



Yolo County Flood Control &
Water Conservation District

Canal System Headgate Automation



Applicant:

Yolo County Flood Control & Water Conservation District
34274 State Highway 16, Woodland, CA 95695
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TECHNICAL PROPOSAL

Executive Summary

Date: March 17, 2021

Applicant Category: A

Applicant Name: Yolo County Flood Control & Water Conservation District

Address: 34274 State Highway 16, Woodland, CA 95695

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The Yolo County Flood Control & Water Conservation District's (YCFC&WCD) Canal System Headgate Automation project will enhance water use efficiency in the Cache Creek watershed by improving water delivery efficiency and flexibility and reducing operational spill. This project will install canal automation technology and will advance the YCFC&WCD's vision in operating an "on-demand" irrigation canal system by improving precision management of water delivery timing, volume, and measurement.

Precise flow measurement and control gates will be installed on up to seven YCFC&WCD's canal headgates. The installation of these headgates will also include secure communications that will establish individual connections with the YCFC&WCD's SCADA system to control and monitor the new gate asset in real time. Operational spill is reduced with the continuous real-time control of the headgate and surface water supplies are conserved in compliance with the requirements of the SB X7-7 Water Measurement Compliance Program and California's Agricultural Water Measurement Regulation. The goals of this project are consistent with local and regional needs as part of the Yolo County Integrated Regional Water Management Plan (IRWMP) and Westside-Sacramento IRWMP; as well as critical State water issues outlined in California's Bulletin 160-09 and Water Resilience Portfolio 2020, such as agricultural water use efficiency goals.

YCFC&WCD's experienced project management staff expect project construction to occur over five months, with a tentative start date of February 1, 2022 depending on USBR's contracting process. None of the proposed seven sites in the project are located on a Federal Facility.

Project Location

The YCFC&WCD's Canal System Headgate Automation project is located within the boundaries of the YCFC&WCD in Yolo County, California. Figure 1 shows an aerial view of the YCFC&WCD's 160-mile canal system (blue lines) and manually operated headgates (yellow pins) considered for upgrading.

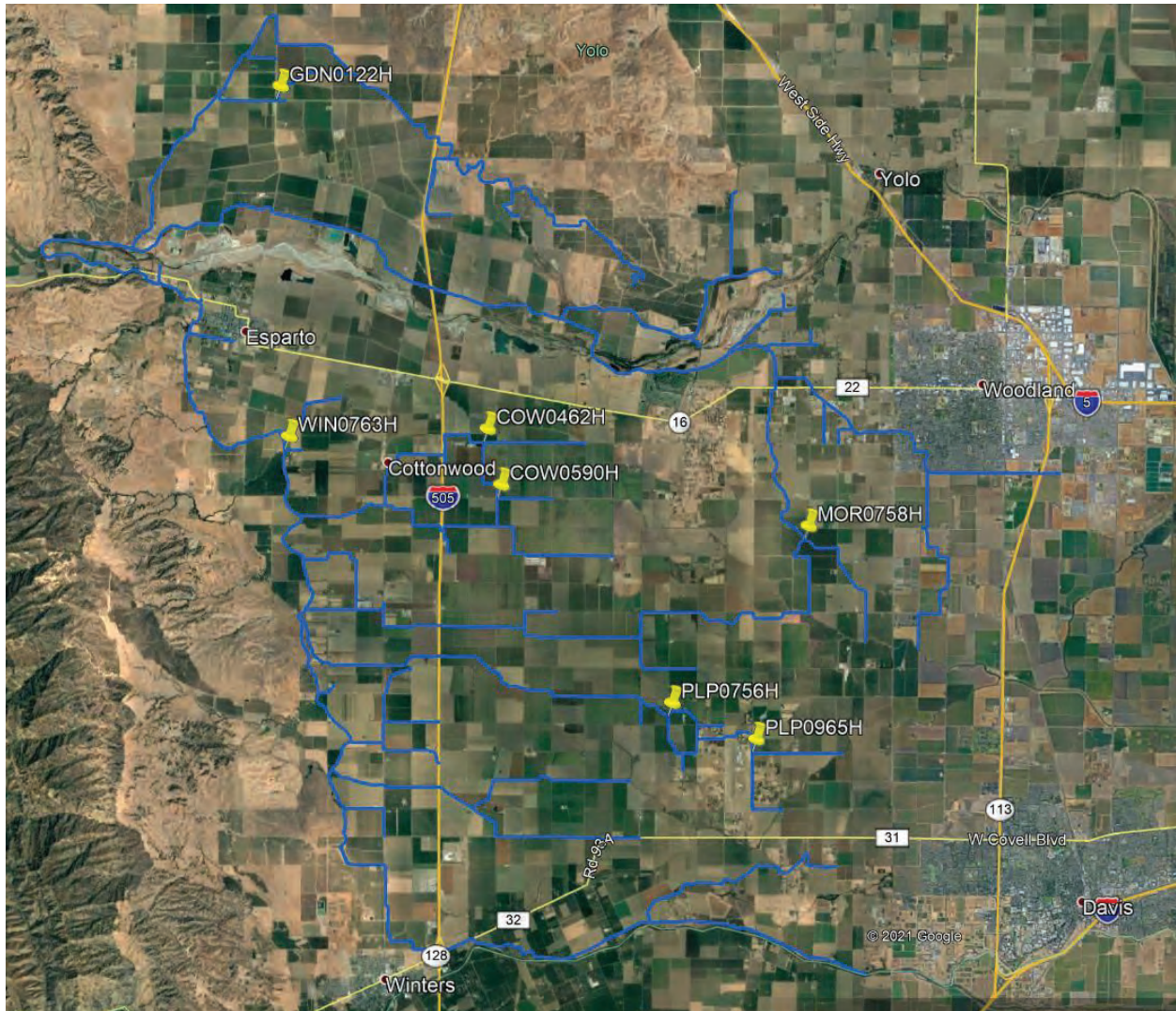


Figure 1. Locations of Existing Manually Operated Canal Headgates for Potential Consideration

Project Description

The Yolo County Flood Control & Water Conservation District (YCFC&WCD) was formed by the California Legislature in 1951, to control, manage, and distribute water resources for beneficial use within the YCFC&WCD's boundaries. The YCFC&WCD's mission is *to plan, develop, and manage the conjunctive use of its surface water and groundwater resources to provide a safe and reliable water supply, at a reasonable cost, to sustain the socioeconomic and environmental well-being of Yolo County.*

YCFC&WCD operates approximately 160 miles of canals that convey agricultural irrigation water to over 80,000 acres of farmland in rural western Yolo County. Much of the canal system infrastructure is original, dating back to the early 1900's. Over the past 15 years, YCFC&WCD has been modernizing the canal system flow control and measurement features throughout the system, to increase operation efficiencies and decrease end of canal spill. During that time, YCFC&WCD has committed and spent more than \$4.5 million on automated canal gates and flow monitoring sites, SCADA computer and communication systems, and SCADA dedicated personnel.

At first, management recognized a need for a high-speed radio communication network to support the future Telemetry and SCADA system. 'Off-the-shelf' wireless Ethernet radios were installed to create links from YCFC&WCD Headquarters to mountain top commercial towers that overlook the Sacramento Valley and YCFC&WCD's service area. Access point radios were installed at these towers to provide a dense and widespread radio signal coverage area for future SCADA sites. From those towers, links were also established to towers in Lake County, where YCFC&WCD manages and operates two water storage reservoirs: Clear Lake and Indian Valley Reservoirs. In addition to future SCADA projects, this radio system is utilized for surveillance and telecommunications at these remote facilities.

With a secure, robust, and cutting-edge radio communication network in place, YCFC&WCD designed and began installing strategically located remote flow monitoring sites designed to give operators real-time data on canal operation to minimize end of canal spill. Next, YCFC&WCD focused on installing remote control automated gates at checks for canal-level control and canal headings for flow control. With several strategic flow monitoring and control sites in place and operating, YCFC&WCD has seen a consistent increase in operation efficiency and reduction in end of canal spills.

The proposed project will continue YCFC&WCD's mission to reduce end of canal spill and increase canal operation efficiency and flexibility by replacing up to seven manually operated canal headgates with remote control automated canal headgates. Either the Rubicon SlipMeter® or PikoMeter® will be installed depending on dimensions of the existing civil works and the maximum required canal flowrates.

During the planning phase of this project, all remaining manually operated canal headgates were considered for an upgrade to an automated SCADA gate. Evaluation criteria such as volume delivered, frequency of use, age, and condition, were applied to the remaining 18 manual headgates. Seven of those gates were selected as priority sites for upgrading to an automated

SCADA gate. Once a gate was identified as a priority site, further details were gathered and produced, to determine which Rubicon gate and size should be installed.

Both the SlipMeter® and the PikoMeter® are an ‘all-in-one’ integrated canal turnout gate and meter. Both products measure and control canal water flowrate in the same way, via their Sonaray® flow measurement technology and CableDrive® actuation system. Their flow measurement accuracy of +/- 2.5% has been independently validated and can be achieved even in partially full pipe scenarios. Each gate is equipped with the Rubicon Control Pedestal that powers and controls the gate. The pedestal also provides an LCD operator interface for local interaction with the gate system. Both gates are relatively simple to install and require little maintenance. Further details regarding the Rubicon gate features and technology can be found in the product brochures and data sheets on the Rubican Water website at the following locations:

Rubicon SlipMeter®:

https://www.rubiconwater.com/modules/prodcatalogue/files/28605/719/719_Rubicon%20SlipMeter%20Data%20Sheet%20%28English%20US%29.pdf

Rubicon PikoMeter®:

https://www.rubiconwater.com/modules/prodcatalogue/files/58957/719/719_Rubicon%20Data%20Sheet%20PikoMeter%20%28English%20US%29.pdf

YCFC&WCD has previously replaced 10 existing canal headgates with six Rubicon SlipMeters® and four Rubicon PikoMeters®. Similar to these previous gate replacement projects, new gates will be connected to the SCADA system with wireless ethernet radios or cellular modems. Operators will primarily use tablets for secure mobile access to the SCADA system and connected gates and monitoring sites.

Gate site preparation will be completed by YCFC&WCD staff. The SCADA Operation Supervisor, SCADA Technician, and Water Resources Technician will perform and complete all required civil construction and electrical conduit installation sub tasks.

YCFC&WCD will remove existing canal gates and prepare the concrete civil works for installation of the new gates. Some sites may require a new concrete wall be constructed for the mounting the new gate frame. All sites require a small concrete slab or footing for mounting the new gate pedestal. First, the pedestal slab is formed with 2”x10” lumber and braced with forming stakes and 2”x4” lumber. A grid of ½” reinforcement steel rebar is tied inside the form and then 1-1/2” PVC conduit is installed and stubbed off for later use to neatly route cables between the gate and the pedestal. Next, five-sack concrete is poured into the form and finished. Once the concrete has cured, the forms and bracing material can be removed.

Once each site has been prepared for the new gate installation, Rubicon technicians will complete the gate system installation. First, the gate frame is leveled and attached to the concrete headwall with epoxied stainless steel all-thread anchors and sealed with construction adhesive. The gate control pedestal is then installed adjacent to the gate frame on the pre-constructed concrete footing with epoxied all-thread anchors. On the following day, once the

epoxy and sealing construction adhesive has cured, the gate frame attachment anchors are torqued to manufacturer's specifications and the frame is lubricated for gate installation.

YCFC&WCD will provide a backhoe or excavator and an operator to lift and lower the gate from a transport trailer into the attached gate frame. Besides the heavy equipment operator, two Rubicon technicians will guide the gate into the frame as its lowered by the backhoe or excavator. The frame is designed to seal around the gate to prevent water leakage.

Once the gate is seated properly in the frame, YCFC&WCD staff will install metal electrical conduit that connects to the previously installed PVC conduit, completing the conduit system. Control and power cables can then be installed, connecting the pedestal to the gate. Subsequently, Rubicon technicians will attach the solar/radio mast to the pedestal base and install the solar panel. At this point the gate is ready for dry commissioning, during which, Rubicon technicians check gate operations and calibrate the position sensor encoder.

Following dry commissioning, YCFC&WCD staff will install either a wireless Ethernet radio and connect to the YCFC&WCD's private wireless Ethernet network or they will install a cell phone modem. A cell phone modem is only installed when YCFC&WCD's private communication network is unreachable from the gate location. This is commonly caused by dense patches of trees in the radio signal path or excessive distance from a network access point. Whether or not a cell phone modem is utilized to connect to the YCFC&WCD's SCADA system, an encrypted VPN is used to protect data flowing to and from SCADA to the gate.

Once secure communications have been established between the new gate and the SCADA system, YCFC&WCD staff can program and configure the SCADA system to control and monitor the new gate asset. This process is very rapid as it has been done many times already for existing Rubicon gates. SCADA commissioning can then be completed, which tests all remote gate control features including functional and applicable alarms and sensors.

The last step to complete a Rubicon SlipMeter® or PikoMeter® installation is wet commission. Rubicon technicians will typically return to YCFC&WCD in the first week of irrigation season, usually in April. During wet commissioning, all gate functions will be tested again in addition to calibration of water level and flowrate sensors.

Following project completion, the gates will receive regular maintenance and periodic flow measurement validation. Recommended maintenance tasks, procedures, and schedules are listed and described in the operations and maintenance manual provided by Rubicon. In the event manufacturer repairs or technical support is needed, the local Rubicon office and warehouse is only two hours away in Modesto, California.

The following pictures are meant to illustrate some of the steps outlined above.

Example of a Headgate Replacement with SlipMeter Gate



Fig. 2: Demolition of Existing Canal Heading



Fig. 3: Installation of Precast Heading Structure



Fig. 4: Installation of Gunite for Stilling Pool



Fig. 5: Completed Civil Construction



Fig. 6: Installation of SlipMeter gate



Fig. 7: Completed SlipMeter project

Example of a Headgate Replacement with PikoMeter Gate



Fig. 8: Existing Manual Gate



Fig. 9: Installation of PikoMeter



Fig. 10: Completed PikoMeter

Examples of Potential Headgates to Upgrade



Fig. 11: COW0496H Gate



Fig. 12: PLP0796H Gate



Fig. 13: MOR0758H Gate

Evaluation Criteria

E.1.1 Evaluation Criterion A – Project Benefits (35 points)

- *Describe the expected benefits and outcomes of implementing the proposed project.*
 - *What are the benefits to the applicant’s water supply delivery system?*

Reduced Canal Spill Through Operation Flexibility

SCADA gates provide operators with a convenient and practical means of adjusting canal flow to match frequently changing irrigation delivery demand in the canal system. Paired with existing end of canal flowrate monitoring sites, Operators can use SCADA gates to transfer surplus irrigation water to other canals for sales or direct it to a buffer reservoir for temporary storage, thereby reducing operational spill.

In recent years, a growing number of water customers have shifted from 24-hour irrigation runtimes to 12-hour or less runtimes due to changes in crop types and labor regulations. From 2019 to 2020, irrigation deliveries less than 24 hours increased by 5%, or 416 deliveries. This has been problematic for operation and management staff as the YCFC&WCD’s water delivery system was designed for 24-hour or longer irrigation runtimes. Customer orders (starts or stops) are reported to YCFC&WCD staff every day during the irrigation season. At 11am, the orders are totaled and a corresponding change to water storage releases at the two reservoirs in Lake County is made if needed. The change in releases takes approximately 18 hours to reach the diversion dam in Yolo County, at which point it will be distributed through the canal system. Prior to the introduction of remote-control automated canal gates (SCADA gates), if a water customer decided to irrigate for less than 24 hours, and not wait until the following day when the equivalent flow can be subtracted from storage releases, that flow was typically lost to spill.

Improved Customer Service and Groundwater Conservation

YCFC&WCD is transitioning to an ‘On Demand’ System to improve service for water customers, which allows them to receive water on demand – when and how they want it. Though a gravity canal system, with water storage 18 hours away, could never practically be converted to a 100% on-demand system like a pressurized pipe distribution system, YCFC&WCD is working hard to provide customers with the next best thing: delivery flexibility. Allowing customers to buy irrigation water in durations less than 24 hours is encouraging customers to irrigate with surface water rather than groundwater. Customers with both surface and groundwater available to them for irrigation purposes, are more likely to choose the more convenient and economical option, rather than the more resource conscientious option.

Increase of Operation Personnel Available Time

In past years, the 160-mile canal delivery system was divided into five areas or ‘Rides’ and required 10 operators, with seven day alternating shifts to operate it. In recent years, SCADA gates and monitoring systems have reduced the length of time to complete daily operational tasks in each canal Ride. This has directly facilitated consolidation of the five Rides into three. No

operation personnel were laid off because of this boost in efficiency. Instead, more time was available to work on other operational tasks, such as deferred maintenance.

If awarded this grant, and proposed SCADA gates are installed, YCFC&WCD anticipates a proportionate increase in available operation personnel time.

Reduction of Fuel Consumption and Greenhouse Gas Emissions

This project will allow operators to make multiple flow adjustments each day without driving to the canal gate location for each adjustment. This will reduce fuel consumption, greenhouse gas emissions, vehicle mileage, and operator driving time, which includes wages and opportunity cost. The table below estimates annual reductions and savings from installation of seven SCADA gates.

Table 1. Estimates of Reduced CO₂ Emissions and Costs from Project Implementation

Reduction of Miles	Fuel Reduction (gallons)	Emission Reduction (kg of CO₂)	Mileage Cost (\$)	Wage Savings (\$)
20,061	1,329	11,555	\$11,535	\$22,923

The calculated values above are based on the following averages and assumptions:

- Average pickup truck fuel economy: 15.09 miles/gallon
- Average pickup truck emissions: 576 grams of CO₂/mile
- Average pickup truck speed: 45 miles/hour
- Pickup truck mileage reimbursement rate: \$0.575/mile
- Average operator wage with fringe benefits: \$51.42/hour
- Average distance to gate from headquarters: 16.1 miles
- Number of additional trips to gate: 1
- Number of days in the irrigation season: 178

Facilitation of Diversion of Excess Storm Flows for Groundwater Recharge

Approximately 155 of YCFC&WCD’s 160-mile canal distribution system is earthen lined rather than concrete lined. Due to this, on average 25% of conveyed irrigation water percolates into the ground, recharging the local groundwater aquifer.

In 2016, YCFC&WCD applied for, and received the water right to divert wintertime storm runoff from Cache Creek, into the canal system for the sole purpose of groundwater recharge. SCADA gates were used to safely monitor, and control 11,000 acre-feet of excess storm flows diverted into the canal system. Without the SCADA gates, this accomplishment would not have been practical or safe due to muddy and impassable canal roads. Since 2016, YCFC&WCD has diverted excess storm flows from Cache Creek two additional times, for a total of approximately 20,000 acre-feet.

The picture below is a frame from a surveillance video at a SCADA gate, showing storm flow runoff in a YCFC&WCD canal in January of 2019. This was during a major storm event and

was not part of intentional diversions for groundwater recharge. However, it demonstrates yet another beneficial use of SCADA gates.



Fig. 14: SCADA Gate Surveillance of Storm Runoff Event

- *If other benefits are expected explain those as well. Consider the following:*
 - *Extent to which the proposed project improves overall water supply reliability.*
 - *The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin)*

Decreased end of canal spill will keep surface water from leaving our local region, optimizing water supply availability. Water conservation within the canal system allows for water to be preserved upstream in the reservoirs and utilized for other purposes.

- *Extent to which the proposed project will increase collaboration and information sharing among water managers in the region.*

YCFC&WCD collaborates with local reclamation and irrigation districts as part of annual system operations; lessons learned from this project will be communicated to collaborators in real time. YCFC&WCD routinely communicates and shares information with regional water managers such as Reclamation District 108, Reclamation District 787, Reclamation District 2035, Solano County Water Authority (SCWA), and Solano Irrigation District (SID). The SCADA Operations Supervisor has hosted several tours of past SCADA gate projects and presented related projects at the United States Committee on Irrigation and Drainage (USCID). All water management data and user experiences from this project will be available to YCFC&WCD partners and Yolo County stakeholders.

- *Any anticipated positive impacts/benefits to local sectors and economies. (e.g., agriculture, environment, recreation, tourism)*

YCFC&WCD anticipates an increase in surface water conservation and reclamation due to this project. This will directly reduce the surface water volume released for irrigation purposes from YCFC&WCD's two reservoirs in Lake County. Both reservoirs have a distinct environmental and recreational benefit. Both reservoirs are host to many species of fish, which not only supports local wildlife, but also provides a recreational activity for fishermen and women.

YCFC&WCD operates a public campground at Indian Valley Reservoir that is dependent on the surface water in the reservoir. When the reservoir level is too low the local water treatment facility cannot produce treated water to operate the campground facilities. Thus, in dire, drought years the campground must be closed due to low reservoir levels.

- *Extent to which the project will complement work done in coordination with NRCS in the area (e.g., with a direct connection to the district's water supply). Describe any on-farm efficiency work that is currently being completed or is anticipated to be completed in the future using NRCS assistance through EQIP or other programs.*

The local NRCS office in Woodland has had numerous growers from within the YCFC&WCD service area participate in the local Environmental Quality Incentives Program (EQIP). NRCS provides technical and financial incentives through EQIP to install more efficient irrigation systems, such as replacing surface irrigation with buried or surface drip systems. In Yolo County, over 30,000 acres have received financial assistance from NRCS to improve on-farm irrigation practices.

YCFC&WCD intends to coordinate closely with NRCS in the future to learn more about the potential for a direct EQIP contract with NRCS associated with the 2018 Farm Bill, specifically focusing on irrigation-related structural measures to conserve surface and groundwater.

E.1.2. Evaluation Criterion B—Planning Efforts Supporting the Project (35 points)

- *Describe how your project is supported by an existing planning effort.*
 - *Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?*

The proposed project assists YCFC&WCD in complying with the requirements of the SB X7-7 Water Measurement Compliance Program and California's Agricultural Water Measurement Regulation. Additionally, the goals of this project are consistent with local and regional needs as part of the Yolo County Integrated Regional Water Management Plan (IRWMP) and Westside-Sacramento IRWMP, as well as critical State water issues outlined in California's 160-09 and Water Resilience Portfolio 2020, specifically agricultural water use efficiency.

- *Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.*

The YCFC&WCD has developed and implemented numerous water management practices and has participated in several regional planning efforts to further our mission ***to plan, develop, and manage the conjunctive use of our surface and groundwater resources to provide a safe and reliable water supply, at a reasonable cost, to sustain the socioeconomic and environmental well-being of Yolo County.***

The YCFC&WCD has identified and prioritized efficient water management “plans” (EWMPs) as part of the Agricultural Water Management Planning efforts, including development and implementation of a Water Measurement Certification Program. The Agricultural Water Management Plan (AWMP) Water Measurement Certification Program outlines the YCFC&WCD’s water measurement best professional practices and the corrective action plan for ensuring improved delivery and water efficiency.

Infrastructure improvements, automated canal controls, and increased system flexibility are all high-priority EWMPs in YCFC&WCD’s AWMP.

Additionally, the YCFC&WCD Capital Improvement Program prioritizes projects that advance these water management objectives and our mission of enhancing conjunctive use management. The proposed project is considered important and high priority because of the multi-benefit nature in implementing the following goals:

- 1) improving delivery and customer service;
- 2) minimizing surface water losses, groundwater pumping, staff time, fuel consumption and emissions; and
- 3) maximizing excess storm flow diversions and conveyance.

The aforementioned, along with the potential applicability for WaterSMART grant funding, makes the proposed project an outstanding opportunity for the YCFC&WCD. And we greatly appreciate USBR staff time and consideration as part of the application evaluation process.

E.1.3. Evaluation Criterion C—Project Implementation (10 points)

- *Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.*

YCFC&WCD project management staff have completed all planning and design components of the proposed project and have outlined implementation tasks and milestones in the estimated project schedule shown below. Staff will adjust the schedule according to USBR’s solicitation and contracting processes.

Sign Project Contract: Late Summer 2021

Order Gates: Late Summer 2021 (following contract signing)

Start Project Construction: February 1, 2022

Complete Project Construction: July 1, 2022

Table 2. Estimated Project Schedule

Estimated Project Schedule	Weeks after contract signing																													
	1	2	3-13	14	15	16	17	18	19	20	21	22	23	24	25	26-29	30													
Task 1. Administration and Management																														
Project management	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Grant reporting			█																											
Task 2. Ordering and Procurement																														
Confirm existing gate sites dimensions and condition	█		█																											
Order equipment (gates)		█	█																											
Procure installation materials		█	█																											
Receive gates			█	█																										
Task 3. Construction																														
Remove existing gates			█	█	█																									
Prepare sites for new gate installation (civil and conduit work)			█	█	█	█	█	█	█	█																				
Install new gates			█									█	█																	
Dry commissioning			█									█	█																	
Task 4. SCADA Integration																														
Install SCADA communications			█											█	█															
Program and configure SCADA			█																											
SCADA commissioning			█																											
Wet commissioning			█																											

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

YCFC&WCD staff do not anticipate any permits will be required for this project since the proposed project is within general operations and maintenance activities.

- Identify and describe any engineering or design work performed specifically in support of the proposed project.

In support of the proposed project, staff identified potential site locations for headgate upgrades utilizing technical evaluation criteria. Additionally, staff determined the appropriate Rubicon gate size for proper installation.

- Describe any new policies or administrative actions required to implement the project.

No new policies or administrative actions are required to implement the proposed project.

- *Describe the timeline for completion of environmental and cultural resource compliance. Was the timeline for completion of environmental and cultural resource compliance discussed with the local Reclamation office?*

Environmental and cultural resource compliance does not apply to the proposed project.

E.1.4. Evaluation Criterion D— Nexus to Reclamation (10 points)

- *Is the proposed project connected to a Reclamation project or activity? If so, how? Please consider the following:*

The proposed project is within the same groundwater subbasin as numerous Reclamation projects – the Yolo Subbasin (5-21.67) of the Sacramento Valley Groundwater Basin as described by California Department of Water Resources Bulletin 118.

- *Does the applicant receive Reclamation project water? No.*
- *Is the project on Reclamation project lands or involving Reclamation facilities? No.*
- *Is the project in the same basin as a Reclamation project or activity?*

This project is in the same groundwater subbasin as other Reclamation projects (Colusa Drain Mutual Water Company; Conaway Preservation Group, LLC; Dunnigan Water District; Reclamation District 108; River Garden Farms; and multiple single parties: <https://www.usbr.gov/mp/cvp-water/docs/latest-water-contractors.pdf>)

- *Will the proposed work contribute water to a basin where a Reclamation project is located?*

The proposed project will result in water savings and efficient conjunctive use management within the Yolo Subbasin and will contribute water to the Subbasin where many Reclamation projects are located (via capturing excess storm flows and maximizing groundwater recharge potential).

- *Will the project benefit any tribe(s)?*

By conserving water and allowing for more water to remain upstream in the Clear Lake and Indian Valley Reservoirs, this project will indirectly benefit Tribal Nations in Lake County (Big Valley Band Rancheria, Elem Indian Colony, Habematolel Pomo of Upper Lake, Middletown Rancheria of Pomo Indians, Robinson Rancheria, and Scotts Valley Reservation). Additionally, the Yocha Dehe Wintun Nation in Yolo County will directly benefit from this project as a YCFC&WCD customer and Yolo Subbasin groundwater user.

PROJECT BUDGET

Funding Plan

The YCFC&WCD will be funding the non-Federal share of project costs from our capital projects budget. There will be no third-party in-kind or direct financial contributions to the proposed project.

Budget Proposal

YCFC&WCD project management staff estimate the project budget as shown below in Tables 3 and 4.

Table 3. Total Project Cost

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	\$75,000.00
Estimated costs to be paid by YCFC&WCD	\$109,693.51
Value of third-party contributions	\$0.00
TOTAL PROJECT COST	\$184,693.51

Table 4. Project Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
SCADA Operations Supervisor	\$55.49	90	Hour	\$4,994.10
SCADA Technician	\$27.12	60	Hour	\$1,627.20
Water Resources Technician	\$33.06	40	Hour	\$1,322.40
Operator	\$28.73	12	Hour	\$344.76
Fringe Benefits				
SCADA Operations Supervisor	\$24.97	90	Hour	\$2,247.35
SCADA Technician	\$12.20	60	Hour	\$732.24
Water Resources Technician	\$14.88	40	Hour	\$595.08
Operator	\$12.93	12	Hour	\$155.14
Equipment*				
Rubicon SMB-900-1800-C	\$31,099.68	1	Each	\$31,099.68
Rubicon SMB-750-1800-C	\$24,517.08	1	Each	\$24,517.08
Rubicon SMB-750-2400-C	\$25,187.76	1	Each	\$25,187.76
Rubicon PM-450-1800-C	\$15,384.60	4	Each	\$61,538.40
Supplies and Materials				
Mikrotik QRT5 Radio/Router	\$157.00	7	Each	\$1099.00
5 Sack Concrete	\$200.00	4	Yard	\$800.00
½" x 20' Steel Rebar	\$5.00	10	Each	\$50.00
2"x10"x12' Form Lumber	\$31.00	8	Each	\$248.00
2"x4"x16' Form Lumber	\$14.00	7	Each	\$98.00
1"x2"x3' Forming Stakes	\$7.00	6	Each	\$42.00
2.5" Deck Screws	\$40.00	1	Each	\$40.00
Conduit Supplies	\$95.00	7	Each	\$665.00
Contractual/Construction				
Rubicon (Gate Installation & Gate Commissioning)	\$1,500.00	6	Each	\$10,500.00
Other				
Other				\$0.00
TOTAL DIRECT COSTS				\$167,903.19
Indirect Costs				
10%	percentage	\$base		\$16,790.32
TOTAL ESTIMATED PROJECT COSTS				\$184,693.51

*Proposed Budget includes sales tax and Rubicon quote on page 20 does not includes sales tax.

Budget Narrative

All planning and design components of the proposed project have been completed and are not included in the budget proposal. All implementation costs have been considered and are included in the proposed budget. All equipment installed in this project is designed and built for a 30-year economic life and the regular preventative maintenance is estimated to be less than 2.5% of the initial capital expenditure.

Prior to developing the proposed project budget, procurement standards for Federal awards found at 2 CFR §200.317 through §200.326 were reviewed. The project budget was developed and tailored to the specific scope of this project and utilizes planning efforts, experience, and knowledge of prior completed projects with similar equipment and scope.

The following is a list of project budget percentage by category:

<u>Budget Category</u>	<u>Percent of Budget</u>
• Equipment Cost.....	77%
• Overhead.....	9%
• Direct Labor & Fringe Cost.....	7%
• Rubicon Installation and Commissioning Cost.....	6%
• Supplies and Materials.....	1%

Salaries and Wages

Table 5 provides a detailed list of the salaries and wages costs by task for each staff member.

Table 5. List of Detailed Salaries and Wages

Tim Ireland – SCADA Operations Supervisor (Project Manager)			
Project Subtasks	Rate (\$/Hr)	Hours	Total
• Project management and grant reporting	\$55.49	20	\$1,109.80
• Equipment and material procurement	\$55.49	10	\$554.90
• Concrete forming and reinforcement	\$55.49	30	\$1,664.70
• PVC conduit installation	\$55.49	5	\$277.45
• Concrete pouring and finishing	\$55.49	10	\$554.90
• Metal conduit installation	\$55.49	5	\$277.45
• Radio and SCADA configuration	\$55.49	10	\$554.90
Marcus Herzog – SCADA Technician			
Project Subtasks	Rate (\$/Hr)	Hours	Total
• Removal of existing gates	\$27.12	20	\$542.40
• Concrete forming and reinforcement	\$27.12	20	\$542.40
• Concrete pouring and finishing	\$27.12	10	\$271.20
• Removal of concrete forms	\$27.12	5	\$135.60
• Radio installation	\$27.12	5	\$135.60
Aaron Gurecki – Water Resources Technician			
Project Subtasks	Rate (\$/Hr)	Hours	Total
• PVC conduit installation	\$33.06	10	\$330.60
• Concrete trailer transportation and pouring	\$33.06	10	\$330.60
• Removal of concrete forms	\$33.06	10	\$330.60
• Metal conduit installation	\$33.06	10	\$330.60
Operator			
Project Subtasks	Rate (\$/Hr)	Hours	Total
• Heavy equipment operation for gate installation	\$28.73	12	\$344.76

Total Salaries and Wages Cost: \$8,288.46

Fringe Benefit Costs

Table 6 provides a detailed list of the fringe benefit cost for each staff member. The fringe benefit cost for each staff member is calculated using a flat rate of 45% of gross wage. Fringe benefits include the following:

- Medical Insurance
- Dental Coverage
- Vision Coverage
- Life Insurance
- Disability Insurance
- Unemployment Insurance
- Social Security
- Retirement Contribution
- Paid Time Off (Sick and Vacation)

Table 6: Fringe Benefits Costs

Staff Member	Rate (\$/Hr)	Hours	Total
Tim Ireland – SCADA Operations Supervisor	\$24.97	90	\$2,247.35
Marcus Herzog – SCADA Technician	\$12.20	60	\$732.24
Aaron Gurecki – Water Resources Technician	\$14.88	40	\$595.08
Operator	\$12.93	12	\$155.14

Total Fringe Benefits Cost: \$3,729.81

Equipment

Table 7 is a quote from Rubicon Water for gate equipment and installation and commissioning as part of the proposed project. Each item is a standard product, with a list price from Rubicon’s catalog. Each gate will be ordered with an additional ceramic coating applied to all parts of the gate that will be submerged in canal water. The ceramic coating offers superior, long-term protection from corrosion.

Table 7. Gate Equipment Quotation from Rubicon

Pricing:				
Qty	Product Number	Description	Each (US\$)	Total (US\$)
1	SMB-0900-1800-C Coated	Rubicon SlipMeter, designed for nominal frame width of 36". Minimal Flow 2.4 CFS. Maximum Flow 57 CFS. Includes Ceramic Coating.	\$28,796	\$28,796
1	SMB-0750-1800-C Coated	Rubicon SlipMeter, designed for nominal frame width of 30". Minimal Flow 1.7 CFS. Maximum Flow 39 CFS. Includes Ceramic Coating.	\$22,701	\$22,701
1	SMB-0750-2400-C Coated	Rubicon SlipMeter, designed for nominal frame width of 30". Minimal Flow 1.7 CFS. Maximum Flow 39 CFS. Includes Ceramic Coating.	\$23,322	\$23,322
4	PM-0450-1800 Coated	Rubicon PikoMeter, 18" diameter designed for a 6 ft headwall height. Minimum Flow 0.1 CFS; Maximum Flow 17.5 CFS. Includes Ceramic Coating.	\$14,245	\$56,980
7	Installation & Commissioning	Installation & Commissioning (per gate)	\$1,500	\$10,500
Total *				\$142,299
*Excluding taxes				

Supplies and Materials

Necessary construction materials and supplies have been estimated and listed in the Project Budget Proposal above. Specific materials, unit prices, and quantities were obtained from recent quotes and experience.

Contractual

Rubicon Water, Modesto, California branch, is a licensed contractor (CLSB#984209) and will be hired to complete installation and commissioning of each gate at a contracted and flat rate of \$1,500 per gate. This service will happen in two parts, at two different times: 1) the gate installation service will be scheduled and completed once civil, and PVC conduit work has been completed, and 2) the gate dry commissioning service will be completed following the gate installation and once the metal conduit is complete. Wet commissioning will be completed in the Spring, after YCFC&WCD begins the irrigation season when canal water levels are adequate.

The following is a list of the supplies and materials that will be provided by Rubicon for each gate installation and are included in the \$1,500 installation and commissioning rate.

- Construction sealant
- Concrete anchor epoxy
- 3/8"x4" concrete anchors
- 5/8"x10" concrete anchors

Third Party In-Kind Contributions

This project will have no third-party in-kind contributions.

Environmental and Regulatory Compliance Costs

We do not anticipate any environmental or regulatory compliance costs as part of the proposed project since it falls within the YCFC&WCD's routine operation and maintenance activities.

Other Expenses

All project expenses have been identified and listed in the above tables.

Indirect Costs

YCFC&WCD estimates internal indirect cost for capital projects, such as the proposed project, at 20% and is generally referred to as the 'Overhead Cost' of a project. Without a current negotiated rate for indirect cost, YCFC&WCD elects to charge de minimis rate of 10% of modified total direct costs (MTDC).

ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

We do not anticipate any environmental or regulatory compliance necessary as part of the proposed project since we are upgrading existing YCFC&WCD equipment within the canal system.

REQUIRED PERMITS OR APPROVALS

We do not anticipate any permits or approvals are required as part of the proposed project since we are upgrading existing YCFC&WCD equipment within the canal system.

OFFICIAL RESOLUTION

Please see pages 25-26 for Resolution No. 21.03 Approving the YCFC&WCD's Application to the USBR for the WaterSMART Grant Program.

RESOLUTION NO. 21.03

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE
YOLO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVING THE APPLICATION TO THE USBR FOR THE
WATERSMART GRANT PROGRAM**

WHEREAS, the Yolo County Flood Control and Water Conservation District (District) is a special district and provides irrigation water to farmers in western Yolo County, California; and

WHEREAS, the United States Bureau of Reclamation (USBR) has published a notice of funding opportunity for the WaterSMART Small-Scale Water Efficiency Projects (NOFO No. R21AS0030); and

WHEREAS, the District promotes, supports, and encourages water conservation and structural and technological advancements to improve efficiency, enhance customer service, and ensure water resources sustainability in the future; and

WHEREAS, the District has suffered through a drought that allowed no or limited surface water irrigation in 2009, 2014, and 2015, and is expecting a surface water supply shortage for the 2021 irrigation year; and

WHEREAS, the District needs to continue to advance canal modernization efforts to minimize spill and promote water conservation within the District's service area and to sustain the vitality of farms within Yolo County; and the District appreciates USBR's solicitation and funding opportunity.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Yolo County Flood Control and Water Conservation District, that application be made to the United States Bureau of Reclamation (USBR) for the USBR WaterSMART Grant Program. The General Manager of the Yolo County Flood Control and Water Conservation District, or his designee, is hereby authorized and directed to prepare the necessary data, conduct investigations, and file such application. Additionally, if selected for a WaterSMART Grant, the District will work with USBR to meet established deadlines for entering into a cooperative agreement.

PASSED AND ADOPTED by the Board of Directors of the Yolo County Flood Control and Water Conservation District on March 2, 2021 by the following vote:

AYES: DIRECTORS BARTH, KIMBALL, MAYER, ROMINGER, AND VINK

NOES: NONE

ABSTAIN: NONE

ABSENT: NONE

Signed and approved by me this 2nd day of March 2021.


Bruce Rominger, Chair

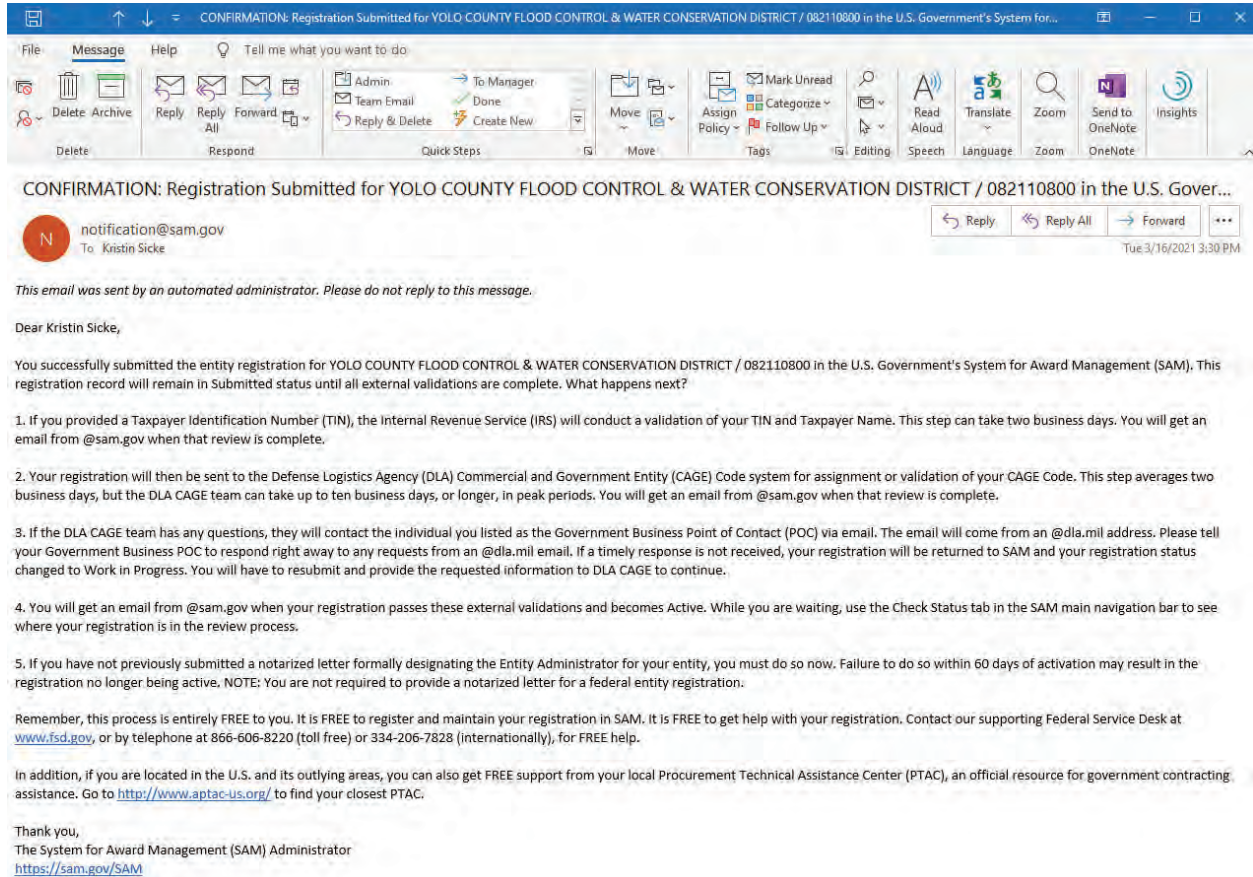
Attest:



Tim O'Halloran, Secretary

UNIQUE ENTITY IDENTIFIER AND SYSTEM FOR AWARD MANAGEMENT

The YCFC&WCD staff successfully submitted the entity registration for YCFC&WCD / 082110800 in the U.S. Government's System for Award Management (SAM) on March 16, 2021 (see confirmation from the SAM Administrator in the email below).



As of March 18, 2021, the SAM status is as shown below.



ALERT: SAM.gov will be down for scheduled maintenance Saturday, 03/20/2021 from 8:00 AM to 8:00 PM.

Entity Dashboard

- Entity Overview
- Entity Registration
 - Core Data
 - Assertions
 - Reps & Certs
 - POCs
- Reports
 - Service Contract Report
 - BioPreferred Report
- Exclusions
 - Active Exclusions
 - Inactive Exclusions
 - Excluded Family Members

[BACK TO USER DASHBOARD](#)

YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

DUNS: 082110800

Status: Submitted

Expiration Date: Not Yet Assigned

Purpose of Registration: Federal Assistance Awards Only

34274 STATE HIGHWAY 16
WOODLAND, CA, 95695-9371,
UNITED STATES

Entity Overview

Entity Registration Summary

DUNS: 082110800

Name: YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

Business Type: US Local Government

Last Updated By: Kristin Sicke

Registration Status: Submitted

Registration passed IRS TIN match.

Registration is pending CAGE validation.

Exclusion Summary

Active Exclusion Records? No

LETTERS OF SUPPORT

Please see pages 30-33 for letters of support and a letter of collaboration related to the YCFC&WCD's Canal System Headgate Automation project.



RECLAMATION
DISTRICT

108

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www.facebook.com/irrigationrd108
<https://twitter.com/rd108irrigation>

Board of Trustees

Roger Cornwell, President
Frederick J. Dirst
Hillary Armstrong Reinhard
Sean Doherty
Todd Miller

**General Manager
and Secretary**

Lewis Bair

Deputy Managers

William R. Vanderwaal
Megan Nagy

March 15, 2021

YCFC&WCD

Tim O'Halloran, General Manager
34274 State Highway 16
Woodland, CA 95695
tohalloran@ycfcwcd.org

Mr. O'Halloran,

Reclamation District 108 is pleased to write in support of the Yolo County Flood Control & Water Conservation District's (YCFC&WCD) Canal System Headgate Automation Project grant application to the Bureau of Reclamation WaterSMART: Small-Scale Water Efficiency Grant Program. The YCFC&WCD's project will enhance water use efficiency in the Cache Creek watershed by improving water delivery efficiency and flexibility and reducing operational spill.

Reclamation District 108 is a service-oriented organization providing water delivery, drainage, and flood control in an economical and environmentally sound manner, while preserving District Water Rights. We appreciate your efforts to better manage and conserve the County's water supplies. The goals of this project are consistent with local and regional needs as part of the Yolo County Integrated Regional Water Management Plan (IRWMP) and Westside-Sacramento IRWMP. Additionally, as a Yolo Subbasin groundwater user, we appreciate your efforts to enhance the capabilities of our storm water groundwater recharge program to ensure future groundwater sustainability. This project is essential to the successful implementation of the Yolo Subbasin Groundwater Sustainability Plan.

Recently, RD-108 installed several automated gates on our own system and have found them to be beneficial in conserving water and energy costs by reducing the number of trips our watermen have had to take to conduct manual adjustments to flow. We believe you will find similar efficiencies in your project.

Lastly, as a Sacramento River Settlement Contractor and senior water rights holder, we value any opportunity to conserve and diversify Yolo County's water supply portfolio. We strongly support your grant application and are willing to provide any additional support needed to expedite this process.

Sincerely,

Lewis Bair, General Manager, Reclamation District No.108

Date 3-15-21



March 15, 2021

YCFC&WCD

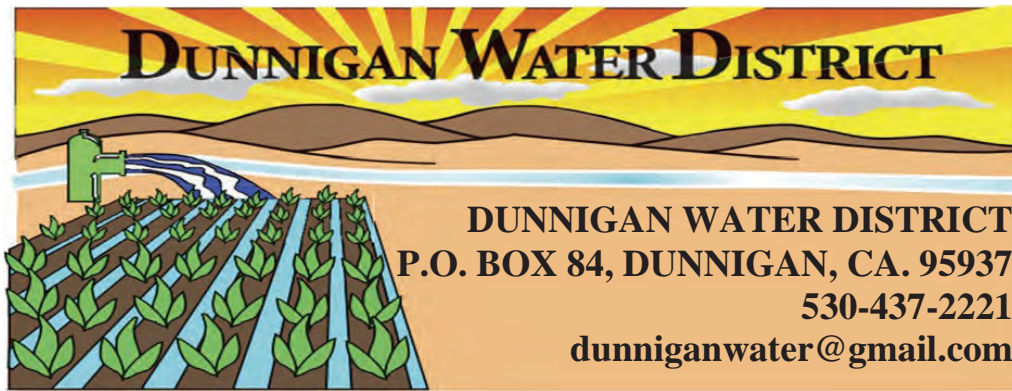
Tim O'Halloran, General Manager
34274 State Highway 16
Woodland, CA 95695
tohalloran@ycfcwcd.org

Mr. O'Halloran,

The Woodland Field Office of the Natural Resources Conservation Service (Woodland NRCS) wishes to collaborate with the Yolo County Flood Control & Water Conservation District (YCFC&WCD) because it furthers the mission of NRCS in Yolo County. The mission of the NRCS is to provide leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. This is done primarily on private lands. The Woodland NRCS has had numerous growers from within the YCFC&WCD service area participate in our Environmental Quality Incentives Program (EQIP). Your proposed project for installing automated headgates within the YCFC&WCD canal system will reduce current water losses in the delivery of water to farms operated by water users. This project aligns well with our practice of providing technical and financial incentives to install more efficient irrigation systems; Woodland NRCS has worked with owners of land to improve on-farm irrigation systems within YCFC&WCD. This resource concern has been identified as a high-priority resource concern for Yolo County by NRCS and we would appreciate the opportunity to collaborate more with the YCFC&WCD in the future. Please let us know how we can facilitate implementation of the proposed project, and better collaborate in the near future.

Thank you,

Phil Hogan
District Conservationist
Woodland NRCS



March 15, 2021

YCFC&WCD
Tim O'Halloran, General Manager
34274 State Highway 16
Woodland, CA 95695
tohalloran@ycfcwcd.org

Mr. O'Halloran,

Dunnigan Water District is pleased to write in support of the Yolo County Flood Control & Water Conservation District's (YCFC&WCD) Canal System Headgate Automation Project grant application to the Bureau of Reclamation WaterSMART: Small-Scale Water Efficiency Grant Program. The YCFC&WCD's project will enhance water use efficiency in the Cache Creek watershed by improving water delivery efficiency and flexibility and reducing operational spill.

Dunnigan Water District is dedicated to responsibly provide reliable and economical water of good quality to the Dunnigan area now and into the future. We appreciate your efforts to better manage and conserve the County's water supplies. The goals of this project are consistent with local and regional needs as part of the Yolo County Integrated Regional Water Management Plan (IRWMP) and Westside-Sacramento IRWMP. Additionally, as a Yolo Subbasin groundwater user, we appreciate your efforts to enhance the capabilities of our storm water groundwater recharge program to ensure future groundwater sustainability. This project is essential to the successful implementation of the Yolo Subbasin Groundwater Sustainability Plan.

Finally, as a Service Contractor with Bureau of Reclamation, we value any opportunity to conserve and diversify Yolo County's water supply portfolio. We strongly support your grant application and are willing to provide any additional support needed to expedite this process.

Thank you

A handwritten signature in blue ink, appearing to read 'W Vanderwaal', is written over a light blue circular stamp.

William Vanderwaal
General Manager
Dunnigan Water District



YCFC&WCD
Tim O'Halloran, General Manager
34274 State Highway 16
Woodland, CA 95695
tohalloran@ycfcwcd.org

Mr. O'Halloran,

River Garden Farms is pleased to write in support of the Yolo County Flood Control & Water Conservation District's (YCFC&WCD) Canal System Headgate Automation Project grant application to the Bureau of Reclamation WaterSMART: Small-Scale Water Efficiency Grant Program. The YCFC&WCD's project will enhance water use efficiency in the Cache Creek watershed by improving water delivery efficiency and flexibility and reducing operational spill.

River Garden Farms appreciates your efforts to better manage and conserve the County's water supplies. The goals of this project are consistent with local and regional needs as part of the Yolo County Integrated Regional Water Management Plan (IRWMP) and Westside-Sacramento IRWMP. Additionally, as a Yolo Subbasin groundwater user, we appreciate your efforts to enhance the capabilities of our storm water groundwater recharge program to ensure future groundwater sustainability. This project is essential to the successful implementation of the Yolo Subbasin Groundwater Sustainability Plan.

Lastly, as a Sacramento River Settlement Contractor water right holder, we value any opportunity to conserve and diversify Yolo County's water supply portfolio. We strongly support your grant application and are willing to provide any additional support needed to expedite this process.

Thank You,

Roger Cornwell
General Manager
River Garden Farms

