

# Fremont-Madison Irrigation District SCADA and Automation Project

Small Scale Water Efficiency WaterSMART Grant Proposal 2019  
Funding Opportunity Number: BOR-DO-19-F005



Teton River Splitter Structure

## APPLICANT:

Fremont-Madison Irrigation District  
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## PROJECT MANAGER:

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# Fremont-Madison Irrigation District SCADA and Automation Project

## Small-Scale Water Efficiency Projects FY 2019

### 1. Executive Summary

#### Applicant Info

**Date:** April 24, 2019

**Applicant Name:** Fremont-Madison Irrigation District

**City, County, State:** Saint Anthony, Fremont, Idaho

**Project Manager:**

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**Project Funding Request:** Small Scale Water Efficiency Projects- Total Cost \$83,348.04. Fremont-Madison Irrigation District is requesting 50% funding from Reclamation or \$41,674.02

#### Project Summary

*A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of this FOA*

Fremont-Madison Irrigation District proposes to install remote operating equipment on 3 main control structures, flow measurement\telemetry equipment for 6 additional locations and a SCADA (Supervisory Control and Data Acquisition) computer system in our office for data collections and analysis. The project will help manage water more efficiently and promote conservation among water users within our service area. This project will also be the first concrete step toward implementing an alternative in the 2015 Henry's Fork Basin Study which was coordinated and completed with the help of several partners including the Bureau of Reclamation (Reclamation). In the study, canal automation/remote operations was identified as one of the most economical means of conserving water in the Henry's Fork.

#### Schedule

*The length of time and estimated completion date for the proposed project*

The desired start date for the project is October 2019, however this will depend on whether grant funds are obtained. The desired project completion is July of 2020. This will give us the opportunity to use the equipment for part of the 2020 irrigation season.

#### Federal Facility

*Whether or not the project is located on a Federal Facility*

In 1935, the Unites States Congress authorized Island Park and Grassy Lake Reservoirs and the

Crosscut canal which was a U.S. Bureau of Reclamation (Reclamation) project. FMID was also established in 1935 in order to contract with Reclamation. In 1996 the operation and maintenance responsibilities for Island Park Reservoir and Grassy Lake Reservoir were transferred to FMID. In 2003, Reclamation completed title transfer of the Crosscut Canal to FMID through the Fremont-Madison Conveyance Act. One of the structures to receive remote operations equipment is on the Crosscut Canal. Henry's Lake Dam and the Teton River Splitter are not federal facilities.

## 2. Background Data

### Project Location

All proposed replacement of existing infrastructure and installation of new monitoring and computer equipment will occur in the Henry's Fork watershed, within Fremont County, Idaho (Figure 1). Henry's Lake Dam is located at 44°36'N 111°21'W about 15 miles north of the town of Island Park. The head of the Crosscut Canal is located at 44°01'N 111°35'W, about 7 miles southwest of the town of Ashton. The Teton splitter is located at 45°34'N 111°40'W, about 5 miles south of the town of St. Anthony. Computer equipment and software will be housed in FMID's office in St. Anthony. The 6 locations for additional flow measurement equipment and telemetry are described in table 1 below.

Table 1. Locations of flow measurement/telemetry stations

Location Name	Latitude	Longitude	Project Type	County
North Fork Teton River	43°53'39.11"N	111°41'33.23"W	flow/telemetry	Fremont
End of North Fork	43°53'56.37"N	111°50'9.08"W	flow/telemetry	Fremont
Mill Race Return	43°53'26.95"N	111°41'11.02"W	flow/telemetry	Fremont
Teton Island Fdr Split-TI	43°53'6.08"N	111°43'40.25"W	flow/telemetry	Fremont
Teton Island Fdr Split-SI	43°53'6.17"N	111°43'40.81"W	flow/telemetry	Fremont
North Branch FRC	43°59'3.45"N	111°36'19.76"W	flow/telemetry	Fremont

### Water Supply

*Describe the source of water supply, the water rights involved, current water uses (i.e., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in water supply. If water is primarily used for irrigation, describe major crops and total acres served.*

### Current water uses and number of water users served

FMID serves nearly 1,900 space holders and water users, including individuals and canal companies. These water users are located in Fremont, Madison and Teton Counties. This proposed project will result in more water kept in the reservoir and therefore benefits all water uses within FMID.

### Source of water supply and water rights involved

Located in the headwaters of the upper Snake River basin in eastern Idaho and western Wyoming (Figure 1), the 3,200 square-mile watershed of the Henry's Fork Snake River is a major source of water for irrigated agriculture both locally and regionally. The water resources and uses of the

watershed are thoroughly described in the Henry's Fork Basin Study and supporting technical documents, completed in 2015 by USBR and the Idaho Water Resource Board. The background data presented here is a brief summary of the information already published in the Basin Study.

The Henry's Fork watershed contains three major sub-watersheds, those of the Upper Henry's Fork, Fall River and Teton River, in addition to a large area of the Snake River Plain that has few surface water features. Mean annual basin yield is 2.54 million ac-ft: 1.23 million ac-ft from the upper Henry's Fork, 700,000 ac-ft from Fall River, and 610,000 ac-ft from the Teton River. About 1.1 million ac-ft per year is diverted from the surface water system for irrigated agriculture, although total diversion has been declining steadily at about 7,500 ac-ft per year since the late 1970s due to increased irrigation efficiency. Of the 1.1 million ac-ft withdrawn annually for irrigation, about 256,000 ac-ft is consumptively used by crops, 12,000 ac-ft is lost to evaporation, and the remainder returns to the surface system or regional aquifer within the upper Snake River Basin. About 1.66 million ac-ft leaves the Henry's Fork watershed as surface flow, and 600,000 ac-ft recharges the Eastern Snake Plain Aquifer, which discharges to the Snake River downstream of the Henry's Fork watershed. About 180,000 ac-ft of groundwater is withdrawn for irrigation in the watershed, and only about 18,000 ac-ft, almost all groundwater, is withdrawn for all non-irrigation uses. In addition to providing water for agriculture across the entire upper Snake River Basin, the rivers, reservoirs, lakes and streams of the Henry's Fork watershed support world- recreational trout fisheries that are economically important to local communities.

FMID holds the right to just over 150,000-acre feet of storage water in Island Park and Grassy Lake Reservoirs. The natural flow water rights are held by the FMID member canal companies and total over 4,000 cfs.

### Current and projected water demand/ Potential shortfalls in water supply

Over 450,000 acres in the Henry's Fork watershed are listed as places of use for irrigation water rights, of which 250,000 acres are irrigated by surface water year to year. Major crops, in descending order of acreage, are barley, alfalfa, potatoes, and wheat. In 2010, these four crops accounted for 232,000 acres, the vast majority of which was irrigated. A small amount of grain is grown without irrigation, and some pasturelands are irrigated, especially in the higher-elevation areas of the watershed. Theoretical crop evapotranspiration on the 250,000 surface-irrigated acres is around 440,000 ac-ft, of which 310,000 ac-ft is met by a combination of irrigation and growing-season precipitation, leaving a shortfall of 130,000 ac-ft. This shortfall is generally accommodated by fallowing and partial-season irrigation of pasture and alfalfa.

Reclamation has been an important partner in collaborative water management with FMID and other stakeholders in the Henry's Fork Watershed. All of that collaborative management has originated through the Henry's Fork Watershed Council, a grassroots, consensus-based watershed organization founded in 1993 and co-facilitated by FMID and the Henry's Fork Foundation (HFF). HFF represents the fisheries conservation interests of its 2,600 members, including numerous fly-fishing guides and outfitters who make their living on the Henry's Fork and its tributaries. Reclamation has been an active and regular participant in the Watershed Council since its inception, frequently presenting water-supply updates and other information at Council meetings. In 2003, after years of deliberation by the Council, a Congressional Act transferred ownership of the Crosscut Canal, along with some groundwater wells and permits, from Reclamation to FMID. That Act also required development of a Drought Management Plan (DMP) to provide a framework for

collaborative management of Island Park Dam among water users, agencies and fisheries conservation groups. The DMP was completed in 2005 and signed by FMID, NFRC, Reclamation, HFF, Trout Unlimited, and The Nature Conservancy. These six entities form the core of the DMP Committee, which meets four times each year to set general operational strategies for managing the reservoir to benefit fisheries as much as possible under the legal system that governs storage and delivery of irrigation water. Because the entire upper Snake River Basin is administered under a single, common system of water rights, the DMP Committee seeks to optimize integrated operation of Henry's Lake, Island Park Reservoir, and Grassy Lake to benefit local water users and resources, within the larger upper Snake River Basin system. Reclamation's participation in the DMP Committee is critical to bringing the system-wide perspective to DMP process.

Both the DMP and the charter of the Watershed Council encourage scientific research to inform system management. Much of that research has shown that trout fisheries in the Henry's Fork benefit from keeping as much physical water in Island Park Reservoir year-round. Additional research has led to development detailed and fine-scale hydrologic models that have allowed more precise operation of the Henry's Fork irrigation system to reduce the amount of physical water delivered from the reservoir system and minimize the risk of delivering excess storage water to Teton Island Feeder during the middle of irrigation season. Minimizing the amount of both physical and administrative storage water delivered from the reservoir system benefits both water users and the fishery. Furthermore, as administrative procedures and infrastructure improve, storage water saved during irrigation season could be used for managed aquifer recharge in the future. Precision system operation increased carryover in Island Park Reservoir by about 17% in 2018, but further gains are limited by current irrigation infrastructure and the time and resources necessary to operate it.

## Water Delivery System

*Describe the applicant's water delivery system as appropriate. For agricultural systems, please include the types and appropriate lengths canals and laterals, the number irrigation turnouts and other existing irrigation improvements. For municipal systems, please include the length of distribution lines, number and size of storage tanks, number of pump stations and capacities, and number of connections and/or number of water users served and any other relevant information describing the system.*

FMID is responsible for delivering storage water from the reservoirs to irrigation diversions on the rivers. Therefore, the delivery system is essentially the Henrys Fork River, Fall River and Teton Rivers. In addition to the unlined 7-mile-long Crosscut Canal which is required to deliver storage water from the Henrys Fork to the Teton River (Figure 1). There are approximately 35 canal companies and 140 total river diversions that FMID delivers water to. From the river the FMID water is delivered to the individual space-holders through nearly 450 miles of unlined canals and another 50 miles of pipeline. However, FMID is not responsible for the operation and maintenance of these conveyance systems.

## Connections

There are approximately 140 river diversion that deliver water to nearly 1900 water users.

## Relationship with Reclamation

*Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the project(s).*

FMID collaborates with Reclamation on several ongoing and completed projects.

Henry's Fork Basin Study 2015: This study identified several alternative for water conservation on the Henry's Fork of the Snake River. One of the most economical alternatives was canal remote operation/automation.

Drought Management Plan Update 2018: This plan sets forth the results of the Henry's Fork of the Snake River drought management planning process that was set into motion by the Fremont-Madison Conveyance Act (Public Law No. 108-85).

Water Conservation Plan Update 2009: This plan identifies the lower Teton River below the Crosscut canal as an area of concern that needs additional flow measurement to more accurately account for daily water diversion.

Fremont-Madison Conveyance Act (Public Law No. 108-85) 2003: Reclamation completed title transfer of the Crosscut Canal and 5 groundwater wells to FMID.

Teton Canyon Recreation Charter 2019: FMID is a participating member of the charter developed to improve recreation opportunities at the Teton Dam site and in the Teton Canyon. Reclamation leads this effort.

Operation and Maintenance of Island Park and Grassy Lake Reservoirs (Ongoing): FMID is responsible for operation and maintenance of these two reservoirs with oversight from Reclamation.

## 3. Technical Project Description

As described in the background information, the overarching goal of FMID and its partners on the DMP Committee is to meet irrigation demand throughout the watershed while minimizing both physical delivery of storage water and the amount of water diverted that is charged to FMID and its spaceholders as administrative storage. Accomplishing this goal involves a sequence of manual adjustments that require time and travel on the part of the irrigation-company and FMID employees, all of whom have numerous other responsibilities ranging from farming to operation of irrigation infrastructure on other canals.

At the top of the system, adjustments at Henry's Lake require two hours of round-trip driving, plus another hour or two to wait for manual adjustments of the headgate to be recorded at the USGS gaging station downstream and ensure that the desired outflow is achieved. Changes in flow releases at Henry's Lake require one day to be realized in Island Park Reservoir. Changes there can be made on short notice by a dam tender who is always in close proximity to the dam,

but another 16-20 hours are required for adjustments at Island Park to reach the head of the Crosscut Canal. Adjustments at the Crosscut require an FMID employee to drive about 15 minutes one-way, half of that time on a rough dirt access road. Another 10 hours is required for flow adjustments there to reach the Teton splitter. Adjustments at the splitter require more dirt-road driving, and more time must elapse before it is certain that irrigation needs are met without delivering excess water into either of the forks. In reality, the process actually works in reverse—changes in demand at the bottom of the system propagate back up through the system as additional required adjustments, even though the water moves downstream. Optimally, the canal companies report changes in demand to FMID a day or two ahead of time, so that outflow from Island Park Reservoir can be adjusted in time for the change in flow to be realized in the lower Teton River when water users there will either increase or decrease diversion. When adjustments through the whole system cannot be coordinated or made in a timely manner due to human resource constraints, either excess water is delivered from the reservoir system, or users at the bottom of the system run short of water. Because of water travel times, misalignment between delivery and need usually occurs over periods of 12-36 hours.

We propose to install remotely controlled headgates on Henry’s Lake Dam, the Crosscut Canal, and the Teton Splitter. We will also install flow measuring devices at these locations that will respond to flow changes in real time. The computer and software required to operate the headgates and observe flow changes will be located in the FMID’s office, allowing FMID staff to make flow changes of precise magnitudes and precise times. These can be coordinated with releases at Island Park Dam, minimizing the frequency and duration of periods when delivery and demand on the lower Teton River do not align. Based on operations in 2018, we estimate that the project will allow a reduction of about 3,000 ac-ft per year in storage water delivered to the North Fork Teton that is not needed by users on Teton Island Feeder. At \$6 per ac-ft for FMID storage, this is a savings of \$18,000 in storage assessments. During years when FMID users must rent storage water, the savings can be as much as \$17 per ac-ft, or \$51,000 total. We also estimate that smoothing fluctuations in delivery to the South Fork Teton can reduce physical storage delivery by about 8,000 ac-ft per year. Some of the 3,000 ac-ft of savings at Teton Island Feeder would be included in the 8,000 ac-ft per year on the South Fork, but in total, we estimate a total reduction in Island Park storage delivery of around 9,000 ac-ft per year. In 2018, this would have increased reservoir carryover from the 17% attained with the existing infrastructure to around 31%.

We also propose to install 6 additional flow measurement stations, two on the lower Teton River and the remaining 4 locations at key areas that will help us better account for daily water need and diversion along the Crosscut Canal and lower Teton River.

## 4. Evaluation Criteria

### **Evaluation Criterion A—Project Benefits (35 points)**

*Describe the expected benefits and outcomes of implementing the proposed project.*

*What are the benefits to the applicant's water supply delivery system?*

The proposed project will provide many benefits to FMID’s system including:

- Better management of the water system. For example –The water-masters responsible for making flow adjustments at all three locations proposed for

remote control are full-time farmers and part-time water managers. If a change is needed at the Teton Splitter in the morning the water-master may not be available until evening. Additionally, the gates are currently operated with a portable gas engine. This engine requires two men to carry it out on to the deck to adjust the gates. They make the initial change in gate height based on past experience but have to wait several hours to know the actual change in flow because flows are not measured until several miles downstream. More often than not the adjustments they make are not quite right. By the time we realize another adjustment is needed another day has gone by. This inability to manage the water in real time results in significant inefficiencies in water use.

- Real time flow data and remote operation of the gates will allow FMID to make precise management decisions from the office where we have full-time dedicated staff. For example, instead of making an adjustment at the Teton Splitter and waiting 2-4 hours before that flow is measured down river, we can make the adjustment, check the real time flow data and make an additional adjustment if needed in a matter of minutes without water losses.
- For the Henry's Lake outlet gates, we currently make an adjustment in flow one day, check the flow later that day once it has reached the measurement point. Then depending on the results, often a second 120-mile round trip is required the following day to fine tune the adjustment. This project will make it so we can make adjustments to the flow from the office.
- When additional storage water is needed from Island Park Reservoir for the Teton River, we can make the release from the reservoir and time the increase in the Crosscut Canal 20 hours later, resulting in minimal water lost or water shortage on the Henry's Fork.
- Time savings, vehicle wear, and a reduction in our carbon foot print. The three proposed sites for remote control are not close nor do they have easy access. The Teton Splitter and the head-gate for the Crosscut Canal are located on rough dirt roads that require slow travel. The Henry's Lake outlet is 60 miles from our office in Saint Anthony and even further from the water manager responsible for making the adjustments.
- Real time data will aid in future modeling and precision management efforts. As described previously, with the help of the HFF we have undertaken a significant modeling effort. This will help us develop better daily, weekly and irrigation season plans resulting in better water management.

*If other benefits are expected explain those as well. Consider the following:*

*Extent to which the proposed project improves overall water supply reliability*

Real time flow data and remote operation of the water control structures will help us get to the next level in water conservation. This will result in more water in the reservoirs that can be stored for future drought years.

*The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin)*

The proposed project will specifically benefit the Henry's Fork Basin. It will also benefit the entire Upper Snake System. This project will allow us to keep more water in Island Park Reservoir, making it easier to fill each winter. Once Island Park Reservoir is full, the excess water spills into American Falls Reservoir and fills it. Therefore this project benefits the entire Upper Snake System.

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

This project will allow for the sharing of water use data between FMID, the canal companies, Reclamation, HFF, USGS and Water District 01. It will provide information that has not been available in the past, increasing collaboration opportunities and the precision of water management. One of our ongoing conflicts is water measurement on the lower Teton River. This was identified as our biggest issue during a water users survey completed as a part of our Water Conservation Plan. This additional data and management ability will enable a collaborative effort that has the potential to help resolve the most significant water conflict in the FMID service area.

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

The project will increase the water reliability for an irrigated ag economy that averages over \$300,000 million in crop sales per year in Fremont, Madison and Teton counties according to the 2010 census of agriculture.

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

This project complements many of the on-farm projects the NRCS is currently working on in our area.

## **Evaluation Criterion B—Planning Efforts Supporting the Project (35points)**

*Describe how your project is supported by an existing planning effort.*

*Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?*

Yes, this project will address several needs that have been identified in existing planning

efforts. Canal automation was identified as one of the most economical alternatives for conserving water within FMID in the 2015 Henry's Fork Basin Study.

Additionally, in the FMID Water Conservation Plan completed with the assistance of Reclamation, one of the issues identified was our ability to measure water and know how much water is being diverted daily. The plan specifically identifies the lower Teton River as the most significant area of concern. This was also identified as the biggest water issue by water users within FMID. Often times there are substantial adjustments in the water accounting at the end of the year because of our inability to accurately measure water on a regular basis. With the installation of additional flow measurement equipment this project will help us address this issue.

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

Through the planning efforts of FMID and the DMP Committee this project has been identified as the most economical way of conserving water. The 2015 Henry's Fork Basin Study also identified canal automation as one of the most economical ways of conserving water in our basin.

In our efforts to continue to implement a science-based approach this project is a necessary next step to achieve additional water conservation.

**Evaluation Criterion C—Project Implementation (10 points)**

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

The schedule provided below outlines timing of the major tasks and milestones for the proposed project. Before any work can begin on the project, an environmental document will be prepared in collaboration with Reclamation's Upper Snake Field Office. Once this is complete construction can begin. Ideally if the WaterSMART grant is awarded and environmental work is completed the construction phase of the project will begin in November of 2019 and be complete by July 1<sup>st</sup>, 2020. This is a shovel ready project. We are only waiting for funding.

FMID SCADA and Automation Project	2018				2019											
	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Award of WaterSMART grant																
Develop and sign WaterSMART contract																
Environmental evaluation																
Installation of centralized data collection equipment																
Installation of remote operating equipment																
Installation of flow measuring equipment																

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

FMID will consult with Idaho Department of Water Resources and US Army Corps of Engineers regarding permitting for the installation of water-level sensors for the rated section below Henry's Lake Dam and the Teton Splitter. Past experience has been that FMID's partner HFF has been able to install instruments in a manner that meet IDWR/US COE de-minimis requirements. The proposed project will not require any other permitting because the other work will be confined to modifications of existing structures.

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

The design work necessary for the installation of the equipment is included in the proposals relied upon for budget calculation. Engineering, flow studies and rating of sections will be needed to fine tune the flow measurement stations. HFF has agreed to complete this work as an in-kind donation to the project.

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

The proposed project will enhance the ability to manage water under current policies and administrative mechanisms, without requiring new policies or changes in administration.

*Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation office?*

Yes, the Boise and Heyburn Reclamation offices reviewed the potential needs for environmental compliance. They estimated the cost for NEPA at \$500 dollars and cultural at \$5,000 for a total of \$5,500.

### **Evaluation Criterion D— Nexus to Reclamation (10 points)**

*Is the proposed project connected to a Reclamation project or activity? If so, how?*

The proposed project will be performed within FMID, which is a part of Reclamation's Minidoka Project. It will therefore benefit FMID and Reclamation through better management of water resources and reduce overall demand.

*Does the applicant receive Reclamation project water?*

Yes, FMID and FMID member canal companies receive all the storage water in Island Park and Grassy Lake Reservoirs.

*Is the project on Reclamation project lands or involving Reclamation facilities?*

The project will be located on lands that are a part of the Minidoka Project, serving land irrigated with water from Island Park and Grassy Lake Reservoirs. The project will not be installed on Reclamation facilities but will impact the overall operations of Island Park and Grassy Lake Reservoirs.

*Is the project in the same basin as a Reclamation project or activity?*

Yes, the project is located in the Henry's Fork Basin which includes Island Park and Grassy Lake Reservoirs that are a part of Reclamation's Minidoka Project.

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

Yes, the proposed project will better manage water resources within the Henry's Fork Basin by providing better water management ability and better water use data to FMID. This project is expected to conserve water allowing us to keep it in the reservoirs thereby reducing impacts of potential subsequent drought years.

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

As a part of the Nez Perce Water Rights Settlement Agreement of 2005, the Upper Snake River water users provide flow augmentation water down river for fish habitat. The amount of flow augmentation water available from the Upper Snake River system is significantly dependent upon reservoir levels. This project will help keep more water in the reservoir and therefore more water may be available in any given year for flow augmentation down river.

### ***Evaluation Criterion E— Department of the Interior Priorities (10 points)***

- 1. Creating a conservation stewardship legacy second only to Teddy Roosevelt*

The proposed project will utilize the latest technology in remote operation controls and data collection. This data collection will allow us to more accurately model water use trends during the irrigation season. This data along with the remote operation equipment will allow us to develop better plans and react quickly to changes. This project is really the 1<sup>st</sup> phase in what will likely be a domino effect in canal remote operation and automation in the Henry's Fork Basin. This is the first remote operation & data collection project in the area but establishes a framework for FMID to work with other canal companies within our service area to implement these technologies.
- 2. Utilizing our natural resources*

The proposed project will conserve water benefiting agriculture and fisheries. The project will also reduce vehicle travel by thousands of miles each year reducing our reliance on fossil fuels.
- 3. Restoring trust with local communities*

The data this project will allow us to collect will go a long way in restoring trust. Specifically, on the Teton River the daily water accounting has not been accurate resulting in wide swings between daily reports and final irrigation season reports on water use. These wide swings in data have harmed our relationships with the canal companies FMID delivers water to. The additional flow measurement equipment this project will

allow us to install will provide accurate flow measurements for our daily water account which will help restore trust in our communities. This project will also specifically strengthen FMID's relationships with the Henry's Fork Foundation, a local non-profit organization.

4. *Striking a regulatory balance*

The proposed project will reduce the amount of storage water needed in the Teton River which will also limit the need for FMID to curtail deliveries to Teton River canals. Ultimately, the result of the project will be less regulatory influence creating a more positive balance.

5. *Modernizing our infrastructure*

The proposed project will modernize FMID's existing infrastructure by implementing the latest technology in remote operation and data collection.

## 5. Environmental and Cultural Resources Compliance

1. *Will the 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 will not impact the surrounding environment. There will be very little if any ground disturbance. No animal habitat will be negatively impacted.

2. *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?*

No endangered species will be negatively impacted.

3. *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 project may have.*

There are wetlands in FMID's boundaries, however, this project will not affect wetland areas.

4. *When was the water delivery system constructed?*

Henry's Lake Dam was constructed in 1922. Island Park and Grassy Lake Dams were constructed between 1937 and 1939, as was the Crosscut Canal. The Teton Splitter was constructed after the Teton Dam failure in 1976-1977.

5. *Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., head gates, 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 not change or modify any structures. The project will simply retrofit the structures with remote operation technology including electric motors etc.

6. *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.*

No

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

No, there are no known archeological sites.

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

No.

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

No.

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

No.

## 6. Required Permits and Approvals

FMID will consult with Idaho Department of Water Resources and US Army Corps of Engineers regarding permitting for the installation of water-level sensors for the rated section below Henry's Lake Dam and the Teton Splitter. Past experience has been that FMID's partner the Henry's Fork Foundation has been able to install instruments in a manner that meet IDWR/US COE de-minimis requirements. The proposed project will not require any other permitting because the other work will be confined to modifications of existing structures.

## 7. Official Resolution

An official resolution is attached as appendix D.

## 8. Project Budget

### Funding Plan and Letters of Commitment

*1. How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).*

FMID or its partners will fund all non-Federal contributions entirely with operating revenues. FMID officially committed to fund the non-federal share of the project in the official resolution (See appendix D). The Henry's Fork Foundation committed to fund a share of the project in their letter of support (See appendix E).

*2. Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:*

N/A

3. Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards the cost share unless otherwise allowed by statute.  
N/A

Describe any pending funding requests that have not yet been approved and explain how the project will be affected if such funding is denied.

There are no other pending funding requests.

Table 2.-Total Project Cost Table

Source	Amount	% of Total Projects Cost
Cost to be reimbursed with the requested Reclamation funding	\$41,674.02	50%
Cost to be paid by FMID	\$30,569.02	37%
Value of Third-Party Contributions- In-kind contribution Henrys Fork Foundation	\$2,798.00	3%
Value of Third-Party Contributions-monetary contribution Henrys Fork Foundation	\$8,307.00	10%
Total Project Cost	\$83,348.04	100%

As described in table 2, the total cost of the project is \$83,348.04. FMID is requesting \$41,674.02 in WaterSMART grant funds. The remainder of the project will be paid for through in-kind and monetary contributions from the Henrys Fork Foundation and FMID.

Table 3.-Budget Proposal

Budget Item Description	COMPUTATION		Quantity Type	Total Cost
	\$/Unit	Quantity		
<b>Salaries and Wages</b>				
none	\$0.00	0	Hours	\$0.00
<b>Fringe Benefits</b>				
none	\$0.00	0	Hours	\$0.00
<b>Contractual</b>				
<b>Teton Splitter Remote Operation</b>				
<i>Sensors above and below the overshot gates, and in the rated section. Position sensors and actuators for one overshot gate on the North Fork and one on the South Fork. Solar power, batteries, and communication equipment. Including Installation</i>	\$20,955.00	1	EA	\$20,955.00
<b>Crosscut Head-gate Remote Operation</b>				

<i>Sensors in the forebay, immediately below the radial gate, and at the WD01 Weir. Position sensor for the radial gate. Logic controller &amp; relays to control existing motor actuator. Communication equipment. Including Installation.</i>	\$12,555.80	1	EA	\$12,555.80
<b>Henrys Lake Outlet Remote Operation</b>				
<i>Sensors in the forebay, immediately below the radial gate, and at the USGS gauge Position sensor for the radial gate. Logic controller &amp; relays to control existing motor actuator. Communication equipment. Including Installation</i>	\$18,150.00	1	EA	\$18,150.00
<b>Materials and Supplies</b>				
<b>Measurement Stations with Telemetry</b>				
<i>Vented pressure transducer w/o data logger</i>	\$742.70	6	EA	\$4,456.20
<i>CR300-CELL210-ND data logger w/ internal voltage regulator &amp; modem</i>	\$995.00	6	EA	\$5,970.00
<i>12 V 7Ah sealed battery</i>	\$74.00	6	EA	\$444.00
<i>20W Solar panel w/ cable &amp; std mounting kit</i>	\$323.00	6	EA	\$1,938.00
<i>Enclosure</i>	\$265.00	6		1590
<i>4G/3G Omni 2dBd Antenna</i>	\$98.00	6	EA	\$588.00
<i>LMR195 antenna cable</i>	\$71.34	6	EA	\$428.04
<i>Post, concrete, conduit, misc. installation hardware</i>	\$200.00	6	EA	\$1,200.00
<b>Office Hardware</b>				
<i>Software, communication equipment and server for FMID office.</i>	\$6,775.00	1	EA	\$6,775.00
<b>Other-3rd Party In-Kind Contribution</b>				
<b>Henrys Fork Foundation installation of flow measurement &amp; telemetry equipment for 6 sites</b>				
<i>16 Supervisor Hours @\$50/hr, 48 Technical Hours @ \$25/hr, 48 Intern Hours @ \$12.50/hr and 360 Vehicle miles @\$.55</i>	\$2,798.00	1	EA	\$2,798.00
<b>Other-Environmental</b>				
<i>NEPA and Cultural Review</i>	\$5,500	1	Lump Sum	\$5,500
		<b>Total Project Cost</b>		<b>\$83,348.04</b>

### Budget Narrative

The budget proposal was developed using a bid from a local contractor. The contractor bid the remote operations equipment and installation together. The measurement equipment will be installed by the Henry's Fork Foundation. They have agreed to install this equipment as a 3<sup>rd</sup> party in-kind donation.

Final selection of the contractor will be completed in accordance with Idaho law for Irrigation Districts and any additional requirements of the WaterSMART grant program.

### Salaries & Wages

FMID's staff time will not be counted toward the project cost.

### Fringe Benefits

No fringe benefits will be required.

### Travel

No travel will be required.

### Environmental and Regulatory Compliance Costs

The environmental document for this project will be minimal. The cost was included at \$5,500. This is based on an estimate completed by Reclamation.

### Reporting

FMID's staff time to prepare the reports will be over and above the cost of the project and will not be counted toward the project cost.

### Other Expenses

No other expenses will be part of the project.

### Indirect Costs

No indirect costs will be part of the project.

Appendix A

Figure 1-FMID Delivery System, Irrigated Acres and Proposed Project Locations

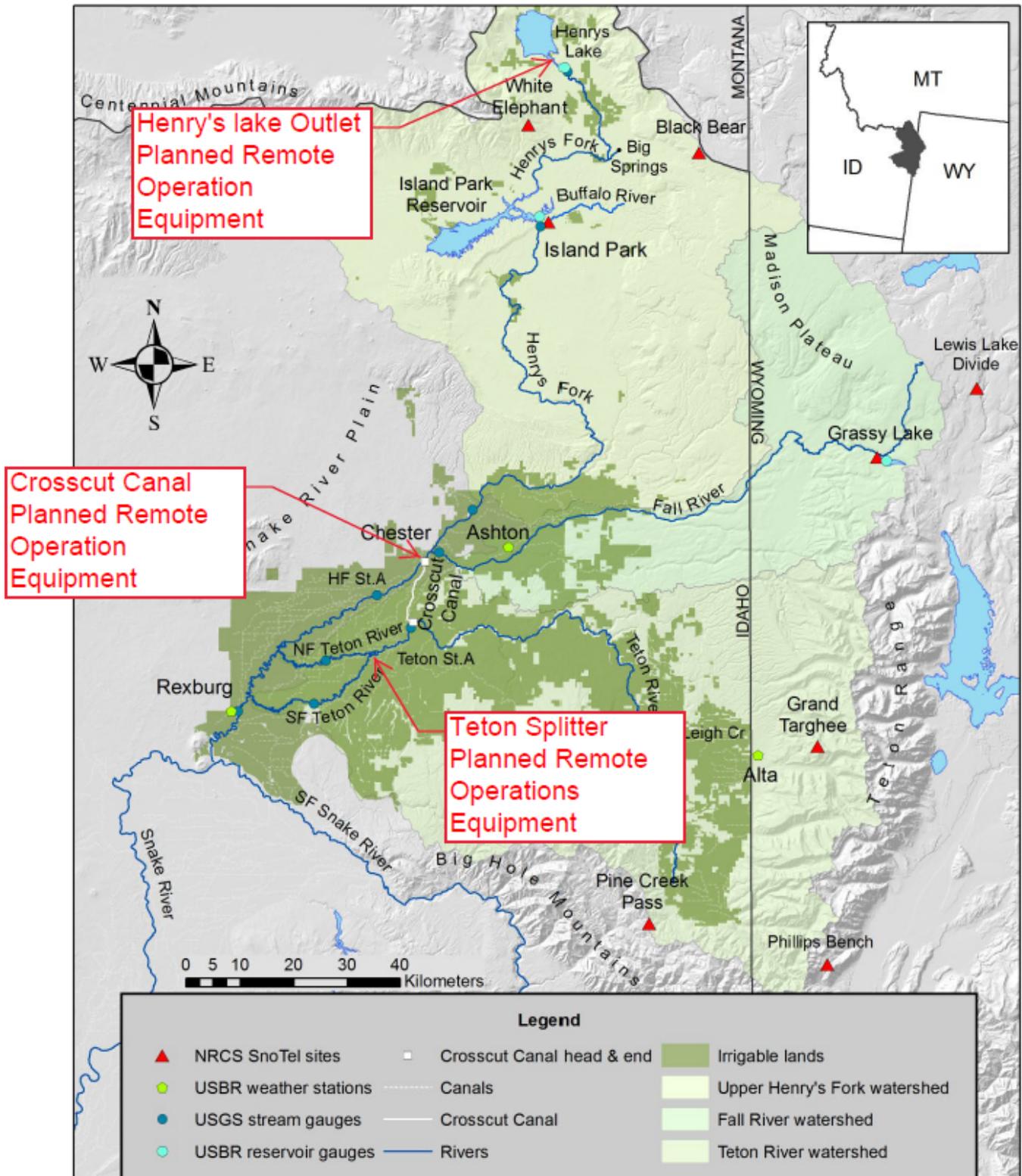
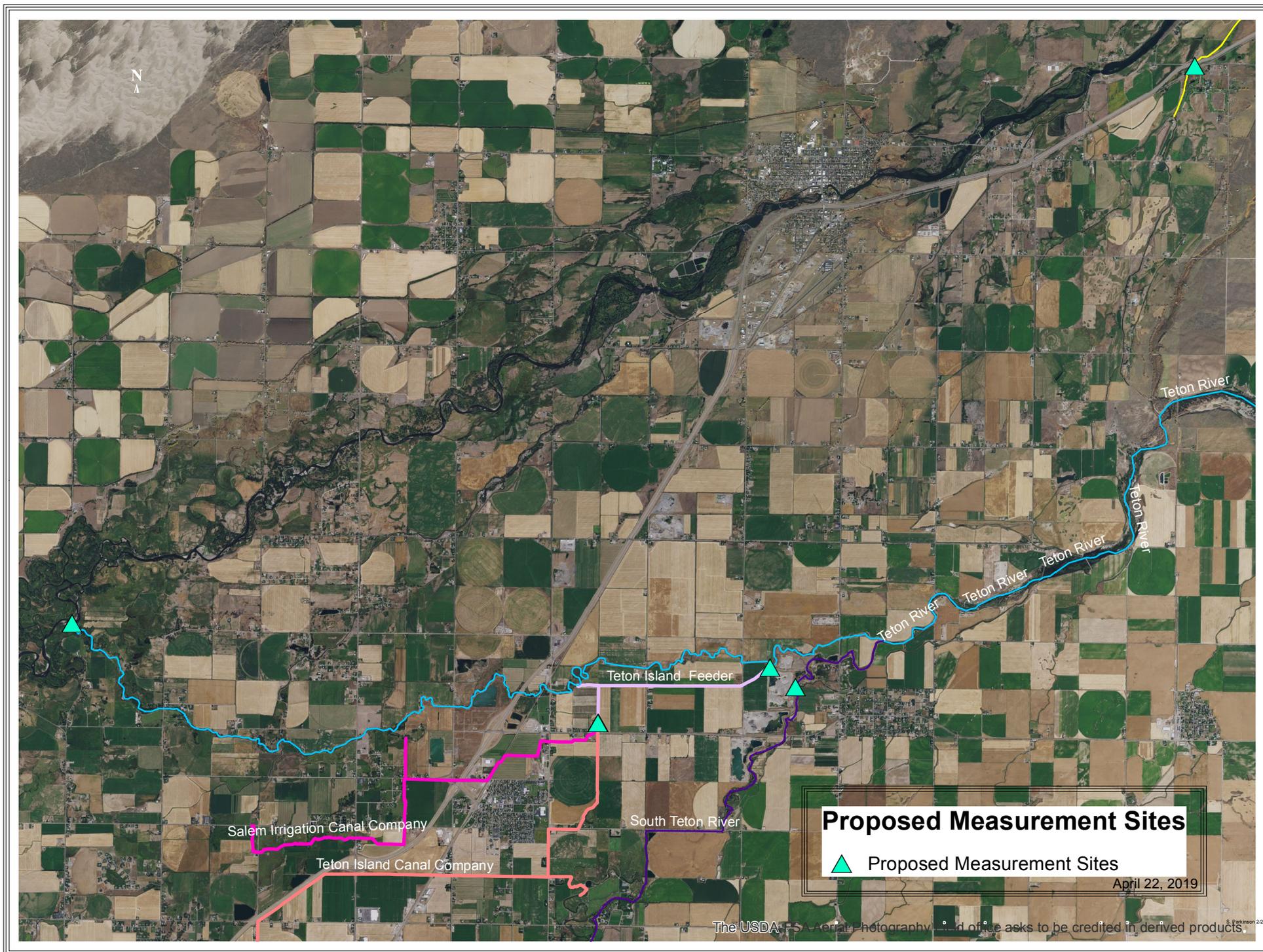
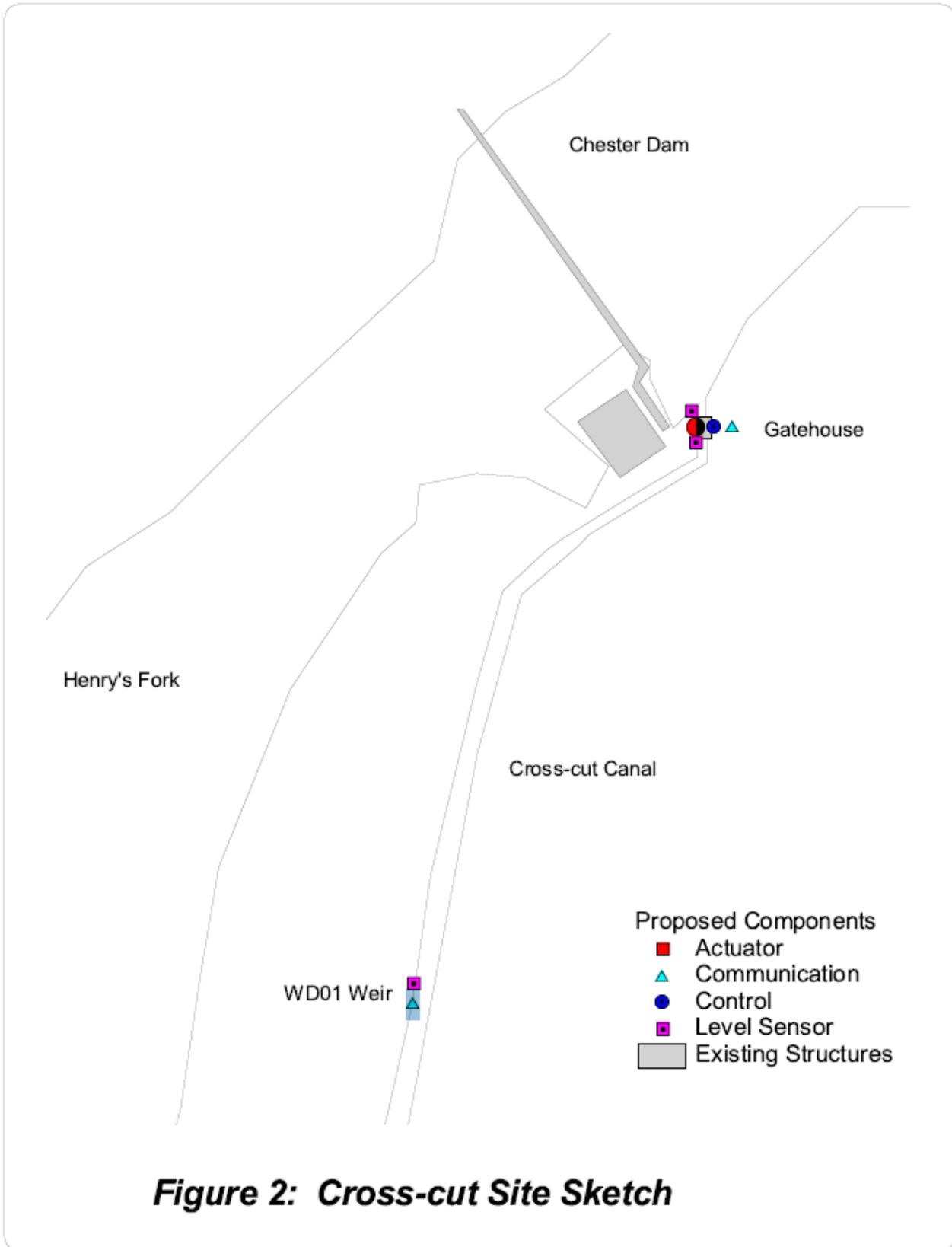


Figure 1a- Proposed locations for flow measurement/telemetry equipment

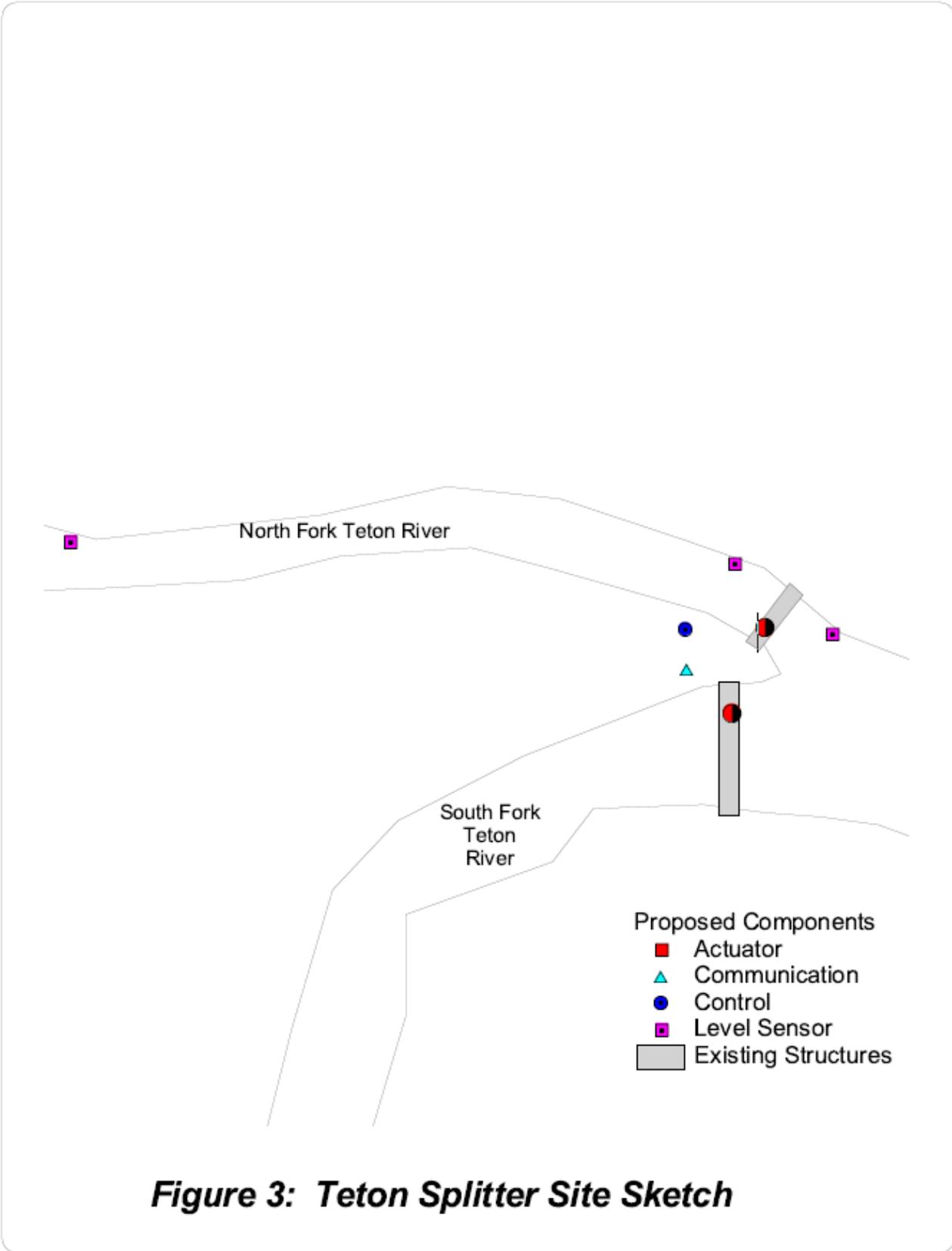


Appendix B-Figure 2 Crosscut Site Sketch

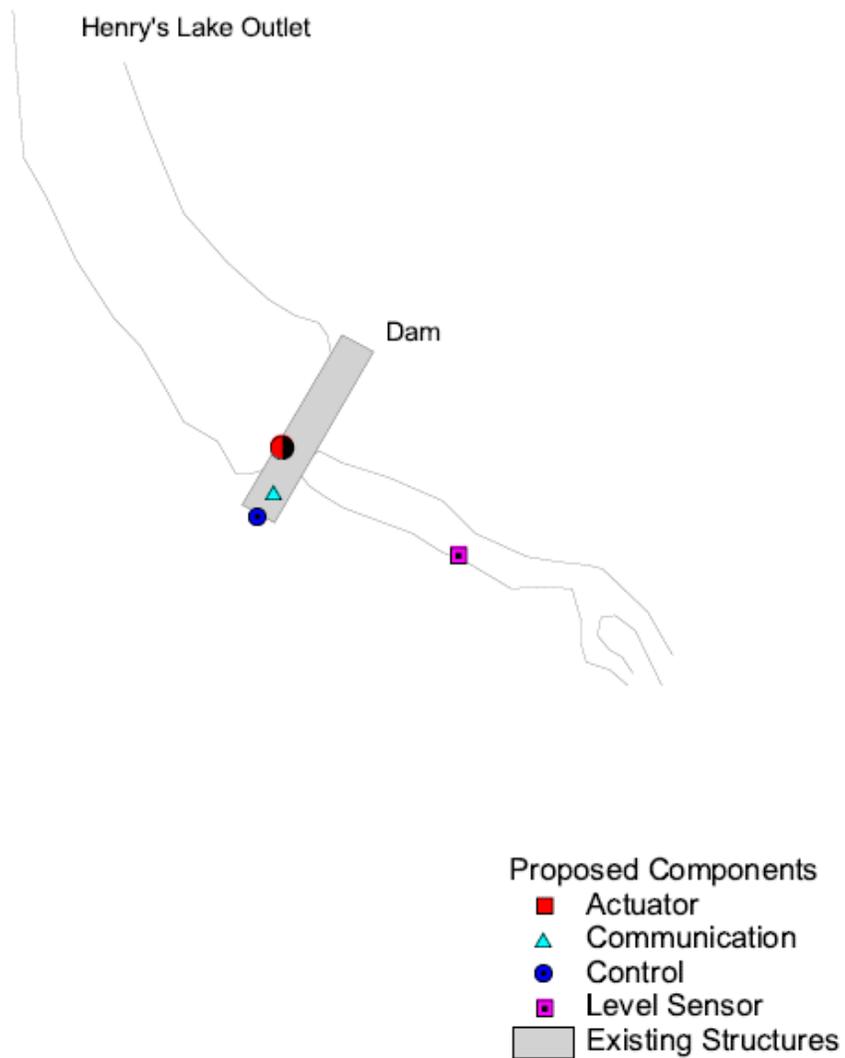


**Figure 2: Cross-cut Site Sketch**

Appendix B- Figure 3 Teton Splitter Site Sketch



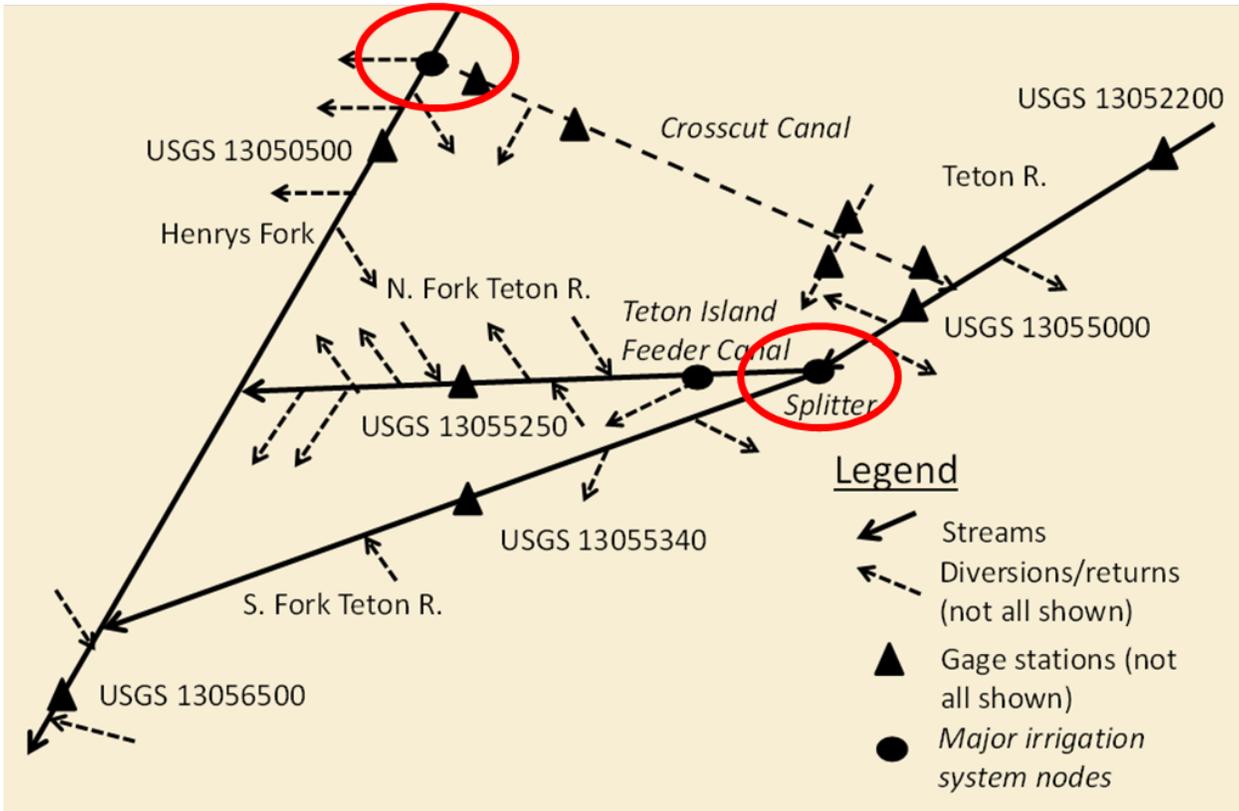
Appendix B-Figure 4 Henry's Lake Outlet Site Sketch



**Figure 4: Henry's Lake Dam Site Sketch**

Appendix C

Figure 5. Schematic of lower Henry's Fork and lower Teton River irrigation system, showing location of proposed infrastructure upgrades.



## Fremont-Madison Irrigation District

### Official Resolution 2019-01

*In the matter of the proposed WaterSMART application to United States Bureau of Reclamation (Reclamation) for canal remote operations, additional flow measurement equipment and a SCADA computer data collection system for Fremont-Madison Irrigation District (FMID).*

*WHEREAS, Reclamation's Small-Scale Water Efficiency Grants provide funding to non-federal entities to implement actions to increase water supply reliability through investments in existing infrastructure and attention to local water conflicts; and*

*WHEREAS, Reclamation requires that Small-Scale Water Efficiency Grant applicant adopt a resolution verifying (1) the identity of the official with legal authority to enter into agreement, (2) the board of directors, governing body, or appropriate official who has reviewed and supports the application submitted, (3) the capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the funding plan, and (4) that the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement; and*

*WHEREAS, FMID desires to apply for a Small-Scale Water Efficiency Grant to assist the District with installing remote operating equipment on 3 main water control structures within the district, and install a SCADA computer system to collect and analyze water delivery data, and install equipment to take additional flow measurement on the Henry's Fork of the Snake River and the Teton River, a project designed to improve water use efficiency; and*

*WHEREAS, The FMID Board of Directors have reviewed the WaterSmart Grant proposal and supports the grant application; and*

*NOW, THEREFOR, BE IT RESOLVED that FMID authorizes application to Reclamation for a WaterSMART grant and authorizes Jeff Raybould, Chairman to enter into an agreement with Reclamation for the WaterSMART grant; and*

*FURTHER IT BE RESOLVED, that FMID recognizes that Jeff Raybould, Chairman will represent FMID as its legal entity in the cooperative agreement; and*

*FURTHER IT BE RESOLVED, that FMID agrees to the WaterSmart funds and will work cooperative with Reclamation to meet established deadlines for entering into a cooperative agreement; and*

*FURTHER IT BE RESOLVED, that FMID shall provide or ensure the non-federal portion of the project costs.*

Dated this 23 day of April 2019.

Fremont-Madison Irrigation District

  
\_\_\_\_\_  
By: Jeff Raybould, Chairman

Fremont-Madison Irrigation District

  
\_\_\_\_\_  
By: Aaron Dalling, Executive Director

Appendix E-Letter of Support

**Mike Crapo**  
**United States Senator**  
239 Dirksen Senate Office Bldg.  
Washington, D.C. 20510

**James E. Risch**  
**United States Senator**  
483 Russell Senate Office Building  
Washington, D.C. 20510



**Mike Simpson**  
**Member of Congress**  
1339 Longworth House Office Bldg.  
Washington, D.C. 20515

April 22, 2019

Secretary David Bernhardt  
U.S. Department of the Interior  
1849 C Street, N.W.  
Washington, D.C. 20240

Dear Secretary Bernhardt:

We write in support of the grant application submitted by the Fremont-Madison Irrigation District (FMID) Bureau of Reclamation (Reclamation) WaterSMART. FMID was established in 1935 and includes more than 285,000 irrigated acres in three Idaho counties.

Well managed, available water is central to Idaho's economic sustainability and growth. We support the efforts of FMID to conserve this critically valuable resource. FMID participates in the Henry's Fork Watershed Council, engaging with conservation interests and stakeholders in mind.

Idaho's water supply is limited with competing demands including irrigation, municipal, recreation, ecological and industrial uses. Various demands and potential solutions to water availability bottlenecks were addressed in the Henry's Fork Basin Study hosted by the Henry's Fork Watershed Council. Completed in 2015 and funded by Reclamation and the Idaho Water Resource Board, the Henry's Fork Basin Study is an example of FMID working with collaborating partners to determine new and innovative means of conserving water. We understand this project to install a centralized operations system, headgate remote control and additional flow measurements in the Henry's Fork and Teton Rivers will help secure Idaho's water for the future.

We urge the BLM to give this application all due consideration.

Sincerely,

Handwritten signature of Mike Crapo in blue ink.

MIKE CRAPO  
United States Senator

Handwritten signature of James E. Risch in blue ink.

JAMES E. RISCH  
United States Senator

Handwritten signature of Mike Simpson in blue ink.

MIKE SIMPSON  
United States Congressman

**BRITT RAYBOULD**  
DISTRICT 34  
MADISON & BONNEVILLE  
COUNTIES



HOME ADDRESS  
P.O. BOX 653  
REXBURG, IDAHO 83440  
HOME: (208) 419-0768

STATE CAPITOL  
P.O. BOX 83720  
BOISE, IDAHO 83720-0038  
208-332-1173

## House of Representatives State of Idaho

April 22, 2019

To Whom It May Concern:

I'm pleased to support Fremont-Madison Irrigation District's (FMID) grant application for automation of the Teton River Splitter, Crosscut Canal, and Henrys Lake Outlet. Water efficiency is critical in our area and throughout the Snake River Plain. This project is an excellent example of using the most current technology to manage our water resources.

Well managed, available water is central to Idaho's economic sustainability and growth. I strongly support FMID's efforts to conserve this critically valuable resource. FMID's long-standing efforts to participate in the Henry's Fork Watershed Council and engage with conservation interests in the region is a model for the rest of the west.

The Henry's Fork water supply is limited with many competing demands including irrigation, municipal, recreation, ecological, and industrial uses. These various demands and potential solutions to water availability bottlenecks were addressed in the Henry's Fork Basin Study hosted by the Henry's Fork Watershed Council.

Completed in 2015 and funded by Reclamation and the Idaho Water Resource Board, the Henry's Fork Basin Study is a prime example of FMID working diligently with their collaborating partners to determine new and innovative means of conserving water. This project will help secure Idaho's water for the future and is one of the first concrete steps to utilization of the Henry's Fork Basin Study.

Sincerely,

  
Representative Britt Raybould



April 23, 2019

Small Scale Efficiency WaterSMART Grant Proposal 2019  
Letter of support for application of Fremont-Madison Irrigation District

Dear Grant Selection Committee:

As a nonprofit organization whose mission is to conserve, restore and protect the unique fish and wildlife resources of the Henry's Fork of the Snake River, the Henry's Fork Foundation (HFF) fully supports the grant proposal of Fremont-Madison Irrigation District (FMID) to the US Bureau of Reclamation's Small Scale Efficiency WaterSMART program. For over 25 years, our two organizations have collaborated with one another to advance the science and practice of watershed management. In fact, HFF has worked closely with FMID to develop this proposal in the hopes that precision management of water resources will result in benefits to both irrigation entities and the wild trout fishery.

This grant proposal takes another step toward implementing some of the alternatives developed through the Henry's Fork Basin Study. With funding from its WaterSmart program, along with match from the State of Idaho, the U.S. Bureau of Reclamation completed the Henry's Fork Basin Study, a planning document intended to be a template for future actions to ensure reliability and sustainability of water resources in the basin. The Henry's Fork Watershed Council, which HFF co-facilitates with Fremont-Madison Irrigation District, served as the stakeholder workgroup for this planning effort. The Basin Study contains a number of potential options that were thoroughly vetted by a diverse group of stakeholders. These options include small off-stream storage reservoirs, modest enlargement of existing reservoirs, managed aquifer recharge, market-based administrative exchanges in time and place of water use, and automated irrigation delivery infrastructure. Although developed with the entire watershed—and even the entire Snake River basin—in mind, the most viable options in the Basin Study are relatively small in scale and designed to be implemented and managed in conjunction with other efforts at the local level. After official release of the final Basin Study document in 2015, HFF's Board of Directors directed staff to take a leadership role in pursuing implementation of alternatives in the Basin Study, as well as other, related actions that ensure sustainability of water resources for all uses, including fish and wildlife. Many of the important management issues identified in the Basin Study are related to late-season shortages of water in the Teton River and resulting demands on Island Park Reservoir. Addressing these shortages is critical to improving late-season and winter flows on the mainstem Henry's Fork and other tributaries. The project proposed by FMID takes a major step toward developing and implementing site-specific actions that will increase late-summer flows in the Teton River and increase annual carryover in Island Park Reservoir. Thus, this effort directly supports and complements HFF's work in other parts of the watershed.

To support FMID, HFF is pledging the following:

- 1) General project support for this grant and continued technical service on this project and related projects.

- 2) Specific commitment to provide 16 supervisory hours, 48 technical staff hours, 48 intern hours and 360 vehicle miles to support installation of flow measurement & telemetry equipment at six sites. The value of this in-kind support is \$2,798.
- 3) Cash match of \$8,307 towards hardware.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Brandon Hoffner".

Brandon Hoffner  
Executive Director

**Teton Island Feeder Canal Company  
386 North 2400 East  
Saint Anthony, ID 83445**

April 23, 2019

Small Scale Water Efficiency WaterSMART Grant Proposal 2019  
Letter of support for the application of Fremont-Madison Irrigation District

Dear Grant Selection Committee:

We are writing this letter in support of Fremont-Madison Irrigation Districts WaterSMART grant application for automation of the Teton Splitter, Henrys Lake Outlet and Crosscut Canal in addition to flow measurement equipment for the Henry's Fork and Teton Rivers.

For as long as we can remember water measurement has been a huge issue on the Teton River. We rarely know how much storage water we have diverted until the end of the irrigation season. This usually results in us either renting more water than need, or we pay excess use fees because we didn't rent enough water up front. In years this happens it can create a significant financial burden for our shareholders.

Adding automation/remote operations to the existing infrastructure will be a significant benefit to our canal company. Once we start using storage water our canal is required to divert all the water that comes down the Nork Fork of the Teton River from the Teton Splitter. We almost always either have too much or too little water. This results in significant water use inefficiencies.

We are ecstatic about the potential this project has for our canal company and believe it will resolve many long-standing conflicts among water users on the Teton River.

Sincerely,



Rodney Dalling  
President