WaterSMART: Water & Energy Efficiency Grants

FY 2017

West Porterville Irrigation Company

Piping & Micro-Hydro Project

APPLICANT

West Porterville Irrigation Company
1200 East 100 South
Morgan, UT 84050

PROJECT MANAGER

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Executive summary

Applicant Info

Date: January 11, 2016
Applicant Name: West Porterville Irrigation Company (WPIC)
City, County, State: Porterville, Morgan County, Utah
Project Manager:

- Brian Deeter, P.E. Project Manager
- Telephone: 801-547-0393
- E-mail: brd@jub.com

Project Funding Request: Funding group II $1,000,000 total project cost $2,109,525

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 (see Section C.3.1. Eligible Projects)

The West Porterville Irrigation Company Piping and Micro Hydro Project will have a quantifiable water savings of 540 acre-feet and will better manage 1,760 acre-feet of water. The proposed project consists of installing 25,075 feet of new 8 to 18-inch HDPE pipe, excavating 3,000 cubic yards to expand the size of the current reservoir, and install a 15kW Micro Hydro/PRV1 station that will produce 55,080 kWh of energery per year. The West Porterville Irrigation Company (WPIC) is committed to maintaining instream flows to ensure water for the fish habitats within in East Canyon Creek and HardscrabbleCreek. This continued commitment will not only benefit the two creeks as the water reaches the Weber River, it will also benefit the status of two sensitive species that now warrant additional conservation efforts. These sensitive species are the Bonneville Cutthroat Trout and Bluehead Sucker. Both are native fish species and both are covered by conservation agreements between the State of Utah and the U.S. Fish and Wildlife Service and other parties.

See Attachment A – Geographic and Project Location Map for project information.

WPIC is requesting funds under Funding Group II.

Estimated Schedule

Length of time and estimated completion date

This project is ready to move forward as soon as it is awarded. Upon award, preparation of the final design and the environmental report will occur simultaneously and are estimated to take six to eight months to complete. The project will be located within the current right-of-way, but not in the existing pipe location. Therefore, the project can be built without interrupting water during the irrigation season. The excavation of the reservoir will take place in October 2018 after the

irrigation season. The WPIC irrigation season is from May 1 – October 1. It is anticipated that the actual construction of the piping portion of the project will start in the June/July 2018 – April 2019 timeframe. The project will be accomplished within the three-year allowance. Oct 2017 - Sept 2020.

Year 1 Oct 2017 - Sept 2018	Year 2 Oct 2018 - Sept 2019	Year 3 Oct 2019 - Sept 2020
•Contracts •Complete environmental process •Complete final design and bid the project •Start the piping project ($300,000)	•Excuvate the reservoir •Continue the piping project ($500,000)	•Continue the project •Close out the project ($200,000)

Federal Facility

The project is not directly located on a federal facility. However, they do receive some of their water through East Canyon Creek that comes from East Canyon Dam which is a Reclamation project.

Background Data

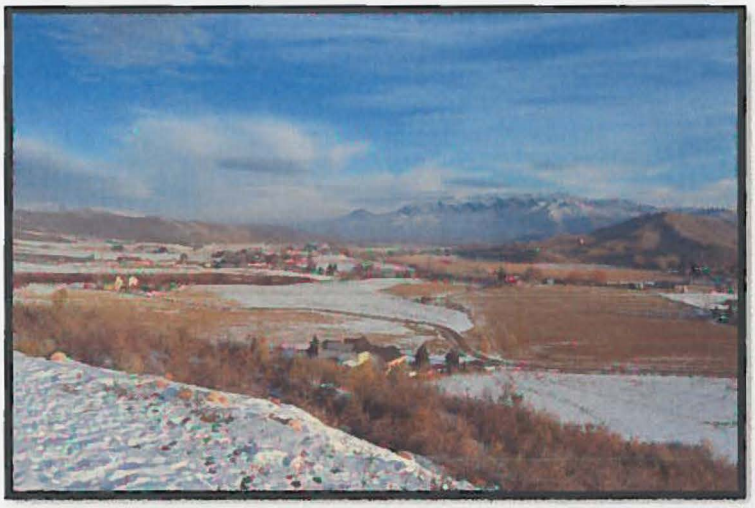
The West Porterville Irrigation Company prepared a Field Service Water Conservation and Management Plan (Plan) in 2016 that allowed them to evaluate and understand ways to conserve and better manage their system. The Plan estimated water losses, energy inefficiency opportunities, and ways to reduce potential conflicts between users. Within the Plan, WPIC identified water losses of 540 acre-feet annually.

Photo 1 Hardscrabble Creek

The Company has a long history of irrigating economically important agriculture fields in

Morgan County, Utah. They have water rights that go back as far as 1862, the earliest water right in the area. Their water rights come from Hardscrabble Creek and East Canyon Creek.

Photo 2 View of the Service Area



The Plan allowed the Company to better understand the condition of their existing delivery system, pipe sections and evaluate the flow capacities.

The Company's present delivery system was piped in 1976 and consists of over six miles of pressurized, secondhand, Transite pipe in varying sizes from 6 inches to 20 inches. All of the irrigators use sprinkler systems in their fields.

The area, because of its elevated location, has a very short growing and irrigation season. The typical irrigation season is from May 15th to the first week of October based on the weather. The system is such that if you have a break on a lateral – especially up at the high end of the pipeline – the entire pressurized pipeline, all six miles, must be shut down and drained to fix the broken lateral. Breaks in the system have been a significant hardship on the water users because the system can be down for days. The West Porterville Piping and Micro Hydro Project will allow WPIC to conserve 540 acre-feet of water, secure their water right, improve the delivery system and water supply reliability, improve crop yields, and produce needed energy.

The energy produced by installing a 15kW hydropower turbine will be 55,080 kWh annually that will be sold to local residential and agriculture users to help power their out buildings and other facilities during the irrigation season.

Geographic Location /Map

The service area of WPIC includes residential and agricultural areas of Morgan County, Utah. The project location is shown in an overview of the entire service area and indicated in Attachment A – Geographic and Project Location Map.

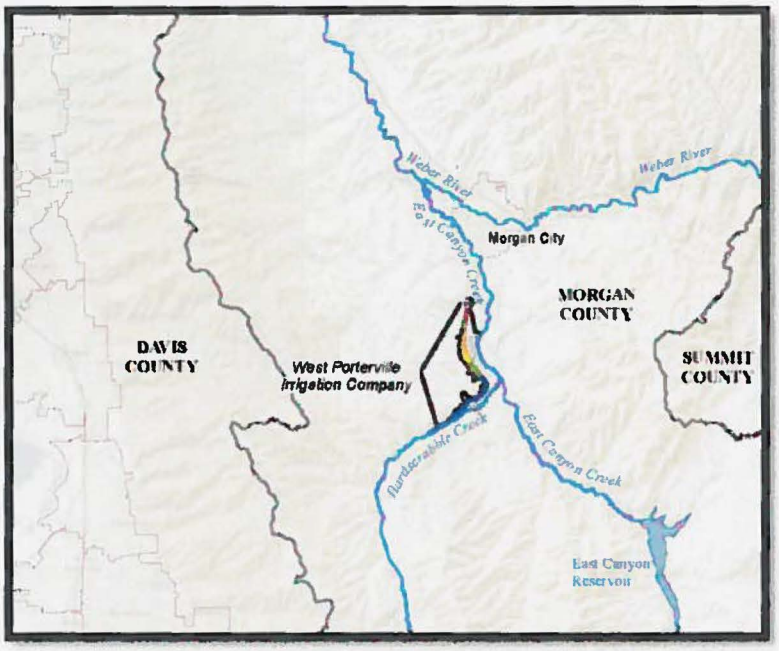
Water Supply

- ***Source of water supply:***
  Hardscrabble Creek and East Canyon Creek

- ***Water rights involved:***
  WPIC has water rights that go back as far as 1862, the earliest water right in the area. They have two water rights out of Hardscrabble Creek; both include flood flows of 10.12

CFS (high 6.75 CFS and low 3.80 CFS) which is the equivalent of about 3/5ths of the flow in Hardscrabble Creek. They also have 100 shares of East Canyon Creek which equals 100 acre-feet.

Photo 3 West Porterville Location



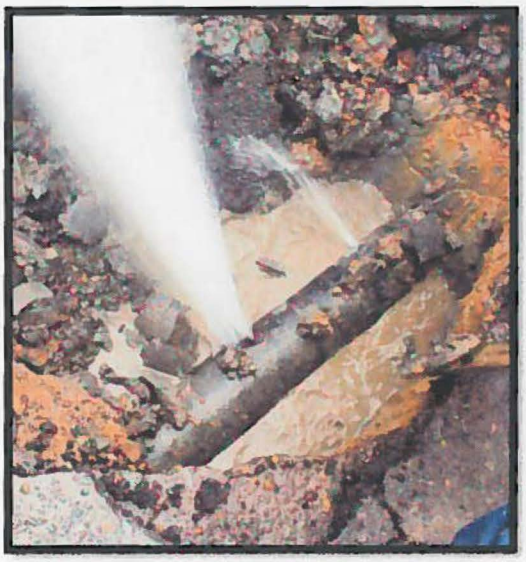
- ***Current water uses and number of water users served:***
  WPIC has 718.5 shares and 114 shareholders

- ***Current and projected water demand:***
  The current demands 1756 acre-feet if the system is not replaced that will have a greater demand in order to get water to the end of the pipe.

- ***Potential shortfalls in water supply:***
  WPIC faces potential shortages in two main areas:

Water Loss and Seepage:
Water seepage and losses within the project area are estimated to be at least 540 acre-feet of water annually. These losses have impacted water delivery in the past and have gotten even worse with the drought situation in 2016. During this irrigation season, leaks within the lower portion of the system required some users upstream to shut their system down for days at a time so others in the lower areas could get their water.

Photo 4 Leaking Old Transite Pipe



Additional water has to be put in the system just to get it to the bottom users. In an average year, the amount of water lost in the system is so high that many users at the bottom of the pipe have not received their allocated shares for more than five years.

Failures and drought have placed demands on residential wells that are used to supply culinary water. With the breaks and losses in the system, residential users find it necessary to use their culinary sources to supplement their lack of water for flowers and gardens. Loss of crop production, reduced grazing times, and impacts to other

culinary water resources are a product of the water losses and system failures.

Drought - WPIC potential shortfalls from drought can and have had an impact on the current water supply. In the winter of 2016 snow pack was good but the short winter and early spring runoff did not fill the reservoirs. Much of the precipitation that made up the difference in the water supply came in the form of rain. "That may help Utah's water totals, but it does not necessarily fill the state's reservoirs, which are built to capture snowmelt and runoff, not rainfall," said Randy Julander, Utah Snow Survey supervisor for the Natural Resources Conservation Service (NRCS). Statewide, reservoirs are averaging 64 percent of capacity, 1 percent less than 2015. In 2015 and 2016 the state suffered from some of its warmest and least snowy winters since the late 1800s when Utah was still a territory.

In an article "Is Utah's Drought over? It depends on whom you ask." published by the Salt Lake Tribune, June 3, 2016, it states:

> *" Is the drought really over?...you can take a look at the drought from many perspectives, but if you are the guy who does not have any water, that is still a drought condition to you. So no the drought is not over."*

The drought situation has continued to impact the water supply this past irrigation year and will continue to have an effect on WPIC. The National Weather Service Climate Center predicts improvements in drought intensity for 2017. The drought conditions will remain but will be improved based on the ongoing El Niño and a relatively wet climatology during the outlook period. However, if WPIC does not make changes in its delivery system, and the drought situation continues, whether it is a less intense, WPIC will still continue to have extreme losses in its system. The losses will have disastrous impacts on the farmers, residents, and instream flows within the WPIC service area.

» ***Major crops and total acres served:***
WPIC provides irrigation water to approximately 760 acres of agriculture and residential users for irrigation, lawns, and gardens. Main crops are grains, hay, and corn.

Water Delivery System

Also, describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (e.g., type, miles, and acres). For municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.

The original open ditch delivery system was piped in 1976 and is more than six miles of pressurized, very old, secondhand, asbestos concrete (Transite) pipe. The pipe installed in 1976 consisted of several thousands of feet of pipe that had been either moved from another site – thus

secondhand – and then given to WPIC and/or new Transite pipe that was disregarded due to the new laws that disallowed its use for culinary water delivery systems. The pipe has been used well past its useful life of 40 years and experiences constant leaking despite many efforts to repair the pipe. Most of the leaking is from deteriorating pipe joints with nearly every joint in the system experiencing at least some leakage. Approximately 80% of the pipe runs through open ground, and the rest is on the highway shoulder, so most of the leaking does not harm existing structures or other surface improvements. The existing pipe is 25,000 feet of pipe ranging in sizes of 20 inch to 6 inches.

The current system includes two Pressure Reducing Valves (PRV). One is located about 12,000 feet down from the pipe inlet, and the other PRV is about 19,000 feet below the other. Both are located in open fields.

Energy Efficiency

If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.

The system is a gravity fed pressurized system. No pumps or alternative sources of power are required to run the existing system. As part of the Field Service Water Management and Conservation Plan completed in 2016, the potential for hydroelectric power generation was evaluated. Both the existing and proposed piping include a PRV station about midway to regulate pressure. An alternative to a traditional PRV would be a 15kW micro-hydro station which would generate 55,080 kWh of power while regulating pressure. A conventional PRV would still be required parallel to the micro-hydro station in case of failure of the micro hydro and the need to bypass water. The hydropower will be sold to reduce reliance on outside sources for some nearby residents to power their agricultural barns and other facilities. See Attachment – B Management Plan for pages from the Plan.

Past 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).

WPIC receives water from East Canyon Creek that is fed from East Canyon Reservoir, which is owned by Reclamation. WPIC has worked with Reclamation, most recently, on a fish bypass within East Canyon Creek along with the Utah Department of Natural Resources, Trout Unlimited, and Weber Basin Water Conservancy District.

Technical Project Description

The project description should describe the work in detail, including project milestones and specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.

Photo 5 West Porterville Reservoir

The proposed West Porterville Irrigation Company Piping and Micro Hydro Project has three components: (1) water conservation and better management, (2) renewable energy production, and (3) commitment to maintain instream flows in Hardscrabble and East Canyon Creeks to help fish habitats. The project consists of installing 12,850 feet of 18-inch, 1,725 feet of 14-inch, 2,000 feet of 12-inch, 3,200 feet of 10-inch, and 5,300 feet of 8-inch HDPE pipe. Along with this 19 air vents, one 15kW Micro Hydro/PRV station, and a screening structure will be installed. WPIC will also excavate 3,000 cubic yards to expand the size of the current reservoir which will allow the water to be held in the reservoir longer and for more water to flow instream from Hardscrabble Creek for longer times throughout the irrigation season. WPIC is designing their system to reduce the amount of water it takes to run the sprinkling systems. All of the users are required to sprinkle and to use certain size heads for their system. The design of the system will allow for more efficiency in the system and reduce the amount of time they need to spend watering to get the required amount of water.

See Attachment A – Geographic and Project Location Map for project information.

Why the Project is Needed

Water Losses

The water losses in the system are conservatively calculated at 540 acre-feet. A ten-year average of water usage indicates that WPIC is delivering approximately 1,756 acre-feet in an irrigation season. This project will better manage all of the 1,756 acre-feet that are being transported through the system and help ensure that those downstream are receiving their full water right, which currently they are not. Within the shareholder's letter, sent to all shareholders, dated July 22, 2016, it stated:

> *"The water supply coming from Hardscrabble Creek has dropped considerably over the past month. The good amount of winter snow accumulation and spring rain has been overcome by the unrelenting, hot and dry summer months and the creek is currently down to three-tenths of a foot at the weir. The low water and the leaking system create a combination of conditions that is extremely difficult to manage. The current flow of the creek at 7 cu. ft. per second would support 580 birds with 11/64" nozzles at 40 pounds of pressure. However, we are currently*

only able to effectively run water to the homes and just over half of that amount of birds; the leaks take the rest."

WPIC state the losses in the system and the inability to provide water as the largest single reason for why they are pursuing funding from Reclamation and the Utah Board of Water Resources to help to replace the line.

Renewable Energy

The proposed project will allow WPIC to improve efficiency in their water delivery system and produce 55,080 kWh of power thought a micro hydro PRV station. The generated power can be sold to local residential and agriculture users to help power their out buildings and other facilities during the irrigation season.

Maintain Instream Flows

In the past, WPIC has not typically taken all of its water rights from Hardscrabble or East Canyon Creeks. This past year, however, as previously stated, Hardscrabble did not have enough water even to run the all of the user sprinkling systems. Many of the large shareholders did not take water in the middle of the irrigation season to allow residential users and full-time farmers, who rely on farming for their income, to get their full shares of water.

Reducing the losses in the system and designing it to be more efficient would lessen the likelihood that WPIC would have to use its East Canyon Creek shares to supplement its system. This water can now stay in East Canyon Creek longer and eventually into the Weber River system during some of the most critical times of the season. It will allow WPIC to maintain instream flows within Hardscrabble Creek and East Canyon Creek to sustain the fish habitats. This water can now be used to improve the environmentally critical habitats within the Weber River system.

Evaluation Criteria

Evaluation Criterion A: Quantifiable Water Savings

- *Average annual acre-feet of water supply:*

The average annual acre-feet of water supply for WPIC is approximately 1,780 acre-feet (ten-year measured average).

- *Where is the water currently going ((e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*

Water is leaking through breaks the 1976 second-hand Transite pipe and through the pipe joints into the ground and is being taken up by vegetation. The soils around the pipe are sands and gravels and allow the water to pass through very quickly.

Photo 6 Broken Transite Pipe

- *Where will the conserved water go?*

The conserved water will provide a more secure water right, be more available as a buffer during times of drought, and a portion it will be made available to maintain instream flows to benefit the environment and fish and wildlife habitats within Hardscrabble Creek and East Canyon Creek and eventually the Weber River. The conserved water can be an advantage to the Creek and the River as it allows for a prolonged and balanced stream flows.

Canal Lining/Piping

Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:

(a) ***How has the estimated average annual water savings that will result from the project been determined?***

A 2016 study conducted by J-U-B Engineers of the West Porterville pipe took measurements within the system using an Ultrasonic Flow Meter. The system loses on average 800 gpm. This loss equates to an annual seepage loss over 150 days of 540-acre-feet

(b) ***How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.***

A water loss study was conducted on May 12, 2016, using an inflow/outflow test. An ultrasonic flow meter was temporarily installed at a location near the beginning of the pipeline. The system was charged and then all services and flush valves were closed so that no flow leaving the system. After shutting the system down, the meter was reading 800 gpm. A large turnout was opened near the end of the system, and the flow jumped to 1,800 gpm. The turnout was again closed, and the system was allowed to stabilize. The sustained flow was 826 gpm. The two flow measurements were average to 813 gpm for the system losses. The pipe is 1976 second-hand Transite pipe that leaks at nearly every joint.

(c) *What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?*

It will be a closed pipe system constructed of fused joint HDPE, so the assumption is that there will be no leaks and 100% reduction in seepage. The main pipeline will have a permanent meter installed at the upper end before the first turnout.

(d) *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?*

The overall average reduction in water loss for the six miles is 91 acre-feet/mile.

(e) *How will actual canal loss seepage reductions be verified?*

Through monitoring the system meters and comparing those values with historical flows volumes WPIC will document this information. Inflow/outflow tests will be performed similar to the water loss study that was performed previously.

(f) *Include a detailed description of the materials being used.*

7900 feet 18" HDPE DR 32.5 pipe
2100 feet 18" HDPE DR 26 pipe
2850 feet 18" HDPE DR 21 pipe
1725 feet 14" HDPE DR 32.5 pipe
2000 feet 12" HDPE DR 26 pipe
3200 feet 10" HDPE DR 26 pipe
5300 feet 8" HDPE DR 26 pipe
15kW Micro Hydro - PRV station

Evaluation Criterion B: Water Sustainability Benefits

Please describe in detail where the conserved water will go and how the conserved water is expected to increase water sustainability. Consider the following:

- Will the project commit conserved water to instream flows?

Yes, WPIC is determined to maintain an instream flow that will benefit the fish habitats within the Hardscrabble Creek and East Canyon Creek and eventual into the Weber River. This commitment will not only benefit the two creeks water quality, but it will also benefit the isolated populations of Bonneville Cutthroat within Hardscrabble Creek. The Bonneville Cutthroat Trout are considered sensitive species that warrant additional conservation efforts.

As the instream flows reach the Weber River it will also benefit the status of two sensitive species also within the Weber River that warrants additional conservation efforts. These sensitive

species include Bluehead Sucker and the Bonneville Cutthroat Trout. Both are native fish species, and both are covered by conservation agreements between the State of Utah and the U.S. Fish and Wildlife Service and other parties.

- Provide a detailed description of the mechanism that will be used (e.g., collaboration with a state agency or nonprofit organization, or other mechanisms allowable under state law) and the roles of any partners in the process. Please attach any relevant supporting documents.

WPIC will work in close collaboration to collaborate with Trout Unlimited, Weber Basin Water Conservancy District, Utah Division of Wildlife Resources and Reclamation to determine the instream flows necessary to allow for better water quality and to benefit the fish species in the creeks. WPIC has been working with these group over the past few years as WPIC rebuilt its diversion structure to allow for fish passage and will continue this working relationship. The roles of the partners will be determined as the groups collaborate with one another. See Letters of Support

- Indicate the quantity of conserved water that will be committed to instream flows. Describe where conserved water will be committed to increase instream flows (indicate specific stream reaches if applicable).

WPIC has made a commitment in the past to allow portions of their 100 acre-feet of East Canyon Creek to stay within the creek during critical times within the irrigation season. They will continue the 100 acre-feet as well as maintain instream flows within Hardscrabble Creek. In the past because of water losses within the system and drought issues, the amount of water in Hardscrabble has been limited. However, WPIC will work closely with its partners to maintain instream flows within this creek as they reduce the losses in the system. WPIC will collaborate closely with its partners to help incorporate and better understand the challenges within the Weber River Watershed Plan, approved in 2014, and the role that WPIC plays in helping to foster respect for the resources, educate on the need for conservation, and maintaining instream flows to support increasing habitat viability.

- Describe the benefits that are expected to result from increased instream flows. Will the increased instream flows result in benefits to fish and wildlife? If so, please describe the species and expected benefit of the project.

Hardscrabble and East Canyon Creeks are both tributaries to the Weber River. Maintaining instream flows benefits the water quality of both of these creeks and the Weber River, which provides drinking and irrigation water to 21% of Utah's population.

Within the Weber River Watershed Plan it indicates that, "In 2010, the TMDL's were revised for East Canyon Creek. The 2010 TMDL found that in East Canyon Creek water column nutrients have been reduced to such an extent that the water quality impairments are now primarily due to temperature, excessive algal and macrophyte growth, and insufficient stream flow." The WRWP goes on to state that projects in the East Canyon Watershed needed to help to continue to address excessive sedimentation additional emphasis on shading the stream corridor and increasing stream flow to reduce temperatures and improve aquatic habitat. By working with our partners, WPIC can help coordinate instream flows to help address some of these issues previously discussed.

Photo 7 Bonneville Cutthroat Trout from the Weber River

This commitment to work with our partners to maintain instream flows not only will the benefit be the water quality but also two sensitive species. There are known isolated populations of Bonneville Cutthroat within Hardscrabble Creek. The Bonneville Cutthroat Trout are considered one of the sensitive species that warrant additional conservation efforts.

As the instream flows reach the Weber River it will also benefit the populations of the Bonneville Cutthroat Trout and Bluehead Sucker in the Weber River. The status of these two sensitive species warrants additional conservation efforts. Both are native fish species, and both are covered by conservation agreements between the State of Utah and the U.S. Fish and Wildlife Service and other parties.

- Please describe the status of the species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular ecological, recreational, or economic importance), the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.

The Weber River Watershed Plan identifies many factors that have contributed to the decline of these two species including habitat degradation, disease, hybridization, and negative interactions with non-native fish species. Currently, Bonneville cutthroat trout are managed range-wide through a cooperative, multi-partner Conservation Agreement and Strategy, managed throughout Utah via a statewide Agreement and Strategy.

The Reclamation projects in the Weber River Watershed have had an impact on the sensitive species both in a positive and negative way. Many of the hydropower dams, water conservation district and water needs and uses developed by Reclamation have an impact on the ecosystem of these species. In the Weber River Watershed Plan, it indicates the change resulting from improvements.

"The Weber River Watershed has experienced a long history of human-influenced changes and alterations to enhance human well-being. These actions have enhanced water transportation and delivery, developed sources of hydropower, reduced flood hazards, provided agricultural, municipal and industrial water supplies, created transportation corridors, developed economic assets, and fostered the growth of the cities, all of which are essential to the survival and quality of life of this area. However, many of those enhancements have not been realized without considerable impacts to aquatic ecosystems, which provide immense natural wealth and human benefit."

- Will the increased instream flows result in benefits to habitat or other ecological benefits? If so, describe these benefits. Will the flows specifically benefit federally designated critical habitat?

Habitats for birds and other wildlife will benefit just by the fact that we are maintaining instream flows that will benefit the fish. There are no other federally designated critical habitats that WPIC is aware of in the project area.

- Will the increased instream flows result in other benefits not discussed above, including recreational, social, or economic benefits? If so, please explain.

The Weber River Watershed Plan states: "The Weber River and its tributaries provide habitats, opportunities and resources that are essential to the peoples' survival, a way of life, and collective quality of life." The impacts of this conservation project – though small in comparison to the large watershed – can and will have an impact that can support partnerships amongst private landowners, city, county and state governments, and non-governmental organizations to develop larger-scale restoration, protection, and water conservation projects. It takes everyone doing their part to conserve, educate, and change the way we view our ecological stewardship. WPIC and the Creeks they take their water from are highly used for fishing, camping, and hunting. All of these activities will benefit from WPIC maintaining instream flows and conserving over 540 acre-feet of water that can be used to improve recreation and social pursuits in the area.

Some projects may address water supply sustainability in ways other than committing water for instream flows. If the questions listed above are not applicable to your project, please address the following to explain how the water savings from the project are expected to result in a public benefit:

- Is there a specific water supply sustainability concern in the region? What factors are contributing to the concern? Please include a description of the impacted geographic area and stakeholders, the partners that are collaborating to resolve the concern, and any other applicable information. How will the proposed project help to address that concern?

There are a number of concerns for water sustainability throughout the entire Weber Basin Watershed. This proposed project, however, will address areas of concern within WPIC service area and the Creeks where they divert their water. The areas of concern are 1) large water losses

that reduce the ability for users to receiving their full share of water and 2) instream flows that are reduced because of having to take a full water right just to get water to the end of the system. These two concerns continue to escalate every year as the system continues to lose 31% of its water through leaks, breaks, and seepage. Leaks this past irrigation season within the system's main line, at the top of Hardscrabble Creek, required that the entire system is shut down for 7-10 days to be fixed. It was decided that it would be better to repair the leak at the end of the irrigation season to avoid a disruption in water service.

Voluntary restrictions were put in place this past season with residential uses going from every-other-day to every-third-day. Many others voluntarily reduce or stop using their water altogether to help with the water supply issues.

The proposed project will eliminate the two areas of concern as it will allow for zero losses in the system and give WPIC the ability to reduce the amount of water they divert and allow for them to maintain instream flows.

Because drought is a real concern and has been over the past several years, the proposed project will help lower drought concerns and allow WPIC to have a system that is designing to reduce the amount of water it takes to run the sprinkling systems. All of the users are required to sprinkle and to use certain size heads for their system. The design of the system will allow for more efficiency in the system and reduces the amount of time users need to spend watering to get the required amount of water and will lessen over-allocation.

- Will water conserved through the project result in reduced diversions or be made available to help alleviate water supply shortages due to drought, climate variation, or over-allocation?

The Weber Basin Drainage is over allocated and is impacted from drought. Conserved water will say in the Weber River and after it flows through the sensitive fish habitat the water will be collected at Willard Bay by Weber Basin Water Conservancy District. Weber Basin is a Reclamation project and helps supply water to entities struggling with water supply.

- Will the project make additional water available to Indian tribes, and/or rural or economically disadvantaged communities)? If so, please explain.

This project will benefit the rural population served by West Porterville Irrigation Company by providing water supply sustainability.

- Will water conserved through the project help to address water supply sustainability in a way not listed above?

There may be other irrigation companies that divert from Hardscrabble Creek and East Canyon Creek that may see water supply sustainability from WPIC conservation project that cannot be quantified at this time.

Evaluation Criterion C: Energy-Water Nexus

Subcriterion No. C.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 approved Field Service Water Management and Conservation Plan (Plan) for the WPIC included a simple evaluation for hydropower generation within a PRV station. The Plan reviewed one location scenario for power generation. As part of the proposed project a micro-hydro power generator on the central PRV station will be installed. The15kW micro hydro unit will produce 55,080 kWh annually.

*Energy Production: 15kW * 153 days * 24 hours = 55,080 kWh per year*

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.

The Management Plan identified that the micro hydropower generation could operate the entire time the water is running through the pipe from May 15th to October 15th. The turbine would operate for 3,672 hours during that period. The micro hydro generator produces 15kW and would generate 55,080 kWh per year.

<u>Available Energy</u>
*P = Efficiency * 62.4 * Q * H * 1.356*
P = Potential Energy
Q = Flow (cfs)
H = Head (feet)
Efficiency = 75%

Q = 2,085 gpm = 4.65 cfs
H = 23 psi = 53 feet

*P = 0.75 * 62.4 * 4.65 cfs * 53 ft * 1.356 = 15,640 W or 15.64 kW*

Available Energy 15.64 kW

<u>15kW Turbine</u>
A 15kW hydropower turbine can be used to replace the PRV station and over the 5-month irrigation season would generate 55,080 kWh per year.

*Energy Production: 15kW * 153 days * 24 hours = 55,080 kWh per 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:

- *Expected environmental benefits of the renewable energy system*

This renewable energy source will operate during the months of the peak electrical power is used and could be used by local farmers to offset power usage for some of their out buildings and other facilities that are located near the micro-hydro station. This micro-hydro station will contribute to reducing the need to use more fossil fuels to meet the energy demands of the farmers.

- *Any expected reduction in the use of energy currently supplied through a Reclamation project*

Electricity along the Wasatch Front comes from a variety of sources. One of those sources is the hydropower at Rockport Reservoir which is a Reclamation project. It is unlikely that this project will have any impact on hydropower generation from the Reclamation projects in the area.

- *Anticipated beneficiaries, other than the applicant, of the renewable energy system*

Although this is a small amount of power in the overall scheme of things, the power generated will allow WPIC to sell the power to farmers that have limited access to power for their outbuildings.

- *Expected water needs of the renewable energy system*

The micro-hydro generator will be placed alongside a PRV station and will be operated by the water that flows through the pipe. No additional water will be needed to operate the generator.

Evaluation Criterion D: Addressing Adaptation Strategies

- Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project and how the proposed WaterSMART Grant project would help implement the adaptation strategy.

In the *Colorado River Basin; Water Supply and Demand Study Update Plan* (2013) there are six options submitted that related to agricultural water conservation measures listed to reduce demand in areas receiving Colorado River supply. They consist of advanced irrigation scheduling, deficit irrigation, on-farm irrigation system improvements, controlled environment agriculture, conveyance system efficiency improvements, and fallowing of irrigated lands. Many of these options were related to specific agricultural conservation programs in two categories: (1) implementation approaches which are incentive-based programs and (2) water transfers that might provide additional opportunities for conservation in the Colorado River Basin as a whole.

The project is consistent with this study as well as the State Regional Water Plan for the Weber River Basin in that the project address irrigation efficiency, leak detection, and loss control. In the "Weber River Basin Planning for the Future" document prepared in September 2009 it states:

> *"The challenges facing the Weber River Basin are complex – solutions will involve many stakeholders and may stir emotional public debate and scrutiny...In order to meet future water needs, water planners and managers within the Weber River Basin must promote effective water conservation programs and measures. They must also ensure that agricultural water conversions are transferred to meet both indoor and outdoor urban water needs, and implement innovative water management strategies. This, along with carefully planned water developments, will secure sufficient water for the future."*

The Weber River Basin Plan of 2009 indicates, in Chapter 4, several conservation goals that they would like to implement, most of which this project will help to satisfy. The specific goal that this project will help implement is to help reduce outdoor use through better monitoring and more efficient application and delivery of the water.

The 2009 Plan is available at http://www.slideshare.net/StateofUtah/weber-river-basin-2009-water-plan

- Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.

This project has two implementation approaches defined in the 2013 Plan: incentive-based programs and water transfers. It is indicated that the water conservation programs should address the following issues:

- Conserved water needs to be measurable by a reduction in demand, conservation measures need to be easily observable, and, where costs are not prohibitive, should be verified by volumetric water use measurement.
- Legal mechanisms must be in place to protect conserved water in-stream for intended uses, especially in areas where insufficient stream flow currently limits downstream water users from exercising their full diversion rights.
- Controls may be needed to prevent expansion of effectively irrigated areas associated with water conservation investments.
- Continuing to maintain a healthy agricultural economy and development of associated policy.

This project will focus on improvements in conveyance system efficiency through delivery and improved pressurized pipes. It will have measurable conservation and will protect flows to help ensure that water users will be able to exercise their full diversion right; at present they are not always receiving their full right.

The 2009 State Water Plan indicates that "as the basin's population grows, so will the demand for water." This project will help WPIC reduce the extreme loss in their system that hinders them in delivering a full right of water to its users.

- Identify the applicant's level of involvement in the Basin Study (e.g., cost- share partner, participating stakeholder, etc.).

WPIC is a member of Weber River Water Users Association (WRWUA) that participates in this type of planning with Reclamation.

- Describe whether the project will result in further collaboration among Basin Study partners.

This project will require the collaboration with WRWUA, Richville Ditch Company, East Porterville/Mustard Ditch, Utah Department of Natural Resources, Trout Unlimited, and others who are major shareholders in East Canyon Dam, East Canyon Creek, and the Weber River. It will allow for the collaboration between all these parties and WPIC as they design the project.

Evaluation Criterion E: Expediting Future On-Farm Irrigation Improvements

If the proposed projects will help expedite future on-farm improvements, please address the following:

- Include a detailed listing of the fields and acreage that may be improved in the future

WPIC provides water to approximately 114 shareholders. The system will be designed to deliver the proper pressures for an agricultural sprinkler system. This project will be a positive move toward ensuring that shareholders will receive their shares of water through a delivery system that is piped so losses are minimal and conservation is maximized, the environment is protected, instream flows are maintained to service fish flows, and water users receive their full right.

WPIC is aware of three of the largest shareholders that have made contact with their local NRCS office to apply for AWP Program to upgrade the laterals from the main line that are currently in very poor condition. Water users that would use NRCS funds for on-farm and near farm lateral upgrades include:

1. John Wilkinson 95 Shares
2. Var Stephens 60 Shares
3. Rodney Rose 40 Shares
4. R. Aaron Rose 32 Shares

See Attachment C – Letters of Commitment

- Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.

With the current system pressures fluctuate greatly which decreases the reliability and efficiency of the existing sprinkling systems. The new delivery system will provide more consistent pressures to the sprinklers. Many of the laterals delivering water to the farms from the main delivery system are in poor condition and need to be replaced in order for the existing sprinkling systems to function as designed and to deliver the water more efficiently. Upgrading the laterals will allow for higher crop yields and fewer seepage losses that are happening in the near-farm and on-farm lateral lines.

- Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.

This project will provide:

- a pressurized system that is efficient and with no water loss that can be used to supply on-farm sprinkler systems
- access to stream flows that will allow water users to exercise their full diversion rights
- better management, metering, and monitoring of the system

- Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.

Based upon calculations and information submitted already as part of this application returned savings in water for agriculture would be estimated at between 8 to 10% water savings. Better use of the water will come about by reducing water wasting and losses due to seepage and pipe failures.

- Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of farmers/ranchers who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ ranchers in the affected project areas.

The four landowners previously listed have expressed strong interest in participating in NRCS funding programs to accomplish similar goals as are contained in this application. These projects will allow for effective irrigating, conservation, and the ability to exercise a full water right. The NRCS projects would account for 27% of the water shares within WPIC. See Attachment C – Letters of Commitment

- Describe the extent to which this project complements an existing NRCS- funded project or a project that either has been submitted or will be submitted to NRCS for funding.

WPIC is not aware of any other funded projects at this time.

Evaluation Criterion F: Implementation and Results

Subcriterion No. F.1: Project Planning

- *Does the project have a Water Conservation Plan and/or System Optimization Review (SOR) in place. Please self-certify, or provide copies of these plans where appropriate to verify that such a plan is in place.*

Provide the following information regarding project planning:

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

Yes, WPIC completed a Water Management and Conservation Plan funded by WaterSMART Water Conservation Field Service Program this past year. The purpose of this study was to assess the condition of the existing delivery system and provide a plan to modernize and improve the system. This project was the highest priority and only project listed in the plan.

The existing pipe system was constructed in 1976 of secondhand Transite pipe and is in very poor condition. This past year the water supply coming from Hardscrabble Creek dropped considerably due to the unrelenting, hot and dry summer months. WPIC conducted testing as part of the Management Plan in May 2016 to determine the amount of water that the aging system was leaking. The test results confirmed that the system was losing approximately 800 gpm at full pressure with nobody watering. The extremely low water in the Creek and the leaking system create a combination of conditions that are tough to manage. The current flow of the creek at seven cfs would support 580 sprinkler heads with 11/64" nozzles at 40 pounds of pressure. However, WPIC is currently only able to efficiently run water to the homes and just over half of that amount of birds (240 sprinkler heads) with the leaks taking the rest.

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

Along with the WPIC Water Management and Conservation Plan, West Porterville also is in aligning with the plan developed with Weber River Waters Users' Association. The developed of the WRWUA "Water Management and Conservation Plan" in 2009 with a Reclamation grant, addressing the needs for the Weber River Basin. The Weber River Basin Plan of 2009 indicates, in Chapter 4 of the plan, several conservation goals that they would like to implement, most of which this project will help to satisfy. The specific goal that this project will help implement is to help reduce outdoor use through monitoring and more efficient application and delivery of the water.

The Weber River Water Users' Association has a number of goals and issues that this project will help to fulfill. The proposed project will keep more water in the Weber River and East

Canyon Creek. This project is also consistent with the State Regional Water Plan for the Weber River Basin. In the "Weber River Basin Planning for the Future" document prepared in September 2009 it states:

> *"In order to meet future water needs, water planners and managers within the Weber River Basin must promote effective water conservation programs and measures. They must also ensure that agricultural water conversions are transferred to meet both indoor and outdoor urban water needs, and implement innovative water management strategies. This, along with carefully planned water developments, will secure sufficient water for the future."*

Subcriterion No. F.2: Support and Collaboration

Does the project promote and encourage collaboration among parties? Consider the following:

1. Is there widespread support for the project?
   Yes, the users in this project area want the project and so does the Morgan City and Morgan County. They know that they have to do something to secure their water rights and help reduce failures in the system.

2. What is the significance of the collaboration/support?
   Collaboration with all parties have been happening over the past ten years with Weber River Water Users, East Canyon Watershed Committee, users, county, state and federal agencies, and others.

3. Will the project help to prevent a water-related crisis or conflict?
   The 40-year-old pipe has deteriorated causing seepage losses, failures, and breaks in the system which in turn has a great impact on the irrigation and residential users. With the issue of leakage and breaks, residential users turn to culinary water to supplement their water for lawn and gardens. This project will reduce those failures and give back a secure distribution system allowing for less of an impact and lessen the tension between residential users.

4. Is there frequently tension or litigation over water in the basin?
   There is always tension when it comes to water. Natural disasters, drought, and un-maintained pipes and ditches seem to be the major factors in developing tension within any service area. The collaboration between agricultural users, other irrigation companies, and residential users is significant and can help promote cooperation in the future. By WPIC working toward better and more efficient water management tension can be reduced.

5. Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?
   This project is the result of a similar project constructed in the area – Echo Dich Company, East Wanship, Hoytsville Irrigation, North Summit Irrigation, etc. WPIC has seen the

benefits of those projects to their shareholders and better, understands the need to conserve and be more efficient with one of their most valuable renewable resources. With water being the life blood of their farms and for many their livelihoods they cannot afford to wait. The project will educate others to understand better that conservation is not losing your water right but being more efficient and productive with your water right. Shareholders of WPIC understand that by modernizing, piping, and fixing your system, you can have higher crop yields that intern brings more economic benefit to the area.

Subcriterion No. F.3: Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved). For more information, calculating performance measure, see Section D.2.2.5 Performance Measures.

This project has meters within the system that will be used to measure water use within the main diversion system. An inflow/outflow test over the irrigation season will be done to determine the water what enters the system and what water leaves the system. The water will be metered to account for the volume/flow rates. These will be compared with the historical volumes and flow rates diverted from the river and will give a comparison by which to verify water savings. Also after the pipe is installed it will be filled with water and all of the turnouts closed. The system meter will be checked to verify that it is reading zero and that there are no loses in the closed system.

The Field Service Water Conservation and Management Plan included a feasibility evaluation for micro-hydroelectric power generation. The assessment made some assumptions by estimating the power of free-flowing water and with the timeline (May – October) in which the turbine would be in operation to calculate the amount of kWh that would be generated. The performance measures will use these calculations to make a comparison of the actual number of kWh that will be recorded on the meter. A reading of the meter will be made monthly and recorded. Then a calculation and comparison will be established to show the performance measures. These monthly reports will be summarized annually in November and reported to the WPIC Board. An evaluation of the energy being sold to local farmers will be reported on and evaluated.

Evaluation Criterion G: Additional Non-Federal Funding

$1,099,077 Non-Federal Funding
$2,099,077 Total Project Cost = 53%

Evaluation Criterion H: Connection to Reclamation Project Activities

1. How is the proposed project connected to Reclamation project activities?
   A percentage of water supplied for WPIC comes through East Canyon Creek through East Canyon Dam which is a Reclamation project.

2. Does the applicant receive Reclamation project water?
   Yes. WPIC receives water through East Canyon Creek through East Canyon Dam, which is a Reclamation project

3. Is the project on Reclamation project lands or involving Reclamation facilities?
   No.

4. Is the project in the same basin as a Reclamation project or activity?
   Yes, the project is located in the Weber River Basin where a number of Reclamation projects are located.

5. Will the proposed work contribute water to a basin where a Reclamation project is located?
   Yes, as the project conserves water and reduces losses WPIC can maintain instream flows within Hardscrabble and East Canyon Creeks and will help contribute to the storage and potential flows in the Creeks and the Weber River allowing for enhancing habitats and recreational opportunities. Conserved water will be delivered through the Weber River to Willard Bay which is a Reclamation project.

6. Will the project help Reclamation meet trust responsibilities to Tribes?
   No.

Environmental and Cultural

1. *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.*

   Impacts will be those associated with piping and installing PRV's in right-of-ways and within/near existing pipe locations. The proposed project improvements will take place entirely within the existing right-of-ways. In the past, similar projects have had minimal impacts. The surface vegetation will be restored upon completion of the project.

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?*

   WPIC is not aware of any impacts concerning threatened or endangered species in this area. A comprehensive investigation will be done as part of the required environmental process.

3. *Are there wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act (CWA) jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.*

   WPIC is not aware of any impacts to wetlands. A comprehensive investigation will be done as part of the required environmental process.

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

   The system was built in 197o's and many improvements have been made over the years. As part of the completed environmental document the required historical documentation for the project will be completed.

5. *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 reservoir outlet structure will be slightly modified to connect to the new pipe. The structure was constructed in the 1970's. This project will install new pipe alongside the existing pipe which will remain in place.

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.*
   WPIC is not aware of any building, structures or features that would qualify. A cultural resource inventory will be completed as part of the submitted environmental document.

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

   WPIC is not aware of any impacts to or locations of archeological sites. A comprehensive investigation will be done as part of the required environmental process.

8. *Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?*
   No. The project would not require a right-of-way or relocations from adjacent properties and would have no impact on residential uses within the study area.

9. *Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*
   No.

10. *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?*
    No.

Letters of Project Support

Trout Unlimited – Paul Burnett, Weber River Project Coordinator

Utah Division of Wildlife Resources – Clint Brunson, Aquatics Habitat Restoration Biologist

Trout Unlimited
1777 N Kent Street, Suite 100
Arlington, VA 22209
(703) 522-0200

January 13, 2017

John Wilkinson
General Manager
West Porterville Irrigation Company
1200 East 100 South
Morgan, UT 84050

Dear Mr. Wilkerson:

Over the past several years, Trout Unlimited has had the great opportunity and privilege to be involved in a positive effort within the Weber River Watershed, known as the Weber River Partnership, which represents a broad and diverse array of interests within the basin. The Weber River Partnership has made great progress in the Weber River by providing a platform for communication, coordination and collaboration among the diverse stakeholders and we believe this diversity has brought considerable value to developing a cohesive vision that includes water security, agricultural interests, community development and natural resources values.

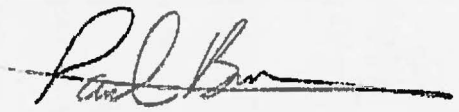
Trout Unlimited has been working on the ground with a number of partners throughout the Weber River Basin, including the Utah Division of Wildlife Resources, agricultural producers and water users to protect and restore populations of Bonneville cutthroat trout and bluehead sucker though habitat restoration, fish passage and water efficiency projects. The bluehead sucker and Bonneville cutthroat trout populations have declined and are considered to be in jeopardy and petitions for listing under the Endangered Species Act are possible.

Understandably, all partners in the watershed benefit by preventing the listing of imperiled species, but beyond that, we believe that many watershed partners also greatly value the fact that these species still persist in the Weber River, a sign of the great resilience of these native species and a reflection of the rich economic vitality they bring to our communities. Nevertheless, these species need our help and a cohesive strategy through the Weber River Partnership broadens the scope of our actions on the ground to provide broad benefits to all stakeholders in the Basin.

Trout Unlimited is supportive of your proposed project through WaterSMART funding to greatly improve the water conveyance efficiency of your irrigation system and reserve a portion of the water efficiency savings to be protected in-stream. We believe your proposed actions are complimentary to your past actions of irrigation diversion reconstruction and fish passage on

Hardscrabble Creek. Lower Hardscrabble Creek is frequently exposed to chronic low water conditions, which have negatively affected the Bonneville cutthroat trout population over time. We are encouraged by your consideration of the ecological values of the native fish population and their water needs as a beneficiary of a portion of your conveyance efficiency savings. We support your proposal and are committed to working with you on as the project develops.

With Kind Regards.



Paul Burnett - Weber River Project Coordinator
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GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Wildlife Resources
GREGORY SHEEHAN
Division Director

January 6, 2017

John Wilkinson
West Porterville Irrigation Company
1200 East 100 South
Morgan, Utah 84050

Subject: U.S. Bureau of Reclamation WaterSMART Water Efficiency Grant

Dear Mr. WilkinsonSmith:

As the Aquatics Habitat Restoration Biologist in Northern Utah for the Utah Division of Wildlife Resources (UDWR), I am pleased to write in support of the grant application you are submitting to the U.S. Bureau of Reclamation Water and Energy Efficiency Grants Program. I applaud your efforts to increase the efficiency of your system to conserve valuable water and energy. All water savings in the Weber River are valuable to ensure that we have adequate water for future generations.

The Bonneville cutthroat trout and bluehead sucker are native fish species found in portions of the Weber River. Both species are covered by conservation agreements the State of Utah has entered into with the U.S. Fish and Wildlife Service and other parties. The population status of these two sensitive species warrants additional conservation effort to diminish the likelihood of future listings under the Endangered Species Act. UDWR's approach to aquatic species conservation and management in the Weber River, in part, focuses on reconnecting and maintaining connectivity of priority habitats by removing unnecessary barriers to fish migration, or by modifying existing barriers to allow upstream movement of these species, particularly for Bonneville cutthroat trout and bluehead sucker. Naturally of course, stable and connecting flows between those habitats are a fundamental requirement for those conservation actions to be successful. Within that context, most any project that enhances the continuity and maintenance of flows within the Weber River is a step in the right direction, as we work cooperatively to protect and conserve these native species.

The Weber Basin Water Conservancy District has been a great partner and contributed to a graduate student project that is currently studying bluehead sucker in the Weber River. The outcome from this study will be to determine important spawning locations (including spawning habitat requirements) and the type of low velocity/backwater habitats needed for juvenile bluehead sucker survival and recruitment. The results from this study will guide future management of bluehead sucker in the Weber River into the future and will help guide future habitat restoration projects.

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UTAH DNR WILDLIFE RESOURCES

The population of Bonneville cutthroat trout in the lower Weber River is quite unique in that they travel significant distances in the main stem Weber River and ultimately up into tributary streams to spawn. This life history attribute has been lost from almost all Bonneville cutthroat trout populations, but still persists in the Weber River! We are very excited regarding the objective in this grant application that specifically addresses two specific lengths of canal needing repair. Water saved by piping both reaches of canal will benefit both Bonneville Cutthroat Trout and bluehead sucker in the lower stretches of the Weber River. Both the UDWR and TU are fully committed to partner with the West Porterville Irrigation Company to ensure that as the work on the pipe is completed, thus allowing more water for fish use in the lower Weber River. This project will help ensure that Bonneville cutthroat trout and bluehead sucker do not become a federally listed species under the Endangered Species Act in the future.

Sincerely

Clint Brunson
Aquatics Habitat Restoration Biologist
Utah Division of Wildlife Resources

Required Permits or Approvals

A FERC permit will be required for the small hydro turbines as well as a power sales agreement. Documents for the small hydro and power sales agreement have been obtained and information required to complete these has been assembled and submitted with a previous project.

Official resolution

The Official Resolution will be submitted by February 18, 2017

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).

The West Porterville Irrigation Company has committed $166,428 cash reserve account and request a loan of $943,096 from the Board of Water Resources. The application has been completed and will be submitted in February 2017 for Board review.

2. Describe any costs incurred before the anticipated Project start date that you seek to include as project costs. For each cost, identify:

There is no incurred project cost included in this project.

3. Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.

The West Porterville Irrigation Company will submit an application to the Utah Board of Water Resources for a loan in the amount of $943,096. The Irrigation Company has discussed the project with David Humphreys, the Weber River District Board Member, he is aware of the project and indicated that the Board funds more than 90% of loan requests.

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

N/A

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

As stated above, a loan application will be submitted to the Utah Board of Water Resources. The WPIC has been in communication with David Humphreys and he said the loan requests are very rarely denied; they fund more than 90% of loan requests.

For a project with such significant water and energy savings, WPIC feels confident that they will receive the loan from the Board of Water Resources. If the funding were to be denied, they may look to the open market.

FUNDING SOURCES	*FUNDING AMOUNT*
Non-Federal Entities	*$1,109,525*
$166,428 cash from WPIC	
$943,096 Board of Water Resources Loan	
Non-Federal Subtotal	*$1,109,252*
Other Federal Entities	*$0.00*
Other Federal Subtotal	*$0.00*
Requested Reclamation Funding	*$1,000,000*
Total Project Funding	*$2,109,525*

Budget Item Description	Computation		Quantity Type	Total Cost
	Quantity	Unit		
Salaries and Wages		$0.00		$0.00
Fringe Benefits		$0.00		$0.00
Travel		$0.00		$0.00
Equipment		$0.00		$0.00
Supplies/ Materials		$0.00		$0.00
Contractual/Construction				
Design (8%)	1	$141,000.00	EA	$141,000.00
Construction Management (7%)	1	$124,000.00	EA	$124,000.00
Mobilization	1	$ 93,000.00	EA	$ 93,000.00
18" HDPE DR 32.5 PIPE	7900	$42.00	LF	$331,800.00
18" HDPE DR 26 PIPE	2100	$46.00	LF	$96,600.00
18" HDPE DR 21 PIPE	2850	$50.00	LF	$142,500.00
14" HDPE DR 32.5 PIPE	1725	$33.00	LF	$56,925.00
12" HDPE DR 26 PIPE	2000	$30.00	LF	$60,000.00
10" HDPE DR 26 PIPE	3200	$24.00	LF	$76,800.00
8" HDPE DR 26 PIPE	5300	$23.00	LF	$121,900.00
Connect to Reservoir	1	$15,000.00	EA	$15,000.00
Fittings	1	$90,000.00	LS	$90,000.00
Air Vents	19	$4,000.00	EA	$76,000.00
Connect to Existing Lines	22	$10,000.00	EA	$220,000.00
Micro Hydro/PRV	1	$110,000.00	EA	$110,000.00
Screening Structure	1	$25,000.00	EA	$25,000.00
Connect to Piping	1	$10,000.00	EA	$10,000.00
Road Crossings	1	$10,000.00	EA	$10,000.00
Surface Restoration	1	$100,000.00	EA	$100,000.00
Imported Backfill	3000	$15.00	TON	$45,000.00
Mic. Transite Pipe Disposal	1	$20,000.00	EA	$20,000.00
Reservoir Excavation	3000	$25.00	CY	$75,000.00
NEPA & Cultural	1	$53,000.00	EA	$53,000.00
Reporting	1	$5,000.00	EA	$5,000.00
Administration	1	$10,000.00	EA	$10,000.00
Other		$0.00		$0.00
Total Direct Costs				$2,109,525.00
Indirect Costs		$0.00	-	$0.00
		Total Project Cost		**$2,109,525.00**

Salaries & Wages

No WPIC Salaries or Wages will be included. All services will be contracted.

Fringe Benefits

No fringe benefits will be required.

Travel

No travel will be required.

Equipment

Equipment will be part of the contracted portion of the project.

Materials and Supplies

Materials and Supplies will be part of the contracted portion of the project and will be documented as required.

Contractual

In order to determine unit costs which were included in the cost estimate for this project, WPIC relied upon contract unit prices from similar projects recently bid in 2016.

WPIC will bid the construction portion of the project to several prequalified construction companies. The contractual costs shown are estimates for each of the components to furnish and install all the equipment. Generally, the low bidder will be selected based on a determination of acceptable qualifications.

Contractual will include design, construction engineering, reporting, administration, mobilization, NEPA, and installing the following:

18" HDPE DR 32.5 PIPE	7900	$42.00	LF
18" HDPE DR 26 PIPE	2100	$46.00	LF
18" HDPE DR 21 PIPE	2850	$50.00	LF
14" HDPE DR 32.5 PIPE	1725	$33.00	
12" HDPE DR 26 PIPE	2000	$30.00	LF
10" HDPE DR 26 PIPE	3200	$24.00	LF
8" HDPE DR 26 PIPE	5300	$23.00	LF
Connect to Reservoir	1	$15,000.00	EA
Fittings	1	$90,000.00	LS
Air Vents	19	$4,000.00	EA

Connect to Existing Lines	22	$10,000.00	EA
Micro Hydro/PRV	1	$110,000.00	EA
Screening Structure	1	$25,000.00	EA
Connect to Piping	1	$10,000.00	EA
Road Crossings	1	$10,000.00	EA
Surface Restoration	1	$100,000.00	EA
Imported Backfill	3000	$15.00	TON
Mic. Transite Pipe Disposal	1	$20,000.00	EA
Reservoir Excavation	3000	$25.00	CY

Environmental and Regulatory Compliance Costs

The environmental document for this project is anticipated to be a categorical exclusion in that all the work will be located in the existing pipeline easements. The cost was included as 3% of the project at $53,000.

Reporting

WPIC staff in conjunction with J-U-B Engineers will prepare the reports at $5,000.

Other Expenses

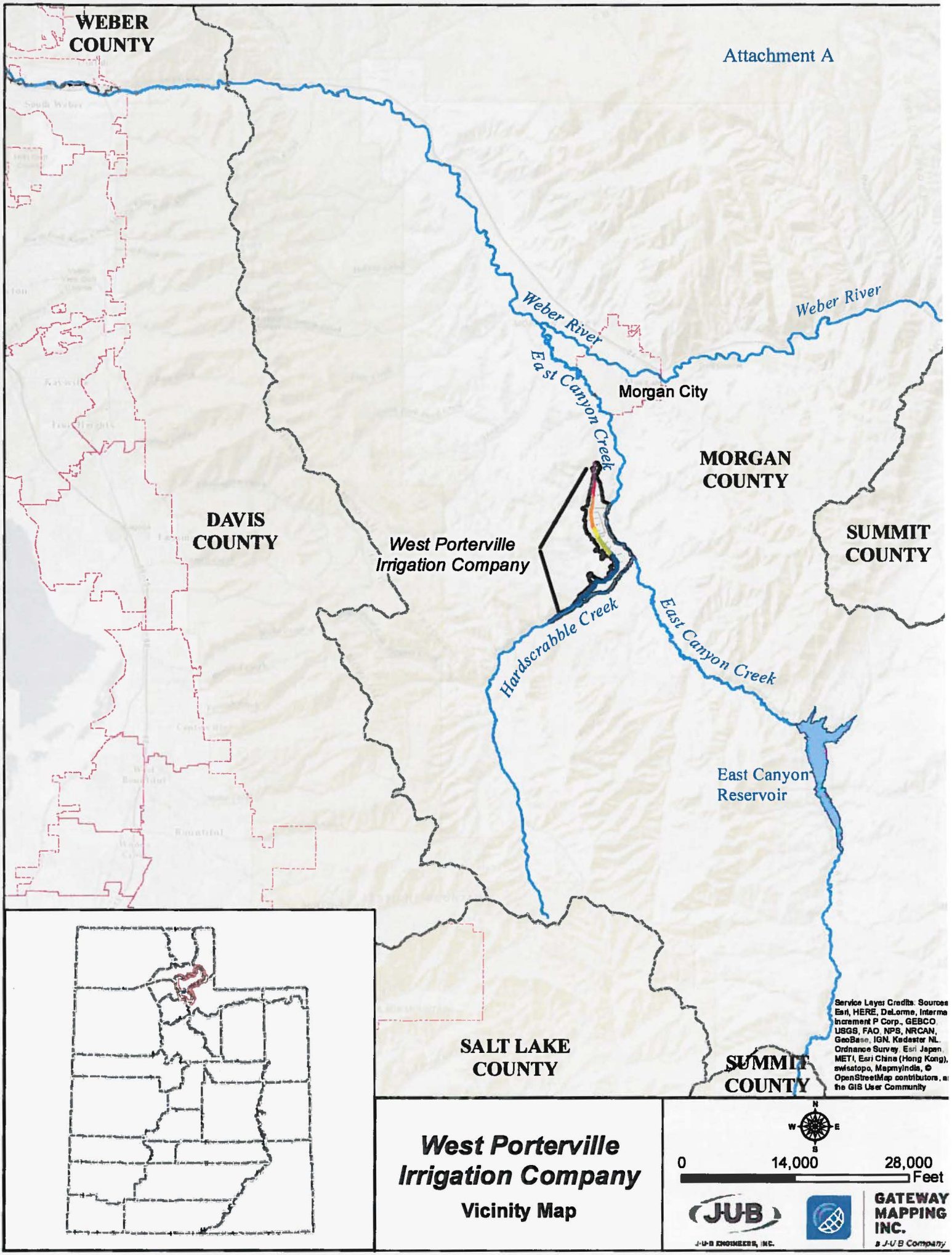
J-U-B Engineers will work with WPIC to review and administer all the billings from the contractor, attend meetings, and report to the board on the project regularly at $10,000.

Indirect Costs

No indirect costs will be part of the project.

Total Costs

WPIC Portion	Fed Portion	Total
$1,109,525	$1,000,000	$2,109,525

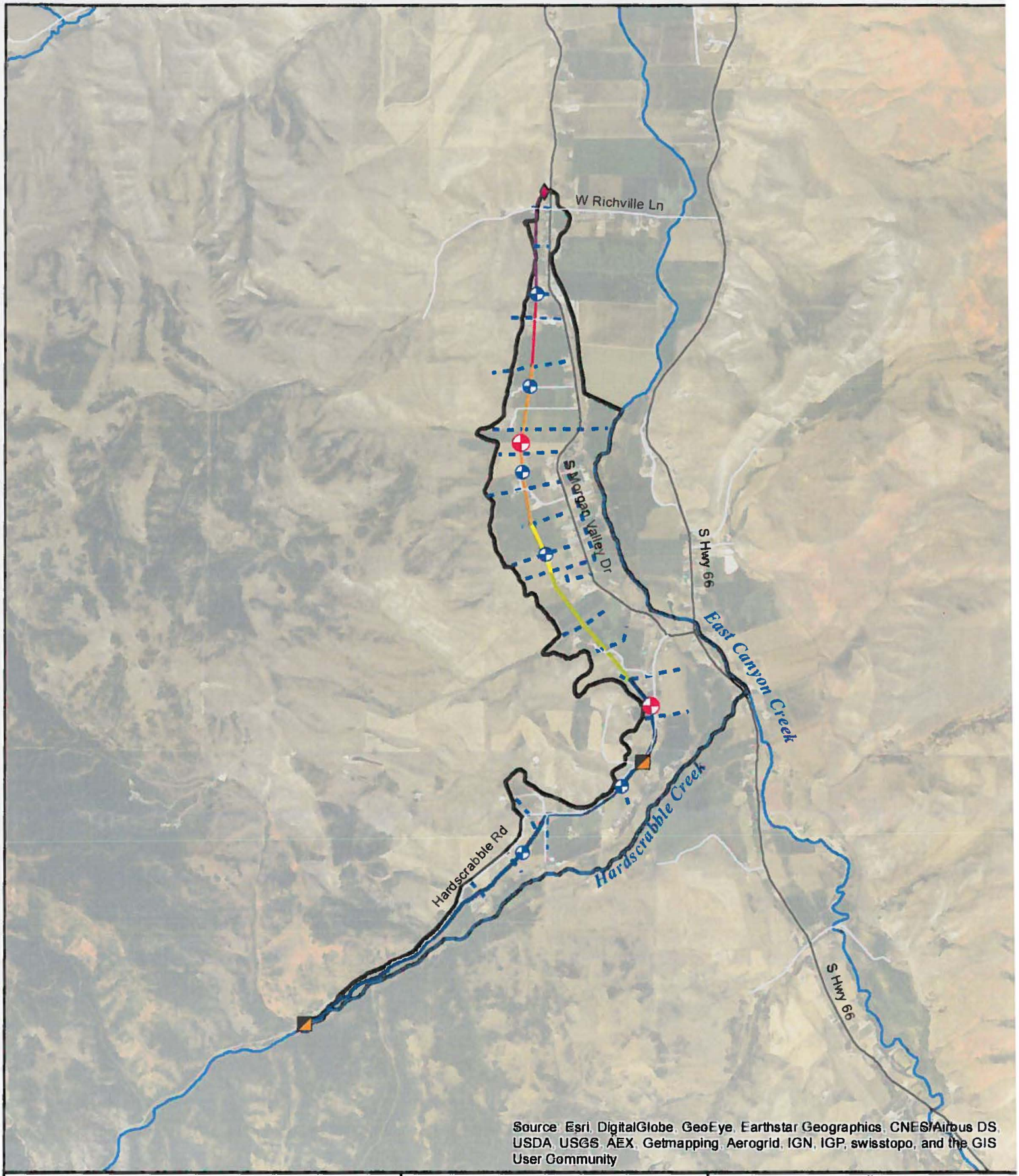


West Porterville Irrigation Company

Vicinity Map

JUB ENGINEERS, INC.

GATEWAY MAPPING INC.
a J-U-B Company



West Porterville Irrigation Pipeline

- 6 inch
- 8 inch
- 10 inch
- 12 inch
- 14 inch
- 16 inch
- Laterals

- Air Vac
- Headgate
- End of Line
- Gate Valve
- PRV
- WPIC Service Area

West Porterville Irrigation Company

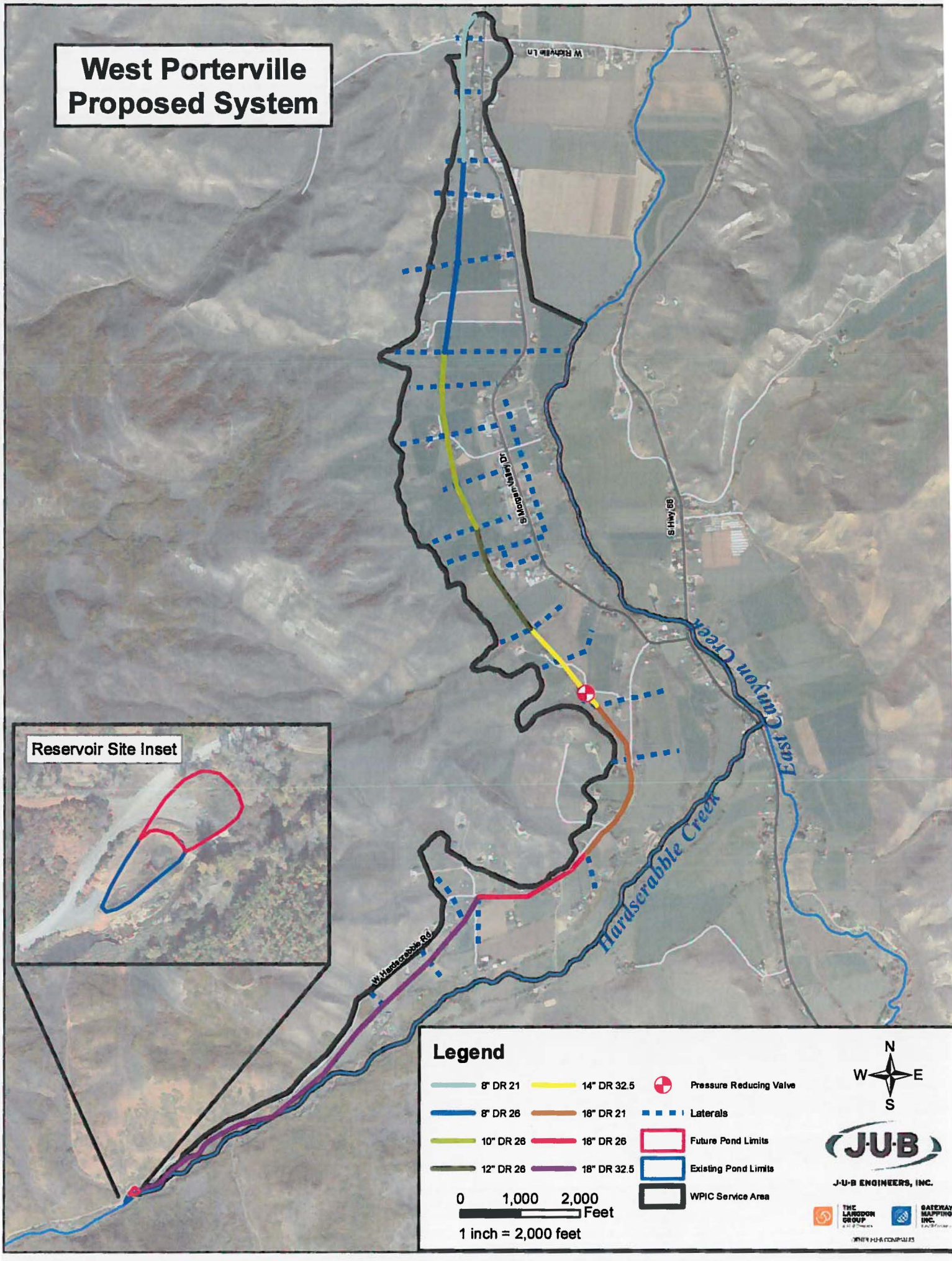
System Map

N
W E
S

0 3,000 6,000 Feet

JUB ENGINEERS, INC.

GATEWAY MAPPING INC.
a JUB Company


West Porterville
Proposed System
Reservoir Site Inset
W Hardscrabble Rd
S Main Ln
S Hwy 65
East Canyon Creek
Hardscrabble Creek
Legend
8" DR 21
8" DR 26
10" DR 26
12" DR 26
14" DR 32.5
16" DR 21
16" DR 26
18" DR 32.5
Pressure Reducing Valve
Laterals
Future Pond Limits
Existing Pond Limits
WPIC Service Area
0 1,000 2,000
Feet
1 inch = 2,000 feet
N
W
E
S
J-U-B
J-U-B ENGINEERS, INC.
THE LANGDON GROUP
GATEWAY MAPPING INC.

2 - SYSTEM EVALUATION

2-1 Existing Diversion

The existing diversion is located on Hardscrabble Creek approximately 3 miles up Hardscrabble Canyon from the intersection at State Road 66. Water is split as it flows through a flume with 3/5ths of the stream flow being diverted into a small reservoir. The existing reservoir has a volume estimated to be about 2 acre-feet. The water is screened through a cage screen as it leaves the reservoir.

The instream flume and splitting mechanism are in good condition and seem to proportionally split the flow and screen out bigger debris.

The finer screening at the reservoir does not appear to be able to filter out the floating debris to the extent preferred for residential and agricultural sprinkling. The screen cage is located in the middle of the reservoir with access provided by a grated catwalk. Any floating debris that builds up on the screen would be difficult to remove from the reservoir once it's cleaned off of the screen.

2-2 Existing Delivery System

The existing pipe system was constructed in 1976 and is in very poor condition.

2-2-1 Pipe Condition

The existing pipe is 25,000 feet of 16" through 6" Transite pipe. The pipe experiences constant sever leaking despite many efforts to repair the pipe. Most of the leaking is from deteriorating pipe joints with nearly every joint in the system experiencing at least some leakage. Approximately 80% of the pipe runs through open ground and the rest is within the highway shoulder so most of the leaking does not harm existing structures or other surface improvements.

The existing system includes two Pressure Reducing Valves (PRV). One is located about 12,000 feet down from the pipe inlet and the other about 19,000 feet. Both are located in open fields.

2-2-2 Water Loss Study

A water loss study was conducted on May 12, 2016. An ultrasonic flow meter was temporarily installed at a convenient location near the beginning of the pipeline. The system

was charged and then all services and flush valves were closed. With every valve closed, the flow through the meter was 826 gpm. Next the mainline was closed at the upper PRV. The flow through the system with the PRV valve closed was 260 gpm which indicates that the more severe water loss in the system is in the lower half. These losses due to leakage are very significant.

2-3 System Demands

Information provided by WPIC is that each share represents 4.5 gpm during High Flow conditions. The total system demand for all 760 shares equates to 3,420 gpm. The system was modeled using this demand.

3 – PROJECT IDENTIFICATION

3-1 Generation of Improvement Alternatives

Using the flow and elevation data gathered, the system was evaluated in a hydraulic model. The modeling software used was Innovyze's InfoWater running in ArcGIS. The initial improvement considered was replacing the existing pipe within the existing alignment.

In addition to piping improvements, the settling pond and screening were also considered. Natural Resource Conservation Service (NRCS) Design Standards were considered in the evaluation of improvement alternatives.

Alternatives generated evaluated internally by J-U-B ENGINEERS, Inc., as well as with WPIC and representatives for the individual ditches. This evaluation looked at these initial alternatives to consider how they might be modified to be more efficient and still serve the needs of the irrigators. As a minimum the following criteria were considered:

1. Alignment adjustments
2. Combining ditches
3. Non-piping project considerations

As more efficient alternatives emerged, it became necessary to generate preliminary cost estimates to continue with the evaluation of and comparison between alternatives. These cost estimates were based on pricing data from recent projects, material suppliers and local contractors. Cost estimates within this report are presented in present day dollars.

A project map is located in Appendix A and cost estimates of the different project alternatives are included in Appendix B.

3-2 Improvement Project Descriptions

3-2-1 Replace Existing Transite Pipe

The most glaring and obvious problem with the system is the severe leakage of the existing Transite pipe. An alternative to replace the pipe includes installing new pipe adjacent to the existing pipe without removing the Transite pipe which would be abandoned in place. Pipe materials considered included High Density Polyethylene (HDPE) and Polyvinyl Chloride (PVC).

3-2-1-1 HDPE

HDPE pipe is well-suited to installations that follow meandering alignment as it can be deflected without requiring fabricated joints. Also, HDPE has heat-fused joints which are at least as strong as the pipe wall itself and can withstand some ground movement and resulting deflection without any damage to the joint. Installation requires specialized equipment to perform the joint fusion and connect fittings or services.

This alternative included the installation of 25,000 feet of 18"to 8" HDPE pipe and a PRV approximately midway. Specific pipe diameters, dimension ratio and lengths are listed here.

18" HDPE DR 32.5 PIPE	7900	LF
18" HDPE DR 26 PIPE	2100	LF
18" HDPE DR 21 PIPE	2850	LF
14" HDPE DR 32.5 PIPE	1725	LF
12" HDPE DR 26 PIPE	2000	LF
10" HDPE DR 26 PIPE	3200	LF
8" HDPE DR 26 PIPE	5300	LF

3-2-1-2 PVC

The existing piped system was constructed with a rigid pipe material so it can be assumed that it followed straight alignments as much as possible to minimize pipe bends. If the new pipe is installed along that same alignment, it can be assumed that pipe bends can be minimized. PVC can be installed with traditional methods without the need for specialized equipment. Similarly, future repairs can be done without specialized equipment.

This alternative includes the installation of 25,000 feet of 18" – 8" PVC pipe and a PRV approximately midway. Specific pipe diameters, dimension ratio and lengths are listed here.

18" C900 PVC	13,000	LF
14" C900 PVC	1725	LF
12" C900 PVC	2000	LF
10" C900 PVC	3200	LF
8" C900 PVC	5300	LF

3-2-2 Expand Existing Reservoir

The existing reservoir could be expanded to land that is available to the north and east. The volume could be doubled to approximately 4 acre-feet. Expanding the reservoir would provide more storage volume for equalization during periods of fluctuating demand and inflow. It would also provide more time for settling out the water especially during spring runoff.

The existing screening system has worked well but would need to be reconstructed as the reservoir is expanded.

3-2-3 Hydroelectric Considerations

Both the existing and proposed piping include a PRV about midway to regulate pressure. An alternative to a traditional PRV would be a micro hydro which would generate power while regulating pressure. A traditional PRV would still be required parallel to the micro hydro in case of failure of the micro hydro and the need to by-pass water. The additional cost to incorporate a micro hydro into the PRV vault would include the 15kW micro hydro unit which could produce 55,080 kWh per year over 135 days running 24 hours a day. A larger vault and the electrical inter-connect would be required as well as any permitting. For the purposes of this report that additional cost is estimated to be $110,000. Appendix C contains a breakdown of this analysis.

3-2-4 Combining with Richville Ditch Company

Richville Ditch Company is the ditch located at the bottom of WPIC delivery system that currently has open unlined ditches. Richville owns 80 shares of East Canyon Creek. (East Porterville/Mustard Ditch owns the other 2/5ths of the rights of Hardscrabble Creek.) One component of this feasibility study was to consider the combining of these two water companies. At the time of this report, Richville Ditch Company indicated that they had no interest in combining with West Porterville.

Attachment C Letter of Commitment

Letter of Interest and Commitment January 12, 2017

The following Irrigators' are interested in developing on-farm and near-farm irrigation improvements by participating and requesting AWP or EQIP funding from NRCS. With the development of the proposed WaterSMART Energy Efficiency Grant opportunity for the West Porterville Irrigation deliver system to have a more consistent pressures to run the sprinkler systems for the agricultural users. The following shareholders will have or have already made contact with their local NRCS office to apply for AWP or EQIP Program to upgrade laterals from the main line.

Name	Number of Shares	Signature
John Wilkinson	95	John B Wilkinson
Var Stephens	60	Var Stephens
Rodney Rose	40	Rodney Rose
R. Aaron Rose	32	Aaron Rose by Rodney Rose