— BUREAU OF —
RECLAMATION

R21AS00300

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
WaterSMART GRANTS: SMALL-SCALE
WATER EFFICIENCY PROJECTS

INSTALLATION OF 3 RUBICON SLIPMETER GATES ON THE GILA BEND MAIN CANAL

PALOMA IRRIGATION & DRAINAGE DISTRICT
ROBERT VANHOFWEGEN, DISTRICT MANAGER
38401 WEST I-8 #175
GILA BEND, AZ 85337-3033
ROBERT.V@PALOMAIDD.COM
P: (928) 683-2236

MARCH 18, 2021

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1. Technical Proposal and Evaluation Criteria

1.1 Executive Summary

This application is being submitted on 03/18/2021:
Paloma Irrigation and Drainage District – Category A Applicant
38401 W. I-8 # 175 Gila Bend, AZ 85337, Maricopa County

The Paloma Irrigation and Drainage District (PIDD) located in Gila Bend, Arizona has operated for over 100 years using manual controls to deliver water to their water users. This system is inefficient and prone to uncontrolled releases, spills, overflows, and requires constant overwatch and maintenance. Especially because we rely on 84 wells (65%) and surface water from the Gila River (25%) for our source of water. PIDD proposes to slowly upgrade our irrigation system and bring it into the 20th century. We plan to modernize a segment of our system by **installing three new automated Rubicon SlipMeter turnout gates for water delivery to producers off the 34-mile long Gila Bend Main Canal.** This is our **fourth Rubicon Gate installation project** and part of our overall strategy to slowly upgrade our irrigation system with State-of-the-Art real-time technology, new automated gates, and associated components. We plan to replace the three manual canal gates, that are inefficient, badly deteriorated, poorly functioning, and requires constant on-site monitoring and maintenance with these three new automated "Rubicon SlipMeter gates".

In May of 2018, PIDD contracted with Rubicon Systems Australia Pty Ltd to conduct a Scoping Study of our water delivery system to help us develop a plan to modernize our aging infrastructure with state-of-the-art technology and their" tried and tested" Rubicon gates. Because of the high costs to upgrade and network our entire system, we plan to implement these improvements in phases, carefully leveraging funding and internal resources. In 2021, we submitted our first grant (Small-Scale Water Efficiency) to BOR for one new Rubicon gate and were successful. PIDD wants to build on this initial upgrade to our system, and the associated benefits.

We will accomplish the goals established for the WaterSMART program by leveraging funding to conserve and better manage our water resources and increase efficiency of our system by slowly creating improved operations via an integrated network of automated Rubicon gates. We plan to construct the project in a **6-week period** and installation can begin in the late winter anytime between **Nov. 1st, 2022 and Jan. 31st, 2023**, depending upon NTP. Since the primary use of the water is agricultural, this is the best time because there is less demand, thus minimal impact to our producers/growers. We would schedule our work to accommodate them.

This project **is not** located on a Federal facility. The Paloma Irrigation and Drainage District canal system was the largest privately funded irrigation project in Arizona history, costing private owners about $2 million in 1919. Later in 1920, Frank Gillespie, a local rancher built the 1,700 LF Gillespie Dam to help provide water for irrigation. This community has practiced self-reliance for many decades, but now with the high costs of improvements, water shortfalls, and drought impacts, and increased operating costs, we must seek ways to leverage funding from grants or develop creative strategies to continue to provide our much needed services for this area.

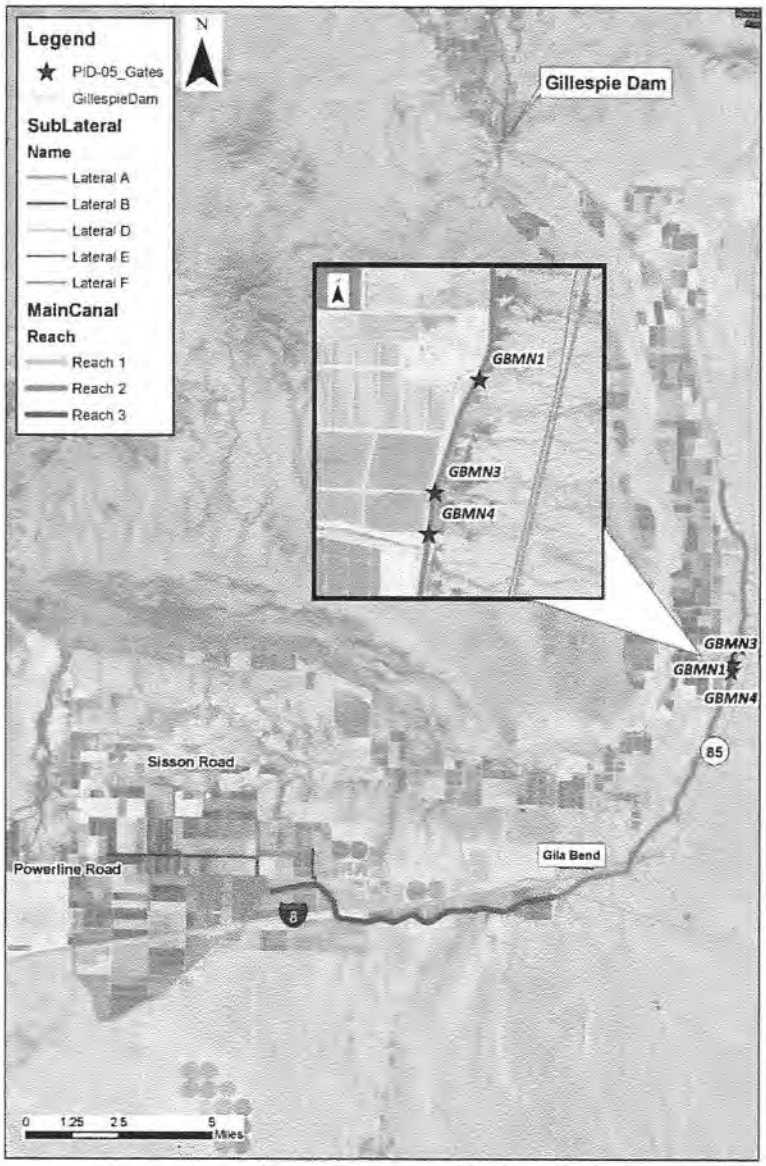
1. Technical Proposal and Evaluation Criteria

1.2 Project Location

Within the historical boundaries of the towns of Gila Bend and Buckeye, in Maricopa County, Arizona, it is about 25 miles south of the confluence of the Gila River and Hassayampa River. It is downstream of the Aqua Fria River and the Salt River, west of the Arizona State Route 85 Corridor. It is located in Reach 2 of the Gila Bend Main Canal.

Gate GBMN1:	Latitude: 33.03658	Longitude: -112.652375
Gate GBMN3:	Latitude: 33.14432	Longitude: -112.391952
Gate GBMN4:	Latitude: 33.13501	Longitude: -112.392082

Figure 1



Paloma Irrigation and Drainage District
District Overall Map

1. Technical Proposal and Evaluation Criteria

1.3 Technical Project Description

The Paloma Irrigation and Drainage District (PIDD) has operated for over 100 years using manual controls to deliver water to their water users. This system is inefficient and prone to uncontrolled releases, spills, overflows, and requires constant overwatch and maintenance. Especially because we rely on well water (65%) and surface water (25%) for our water supply. PIDD proposes to slowly upgrade their irrigation system and bring it into the 20th century. We plan to modernize our system, a **few gate/structures** at a time in addition to SCADA implementation. This project is for installation of three 2-foot wide Rubicon SlipMeter Turnout Gates, located within the 34-mile long Gila Bend Main Canal.

In May of 2018, PIDD selected Rubicon Systems Australia Pty Ltd to conduct a Scoping Study for our water delivery system to help us develop a plan to modernize our aging infrastructure with state-of-the-art technology and their" tried and tested" Rubicon Gates. The base cost estimate for upgrading just our main canal delivery system is around $2.8 million; not including turnout gates, installation or commissioning and design costs. We also had George Cairo Engineering, Inc. (GCE, Cairo), a local canal system modernization expert firm review our plan and provide validation and input. Because of the high costs of irrigation modernization projects, we have carefully identified and prioritized canals/laterals/structures and their ancillary components, so we can create an integrated network of automated check and turnout gates. Last year, we submitted our first grant (Small-Scale Water Efficiency) to BOR for one new Rubicon gate and were successful.

This is our **fourth Rubicon Gate installation project** and part of our overall strategy to slowly upgrade our irrigation system with real-time technology, new automated gates, and associated components. We plan to replace the three manual canal turnout gates, that are badly deteriorated, poorly functioning and require constant on-site monitoring and maintenance with three new "Rubicon SlipMeter gates" with Network controls in the 34 mile-long Gila Bend Main Canal. The three canal turnout gates are located in Reach 2 of the Gila Bend Main Canal.

Two pages from the Rubicon Data sheets for the SlipMeter Gate System (Figures 3 and 4) have been provided for reference in Section 1.4 Criteria C: Project Implementation and the complete information package from Rubicon has been provided in the Appendix. A schematic (Figure 2) has also been provided on the following page that illustrates the conditions "Before and After" the installation of the new automated SlipMeter gate system.

This Small-Scale Water Efficiency project is a priority to PIDD and is in the final design stage after receiving input from Rubicon Systems Australia Pty Ltd and George Cairo Engineering. It has been discussed and approved by our Board and also with our local BOR contact. We hope to leverage funding from the WaterSMART program to help us complete this project, meeting both PIDD's and BOR's goals to conserve and better manage our water resources and increase efficiency of our system. In order to better understand the needs of our district, we have provided a summary of PIDD's background, history and description in the Appendix.

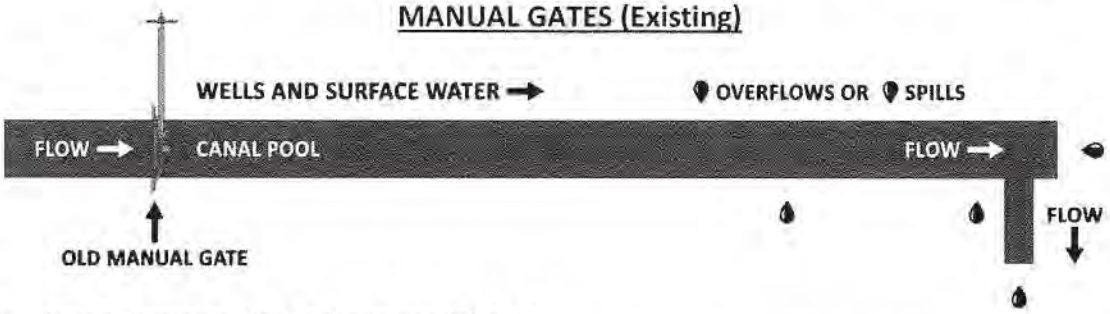
1. Technical Proposal and Evaluation Criteria

1.3 Technical Project Description

Figure 2

Schematic Design of Automated System Before and After New Installation

MANUAL GATES (Existing)



- Gate adjustment, ditch rider on-site full-time
- Try to maintain constant flow/elevation – fluctuation +/- 2FT, yields variable, inefficient deliveries
- Must anticipate when to stop pumps and adjust gates to match flows and provide water needed
- Close to soon → inadequate delivery
- Close too late → excess flows carry downstream can cause overflow/flooding or loss (downstream gates open to prevent flooding and system overflow)

AUTOMATED GATES (New Installation)

- Adjusts automatically, ditch rider uses integrated network controls
- Maintains delivery ditch pool constant delivery flow
- Gate adjusts precisely when needed to varying water levels on canal pool
- Yields steady deliveries

1. Technical Proposal and Evaluation Criteria

1.3 Technical Project Description

Materials and Equipment to be Used:

List of Materials:

Appurtenances and structures for three new Rubicon SlipMeter Gates:

Concrete, sections near each gate will be reinforced with mesh and/or rebar, non-shrink grout gravel, Forms/Traverses

Pipe - galvanized for footings, Pipe or for Railings or Platforms

Safety Supplies:

Shade, Coolers, Water/Electrolytes, Gloves, Safety Glasses, Reflective Vests, Hard Hats, Steel-Toed Boots, Signage, Cones, Barricades

List of Equipment:

Construction Equipment to be used for this project would include:

Front End Loader John Deere 624K, Dump Truck Kenworth, Rubber Tired Excavator Gradall XL5100, Water Truck GMC, Service Truck 1 Ton 2000 Ford, Project Manager Truck

Automation, Measurement Devices and Controls:

The SlipMeter includes the following items:

- The SlipMeter is a precision flow control and flow measurement gate that measures fully submerged flows (and partial-full flow in partial-full models) and mounts directly to a turnout 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.

Rubicon data sheets for the SlipMeter have been provided in the Appendix.

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

A. Project Benefits

Description of Expected Benefits and Outcomes from Implementing Project:
PIDD's existing water delivery system faces many challenges due to its distance from traditional surface water sources, almost 65% of its water must come from 84 ground water wells. Another 25% is pumped from the Gillespie Dam storage pool (Gila River, 25 miles South) and it includes irrigation tailwater from upstream. Without automation and integrated controls, it is difficult to precisely match water supply with demand to prevent mismatched flows and minimize operational spills. In the proposed improvement reach of the Gila Bend Main Canal, there is no nearby flow regulation check structure making the 3 turnouts susceptible to varying water levels. This results in unsteady deliveries and flow mis-matches carried downstream in the Gila Bend Main Canal.

Improvements to Water Delivery System: Efficiency, integrated control, reliable/constant flow, less water level fluctuations, quick detection/prevention of leaks or spillage, less time required for delivery (from initial request), improved coordination/collaboration with water users, improved response time for Orders (On and Off), less pump use. Create a positive impact by reducing overflows (which can also cause crop damage). All contributing to less water loss and decreased operating costs.

Other Benefits:
Improve Overall Reliability: Better control to prevent overflow/flooding, especially because of the multi-source water (wells and water from Gillespie dam - 34miles away). PIDD currently had an annual shortfall of 31,000 acre feet. This could help address that, as well as helping with future adverse conditions caused by drought and climate changes. These improvements also will result in improved on-farm efficiency and crop production.

Expected Geographic Scope Benefit: Locally – include benefits described in the previous two paragraphs. Sub-basin/Basin - positive impact to entire system by reducing significant water loss ranging from 150 to 250 acre ft/yr (Based on type of crop and growth cycle, irrigation distribution method, and frequency and length of water delivery). Also, reduction of ground water removal by less pumping, contributes to the overall health of the surrounding fragile desert ecosystem. his will improve sustainability and help address drought and climate change issues. Any water conservation measures that support the lower Colorado River basin and other small tributaries in this network system (Hassayampa River, Aqua Fria River and the Salt River) also help sustain wetland and riparian ecosystems as well as the Salt River and Pima-Maricopa Indian Tribes.

Collaboration and Information Sharing Among Water Districts in Region: This project demonstrates collaboration between our water district, BOR, and our agricultural users. It can be used as an example to other water managers reflecting how assessment, planning, usage, need, coupled with automation and new technology can be used to benefit a district, especially on districts relying on multiple sources of water under various conditions (distance from source, seasonal fluctuations in supply, drought and climate change).

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

A. Project Benefits

Local or Economic Positive Impacts/Benefits:

The specific problems PIDD faces are two-fold:

1) Costs from running the pumps and excess water loss from mismatch overflows and spillage.
2) Lack of effective water conservation measures: volume/flow controls (automation) and structures (gates) to precisely match supply and demand.

Specific Topic Benefits:

Agricultural – economic (less water needed, less restriction on crops types, less danger of crop damage from overflows/flooding, reduce shortfalls, less energy needed for pumps). Reduce O&M cost to PIDD so funding can be used for other deteriorating structures and sites.

Environmental – Less noxious/invasive weeds, less erosion, conservation support healthier ecosystem (Native plants, habitat, native species and migratory birds). More viable washes/springs.

Recreational/Tourism – Gila River/Watershed, desert washes– Improved off roading/ camping/hiking.

Cultural – Protection and preservation of native gathering sites (plants and clay).

Food Safety – Less danger of catastrophic crop failure due better water elevation control to prevent of overflows/flooding of fields with food crops.

Public Safety –Less residual flooding from overflow and spillage resulting in unsafe driving conditions and erosion of road and ditch banks.

Expected Outcomes:

These three new Rubicon SlipMeter gates will significantly reduce operating costs and the quantity of water lost (approximately 150 - 250 acre feet/year from spills and overflows). This is based on type of crop and growth cycle, irrigation distribution method, and frequency and length of water delivery). Other ancillary water distribution losses, such as seepage, and evaporation will also decrease.

WaterSMART Goals and Outcomes:

1) Preventing possible water-related crisis (shortfalls or flooding) – creating resiliency
2) Leveraging funding to conserve and better manage our water resources and increase efficiency of our system.
3) Improving water conservation, efficiency and effectiveness of water delivery system.

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

A. Project Benefits

Project Specific Expected Outcomes: Project Specific Expected Outcomes:

1) Reduced Pumping and Energy Costs (More funding available for improvements)
2) Reduced operational losses from spills and overflows (150-250 acre feet/year)
3) Reduced risk of crop damage from flooding, uncontrolled releases or overtopping
4) Reduced manual operating costs and use of resources (More funding for improvements)
5) Reduced delivery level fluctuations (Less water needed with optimum delivery/flow)
6) Enhanced capability to provide on-demand water delivery to customers (Efficiency)
7) Enhanced capability to provide remote monitoring and operation to PIDD staff (Better resource/staff management)
8) Ability to identify leaks and seepage and unauthorized usage by utilizing the precise flow rate measurement provided by the upgraded gate regulator (Timely preventative actions)
9) Provide full integration between flow regulation gate structure and groundwater pumps (Accurate water quantity delivery – no excess)
10) Improved on-farm water use efficiency and improved yields with reduction in fertilizer protecting the groundwater.
11) Provide constant supply levels to maintain more constant flow rates through turnouts to improve levels of service to water users (Less water needed with optimum elevation/flow)
12) Reduced "Order On" Lead Times to allow water delivery to be more precisely timed to crop needs (Less water needed)
13) Reduced "Order Off" Lead Times to allow precise volumes to be applied to farm (Less water)
14) Provide improved collaboration between multiple users and PIDD with automated water ordering (More efficient use of delivery system, less water needed)
15) Provide irrigation decision support tools to, such as on-line scheduling applications and digital monitoring of water usage and flow levels for water users (Efficient, timely and convenient)
16) More precisely match water supply to crop demand in order to irrigate each crop with the required amount of water (More accurate matching of need/demand with actual water quantity needed).

Complementing NRCS Projects:

This project would greatly enhance our farmers ability to make "On-Farm water efficiency improvements through the NRCS EQIP program, however, until PIDD can provide better controlled water delivery systems study (flow rate, pressure and elevation), it is difficult for them to make these improvements. As District Manager at PIDD and a 3rd generation farmer, I have an excellent relationship with NRCS and have received funding from them. I am working with NRCS to help develop a strategy to match our improvements with "On-Farm" projects. Also, to facilitate collaboration between our farmers with USDA programs from NRCS, Rural Development, the Farm Service Agency, as well as new stand-alone programs. These partnerships between PIDD, Federal Ag Agencies, BOR and producers are critical to our future.

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

They will help us plan and develop projects that complement each other, improving the overall system from diversions to the farm. Especially in the Western states where drought, climate change and aging infrastructure greatly affect our daily operations.

B. Planning Efforts Supporting the Project

This Small-Scale Water Efficiency project is a priority to PIDD and is in the final design stage after receiving input from Rubicon Systems Australia Pty Ltd and George Cairo Engineering. It has been discussed and approved by our Board as well as with our local BOR contact. We hope to leverage funding from the WaterSMART program to help us complete this project, meeting both PIDD's and BOR's goals to conserve and better manage our water resources and increase efficiency of our system.

Our "Water Conservation Plan" mandates that we periodically access our water delivery system and identify problems or needs as we continue to mature and adapt to meet changing conditions as well as identifying new technologies and strategies. In May of 2018, PIDD selected Rubicon Systems Australia Pty Ltd to conduct a Scoping Study for our water delivery system to help us develop a plan to modernize our aging infrastructure with state-of-the-art technology and their" tried and tested" Rubicon Gates. We have already installed two of these structures/automated systems Gates (Enterprise Turnout and Sump 4 Measuring Water Losses). We have also recently placed 28 Wells on remote control and monitoring (Crop Link by Agsense). We have established an excellent relationship with a local engineering firm that specializes in irrigation district infrastructure modernization and planning projects, George Cairo Engineering. They will also be conducting a System Optimization Review for us (if that BOR grant is successful).

Each year, we identify and prioritize our system needs and problems and projects not addressed in the previous year are added. Our criteria include:

1) Is the project (components) listed as a priority on our Capital Improvement Plan and Water Conservation Plan.
2) Can the problem or need be remedied with existing resources and funds?
3) What benefits will occur from the corrective action taken (water/monetary savings, efficiency, sustainability, annual maintenance, crop losses, shortfalls, acre foot savings).
4) Are additional resources and funds available if the existing funds are not available?
5) Recommendations from SOR (if grant successful).

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

C. Project Implementation

Implementation Plan:

Once the Categorical Exclusion is completed and we receive the NTP, we will begin initial planning. An Action Plan will be developed that lists each task, scheduled interval, responsible party, comments/notes and when the activity or task is completed and by whom. A work plan will also be completed. Major phases will include:

Engineering/Design Work Required for Project (3 months) *Allows for plenty of time for review.* This technical support will be performed by Rubicon Systems Australia Pty Ltd and George Cairo Engineering, Inc. – both have provided professional services for installation of 2 PIDD automated Rubicon gates and the 4th gate with funding just received from a Reclamation Small-Scale Grant.

- Design and Fabrication of Rubicon SlipMeter Gate, Controls and Framework - Rubicon
- Design of Concrete and Structures Modifications and Appurtenances - Cairo
- Order Gates – PIDD (Long Lead Item, may need 16 weeks lead time for fabrication)

Pre-Construction/Site Preparation for Project (1-2 Weeks) *One site or more, may be done concurrently, grouped by operational phasing and proximity (Estimate 16 Hrs/Site)*

Time is of the essence water outage work, try to complete all activities to reduce Dry-Up time.

- On-site support/final planning and safety/COVID 19 meetings – Rubicon and Cairo, concrete and civil works contractor.
- Begin Safe Dry-down to prevent canal liner damage, include notification to producers/growers – PIDD
- Mobilization of Employees and Equipment
- Begin pre-casting or ready to cast in place concrete structures (Sidewalls, Aprons, Sills, miscellaneous metals, and Appurtenances) – Concrete and Civil Works Contractor
- Order Additional Concrete

Construction and Installation (2-3 Weeks) *One site or more, may be done concurrently, grouped by operational phasing and proximity.*

- Implementation of all safety measures and COVID 19 requirements
- Removal of each Manual Gate and Demolition/Removal of any required structure elements - PIDD
- Continue to Coordinate/schedule with affected water user(s) - PIDD
- Final Site Preparation - PIDD Equipment Operator
- Concrete Foundation (Sidewalls and aprons) - PIDD, Rubicon and Cairo (Oversee)
- Installation of each of the three SlipMeter Gates (Attach to concrete structures) – PIDD, Cairo and Rubicon (Oversee)

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

C. Project Implementation

Post-Construction:

- Installation/testing of automation systems/controls (All activities not requiring Dry-out)
- Commission gates and certify accurate measurement and operation
- Postmortem to discuss lessons learned

Closeout/Reports:

As required (Progress Reports - Quarterly or Semi-Annual).
As-build final installation
Final report with documentation

Figure 3

SlipMeter Gate Specifications (Additional pages in Appendix) **and Schematics** (See page 5)

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

C. Project Implementation

Figure 4

SlipMeter Gate Specifications (Additional pages in Appendix) **and Schematics** (See page 5)

SlipMeter®

Control Pedestal

Each SlipMeter installation includes a robust pedestal that provides power and control to the gate and is a secure, weatherproof housing for electronic components and batteries.

The pedestal also serves as a local user interface. A keypad and LCD display are located under the lockable lid, allowing farmers to monitor, or operators to control and troubleshoot on-site.

Partially-full measurement

With a MicronLevel ultrasonic water level sensor fitted, the SlipMeter provides accurate flow measurement even when the measurement box is not completely full.

The sensor is unaffected by surrounding objects, debris, foam, silt or other contaminants and it self-calibrates on every reading to eliminate drift in speed of sound variations due to changes in temperature or humidity.

Gate control technology

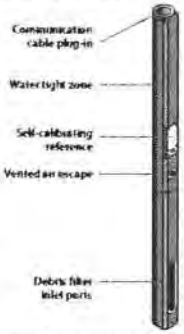
CableDrive™ is Rubicon's actuation system designed to provide precision gate position accuracy and repeatability in harsh environments. The drive is a wire-rope (cable) and drum mechanism that provides positive drive in both the raise and lower directions. It is designed for high duty cycle operation and provides precise gate positioning to within ±0.02in (0.5mm). The drive is managed by Rubicon's SolarDrive® technology – a purpose built integrated circuit board that manages gate positioning, solar power regulation, battery charge, fusing and the pedestal user interface.

Low maintenance

The SlipMeter's modular design allows it to be maintained in the field with minimal tools, training, and easily replaceable parts.

- Level sensors are easily removed during in-field servicing
- Seals can be replaced
- On-site diagnostics built into the software
- Service can be done by local Rubicon field technicians or authorized/trained independent local integrators

Local User Interface



MicronLevel® sensor detail

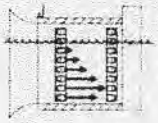
SCADAConnect® Live

Sonaray® flow measurement technology

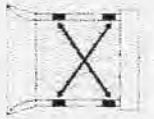
Rubicon's SlipMeter employs Sonaray ultrasonic array technology. The ultrasonic array principle maps the velocity profile by using multiple transecting paths to provide an accurate representation of the velocity distribution within the meter box.

This technique measures across the entire velocity field within the meter box and is resistant to swirl, or other non-uniform velocity distributions caused by garbage or other debris.

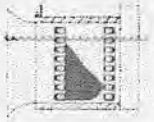
It also eliminates the need for flow profile calibrations that are required for single-point, single-path and velocity-sample based metering technologies.



Eight horizontal planes sample the velocity distribution passing through the meter (side view)



Each measurement plane implements crossed-path transit time ultrasonics to sample the entire velocity field in that plane (plan view of measurement planes)



The horizontal velocity distributions are then integrated vertically to construct the flow velocity distribution (side view)

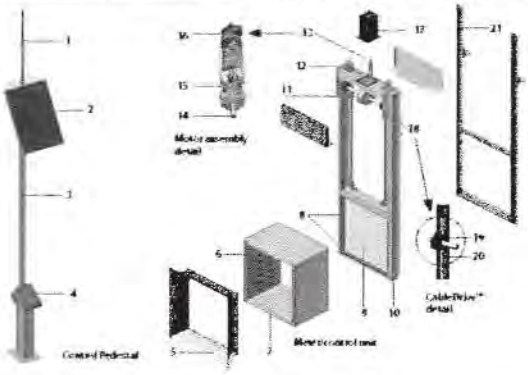
SlipMeter® components

Control Pedestal

1 Antenna
2 Solar panel
3 Hinged mast
4 Secure controller housing with LCD display

Meter/control unit

5 Entry flare
6 Sonaray sensors
7 Meter box
8 Gate seals
9 Gate panel
10 Internal frame (houses optional level sensor)
11 Output drive assembly (gearbox)
12 Lifting hooks
13 Motor and encoder
14 Motor drive shaft
15 Planetary gearbox
16 Encoder
17 Motor cover
18 CableDrive assembly
19 Cable drum
20 Cable guide
21 External frame



Data Sheet

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

C. Project Implementation

Figure 5
Tentative Milestone/Task Schedule

Milestone/Task	Planned Start Date	Planned Completion Date
USBR Award *Note: can take up to 16 weeks for Rubicon to fabricate gates and ship gates from Australia. May order with USBR approval before NTP.*	01/03/22	01/03/22
USBR NTP	01/10/22	01/10/22
Pre-Construction Contractor/Vendor Procurement: Engineering/Design, Concrete and Gates with associated structures, Concrete Subcontractor	01/10/22	10/31/22
Construction/Installation Coordinate/schedule with affected water user(s) Site Preparation Concrete Structures/Foundations Installation of three SlipMeter Gates Cleanup and Debris removal	011/01/22[1]	12/31/22[1]
Completion Closeout/Final Report	12/31/22	01/31/23

[1] Construction and Installation will only take four weeks but will take place in the late winter between these two dates. There is less demand (quantity and time), thus minimal impact to our producers/growers. We would schedule our work to accommodate them.

Ideally, we would like to start construction as soon as possible for design and procurement late 2021 or early 2022, but unless we receive the Award and NTP December 2021 or January 2022 from USBR, this is unlikely.

Permits Required: None

Engineering/Design Work Required for Project:
Will be performed by Rubicon and George Cairo Engineering
Design and Fabrication of SlipMeter Gates, Controls and Framework
Design of Concrete Sidewalls, Aprons and Appurtenances

1. Technical Proposal and Evaluation Criteria

1.4 Evaluation Criteria

C. Project Implementation

New Policies or Administrative Actions Required to Implement Project:
No new policies or actions, PIID always gets approval from their board and coordinates improvement projects with the water users to minimize impact to their agricultural operations.

Describe the Environmental Compliance Process and Estimate:
All work will comply with Federal environmental and cultural resource laws and other required regulations. However, since no earth disturbing activities will occur and all work will take place within the canal itself which was constructed above grade on **elevated "borrow" material**, we anticipate that only a Categorical Exclusion will be required at no costs. Most likely Categorical Exclusion at no costs. See responses to Environmental Compliance Questions in Section 3, page 20 for additional information.

D. Nexus to Reclamation

This project is connected to the Reclamation vision and goals by improving efficiency and conservation of our water systems for our district and supporting lower basin drought water management.

The PIDD receives Reclamation Water: ***Yes***
Via the Gillespie Dam Lift Station

Project on Reclamation lands or facilities: ***NO***
PIID utilizes Gila River water and ground water (wells) for the irrigation systems.

Project in same basin as Reclamation project or activity: ***Yes***
Gila River (Provides 25% water supply)
Aqua Fria River and the Salt River (Upstream Tributaries)
Lower Colorado River (Downstream – confluence in Yuma)

Project contributes water to a basin where a Reclamation project is located: ***Yes***
Gila River Valley – Lower Colorado River Basin (Confluence of Colorado River in Yuma)

Tribal Benefit: ***Yes***
Ancestral lands of Hohokam, Pima, Maricopa, Opa (Protected) Tohono O'odham San Lucy.
Water conservation measures (improvements (Protect native plants and species)

PIDD was just awarded their first grant from BOR, a Small-Scale Water Efficiency Grant for installation of a new 8 Foot Rubicon Gate. We also submitted a WEEG in 2020 for installation of 10 new Rubicon Gates as well as a grant application for a System Optimization Review.

2. Project Budget

2.1 Funding Plan and Letters of Commitment

The **Federal share** is **43.86%** and the **Non-Federal** share is **56.14%**.
PIDD Staff will be utilized for specific tasks during this six-week construction phase (November – January) with (Four on-site personnel: hours ranging from 100 to 120 hours each). We will utilize our staff and heavy equipment. The installation and commissioning will be overseen by a Rubicon representative, but PIDD's responsibilities will include project management, site preparation, some demolition, fill/compaction, concrete work, gate installation, dust control, cleanup and removal of debris and material at completion. By using our own staff costs will be greatly reduced because less hours will be required, and we will utilize our own equipment.

Costs incurred before start date: None (May need to place order for Rubicon Slip Meter Gates since they take 16 weeks of lead time to fabricate and are shipped from Australia).

2.2 Budget Proposal

Total Project Costs

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal Funding	$75,000.00
Costs to be paid by the Applicant	$95,984.00
Value of third-party contributions	$0.00
TOTAL PROJECT COSTS	**$170,984.00**

Project Costs Breakdown:

Federal Funding

BUDGET ITEM DESCRIPTION	AMOUNT
Materials: 3 Rubicon SlipMeter Gates @ $24,190 Each	$72,570.00
Contractual: Rubicon Installation & Commissioning 2 Gates @ $ 2,000 Each - $1,570 =	$2,430.00
TOTAL FEDERAL FUNDING	**$75,000.00**

Non-Federal Funding (PIDD) – In Kind and Cash

BUDGET ITEM DESCRIPTION	AMOUNT
Salaries and Wages: *In Kind*	$18,845.00
Fringe: *In Kind*	$7,880.00
Materials: *Cash* Concrete 3 Gates x 8 cu yds Each @ $140	$3,360.00
Materials: *In Kind and Cash* Safety and Construction Supplies	$3,000.00
Equipment: *In Kind or Cash* if rented	$15,285.00
Contractual: *Cash* Rubicon Installation & Commissioning 1 Gates @ $ 2,000 Each + $1,570 =	$3,570.00
Contractual: Cash George Cairo E & D for Concrete Support Structures 3 Gates x $5,000	$15,000.00
Contractual: Concrete Contractor 3 Gates @ $4,500	$13,500.00
In Direct Costs – De Minimus In-Kind	$15,544.00
TOTAL NON-FEDERAL FUNDING	**$95,984.00**

2. Project Budget (continued)

2.2 Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	$/Limit	Quantity		
Salaries and Wages				
Project Manager	$66.35	160	Hrs	$10,616.00
Water Master/Foreman	$30.89	100	Hrs	$3,089.00
Equipment Operator	$22.00	120	Hrs	$2,640.00
Laborer	$15.00	120	Hrs	$1,800.00
Grant Administration	$17.50	40	Hrs	$ 700.00
Total		**540**	**Hrs**	**$18,845.00**
Fringe Benefits				
Project Manager	$20.00	160	Hrs	$3,200.00
Water Master/Foreman	$10.00	100	Hrs	$1,000.00
Equipment Operator	$20.00	120	Hrs	$2,400.00
Laborer	$8.00	120	Hrs	$960.00
Grant Administration	$8.00	40	Hrs	$ 320.00
Total		**540**	**Hrs**	**$7,880.00**
Equipment (PIDD)				
Front End Loader John Deere 624K	$89.19	40	Hrs	$3,567.60
Rubber Tired Excavator Gradall XL5100	$102.53	40	Hrs	$4,101.20
Dump Body Rear – Kenworth	$104.01	20	Hrs	$2,080.20
Truck Hwy Chasis 52,000 Lbs 220 HP	$43.21	20	Hrs	$ 864.20
Water Tanker Trailer 5,000 Gal	$12.30	20	Hrs	$ 246.00
Truck Hwy Chasis 32,000 Lbs 220 HP	$3.61	20	Hrs	$ 72.20
Crew Truck 1/2 Ton 2000 Ford 4x4	$27.57	80	Hrs	$2,205.60
Project Manager Pickup Truck 4x4	$26.85	80	Hrs	$2,148.00
Total		**320**	**Hrs**	**$15,285.00**
Materials and Supplies				
Safety and Construction Supplies	$3,000.00	1	LS	$3,000.00
Rubicon SlipMeter Gates	$24,190.00	3	EA	$72,570.00
Concrete	$140.00	24	CY	$3,360.00
Total				**$78,930.00**
Contractual/Construction				
Engineering and Design Concrete	$5,000.00	3	EA	$15,000.00
Concrete Contractor	$4,500.00	3	EA	$13,500.00
Installation Supervision & Commissioning	$2,000.00	3	EA	$6,000.00
Total				**$34,500.00**
Environmental and Regulatory Compliance – Categorical Exclusion				**$0.00**
TOTAL DIRECT COSTS				**$155,440.00**
Indirect Costs – De-Minimus Fixed	10%			**$15,544.00**
TOTAL ESTIMATED PROJECT COSTS				**$170,984.00**

2. Project Budget (continued)

2.3 Budget Narrative

Salaries and Wages:

Project Manager: Robert VanHofwegen, District Manager 160 Hrs
Manage Overall Project:
Bid Procurement Process
Meet with Contractor Installation of Rubicon SlipMeter Gates/Associated Controls/Structures
Scheduling of Staff and Equipment.
Prepare reports and financial closeout

Water Master/Foreman/Crew Leader: 100 Hrs
Assist Project Manager – supervise PIDD employees

EQ Operator: 1 x 120 Hrs or 2 x 60 Hrs
Initial site preparation – some demolition activity and water diversion system if required, assist with construction – gate and concrete structure placement and testing.

Laborer: 1x 120 Hrs or 2 x 60 Hrs
Assist with construction – gate attachment, testing and structural supports

Grant Administration: 40 Hrs
Purchasing, Payroll, Track Costs, Project Hours (Employees and Equipment)

Fringe: Fixed
Project Manager
Water Master
Equipment Operator
Laborer
Grant Administrator
PIDD certifies that the labor rates included in the budget proposal represent the actual labor rates of the identified personnel.

Travel: No Travel Required

2. Project Budget (continued)

2.3 Budget Narrative

Equipment: Will use USACDOE equipment (EP 1110-1-8 30 November 2018)
Front End Loader – Site preparation and final cleanup, installation (L40CA024)
Rubber Tired Excavator – Site preparation and final cleanup, installation (H30GA011)
Dump Truck – Haul away construction debris and material (T50XX026 and(T45XX030)
Water Truck – Dust Control (T50XX029 and T40OX002)
Service Truck – Used in support of PIDD Crew on-site (T50XX010)
Project Manager Truck – project management at site (T500XX006)

Materials and Supplies:
Safety (Level D) and Construction:
Shade, Coolers, Water/Electrolytes, Gloves, Safety Glasses, Reflective Vests, Hard Hats, Steel-Toed Boots, Signage, Cones, Barricades

Concrete 8 cu yds for support structures for each gate (3 x 8 = 24) Includes allowance for rebar or pipe.

Three Rubicon SlipMeter Gate Systems for Farm turnouts

Contractual:
Engineering and Design of Concrete support structures
Gate Installation: This work will be performed by Rubicon staff and augmented by PIDD Personnel & Equipment.
Concrete Contractor: Use Forms to make support structures

Other:
Environmental Regulatory Compliance Costs: Most likely Categorical Exclusion at no costs. No earth disturbing activities and no demolition of existing structures. New gate structures to be installed on elevated "borrow" material used to construct canal.

See responses to Environmental Compliance Questions on page 20 to determine what may be needed and preparation of Environmental compliance documents as required

3. Environmental and Cultural Resources Compliance

3.1 Impact to Surrounding Environment ***NONE***

No significant impact, all earth-disturbing work will occur within existing canal and sidewalls. Canal is at higher elevation and was created with imported fill.

3.2 Threatened or Endangered Species, or Designated Critical Habitat ***NONE***

This area is greatly disturbed and in constant agricultural use. There are no threatened or endangered species present or critical habitat. *See page 14 last paragraph for description of surrounding biomes.*

3.3 Wetlands or Other Surface Waters (CWA) – Waters of the United States ***NONE***

There are no wetlands within the project boundary.

3.4 Water Deliver System Date of Construction

The Gila Bend Main Canal was constructed in 1919.

3.5 Modifications or Effects to Individual Features of a Delivery System (i.e., head gates, canals, or flumes) ***YES - ONE***

Three manual canal gates will be replaced by three Rubicon SlipMeter gates.

3.6 Features in the Paloma Water and Drainage District Listed or Eligible for Listed on the National Register of Historic Places ***NONE***

None in district, but these are 5 to 30 miles away: Stout Hotel, Old Hwy 80, Gila Bend Overpass, Gila Bend Steam Locomotive Water Stop, Gillespie Dam, Gillespie Dam Hwy Bridge, Painted Rock Petroglyph Site, Fortaleza Site (Ancient Hohokam Fort on Hill) and Gatlin Site (Ancient Hohokam Village with homes and irrigation canals).

3.7 Archaeological Sites in Proposed Project Area ***NONE***

There are no archaeological sites in the project area, but 10-20 miles away: Painted Rock Petroglyph Site, Fortaleza Site (Ancient Hohokam Fort on Hill) and Gatlin Site (Ancient Hohokam Village with homes and irrigation canals).

3.8 Disproportionately High or Adverse Effects on Low Income or Minority Populations ***NONE*** No disproportionally high or adverse effects on low income or minority populations. If anything, this will have the opposite effect economically.

3.9 Limit Access to and Ceremonial Use of Indian Sacred Sites or Impact on Tribal Lands ***NO***

Not limit access to and ceremonial use of sacred sites or impact Tribal lands.

3.10 Contribution to Introduction, Continued Existence, or Spread of Noxious Weeds or Non-Native Invasive Species ***NO***

If anything, this project will have the opposite effect, reducing noxious weeds and non-native invasive species, including aquatic vegetation.

4. Required Permits or Approvals

There are no permits or approval required for this project.

5. Official Resolution

Approved by Board, no third party financial support. Resolution will be provided within 30 days from submission.

6. Letters of Support

See attachment for Letters of Support on this project.

Appendix

Rubicon Slip Meter Data Sheets and Quote

PIDD Summary

Description, Background and History

Letters of Support

RUBICON™

QUOTATION

Rubicon Water
Rubicon Systems America Inc.
Fort Collins
1501 S. Lemay Avenue
Suite 101
Fort Collins, CO 80524
toll free 1-877-440-6080
phone 970-482-3330
fax 970-482-3222
email inquiry@rubiconwater.com
Modesto
2318 Teruya Drive
Modesto, CA 95354
Imperial
415 W Aten Road
Imperial, CA 92251
www.rubiconwater.com

Date: February 12, 2021

To: Robert VanHofwegen
Company: Paloma Irrigation and Drainage District
Address: 38401 I-8
Gila Bend, AZ 85337
Phone: (928) 683-2236
E-mail: Robert.v@palomaidd.com

Project: 3 x SMB-600-3000 SlipMeters
Quote #: Q501297
Valid For: 60 days

Shipping terms: FOB Modesto, CA
Billing terms: Net 30 days (see Payment Terms for details)
Prepared by: Darren McGregor

It is with pleasure that Rubicon Water submits this quotation for SlipMeters in support of Paloma's grant submissions; we look forward to working with you on these sites once the grant has been won.

Pricing is as shown below:

Qty	Product Number	Description	Each (US$)	Total (US$)
1	SMB-600-3000	Rubicon SlipMeter, designed for nominal frame width of 2', head wall heights of up to 10'. Minimal flow 1.1 CFS; maximum flow 25 CFS. Fully integrated solution.	$19,690	$59,070
1	Supervision & Commissioning	Supervision & Commissioning (per gate)	$1,500	$4,500
		Total *		**$63,570**

*Excluding taxes

SlipMeter®

RUBICON™

Overview

The SlipMeter is a breakthrough all-in-one gate and meter for farm turnouts and canal offtakes. Now it's less labor intensive to provide irrigators with a reliable, flexible and accurate water delivery service.

You can remotely pre-set the SlipMeter to automatically deliver a constant and accurately measured flow rate and volume. This means you can provide a great service day or night, even when supply canal levels are fluctuating.

And the all-in-one design means everything – drive system, motor control, ultrasonic measurement, power supply, local control keypad and telemetry – functions as a single unit, avoiding installation problems or incompatibilities.

The SlipMeter's ability to measure accurately at high and very low flow rates means it is suitable for all crop types. And the extremely low head loss means that command is not compromised even when very little head is available.

It has been designed to be installed in existing structures without costly civil work, by simply sliding into a frame that is fixed to the existing structure.

The built-in software provides the following control possibilities:

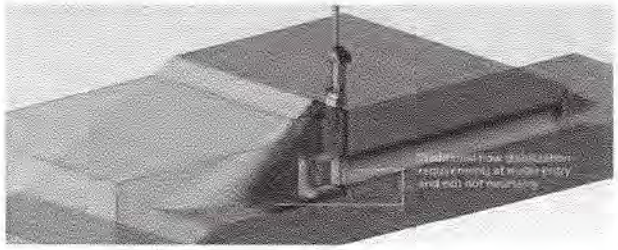
Control objective	Water action
Local site	Position — Moves to a desired set-point and stays there
	Flow — Maintains a constant flow regardless of upstream or downstream levels
	Upstream water level — Maintains a desired level in the pool immediately upstream
Network[1]	Supply — Changes the flow to match the flow supplied from the network above the gate while maintaining a stable upstream water level
	Demand — Changes the flow to match measured outflow from the network below the pool while maintaining a stable downstream water level

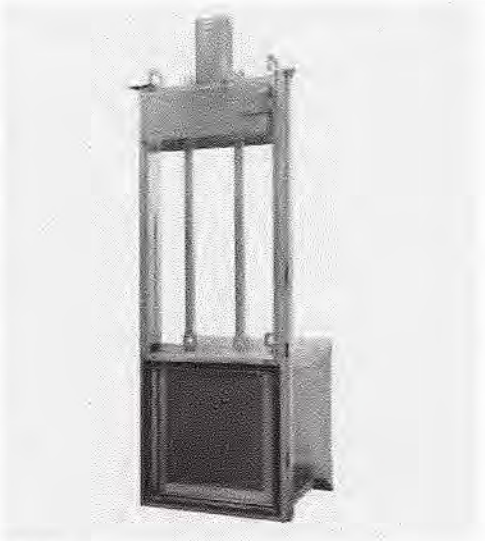
[1] Networked control is available when used with other Rubicon gates and NeuroFlo® software.

A TCC® product

The SlipMeter is one of the products making up a modular family of precision hardware and software called TCC (Total Channel Control®). TCC is an advanced technology set designed to improve the management and productivity of water in open canal and gravity pipeline distribution. Unlike traditional infrastructure, TCC products can interact and work together to help managers improve:

- water availability
- service and equity to users
- management and control
- canal operator health and safety



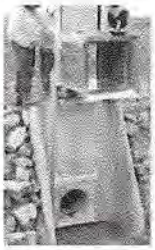


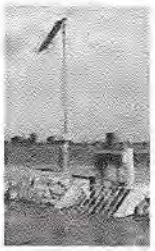
Features

- Sonaray® flow measurement accuracy of ±2.5%[2]
- Exceeds California SBx7-7 requirements
- Solar-charged battery system or AC line power
- SCADA ready communication system – can be integrated to many SCADA platforms
- Partially-full measurement when fitted with MicronLevel® sensor

An ideal solution for...

- Measuring and controlling flow in farm turnouts
- Canal-to-pipe applications
- Automation of canal regulators
- Automation of canal offtakes
- Lowering civil costs because there is no need to stabilize flow at entry and exit
- Turnouts requiring very low head loss and/or high accuracy





Data Sheet

SlipMeter®

Control Pedestal

Each SlipMeter installation includes a robust pedestal that provides power and control to the gate and is a secure, weatherproof housing for electronic components and batteries.

The pedestal also serves as a local user interface. A keypad and LCD display are located under the lockable lid, allowing farmers to monitor, or operators to control and troubleshoot on-site.

Partially-full measurement

With a MicronLevel ultrasonic water level sensor fitted, the SlipMeter provides accurate flow measurement even when the measurement box is not completely full.

The sensor is unaffected by surrounding objects, debris, foam, silt or other contaminants and it self-calibrates on every reading to eliminate drift in speed of sound variations due to changes in temperature or humidity.

Gate control technology

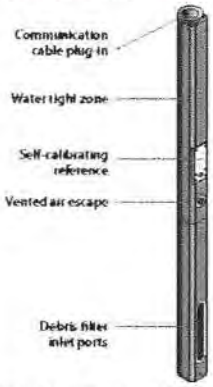
CableDrive™ is Rubicon's actuation system designed to provide precision gate position accuracy and repeatability in harsh environments. The drive is a wire-rope (cable) and drum mechanism that provides positive drive in both the raise and lower directions. It is designed for high duty cycle operation and provides precise gate positioning to within ±0.02in (0.5mm). The drive is managed by Rubicon's SolarDrive® technology – a purpose built integrated circuit board that manages gate positioning, solar power regulation, battery charge, fusing and the pedestal user interface.

Low maintenance

The SlipMeter's modular design allows it to be maintained in the field with minimal tools, training, and easily replaceable parts.

- Level sensors are easily removed during in-field servicing
- Seals can be replaced
- On-site diagnostics built into the software
- Service can be done by local Rubicon field technicians or authorized/trained independent local integrators

Local User Interface



MicronLevel® sensor detail

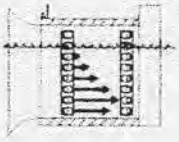
SCADAConnect® Live

Sonaray® flow measurement technology

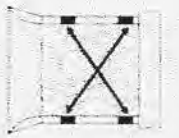
Rubicon's SlipMeter employs Sonaray ultrasonic array technology. The ultrasonic array principle maps the velocity profile by using multiple transecting paths to provide an accurate representation of the velocity distribution within the meter box.

This technique measures across the entire velocity field within the meter box and is resistant to swirl, or other non-uniform velocity distributions caused by garbage or other debris.

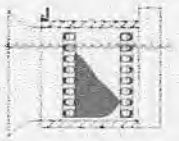
It also eliminates the need for flow profile calibrations that are required for single-point, single-path and velocity-sample based metering technologies.



Eight horizontal planes sample the velocity distribution passing through the meter (side view)



Each measurement plane implements crossed-path transit time ultrasonics to sample the entire velocity field in that plane (plan view of measurement plane)



The horizontal velocity distributions are then integrated vertically to construct the flow velocity distribution (side view)

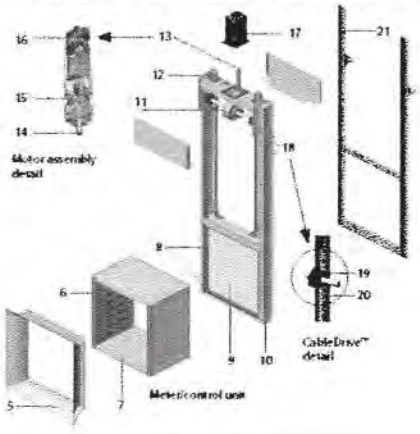
SlipMeter® components

Control Pedestal

1 Antenna
2 Solar panel
3 Hinged mast
4 Secure controller housing with LCD display

Meter/control unit

5 Entry flare
6 Sonaray sensors
7 Meter box
8 Gate seals
9 Gate panel
10 Internal frame (houses optional level sensor)
11 Output drive assembly (gearbox)
12 Lifting hooks
13 Motor and encoder
14 Motor drive shaft
15 Planetary gearbox
16 Encoder
17 Motor cover
18 CableDrive assembly
19 Cable drum
20 Cable guide
21 External frame



Data Sheet

RUBICON®

Easy to install

SlipMeters are designed to mount to existing headwall structures as well as purpose-built emplacements, significantly reducing costs associated with civil work.

- Installed and operational in two days during irrigation or off-season
- Factory calibrated and pre-configured

Remove existing manual gate and... replace with SlipMeter

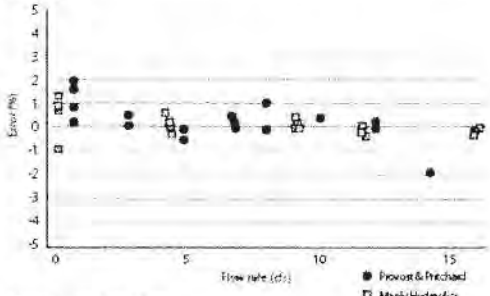
Independently tested flow measurement accuracy

The SlipMeter's flow measurement accuracy has been independently verified under a wide range of conditions and has demonstrated compliance with California's SBx7-7 legislation.

- Provost & Pritchard engineers in California conducted in-situ testing in a customer turnout configuration under calm, turbulent, and extreme turbulent conditions
- Manly Hydraulics Laboratory in Sydney, Australia conducted laboratory tests under wave disturbance, upstream disturbance and submerged conditions

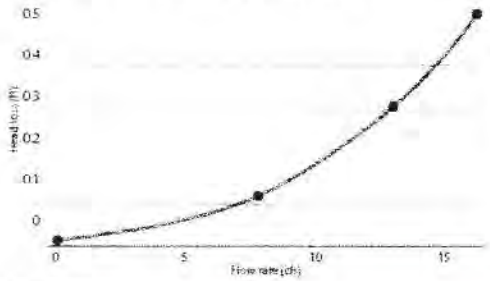
SlipMeter® measurement accuracy

(24in 45° path SlipMeter measured under normal operating conditions relative to ABB Magmaster)



SlipMeter® head loss

(24in 45° path SlipMeter measured at Manly Hydraulics Laboratory)



SlipMeter® specifications

General	
User interface	LCD screen
Data interface	RS232/485, USB, Ethernet, Protocols - DNP3, MDLC, Modbus, TCP/IP, others
Local interface language	English, Spanish, French, Chinese and Italian (metric/imperial units)
Data tags	A comprehensive set of tags are available for integration into SCADA systems
Data storage	Historical data can be uploaded locally via USB for post processing
Control	Local or remote via SCADA
Electronics	SolarDrive® power management and control technology housed in the local Control Pedestal. Each unit passes a 12hr heat pre-stress and 100% functional test.
Gate actuation	12V DC motor with 256 count magnetic encoder
Actuation options	12V DC powered (solar), 120V AC powered, mechanical override, electrical override pendant and battery
Seal performance	<0.1 gallons/minute/foot of seal (exceeds AWWA C513)
Flow measurement	
Technique	Cross-path ultrasonic transit-time
Measurement resolution	100 picoseconds
Measurement rate	2.5 seconds
Accuracy	[1]±2.5% verified in Rubicon's hydraulics laboratory between flow ranges of 1cfs to 24cfs. In addition, the 24in 45° SlipMeter has been independently verified to be accurate to within 2.5% by Manly Hydraulics Laboratory, April 2011 and Provost & Pritchard, November 2011
Measurement range	Accuracy listed above is achieved at flow velocities greater than 1.2 in per second for meters with a 45 degree path angle and greater than 3.25 in per second for meters with an 11.25 degree path angle. Maximum flow capacity is determined by site hydraulic conditions, but is typically greater than 6.5 ft/second. Consult your Rubicon sales engineer for details.
Sensor quantity	32 individual acoustic sensors, arranged in four cartridges, across 8 planes of measurement
Calibration method	Factory pre-calibrated. Optional ultrasonic level sensor is also internally self-calibrating. Simple in-field verification process
Alarming	Alarm indicates excess build-up of silt. Meter alarms if water depth falls below minimum required level.
Water level measurement (optional)	
Technique	Ultrasonic
Accuracy	0.02in (0.5mm)
Resolution	0.004in (0.1mm)
Material	
Frames	Extruded marine grade aluminum
FormiPanel™	Marine grade aluminum composite laminate gate panel
Corrosion protection	Marine-grade aluminum and stainless steel materials designed for typical irrigation water applications. Additional chemical corrosion protection is available for -P models, which are provided with a polyamine-cured epoxy coating[2]. Please consult your Rubicon sales engineer.
Hardware and shafts	Stainless steel
Seals	EDPM rubber
Wear strip	PVC
Pressure rating	9Bft differential pressure or specified checking height (whichever is greater)
Water level sensor	Anodized marine grade aluminum and copolymer acetyl plastic with stainless-steel fittings
Power	
Power supply	12V DC self-contained battery charged from solar panel or AC line power
Batteries	Sealed gel lead acid with temperature sensor (~5yr life, provides ~5 days of operation without solar or AC line power) or optional lithium LiFePO4

Specifications subject to change

RUBICON™

Dimensions and operating ranges

Model		A	B	C	D	E	F	H	Weight	Head loss	
Imperial	metric	in	in	in	in	in	in	in	lb	Max ft	Rec ft
SMB-1½-4-C	SMB-450-1200-C		47.24		65.87	85.55	49.21		366		
SMB-1½-5-C	SMB-450-1500-C		59.06		77.68	97.36	61.02		381		
SMB-1½-6-C	SMB-450-1800-C	17.72	70.87	28.03	94.46	116.14	76.77	3720	421	06	143
SMB-1½-8-C	SMB-450-2400-C		94.49		120.08	139.76	100.39		452		
SMB-1½-10-C	SMB-450-3000-C		118.11		129.76	159.45	120.08		481		
SMB-2-5-C	SMB-600-1500-C		59.06		77.68	103.27	61.02	3720	388	1.1	
SMB-2-5	SMB-600-1500							4823	443	04	
SMB-2-6-C	SMB-600-1800-C		70.87		96.46	122.05	76.77	3720	417	1.1	
SMB-2-6	SMB-600-1800							4823	472	04	
SMB-2-8-C	SMB-600-2400-C	23.62		33.94				3720	459	1.1	25.4
SMB-2-8	SMB-600-2400		94.49		120.08	145.67	100.39	4823	514	04	
SMB-2-10-C	SMB-600-3000-C							3720	487	1.1	
SMB-2-10	SMB-600-3000		118.11		139.76	165.35	120.08	4823	542	04	
SMB-2½-6-C	SMB-750-1800-C							3839	592	17	
SMB-2½-6	SMB-750-1800		70.87		96.46	129.92	74.80	6063	702	06	
SMB-2½-8-C	SMB-750-2400-C							3839	634	17	
SMB-2½-8	SMB-750-2400	29.53	94.49	39.84	120.08	153.54	98.42	6063	744	06	39.7
SMB-2½-10-C	SMB-750-3000-C							3839	685	17	
SMB-2½-10	SMB-750-3000		118.11		139.76	173.23	120.08	6063	795	06	
SMB-3-6-C	SMB-900-1800-C							4961	721	24	
SMB-3-6	SMB-900-1800		70.87		96.46	135.83	74.80	6063	787	09	
SMB-3-8-C	SMB-900-2400-C							4961	762	24	
SMB-3-8	SMB-900-2400	35.43	94.49	45.75	120.08	159.45	98.43	6063	828	09	57.2
SMB-3-10-C	SMB-900-3000-C							4961	812	24	
SMB-3-10	SMB-900-3000		118.11		139.76	179.13	120.08	6063	879	09	
SMB-3½-8-C	SMB-1050-2400-C							4961	885	33	
SMB-3½-8	SMB-1050-2400		94.49		127.95	173.23	104.33	7165	1089	13	
SMB-3½-10-C	SMB-1050-3000-C	41.34		51.66				4961	936	33	77.9
SMB-3½-10	SMB-1050-3000		118.11		147.64	192.91	124.02	7165	1090	13	
SMB-4-8-C	SMB-1200-2400-C							4961	990	43	
SMB-4-8	SMB-1200-2400		94.49		127.95	179.13	104.33	7165	1135	16	
SMB-4-10-C	SMB-1200-3000-C	47.24		57.56				4961	1050	43	101.7
SMB-4-10	SMB-1200-3000		118.11		147.64	198.82	124.02	7165	1175	16	
SMB-5-10-C	SMB 1500-3000-C		118.11		155.51	219.09	133.86	6063	1731	66	
SMB-5-13½-C	SMB-1500-4200-C	59.06	165.35	69.37	187.01	250.59	165.35		1828	66	158.9

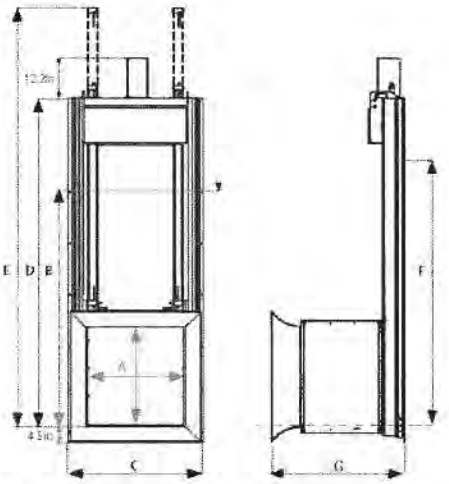
* C denotes a compact SlipMeter with a smaller footprint that contains an 11.25° transducer arrangement for situations where space is limited. Compact SlipMeters have a marginally higher minimum flow rate in comparison to the standard SlipMeter due to the configuration of the transducer paths.

† Fusion-bonded polyamine-cured epoxy coating is available for protection against chemical corrosion. This option is denoted by a -F added to the model number when ordering e.g. SMB-2-6-C-F.

‡ Contact your Rubicon Sales Engineer to discuss higher flow rate requirements. The maximum flow rate at which the measurement accuracy is within ±2.5% is subject to installation hydraulics.

Complete dimensions or additional sizes can be obtained by contacting Rubicon. Consultation with a Rubicon sales engineer is recommended prior to gate sizing. Weights are approximate.

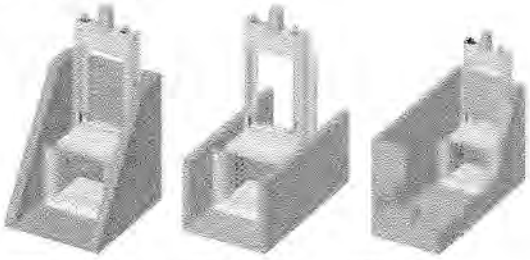
Front and side views



A Gate size
B Checking height
C Frame width
D Overall gate height*
E Fully open height*
F Maximum headwall height
G Box length

* Dimension D and E are measured from the elevation of the meter floor (invert). An additional 4.5in clearance is required between the invert and the base of the headwall to accommodate the SlipMeter installation requirements.

Mounting options



Headwall Sidewalls Control box

About Rubicon Water

Rubicon Water delivers advanced technology that optimizes gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers' lives.

Founded in 1995, Rubicon has more than 30,000 gates and meters installed in TCC systems in 15 countries.

DS-SM-08/20-US

www.rubiconwater.com

Background, History and Description of PIDD

The Paloma Irrigation and Drainage District (PIDD) claims water rights on the Gila River dating back to the late 1800s and annually diverts an average of 185,000 Acre-Feet/Year for 27,000 acres. The District canal system was the largest privately funded irrigation project in Arizona history, costing private owners about $2 million in 1919. It was formally recognized as the Paloma Irrigation and Drainage District by Maricopa County in May of 2001. PIDD lies in the vicinity of Gila Bend, Arizona, with its diversion point on the Gila River being about 25 miles south of the confluence of the Gila River and Hassayampa River. It is downstream of the Aqua Fria River and the Salt River. Return water flows back into Bull Durham Wash, which is tributary to the Gila River. The most important crops grown in our district are Alfalfa, Corn, Cotton, Sorghum, Millet, Milo and other small grains. Crops can be grown year-round in this warm dry climate with little need for frost protection.

Currently, the Paloma Irrigation and Drainage District operates and maintains 99 miles of irrigation ditches and canals; 100% are lined with concrete. PIDD has the right to divert essentially all the water that arrives at Gillespie Dam on the Gila River and supplements it with water pumped from wells so that it produces approximately 185,000 acre feet per year to irrigate approximately 27,000 acres. Efforts to conserve water are challenging in PIDD's antiquated control systems, but PIDD works closely with its Water Users, USBR and other agencies to be pro-active in addressing these issues.

Source of Water Supply:
Gila River (Gillespie Dam Lift Station 40-80 cfs) Includes Upstream Irrigation Tailwater: 25%
84 Ground Water Wells (4.5 cfs): 65%
Sumps and Pump Backs (10%)
Distributed to PIDD Canal

Total Quantity of Water Supplied: 185,000 acre ft/yr

Quantity of Water Supplied to Gila Bend Main Canal 165,000 acre feet

Water Rights Involved: approx. 1881 Priority

Current Users and Number Served: Agricultural 22

Current Water Demand: 360 cfs **Projected Water Demand:** Same

Total Acres Served: 27,000 Acres

Background, History and Description of PIDD

Paloma Irrigation and Water District Water Delivery or Distribution System:
Agricultural Use only.

Major Crops: Alfalfa, Corn, Cotton, Sorghum, Barley, Wheat and Oats

Potential Shortfalls in Water Supply: 31,000 acre feet/yr (Actual)
If drought continues and adverse effects of climate change persist, shortfalls quantities could increase. Increased demand from new users. Water conservation measures are critical. Farmers here have already been encouraged to implement water conservation measures. They must fallow parts of their farms each year and go on pro rata shares of the available water in the summer months.

Type and Approximate Total Lengths of Canals, Laterals and Pipes: 99 Miles
Concrete Lined/Pipe: 99 Miles (100%) **Unlined:** 0 Miles

Type and Approximate Total Lengths of Canals: 34 Miles
Concrete Lined: 34 Miles (100%) **Unlined:** 0 Miles

Type and Approximate Total Lengths of Laterals: 65 Miles
Concrete Lined: 65 Miles **Unlined:** 0 Miles

Fragmented/Deteriorated Concrete Lined Lateral: 17 Miles

Type and Approximate Total Lengths of Pipes: 4 Miles

Number of Irrigation Turnouts: 166

Significant Irrigation Improvements:
Automated Controls Structures: 2 Rubicon Automated Gates (Enterprise Turnout and Sump 4 Measuring Water Losses)
SCADA: 0
Remote Monitoring Devices: 8/84 Wells recently placed on remote controlled and monitoring (Crop Link by Agsense).
PIDD was just awarded their first grant from BOR, a Small-Scale Water Efficiency Grant for installation of a new 8 Foot Rubicon Gate on the Gila Bend Main Canal. We also submitted a WEEG in 2020 for installation of 10 new Rubicon Gates as well as a grant application for a System Optimization Review.

Flying R Farms

4225 S. Dean Rd.

Buckeye, Az. 85326

March 18, 2021

SUBJECT: **Department of the Interior Bureau of Reclamation Funding No. R21AS00300**
WaterSMART Grants: Small-Scale Water Efficiency Projects
Paloma Irrigation and Drainage District -
Installation of 3 Rubicon SlipMeter Gates on the Gila Bend Main Canal

To Whom It May Concern,

It is with great pleasure that I provide this letter of support for the Paloma Irrigation and Drainage District (PIDD) of their application to the Reclamation for the WaterSMART Grants: Small-Scale Water Efficiency Projects Funding Opportunity No. R21AS00300. This project will allow the PIDD to replace deteriorated Waterman C-10 cast iron canal gates with 3 new Rubicon SlipMeter gates. Replacement of these gates will allow PIDD to provide better water supply and conserve more water long term, they will be able to provide more reliable water supplies for our farm operation. With more reliable flows, I am able to farm efficiently and improve crop production.

Thank you for accepting this letter of support.

Sincerely,

Todd Rovey

Flying R Farms

Gila Bend, AZ

Sunset Farms

55310 S. Citrus Valley Road

Gila Bend, AZ 85337

March 18, 2021

SUBJECT: **Department of the Interior Bureau of Reclamation Funding No. R21AS00300**
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Paloma Irrigation and Drainage District -
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Thank you for accepting this letter of support.

Sincerely,

Kyle VanHofwegen

Sunset Farms

Gila Bend, AZ