



Quincy-Columbia Basin Irrigation District

Automation of W3 Lateral Turnout of the West Canal

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Small-scale Water Efficiency Project

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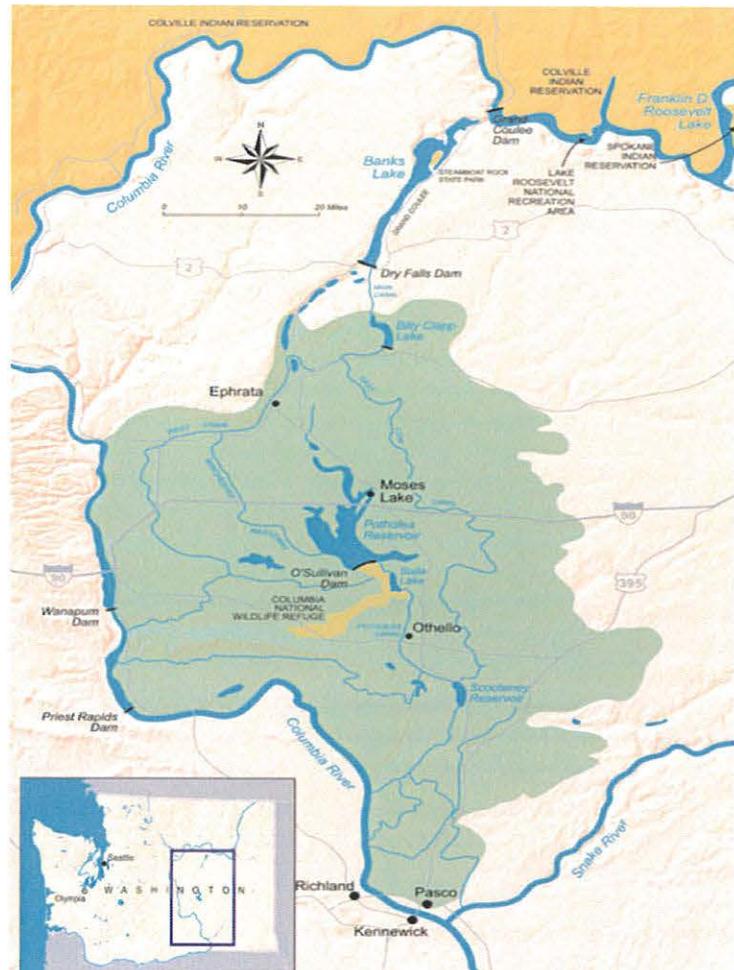
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Background Data

The Quincy-Columbia Basin Irrigation District (District/QCBID) is located in east central Washington, within Reclamation's Pacific Northwest Region. Reclamation's Columbia Basin Project serves approximately 671,000 acres of farmland. Water is pumped uphill from Lake Roosevelt behind Grand Coulee Dam into Banks Lake Reservoir where it is diverted onward through over 300 miles of project main canals and about 5,500 project miles of laterals, drains, and wasteways. Water is primarily used for irrigation, but in limited circumstances is used for municipal and industrial purposes. Over 90 different crops are grown with apples, wheat, and corn being the largest value crops. Other benefits of the Columbia Basin Project include recreation, habitat creation, flood control, and power generation.

District Headquarters are located in Quincy, Washington approximately 17 miles west of Ephrata, Washington. The District operates and maintains a portion of the Columbia Basin Project, under contract with the Bureau of Reclamation's Ephrata Field Office. The District's main canal is 89 miles long in addition to several thousand miles of laterals, wasteways, and drains. The Quincy-District serves approximately 250,000 acres of farmland.

In an effort to conserve water, the District consulted with Montgomery Water Group in 2002 to develop a Water Conservation Plan. Additionally, the District has entered into a coordinated water conservation plan with the East and South Columbia Basin Irrigation Districts and the Washington State Department of Ecology to allow additional irrigation acreage to be served, while remaining water budget neutral on the Columbia River. Long-term planning is essential to solving future water resource problems such as project water shortages caused by drought. Since 2009, the Districts on the project have conserved over 30,000 acre-feet of water by completing over 150,000 feet of piping and canal lining projects.



The coordinated water conservation plans identified canal automation as means to conserve water. The District through its development of system improvement planning has identified automation of the W3 Lateral turnout as a key water savings opportunity.

Technical Project Description

Automation of the W3 Lateral Turnout of the West Canal

The first control check on the West Canal, High Hill Check, is located at about mile 6 of the canal. The six-mile section of canal upstream of High Hill Check sees significant flow changes each day which result in changes of elevation in water level at the W3 Lateral turnout. This results in significant changes of flow through the W3 Lateral turnout, and resultant surplus delivery which is lost as operational spill. W3 Lateral average annual diversion is 17,900 AF. Automation of the W3 Lateral turnout gate will account for these elevation changes and maintain a constant flow setpoint, and would save 1,090 AF annually by reducing spill from the W3 Lateral System.



Figure 1 – Location map of W3 Turnout and West Canal

Reclamation issued specification No. 1286 in 1946 for the construction of the first section of the West Canal, including turnouts. W3 Lateral at West Canal Station 163+25, is a concrete two-

barrel, 5' x 6' turnout, controlled by two manually operated screw lift gates. See attached drawing 222-D-10068 and 222-C-90.

Seven turnouts were constructed by Utah Construction Co and Winston Bros. Co under specification No. 1286. The final construction report states as follows, “Work on the turnouts was started in May 1947 in an endeavor to complete them ahead of lining operations and they were in various stages of completion when work was shutdown on September 1947 due to a slowdown order. Work was resumed in April 1948 and completed during 1948.”

The District has considered various options to automate this site over the years, but it has been complicated by lack of power, and the distance between the turnout location and the downstream measuring weir that is separated by a major state highway.

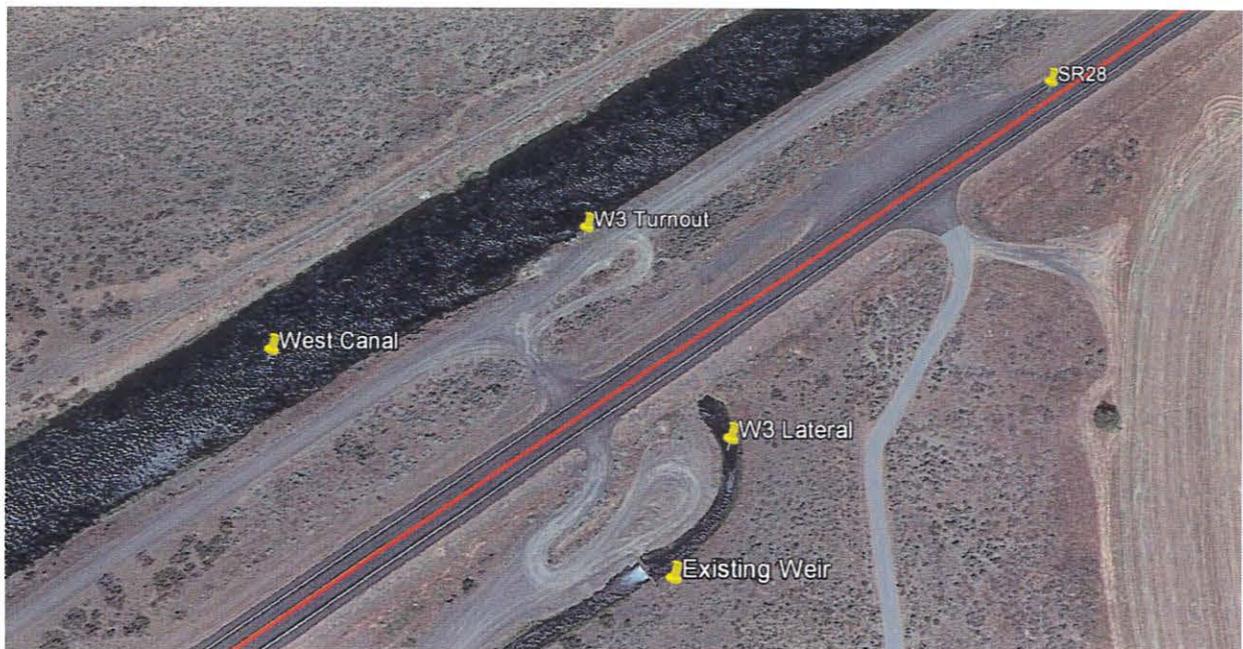


Figure 2 – Location of W3 Turnout and existing weir relative to the SR28 highway.

To overcome these challenges the District is proposing to replace the two existing slide gates with Rubicon SlipMeters. The SlipMeter is a precision flow meter that measures fully submerged flows and mounts directly to the headwall. The SlipMeter is equipped with a separate standalone control pedestal and includes a display and control keypad. The SlipMeter is supplied complete with an integrated power supply comprising an 85W solar panel, a solar regulator, and a 48Amp hour 12 volt deep cycling battery pack.



Figure 3 – Existing W3 Gate Equipment

Improved flow control from the head of the W3 Lateral is estimated to save 1090 AF over the irrigation season. Currently the average waste from the W3 Lateral system is 5.5 cfs per day. With flow control it is estimated that the daily spill average would be reduced to 3.25 cfs. The majority of this savings would occur in the W3EWW with reduction of 1.50 cfs per day. The savings of 2.25 cfs per day over a 200 day irrigation season would save 550 sfd or 1090 AF.

W3 Lateral System Daily spill averages from 2012 – 2016 records (cfs)					
	W3FWW	W3WW	W3F6WW	W3F12WW	W3EWW
Average	1.00	1.50	0.50	0.50	2.00
Estimated W3 Lateral System Daily average spill with flow control					
Average	0.75	1.00	0.50	0.50	0.50
Savings	0.25	0.50	0.0	0.0	1.50

Project Criteria

Criterion A: Planning Efforts Supporting the Project (35 points)

The Quincy-Columbia Basin Irrigation District developed a Water Conservation Plan in March 2002, which was prepared by Montgomery Water Group. One goal of the plan is canal automation to improve conservation. Additionally, the District has entered into a coordinated water conservation plan with the East and South Columbia Basin Irrigation Districts and the

Washington State Department of Ecology. The District maintains a rolling list of system improvement items that are influenced by these water conservation plans. Automation of the W3 Lateral was proposed in 2010 and added to the system improvement list as means to improve flow control and improve operation efficiency. Efforts to implement automation at this site have been hampered by the separation of the turnout gates from the measurement structure by a major state highway and the lack of power at the location. The proposal to replace the existing slide gates with the Rubicon SlipMeters would overcome both of these obstacles. With this new technology the District believes it is time to move forward with the automation of the W3 Turnout.

Criterion B: Project Benefits (35 points):

This project will provide several key benefits, including:

- Automatic regulation of flow from the West Canal into the W3 Turnout will reduce spill from the W3 Lateral system caused by West Canal elevation changes.
- Improved flow control will improve reliability of farm deliveries.
- Improved flow control will greatly benefit the ability to maintain control during application of aquatic herbicides. This will improve aquatic herbicide effectiveness and minimize the potential to waste chemicals with the operation spill.
- Water conserved from the W3 Lateral can be used to meet demands throughout the remainder of the District. Overall this will reduce the demand on the Columbia River.

Criterion C: Project Implementation (15 points)

The project implementation plan details are as follows:

- The District plans a timeframe of two weeks to implement this project in March 2018.
 - o Two days for removal of the existing slide gates and controls
 - o Two days for concrete modifications, including cutting of the existing concrete ledge.
 - o Three days to install the SlipMeter frames and pedestals, lifting of the meters into the frames, and wiring the control pedestals.
 - o One day for commissioning and training by Rubicon in the operation and maintenance of the meters.
- The District has performed the design work needed to remove the existing gates, determined modifications needed to be made to the existing concrete structure, and evaluated the SlipMeter sizing and requirements.
- No permits are required.

Criterion D: Nexus to Reclamation (15 points).

The Quincy-Columbia Basin Irrigation District is located in east central Washington, within Reclamation's Pacific Northwest Region, within Reclamation's Columbia Basin Project.

QCBID operates and maintains the West Canal and its associated facilities for Reclamation under contract no. 14-16-100-6418.

Project Budget

Funding Plan

The District's contribution to the cost share requirement will be approximate 91% monetary and 9% in-kind. Source funds will come from 2018 assessments. The District will not seek to include in-kind costs incurred before the anticipated project start date. Project expenses that have already occurred, but which will not be included in the project include administrative and engineering work to provide existing facility designs and review of initial proposal information regarding design concepts for the project.

Funding Sources	Funding Amount
Non-Federal Entities (Quincy-Columbia Basin Irrigation District)	
QCBID Participation and Project Management	\$ 4,213
QCBID Share of Contract	\$ 42,268.50
Non-Federal Entities Subtotal (QCBID)	\$ 46,481.50
Other Federal Entities Subtotal	\$ -
Requested Reclamation Funding Subtotal	\$ 46,481.50
Total Project Funding	\$ 92,963

Budget Proposal

The District's contribution to the cost share requirement will be approximate 91% monetary and 9% in-kind. The District proposes to contribute \$46,481.50 and is seeking \$46,481.50 in Federal funds. Source funds will come from 2018 assessments. The District will not seek to include in-kind costs incurred before the anticipated project start date. Project expenses that have already occurred, but which will not be included in the project include administrative and engineering work.

Funding Sources	Percent of Total Project Cost	Total Cost by Source \$
Recipient Funding	50 %	\$ 46,481.50
Reclamation Funding	50 %	\$ 46,481.50
Other Federal Funding	0 %	\$ -
Totals	100 %	\$92,963

Equipment

The District will enter into an agreement with Rubicon Water for the purchase of two new SlipMeters and SCADA Hardware. Please see the attached quotation.

Contractual

The District will enter into an agreement with Rubicon Water to perform installation, start-up and commissioning of the new equipment. Please see the attached quotation.

The District will contract with concrete cutting company to cut 16' of 12" thick concrete.

Environmental and Regulatory Compliance Costs

There are no expected environmental permits required for the completion of the proposed project. A line item has been included in the budget to cover cost incurred to determine the level of environmental compliance required for the project.

Reporting

Reporting expenses have been included in the budget to cover costs associated with reporting requirements. All reporting will be performed by District staff

Indirect Costs

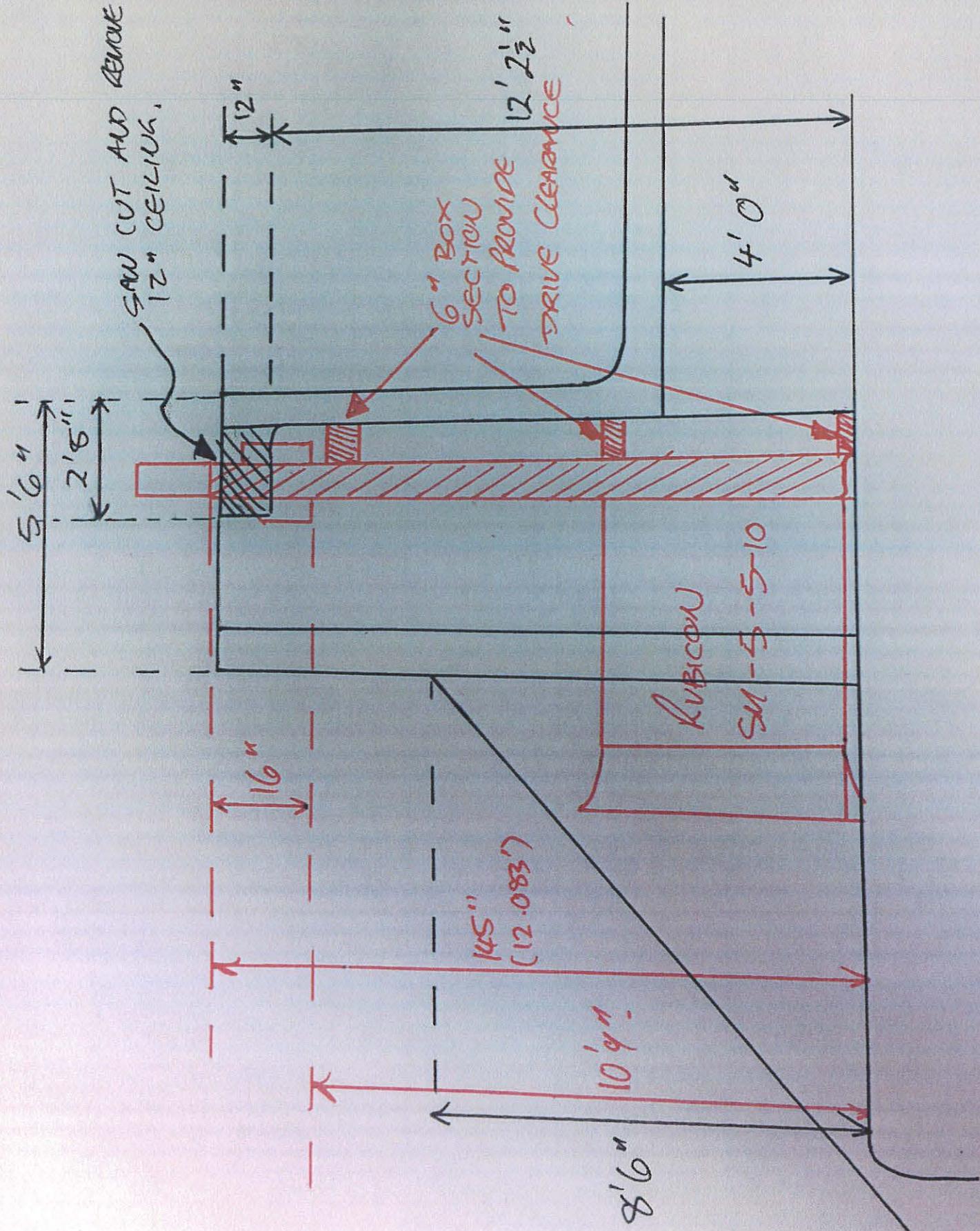
No indirect costs are included.

Total Costs

Total project total cost is expected to be \$92,963.

Attachments

- A. Design Drawing
- B. Rubicon Water – Quotation – SM 5-4-14 SlipMeters for Lateral W3 Turnout of West Canal, April 19, 2017
- C. Procut – Quotation
- D. Resolution 2017-XX – Water Conservation Field Services Program – Grant BOR DO-17-F011



QUOTATION



Date: April 19, 2017

To: Roger Sonnichsen

Company: Quincy Columbia Basin Irrigation District

Address: 1720 South Central Avenue
PO Box 188
Quincy, WA 98848

Phone: (509) 787-3591

Solution: SM-5-4-14 SlipMeters for Lateral W-3.0 Turnout

Quote #: Q500757

Valid For: 60 days

Rubicon Water

Fort Collins
1501 S. Lemay, Suite 101
Fort Collins, CO 80524
Toll Free 1-877-440-6080
Telephone 970-482-3200
Facsimile 970-482-3222

Modesto
615 Kansas Avenue, Unit B
Modesto, CA 95350

Imperial
415 Aten Road
Imperial, CA 92251

www.rubiconwater.com
usainquiry@rubiconwater.com

Shipping terms: FOB Modesto, CA

Billing terms: Net 30 days (see Payment Terms for details)

Prepared by: Damien Pearson

It is with pleasure that Rubicon Water submits this quotation for two SlipMeters™ to provide accurate flow measurement and control of flows in the West Canal –STA. 163+25 Lateral W-3.0 Turnout.

Qty	Product Number	Description	Each(\$)	Total (\$)
2	SM-5-4-14	SlipMeter designed to measure and control flows into a 5ft wide by 4ft tall inverted culvert, mounted to a 14ft tall headwall, provided with water level measurement for accurate partial-full flow measurement.	\$37,500	\$75,000
2	Technical Services	Installation, Start-up and commissioning	\$1,500	\$3,000
1	SCADA Hardware	SCADAConnect Live cell modem and antenna kit	\$1,000	\$1,000
1	Yearly SCADA Hosting Service	1 Year Hosting of Site on SCADAConnect Live to provide a web-based monitoring and control interface (yearly subscription at \$750 per year)	\$750	\$750
			TOTAL	\$79,750

*Prices exclude all taxes, prices are in US Dollars

tax

\$ 6,300

\$ 86,050

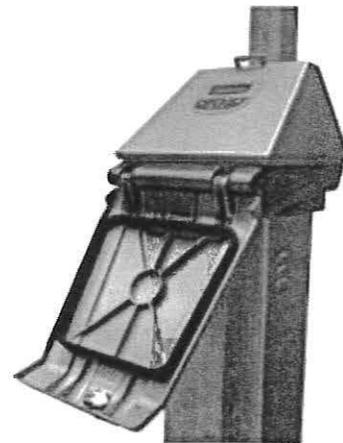
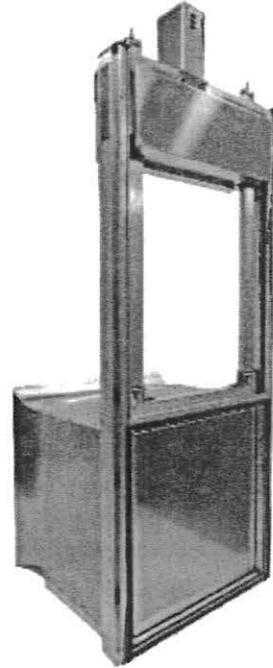
SlipMeter Description

The SlipMeter is a precision flow meter and control gate designed to measure and control flows into pipelines. The SlipMeter is installed onto the pipe inlet headwall and provides accurate measurement and control of flows entering the pipeline from open canals or sump inlets. The SlipMeter provides accurate flow measurement and control in both fully submerged and partially full pipe flow conditions.

The SlipMeter uses the acoustic transit time measurement principle, and does not require reflector particles in the water and is not impacted by water temperature or conductivity.

The SlipMeter installs into an external frame which is permanently mounted on the pipe headwall. Its location on the pipe inlet headwall makes inspection and maintenance simple during the season when flows are being delivered.

The SlipMeter is provided with a telemetry pedestal and solar power supply which is mounted to a concrete footing adjacent to the headwall. The pedestal and power supply are of the same design as that provided with Rubicon’s FlumeGate product, and provides an industry standard Modbus data interface. Integration into the District SCADA system is as per EID’s FlumeGates – with fitment of a District supplied radio and integration of Modbus tags into the District’s SCADA software.



SlipMeter Description

The SlipMeter includes the following items:

- The SlipMeter is a precision flow meter that measures fully submerged flows (and partial-full flow in partial-full models) and mounts directly to a headwall with no straight pipe requirements.
- The SlipMeter comes equipped with an internal and external frame c/w stainless steel anchors, epoxy capsules and polyurethane sealant.
- Each SlipMeter comes equipped with a separate standalone control pedestal which includes a display and keypad, solar panel power system and a 16 ft mast for mounting of communication antenna; RTUs, radio and antenna by others.
- The SlipMeter comes complete with an integrated power supply comprising an 85W solar panel, a solar regulator, and a 48Ah 12 volt deep cycling battery pack. Note, the batteries must be removed from the meter and charged if the gates are not installed within four weeks of delivery.
- Standard Rubicon local controller software, including automatic local/remote flow control mode, local/remote gate position mode and local manual mode.

Installation Labor

Installation labor is priced at USD\$1,500 per site.

Services during installation include:

- Site visits by a Rubicon certified Field Technician. The visits will involve field installation of the meter frame and pedestal, supervising the lifting of the meter into the frame, wiring of control pedestal to meter, commissioning and training in the operation and maintenance of the meter.

Exclusions:

- Civil works to structures to fit above meters.
- Provision of concrete footing to mount control pedestal.
- Supply and operation of crane for install of meter.
- Upstream level control option (Requires tuning from Rubicon Hydraulic engineers via modelling)
- Third-party radio and antenna or installation thereof
- Dewatering of site for installation
 - It is expected that the site will be dry and clean for installation of external frames. If the Rubicon Technician finds that there is water on the site the day of the scheduled external frame installation, the client will pay for the additional day of labour lost

Payment Terms

Payments are to be made as follows:

- Net 30 days.
- Spare parts will be invoiced 100% when shipped.
- In the event that frames and meter/gate hardware are shipped separately, payment is to be made as follows:
 - 30% of the total price within 30 days of shipment of frames.
 - 70% of the total price within 30 days of the delivery of the meter/gate hardware.

All payments are to be made by check to Rubicon Systems America Inc.

Warranty

Rubicon Water warrants the hardware offered in this quotation to be free of defects in material and workmanship for a period of twelve months from the date of commissioning.

QUINCY-COLUMBIA BASIN IRRIGATION DISTRICT

RESOLUTION 2017 - 14

WaterSMART Grant

WHEREAS, the Quincy-Columbia Basin Irrigation District is in receipt of the U.S. Bureau of Reclamation Funding Opportunity Announcement No. BOR-DO-17-F011, *WaterSMART: Small-Scale Water Efficiency Projects for FY 2017*; and

WHEREAS, the Quincy-Columbia Basin Irrigation District has legal authority to enter into a grant agreement with the U.S. Bureau of Reclamation; and

WHEREAS, the Board of Directors of the Quincy-Columbia Basin Irrigation District supports the application submitted; and

WHEREAS, the Quincy-Columbia Basin Irrigation District is capable of providing the amount of funding and/or in-kind contributions specified in the funding plan; and

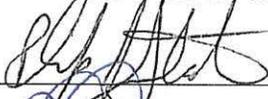
WHEREAS, the Quincy-Columbia Basin Irrigation District will work with the U.S. Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement; and

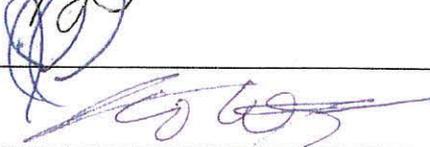
WHEREAS, receiving financial assistance through a WaterSMART Grant does not subject the Quincy-Columbia Basin Irrigation District to the discretionary provisions of the Reclamation Reform Act of 1982;

NOW, THEREFORE, BE IT HEREBY RESOLVED by the Board of Directors that the Quincy-Columbia Basin Irrigation District is committed to the financial and legal obligations associated with receipt of WaterSMART Grant financial assistance.

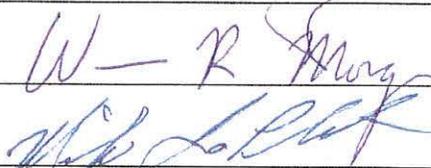
DULY ADOPTED during the regular meeting of the Board of Directors this 3rd day of May 2017.

BOARD OF DIRECTORS

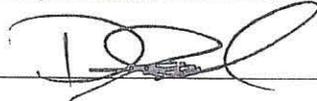




W-R Morgan



William Steers





Secretary

