

Title:

**Irrigation Efficiency Upgrades and Water Savings:
SCADA and Automated Water Delivery Systems**



Applicant:

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15090 Cranmore Rd., Robbins, CA, 95676

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Technical Proposal

1.0 Executive Summary

Date: November 3, 2021.

Applicant Name: Sutter Mutual Water Company

City, County, and State: Community of Robbins, Sutter County, CA.

Applicant Category: Category A (water district with water delivery authority)

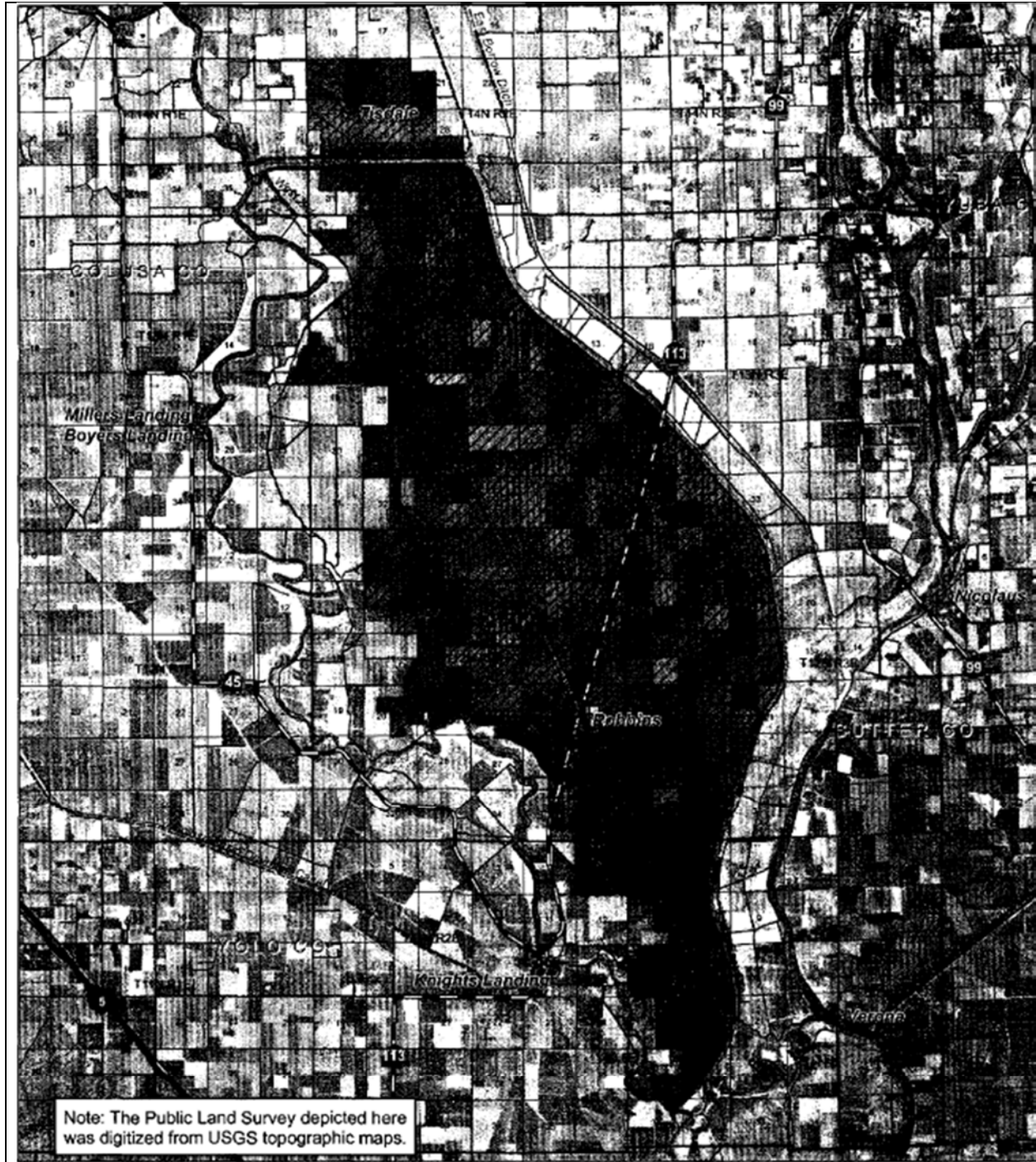
Project Summary: The project targets irrigation infrastructure located within Sutter Mutual Water Company's (SMWC's) service area—an area of approximately 46,746 acres of irrigated land containing 200 miles of canals and about 500 turnouts. SMWC is located in the Sutter Basin in southern Sutter County, CA, a low-lying area that is used to farm primarily rice as well as safflower, wheat, and various oil seed and row crops. Historically, SMWC has relied extensively on manual deliveries and gates, visual inspections, and other labor-intensive, slow-to-respond methods for water management within its service area. As a result, SMWC's water supply infrastructure operates with an elevated level of inefficiency. Water deliveries, for example, are imprecise, and existing operations frequently release more water than is needed into downstream canals, resulting in inefficiencies in water distribution across SMWC's service area. The project, which will involve SMWC as lead, and irrigation / installation engineers and contractors to support project deployment, will deploy a series of planned, focused upgrades along main line canals and key peripherals, intended to alleviate these existing inefficiencies. Key elements of the proposed system will include automated gates to control water flow and delivery, variable speed / variable frequency drives on existing SMWC motors, and a new SCADA system to support centralized monitoring and controls. As a result of these system improvements the project is expected to result in a significant water savings—of at least 7,706 acre-feet per year (AFY), which will be used to support additional operations within SMWC's service area. Chief among these targeted additional uses is additional water needed to support environmental uses and associated benefits.

SMWC will complete the project during a two-year period, from July, 2022 to July, 2024.



The project is not located on a federal facility.

2.0 Project Location



The project encompasses the main canals and major peripherals located within SMWC's service area, as shown in Figure 1. SMWC's service area itself is located in southern Sutter County, California, approximately 20 miles northwest of Sacramento and approximately 18 miles southwest of Yuba City. SMWC's service area and therefore the project area encompasses 46,746 acres. The approximate centroid of the project area is located at latitude 38.9200N and longitude -121.7600W.



Sutter Mutual Water Company
Contract No. 14-06-200-815A-R-1
Exhibit B

 Contractor's Service Area
 District Boundary

0 2.5 5 Miles

 
725-202-44

Date: November 4, 2004
File Name: N:\districts\contracts\sutter_mw\csutter_mw.rmt

Figure 1. The project area encompasses SMWC's service area and specifically the main canals and major peripherals located therein. SMWC's service area is located in north-central California, in southern Sutter County.

3.0 Technical Project Description

The project will deploy multiple water use efficiency and energy efficiency elements that will increase the operability of SMWC's existing irrigation system, save water, and reduce system electricity costs. Key elements of the project will include the following:

- Improvements to gates and automation to control water flow / delivery
 - Automation system
 - Replacement of control gates
 - Replacement utility connections
 - Minor maintenance-level dirt work needed for deployment
- Variable speed / variable frequency drives
 - Installed onto existing pump motors
 - Conveyance pumps within SMWC's operational area (along canals, etc.)
- New SCADA system
 - Field monitoring and controls / actuators
 - Centralized monitoring and reporting system/framework
 - Networked communications

Key specific elements to be updated will include the following:

Armondo's Head Gates (Main Canal Check Structure)

The Main Canal check structure is located immediately downstream of the Reclamation Road Bridge crossing over the Main Canal. The check structure consists of seven bays, each approximately 60 inches wide with a manually operated sluice gate. This check structure will be automated to maintain a constant upstream water level to control the pumping rate at the Tisdale Pumping Plant, the flow through the Reclamation District 1660 (RD 1660) turnout, and the gate operations at the Coles Road Check in West Canal.

Automation improvements include:

- Remove existing slide gates and operators;
- Retrofit openings with 3-inch stainless steel channel guides to support LOPAC® gates;
- Install LOPAC gates in each opening, approximately 60" x 108" gate opening with an 11-foot frame height;
- Install LOPAC gate control cabinet with properly sized solar panel and backup battery capacity;
- Install SCADA communications radio and antenna in/on control cabinet; and
- Install new stilling wells with level transducers upstream and downstream of the check structure.

The LOPAC gate PLC will be programmed with the follow features:

- Multi-gate operation to maintain upstream water level setpoint through a range of 50 and 960 cfs;
- Manual gate operation override to set gate positions (useful during startup and shutdown);
- Flow calculation based on gate position, upstream water level, and downstream water level;
- Complete SCADA integration.

Coles Road Check (West Canal Headworks)

The West Canal supply will be controlled by the check structure downstream of the Coles Road bridge. The check structure consists of six bays, each approximately 60 inches wide. Three of the bays have manually operated sluice gates to regulate flow. All six utilize stop logs to pass high flows to prevent submergence of the Coles Road bridge. The operating water level downstream of the control structure is notably lower than upstream.

This structure will be automated to maintain a constant downstream water level target set by operators based on the downstream demand and associated water level required to supply the West Canal. The upstream water level will be managed/maintained by the Armondo's Head Gates, however, an emergency high-level override will open the gates at the Coles Road Check to prevent submergence of the Coles Road bridge.

Automation improvements include:

- Remove the existing sluice gates and operators;
- Retrofit openings with 3-inch stainless steel channel guides for LOPAC gates;
- Install LOPAC gates in the middle three bays, approximately 60" x 84" gate opening with a 9-foot frame height;
- Install LOPAC gate control cabinet with properly sized solar panel and backup battery capacity;
- Install SCADA communications radio and antenna in/on control cabinet; and
- Install new stilling wells with level transducers upstream and downstream of the check structure.

The gate PLC will be programmed with the following features:

- Multi-gate operation to maintain downstream water level setpoint;
- Downstream setpoints will be determined for flood-up and maintenance flows ranging between 50 and 300 cfs;
- Additional setpoints can be added based on typical operation conditions;
- High-level override based on elevation of the soffit of the Coles Road bridge;
- Flow calculation based on gate position, upstream water level and downstream water level; and
- Complete SCADA integration, including remote capabilities to change downstream water level setpoint.

Pellet Mill Check (East Canal Headworks)

The East Canal supply is controlled at Pellet Mill Check. The check structure consists of five 60-inch bays with sluice gates to regulate flow in the East Canal. This check structure will be automated to maintain a constant downstream water level to meet demand in the East Canal. Excess flow will be routed to the Central Canal.

The existing adjacent structure on the Central Canal will remain in place without control gates or flashboards. Once the automation of the Pellet Mill Check is complete, this structure will be re-evaluated to determine whether it constricts flow and should be removed. The adjacent road crossing on the Central Canal consists of 3 corrugated metal pipe culverts in need of repair. New culverts are recommended to maximize the opening to prevent significant headloss through the crossing, effectively extending the Main Canal down to the Central Canal Headworks.

Automation improvements include:

- Remove the existing sluice gates and operators;
- Retrofit openings with 3-inch stainless steel channel guides for LOPAC gates;
- Install LOPAC gates in the middle three bays, approximately 60" x 84" gate opening with a 10 foot frame height;
- Install LOPAC gate control cabinet with properly sized solar panel and backup battery capacity;
- Install SCADA communications radio and antenna in/on control cabinet;
- Install new stilling wells with level transducers upstream and downstream of the check structure; and
- Replace existing culverts with new HDPE pipe sized to maximize the flow area.

Central Canal Headworks

The Central Canal Headworks is located approximately one mile south of the Pellet Mill Check. The control structure consists of four 36-inch slide gates mounted on culverts through the road crossing immediately downstream of the gates. This facility will be automated to manage all flow variations in the Main Canal and maintain a constant upstream water level for the East Canal Headworks and the ML-16 turnout.

The ITRC reported that there is a significant head drop across the Central Canal Headworks control structure. It is assumed that the lower downstream water level is required to prevent inundating the Pelger Road bridge. Further investigation is recommended to confirm that the Pelger Road bridge is limiting the downstream operating water level. If the bridge is not the limiting factor, and the canal banks are high enough, this control structure could be eliminated.

Assuming the control structure is required, the existing steel structure and deck that supports the slide gates is not properly configured to accommodate the installation of LOPAC gates to divert flow through the existing culverts. Therefore, the existing steel structure will be replaced with a new concrete structure with training walls to support the LOPAC gates and direct flow to the culverts.

Automation improvements include:

- Remove the existing structure, slide gates and operators;
- Construct new concrete structure with four bays equipped with 3-inch stainless steel channel guides to support the LOPAC gates;
- Install four LOPAC gates, approximately 36" x 84" gate opening with a 10-foot frame height;
- Install LOPAC gate control cabinet with properly sized solar panel and backup battery capacity;
- Install SCADA communications radio and antenna in/on control cabinet; and
- Install new stilling wells with level transducers upstream and downstream of the check structure.

Check Structure at Booster Pump 5A/5B

The intent of automating check structures in the Main Canal is to route any flow variations to the Central Canal. The last check structure to be automated in the Central Canal is located

downstream of Booster Pump 5A/5B which consists of four 60-inch bays with a sluice gate in one of the bays and flashboards in the remaining three bays.

This check structure will be automated to maintain a constant downstream water level to meet demand in the remainder of the Central Canal system. Variation in flow upstream of the check structure will be managed by regulating Booster Pump 5A/5B to maintain a constant water level upstream of the check structure. Should excess flow exceed the regulating capacity of Booster Pump 5A/5B, a high upstream level override will allow the excess flow to pass downstream.

Automation improvements include:

- Remove the existing sluice gate and flashboards in the middle two bays;
- Retrofit the middle two bays with 3-inch stainless steel channel guides to support the LOPAC gates;
- Install two LOPAC gates, approximately 60" x 84" gate opening with a 10-foot frame height;
- Install LOPAC gate control cabinet with properly sized solar panel and backup battery capacity;
- Install SCADA communications radio and antenna in/on control cabinet; and
- Install new stilling wells with level transducers upstream and downstream of the check structure.

Additional description and details of the proposed system are contained in the subsequent details of Section 4.0, Evaluation Criteria, below. Variable frequency drive replacements are discussed in the section on energy savings below.

4.0 Evaluation Criteria

4.1 Evaluation Criterion A—Quantifiable Water Savings

1) Describe the amount of estimated water savings. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.

SMWC manages up to 226,000 AFY of water (average of 203,102 AFY) and is, in terms of water volume, one of the largest California State Water Project contractors in the state.

Approximately 1/3 of this volume annually—equivalent to an average of 77,055 AFY—is spilled from the targeted area of canals and associated infrastructure that is proposed for upgrading. SMWC has already initiated a pilot program in 2020 to validate the potential benefits of the proposed project. Results from that work indicate an overall water savings potential of at least 10% for the proposed project, once fully deployed as described above. Therefore, SMWC estimates that **total annual average water savings will be 7,706 AFY** (each year) for the lifetime of the project.

2) Describe current losses: Please explain where the water that will be conserved is currently going and how it is being used.

The water to be conserved is currently flowing—inefficiently—onto the wrong fields, resulting in over-application in some areas and under-application in others. Additionally, excess spills from the system are collected downstream along SMWC and local reclamation district flood

control systems. Water collected here either seeps into the ground or, if flows are sufficient, is pumped into the Sacramento River at an existing flood control pump plant (managed by the local Reclamation district).

The majority of current losses are not being used by others, as noted above. All irrigation water in the Sutter Basin is provided as surface water, and irrigators do not rely on local groundwater. A relatively small / unquantified amount of water is discharged back into the Sacramento River, where it may contribute to downstream uses. With respect to benefits of the existing inefficient use of water, there may be some minimal level of benefit to fish or animal species, particularly those inhabiting SMWC's canal system and the downstream flood control / drainage canals. However, these benefits are poorly managed and unoptimized. Water savings under the project has significant potential to increase habitat related benefits by providing a new management tool and manageable source of water for such uses.

3) Describe the support/documentation of estimated water savings: Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.

Water savings are based on actual reported water usage rates for SMWC. Briefly, historic water use is summarized in SMWC's Agricultural Water Management Plan, which can be accessed online.¹ SMWC routed through its system a total of 203,102 AFY, on average, during the 10 year reported period, from 2004 through 2013. Of this volume, an average of 77,055 AFY of water flowed out of the system as spilled water. This volume of water represents a reasonable low-end estimate of the total water that is potentially available for savings under the project and other water management improvement strategies. Additional water volumes which cannot currently be quantified may also be available due to on-field losses of over-applied water, that does not subsequently return to tailwater recovery systems. SMWC's current operations do not include field level metering. As a result, SMWC operators commonly err on the side of over-application to ensure that sufficient water is entering a field. As a matter of practice and based on reported / collected estimates compiled to date, SMWC operators commonly purposefully or incidentally (due to staff coordination and driving time required to tend sites) release an average of 10% additional water above and beyond scheduled deliveries. The majority of this over-applied water is routed back to SMWC's canal system via tailwater, but a portion may remain on or evaporate from fields. In total, the upgrades proposed under the project are expected to result in a minimum 10% reduction in water spillage, in comparison to existing conditions. This is equivalent to a water savings rate of 7,706 AFY on average, based on historic flows. Data to increase the precision of these numbers are difficult to acquire due to the lack of existing monitoring and delivery meters within SMWC's service area.

4) Please address the following questions according to the type of infrastructure improvement you are proposing for funding.

(1) **Canal Lining/Piping:** The project will not involve canal lining or piping.

¹ Refer to <https://sutterbasinwater.com/agricultural-water-management-plan/> starting on page 213.

(2) **Municipal Metering:** The project will not involve municipal water metering.

(3) **Irrigation Flow Measurement and Management:** The project will involve irrigation flow measurement along with a supporting SCADA system and automated controls.

Irrigation flow measurement improvements can provide water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators. Applicants proposing municipal metering projects should address the following:

a. How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.

For a review of methods regarding the calculation of water savings, please refer to the prior discussion of water savings contained in item 3) above.

b. Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.

As discussed previously under item 3) above, an average of 77,055 AFY of water flows out of the system as spilled water.

c. Are flows currently measured at proposed sites and if so, what is the accuracy of existing devices? How has the existing measurement accuracy been established?

Flows are currently measured at the proposed sites using existing weirs / height rating curves. Accuracy is +/- 10% during the actual reading. However, the system requires an operator to be present to take such a reading, and flows vary over time. Therefore real world accuracy is likely lower, and is estimated to be on the order of +/- 20% to 25%, based on periodic increases in the frequency of readings compared to single point readings. However, total water spilled from the system is measured accurately at a single downstream flood protection facility that pumps spilled water out of SMWC's service area. Measurements at this site are cited above for the average 77,055 AFY figure. These measurements are taken during the irrigation season only, when natural runoff is negligible. Based on gage accuracy as well as system constraints, these estimates are likely to be accurate within 20%, where the identified value is likely a conservative underestimate of total water spilled: seepage to groundwater and also evaporation account for the majority of this uncertainty.

d. Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.

Refer to response to item c above.

e. Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?

Current practice is to err on the side of over delivery to ensure that farmers are not shorted water. SMWC's operators, under current standards of practice, typically seek to leave supply gates open for an extra ~10% of the total time calculated to be needed to provide sufficient water to a given field or location. During some periods, due to limited personnel, supply gates are left open for longer periods. Unfortunately, SMWC does not have existing meter systems that are capable of measuring field level deliveries. However, based on these typical / standard procedures for water delivery operations, SMWC anticipates that an overall 10% water savings identified here is a reasonable yet conservative underestimate of the actual likely water savings of the project.

f. How will actual water savings be verified upon completion of the project?

The project will enable precise monitoring of water volumes released along critical project targeted points of SMWC's irrigation system. While field-level volume measurements will not yet be available under the project, these system level measurements will allow SMWC to confirm the volume of water actually delivered in comparison to that supplied by its water intake. Comparing historic intake volumes and estimated deliveries to project intake volumes and actual deliveries will provide a consistent and reliable basis for verifying water savings upon project completion. Refer also to Section 5.0.

(4) **Turf Removal:** The project will not involve turf removal.

(5) **Smart Irrigation Controllers, Controllers with Rain Sensor Shutoff, Drip Irrigation, and High-Efficiency Nozzles:** The project will not involve these elements.

(6) **High-Efficiency Indoor Appliances and Fixtures:** The project will not involve these elements.

(7) **Commercial Cooling Systems:** The project will not involve these elements.

4.2 Evaluation Criterion B—Renewable Energy

Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery

The project would deploy only limited solar equipment that would provide only sufficient power generation to supply power to remote SCADA equipment / operations. Large scale solar or other renewable power elements will not be included in the project.

Subcriterion No. B.2: Increasing Energy Efficiency in Water Management

Describe any energy efficiencies that are expected to result from implementation of the water conservation or water efficiency project (e.g., reduced pumping).

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- If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.

The project would include the replacement of standard on/off electric motor drives with variable speed / variable frequency drives (VFDs), as discussed in Section 3.0. The addition of VFDs to the system will support improved energy efficiency and reduced energy consumption by allowing pumps to operate at less than full capacity when full capacity operation is not warranted. The project will specifically add VFDs to the pump locations shown in the table below.

Pump No.	Location	Motor Size (HP)	Capacity (cfs)	Energy Rating	Estimated VFD Savings (kWh/yr)
1	West Canal / Lateral R	30	15	9	10,181
2	West Canal / Lateral R	150	30	9	47,539
3	Central Canal / Main Lateral-6	30	12	9	8,145
5	Central Canal / Main Lateral-14	50	25	10	20,366
6	Central Canal / Main Lateral-10	30	12	10	12,218
7	West Canal / Lateral P	40	18	10	27,480
9a	West Canal / Lateral U	60	18	10	26,419
9b	West Canal / Lateral U	50	12	10	16,969
Total Annual Savings (kWh)					169,316

In centrifugal pump applications with low or relatively low head, VFDs can be especially effective in reducing electricity consumption. For such operations it is not uncommon for a VFD to reduce energy consumption by up to half, particularly when pump systems have been designed to be over-sized in order to compensate for / manage higher peak flow rates (designed to peak). electricity consumption reductions. To calculate specific reductions associated with the project, SMWC used an existing / available VFD efficiency calculator tool that is available at no cost through the Hydraulic Institute.² Assumptions and contributions from each pump to energy savings is summarized in the table above. As shown, these upgrades will result in a net savings of at least 169,316 kWh/year.

- How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.

² Refer to <https://estore.pumps.org/Pump-Savings-Calculator-P3263.aspx?ItemId=138888>

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Reductions in electricity consumption will directly translate into reductions in GHG emissions, because reduced electricity consumption will result in reduced demand for electricity, where GHG emissions are generated during electricity production. Based on the most recent available data from electric utility supplier Pacific Gas and Electric (PG&E), electricity consumed by the project will result in the emission of 206 lbs of carbon dioxide per megawatt hour (MWh) of production. The project will therefore result in the following carbon dioxide emissions reduction:

$$(169,316 \text{ kWh/yr electricity savings}) \times (1 \text{ kWh/MWh}) \times (206 \text{ lbs CO}_2\text{/MWh}) = 34,879,148 \text{ lbs CO}_2\text{/yr}$$

- If the project will result in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements and energy usage?

Please refer to the first response under Subcriterion No. B.2.

- Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.

Energy savings estimates originate from booster pumps deployed along SMWC's existing system / facilities.

- Does the calculation include any energy required to treat the water, if applicable?

The calculation only considers increases in energy efficiency due to the addition of VFDs. Depending on the proposed uses / benefits of the project, the same volume of water may still flow through SMWC's system in comparison to existing conditions. Therefore electricity savings due to reduce flow conditions were not considered.

- Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.

The project will result in negligible reductions in these parameters.

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

The project will include the installation of solar panels to power SCADA equipment, which will avoid the need for new grid connections at such sites and also reduce power consumption. Energy consumption reductions are zero to negligible for these elements, because the existing system does not include a SCADA system and the project would not reduce an existing electricity use / consumption on site.

4.3 Evaluation Criterion C—Sustainability Benefits

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

- Does the project seek to improve ecological resiliency to climate change?

Water saved by the project will be made available for other beneficial uses, including to support for downstream fisheries and habitat improvement in the face of the increasing effects of climate change. Climate change is increasing the intensity and frequency of droughts in California, which is placing additional strain on local ecological resources. Improved water resources management along the Sacramento River and its tributaries—including agricultural areas such as the project area—provide substantial opportunities for habitat benefits. During a given year, up to 70% of water saved under the project may be allocated to support ecological resiliency, habitat benefits, and other ecological benefits that will help to minimize the effects of climate change.

- Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits (e.g., maintaining water temperatures or water levels).

The project will allow for improved flexibility in water management within SMWC's system. As a result, less spillage and less waste / loss of water will occur, as discussed previously. This reductions in water loss and in inefficient water application will result in improved flexibility with respect to the release and delivery of water from upstream reservoirs. For example, improved water use efficiency will result in a net increase in the volume of water that can be held in upstream reservoir storage during the early to mid irrigation season, resulting in lesser releases of cold water during that period, and a temporary net increase in temporary cold water storage behind upstream reservoirs. Later in the irrigation season, when the water is called for irrigation or habitat support purposes, this water will be released, potentially contributing cooler water to the Sacramento River upstream of SMWC, and other conveyances, which will provide benefit to fisheries and habitat. These releases will also help to maintain volume along the river during these periods.

- Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).

Water saved under the project, as noted previously, will be utilized in part to support improved habitat and water quality / water availability for applicable fish species along the Sacramento River complex. Key special status species present in the region that could benefit from this element of the project would include the following federally-listed anadromous fish species:

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- Sacramento River (SR) winter-run Chinook salmon (endangered)
- Central Valley (CV) spring-run Chinook salmon (threatened)
- California Central Valley (CCV) steelhead trout (threatened)
- Southern Distinct Population Segment (sDPS) green sturgeon (threatened)

- Please describe any other ecosystem benefits as a direct result of the project.

Improved water management and flexibility within SMWC's system has the potential to improve internal water operations, resulting in increased ability to allocate water in such a manner as to improve water quality, reduce salt concentrations, and therefore reduce associated impacts on downstream habitat and fisheries, including those identified above.

- Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?

As noted above, the project will result in more effective, efficient, and flexible management of SMWC's existing water supply; it will increase the amount of water available within the system available to support environmental and species / habitat benefits as noted above. It will also enable improved water quality management, reduced salt concentrations, and increase the potential for SMWC to more actively participate in regional water supply oriented conservation efforts including those targeted at improvements to ecosystems.

Addressing a specific water and/or energy sustainability concern(s). Will the project address a specific sustainability concern? Please address the following:

- Explain and provide detail of the specific issue(s) in the area that is impacting water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.

As noted above, California including the Sacramento Valley and the region surrounding the project are subject to drought conditions that are increasing in frequency and in severity. These droughts are placing significant stress on the region's agricultural producers, as well as municipalities and ecosystems, habitats, and special status species. In the last decade, our region has been subjected to increasing curtailments in water delivery due to drought, which has resulted in field fallowing and in some cases very significant agricultural losses. These effects are currently projected to increase in severity in the future as a result of the continued development of climate change related effects in our region.

- Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.

Interruptions in service have become commonplace in northern California, as a result of utility shutdowns during inclement weather. These shut downs are meant to reduce potential to start

fires, and are now being initiated by the local utility as early as mid to late summer—still during irrigation periods. Pumping demand during these periods contributes to demand on electricity grid transmission lines, which can exacerbate these issues in terms of frequency or duration.

- Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?

The project will free up a substantial volume of water—as noted above—for improved water management flexibility. When possible, up to approximately 70% of the water saved by the project would be used to support environmental uses. Additionally, the project will also improve reliability of water delivered within SMWC’s service area, by alleviating over- and under-deliveries of water to specific locations, and by improving the flexibility of water deliveries. These improvements can be especially meaningful during drought periods. Also during drought periods, water saved could potentially be temporarily sold to other downstream users to support emergency or drought period water supplies. With respect to interruptions of energy service, the project will result in a net reduction in pump electricity demand for existing and ongoing SMWC operations. Reduced electricity demand will reduce strain on grid systems, thereby reducing potential need to shut down key transmission lines during extreme weather events. Moreover, in the event of a grid down event, reduced system power loads will increase SMWC’s ability to operate its system on current or future planned backup power resources, by reducing total demand and as a result increasing the extent of the irrigation system that can be operated on backup power.

- Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.

Refer to the previous response. Groundwater pumping offsets are not planned, because groundwater pumping in SMWC’s service area is limited.

- Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.

Refer to the previous response; more specifically, for in-district benefits, SMWC will actively manage water flows using its existing and proposed water management facilities and equipment. For out of district benefits, SMWC will have the opportunity to flexibly utilize multiple mechanisms to provide benefits while putting conserved water to intended uses. Specific mechanisms will include increased return flows pumped back into the Sacramento River, reduced withdrawals from the Sacramento River system or bypassing of water withdrawals to support increased in-river flow, and additional water management practices including changes in the timing of water calls by SMWC to delay release of water from upstream and save cold water / water volumes until later in the season, or paper water transfers and similar mechanisms designed to increase water management flexibility.

- Indicate the quantity of conserved water that will be used for the intended purpose(s).

The amount of conserved water that will be used for these purposes will vary on a year by year basis based on current conditions, particularly the presence or absence of drought conditions. However, up to 100% of the volumes identified in Section 4.1 will be used for these purposes, with up to 70% of the volumes identified in Section 4.1 used specifically for environmental purposes in any given year.

Other project benefits. Please provide a detailed explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

(1) **Combating the Climate Crisis:** E.O. 14008: *Tackling the Climate Crisis at Home and Abroad*, focuses on increasing resilience to climate change and supporting climate resilient development. For additional information on the impacts of climate change throughout the western United States, see: <https://www.usbr.gov/climate/secure/docs/2021secure/2021SECUREREport.pdf>. Please describe how the project will address climate change, including the following:

- Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.

Refer to the subsection on *Addressing a specific water and/or energy sustainability concern*, above.

- Does this proposed project strengthen water supply sustainability to increase resilience to climate change?

The project improves / strengthens water supply sustainability and reliability including in the face of climate change, and will therefore increase resilience to climate change. Refer to the subsection on *Addressing a specific water and/or energy sustainability concern*, above.

- Will the proposed project establish and utilize a renewable energy source?

The project will involve an increase in the use of solar power for certain on site uses, as described in Section 4.2. Please refer to that section for additional detail.

- Will the project result in lower greenhouse gas emissions?

The project will result in lower greenhouse gas emissions through a combination of increased energy efficiency and the select deployment of renewable energy, as discussed in Section 4.2. Please refer to that section for additional detail.

(2) **Disadvantaged or Underserved Communities:** E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public

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health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including:

a. Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to, public health and safety through water quality improvements, new water supplies, new renewable energy sources, or economic growth opportunities.

Residents of the community of Robbins—classified as a low income community wherein annual median household income is less than 100% of the statewide annual median household income for the state—would benefit from the project. This community is deeply entrenched in agricultural production and ag activities within SMWC’s service area, and most families living in the community are directly or indirectly connected to these agricultural activities as farmers or as service and equipment providers that support the agricultural industry. Disruptions to the local agricultural industry, including as a result of climate change or poor water system resiliency during droughts, have the potential to result in critical economic consequences on the community of Robbins. The project will provide improved water deliveries and increase the reliability of those deliveries, for agricultural uses surrounding the community, including benefits that will help offset the effects of climate change and improve drought resiliency.

b. If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act, which is defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State, or the applicable state criteria for determining disadvantaged status.

Refer to the response to the previous question. Robbins qualifies as a disadvantaged community; its residents would be primary beneficiaries of the resiliency and other water system improvements provided by the project.

c. If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

Based on federal 2019 estimates of household income, census tract 6101050900, with a population of 1,499 persons, had a median household income of \$49,659, which is 66% of the statewide median income of \$75,235.

(3) **Tribal Benefits:** The project will not provide direct or indirect Tribal benefits.

(4) **Other Benefits:** Will the project address water and/or energy sustainability in other ways not described above? For example:

a. Will the project assist States and water users in complying with interstate compacts?

Not applicable.

b. Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?

The project will benefit both agricultural and environmental sectors, as described above. Moreover, water savings has the potential to be used to support future short term water transfers to municipalities, which would also support municipal and industrial uses.

c. Will the project benefit a larger initiative to address sustainability?

The project will improve water supply management flexibility in SMWC's service area and as a result, incrementally improve flexibility within the Sacramento River Basin. Therefore, water saved under the project could be managed, within the uses identified above (particularly environmental uses) to support basin wide sustainability and habitat / fisheries improvement efforts, in collaboration with SMWC.

d. Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?

There is not litigation over water in the basin at present. However improved water management flexibility will increase the amount of water that could be utilized through the mechanism identified above. Moreover, the project helps to address concerns regarding water conservation, and will ensure that SMWC is doing its part to improve water use efficiency and increase water management flexibility throughout the state.

4.4 Evaluation Criterion D—Complementing On-Farm Irrigation Improvements

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

o Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.

SMWC is currently working with farmers that receive water from the district to install on-farm water delivery measurement systems. As a supplementary program to the canal level operations upgrades proposed under this project, SMWC is also working with individual farmers to install a box meter with a solar panel to operate the meter, into turnouts for specific fields or ag operations. These systems cost \$10,000 to \$15,000 to install, while yielding meter data on a field by field basis. Ultimately, SMWC seeks to install these systems for all water users, with telemetric data that can be monitored and managed by SMWC, including integration into the data and operations proposed under the project.

o Provide a detailed description of the on-farm efficiency improvements.

Refer to the previous response.

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- Have the farmers requested technical or financial assistance from NRCS for the on farm efficiency projects, or do they plan to in the future?

SMWC is working with its farmers to receive technical and possibly financial assistance from NRCS to support this effort.

- If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.

This program is currently under development.

- Applicants should provide letters of intent from farmers/ranchers in the affected project areas.

This program is currently under development.

- Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.

Refer to the first response under Section 4.4.

- Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how? For example, installation of a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip-irrigation.

Refer to the first response under Section 4.4. The proposed WaterSMART improvements will ultimately integrate with the on-farm systems to provide a coordinated and automated irrigation management system that supports further improvements in water use efficiency improvement and management flexibility.

OR

- Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?

Refer to the previous response.

- Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.

These anticipated on-farm elements will help to further understand and manage the volume of water delivered to each agricultural field on an ongoing basis. While SMWC has not yet quantified the additional water savings potential for these elements, it is expected that these

elements will result in additional water savings and therefore additional improvements to water use efficiency within SMWC’s system.

- Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.

On farm estimates are still in process and will depend on the ultimate penetration of the program across SMWC’s service area. However, even a one percent increase in water use efficiency, when applied in SMWC’s service area, could result in substantial benefits. For example, even if applied over only half of SMWC’s service area, a very conservative one percent improvement in water use efficiency could save 1,130 AFY of additional water every year on average, in addition to the savings identified above for the project.

- Please provide a map of your water service area boundaries. If your project is selected for funding under this NOFO, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.

Refer to Figure 1 for the requested map.

4.5 Evaluation Criterion E—Planning and Implementation

Subcriterion E.1— Project Planning

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

SMWC certifies that it has completed a Preliminary Modernization Plan (PMP) for its water supply system; the plan was funded by USBR, and was completed in March of 2019 by the Irrigation Training and Research Center at the California Polytechnic University San Luis Obispo, and is available upon request.³ The following excerpt is from the introduction of that report:

This report provides preliminary modernization recommendations for the Sutter Mutual Water Company regarding its operation strategy and infrastructure. The term “preliminary” is used because it is anticipated that after adopting these recommendations, SMWC will eventually move well past them as the need to modernize increases.

The preliminary recommendations are of two types:

- 1. Improvements intended to demonstrate a concept while improving operations.*
- 2. Adoption of a new strategy of districtwide management for higher efficiency.*

³ Burt, C M and Vazquez, T B., 2019. Sutter Mutual Water Company Preliminary Modernization Plan. March, 2019.

Provide the following information regarding project planning:

(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.

Refer to the previous response.

(2) Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).

The project is wholly in conformance with the PMP; it implements key elements of the PMP that are named therein, targeted specifically at water use efficiency and system operation improvements.

(3) If applicable, provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed WaterSMART Basin Study or Water Management Options Pilot (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes)

The PMP identifies a strong and significant need for modernization within SMWC's existing irrigation system. Much of the SMWC's existing operations are completed *by art* and without direct or specific, quantifiable measurements. As a result, the system is inefficient. Moreover, systemwide upgrades are needed to deploy new measurement and monitoring technology. These efforts will improve water supply management and reduce water loss from the system. The project implements a portion of this overall strategy, supporting multiple key needed benefits including improvements to climate resilience, drought management, and improved water management generally.

Subcriterion E.2— Readiness to Proceed

Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description provided in Section D.2.2.4.; this section should focus on a summary of the major tasks to be accomplished as part of the project.

Task 1. Administration:

Work to be accomplished. SMWC will retain a qualified consultant to provide administration services to support the project. Administration will include day to day management and oversight

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of project budgets, expenditures, invoicing, and all direct administrative related coordination with Reclamation. Administration costs will also cover all project reporting, contract management, and other administration activities for the duration of the 2-year grant period.

Task 2. Engineering:

Work to be Accomplished. SMWC will retain a qualified engineering consultant to complete limited / focused design needed for select upgrades and elements of the project, as described in the attached Technical Proposal. Engineering and design elements will require \$35,000 in funds identified in this category. The consultant will provide support services needed to support acquisition of building permits for work elements where building permits are needed, as well as any environmental permits and environmental compliance requirements. Note that these elements are expected to be minimal in extent, as discussed in the attached Permits and Approvals document.

Task 3. Site Work:

Work to be Accomplished. SMWC will retain a qualified consultant / site work manager or EPC to handle site work / preparation. Site work will be limited to replacement of select automated gate equipment, as described in the Technical Proposal. Work will include minor demolition and removal, as well as limited physical site preparation and site work needed to support project implementation. Site work will include equipment and labor fees, as well as costs for off-haul and materials.

Task 4. Construction:

Work to be Accomplished. SMWC will retain a qualified construction manager to oversee and actively manage all stages of project construction. The consultant will also provide for the installation of other site requirements and appurtenances proposed under the project, as described in the Technical Report.

Task 5. Equipment Procurement:

Work to be Accomplished. SMWC will retain a qualified EPC or similar contractor that will procure and purchase all equipment. Costs under this category will include the cost of equipment needed to support project implementation, as well as limited time and materials costs to support the procurement process itself. SMWC plans to initiate procurement as soon as possible after initiation of the project, and will start to procure equipment—through its contractor—starting in Q2 of the project.

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

The proposed improvements will be classified, for the purposes of permitting and environmental compliance, as maintenance and associated upgrades to SMWC's existing irrigation system. As a result, permitting will be limited. Utility connections in some cases may need to be modified, which would require approval from the local utility (PG&E). Other permits are not anticipated.

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

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SMWC and its consultants have completed the preliminary engineering and planning level evaluations needed to deploy the project. Additional detailed engineering level design will not be needed for most of the upgrades proposed. For elements that do require additional engineering design, such work will still be limited, and is planned for completion within the timeframe identified for the project.

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

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

- Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete)

SMWC will complete the project according to the Gantt chart / schedule shown below.

Task No.	Description	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1.0	Administration								
2.0	Engineering								
3.0	Site Work								
4.0	Construction								
5.0	Equipment Procurement								

For additional detail please refer to the attached Budget Justification.

4.6 Evaluation Criterion F—Collaboration (6 points)

- Please describe how the project promotes and encourages collaboration. Consider the following:
 - Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?

SMWC has presented the project and its elements to the farmers that it serves, as an element of the PMP (see above). This previous planning process greatly helped farmers to understand how SMWC's existing system includes multiple inefficiencies and requires upgrade. While support for the project is not ubiquitous among the farmers in its service area, the proposed project and associated actions are generally supported by SMWC members and have not met significant or coordinated resistance. Area farmers are aware of the program and are either supportive or have chosen not to discourage its implementation.

- What is the significance of the collaboration/support?

Support and/or willingness to comply with the proposed updates represents a major step forward, particularly for a rural community that has established practices and procedures for water management. SMWC looks forward to further developing a collaborative spirit and support among the farmers that it serves.

- Will this project increase the possibility/likelihood of future water conservation improvements by other water users?

This project will increase the efficacy and likelihood of implementation of the on farm elements described above, which will have additional benefits to water conservation in SMWC's service area.

4.7 Evaluation Criterion G— Additional Non-Federal Funding

Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided using the following calculation:

$(\text{Non-Federal Funding})/(\text{Total Project Cost}) = \$1,000,000/\$2,000,000 = 0.5$ or 50% cost share.

4.8 Evaluation Criterion H— Nexus to Reclamation

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider the following:

- Does the applicant have a water service, repayment, or O&M contract with Reclamation?

The Applicant does not have these.

- If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?

The Applicant receives water through various agreements that provide water from Shasta Reservoir and Dam, a Reclamation owned and operated facility.

- Will the proposed work benefit a Reclamation project area or activity?

The project will provide environmental water and other benefits within various Reclamation project / activity areas along the Sacramento River watershed, and potentially, through paper transfers, to the San Joaquin River watershed.

- Is the applicant a Tribe?

The Applicant is not a Tribe.

5.0 Performance Measures

SMWC will track and report to Reclamation upon completion of the project (and at other intervals upon request) the following performance measures:

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- Baseline historic data (i.e., prior to project installation):
 - Intake water volume (monthly or daily as available)
 - Water flow data at each project implementation site (monthly or daily as available)
 - Water delivery volume data (monthly or daily as available)
 - Estimated existing agricultural season spill volumes based on pump data at the reclamation district pumps for tailwater and drainage (monthly or daily as available)
 - Existing system electricity consumption (monthly or daily as available)
 - Historic electricity outages (monthly or daily as available)
- Project data
 - Intake water volume (daily and monthly)
 - Water flow data at each project implementation site using updated system (daily and monthly)
 - Water delivery volume data using updated system (daily and monthly)
 - Estimated existing agricultural season spill volumes based on pump data at the reclamation district pumps for tailwater and drainage (daily and monthly)
 - Water savings estimates as a result of the project (daily and monthly)
 - Benefits documentation:
 - Saved water volume re-allocated for environmental use (daily and monthly)
 - Saved water volume re-allocated for drought benefits (daily and monthly)
 - Saved water volume re-allocated for other uses—transfers, municipal use, etc. (daily and monthly)
 - Documentation of system operations showing accurate deliveries to fields (daily and monthly)
 - System electricity consumption (daily and monthly)
 - Electricity outages (daily and monthly)

Funding Plan, Budget Proposal, and Budget Narrative

FUNDING PLAN

Cost-Share Requirement

The cost-share requirement of \$1,000,000 will be supplied entirely by the Sutter Mutual Water District (SMWD, Applicant). SMWC has carefully reviewed the project internally and has determined that it will allocate funds as identified below. All non-Federal cost share identified below has already been secured and will be allocated for SWMC's share of implementation costs for the project, as noted below.

Source of funds

All applicable cost share committed by SMWC to support the design, construction, and implementation / deployment costs of the project will be funded through existing cash on hand. These funds are currently available in a reserve account, and are derived from SMWC's annual operational revenues. All cost share will be provided as cash to fund 50% of all implementation costs for the project.

No third-party contributions are included in the cost-share amount and there are no pending grants or loans awaiting approval for the project.

The budget proposal does not include any project costs that have been incurred prior to the award.

BUDGET PROPOSAL

Table 1: Total Project Cost Table	
SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	\$ 1,000,000.00
Costs to be paid by the applicant	\$ 1,000,000.00
Value of third-party contributions	N/A
TOTAL PROJECT COST	\$ 2,000,000.00

Table 2: Summary of Non-Federal and Federal Funding Sources	
FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. Sutter Mutual Water Company	\$ 1,000,000.00
Non-Federal Sub-Total	\$ 1,000,000.00
REQUESTED RECLAMATION FUNDING	\$ 1,000,000.00

Table 3: Budget Proposal				
BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
N/A				
Fringe Benefits				
N/A				
Travel				
N/A				
Equipment				
N/A (see below)				
Supplies and Materials				
N/A				
Contractual/Construction				
Administration	\$150,000	1	Contract	\$ 150,000.00
Engineering Fees	\$50,000	1	Contract	\$ 50,000.00
Site Work	\$100,000	1	Contract	\$ 100,000.00
Construction	\$450,000	1	Contract	\$ 450,000.00
Equipment Procurement	\$1,250,000	1	Contract	\$1,250,000.00
Total Project Cost				\$2,000,000.00
Other				
N/A				

TOTAL DIRECT COSTS					\$2,000,000.00
Indirect Costs					
N/A					
TOTAL ESTIMATED PROJECT COSTS					\$2,000,000.00

BUDGET NARRATIVE

This budget narrative discusses and provides an explanation for each of the items included in the Budget Proposal. Note that there are no third-party in-kind or other third-party match contributions included in the project.

Salaries and Wages

SMWC is not seeking reimbursement for any salaries or wages, nor is SMWC relying on salaries or wages to provide cost share / match for the project. Note that due to staffing shortages, SMWC will retain a contractor to complete all **project administration and internal project management**, which is shown below under the contractual explanation.

Fringe Benefits

SMWC is not seeking reimbursement for any fringe benefits, nor is SMWC relying on fringe benefits as a source of cost share / match for the project.

Travel

SMWC is not seeking reimbursement for any travel costs, nor is SMWC relying on travel costs as a source of cost share / match for the project.

Fringe Benefits

SMWC is not seeking reimbursement for any fringe benefits, nor is SMWC relying on fringe benefits as a source of cost share / match for the project.

Equipment

SMWC is not seeking direct reimbursement for any costs associated with the separate purchase of equipment, nor is SMWC relying on direct equipment purchase costs as a source of cost share / match for the project. **Note that all equipment will be furnished and installed under a construction contract, and is accounted for within the contracted costs discussed below.**

Materials and Supplies

SMWC is not seeking direct reimbursement for any costs associated with the purchase of materials and supplies, nor is SMWC relying on direct purchase costs for materials and supplies as a source of cost share / match for the project. **Note that any required materials and supplies will be furnished and installed under a construction contract, and are accounted for within the contracted costs discussed below.**

Contractual

All costs for the project will be included as contractual expenses. Contractors will be hired based on SMWC's standard bid process, which is consistent with Reclamation / federal competitive procurement methods, as defined at 2 CFR §200.320, using only a qualifications based procurement method only for all architectural and engineering services. SMWC has carefully reviewed applicable terms, conditions, and requirements as required by Reclamation, and already understands applicable federal requirements for procurement, profit negotiation, and typical contracting requirements. SMWC's procurement process includes:

1. Issuance of a publicly available RFP through SMWC's existing channels
2. Completion of a pre-bid meeting or conference call, as applicable
3. Acceptance and review of received bids
4. Bids will be scored based on qualification requirements and construction cost

5. The contract will be awarded to the respondent that is the lowest construction cost while also meeting the qualification/contractual requirements.
6. SMWC will initiate and complete the contracting process with the selected contractor

Contractual expenses will include the following project elements:

- **Administration:**
 - **Work to be accomplished.** SMWC will retain a qualified consultant to provide administration services to support the project. Administration will include day to day management and oversight of project budgets, expenditures, invoicing, and all direct administrative related coordination with Reclamation. Administration costs will also cover all project reporting, contract management, and other administration activities for the duration of the 2-year grant period. Total budgeted expenditures for this element of the proposal is \$150,000 for the project period. Funds for this element will be required on an ongoing basis at a rate of \$17,500 per quarter for all quarters except the last quarter. Last quarter expenditures will total \$27,500 to account for required reporting and project close out.
- **Engineering Fees:**
 - **Work to be Accomplished.** SMWC will retain a qualified engineering consultant to complete limited / focused design needed for select upgrades and elements of the project, as described in the attached Technical Proposal. Engineering and design elements will require \$35,000 in funds identified in this category. The consultant will provide support services needed to support acquisition of building permits for work elements where building permits are needed, as well as any environmental permits and environmental compliance requirements. Note that these elements are expected to be minimal in extent, as discussed in the attached Permits and Approvals document. Permitting and environmental clearance support, including applicable permitting fees, will require \$15,000 in funds. The total budgeted expenditures for this element of the proposal is \$50,000. Costs for engineering will be completed in the first 6 quarters of the project, and will include \$20,000 in Q1, then \$6,000 in Q2 through Q6.
- **Site work:**
 - **Work to be Accomplished.** SMWC will retain a qualified consultant / site work manager or EPC to handle site work / preparation. Site work will be limited to replacement of select automated gate equipment, as described in the Technical Proposal. Work will include minor demolition and removal, as well as limited physical site preparation and site work needed to support project implementation. Site work will include equipment and labor fees, as well as costs for off-haul and materials. Total costs will be \$50,000, and 100% of this amount will be expended in Q2 (\$25,000) and Q3 (\$25,000) of the project.
- **Construction:**
 - **Work to be Accomplished.** SMWC will retain a qualified construction manager to oversee and actively manage all stages of project construction. The consultant will also provide for the installation of other site requirements and appurtenances proposed under the project, as described in the Technical Report. Total costs will be \$450,000.

Construction costs will start up in Q3 of the project, and will continue from Q3 to Q8 at a spend rate of \$75,000 per quarter during that period.

- **Equipment:**
 - **Work to be Accomplished.** SMWC will retain a qualified EPC or similar contractor that will procure and purchase all equipment. Costs under this category will include the cost of equipment needed to support project implementation, as well as limited time and materials costs to support the procurement process itself. SMWC plans to initiate procurement as soon as possible after initiation of the project, and will start to procure equipment—through its contractor—starting in Q2 of the project. Procurement will cease during Q7 of the project, leaving the final quarter to complete any remaining installation and construction efforts. Total costs will be \$1,250,000 and will continue at a rate of \$220,000 per quarter for Q2, Q3, Q4, Q5, and Q6, then will slow to \$140,000 in Q7.

Other Expenses

SMWC has not identified or included any additional expenses associated with the project.

Indirect Costs

SMWC will not include or seek reimbursement for or use as cost share / matching funds, any indirect costs incurred under the project.

Third Party In-Kind Contributions

SMWC has not included any third-party in-kind contributions to the project.

Environmental and Cultural Resource Considerations

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. The application should include the answers to:

- **Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.**

The project site encompasses multiple individual areas located across SMWC's service area, as described and discussed in greater detail in the Technical Proposal. Earth disturbing activities will be limited to the installation of the proposed equipment at each targeted project site. Note that footprints for this equipment would be small / limited, and the proposed equipment would be installed at existing control points, pumps, and gate structures that are already located within SWMC's service area. At each target site, minor upgrades would be made to modify existing facilities and equipment in order to install the proposed SCADA, water management, and other systems. The proposed equipment would be installed without ground disturbance. Herein, the project would not affect adjacent water, drainage, animal habitat, or other sensitive biological resources.

- **Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?**

The following Federal special status species are known to occur within the project area and its vicinity:

No federal special status species are expected to be in the locations where on the ground activities would take place.

Flows associated with the project—including specifically flow patterns associated with water related environmental / habitat and species benefits—will, however, reach areas where the following federally listed special status species occur:

- Sacramento River (SR) winter-run Chinook salmon (endangered)
 - Central Valley (CV) spring-run Chinook salmon (threatened)
 - California Central Valley (CCV) steelhead trout (threatened)
 - Southern Distinct Population Segment (sDPS) green sturgeon (threatened)
- **Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?” If so, please describe and estimate any impacts the proposed project may have.**

The project will be installed along agricultural drainages and ditches, which, ultimately, have a downstream connection to navigable waterways and therefore are expected to fall under CWA jurisdiction as Waters of the United States. The proposed equipment would be installed at existing control points along these waterways, and project activities would be limited to small scale upgrades at the existing control points, including for example the installation of SCADA and equipment for automation/remote telemetry. As a result, while the project area is immediately adjacent to waters that are likely to be jurisdictional, the project would not affect or impact these areas, and no mitigation is required.

- **When was the water delivery system constructed?**

The existing water delivery system was constructed in the 1920s, and has been maintained and upgraded intermittently since that time.

- **Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.**

The project will install automation and SCADA control / remote telemetry equipment at multiple irrigation system sites across the project area. The target features, including headgates and ag field turnouts, were constructed between 1920 and 1950. As noted above, however, the project would not make any extensive alterations or modifications to these existing features. To the contrary, the project will install limited equipment on these existing facilities, and will leverage / utilize existing facilities / equipment that is already in place to the greatest extent reasonably possible to minimize cost, as well as environmental impact.

- **Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.**

The existing water intake was constructed in the 1920s, and select canal infrastructure was constructed between 1920 and 1950. As a result, these sites would potentially be considered eligible for listing on the National Register of Historic Places. No District sites have been listed to date.

- **Are there any known archeological sites in the proposed project area?**

There are no known archaeological sites in the project area.

- **Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?**

The project will install a new SCADA and control system along an agricultural water supply system. It will not include activities or actions that would affect or impact low income or minority populations.

- **Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?**

There are no ceremonial use or sacred sites located in or in the vicinity of the proposed project. Therefore the project would not affect such sites.

- **Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?**

The project will include only the installation of new SCADA and control systems, and related energy efficiency upgrades, within the project area. These activities will incur negligible ground disturbance, and would not result in the introduction or spread of noxious weeds or non-native invasive species to the area. The project will not affect or alter continued existence of such species that may already be present within or in the vicinity of the project area. No mitigation is warranted.

Permits and Approvals

SMWC anticipates the following permits and approvals will be necessary in order to deploy the proposed project.

- **Building Permit (Sutter County)**

The project will install multiple pieces of equipment, including equipment that requires connection to and / or minor modification of electrical equipment, installation in or on existing structures, and other limited scale construction and installation activities. SMWC anticipates that these elements of the project could trigger requirements for a County building permit. Given that building permits are relatively easy and fast to acquire (typically 2 to 4 weeks) and, on average, require only basic project design / planning information, SMWC or its contractors will contact Sutter County at least two months prior to initiation of any project element that could require a building permit, to confirm that a permit is needed. SMWC or its contractors will then submit an application for a building permit at least one month prior to the anticipated start of construction / installation. Typically, Sutter County requires an inspection by a County agent upon completion of construction / installation.

- **Environmental Permits**

Based on the limited scope and extent of the project, SMWC anticipates that the project will not require acquisition of environmental permits, such as wetland fill or discharge permits, stormwater discharge permits, water quality permits, or permits required for disturbance to special status species or sensitive habitats. The physical footprint of the project will include only minor / limited physical updates to existing water management and control facilities, and will not require large scale construction, ground disturbance, or disturbance to any adjacent sensitive environmental resources. The entire ground disturbance footprint of the project would be well under one half acre and therefore would not trigger any stormwater management / permitting requirements. All proposed equipment will be electric, and will not result in the installation of new diesel equipment or an increase in use of existing diesel equipment, such that a new or updated air permit would be required.

The project will also require compliance with state and federal environmental regulations, as follows:

- **National Environmental Policy Act (NEPA) Compliance:** Reclamation will serve as the NEPA lead agency for the project. Based on our preliminary review of the project and its potential to affect or impact the environment, SMWC anticipates that a Categorical Exclusion will be the most appropriate environmental document to secure NEPA compliance. SMWC has already compiled much of the background information needed to complete the Categorical Exclusion. Time and level of effort needed to complete the Categorical Exclusion are minimal, and are accounted for in SMWC's proposed budget.
- **California Environmental Quality Act (CEQA) Compliance:** Sutter County would serve as the lead agency for CEQA. However, SMWC anticipates that the project would not require any discretionary action or other approval by Sutter County in order to implement, beyond building permits as listed above. The project would not result in any substantive environmental impacts (refer to the attached environmental compliance form) and therefore would not trigger involvement from

any other agencies. As a result, the proposed project would be managed using a categorical exemption under CEQA (maintenance and repair / swap out of existing equipment), a brief process that requires limited paperwork and can be managed quickly.

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$ 150,000.00	\$	\$ 150,000.00
2. Land, structures, rights-of-way, appraisals, etc.	\$	\$	\$
3. Relocation expenses and payments	\$	\$	\$
4. Architectural and engineering fees	\$	\$	\$
5. Other architectural and engineering fees	\$ 50,000.00	\$	\$ 50,000.00
6. Project inspection fees	\$	\$	\$
7. Site work	\$ 100,000.00	\$	\$ 100,000.00
8. Demolition and removal	\$	\$	\$
9. Construction	\$ 450,000.00	\$	\$ 450,000.00
10. Equipment	\$ 1,250,000.00	\$	\$ 1,250,000.00
11. Miscellaneous	\$	\$	\$
12. SUBTOTAL (sum of lines 1-11)	\$ 2,000,000.00	\$	\$ 2,000,000.00
13. Contingencies	\$	\$	\$
14. SUBTOTAL	\$ 2,000,000.00	\$	\$ 2,000,000.00
15. Project (program) income	\$	\$	\$
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 2,000,000.00	\$	\$ 2,000,000.00
FEDERAL FUNDING			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X <input type="text" value="50"/> %		\$ 1,000,000.00

RESOLUTION NO. 2020-1

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SUTTER MUTUAL WATER COMPANY COMMITTING TO THE FINANCIAL AND LEGAL OBLIGATIONS ASSOCIATED WITH RECEIPT OF A FINANCIAL ASSISTANCE AWARD FROM THE U.S. BUREAU OF RECLAMATION WATERSMART PROGRAM

WHEREAS, the Board of Directors of the Sutter Mutual Water Company continues to pursue funding for its projects to improve the efficiency of water delivery within its service area and improve the energy efficiency of its operations; and

WHEREAS, the Bureau of Reclamation has released funding opportunity **R22AS00023**; and

WHEREAS the Sutter Mutual Irrigation and Energy Efficiency Improvement Project (Project) meets all the criteria required to be eligible for opportunity **R22AS00023** and the Sutter Mutual Water Company desires to submit an application for consideration.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the Sutter Mutual Water Company, as follows:

- 1.o Sutter Mutual Water Company has reviewed funding opportunity **R22AS00023** and approves the filing of an Application for the funding opportunity and commits to the financial and legal obligations associated with receipt of a financial assistance award under this FOA.o
- 2.o Appoints the General Manager as legal agent to conduct all negotiations, execute and submit all documents, including, but not limited to, applications, agreements, payment requests and so on, for the Projecto
- 3.o The Sutter Mutual Water Company has the capability to fund at least 50 percent of the Project costs as specified in the funding plan.o
- 4.o The Sutter Mutual Water Company will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.o

PASSED AND ADOPTED by the Board of Directors of Sutter Mutual Water company this 6th day of August 2020 by the following vote:

Ayes 4

Noes 0

Absent 3

SUTTER MUTUAL WATER COMPANY


Steve Butler, Chairman

ATTEST:


Brad Mattson, Secretary