gate with Solar Pedestal



Additional sources of water losses include small-scale theft of water using portable pumps to steal water from open canals, canal breaks, leaks of or damage to exposed irrigation fittings on farms. There are no benefits to lost water in the context of the proposed project; and any water lost down the Rio Grande River flows into the Gulf of Mexico. While District field personnel (canal riders) are vigilant in patrolling and inspecting infrastructure, United Irrigation District encompasses nearly 35,000 acres with approximately 25 miles of open canal for canal riders to inspect and District personnel to maintain. The proposed remote monitoring capabilities and subsequent future expansion of remotely operated and monitored infrastructure, and technological advancements in District operations will allow the District to focus their field resources on water conservation and management. This will address any potential issues such as canal or pipeline leaks and breakages in a more timely manner and stay even more up to date on maintenance which will improve water use efficiency. Existing meters at the First Lift Pump Station are Doppler meters, which are very accurate when they work. However, the meters at the First Lift Pump Station are installed in the suction piping of the pumps and in fairly close proximity to the pumps themselves. Ideally, these meters would be installed on the discharge piping from the pump at an adequate distance from the pumps themselves. With a short run of discharge piping between the pumps and the Mission Main Canal, an ideal and accessible location for meter installation is not viable. Additionally, when the pumps are not running, the meters are within dry pipe, allowing for biological fouling which hinders the meter's accuracy and requires constant upkeep and cleaning. The proposed Flow Control & Metering gates at the First Lift Pump Station represent the most cost-effective and water-efficient solution to improve metering at the pump station, considering the additional need for flow control together in an integrated solution. All other existing meters at the water treatment plants involved in the proposed project are magnetic meters, which are also generally accurate. However, flow control is a primary goal of the proposed project, and the installation of Flow Control & Metering Gates allow for the integration of the proposed meters as backups and a means of verifying existing magnetic meter calibration, as well as obtaining water flow data remotely and instantaneously, without the need for travel by District personnel. Standalone solar-charged battery power at the meters also offers resilience to inclement weather and power outages which impact flow control and water metering. Meter accuracy is verified using the District-maintained water accounting ledger and comparison to ledgers of previous years on a monthly increment, referencing historical seasonal demands. Water supply and delivery contracts maintained between the District and potable water suppliers all have provisions for meter ownership and maintenance responsibilities and calibration schedules. The proposed meters will be monitored for accuracy via computer or smartphone.

Evaluation Criteria B: Renewable Energy

B.1. Implementing Renewable Energy Projects Related to Water Management and Delivery

All eleven proposed Flow Control Gates and Flow Control & Metering Gates will be powered by new renewable energy capacity in the form of 100% solar energy with batteries to store the solar energy for 24/7 access to monitoring and control. The Flow Control Gates and Flow Control & Metering Gates will each have one 85-Watt solar panel and a 56 Amp-hour sealed gel cell 12 Volt DC battery for standalone power and 100% renewable energy operation. The total solar energy production capacity of the proposed project is 935 Watts. Based on South Texas' peak sun hours (PSH) at 5.5 hours per day, the proposed project will generate 1,500 kWh in total, annually. Figure 15 shows a similar remote pedestal to those that will be present at every proposed Flow Control Gate and Flow Control & Metering Gate.

B.2. Increasing Energy Efficiency in Water Management

In addition to the solar energy generated by the proposed project, improved water efficiency and water management of the proposed project will result in reduced grid-power consumption by minimizing water losses. Minimizing water losses within the District, in any form, reduces the amount of water diversions needed from the Rio Grande. As Rio Grande diversions are reduced, power consumption by lift pump motors is reduced as well. Within the District, water is lifted a total of three times through the First Lift Pump Station, Second Lift Pump Station, and Third Lift Pump Station to lift water to an elevation high enough for gravity conveyance through most of the system to municipal and agricultural water users served by the District. The District primarily uses electric motors to drive lift pumps to accomplish this conveyance, but the district does have natural gas driven lift pumps for backup and for continued operation during power outages due to inclement or extreme weather. The conservation achieved by the proposed project significantly reduces energy consumption by the district at its First Lift Pump Station in electricity, and in reduced natural gas consumption when the District must operate the natural gas driven pump, increasing energy efficiency, and reducing the creation of greenhouse gas emissions. This reduction in energy consumption helps ensure that more American energy is available to meet our security and economic needs

Pumping needs will be reduced at the First Lift Pump Station has three 60" horizontal, centrifugal pumps, with two pumps having 500hp electric motors and the third pump having a backup/emergency 500hp Waukesha natural gas engine. First Lift Pump No. 1 has a modern, premium efficiency WEG motor with a variable frequency drive (VFD) for operation at optimum water and energy efficiency. The First Lift Pump No. 2 is currently being rebuilt and will have a new speed reduction gearbox and a new premium efficiency motor installed, as well as a VFD for even greater improvements to pumping efficiency in both water and energy.

The Second Lift Pump Station has two electric vertical turbine pumps and two natural gas engine pumps for backup and emergency use. The Third Lift Pump Station has one electric driven 50 cfs pump, one natural gas driven 45 cfs pump, one electric driven 30 cfs pump, one natural gas driven 30 cfs pump and one natural gas driven 30 cfs pump. The pump station capacities are provided in Figure 2, Schematic. The Reservoir Pump Station has three 50 cfs pumps and one 25 cfs pump that can pump out of, or into, the reservoir.

Evaluation Criteria C: Other Project Benefits

The water conserved by the proposed project reduces the amount of energy required to lift water through the First Lift Pump Station, the Second Lift Pump Station, and the Third Lift Pump Station. The reduction in energy consumption ensures more American Energy is available to meet our security and economic needs. The Lower Rio Grande System is managed by the Texas Commission on Environmental Quality (TCEQ), Rio Grande Watermaster. There are several categories of water right holders, including municipal, industrial, irrigation, and mining water rights. Municipal and industrial rights are continually reserved first, at 9% of the reservoir system capacity, but diversions are limited annually to the water right. Irrigation and mining rights are allocated based on inflows into the system. United Irrigation District diverts water out of the Rio Grande based on their irrigation rights. An irrigation diverter may only utilize its total water right annually, but may store an additional 41% in the reservoir system. Once that level is exceeded, surplus water is allocated to other users in the system. Figure 18, from the International Boundary and Water Commission (IBWC), is the history of United States' and Mexico's storage levels in the Lower Rio Grande System. The last time the US storage was at 100% was in 2011. Since that time, United Irrigation has had multiple months where they've had maximum storage, such that all conserved water was allocated to other users in the system. In the case of United Irrigation District, all conserved water is eventually allocated to other users in the system. United Irrigation District provides raw water to three potable water suppliers (PWS), the City of Mission, Sharyland Water Supply Corporation and the City of McAllen. Those PWS customers treat the raw water to TCEQ drinking water standards and distribute it to their customers. Cumulatively, these three entities serve approximately 300,000 people. By contract, United Irrigation District charges the PWS customers a 15% loss to deliver their water by charging the amount diverted (delivered water plus the lost water) against the customer's municipal water right. It is imperative that United Irrigation District upgrades its system to maintain losses below this contract threshold. As United Irrigation District continues to improve efficiency through conservation, it may eventually lower its contracted loss rate, resulting in a higher net useable amount of the customers' water right. Since there is a limited number of water rights in the Lower Rio Grande System, all conservation helps reduce competition for the over-allocated supply.

South Texas is unique in that it shares its water supply with Mexico based on an International Treaty. According to the Treaty, 1/3 of water from several Mexican Tributaries is allotted to the US.

Since the Treaty, Mexico has constructed reservoirs upstream of Falcon and Amistad that allow Mexico to withhold runoff that many in the US consider a violation of the Treaty. Figure 17 is the status of the current five-year cycle. Mexico is about two years behind in delivery of water to the US, causing drought in the more heavily irrigated Districts in South Texas. There are conflicts in Mexico where farmers have protested against the Mexican government's plans to repay the debt. The fact that Mexico delays releases is evident in the graph displayed in Figure 18, where Mexico's percentage of storage in the Falcon and Amistad reservoirs are typically much less than the US share. One third of water released into Falcon and Amistad from Mexican reservoirs eventually becomes US water, so Mexico delays that release as long as possible. The conservation that will occur from this project, as well as conservation from past USBR projects, helps ease international conflict over the shared, limited water resource. The US Fish and Wildlife Service (USFWS) is a major water right holder in the Lower Rio Grande Valley. As the Lower Rio Grande Valley National Wildlife Refuge (Refuge) expanded, it also acquired water rights. The Refuge manages their water to restore critical habitat. As part of the 2013 WaterSMART Grant, United Irrigation installed an outlet for the Refuge on a tract near the Rio Grande and constructed a pipeline to a Resaca managed by the Refuge. United Irrigation diverts water for the Refuge, upon request, from the outlet to the Refuge. All water conserved by United Irrigation District is eventually allocated to other users in the system, including the Refuge. The Refuge utilizes the water to restore critical habitat for the Ocelot and other endangered species. This project will benefit a larger initiative to address reliability, as canal automation is one of the conservation efforts listed in the "2022 State Water Plan," created to identify strategies to best manage water supply into the next 50 years. The State Water Plan incorporates all the recommendations of the "2021 Rio Grande Regional Water Plan," prepared by the Rio Grande Regional Planning Group (Region M).

The proposed project, for the same reasons mentioned above, does offer ecological benefits by conserving water in Falcon and Amistad Reservoirs. The Rio Grande's Falcon and Amistad Reservoirs, at the time of this application, are at 21.8% storage capacity, and the region is presently experiencing the worst drought since completion of the Falcon Dam in 1954 and Amistad Dam in 1967, both on the Rio Grande, designed to reduce the severity of drought. Of the 25 irrigation districts in South Texas that rely on the dams, about half have no water for irrigation and the other half have initiated their Drought Contingency Plans. Releases from the reservoirs are minimized to little more flow than is ordered by diverters along the Rio Grande, resulting in low river levels in the absence of rainfall, which has also been scarce. Water conservation efforts resulting from the proposed project and conservation measures/improvements and the implementation of water management strategies such as those proposed in this project aid in sustaining the ecosystems of the Falcon and Amistad Reservoirs, and aquatic life in the Rio Grande. The Falcon and Amistad Reservoirs are well known for excellent bass fishing, visited by tourists from around the county and are home to many other species of wildlife, aquatic life, and flora and fauna.

Figure 17

Rio Grande River Basin

**Estimated Volumes Allotted to the United States by Mexico from Six Named Mexican Tributaries
and Other Accepted Sources* under the 1944 Water Treaty
Current Cycle: October 25, 2020 thru February 10, 2024**

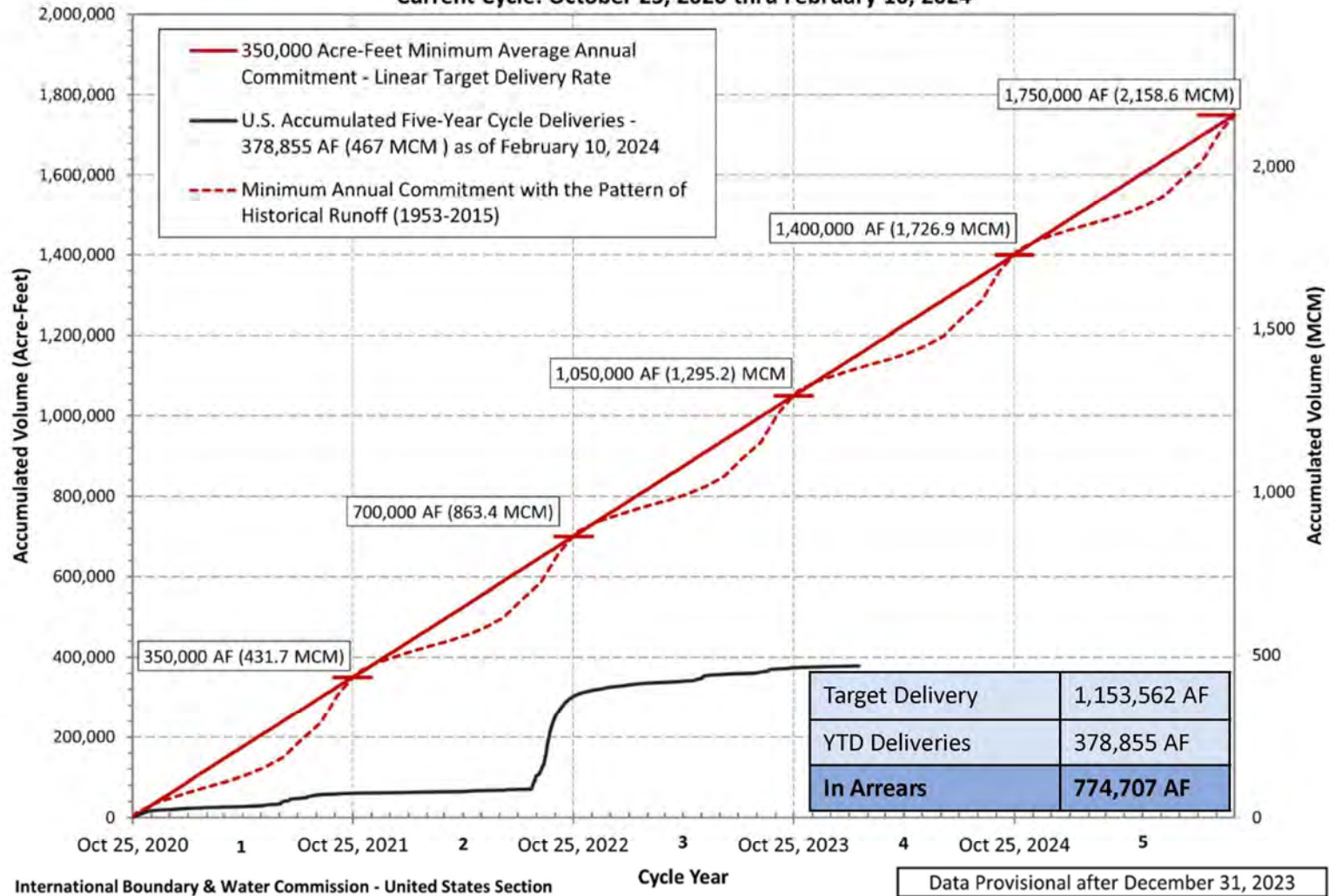
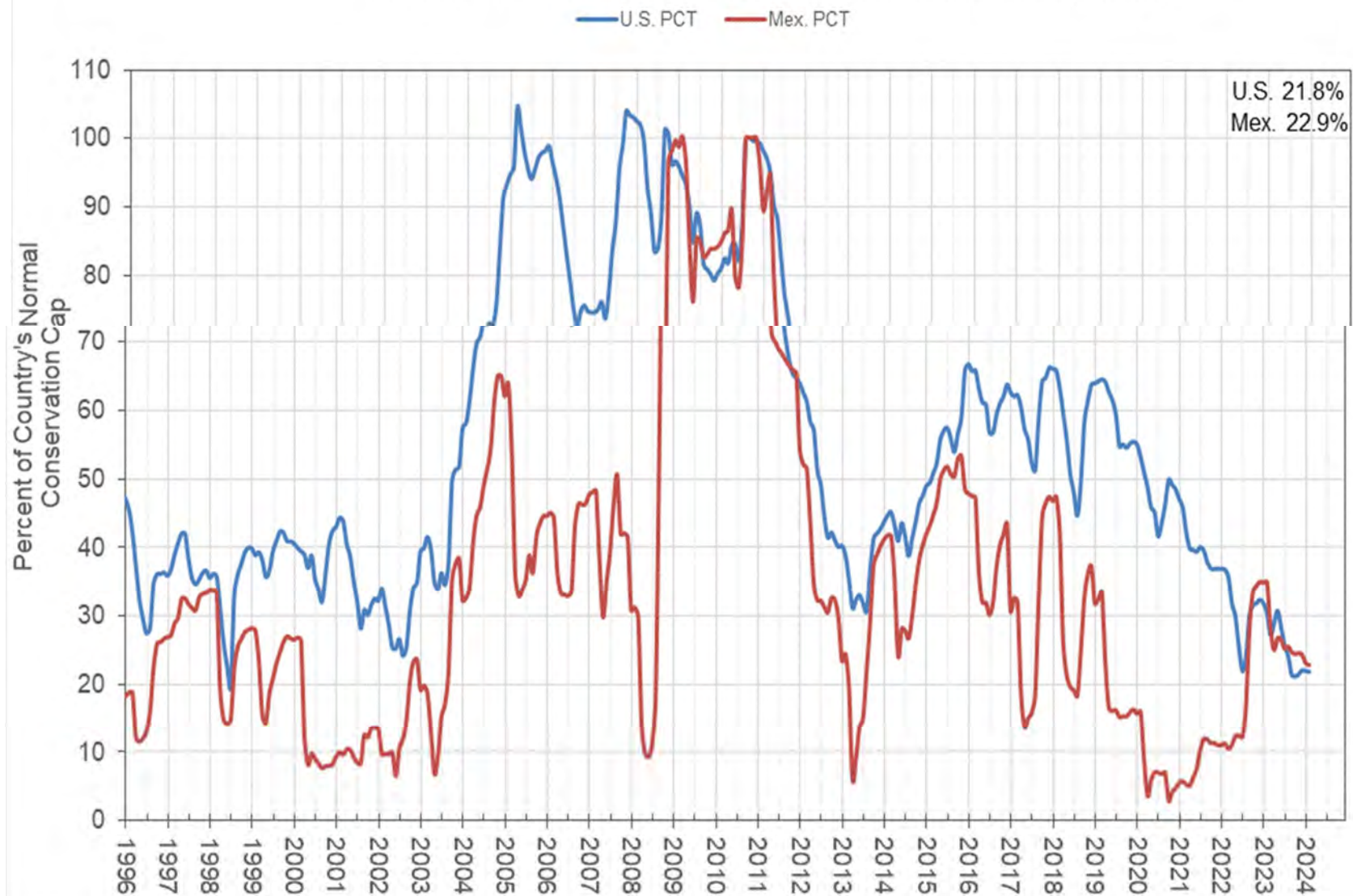


Figure 18
Amistad-Falcon Percent of Conservation Capacity



Evaluation Criteria D: Disadvantaged Communities and Tribal Benefits

The proposed project supports E.O. 14008: *Tackling the Climate Crisis at Home and Abroad* through the advancement of environmental justice for disadvantaged communities by ensuring a reliable water source is supplied to local water treatment plants which serve these communities with safe potable water through remote monitoring and control of canal levels at water treatment plant intake points and remote flow control. The District's boundary includes the cities of Mission, McAllen, Palmhurst, and Alton; while also including a number of small colonias, or unincorporated communities. In addition, the potable water suppliers that the district delivers to beyond the district boundaries serve additional towns and colonias, or unincorporated communities north of the District. Figure 13 shows a map of potable water service areas, or CCN's (Certificate of Convenience and Necessity) for the potable water suppliers, supplied by United Irrigation District. Shown in Figure 14 is the area serviced by potable water suppliers who receive water for treatment from United Irrigation District using the White House Council on Environmental Quality's interactive Climate and Economic Justice Screening Tool. As shown on the map in Figure 16, the vast majority of areas served by the City of Mission, the City of McAllen, and Sharyland Water Supply Corporation's water treatment plants are disadvantaged communities which experience burden.

Hidalgo County, Texas has a population of 865,677, with a poverty rate of 28.1% and a median household income of \$44,666. The City of Mission, Texas has a population of 85,311, with a poverty rate of 19.8% and a median household income of \$53,067. The City of McAllen, Texas has a population of 141,941, with a poverty rate of 21% and a median household income of \$52,422. The City of Alton, Texas has a population of 17,993, with a poverty rate of 30.6% and a median household income of \$39,077. For comparison, the State of Texas has a population of 28.9 million, with a poverty rate of 14% and a median household income of \$67,321. All data presented above is from datausa.io for the year of 2021.

Evaluation Criteria E: Complementing On-Farm Improvements

The proposed project compliments existing and future On-Farm Improvements by improving flow control to irrigation demands in the District, ensuring canals are full through remote monitoring and remote control over flow control structures on demand. This ensures that irrigators who are using more efficient methods of irrigation such as drip and micro irrigation are able to continue to do so, and continue to implement these more efficient methods of irrigation.

Evaluation Criteria F: Readiness to Proceed

The anticipated timespan for the proposed project is 18 months from start to completion and implementation, with a final report to be submitted to the USBR 3 months following project completion. The anticipated start date is January 1st, 2025, with environmental compliance and construction plans completed by July 1st, 2025, bids will be received and contract entrance expected by October 1st, 2025, with construction complete by July 1st, 2026, and the final report submitted to the USBR by October 1st, 2026.

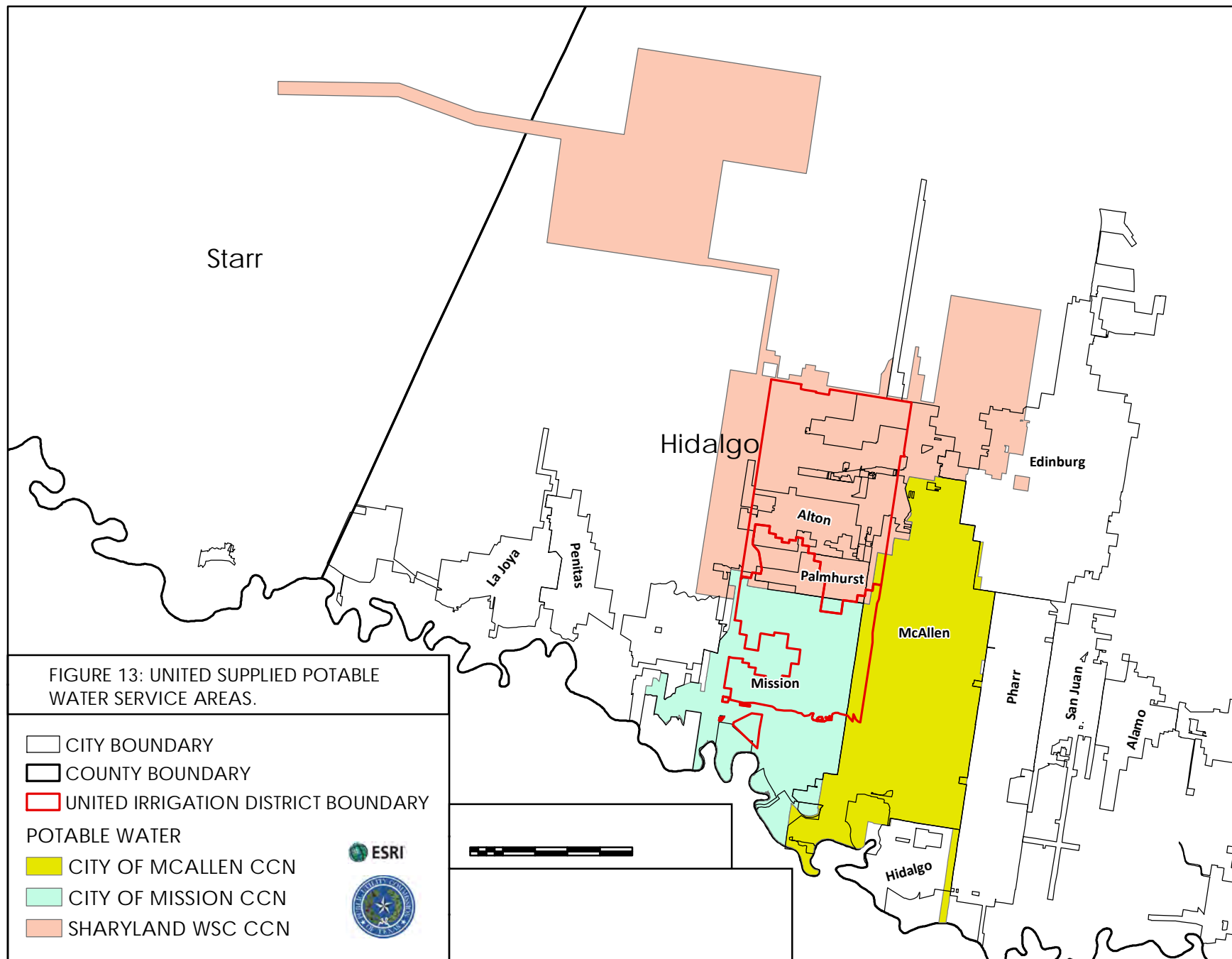
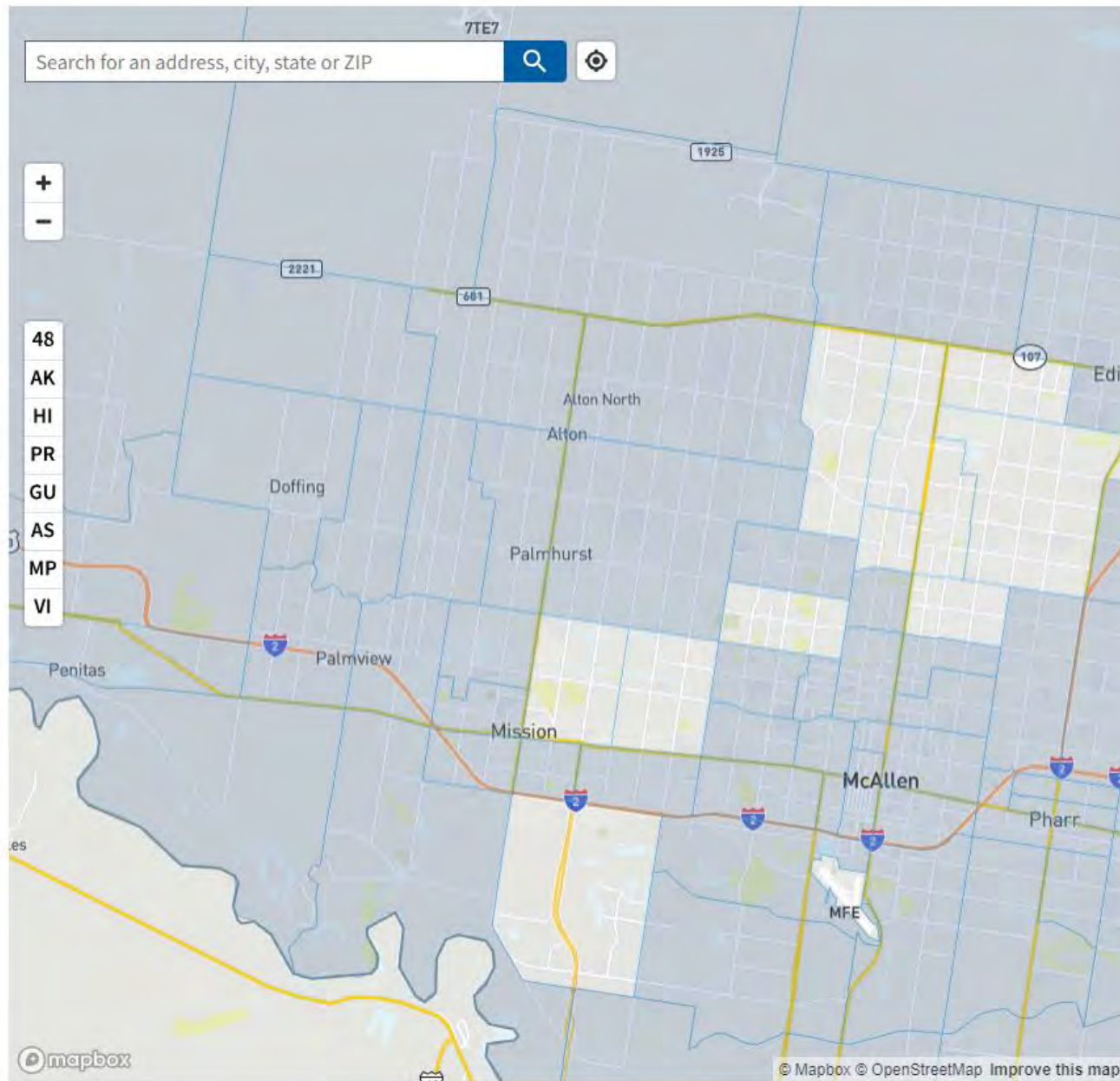


Figure 16 - Climate and Economic Justice Map



How to use the map:

Zoom in **+**, search **Q**, or locate yourself **📍** and select to see information about any census tract.

Things to know:

The tool uses census tracts **📍**. Census tracts are a small unit of geography. They generally have populations **👤** of between 1,200 - 8,000 people.

Communities that are disadvantaged live in tracts that experience burdens. These tracts are highlighted **🟡** on the map.

The tool ranks most of the burdens using percentiles **📊**. Percentiles show how much burden each tract experiences when compared to other tracts.

Thresholds **📏**, or cutoffs, are used to determine if communities in a tract are disadvantaged. Certain burdens use percentages **📊** or a simple yes/no **✓**.

No permits or approvals are anticipated for the proposed project, other than consultation with the State Historic Preservation Officer; nonetheless, no issues are expected. 9 out of the 11 total proposed project sites have existing structures and will simply involve replacement of manual gates with the proposed automated Flow Control Gates and Flow Control & Metering Gates. The other two proposed project sites have already been surveyed by Ferris, Flinn & Medina LLC for the composition of this grant application and its figures to determine the project budget and execution of project construction. Design Work can begin immediately following the award of the grant and availability of funds.

Evaluation Criteria G: Collaboration

The proposed project involves the construction and implementation of Flow Control & Metering Gates to 5 water treatment plants for three different entities: the City of Mission, City of McAllen, and Sharyland Water Supply Corporation. Water is supplied to these entities by the District for the treatment of potable water and supply to their communities. The District and these entities have and maintain water supply and delivery contracts, which all contain agreements for metering standards and practices. The proposed project will improve relationships and collaboration between the District and the above-mentioned entities through increased meter accuracy and data availability, while eliminating potential disputes regarding quantities of delivered water and the resultant billing charges. More precise flow control through the proposed project will also ensure that no excess water is delivered to water treatment plants as well as ensure that water is available and delivered precisely when the plants' water needs arise. Letters of support from the three potable water suppliers, whose water treatment plants' efficiency and reliability benefit from the proposed project, are attached in Appendix B, demonstrating collaborative support for the project. Also found in Appendix B are letters of support from local agricultural users in the District who are committed to improving water management, efficiency and conservation. The proposed project increases the likelihood of future water conservation by others in the region through the implementation of state-of-the-art technology in water conveyance, water management, and water conservation. The Rio Grande Valley Water Manager's Association meets monthly with active collaboration and communication between irrigation and water improvement districts. Infrastructure improvements such as the ones proposed in this application will be discussed at these meetings and through regular correspondence outside of meetings, with quantified results available to share with other water managers for potential implementation of such systems in other districts that may stand to be improved from these improvements. During research for the proposed project, Hidalgo County Irrigation District No. 2 welcomed United Irrigation District to tour similar Flow Control & Metering Gate structures, related software, and remote operation practices which have long been implemented in their district. Figures 14 and 15 of similar Flow Control & Metering Gates to those proposed in this application were taken in Hidalgo County Irrigation District No. 2 during the aforementioned tour. This collaboration is anticipated to continue with other districts who will improve their conveyance systems and implement more modern technology to update aging infrastructure.

Evaluation Criteria H: Nexus to Reclamation

Reclamation has been funding conservation and irrigation projects in South Texas for many years. One such project was the “Lower Rio Grande Rehabilitation Project,” (www.usbr.gov/projects/index.php?id=344), authorized by Public Law 85-370, approved in 1958 and Public Law 86-357, approved in 1959. The project conservation is in the same basin as the proposed project. Public Law 106-575, also known as the “Lower Rio Grande Valley Water Resources Conservation and Improvements Act of 2000,” (Lower Rio Grande Valley Project) was signed into law on December 28, 2000. The law was amended in 2002, to include \$14,969,585.00, conservation improvements to United Irrigation District. The projects are administered by Reclamation. United has completed about 40% of the project. In addition, United was awarded a 2013 WaterSMART Grant in the amount of \$1,333,901.00, for a conservation project that totaled nearly \$4,000,000.00. The project resulted in conservation of 2,777 acre-feet per year, as well as 352,000 kilowatt hours per year, in energy.

The “Lower Rio Grande Basin Study” was completed in December 2013 by the USBR, in cooperation with the Rio Grande Regional Water Authority (RGRWA). The District is a member of the RGRWA. The Basin Study refers to the 2010 Region M Plan, “Rio Grande Regional Water Plan”, dated October 1, 2010, to reiterate that Irrigation Conveyance System Conservation as one of the water management strategies that will result in the greatest amount of water for further use when compared to 15 other strategies. This canal automation project is an Irrigation Conveyance System Conservation Project.

The District’s project is connected to reclamation activities. Reclamation has been essential to the District’s recent conservation efforts. This project builds upon that success. Conservation in United eventually benefits other users in the system, as conserved water is allocated to others.

Performance Measures

Following completion and implementation of the proposed project, water conservation, energy conservation, and improved water management data and results will be compiled, analyzed, and presented with the final report to the USBR to determine the effectiveness of the completed project and its components. The efficiency and management results will be shown in the District’s water accounting ledger.

This ledger details weekly water ordered from the Rio Grande Watermaster, amount of water actually pumped for each order (any differences between water ordered and water pumped are considered river losses), monthly amounts of water delivered to municipal customers (City of Mission, City of McAllen, and Sharyland Water Supply Corporation), amount of water delivered to agricultural customers by irrigation ticket/order, amount of current useable water balances in district accounts, and water delivered to other entities who have their own water rights/accounts, such as the USFWS.

Total water pumped at the First Lift Pump Station as diverted from the Rio Grande minus the total amount of water delivered to customers for a given period represents in-district losses and is used to determine in-District water efficiency through conveyance infrastructure, much of which is to be improved by the proposed project. The proposed flow control and metering system, funded by the grant, will allow quantification of currently difficult-to-quantify water conservation beyond the quantifiable river losses. The methodology for presenting the above performance measures are executed yearly in the District water efficiency analysis shown in Table 1, depicting the District's familiarity and regular practice of water data analysis and ability to quantify conservation resulting from any implemented infrastructure improvements. These practices have been used in the past for previous awarded grants for improvement projects mentioned in the Nexus to Reclamation section above.

Budget Narrative

The budget was developed based on an estimate for the gates provided by Rubicon Water, historical bid prices for installation on file at the office of the District Engineer; Ferris, Flinn & Medina, LLC. Inflation from older bid price dates to the average time of anticipated construction, 7/1/25, was determined by using an inflation factor from Construction Analytics Construction Inflation 2024, available from ["https://edzarenski.com/2024/01/17/construction-inflation-2024."](https://edzarenski.com/2024/01/17/construction-inflation-2024) The Construction Analytics (CA) factor for each bid price utilized is as provided in Appendix "A" Budget Documentation. The budget development for each project component is provided as follows:

First Lift Pump Station Metering Gates

The price of the two metering gates, SCADA components and start up are provided in the email from Eric Umbreit of Rubicon Water, dated February 12, 2024, totaling \$116,578. The 5'x 5' fabricated stainless steel gate budget of \$12,422.00, is based on a quotation from Fresno Valve and Casting, provided in Appendix "A". A general contractor will be purchasing the gates, as well as, installing them, for a single source responsibility to the District. A general contractor will generally charge overhead and profit to purchase the gates and an additional charge to install them. An overhead, markup and installation charge of 25% of the gate cost is typical and reasonable. The Contractor will need to bypass the gate construction area to construct the concrete foundation and wall that will support the gates, as well as, upstream and downstream slope protection. The price for the bypass is based on the United Irrigation District Off Channel Storage Facility, Bid Item No. 9, which bid on May 22, 2018. The bypass was installed in the same canal, a few miles downstream. The pipe is on site and available for use by the Contractor. The bid tabulation is in the Appendix as well as, the Construction Analytics (CA) Chart indicating that a CA factor of 1.49 should be utilized. The first price in the bid tabulation was not utilized as that contractor withdrew their bid, and the three highest bids (last three columns) were not utilized as the bids were too high. Utilizing the remaining four bids median price for bypassing of \$130,000 multiplied by a CA of 1.49 yields a budget price of \$194,000 for the bypass. Reinforced concrete was based on Bid Item No. 12, from the reservoir project for construction of a headwall for a median price of \$142,000 in 2025 dollars. A copy of the construction plan for the reservoir headwall is included in the Appendix. A calculation of the volume of the existing headwall is provided in the appendix indicating that the reservoir headwall is 58 cubic yards yielding a budget for new concrete in 2025 of \$2,452 per cubic yard. Also included in the Appendix is a calculation of the volume of the new First Lift Metering Wall that will have a concrete volume of 153 cubic yards. The resulting budget for construction of the wall is \$375,156. Six inch slope/canal lining upstream and downstream of the new wall is needed to prevent erosion. The estimated quantity is based on the United Reservoir, Bid Item No 8 with a median price of \$63.00 per square yard (SY), or \$194 per SY after application of the CA factor.

The project will require 845 SY of slope paving, resulting in a budget of \$79,430.00. The total budget for the First Lift Pump Station Metering Gates is \$809,836.00.

Mission WTP #1 Metering Gate

The Mission WTP #1 budget includes the gate price of \$25,930 from Rubicon, general contractor overhead & profit and installation cost at 25%, 43 cubic yards of reinforced concrete for the headwall and 110 SY of slope paving. The above items utilize the same methodology as the First Lift Metering Wall with supporting documentation in Appendix "A". This site will require installation of 61 linear feet of 30" PVC piping from the canal and headwall to the City's Reservoir. The source of pricing for the pipe and installation was the Cameron County Irrigation District No. 6 Canal Piping Project, Bid Tabulation dated January 11, 2021. The pipe materials were \$102.44 per linear foot (LF) while the median price for installation was \$82.36 per LF. Summarizing the materials and installation and multiplying by a CA Factor of 1.1 yields a price of \$203.28 per LF and a total budget of \$12,400.08 for the pipeline. The budget for 100 SF of bar screen needed at the new metering gate is based on a screen installed at Cameron County Irrigation District No. 6, Flume Improvement Project, constructed in December of 2019. Included in Appendix "A" is pricing for the screen, as well as, installation. The cost to the District for labor and materials was \$38,892 for 1,000 SF of screen. Applying a CA Factor of 1.43, results in a 2025 unit price of \$50.60 per SF and a total price of \$5,580 for the new structure. The total budget for the Mission WTP #1 site is \$166,148.58.

The Mission WTP #2 Metering Gate is much simpler as the headwall is in existence. Using the Rubicon price for the gate, 25% for the general contractor to install, and the aforementioned price for a new bar screen, results in a total budget for this site of \$55,070.75.

The Bryan Canal Automation Headgate is based on the price from Rubicon for a Rubicon Flume gate of \$68,850.00, \$17,212.50 for installation and 2 cubic yards of concrete at a price of \$4,904 for a total budget for this site amounting to \$90,966.50.

The Sharyland Water Supply Corporation (SWSC) WTP #1 Metering Gate budget consist of the new metering gate and installation for a total budget of \$31,218.75. Additional concrete work and a new bar screen are not required.

The budget for the Bryan Canal Mile 5 overflow gate consists of the gates, installation and 2 cubic yards of concrete for a total of \$100,566.50. Two overflow gates are required at this location.

The McAllen WTP #2 location will require 50 SF of new bar screen in addition to the new metering gate and the general contractor installation. The total budget for this location is \$47,805.

The total budget for the Bryan Canal at Mile 6 Automated Overflow gate is \$88,154.00, including 2 CY of reinforced concrete.

The proposed SWSC WTP #3 Metering Gate will require 50 SF of new bar screen in addition to the new metering gate and installation for a total budget of \$45,205.

The Mission Main at Mile 6 Flow Control Gate is actually a 60"x60" Flow Control & Metering Gates placed on a headwall at the beginning of a 72" diameter pipeline. A new wall with a 60"x60" square opening will be constructed on the existing headwall to accommodate the new gate. A budget of \$7,356.00 is anticipated to accomplish this task. Adding the cost of the gate and installation results in a total site budget of \$62,887.25.

Professional Engineering Services are required to design the project, procure bids and administer the project for the District. The compensation will be based on the standard hourly rates of the District Engineer; Ferris, Flinn and Medina, LLC. Daily hours and rates for each discipline are provided in the budget table. The total Professional Engineering Services are budgeted at \$98,100.00.

Surveying services, also to be performed by Ferris, Flinn and Medina, LLC, involve boundary and topographic survey for the First Lift site and the Mission WTP #1 site for preparation of accurate drawings. Construction staking will also be performed to ensure proper lines and grades for the new construction. The level of effort and hourly rates are shown in the budget table for a total surveying budget of \$32,000.00.

Inspection will be required for the construction of the First Lift Metering Wall and the Mission WTP #1 structures and pipeline to ensure quality control during construction of these structures. Approximately 240 hours are budgeted for this task at a rate of \$105.00 per hour.

Environmental and Cultural compliance costs are budgeted at 1.13% of contractual construction amounting to \$16,884.50. The District Engineer will be required to consult with the State Historical Preservation Officer for consultation. 1.13% is a typical figure for this task. The total project budget is \$1,700,000.

Table 2 - Project Budget

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/Unit	Quantity		
SALARIES/WAGES				\$0.00
FRINGE BENEFITS				\$0.00
TRAVEL				\$0.00
EQUIPMENT				\$0.00
SUPPLIES AND MATERIALS				\$0.00
CONTRACTUAL CONSTRUCTION				
<i>First Lift Pump Station Metering Gates</i>				
Metering Gates	\$58,289.00	2	Each	\$116,578.00
5' x 5' Fabricated Gate	\$12,422.00	1	Each	\$12,422.00
General Contractor OH&P and Installation of Gates	\$129,000.00	@	25%	\$32,250.00
Bypass System	\$194,000.00	1	Each	\$194,000.00
Reinforced Concrete	\$2,452.00	153	C.Y.	\$375,156.00
6" Canal Lining	\$94.00	845	S.Y.	\$79,430.00
<i>Subtotal First Lift Pump Station</i>		\$809,836.00		
<i>Mission WTP #1 Metering Gate</i>				
Metering Gate	\$25,930.00	1	Each	\$25,930.00
General Contractor OH&P and Installation of Gate	\$25,930.00	@	25%	\$6,482.50
Furnish and Install New 30" PVC Pipe	\$203.28	61	L.F.	\$12,400.08
Reinforced Concrete	\$2,452.00	43	C.Y.	\$105,436.00
6" Slope Paving	\$94.00	110	S.Y.	\$10,340.00
New Barscreen	\$55.60	100	S.F.	\$5,560.00
<i>Subtotal Mission WTP #1</i>		\$166,148.58		
<i>Mission WTP #2 Metering Gate</i>				
Metering Gate	\$38,719.00	1	Each	\$38,719.00
General Contractor OH&P and Installation of Gate	\$38,719.00	@	25%	\$9,679.75
New Barscreen	\$55.60	120	S.F.	\$6,672.00
<i>Subtotal Mission WTP #2</i>		\$55,070.75		
<i>Bryan Canal Automated Headgate</i>				
Automated Overflow Gate	\$68,850.00	1	Each	\$68,850.00
General Contractor OH&P and Installation of Gate	\$68,850.00	@	25%	\$17,212.50
Reinforced Concrete	\$2,452.00	2	C.Y.	\$4,904.00
<i>Subtotal Bryan Canal Automated Headgate</i>		\$90,966.50		
<i>SWSC WTP #1 Metering Gate</i>				

Table 2 - Project Budget

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/Unit	Quantity		
Metering Gate	\$24,975.00	1	Each	\$24,975.00
General Contractor OH&P and Installation of Gate	\$24,975.00	@	25%	\$6,243.75
<i>Subtotal SWSC WTP #1</i>				<i>\$31,218.75</i>
<i>Bryan Canal @ Mile 5 Automated Overflow Gate</i>				
Automated Overflow Gate	\$38,265.00	2	Each	\$76,530.00
General Contractor OH&P and Installation of Gate	\$76,530.00	@	25%	\$19,132.50
Reinforced Concrete	\$2,452.00	2	C.Y.	\$4,904.00
<i>Subtotal Bryan Canal @ Mile 5 Gate</i>				<i>\$100,566.50</i>
<i>McAllen WTP #2 Metering Gate</i>				
Metering Gate	\$36,020.00	1	Each	\$36,020.00
General Contractor OH&P and Installation of Gate	\$36,020.00	@	25%	\$9,005.00
New Barscreen	\$55.60	50	S.F.	\$2,780.00
<i>Subtotal McAllen WTP #2</i>				<i>\$47,805.00</i>
<i>Bryan Canal @ Mile 6 Automated Overflow Gate</i>				
Automated Overflow Gate	\$66,600.00	1	Each	\$66,600.00
General Contractor OH&P and Installation of Gate	\$66,600.00	@	25%	\$16,650.00
Reinforced Concrete	\$2,452.00	2	C.Y.	\$4,904.00
<i>Subtotal Bryan Canal @ Mile 6 Gate</i>				<i>\$88,154.00</i>
<i>SWSC WTP #3 Metering Gate</i>				
Metering Gate	\$33,940.00	1	Each	\$33,940.00
General Contractor OH&P and Installation of Gate	\$33,940.00	@	25%	\$8,485.00
New Barscreen	\$55.60	50	S.F.	\$2,780.00
<i>Subtotal SWSC WTP #3</i>				<i>\$45,205.00</i>
<i>Mission Main @ Mile 6 Flow Control</i>				
Automated Overflow Gate	\$44,425.00	1	Each	\$44,425.00
General Contractor OH&P and Installation of Gate	\$44,425.00	@	25%	\$11,106.25
Reinforced Concrete	\$2,452.00	3	C.Y.	\$7,356.00
<i>Subtotal Mission Main @ Mile 6</i>				<i>\$62,887.25</i>
Subtotal Contractual Construction				\$1,497,858.33

Table 2 - Project Budget

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/Unit	Quantity		
CONTRACTUAL PROFESSIONAL SERVICES				
Engineer in Training	\$120.00	240	Hrs.	\$28,800.00
CAD Technician	\$85.00	480	Hrs.	\$40,800.00
Administrative Assistant	\$85.00	60	Hrs.	\$5,100.00
Subtotal Engineering			\$98,100.00	
Surveying; Boundary and topographic surveying and construction staking				
Sr. Registered Professional Land Surveyor	\$180.00	40	Hrs.	\$7,200.00
Surveyor in Training	\$105.00	60	Hrs.	\$6,300.00
Senior Crew Leader	\$115.00	100	Hrs.	\$11,500.00
Instrument Man	\$70.00	100	Hrs.	\$7,000.00
Subtotal Surveying			\$32,000.00	
Inspection (Project Representative)	\$105.00	240	Hrs.	\$25,200.00
Geotechnical Professional Services	@	2.00%		\$29,957.17
Subtotal				\$185,257.17
OTHER				
Environmental and Cultural Compliance Costs				
Contingencies				
TOTAL DIRECT COSTS				\$1,700,000.00
INDIRECT COSTS				\$0.00
TOTAL ESTIMATED PROJECT COSTS				\$1,700,000.00

Environmental and Cultural Resources Compliance

The proposed project will have no impact on the surrounding environment of the proposed project component sites, since all sites have existing District conveyance infrastructure with minimal modifications to those existing structures, if any. No Federally threatened or endangered species or designated critical habitat are present in the proposed project locations. There are no wetlands or surface waters within the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States". The delivery system was originally constructed approximately 100 years ago, with the current First Lift Pump Station constructed in 1960, and the Second and Third Lift Pump Stations rebuilt in the 1980's. The proposed project will involve modification to individual features of the District's water conveyance system, specifically headgates and canals. The information regarding dates of existing flow control structures and gates to be modified by the proposed project is not known. No buildings, structures, or features at the project locations are listed or eligible for listing on the National Register of Historic Places. There are no known archaeological sites in the proposed project areas. The proposed project will not have any disproportionate or adverse effects on any communities with environmental justice concerns. The proposed project will not limit access to, or ceremonial use of Indian sacred sites and will not result in any other impacts to Tribal lands. The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

Required Permits or Approvals

Consultation with the State Historic Preservation Officer will be executed, and no issues are expected. No other permits or approvals will be required. All sites are on District owned property.

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. The proposal submitted for consideration under this program does not in any way duplicate any proposal or project that has been or will be submitted for funding consideration to any other potential funding source, Federal or non-Federal.

Conflict of Interest Disclosure Statement

There are no actual or potential conflicts of interest existing at the time of submission.



P.O. Box 1868

Mission, Texas 78573-0031

956-585-6081

February 21, 2024

Mr. Juan Martinez
General Manager
United Irrigation District
P.O. Box 877
Mission, TX 78573

Re: United Irrigation District 2024 WaterSMART Grant Application

Dear Mr. Martinez,

United Irrigation District supplies raw water to our Water Treatment Plant No. 1 and Water Treatment Plant No. 3. The proposed metering gates at the two plants will result in more consistent delivery to our plants with redundant metering. We realize that conservation improvements in the District result in a more efficient delivery system and the lowest possible delivery cost to SWSC. In addition, conservation improvements result in conserved water being available to other users in the lower Rio Grande Water System. Thus, Sharyland Water Supply Corporation supports the District's application for the 2024 WaterSMART Grant.

Respectfully,

A blue ink signature of Carlos R. Lima, written in a cursive style.

Carlos R. Lima
General Manager



McALLEN

PUBLIC UTILITY

CHARLES E. AMOS, Chairman
ERNEST R. WILLIAMS, Vice-Chairman
ALBERT CARDENAS, Trustee
RICARDO R. GODINEZ, Trustee
JAVIER VILLALOBOS, Ex-Officio Member
MARCO A. VEGA, P.E., General Manager

February 20, 2024

Mr. Juan Martinez
General Manager
United Irrigation District
P.O. Box 877
Mission, TX 78573

Re: 2024 WaterSMART Grant Application Canal Automation and Metering

Dear Mr. Martinez:

McAllen Public Utility (MPU) supports the District's efforts to conserve water through a WaterSMART Grant. The proposed metering gate at MPU's North Water Treatment Plant will result in more consistent delivery to our plant with a backup meter. Conservation of the area's limited water resources benefits all users in the Lower Rio Grande. In addition, increased delivery efficiency results in lower energy cost and ultimately lowest possible delivery charge to MPU's rate payers.

Should you have any questions, you may call me at (956)681-1630. I will be glad to assist you.

Sincerely,

Marco A. Vega, P. E.
General Manager



CITY OF MISSION

"Home of the Grapefruit"

February 20, 2024

Mr. Juan Martinez
General Manager
United Irrigation District
P.O. Box 877
Mission, TX 78573

Re: United Irrigation District
2024 WaterSMART Grant Application for Canal Automation and Metering

Dear Mr. Martinez,

United Irrigation is the only supplier of raw water to the City of Mission. The two metering gates proposed for the City of Mission will result in more consistent delivery, as well as, provide redundant metering. The City supports your efforts to conserve water through the US Bureau of Reclamation WaterSMART Program. Conservation improvements in United Irrigation District result in a more efficient delivery system to the City of Mission.

Respectfully,
City of Mission

Randy Perez, CPM, MPA
City Manager



February 19, 2024

Mr. Juan Martinez
General Manager
United Irrigation District
P.O. Box 877
Mission, TX 78573

Re: United Irrigation District
2024 WaterSMART Grant Application for Canal Automation and Metering

Dear Mr. Martinez,

South Tex Organics utilizes irrigation water within United Irrigation District. We are supportive of the District's efforts in applying for a WaterSMART Grant from the US Bureau of Reclamation for the canal automation project that will conserve water. The District has a limited water supply. Water conservation projects result in increased efficiency to ensure an adequate supply is available for our agricultural operations. We are more likely to implement NRCS projects as the District continues to implement conservation projects that result in increased system efficiency and a more reliable water supply.

Respectfully,

Dennis Holbrook
President



2/19/2024

Mr. Juan Martinez
General Manager
United Irrigation District
P.O. Box 877
Mission, TX 78573

Re: United Irrigation District
2024 WaterSMART Grant Application for Canal Automation and Metering

Dear Mr. Martinez,

Wonderful Citrus utilizes irrigation water within United Irrigation District. Therefore, we support the District's efforts in applying for a WaterSMART Grant from the US Bureau of Reclamation for the canal automation project that will conserve water. The District has a limited water supply. Water conservation projects result in increased efficiency to ensure an adequate supply is available for our farming operations. We are more likely to implement NRCS projects as the District continues to implement conservation projects that result in increased system efficiency and a more reliable water supply.

Respectfully,

A handwritten signature in black ink, appearing to read "Bruce Sutton", is written over a horizontal line.

Bruce Sutton
Wonderful Citrus Sr. Farming Director