FLOW CONTROL AUTOMATION UPGRADES

The Bureau of Reclamation

WaterSMART Grants Program:

Water and Energy Efficiency Grants for Fiscal Year 2024

Funding Opportunity Announcement No. R24AS00052

DATE:
February 22, 2024

APPLICANT:
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Applicant Information

Application Date: February 22, 2024
Applicant Name: Hallwood Irrigation Company
City, County, State: Unincorporated Yuba County, CA
Applicant Category: Category A Funding Group I
Project Manager: Karl Brustad

Project Summary. This application to the WaterSmart Water and Energy Efficiency (WEEG) Grant Program for the project, "Flow Control Automation Upgrades," is submitted by the Hallwood Irrigation Company (HIC). HIC serves the community of Hallwood, located in unincorporated Yuba County, California. HIC is an eligible Category A applicant, as a tax-exempt non-profit corporation providing irrigation water to approximately 9,200 acres of farmland in the valley north of the Yuba River. The Flow Control Automation Upgrades Project will benefit HIC and communities within Yuba County. The Flow Control Automation Upgrades, located within Yuba County, will upgrade eight (8) sluice gates with automated flow gates, and install one (1) automated overflow gate. One location will require a headwall replacement included in the project to support the new gate installation. Removal of the existing headwall will also require replacement of the existing check structure, so a new automated overshot gate will be installed at this location for upstream level control. These upgrades will take place at two (2) diversion points and three (3) ditch heads along HIC's irrigation system. The automated flow gates will include solar-powered Supervisory Control and Data Acquisition (SCADA) hardware installation with software access via cellular connectivity. This will allow ditch tenders to utilize remote operation technology to manage diversions more efficiently and collect real-time flow data. Improving operational control will greatly increase the efficiency of the system. This project is expected to result in estimated water savings of 4,220 ac-ft/year. The proposed project will provide safe, reliable, and efficient water delivery for years to come. The primary objective of this proposed project is to implement improvements in irrigation system control and management to enhance operational efficiency and prevent water loss. The design objectives include providing flow monitoring, data acquisition, and remote operational control while maintaining existing flow capacities. The proposed project has been approved for 50% cost share funding ($442,300) from Yuba Water Agency (Yuba Water) (see attached funding agreement). The project duration is less than one (1) year. Final design is expected to be initiated in July 2024, during the URBS pre-award phase, and construction is expected to be completed by April 30, 2025. The Flow Automation Upgrades Project is not located on a Federal Facility.

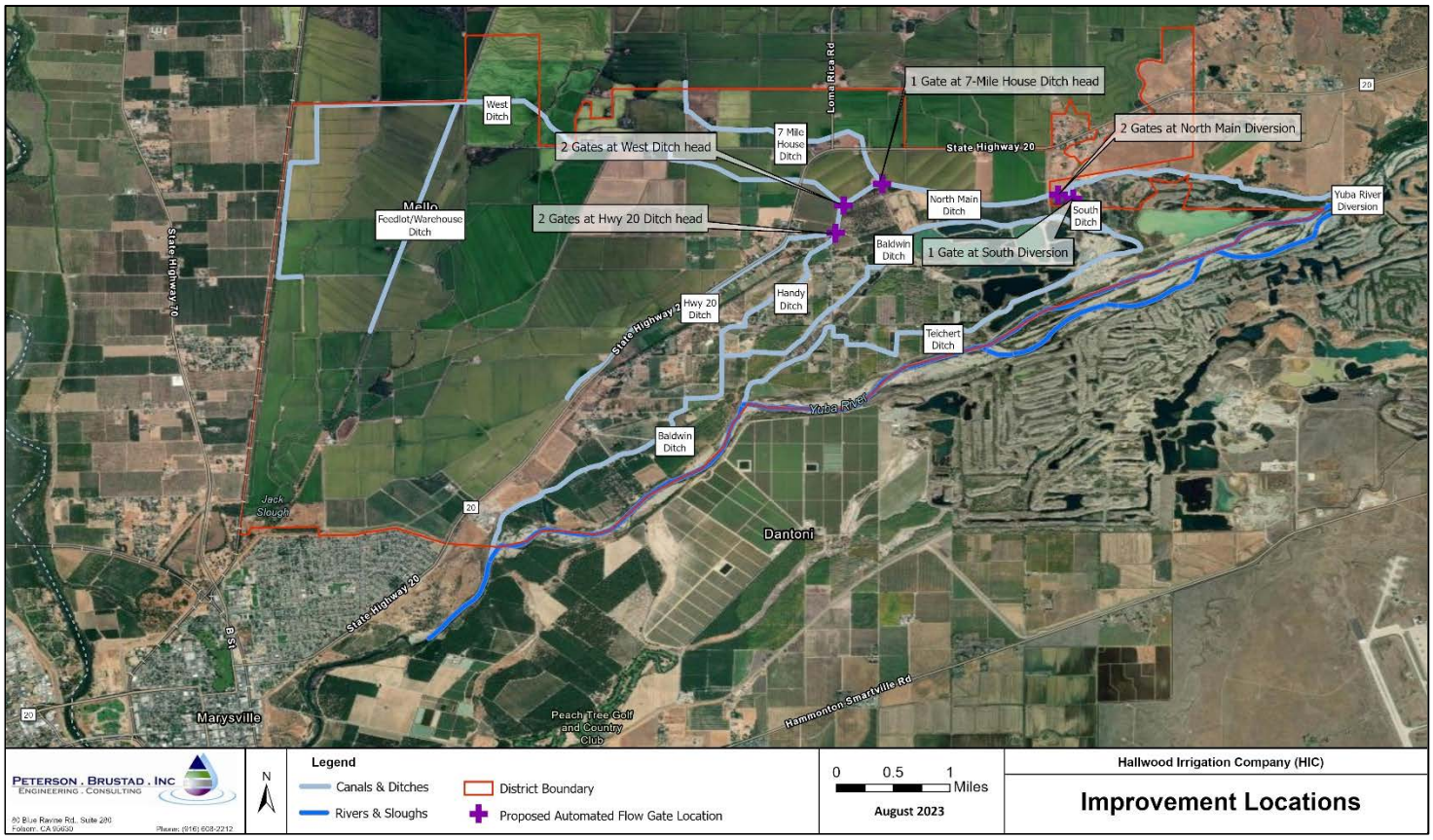
2. Project Location

The Flow Control Automation Upgrades project is located in Yuba County, California, approximately 9.2 miles northeast of the City of Marysville. The longitudes and latitudes of the five diversion points where gates will be replaced are listed below:

1. (1) Gate at South Diversion: 39.209921° N, 121.478887° W
2. (2) Gates at North Main Diversion: 39.209983° N, 121.478925° W
3. (1) Gate at 7-Mile House Ditch Head: 39.209834° N, 121.504519° W
4. (2) Gates and (1) Overflow Gate at West Ditch Head: 39.207059° N, 121.509417° W
5. (2) Gates at Hwy 20 Ditch Head: 39.203501° N, 121.510384° W

Figure 1. Flow Control Automation Upgrades Project – Vicinity Map

Figure 2: Flow Control Automation Upgrades Locations



3. Technical Project Description

In 2022, HIC received a Community Impact Grant from Yuba Water Agency to complete a System Renovation Plan. The first phase of the Renovation Plan included the development of an irrigation system condition assessment, which Peterson Brustad (PBI) completed in December 2022. The condition assessment resulted in the identification and prioritization of several critical improvements. The project proposed in this application, the Flow Control Automation Upgrades, is part of the 1st and 2nd highest priority items out of the 12 improvement projects recommended.

This project will replace sluice gates located at five main diversion points along HIC's irrigation system: North Diversion, South Diversion, and three ditch heads along North Main Ditch (7-Mile House Ditch, West Ditch, and Highway 20 Ditch). An example of the existing sluice gates is shown in Figure 3. The existing system components are as follows:

- North Diversion – Two 48" sluice gates
- South Diversion – One 48" sluice gate
- 7-Mile House Ditch – One 36" sluice gate
- West Ditch – Two 48" sluice gates
- Highway 20 Ditch – Two 24" sluice gates

Figure 3. Example of existing sluice gates (Highway 20 Ditch)

The automated flow gates will include solar-powered Supervisory Control and Data Acquisition (SCADA) hardware installation with software access via cellular connectivity. This would allow the ditch tenders to utilize remote operation technology to manage diversions more efficiently and collect real-time flow data. Improving operational control will greatly increase the efficiency of the system and reduce water loss.

The automated flow gates that will be installed are Rubicon SlipMeter, or an approved equal (See Figure 4). These gates have a built-in flow meter and an ultrasonic water level sensor to measure flow even when the gate opening is partially full (down to 50% full). The metering system uses ultrasonic technology by measuring velocity planes through a known cross-sectional area. The SlipMeter has the capability to be operated and monitored on-site or remotely through cellular communication. The system is solar-powered with backup batteries and can be manually operated if needed.

The overshot gate that will be installed is the Rubicon FlumeGate, or an approved equal (See Figure 5). This gate can also be operated automatically with a solar panel and cellular communication or manually on site with a mechanical override. Internal sensors continuously measure upstream and downstream water levels, and the controller uses this data with the gate position to calculate flow within 5% accuracy. The FlumeGate can be integrated into the same SCADA platform as the SlipMeter, through Rubicon's SiteConnect.

The automated flow gates can be controlled via setpoints for position, flow, or upstream water level. The SCADA system will be accessed through an online platform, such as Rubicon's SiteConnect. Multiple users can access the system to observe data and trends from each gate and adjust setpoints as needed. HIC would have the ability to monitor all flow gates in the system on one centralized webpage, accessed via a laptop or phone with a cellular connection.
Installation of each automated flow gate is a two-day process during the irrigation off-season and will require a crane to lift the gate into place. A manufacturer technician will oversee the installation performed by a contractor. Each gate requires a pedestal assembly (Figure 6) that

controls the gate with a solar panel for power. The pedestal assemblies will be placed in close proximity to the gates, and the panels will be oriented to maximize sun exposure.

The North Diversion currently has two 48” sluice gates, and the South Diversion has one 48” sluice gate (Figure 7). Both the North and South Diversions have headwalls that have been replaced within the last seven years and do not require any improvements for the automated gate installations. The pedestal assemblies can be installed within 25’ of each gate, as shown in Figure 8.

Figure 4. Rubicon SlipMeter

Figure 5. Rubicon FlumeGate

Figure 6. Pedestal assembly

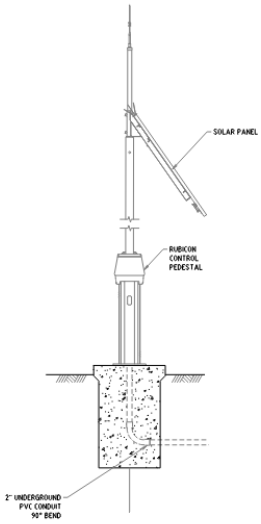


Figure 7. North and South Diversions existing headwall and gates

Figure 8. Proposed locations for North and South Diversion pedestals

7-Mile House Ditch currently has one 36” sluice gate (Figure 9). The existing headwall has insufficient thickness for anchoring the new gate and will require concrete fill in order to meet the installation requirements. This can be achieved using custom brackets provided by the manufacturer to place the new frame within the existing cut-out section while attaching it to the outer walls. The pedestal assembly can be installed within 10’ of the gate as shown in Figure 10.

Figure 9. 7-Mile House Ditch existing headwall and gate

Figure 10. Proposed location for 7-Mile House Ditch pedestal

West Ditch currently has two 48” sluice gates that flow into a single 72” culvert crossing (Figure 11). One of the walls of the structure continues into an existing check structure. The existing headwall requires replacement because it has experienced losses due to erosion and degradation of the structure. The project will include demolition of the entire headwall and the connected check structure. A new precast headwall with two 48” openings and wingwalls on each side will be installed at the head of the West Ditch. To replace the check structure, another new precast headwall (without wingwalls) will span the width of the ditch and will be installed downstream of the West Ditch diversion. This headwall will include a new automated overshot gate and a walkway to cross the North Main Ditch.

Two new parallel 48” reinforced concrete pipes, each approximately 50 feet in length, will be installed from the automated flow gates to the outlet on the other side of the road crossing. The existing void between the sluice gates and the culvert will be filled with piping and backfill material. The proposed pedestal assemblies can be installed within 20 feet of the new gates, as shown in Figure 12.

Figure 11. West Ditch existing headwall and gate

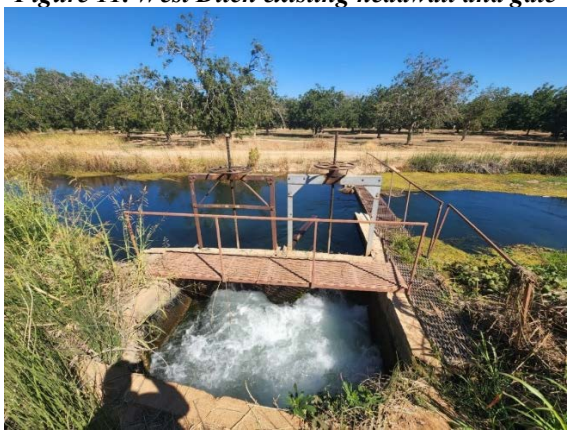


Figure 12. Proposed locations of West Ditch pedestals

The Highway 20 Ditch head currently has two 24" sluice gates (Figure 13). The current headwall does not require any improvements as it was determined to be in adequate condition upon inspection with a sufficient concrete thickness for anchoring the new gates. Two 24" automated flow gates will be installed at this location. The existing headwall will accommodate the installation with adequate clearance between the two gates. The pedestal assemblies can be installed within 15' of the gate, as shown in Figure 14.

Figure 13. Highway 20 Ditch existing headwall and gate

Figure 14. Proposed location of Hwy 20 Ditch pedestal

4. Evaluation Criteria

A. Evaluation Criterion A – Quantifiable Water Savings

1. Describe the amount of es mated water savings.

Currently, the flow gate at the West Ditch is experiencing a continuous leak from damage due to erosion (see Figure 15). HIC staff estimates that this leak is causing continuous losses of approximately 5cfs. This equates to a loss of roughly 3,020 ac-ft/year based on 10 months of running water. The water lost as a result of this leak is lost from the system. The installation of the flow gate along with the headwall replacement will eliminate this leak.

HIC staff have also indicated that there is existing tailwater flow. The tailwater flow is a result of the manual operation of the existing system. The inability to adjust diversions based as demands change can cause excess diversions. Though flow meter data is unavailable, HIC field staff estimate that the tailwater flows vary between 0-10 cfs, with an estimated average of 2 cfs. This equates to a loss of roughly 1,200 ac-ft/year based on 10 months of running water. This excess water ponds at the end of the irrigation system before returning to the Yuba River downstream. This water loss is due to the operational inefficiencies at each of the manually operated gates.

The total estimated water savings resulting from this project are 4,220 ac-ft/year.

2. Describe current losses.

The current water loss is estimated to be roughly 4,220 ac-ft/year. This quantity is based on estimations of flow lost due to erosion damage at the West Ditch head wall (Figure 15), as an estimated average flow of tail water. Both these estimations were provided by HIC field staff as flow meter data is unavailable for the system. The water that is lost because of the leak, leaves the irrigation ditches, and flows into the surrounding area. The tailwater flow is a result of excess

water in the irrigation system. Tail water flows pond at the end of the ditches and eventually returns to the Yuba River downstream, but only after going through the ditch irrigation system. This increases the risk of pollutants and other debris entering the Yuba River and potentially harming the ecosystem and other industries downstream. There are no known benefits associated with the current water losses.

3. *Describe the support/documenta on of the es mated water savings.*

The estimated water savings of 3,020 ac-ft/year is based on estimates from HIC field staff. As previously mentioned, flowmeter data is unavailable. HIC has estimated that the leak at the West Ditch due to headwall erosion runs at roughly 5 cfs. See below for calculations:

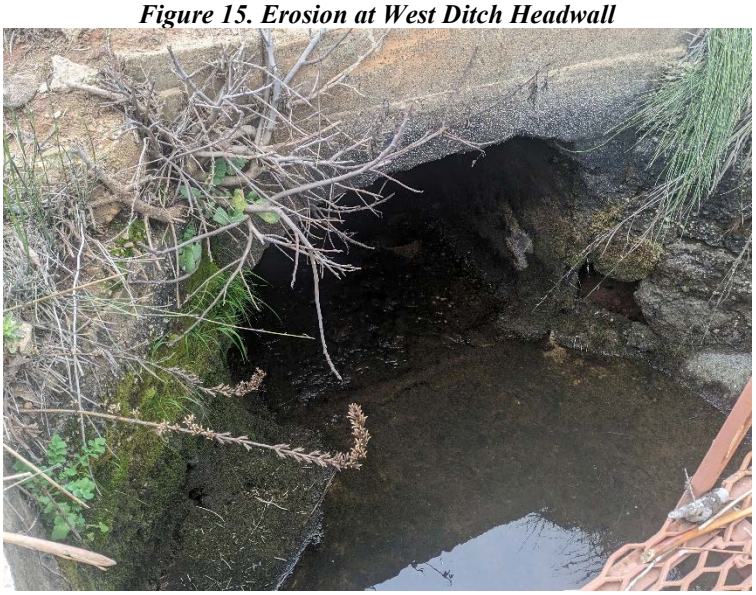
5 ft^3/s x 7.48 gal/ ft^3 x 86,400 sec/day x 305 days of running water/yr x 1 ac-ft/326,000 gal
= 3,020 ac-ft/year

HIC field staff have also estimated that there is an average of 2 cfs of tail water that often ponds before returning to the Yuba River. This project will result in a savings of 1,200 ac-ft/year. See below for calculations:

2 ft^3/s x 7.48 gal/ ft^3 x 86,400 sec/day x 305 days of running water/yr x 1 ac-ft/326,000 gal
= 1,200 ac-ft/year

3,020 ac-ft/year + 1,200 ac-ft/year = ***4,220 ac-ft/year***

Figure 15. Erosion at West Ditch Headwall



4. *Please address the following ques ons according to the type of infrastructure improvement you are proposing for funding.*
   a. How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.

The annual water savings for this project have been determined through estimated flow rates by HIC staff. At the West Ditch, there is erosion damage that is causing roughly 5cfs of water loss. There is also tail water that flows at approximately 2 cfs. This project will replace the headwall that is causing the leak at the West Ditch, as well as eliminate operational inefficiencies that cause excess tailwater flow. This results in a total of roughly 4,220 ac-ft/year in water savings. Please see section above for calculations.

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.

The current operational losses are estimated based on HIC staff experience and estimations of leak and tailwater flows. As previously noted, the West Ditch headwall has erosion damage that is causing a leak at this diversion. There is also between 0-10 cfs of tailwater that often ponds at the end of the ditch before returning to the Yuba River downstream. This was estimated to result in an average flow of 2 cfs. HIC staff is currently having to visit each of the diversion points 3-4 times per day to manually adjust the gates which are susceptible to inaccurate deliveries to irrigation customers. These losses are estimated to be 4,220 ac-ft annually based on 10 months of flowing water per year.

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 not currently being measured at the proposed sites for gate replacement. Without automated controls or monitoring, any unexpected operational change or system failure can result in flow and water level changes that propagate downstream. This can then result in under- or over-deliveries to irrigators and an excessive amount of return water to the Yuba or Feather River. Furthermore, the system is currently managed manually based on institutional knowledge, which creates difficulties during staff turnover.

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

The proposed flow measurement devices are Rubicon SlipMeters and FlumeGates. These devices have capability to automatically adjust to maintain a consistent flowrate in response to changes in upstream and downstream flows. The Rubicon SlipMeter is a flowmeter with an integrated control gate. It is equipped with Rubicon's ultrasonic array flow measurement technology to measure flows in a variety of conditions. The SlipMeter can measure and record instantaneous flowrate and total volume. The SlipMeter also has a local LCD display which will provide HIC staff with the ability to control the flows and view the instantaneous flowrate, volumes of current and past deliveries, and total flow volume for the season. The upgrades will include implementation of SCADA software along which will allow the gates to be operated remotely.

The Rubicon FlumeGate works with the SlipMeter to optimize the flow of the network. The FlumeGate can also be controlled remotely using SCADA software. Using Rubicon's

CableDrive and SolarDrive technology, this gate has been tested to provide precise gate positioning within plus or minus 0.02 inches. Both the SlipMeter and the FlumeGate have an accuracy of plus or minus 2.5 percent based on Rubicon lab tests.

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

Yes, the current farm delivery volumes are often inaccurate due to the lack of control at the diversion points. The varying and inconsistent flows result in inefficiencies and likely over deliveries. This is likely the source of the existing tailwater flows. More efficient, timely, and steadily controlled deliveries will decrease over deliveries and make the system and a whole more efficient.

Estimated water savings are based on HIC's current losses from leaks and tailwater flows due to the inefficiencies of the current system.

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

After the project is completed, the actual water savings will be verified using the newly installed SCADA system. Diversions will be tracked and recorded and compared to pre-project deliveries and estimated diversions. The tailwater flows will also be measured and compared to the pre-project flows.

B. Evaluation Criterion B – Renewable Energy

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

Describe the amount of energy capacity. *For projects that implement renewable energy systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

The proposed project will implement a renewable energy system by installing a solar powered energy system with battery backup. All Rubicon SlipMeter and FlumeGates used for this project will use power generated from integrated solar panels. Each gate will also have a battery back-up to sustain continuous operation during periods when solar panels are not generating power. Rubicon gates and meters include 80W to 160W solar panels as part of their standard package.

Describe the amount of energy generated*. For projects that implement renewable energy systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate. Please explain how the power generated as a result of this project will be used, including any existing or planned agreements and infrastructure.*

The solar panels will produce and estimated 1,190 kWh per year of energy. This estimate assumes nine (9), 85-watt solar panels operating for roughly 305 days of irrigation season for an average of 5.1 hours of peak sunlight.

5.1 hours of sunlight/day x 85 W = 433.5 Watts/day = 0.4335 kWh/day
0.4335 kWh/day x 305 days/year = 132 kWh/year
132 kWh/year x 9 solar panels = 1,190 kWh/year

Describe any other benefits of the renewable energy project: *Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:*
• How the system will combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions
• Expected environmental benefits of the renewable energy system
• Any expected reduction in the use of energy currently supplied through a Reclamation project.
• Anticipated benefits to other sectors/entities.
• Expected water needs, if any, of the system

The proposed project will be installing new flow gates in HIC's structures that will be powered by solar panels using backup batteries. The renewable energy component of these new structures will result in energy savings leading to reduction in greenhouse gas emissions from HIC activities.

Additionally, the automation of the flow gates and implementation of SCADA software will result in less maintenance and monitoring trips by the HIC staff. The greenhouse gas emissions from vehicle fuel is estimated by the EPA to be 8,887 grams of CO_2 per gallon. HIC staff typically visit the facilities for maintenance purposes 3 times per day. Assuming that the system automation reduces the number of trips by one trip per day, or 33%, the greenhouse gas emission reduction volume as a result of this project is 0.8 metric tons of CO_2 annually.

*4.7 miles round trip to facilities * 1 gallon/15 miles * 3 times/day * 305 days of flowing water/year * 8,887 grams of CO_2/gallon = 2,547,903 grams of CO_2/year*
= 2.5 metric tons of CO_2/year
*~ 33.33% reduction = 33% * 2.5 metric tons of CO_2/year = 0.8 metric tons of CO_2/year*

B.2: Increasing Energy Efficiencies in Water management

If quantifiable energy savings are 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 current system requires HIC staff to make 2-3 daily trips for maintenance purposes throughout the system. A round trip to the facilities is roughly 4.7 miles. These upgrades will reduce the maintenance requirements by at least one trip per day. During a 305-day irrigation season, this adds up to 305 trips for a total of about 1,440 miles. The average pick up truck gets about 20 miles per gallon. This results in a savings of at least 72 gallons of fuel per year.

In dry years when surface water supply is limited, customers within the HIC service area supplement their water consumption by pumping from groundwater wells to make up for surface water lost due to leaks and operational inefficiencies. To estimate the approximate energy savings, it is assumed that any loss of water due to operational ineficiencies is pumped from

local wells. The expected water savings will equal the current water loss, which is estimated to be 4,220 ac-ft/yr. The average depth to water in the area from September 2022 through October 2023 was approximately 29 ft. This information was taken from the California Department of Water Resources (DWR) Groundwater Live portal. The well used as reference was Well No. 391917N1215111W00. This well belongs to Yuba Water and is located about 2 miles from the project location. According to a 2007 Yuba Water document for the Proposed Lower Yuba River Accord, well surveys for Yuba County indicate the range of pump efficiencies to be between 58.5% and 71.5%. The power savings based on water savings is estimated to be between 175,269 and 214,217 kWh (See Table 1).

Table 1: Estimated Water Savings

Volume (V-Acre feet)	Lift (H - Feet)	Assumed Efficiency (E)	Power (kWh) (kWh = 1.024*V*H/E)
4,220	29	58.5%	214,217
4,220	29	71.5%	175,269

The estimated average commercial energy rate from energy providers in Yuba County is approximately $0.27/Kwh. With this, the estimated cost savings from reduced energy consumption is approximately $47,323 to $57,839 per year. See calculations below:

Table 2: Estimated Energy Savings

Assumed Efficiency	Energy Savings (kWh)	Estimated Energy Rate ($/kWh)	Annual Cost Savings ($)
58.5%	214,217	$ 0.27	$ 57,839
71.5%	175,269	$ 0.27	$ 47,323

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

The HIC irrigation system is currently difficult to operate and requires considerable experience to manage adequately. The existing sluice gates are manually operated. Without automated controls, any unexpected operational change or system failure can result in flow and water level changes that propagate downstream. This can then result in under or over-deliveries to irrigators and an excessive amount of return water to the Yuba or Feather River.

A more reliable and efficient system will prevent downstream spills and will help promote water conservation. During times of deficiencies, water is supplemented by groundwater pumping. The use of wells to supplement surface water shortages also decreases the demands on the electrical grid and air emissions related to energy creation.

In addition, current maintenance procedures require multiple daily trips to the existing facilities, increasing the emissions resulting from HIC activities.

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

Diversions are restricted during periods of drought causing a deficit in the supply to the HIC customers. During these dry periods, farmers must pump groundwater to fulfill their irrigation water supply needs. Recent curtailment periods occurred in 2021 and 2022.

Farmers within the Halwood Irrigation Company supplement their water needs by pumping ground water when necessary. Groundwater pumping by these customers may be reduced as a result of more accurate water deliveries and less water waste due to spills.

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.

The energy savings estimate outlined above are specific to the service area of the Flow Control Automation Upgrades Project.

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

Not Applicable

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

As noted above, upgrading the flow control systems in the HIC system will result in a reduction of roughly 1 trip or 4.7 driven miles per day. This results in an annual CO_2 emission reduction of 0.8 metric tons.

Describe any renewable energy components that will result in minimal energy savings/production

Not Applicable

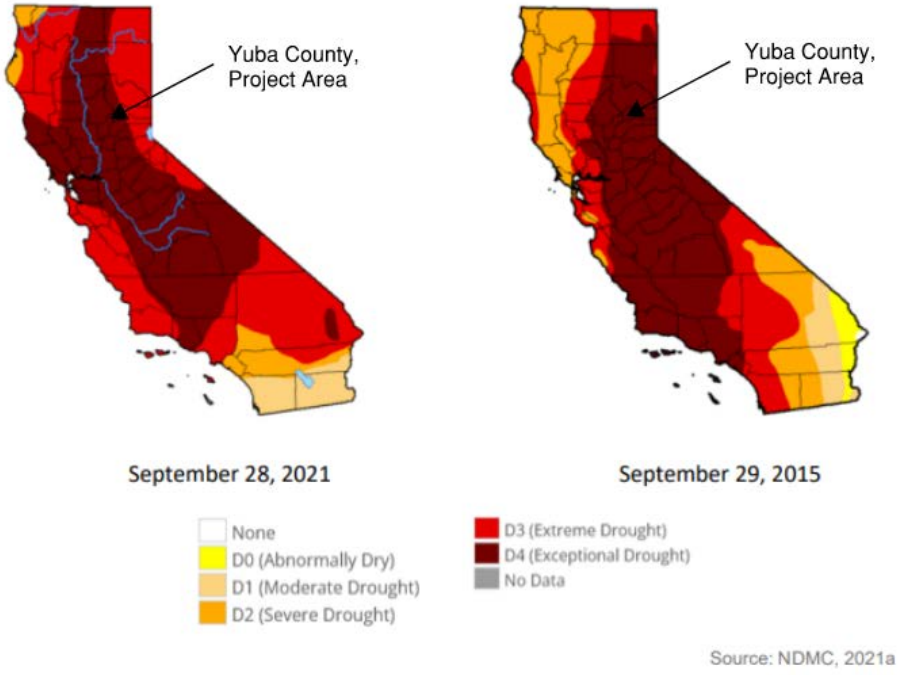
C. Evaluation Criterion C – Other Project Benefits

Explain and provide detail of the specific issue(s) in the area that is impacting water resilience and sustainability. Consider the following:
Describe recent, existing, or potential drought or water scarcity conditions in the project area.

A significant portion of California experienced severe drought conditions during the 5-year period from 2012 to 2016. Most recently, a large portion of California experienced similar drought conditions during the 2021 water year. According to a report produced by the California Office of Environmental Health Hazard Assessment, in September 2021, 88 percent of California experienced extreme to exceptional drought. As shown in Figure 15, the project area (Yuba County) was categorized as experiencing "Exceptional Drought" during both of the most recent

drought events. At the start of the 2023 water year, California was still experiencing drought conditions.

Figure 15: Drought Intensity in California
Comparison of conditions at the end of the Water Year, 2021 vs. 2015



Source: NDMC, 2021a

Is the project in an area that is experiencing, or recently experienced, drought or water scarcity?

The Flow Control Automation Upgrades Project is in an area that has recently experienced severe drought conditions. As illustrated above, Yuba County experienced conditions classified as D4 (Exceptional Drought) in recent years.

Diversions are restricted during periods of drought causing a deficit in the supply to the HIC customers. During these dry periods, farmers must pump groundwater to fulfill their irrigation water supply needs. Recent curtailment periods occurred in 2021 and 2022. Information provided by Yuba Water Agency for the 2022 period of curtailment shows that Hallwood's ability to divert water from Yuba River under their water rights was limited.

Describe any projected increases to the severity or duration of drought or water scarcity in the project area. Provide support for your response (e.g., reference a recent climate informed analysis, if available)

Currently, there are no indications of continued drought conditions in the project area within the near future.

Explain and provide detail of specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service. Please describe how the project will directly address the concern(s) stated above.

As described above, periods of drought can cause service disruptions due to the diversion limitations imposed. This leads to reduced access to full water rights by the customers, leading to an increase in groundwater pumping and usage of other water rights to supplement the supply. The water savings resulting from this project will help offset the deficit during times of water scarcity by keeping more water in the system for longer periods of time.

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?

The primary objective of this proposed project is to implement improvements in irrigation system control and management to enhance operational efficiency and prevent water loss. The design objectives include providing flow monitoring, data acquisition, and remote operational control while maintaining existing flow capacities.

This project will result in more efficient management of the water supply by enhancing the operational efficiency of HIC's facilities. Installing automated flow gates at the identified diversions would improve the efficiency of the HIC system and water usage by allowing for remote operation of the flow-control structure and providing real-time flow rate data acquisition. This will allow flows to match the demands of irrigators more precisely. Additionally, by improving flow control parameters at the identified diversions, less water will be lost through timely adjustments, preventing overflow, increasing system efficiency, reducing excess diversions, and reducing excessive return water to the Yuba River.

Additionally, the project will maintain and enhance a reliable groundwater supply for users within the North Yuba subbasins through the effective management of conjunctive water use. The Yuba subbasins were two of the 127 regions identified as medium-or-high-priority basins in 2014 by the Department of Water Resources (DWR). The project will improve the efficiency of surface water usage through "smarter" operation of the flow control structures. By increasing the efficiency of surface water use, the project maximizes the benefits of limited surface water supplies and reduces the demand on groundwater basins. Such water savings will allow for continued avoidance of "deficit pumping."

This project will directly increase the efficiency of HIC's water delivery system. Implementing a more efficient way to manage HIC's flows will result in diversions from the Yuba River that match the system demand, eliminating excess diversions. As described in the Yuba IRWMP, the resources of the Yuba River are managed for multiple beneficial uses, including municipal and agricultural water supply, hydropower generation, recreation, and environmental benefits.

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 shortage that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.

The water that is conserved as a result of this project will either stay in the system, or be delivered to HIC customers as required. When the water diverted matches the system demand, less ground water pumping and water diversion from the Yuba river is required to sustain the operations.

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

Not applicable for this project

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

Historically, Yuba River has been the subject of water-related tension between environmentalists and fish organizations and Yuba Water Agency. The main subject of the controversy was establishing instream flow schedules to provide adequate flows to both sustain the fish population in the rivers and allow Yuba Water to operate the New Bullards Dam and reservoir to meet local water demands and transfer water to other areas of California. The conflict over these issues led to a series of lawsuits and resulted in a multi-agency settlement agreement that provides benefits for fish and wildlife purposes, and water supply reliability for irrigation, hydropower generation and recreation. This settlement is known as the Yuba River Accord. HIC has been a substantial partner in the Yuba River Accord.

This project supports the tension-reducing goals of the Yuba Accord by improving water supply conditions that allow Yuba Subbasin water suppliers to implement their groundwater substitution transfer program, which provides benefits during dry years to water suppliers throughout the state under Yuba County's Groundwater Sustainability Plan. This ensures that the project will maintain and enhance the benefits for Yuba County by maintaining mutually beneficial relationships with existing Yuba Accord transfer buyers.

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 recovery plan or conservation plan under the Endangered Species Act (ESA).

The Yuba River is home to both steelhead trout and spring-run Chinook salmon. Spring-run Chinook salmon is designated as a threatened species under both the federal Endangered Species Act (ESA), and the California ESA (CESA). Steelhead trout is considered a threatened species under the federal ESA. The Yuba Integrated Regional Water Management Plan (IRWMP)—a water-focused planning document and process that involves all water purveyors and many other entities within Yuba County—states that changes or reductions to the flow of the stream can cause dewatering of salmonid redds and stranding of fry and juvenile fish. To protect the salmon and steelhead trout habitat, the Lower Yuba Accord manages the stream flows. Minimizing the water supply losses and operational inefficiencies provides an opportunity to divert less surface water from the Yuba River and keep more consistent and predictable flows in the system, which will benefit the habitat for these species.

Will the 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, recreational benefits, etc.)

As stated above, minimizing water loss and excess diversions due to inefficiencies in operation provides the opportunity to divert less surface water from the Yuba River allowing more water to remain in the river and thereby providing recreational and environmental benefits downstream of the diversion. Keeping more water in the system for longer periods of time aids HIC in their ability to deliver full water rights to their customers, reducing the likelihood of additional groundwater pumping.

Will the proposed project reduce the likelihood of a species listing or otherwise improve the species status?

As stated above, the Yuba River is home to both the steelhead trout and the spring-run Chinook salmon. Both species are listed as endangered species. The proposed Flow Control Automation Upgrades Project could help improve the status of these species by providing water savings if HIC were to reduce their diversion from the Yuba River. However, there is no formal agreement or guarantee in place to ensure that the water will remain in the river or that diversions will be reduced.

Describe how the project addresses climate change and increases resiliency. For example, does the project helps communities adapt to bolster drought resilience.

This project will contribute to water conservation and resiliency by improving efficiency of water distribution and delivery by minimizing operational errors. Increasing the efficiency of surface water use maximizes the benefits of limited surface water supplies and reduces the demand on groundwater basins. The water savings from the project will improve water supply conditions that allow the Yuba Subbasins water suppliers to implement their groundwater substitution transfer program, which provides benefits during dry years to water suppliers throughout the state under Yuba County's Groundwater Sustainability Plan. The project will improve water conservation decreasing demand on groundwater basins.

This project improves water supply reliability and increases management efficiency. By eliminating operational inefficiencies, this project allows less water to be diverted from the Yuba River, thereby increasing the water supply available within the river. System reliability will be enhanced with this project by better protecting the water delivery system.

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

Yes, the project seeks to provide water savings that will help offset the effects of climate change. The IRWMP has identified a list of climate change impacts in the Yuba County Region. These impacts include reduced streamflow and water supply, reduced water quality, increased flooding, infrastructure failure during winter peak flows, increased wildfire potential, and effects on the

region's recreation industries from lower summer flows. The proposed project will help offset the effects of climate change by reducing water loss due to operational inefficiencies.

Does the proposed project seek to reduce or mitigate the climate pollutions such as air or water pollution?

Yes, the current system requires manual operation of each of the existing gates. This requires maintenance and operations trips to each of the sites. The automation of these systems will allow HIC staff to remotely control the flow of the system, resulting in less miles driven and less harmful emissions being released into the environment.

D. Evaluation Criterion D – Disadvantaged Communities, Insular Areas, and Tribal Benefits

D.1. Disadvantaged Communities

If applicable, describe how the proposed project will serve or benefit a disadvantaged community, identified using the tool. For example, will the project improve public health and safety by addressing water quality, add new water supplies, provide economic growth opportunities, or provide other benefits in a disadvantaged community?

According to the Climate and Economic Justice Screening tool, Marysville, California, is identified as a disadvantaged group. Marysville is in the 99th percentile for expected economic loss to agricultural value resulting from natural hazards each year, the 91st percentile for projected flood risk, the 95th percentile for the level of inhalable particles 2.5 mm or smaller, and the 95th percentile for projected wildfire risk. Marysville also falls in the 77th percentile for low income, where income is less than or equal to twice the federal poverty level.
The State of California defines a Disadvantaged Community (DAC) as a community with an annual median household income (MHI) less than 80% of the statewide annual MHI. Based on the 2010 census, six communities in the project area were identified as DACs. The IRWMP has actively sought to include and benefit DACs in the planning efforts.

The proposed project will provide economic opportunities in the construction sector, services sector, and agricultural sector. The more reliable delivery of water to the irrigators within HIC's system will increase economic opportunities in the area. This project will also increase water delivery system efficiency by minimizing water loss. These avoided water loss from the project will create additional economic opportunities for Yuba Subbasin water suppliers by allowing more participation in the previously described groundwater substitution transfer program. This project will produce and sustain good-paying jobs in the community for years to come.

D.2. Tribal Benefits

Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe? Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety through water quality improvements, new water supplies, increased renewable energy, or economic growth opportunities? Does the proposed project support Reclamation's Tribal trust responsibilities or a Reclamation activity with a Tribe?

Improving the efficiency of the whole system by converting automating the existing flow gates will benefit the local tribes by providing water savings that will help reduce demands on ground water through deficit pumping, thereby improving the conditions in the Basin from which these communities draw their water supply.

Does the proposed project support Tribal led conservation and restoration priorities, and/or incorporate or benefit indigenous traditional knowledge and practices?

No, this project is not applicable to Tribal-led conservation and restoration and will not incorporate indigenous traditional knowledge and practices.

E. Evaluation Criterion E – Complementing On-Farm Irrigation Improvements

USBR funding approval for the proposed project will provide new opportunities for HIC's customers to enhance on-farm water use efficiency. PBI has coordinated with the NRCS Yuba/Sutter Service Center to inform them of the proposed project and seek opportunities for complementing on-farm improvements. The sole use of HIC's water deliveries is for agricultural irrigation, so improvements in water efficiency support the on-farm conservation objectives of NRCS. The NCRS staff provided PBI with the Environmental Quality Incentives Program WaterSMART Initiative (EQIP-WSI) application with the instruction to complete it after receiving WaterSMART funding from USBR. As part of an NRCS focus area in California, the project would be eligible to participate in EQIP-WSI to support water conservation among farmers in the community of Hallwood.

F. Evaluation Criterion F – Readiness to Proceed

The 90% design for this project submitted along with this application. 100% design efforts will begin upon receipt of notice of award.

Identify and provide a summary description of the major tasks necessary to complete the project.

<u>Task 1: Project Administration</u>

Prepare reports detailing work completed during reporting period for inclusion in Quarterly Progress Reports. Monthly invoices will be accompanied with Monthly Progress Reports summarizing services provided by task including any backup documentation.

Milestones/Deliverables*:* Quarterly Progress Reports and Invoices

<u>Task 2: Environmental Permitting</u>

Prepare the appropriate CEQA documentation and file the document(s) with the County Clerk's Office and State Clearinghouse as required. Prepare and submit a Categorical Exemption. Complete the required CEQA documentation. Prepare the appropriate NEPA supporting documentation and provide it to USBR.

Milestones/Deliverables:

- CEQA documentation (Categorical Exemption)
- NEPA supporting documentation (USBR to obtain Categorical Exclusion or Environmental Assessment/Finding of No Significant Impact)

Task 3: Final Design

Develop the 100% design plans and specifications in accordance with requirements for public bidding for construction.

Milestones/Deliverables: 100% design plans and specifications

Task 4: Contract Services

Develop all necessary pre-bid and bid documents to secure a contractor. Award the contract and submit the Notice of Award followed by the Notice to Proceed.

Milestones/Deliverables:

- Proof of bid advertisement & bid documentation
- Notice of Award & Notice to Proceed

Task 5: Construction Administration

Photo-document pre-construction conditions and daily construction activities. Prepare any change orders, address contractor's onsite questions, review/update construction schedule, review contractor submittals and pay requests, and notify contractor if work is not acceptable. Finalize record drawings and submit the as-built drawings.

Milestones/Deliverables:

- Photo-documentation of pre-, during, and post-construction activities included within the appropriate Quarterly Progress Reports
- As-built drawings

Task 6: Construction

Construct project per the final design plans and specifications and as outlined in the awarded contract. Conduct an inspection of the completed project by a licensed professional and submit a Certification of Completion letter from the licensed professional to ensure that the component was constructed per the 100% design plans and specifications. Construction will consist of the following:

1) Mobilization and De-mobilization: Setting up and cleaning up required construction equipment and materials at various locations of work.
2) Site Preparation: The existing headwalls will be prepared for the gate installations. Excavation and erosion control best management practices will be implemented for in preparation for piping and new structure installation.
3) Site Improvements: New structures and piping will be installed at the West Ditch Diversion. After the headwalls are prepared, each flow gate installation will take approximately two days.

Milestones/Deliverables:

- Certification of Completion

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

CEQA and NEPA permitting will be required for the completion of this project. These will be acquired per "Task 2" cited above. Appropriate CEQA documentation will be prepared and filed with the County Clerk's Office and State Clearinghouse as required. Categorical Exemption will be prepared and submitted. Required CEQA documentation will be prepared.

Appropriate NEPA supporting documentation will be prepared and provided to USBR.

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

Design work for the Automation Upgrades will be performed by PBI in collaboration with HIC. PBI will be providing the recommended design of 90% to support this application. 100% plans and specifications will be completed by PBI and are expected to be completed by July 1, 2024.

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

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

Describe the current design status of the project. If additional design work is required prior to construction, describe the planned process and timeline for completing the design work.

The 90% design drawings are being submitted to support this application. The 100% design drawings will be completed by PBI in accordance with any comments received on the 90% design. 100% plans and specifications will be initiated in July 2024, pending notification of the funding award.

Please also include an estimated project schedule that shows that stages and duration of the proposed work, including major tasks, milestones, and dates. Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation regional or area office?

Table 4: Estimated Project Schedule

	2024								2025			
Task	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Task 1 - Project Administration												
Task 2 - Environmental Permitting												
Task 3 - Final Design												
Task 4 - Contract Services												
Task 5 - Construction Administration												
Task 6 - Construction												

PBI has coordinated with the local Reclamation office (Interior Region 10) to discuss the potential environmental and cultural resource compliance requirements on behalf of HIC. In September 2023, PBI met with staff from the local Reclamation office, including environmental and cultural resources specialists. Based on the project details, USBR prepared cost estimates for compliance, which were less than $20,000 to be covered by USBR. PBI's environmental sub-consultant will prepare the biological and cultural surveys and reports necessary for consultation with the US Fish and Wildlife Service and State Historic Preservation Office, as well as provide

draft NEPA documents to assist USBR in the process. PBI's team will also prepare the CEQA documents for California compliance. These costs have been included in the project budget. PBI has coordinated with our local USBR office for their environmental cost. PBI was informed that USBR will cover the cost of resource compliance up to $20,000. A separate line item will be included for the Reclamation's costs and the sub-consultant's costs.

G. Evaluation Criterion G – Collaboration

Is there widespread support for the projects? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?

HIC has led collaborative relationship-building efforts within Yuba County and across the state for years. HIC has participated in Yuba County's transfer pumping program, which has provided much-needed water to drought-stricken farm and ranch lands throughout California. HIC works diligently with federal and state agencies to conserve and protect wildlife and fisheries. This project is the result of robust agency relationships and long-term collaboration between member units (consisting of eight local water districts) and Yuba Water Agency.

What is the significance of the collaboration/support?

HIC shares their diversion from the Yuba River with Cordua Irrigation District and Ramirez Water District. The proposed project will eliminate water loss due to operational inefficiencies of the existing sluice structures. This water provides collaboration opportunities for the beneficial use of this surface water with Cordua Irrigation District and Ramirez Water District. Minimizing water loss and increased water efficiency allows more surface water to be diverted to Cordua Irrigation District and Ramirez Water District.

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

This project will be completed in partnership with Yuba Water Agency. If USBR grant funding is secured, the other half of required funds will come from Yuba Water Agency. The completion of this project will improve the infrastructure and water reliability of the HIC service area. Upon the completion of these improvements, Yuba Water Agency will be able to look to support other irrigation districts in need of improvements.

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

The proposed project will provide economic opportunities in the construction sector, services sector, and agricultural sector. The economic benefit will come as the result of a more cost-effective and reliable delivery of water to the irrigators within HIC's system. This project will also increase water delivery system efficiency by minimizing water loss, benefiting Yuba County residents that also utilize the water within the Yuba River downstream of the diversion point. This project will produce and sustain well-paying jobs in the community for years to come.

Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).

See attached for letters of support.

H. Evaluation Criterion H – Nexus to Reclamation

The Hallwood Side Channel and Floodplain Restoration Project is funded by Yuba Water and the USBR California-Great Basin through the Central Valley Project Improvement Act. This restoration project seeks to improve local fish habitat in the Yuba River and reduce flood risk, and the project area is located directly downstream of HIC's diversion point. The proposed project in this application will reduce water loss adjacent to the Yuba River, which is nearby the Reclamation-funded Hallwood Side Channel and Floodplain Restoration Project.

II. Performance Measures

The proposed project will replace the existing sluice gates with automated flow gates equipped with SCADA software. The damaged headwall at the West Ditch will also be replaced. This will conserve water by preventing or reducing tailwater flows and eliminating the existing leak at the headwall. Project performance will be measured by tracking post-project flows and comparing the data to pre-project flows. Data will be recorded through a full irrigation season to account for seasonal and temporal variations.

III. Budget Narrative

1. Funding Plan

HIC is requesting $442,300 in federal grant funds. The funding provided by the Yuba Water Agency cost share program will be $442,300. The total project cost is $884,600. HIC has received the necessary funding to support the project through 90% design, which will be provided as support documentation for this application. These preliminary costs are not shown in the budget, and are not included as part of the non-federal match.

2. Budget Proposal

Table 5: Summary of Non-Federal and Federal Funding Sources

Funding Source	Amount	Percent of Total Project Cost
Requested USBR Funding	$442,300	50%
Yuba Water Cost Share	$442,300	50%
Total	**$884,600**	**100%**

Table 6. Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$442,300
Costs to be paid by the applicant	$0
Value of third-party contributions	$442,300
TOTAL PROJECT COST	$884,600

Table 7. Budget Proposal

Personnel

Position Title	Time (Hrs or %)	Rate (Hr or Salary)	Total Cost	Rate Basis	Comments (as needed)
Not Applicable for this Project	0	$0	**$0**	N/A	Due to HIC's limited staff, the project will be implemented with the use of consultants and contractors.
			Total	**$0**	

Fringe Benefits

Position Title	Compensation	Quantity	Total Cost	Comments (as needed)
Not Applicable for this Project	0	0.00	**$0**	Due to HIC's limited staff, the project will be implemented with the use of consultants and contractors.
			Total	**$0**	

Travel

Purpose	From/To	# of Days	# of Travelers	Lodging per Traveler	Vehicle per Traveler	Per Diem per Traveler	Cost per Trip	Basis for Estimate
Not Applicable Project	N/A	0	0	$0	$0	$0	**$0**	No travel
						Total	**$0**	

Equipment

Equipment Item	Quantity	Unit Cost	Total Cost	Basis of Cost	Purpose	Rental Comparison
SCADA Software Starter Kit	**1**	$8,500	**$8,500**	Quoted Price From Rubicon	Data collection from flow gates	N/A
			Total	**$8,500**		

Supplies

Supply Item	Quantity	Unit Cost	Total Cost	Basis of Cost	Purpose
Computer	1	**$1,500**	**$1,500**	Average cost of a computer	Data collection and SCADA software use
Software Annual Subscription	9	**$500**	**$4,500**	Quoted Price From Rubicon	Data collection from flow gates
			Total	**$6,000**	

Contractual: Subawards

Subrecipient Name	Description of Activites	Total Cost	Description of budgeted costs	Basis of Cost
Environmental Subconsultant to Peterson Brustad Inc. (PBI)	Provide environmental compliance services to support CEQA and NEPA permitting	**$30,000**		
		Subtotal	**$30,000**	

Recipient-Owned Equipment Use Costs

Equipment Item	Hours	Rate	Total Cost	Basis of Cost	Purpose
Crane Rental and Operations	144	$388	**$55,800**	RS Means Estimate	Movement and install of new Flow Gates
			Subtotal	**$55,800**	

Table 7. Budget Proposal

Construction Materials

Item	Quantity	Unit Cost	Total Cost	Basis of Cost	Comments (as needed)
48" x 48" Automated Flow Gate	5	$38,300	**$191,500**	Quote from Rubicon	Cost includes installation
36" x 36" Automated Flow Gate	1	$32,200	**$32,200**	Quote from Rubicon	Cost includes installation
24" x 24" Automated Flow Gate	2	$24,600	**$49,200**	Quote from Rubicon	Cost includes installation
Automated Overshot Gate 76"	1	$66,000	**$66,000**	Quote from Rubicon	Cost includes installation
Geomembrane Lining with Shotcrete	1	$4,250	**$4,250**	R.S. Means Estimate	
48" Piping Replacement	100	$492	**$49,200**	Received quotes/R.S.	Cost Per Linear Foot - including labor
Shotcrete with Wire Welded Mesh	1	$8,280	**$8,280**	R.S. Means Estimate	Cost is Lump Sum
Custom Bracket for Frame Installation	1	$5,000	**$5,000**	R.S. Means Estimate	
Headwall Replacement for Automated Flow gates	1	$24,500	**$24,500**	R.S. Means Estimate	
Cast in Place Check Structure	1	$16,470	**$16,470**	R.S. Means Estimate	
Pedestal and Conduit	9	$5,000	**$45,000**	Quote	Cost includes installation - pedestal for solar
		Subtotal	**$491,600**		

Contractual

Contractor Name	Description of Services	Total Cost	Description of cost estimate	Basis of Cost
Peterson Brustad Inc.	Engineering consultant design, construction management, grant administration	**$140,000**		Quoted amount based on PBI 2024 rate schedule
TBD (based on public bid)	Construction contractor mobilization/demobilization, worker safety/shoring, implementation of water pollution control plan	**$35,172**		Standard percentage of construction costs
TBD (based on public bid)	Construction contractor labor including excavation, backfill, existing headwall and check structure demolition, existing sluice gate demolition	**$24,300**		R.S. Means
	Subtotal	**$199,472**		

Other Direct Costs

Item Description	Quantity	Unit Cost	Total Cost	Basis of Cost	Purpose
Contingency	15%	$621,372	**$93,206**	90% Design	Contingency applied to construction-related costs and equipment not including PBI services
		Total	**$93,206**		

Indirect Costs

Rate Type	Current Federal NICRA	Base Description	Base Total	Rate	Total Cost
Not Applicable for this project					**$0**
				Total	**$0**

Total Project Costs	**$884,600**

3. Budget Narrative

Salaries and Wages
There are no Salaries and Wages costs associated with this project.

Fringe Benefits
There are no Fringe Benefits or costs associated with this project.

Travel
There are no travel costs associated with this project.

Equipment
This project includes the addition of SCADA software to operate the automated flow gates. HIC will require a SCADA software starter kit. The kit was quoted by Rubicon as a lump sum of $8,500 for the whole project.

Materials and Supplies
This project includes the addition of computing equipment and software required for the Rubicon flow gates to be installed. The computer cost estimate of $1,500 is based on the average cost of a computer with the required specifications.
The operation of the SlipMeter gates requires SCADA software annual subscription quoted at $500 per gate resulting in a total cost of $4,500.

Contractual
An environmental subconsultant to PBI will be contracted to perform environmental permitting services for this project. The subconsultants will prepare CEQA documentation and NEPA supporting documentation as required. The total estimate for the environmental costs was based on a quote received for a previous project. Based on an average hourly rate of $186, the estimated time spent on the project is 161 hours. The estimated cost breakdown by task is shown below:

Task	**Cost**
Categorical Exemption	$19,560
Board of Directors Staff Report	$5,220
Board of Directors Resolution	$5,220
Total	$30,000

PBI will be contracted to provide engineering and administrative services, including final design and construction management services through the duration of the project. The cost estimate is based on costs to perform other similar projects. Based on an average hourly rate of $215, the estimated PBI time spent on the project is 651 hours. The estimated cost breakdown by task is shown below:

Task	Project Budget
Project Administration	$50,000
Final Design	$25,000
Contract Services	$15,000
Construction Administration	$50,000
Total	$140,000

Construction

Construction costs include mobilization/demobilization, worker protection and safety, equipment rental and operations, existing liner demolition, and cost and installation of the inlet and outlet structures. These will be purchased by the construction contractor and installed at the specified project locations. Costs for construction are based on received quotes and RS Means data.

Item Description	Unit Cost	Qty	Unit	Subtotal
Mobilization/Demobilization	$29,310	1	LS	$29,310
Worker Protection and Safety/Shoring	$2,931	1	LS	$2,931
Implementation of Water Pollution Control Plan	$2,931	1	LS	$2,931
Headwall Demolition	$9,500	1	LS	$9,500
Headwall Replacement for Automated Flow Gates	$24,500	1	EA	$24,500
Cast in Place Check Structure Replacement for Automated Overshot Gate	$16,470	1	EA	$16,470
Geomembrane Lining with Shotcrete	$4,250	1	LS	$4,250
48” Piping Replacement	$492	100	LF	$49,200
Shotcrete with Wire Welded Mesh	$8,280	1	LS	$8,280
Excavation	$1,700	1	LS	$1,700
Backfill (Aggregate)	$1,700	1	LS	$1,700
Backfill (Sand)	$400	1	LS	$400
Crane Rental and Operations	$388	144	HOURS	$55,800
Existing Sluice Gate Demolition	$787.5	8	EA	$6,300
Custom Bracket for Frame Installation	$5,000	1	EA	$5,000
Automated Flow Gate 48” x 48”	$38,300	5	EA	$191,500
Automated Flow Gate 36” x 36”	$32,200	1	EA	$32,200
Automated Flow Gate 24” x 24”	$24,600	2	EA	$49,200
Automated Overshot Gate 76”	$66,000	1	EA	$66,000
Pedestal and Conduit	$5,000	9	EA	$45,000
Total				**$612,872**

Other Direct Costs
The proposed project is currently at 90% design and is subject to 15% contingency. The contingency is applied to construction and material-related costs. The total cost for contingency is $93,206. The total cost of the project, including the 15% contingency, is estimated to be $884,600.

Indirect Cost
There are no indirect costs associated with this project.

IV. Environmental and Cultural Resources Compliance

• 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 proposed project will not have any significant impact to the surrounding environment. The diversions are downstream of the fish screen in an existing concrete structure, so it is not a habitat area. The active construction period will be short-term (not to exceed two months) and potential temporary impacts will be managed with environmental controls. The work will be conducted during the irrigation system outage when the water levels are low, and pollution control BMPs will be implemented to prevent any water quality impacts. Once constructed, the Proposed Project would not likely have any adverse long-term or operational impacts. In fact, the Proposed Project would result in approximately 2,700 ac-ft/yr of water savings which would be considered a Beneficial Environmental Impact.

• 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?

Based on State and Federal biological database searches (summary provided below), there were no critical habitats identified within the project area. Additionally, there were no known locations of Federal threatened or endangered species within the project area. The project construction activities will take place along an existing irrigation ditch that is regularly maintained, so there will not be any habitat impacts associated with the proposed project.

Table H 1
List of Federally Listed Special Status Species with Potential to Occur in the Project Area

Name	Status	Designated Critical Habitat in Project Area?	Potential to Occur	Recommendations
Birds				
Yellow-billed Cukoo *(Coccyzus americanus)*	Threatened	There is Final Habitat for this species, but Does Not Overlap with Project Study Area.	Low to Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Reptiles				
Giant Garter Snake *(Thamnophis gigas)*	Threatened	No Critical habitat has been designated for this Species.	Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Insects				
Monarch Butterfly *(Danaus plexippus)*	Candidate	No Critical habitat has been designated for this Species.	Low to Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Valley Elderberry Longhorn Beetle	Threatened	There is Final Critical Habitat for	Low to Moderate	Conduct Biological Assessment and/or

Table H 1 List of Federally Listed Special Status Species with Potential to Occur in the Project Area				
Name	**Status**	**Designated Critical Habitat in Project Area?**	**Potential to Occur**	**Recommendations**
(Desmocerus californicus dimorphus)		this species, but Does Not Overlap with Project Study Area.		Pre-construction Site Surveys
Crustaceans				
Conservancy Fairy Shrimp *(Branchinecta conservation)*	Endangered	There is Final Critical Habitat for this species, but Does Not Overlap with Project Study Area.	Low to Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Vernal Pool Fairy Shrimp *(Branchinecta lynchi)*	Threatened	There is Final Critical Habitat for this species, but Does Not Overlap with Project Study Area.	Low to Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Vernal Pool Tadpole Shrimp *(Lepidurus packardi)*	Endangered	There is Final Critical Habitat for this species, but Does Not Overlap with Project Study Area.	Low to Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Flowering Plants				
Hartweg's Golden Sunburst *(Pseudobahia bahiifolia)*	Endangered	There is Final Critical Habitat for this species, but Does Not Overlap with Project Study Area.	Low to Moderate	Conduct Biological Assessment and/or Pre-construction Site Surveys
Notes: 1) There are no known critical habitats with the Project Area.				

•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.

There are no known wetlands or other surface waters inside the project boundaries that potentially fall under the Clean Water Act (CWA) jurisdiction as "Waters of the United States" and therefore would not have any impacts on these resources.

• *When was the water delivery system constructed?*

HIC was incorporated in 1910. As part of this Application, SMB performed a cultural resources database search of the North Central Information Center's archive for previously recorded cultural resources in the vicinity of the Proposed Project area(s). Based on this research, it appears that some of the diches may have been constructed as far back as the late 1860's with numerous and continuous reconstruction and repairs throughout the years. However, most, if not all, of the

original ditch system has been modified and sometimes covered or entirely replaced by later reconstruction. Based on the numerous modifications throughout the years, it is unlikely that any of these facilities would be eligible for the National Register of Historical Places (NRHP). Specifically, one (1) prehistoric isolated resource and ten (10) built environment resources have been previously recorded within and within 1/4 mile of the project areas. However, none of these resources would likely be affected by the Proposed Project and are and have been considered not eligible for the NRHP or the California Register of Historical Places. Further, the Proposed Project alignments area is on Holocene flood plains, basin floors, and stream terraces associated with the movement of the Yuba River at the eastern side of the project area locations and Jack Slough near the western side of the project area locations (USDA 2022). In the early historic era, the Region was mainly marshy wetlands associated with slow-moving waterways, sometimes bordered by sparse oak groves. Therefore, the Proposed Project and surrounding area appears to have a low sensitivity to adversely affect prehistoric resources, built environmental resources, historic resources, and/or Native American archaeological and cultural resources.

• *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 Proposed Project will not likely result in any modifications of or effects to individual features of an irrigation system or a system of importance as known by the NRHP.

• *Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?*

There are no known buildings, structures, or features that would likely be affected by the Project area that is eligible for listing on the NRHP.

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

There are no known archeological sites that would likely be affected by the Proposed Project. Reclamation would be required to reach out to known Native American Tribes in and around the Project Area to confirm that and complete and satisfy Section 106 process. Similarly, HIC/YWA will need to follow a similar process under California's Assembly Bill 52 (AB52) process to complete the State's AB52 requirements.

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

The Proposed Project will not have a disproportionately high and adverse effect on 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?*

The Proposed Project would not limit access to and ceremonial use of any known Indian sacred sites or result in other impacts on known tribal lands.

• *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 Proposed Project would not likely contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

V. Required Permits or Approvals

Based on a preliminary environmental review, it is expected that this project will be eligible for a Categorical Exclusion and Exemption through NEPA and CEQA, respectively. CEQA documentation will be processed through Yuba Water based on class 1 (existing facilities), 2 (replacement or reconstruction), and 4 (minor alterations to land) exemptions. The timeframe for this process is expected to be completed during the Pre-Award Phase (July 2024 – September 2024). No other permits or approvals are required.

VI. Overlap Duplication of Effort Statement

The Flow Control Automation Upgrades Project is part of the HIC System Renovation Plan. This project was identified as the 1st and 2nd highest priority out of the 12 improvement projects recommended. HIC intends to submit a separate application for the Water SMART grant program under a different funding group for a related project including larger scope. This submission will take place on February 22, 2024. This additional application includes the 1st and 2nd priority projects as well as the Flow Control Automation Upgrades Pipeline project proposed in this application. The WEEG awards are expected to be announced by July 2024. If the Flow Control Automation Upgrades Project is selected for WEEG funding under both applications, HIC will notify the WEEG coordinator immediately to decline this application.

VII. Conflict of Interest Disclosure Statement

As of the date of the submission of this application, HIC is unaware of any actual or potential conflicts of interest that exist with respect to Federal financial assistance agreements.

VIII. Uniform Audit Reporting Statement

Not applicable for this project.

IX. Certification Regarding Lobbying

See attached form.

X. Disclosure of Lobbying Activities

Not applicable for this project.

XI. Letters of Support

A letter of support is included as an attachment.

XII. Letters of Partnership

Not applicable (only for Category B applicants).

XIII. Official Resolution

The executed agreement between YWA and HIC (signed by HIC's Board President) is included as an attachment. If selected, HIC will provide an official resolution from the Board of Directors.

XIV. Letters of Funding Commitment

The executed funding commitment agreement between YWA and HIC is attached.

530.741.5000
info@yubawater.org
yubawater.org

YUBA WATER AGENCY

February 22, 2024

Subject: United States Bureau of Reclamation Funding Opportunity No. R24AS00052
WaterSMART Water and Energy Efficiency Grants
Hallwood Irrigation Company – Flow Control Automation Upgrades

To Whom It May Concern:

I am pleased to provide this letter of support for Hallwood Irrigation Company (HIC) in their application for Funding Opportunity No. R24AS00052 WaterSMART Water and Energy Efficiency Grants. This project will replace HIC's existing manual sluice gates and check structure with eight new automated underflow gates and one new automated overshot gate. Replacement and installation of these gates will improve efficiency and conservation through accurate flow measurement and solar-powered gate operations that will be remotely monitored and controlled via SCADA. By increasing the efficiency of HIC's ditch diversions, the project improves water supply management of the Yuba River and North Yuba Subbasin.

Thank you for accepting this letter of support for the grant consideration.

Sincerely,

Kyle Morgado, PE
Water Resources Manager
Yuba Water Agency