Bureau of Reclamation
WaterSMART Water and Energy Efficiency Grants

Davis and Weber Counties Canal Company

Canal Enclosure and Solar Energy Project

FY23

APPLICANT CONTACT:
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Attachments

Technical Proposal and Evaluation Criteria

Executive Summary

Applicant Info

Date: July 27, 2022

Applicant Name: Davis and Weber Counties Canal Company (DWCCC)

City, County, State: Sunset, Davis County, Utah

Project Manager:

Rick Smith
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Applicant Category: Category A

Project Funding Request: $1,800,000 Total Project Cost: $4,500,000

Funding Group: Group II

Project Summary

A one-paragraph project summary that provides the location of the project, a brief description of the work that will be carried out, any partners involved, expected benefits, and how those benefits relate to the water management issues you plan to address.

The Davis and Weber Counties Canal Company Canal Enclosure and Solar Energy Project will conserve an estimated 1,116 acre-feet of water. The project consists of enclosing 1,995 feet of failing open lined canal within the main delivery canal with an 8-foot by 7-foot and 8-foot by 6-foot gasketed precast concrete box culvert. It will enclose Segment 23b (625 feet) and Segment 38 (1,370 feet). With the development of this project, the lower 22,425 feet of the main canal will be newly lined or enclosed, reducing losses and improving safety. In addition, a 20.1 kilowatt (kW) solar array will be installed at the DWCCC maintenance building and shops to generate 31,299 kilowatt-hours (kWh) of energy per year. The canal enclosure projects were identified as priority projects in DWCCC's System Optimization Review (SOR) 2021 Update. They represent a positive step toward achieving the goals of their SOR Plan and the WaterSMART program by implementing methods and materials that have proven successful for water conservation and energy sustainability.

Length of Time and Estimated Completion Date

State the length of time and estimated completion date for the proposed project. ***Note: proposed projects should not have an estimated construction start date that is prior to May 2023.***

The environmental report was previously completed, and a FONSI was issued for this project about seven years ago. Reclamation has indicated that they will require an update and review of the document before proceeding with construction. The project is ready to prepare the final design as soon as the contracts are signed. DWCCC anticipates contracts to be signed by September 2023 and the final design to take place from September 2023 – June 2024. The design for each segment is estimated to take eight to twelve months. The box culvert will need to be constructed outside the irrigation season between October and April. It is anticipated that Segment 38 will be installed from October 2024 – March 2025, and Segment 23b will be installed from October 2025 – March 2026. The solar portion of the project will be constructed

in June/August 2024. The project will be accomplished within the three-year allowance and will be completed by September 2026.

Federal Facility

Whether or not the project is located on a Federal facility.

The project is not directly located on a Federal facility. However, DWCCC receives water from Echo Reservoir and East Canyon Reservoir, which Reclamation owns. This project will permit conservation and better management of DWCCC's water, allowing water to stay in the reservoir longer during the irrigation season, benefiting the habitats and recreational opportunities within the reservoirs.

Project Location

Geographic Location

DWCCC's service area includes communities located in Weber, Davis, Summit, and Morgan Counties, including the cities of West Point, Clinton, Sunset, Layton, South Weber, Kaysville, Roy, Clearfield, West Haven, Riverdale, and Syracuse; with a total population of over 370,000 residents. DWCCC provides secondary water to South Weber, Roy, Clinton, West Point, Syracuse, Layton, and Kaysville. The project latitude for Segment 23b is {112°1'14"W} {41°9'51"N} and Segment 38 is {112°1'17"W} {41°7'10"N}. An overview of the entire service area is shown in the attached maps. See Attachment A – Project Location Map, Attachment B – Detailed Project Map, and Attachment C – Service Area Map.

Technical Project Description

Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work. This description should provide detailed information about the project including materials and equipment and the work to be conducted to complete the project.

The proposed project includes two separate segments along the lower main canal in Roy and Clearfield, Utah. They are Segments 23b and 38 as defined in DWCCC's SOR. The project consists of enclosing Segment 23b – 625 feet of failing open canal liner with an 8-foot by 7-foot gasketed precast concrete box culvert, and Segment 38 – 1,370 feet of failing open canal liner with an 8-foot by 6-foot gasketed precast concrete box culvert. In addition, a 20.1 kW solar array will be installed at the DWCCC maintenance building and shops to generate 31,299 kWh of energy per year.

- **Segment 23b** is located in Roy and consists of an open concrete canal liner installed in 1988. The concrete liner thickness varies with failed areas revealing concrete less than 3 inches thick. The concrete is unreinforced and has no waterstop at the joints. The liner in this segment of the canal

has extensive cracking on the floor and side slopes, differential settlement between several liner joints, and a panel of liner side slope that has failed and is now earth lined. A USDA Soil Conservation Service Soil Survey indicates that the soils in this area are generally classified as KmC: Kilburn gravelly sandy loam, deep over clean sands, 3 to 10 percent slopes. Any water lost through cracks and failures in the liner can be assumed to quickly drain through these sandy soils.

- **Segment 38** is located in Clearfield and consists of an open concrete canal liner that was installed in 1988. The concrete is not reinforced and has no waterstop at the joints. The liner in this Segment of the canal exhibits cracking on the floor and side slopes, and differential settlement between several liner joints. A USDA Soil Conservation Service Soil Survey indicates that the soils in this area are generally classified as PxB: Preston fine sand, 1 to 10 percent slopes, and KaB: Kidman fine sandy loam, 1 to 3 percent slopes. Any water lost through cracks and offset liner joints can be assumed to quickly drain through the existing sandy soils.

  The canal is bounded on the east by apartments and on the west by homes that sit below the canal. A trail was installed on top of the canal bank a few years ago.

  The east side is excavated into native soils and the west side was built up on top of native soils. The water losses within this segment of the canal are having an impact on property owners below the canal. During the irrigation season, DWCCC has many complaints from property owners about water in their yards and basements. The location of this segment is in a documented area of persistent poverty and a historically disadvantaged population.

Over the past twenty plus years, DWCCC has made significant strides to modernize its infrastructure by implementing methods and materials that have proven successful for water conservation and energy sustainability. These segments are identified in DWCCC's System Optimization Review (SOR) as priority segments that will protect and better manage over 34,000 acre-feet of water that flows through the project area. The development of this project will reduce water losses by 1,116 acre-feet and improve safety. The result of this project will forward the objectives of Reclamation as it facilitates water efficiency, conservation, and energy sustainability.

Evaluation Criteria

Evaluation Criterion A – Quantifiable Water Savings (28 Points)

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

This project will conserve an estimated 1,116 acre-feet of water per year, based on 34,000 acre-feet of water flow through this area annually. This is an approximate 3.2 percent water savings.

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

a. Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?

Water is seeping through the deteriorating canal liner into the ground, and into residential yards and basements, being lost to evaporation, and/or taken up by vegetation. The soils around the canal are classified as "sandy," according to the USDA Soil Conservation Service, and allow the water lost through the deteriorated liner to quickly drain away.

b. If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?

This is unknown to DWCCC except when residential property owners near the canal complain about water in their yards or basements. Current losses are most likely being used by vegetation because the project areas are next to the interstate, commercial areas, and high-density residential areas. The canal runs along the west border of Hill Air Force Base (HAFB). HAFB tracks several shallow Trichloroethylene (TCE) plumes that originate from HAFB and migrate west. It is likely, but not documented, that water losses from the canal contribute water to these shallow plumes due to the sandy nature of the surrounding soils. See Attachment D – DWCCC Environmental Disadvantage Map for the location of the TCE Plumes

c. Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?

None that are known to DWCCC.

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

The water savings were estimated using three resources: an inflow-outflow model, flow measurements, and a Bureau of Reclamation Water Conservation Verification study. The three resources are described below:

Inflow-Outflow Model

The flows through the canal are tracked and monitored over an irrigation season and were used to calculate water savings. In Attachment E – 2021 Inflow-Outflow Model Information, the calculations and assumptions have been documented on how the estimated water savings were developed. The estimated water savings was calculated to be 0.399 acre-feet per year per foot of canal, or a total of 773 acre-feet per year for the combined segments. The 2017 Bureau of Reclamation Water Conservation Verification study showed that this method **predicts conservatively low water savings. Therefore, we are not using this method to provide our water savings calculation; only using it as a resource.**

Flow Measurements
J-U-B ENGINEERS, Inc. (J-U-B) performed flow measurements for Segment 38 on July 8, 2022, and Segment 23b on July 11, 2022, using a Teledyne StreamPro ADCP. Measurements were made at the upstream and downstream extents of each respective Segment. The difference between the upstream and downstream measurements represents the water loss for each Segment. The estimated water savings were shown to be 3,005 ± 2,098 acre-feet per year. While this method gave current condition estimates of the water loss in the canal, the measurements appeared to be high when compared to the other methods. See Attachment F – 2022 Flow Measurement Info

Bureau of Reclamation Water Conservation Verification Study (BOR Study)
In May 2017, the Bureau of Reclamation performed a Water Conservation Verification study for a reach of the same canal immediately upstream of Segment 38 of this application. This Study verified water loss estimates for a similar WaterSMART project within the same canal and for over an equivalent length. See Attachment G – Reclamation Verification Report Section. The estimated water savings from the BOR Study are 0.577 ± 0.386 acre-feet per year per foot of canal. Applying these results to the canal segments of this application resulted in a water savings of 1,116 ± 748 acre-feet per year.

The BOR Study calculating water savings of 1,116 acre-feet per year was selected from these three methods because it represented the most likely water savings present in the canal.

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

(1) Canal Lining/Piping

a. *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*
The water loss calculation for this project is based on information from the three previously stated resources. However, after an investigation of all three, it was determined that the BOR Study would be the best-documented calculation. Based on the BOR Study, the average annual water savings is 1,116 acre-feet per year.

Project Water Losses
As stated previously, in May 2017, the Bureau of Reclamation completed a Water Conservation Verification study of a DWCCC WaterSMART Canal Piping Project. This WaterSMART project piped 950 feet of the open canal, and Reclamation concluded that the 950 feet of the canal would have a water savings of 548 acre-feet. See Attachment G – Reclamation Verification Report Section.

The Reclamation water savings of 548 acre-feet for 950 feet corresponds to a water loss of 0.577 acre-feet per foot of canal. DWCCC used the 0.577 acre-feet of loss as a guide to calculating the losses within this project, which resulted in a calculated water loss of 1,151 acre-feet for 1,995 feet of canal.

(1,995 feet x 0.577 acre-feet per foot = 1,151 acre-feet of water per year)

Using a 3 percent loss for reinforced concrete box culvert, the net water savings for the project will be 1,116 acre-feet per year.

(1,151 acre-feet x 3% = 34.533 acre-feet)
(1,151 acre-feet – 35 acre-feet {rounded up} = 1,116 acre-feet of water loss per year)

The improvements to the canal will allow DWCCC to better manage approximately 34,000 acre-feet of water as it flows through the project area.

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.*
The average annual canal seepage losses were determined by using the results of a 2017 Bureau of Reclamation Water Conservation study (BOR Study) and applying the study results to the application's project segments. The BOR Study measured upstream and downstream flow for a segment of the canal immediately upstream from Segment 38 of this application and similar in condition to the canal liner in Segment 23b. The difference between the upstream and downstream measurements determined the seepage loss for this reach. The seepage loss was divided by the reach length to determine a loss per foot. This loss per foot was multiplied by the segment lengths of this application to determine an average annual canal seepage loss. This result was compared with an inflow-outflow model and measurements taken this year using a Teledyne ADCP meter and is estimated to be the most reliable.

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)?*
A reinforced concrete box culvert with gasketed joints will be used. These materials have an estimated loss factor of minus 3 percent, and these losses will be minimal and have been noted in the calculations for the water loss savings. Data-specific information is available if needed. This is a commonly used material with historical loss information that Reclamation often uses on projects.

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?*
This information is based on the 2021 Inflow-Outflow Model. Annual transit losses are estimated across the entire length of the main canal. The losses in the canal average 4,679 acre-feet for 1.70 miles of the deteriorated or unlined canal; resulting in a loss of 2,760 acre-feet per mile per water season.

e. *How will actual canal loss seepage reductions be verified?*
The actual canal losses will be checked by using the same season-long inflow-outflow test that was done to determine the initial losses. The Roy Flume provides a known quantity of water at the start of the lower portion of the canal. The water used at each turnout will be measured and then subtracted from the total passing through the Roy Flume. The remaining water will be the total water lost to the system after the project has been completed.

DWCCC will take daily measurements on all non-recording water flow measurement devices to quantify how much water has passed through these turnouts. The information will be documented and calculated each month and will allow the Company to monitor and measure the benefits of the project against the water losses of the system.

f. Include a detailed description of the materials being used.

The canal will be enclosed with an 8-foot by 7-foot and 8-foot by 6-foot precast concrete box culvert with gasketed joints to prevent water seepage.

Evaluation Criterion B – Renewable Energy (20 Points)

For projects that include constructing or installing renewable energy components, please respond to Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery. If the project does not implement a renewable energy project but will increase energy efficiency, please respond to Subcriterion No. B.2. Increasing Energy Efficiency in Water Management. If the project has separate components that will result in both implementing a renewable energy project and increasing energy efficiency, an applicant may respond to both.

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

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

In 2017, DWCCC received funding from Reclamation from a WaterSMART Energy Efficiency Grant to install a 10.3 kW solar panel array on the ground at DWCCC's Sunset Reservoir to utilize this power for their maintenance building and shop. This existing solar array has provided over 16,723 kWh per year, which has helped offset energy demands for DWCCC. When the solar array was built, it was built with the intent to add additional panels as future funds were provided. It is a seamless system that does not require other equipment or meters to install additional panels. In 2021, DWCCC received funding to add to this solar array, which is expected to produce another 10.3 kW of power. This part of the project is currently being installed and is anticipated to provide an additional 16,723 kWh per year.

This project will add solar panels to **the roof** of DWCCC's maintenance building and shop at the Sunset Reservoir, producing 20.1 kW of power and providing 27,721 kWh per year. With the development of this solar array, DWCCC will be able to continue utilizing the power on-site at their maintenance building and shops, reducing the cost of outside power sources and environmental impacts throughout the 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. Please explain how the power generated as a result of this project will be used, including any existing or planned agreements and infrastructure.*

The project will install a 20.1 kW solar panel array on the roof of DWCCC's maintenance building and shop at the Sunset Reservoir. The proposed solar array will provide approximately 27,721 kWh per year that will be used to offset energy demands. Within many other WaterSMART projects, DWCCC has implemented hydropower as a renewable energy source to run meters, automated headgates, and other equipment during the irrigation season. With the development of the solar array, DWCCC will utilize the power on-site at their maintenance building and shop, reducing reliance on outside power sources throughout the entire year; not

just when water is in the canal, as is the case with a hydro project. It is estimated that the proposed solar project will offset approximately 43,311 lbs. of CO2 per year, reducing DWCCC's carbon footprint.

In 2018, DWCCC installed a 10.3 kW solar array and will add a similar-sized solar array in 2023. With the addition of the **new rooftop** solar panels to their existing solar array, DWCCC will provide a reduction of over 95,566 lbs. of CO2 per year to its carbon footprint and environmental impacts equivalent to:

Planting 29,318 trees

Burning 1,218,716 lbs. of coal

Driving reduced by 113,893 auto miles, or 5,163 gallons of gas

Describe any other benefits of the renewable energy project: *Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:*

- *How the system will combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions*

The proposed solar project is estimated to offset approximately 43,311 lbs. of CO2 per year compared with coal plant generation, reducing DWCCC's carbon footprint. Over the life of the solar array system (25 years), the reduction of DWCCC's carbon footprint is equivalent to:

Planting 13,334 trees

Burning 558,576 lbs. of coal

Driving reduced by 48,764 auto miles, or 2,211 gallons of gas

Gardner Energy provided the carbon footprint equivalent information above. The 20.1 kW rooftop solar array will operate year-round and generate 27,721 kWh per year of renewable energy.

Describe any other benefits of the renewable energy project: *Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:*

- *How the system will combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions*

This project will reduce 43,311 lbs. of CO2 per year. Utah has an inversion problem! Emissions from point sources are more abundant in the Davis and Salt Lake counties. It is unhealthy! It is dirty! It is ugly! When air sits stagnant, area sources of pollution have health impacts – respiratory ailments like temporary pneumonia or asthma. The balance of power generated not being used by DWCCC can be sold back to Rocky Mountain Power and help reduce the need to use more fossil fuels to meet the demands of the Wasatch Front.

- *Expected environmental benefits of the renewable energy system*

Every little bit helps! If everyone in Utah made small changes like this, we could all impact the environment. This project is just one small step to benefiting the environment. In Utah, according to the EPA August 2016 report, it says:

> *"The State has warmed about two degrees (F) in the last century. Throughout the western United States, heat waves are becoming more common, and snow is melting earlier in spring. In the coming decades, the changing climate is likely to decrease the flow of water*

in Utah's rivers, increase the frequency and intensity of wildfires, and decrease the productivity of ranches and farms."

All of this has come to fruition in just seven years. Utah has been in a mega-drought and extreme drought, which has increased wildfires each year over the past two years. Restrictive water conditions due to low snowpack, faster snow melt, and the drying up of lakes and reservoirs impact water availability for farmers, residents, and businesses. This summer (2022), in Northern Utah, we have had 14 straight days with temperatures over 100 degrees. This is not usually the case, but based on last year's 13 consecutive days, it looks to be increasing each year.

- *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 highly unlikely that this project will have any impact on hydropower generation from the Reclamation projects in the area.

Thick inversion in Layton, Utah – January 2020

- *Anticipated benefits to other sectors/entities*

  Benefits and beneficiaries:
  - Reduced greenhouse gas emissions are a step in the right direction for combatting climate change. The proposed solar project will offset approximately 43,311 lbs. of CO2 per year compared with coal plant generation.
  - The power generated will allow DWCCC to offset some electrical usage at their maintenance building and shops. In a small way, this will reduce the peak usage that Rocky Mountain Power is required to deliver.
- *Expected water needs, if any, of the system*

  No additional water will be required to operate the solar panel array.

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

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

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

DWCCC has always had a gravity-fed system, and this will still be the case with the development of this project. The completion of this project will reduce the time, energy, and money spent to monitor these critical sections of the canal. DWCCC staff has always had to drive the canal twice a day to monitor and evaluate the open canal section during the irrigation season. The development of this project will enclose an additional 1,995 feet of the open canal, allowing DWCCC staff to reduce their 40-mile round trips and reduce it from twice daily to only once daily as they monitor other sections of the open canal. The savings will be in miles traveled, gasoline consumed, decreased CO2 pollutants released, and man-hours saved.

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

Although the solar array is a small amount of power in the overall scheme of things, the power generated will allow the Company to be more self-reliant and put less demand on the Rocky Mountain Power system. The old saying "every little bit helps" is true in this case because of the solar array and the number of small hydro turbines added over the past four years. The energy produced from all of the projects implemented, which include the solar arrays and small hydro's, adds up to over 59,032 kWh of renewable energy each year. Adding this 20.1kW solar project will offset approximately 43,311 lbs. of CO2 per year and produce an additional 27,721 kWh of energy per year.

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

Due to the elevation of the canal, users are not required to pump to receive their allotment of water. However, the secondary irrigation system that provides pressurized water is pumped in some locations. These systems have several pumping stations: three pumps below the Kaysville East reservoir, four pumps below Church Street Reservoir, five pumps in Clinton City, and six pumps in West Point, which are all part of the average annual kWh total of 464,366 kWh used by DWCCC.

Last year, however, was very different because of the mega-drought conditions. DWCCC worked with Weber Basin Water Conservancy District (WBWCD) to implement pumping water from Willard Bay into DWCCC's system, to preserve water in Echo Reservoir and other upper reservoirs for culinary water use in case of another bad water year.

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

The energy savings are based on miles of the round trip from the current point of diversion.

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

No.

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

Completing this project will reduce the time, energy, and money spent to monitor these critical sections of the canal daily during the irrigation season by incorporating these areas into the SCADA system. At 40 miles per round trip, checking the canal twice a day, the canal rider travels 560 miles per week over the 6-month irrigation season, which equates to 14,720 miles an irrigation season. Suppose we can cut the trips to three times a week and only once each day per irrigation season. In that case, we will realize savings that will consist of the following: Fewer vehicle miles traveled, reduced gasoline consumption, decreased CO2 pollutants released, and more man-hours saved.

Traveling only once daily, three days a week at 40 miles per round trip, equates to 3,120 miles per irrigation season; a savings of 11,600 miles per irrigation season. Calculation of CO2 and social cost of the Carbon-based emissions at a 3 percent discount rate per ton, and price for gasoline comes from current costs as of July 15, 2022 in Utah.

Calculation and information for the CO2 metric tons saved comes from the "Carbon Foot Print" website located at www.carbonfootprint.com/calculator.aspx.

The following are the assumptions made:

» Assume 14 mpg for a 2019 Ford F150 four-wheel drive
» Assume fuel cost at 5.12 per gallon
» Assume a Social Cost of Carbon discounted at 3 percent per ton

Gasoline cost savings: $4,239.00
(11,600 ÷ 14 mpg = 828 gallons of gas x 5.12 cost per gallon = $4,239.00 in savings)

Pollution savings: Savings of 7.4 metric tons of CO2 per year, equating to a Social Cost of Carbon per ton at $50.00, which equals savings of $370.00 per year saved. Discounted by 3 percent is $358.90; not to mention fewer carbon emissions into the atmosphere and stratosphere. This analysis does not include the monthly savings for monitoring the pump stations and automated traveling screens.

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

There are no other energy components.

Evaluation Criterion C – Sustainability Benefits (20 Points)

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

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

No significant improvements will be part of this project. However, implementing the solar array will help offset a small portion of DWCCC's carbon footprint.

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

This project's development will allow more water to be saved and held in the Echo and East Canyon Reservoirs and within the Weber River system until later in the year. The conserved water will flow through the Weber River and the existing canal system to the current users.

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

The Bonneville Cutthroat Trout and Bluehead sucker are native fish species found in areas within the Weber River. Both species are covered by conservation agreements that 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 efforts 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 the connectivity of priority habitats. By removing unnecessary barriers to fish migration or modifying existing barriers to allow upstream movement, species, notably the Bonneville Cutthroat Trout and Bluehead Sucker, will thrive.

Stable and connecting flows between Bonneville Cutthroat Trout and Bluehead Sucker habitats are fundamental requirements for successful conservation actions. Therefore, most any project that enhances the continuity and maintenance of flows within the Weber River is a step in the right direction. As DWCCC and UDWR work cooperatively to protect and conserve these native species, their habitats will be benefited.

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

N/A.

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

Water supply reliability is often more than just getting water to the field; it is having water supply available for recreation, the environment, or improving water quality. The Weber River Watershed Plan of 2014 says, "The goal of this plan is to recognize both the human and ecological values that the watershed provides and develop strategies to protect and enhance those values." Allowing more water to remain in the Weber River, Echo, and East Canyon Reservoirs will benefit recreational opportunities, water quality will be improved, recreation fishing will be sustainable, and economic development will continue. This project and the other past and future projects that DWCCC has done, or will do, will all contribute to water reliability and improve sustainability and economic development in the area.

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

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

This past 2021 irrigation season was difficult for all water delivery systems, and the 2022 irrigation season has not been much different, except as of July 1, 2022, they have not had to exchange water, but with the continued drought and high heat, this may be a factor in August.

In 2021, DWCCC worked with WBWCD to exchange water out of Willard Bay, allowing the DWCCC water to remain in Echo and other reservoirs for next year's culinary water. WBWCD felt it was necessary to spend money pumping extra water out of Willard Bay to exchange that water with DWCCC. By doing so, WBWCD was able to preserve storage in the upstream reservoirs such as Echo and East Canyon, thereby helping preserve a drinking water supply for next year in case of another bad winter and spring runoff. To exchange the water, WBWCD had to pump the water into DWCCC's system. The power cost to pump the water from Roy's WBWCD drought relief pump station was about $343,000. The last time WBWCD operated this pump station, other than for testing/maintenance purposes, was in 2006.

In addition to running the drought relief pump station in Roy, WBWCD also had to do supplemental pumping at its Willard Bay pump station. Unfortunately, they found that two of the three electric pumps at that pump station were not operational, so they had to rent a few diesel pumps to make up for the extra water they were sending to DWCCC. The cost of renting and operating these pumps was about $274,000. WBWCD is currently working on the two non-functional electric pumps at Willard Bay and should be functional by next spring. Therefore, if they have to pump the Drought Relief System next year (or any year in the

future), they will be able to meet the demand using their electric pumps, reducing the additional expenses from $274,000, down to about $96,000 for the same period.

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

Because of the mega-drought situation, the pumping from WBWCD was necessary for the 2021 irrigation season to preserve water in the system for culinary use next year. This was costly and required lots of power and fossil fuels to pump this water. As of today, DWCCC anticipates that they may not have to do an exchange as of yet to preserve the water in the upper reservoirs for next year's culinary use, but it can be a possibility.

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

The project will conserve water to allow it to stay in the system longer. It can enable over 1,116 acre-feet of water to be saved for future use or stored for more extended periods.

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

The project will enclose two broken-up open segments of the canal with precast box culvert. The open canals lose essential water to leaks, seepage, and root uptake. Residents below the canal see this water in their yards and basements.

Enclosing the canal will allow the lost water to be used by farmers and secondary water irrigators and held in the reservoirs longer during the irrigation season. This will provide additional water for use in times of drought and will enable users to exercise their water rights more fully. It will also benefit the environment, fish, and wildlife habitats on the Weber River by allowing prolonged and better-balanced stream flows of available water. The conserved water will enable flows to remain in the river system for extended periods.

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

This project's development will allow more water to be saved and held in the Echo and East Canyon Reservoirs and within the Weber River system. The conserved water will flow through the Weber River and the existing canal system to the current users.

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

The 1,116 acre-feet of conserved water will be used to make the water system more reliable. This water will be used within the DWCCC system to reduce the impacts of drought and water shortages.

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

(1) Combating the Climate Crisis

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

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

Concern over water conservation is most prevalent in the western United States, and especially in Utah – the second driest State in the nation. Because of climate change and drought, water conservation in Utah is something that is taken seriously by water distributors and users throughout the State. Although DWCCC can do nothing to stop climate change, and especially drought, the Company actively seeks ways to reduce the disastrous effects of drought on their water users, and by extension, the State. By enclosing their unlined and open canal system, DWCCC is protecting their water right and Utah's water resources. This will help ensure that WBWCD's resources are available to sustain those living within their service area.

b. *Does this proposed project strengthen water supply sustainability to increase resilience to climate change?*

As DWCCC improves its delivery system, they increase resiliency and implement sustainable projects with 50 to 100 years of life to deliver water to their users more effectively. The project adds safety and sustainability to the main lower delivery system that has 34,000 acre-feet of water flowing through these project areas each year.

c. *Will the proposed project establish and utilize a renewable energy source?*

The project will install a 20.1 kW solar panel array at the DWCCC maintenance building and shop at the Sunset Reservoir. The proposed solar array will provide approximately 27,721 kWh per year that will be used to offset energy demands. Within many other WaterSMART projects, DWCCC has implemented hydropower as a renewable energy source to run meters, automated headgates, and other equipment during the irrigation season. With the development of the new solar array, DWCCC will now be able to utilize the power on-site of their maintenance building and shops, reducing reliance on outside power sources throughout the entire year. The proposed solar project is estimated to offset approximately 43,311 lbs. of CO2 per year compared with coal plant generation, reducing DWCCC's carbon footprint.

d. *Will the project result in lower greenhouse gas emissions?*

The old saying "every little bit helps" is true in this case because of the solar array and the number of small hydro turbines that have been added over the past four years. The energy produced from all of DWCCC's solar arrays and small hydro's, including the implementation of this project, will add up to over 103,476 kWh of renewable energy each year. It is estimated that the proposed 20.1 kW solar panel array project will offset approximately 43,311 lbs. of CO2 per year. Although this is a small amount of power in the overall scheme of things, the power generated will allow the Company to be more self-reliant and put less demand on the Rocky Mountain Power system.

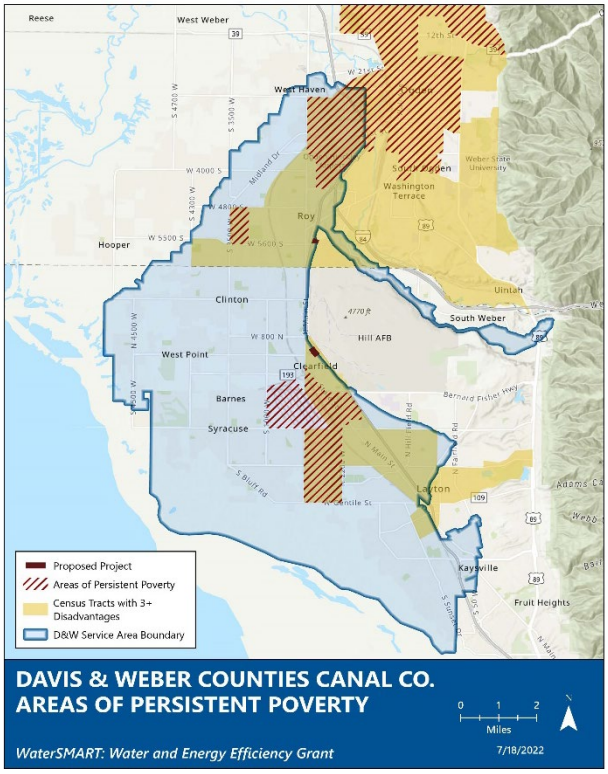
(2) Disadvantaged or Underserved Communities

E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including:

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

Areas near these projects are considered historically disadvantaged and areas of persistent poverty. Many low- and moderate-income homes located near the open canal have been impacted by seepage losses and an increase in water table height. This project will reduce these impacts on residents, reducing the chance of water in their yards and basements and the need to run sump pumps continuously. See Attachment H – DWCCC Areas of Persistent Poverty Map

Figure 1DWCCC Areas of Persistent Poverty Map



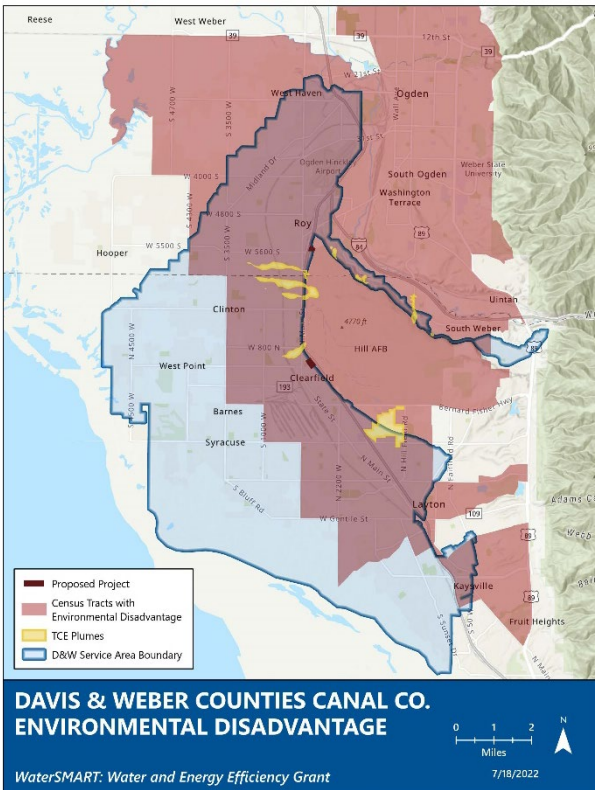
b. *If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged.*

Information provided by the United States Department of Transportation (USDOT) was used to create and document the disadvantaged indicators in Census tracks. USDOT developed this data to be used nationwide as a prototype of Justice40. This project area has multiple disadvantages and areas of persistent poverty. Attachment H – DWCCC Areas of Persistent Poverty Map shows the areas with three or more disadvantaged indicators and the areas of persistent poverty. These indicators include the disadvantage indicators for each census tract with historical health, economy, equity, resilience, and environmental disadvantages.

Attachment D – DWCCC Environmental Disadvantaged Map indicates the areas where there are historically environmental disadvantages, as well as several shallow Trichloroethylene (TCE) spills or plumes that originated from Hill Air Force Base (HAFB) and have migrated west. HAFB and its surrounding area were declared a Superfund site in 1987 and added to the U.S. Environmental Protection Agency's National Priorities List, meaning human exposure to contaminants is not under control. The groundwater contamination spreads between 50 feet a year in Clinton and Sunset to 300 feet a year in Roy.

c. *If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.*
This project will benefit underserved areas within DWCCC's services area because it will reduce water losses that go into the groundwater that move and expand the environmental spills or plumes in the project area. The canal runs along the north and west borders of HAFB, and it is likely, but not documented, that water losses from the canal contribute water to these shallow plumes due to the sandy nature of the surrounding soils. See Attachment D – DWCCC Environmental Disadvantage Map.

Figure 2 DWCCC Environmental Disadvantage Map



(3) Tribal Benefits

The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum "Tribal Consultation and Strengthening Nation-to-Nation Relationships" asserts the importance of honoring the Federal government's commitments to Tribal Nations. Please address the following, if applicable:
There are no Tribal Benefits as part of this project.

(4) Other Benefits

Will the project address water and/or energy sustainability in other ways not described above? For example:

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

b. *Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?*
The project will benefit agricultural, municipal users, and the environment. The conserved water will go directly to the agricultural users to allow them a longer growing season. One of the more significant shareholders of DWCCC is the Weber Basin Water Conservancy District (WBWCD), who will also receive their proportional share of the conserved water. WBWCD supplies water to many cities and counties for culinary and secondary uses. The environment is also benefited as the water can stay in the reservoirs and river system longer.

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

Enclosing the canal segments will allow the water being lost in those areas to be used by farmers and secondary water irrigators. This will provide additional water for use in times of drought and will allow users to exercise their water right more fully.

The water loss savings will provide a more secure water right and be more available as a buffer during times of drought. It will also be available for secondary use as agricultural lands convert to residential lawns and gardens. Opportunities to benefit the environment and fish and wildlife habitats on the Weber River will be considered, allowing prolonged and better-balanced stream flows for available water. The conserved water will enable flows to remain in the river system for more extended periods and to be held for longer in the season in the Echo and East Canyon Reservoirs.

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

Yes, as mentioned above, canal deterioration causes seepage and could result in a breach, which could significantly impact residential areas. It will disrupt services to many communities and agricultural users. This project will secure the main canal and reduce the seepage into groundwater, yards, and basements.

There is always tension when it comes to water. Natural disasters, drought, and un-maintained canals and ditches are significant factors in water conflict within any service area. DWCCC has had its share and will continue to feel the tension, especially as demands for more water come from expanding residential growth. However, in the past few years, there has been more tension than usual with the extreme drought situation. Lack of water due to the drought and seepage losses within the main canal has increased conflicts between recreation users, environmental groups, residents, businesses, farmers, and DWCCC staff. With the drought, Utah has seen significant impacts on the Great Salt Lake as it is drying up. The Lake is at an all-time low, exposing a toxic lakebed that blows the dust toward residential populations. This has caused an increasing health crisis for many of the communities in DWCCC's service area because the exposed dry lakebed has chemicals and arsenic-laden dust clouds that intermittently rise off the dry lakebed, poisoning the air and the remaining water. Other heavy metals, like antimony and zirconium, are also present in the lakebed. This toxic lakebed has become one of the most contentious concerns for the residents in the State of Utah.

Many environmental and government agencies want canal companies and farmers to conserve more water to flow into the Great Salt Lake. With these past drought years, it is hard to tell a farmer that is already water short and economically strapped to conserve even more so it can go to the Lake.

Evaluation Criterion D – Complementing On-Farm Irrigation Improvements (10 Points)

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

- *Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.*
    - *Provide a detailed description of the on-farm efficiency improvements.*

This project will help provide a safer, more reliable, and more efficient water delivery system for the canal. This will allow farmers to install pipes, sprinklers, and pivots to make their irrigation systems more efficient and allow for higher crop yields and less flooding potential in residential neighborhoods continually encroaching on the agricultural lands.

DWCCC provides water to approximately 60 different ditches and turnouts. The canal system is elevated so anyone can connect to the canal to provide sufficient pressure for an agricultural sprinkler system. This project will not change that ability to provide pressure irrigation to farms. This project will be a positive move toward ensuring that shareholders receive their water shares through a metered canal, piped and lined so that losses are minimal. Conservation is maximized, hydropower is developed, the environment is protected, the canal is safe, and water can be delivered efficiently.

The Company is aware of a few local farm projects being considered, most of which are ditch expansions, piping of ditches, and conversion of water deliveries from flood irrigation to sprinklers. The following is a list of those interested in on-farm efficiency projects. See Attachment I – On-Farm Signature Page.

Landowner Name	Area	Location
Mike Kolendrianos	66 Acres	West Layton
The Nature Conservancy	500 Acres	West Layton
Roberts Family Farms	78 Acres	West Layton
Day Farms	200 Acres	West Layton

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

The four previously listed farm projects are in talks with or have expressed strong interest in participating in NRCS funding programs to accomplish similar goals contained in this application. These projects will allow for better safety and conservation. They have not yet requested assistance from NRCS, but they plan to do so in the future.

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

The on-farm assistance has not been requested from NRCS. They are strongly interested in meeting with NRCS to develop high-efficiency irrigation systems.

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

The farmers have signed a signature page that can be found in Attachment I – On-Farm Signature Page. This form indicates the name, signature, and acreage of those

irrigators benefiting from the project who are interested in applying for NRCS assistance.

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

  Yes, the proposed project will complement the on-farm project in the following ways:
    - Less tail water wasting from flood irrigation
    - Better metering and monitoring of the system
    - Innovation for better technologies such as sprinkler and drip irrigation methods
- *Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.*
    - *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 calculation and information already submitted as part of this application, returned savings in water for agriculture would be between 8 to 10 percent water savings, besides the creation of additional water resources through conservation that will benefit future water development needs. Better water use will come about by reducing water waste and seepage losses. This documentation was detailed in this application's Quantifiable Water Savings section.
- *Please provide a map of your water service area boundaries. If your project is selected for funding under this NOFO, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.*

  See Attachment C – Service Area Map.

Evaluation Criterion E – Planning and Implementation (8 Points)

Subcriterion E.1 – Project Planning

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

See Attachment J – Planning Information.

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

   DWCCC completed a SOR for the 17.2-mile canal system in October 2013 and updated the SOR in 2017 and 2021. The SOR planning process allowed DWCCC to evaluate the entire delivery system and give them direction on priority projects that will enable the highest water conservation and renewable energy production.

   The Weber River Water Users' Association developed a "Water Management and Conservation Plan" in 2009 with a Reclamation grant, addressing the needs for the Weber River Basin. Chapter 4 of the Weber River Basin Plan of 2009 indicates several

conservation goals that they would like to implement, most of which this project will help satisfy. The specific goal this project will help implement more efficient application and delivery of the water.

DWCCC has a Conservation Plan that includes aspects of this project. They also have Emergency Action and Response Plans and an Operation and Management Plan, which respond to drought or water shortage conditions. They also developed a conservation plan with the Weber River Water Users' Association. Copies of these plans can be made available upon request.

2) *Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).*
The Weber River Water Users' Association has several goals and issues that this project will help fulfill. They have been addressed previously and are listed in Criterion D. Another plan that this project is consistent with is 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."*

3) *If applicable, provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed WaterSMART Basin Study or Water Management Options Pilot (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes)*
DWCCC participated in the development of the WBWCD Drought Resiliency Plan in 2018. Many mitigation actions included piping and enclosing large irrigation delivery systems to conserve water. This project is just another step in addressing the regional mitigation actions to help reduce the risk of water loss and to help better manage the water in the Weber River Basin. This plan is available upon request.

Subcriterion E.2 – Readiness to Proceed

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

DWCCC has been coordinating this project over the past year. They have a 30 percent preliminary design ready, have modeled the system, and have coordinated with stakeholders on this project. DWCCC has an approved Environmental Report for this project, and they will only be required to do an update to the existing document.

- *Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description provided in Section D.2.2.2.; this section should focus on a summary of the major tasks to be accomplished as part of the project.*
The project's primary tasks include contracting, environmental assessment, design, advertising and bidding, construction, and project closeout.

- **Contracting** includes executing agreements between Reclamation and DWCCC. It also includes the necessary time for DWCCC to secure contracts for engineering, environmental, cultural, and solar design.
- **Environmental assessment** includes the necessary surveys and assessments required to update the existing environmental report that DWCCC has previously completed for this project area. This also includes the review of the update by Reclamation.
- **Design** includes a topographic survey, design review and stakeholder coordination, 50 percent design review, 90 percent design review, and final preparation of bidding documents.
- **Advertising and bidding** include advertising the project, distribution of bid documents, pre-bid meetings, bid opening, and contract award.
- **Construction** includes preparation of construction documents, preconstruction meeting, construction of the canal enclosure, water-ready project walk-through, final grading and surface restoration, substantial completion walk-through, construction of the solar system, final completion walk-through, and **project closeout**.

- *Describe any permits that will be required, along with the process for obtaining such permits.*
  Permits from local communities may be required based on needed access. Clearfield City will require a road excavation permit, and a SWPPP permit will be required. Both permits will be applied for by the successful contractor after a notice to proceed has been issued.
- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*
  Master planning for the project has been done as part of the System Optimization Review to identify pipe sizing and design flow rates.
- *Describe any new policies or administrative actions required to implement the project.*
  None needed.
- *Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation (50% complete); and construction/installation (100% complete)*
  The anticipated schedule is as follows:

  September 2023 – June 2024
  - *Contracting and Environmental Assessment:* September 2023 – June 2024
  - *Design:* October 2023 – June 2024

  July 2024 to September 2024
  - *Segment 23b and 38 Advertising and Bidding:* July 2024
  - *Segment 23b and 38 Award and Construction Contracting:* September 2024

  October 2024 to September 2026
  - *Construct Canal Enclosure:* October 2024 – March 2025 for Segment 38 and October 2025 – March 2026 for Segment 23b
  - *Final Grading, Surface Restoration:* April 2025 – August 2025 for Segment 38 and April 2026 – August 2026 for Segment 23b
  - *Construct Solar:* June 2024 – August 2024
  - *Project Closed Out:* September 2026

- *Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation Regional or Area Office?*

DWCCC has an approved Environmental Report for this project, and they will only be required to do an update to the existing document.

Evaluation Criterion F – Collaboration (6 Points)

Please describe how the project promotes and encourages collaboration. Consider the following:

- *Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?*
  DWCCC completed a SOR for the 17.2-mile canal system in October 2013 and updated the SOR in 2017, and again in 2021. The SOR planning process allowed DWCCC to evaluate the entire delivery system and give them direction on priority projects that allows for the highest water conservation renewable energy production.

  The Weber River Water Users' Association developed a "Water Management and Conservation Plan" in 2009 with a Reclamation grant, addressing the needs for the Weber River Basin. Chapter 4 of the Weber River Basin Plan of 2009 indicates several conservation goals that they would like to implement, most of which this project will help to satisfy. The specific goal this project will help implement more efficient application and delivery of the water.

  DWCCC has a Conservation Plan that includes aspects of this project. They also have Emergency Action and Response Plans and an Operation and Management Plan, which includes responses during drought or water shortage conditions. They also developed a conservation plan with the Weber River Water Users' Association. Copies of these plans can be made available upon request.
- *What is the significance of the collaboration/support?*
  The DWCCC Board comprises many shareholders and other water entities that participate in developing and updating their plans.
- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*
  Many of DWCCC's shareholders include cities and other irrigation companies that have significantly improved their delivery systems. They have made strides to meter their secondary water systems through funding from WaterSMART grants and loans from the Utah Division of Water Resources to conserve water and more efficiently deliver their water.
- *Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).*
  See Attachment K– Letters of Support.

Evaluation Criterion G – Additional Non-Federal Funding (4 Points)

State the percentage of non-Federal funding provided using the following calculation

$$\frac{2{,}700{,}000\ Non-Federal\ Funding}{4{,}500{,}000\ Total\ Project\ Cost} = 60\%$$

Evaluation Criterion H – Nexus to Reclamation (4 Points)

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

- *Does the applicant have a water service, repayment, or O&M contract with Reclamation?*
  No.
- *If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?*
  No, they do not have a contract, but is largest shareholder of the Weber River Water Users Association, which operates Echo Reservoir. Still, WBWCD is a significant shareholder within DWCCC, and they receive several acre-feet of water through DWCCC's delivery system for WBWCD's secondary water system.
- *Will the proposed work benefit a Reclamation project area or activity?*
  Yes, the project will conserve water that can now be stored up in the Echo and East Canyon Reservoirs, contributing to the storage and potential flows within the Weber River.
- *Is the applicant a Tribe?*
  No.

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).
There are two areas of this project where performance measures can be documented and quantified to show the actual benefits upon project completion. These include renewable energy that will be generated and water that is saved.

Energy Generated Performance Measures
The energy produced by the solar array will be metered, and the metered output will be recorded monthly and compared to this application's estimation of power generation. This information will be provided to the DWCCC Board of Directors in an annual report.

Water Savings and Better Water Management Performance Measures
The System Optimization Review identifies the water tracking and usage procedures for the DWCCC canal. Attachment E describes the method for calculating water savings using the inflow-outflow model. The same methods will be used to measure the actual water saved/better managed after completing this project.

Season-long Inflow/Outflow Summary of Lower Portions of the Canal
There is a meter on the main canal at the start of the lower portion of the canal called the "Roy Flume." DWCCC currently has fourteen continuously reading meter turnouts and seven turnouts with weirs and flumes along the lower part of the canal. Daily flow measurements at each turnout and flow measuring device readings are taken and recorded. Flow measurements will be taken each month to determine how much water has passed through the Roy Flume, how much water went down each turnout, and how much water was lost to the system for that month. The water lost for the entire irrigation season will be compared to the water savings calculations in this application. The individual gates are combined into a summary of all gates on the lower canal. This summary will be completed on the 15th of each month and reviewed by the DWCCC Manager.

Project Budget

Funding Plan and Letters of Commitment

Describe how the non-Federal share of project costs will be obtained.

DWCCC will use money from their own Construction Reserve Account and operation funds and make an application for a loan from the Division of Water Resources for their contribution.

Identify the sources of the non-Federal cost-share contribution for the project, including:

- *Any monetary contributions by the applicant towards the cost-share requirement and source of funds (e.g., reserve account, tax revenue, and/or assessments).*
  DWCCC will use money from their own Construction Reserve Account and operation funds and make an application for a loan from the Division of Water Resources for their contribution.
- *Any costs that will be contributed by the applicant.*
  DWCCC will use money from its own Construction Reserve Account, and staff time will be over and above the project cost and will not be counted toward the project cost.
- *Any third-party in-kind costs (i.e., goods and services provided by a third party).*
  None.
- *Any cash requested or received from other non-Federal entities.*
  None.
- *Any pending funding requests (i.e., grants or loans) that have not yet been approved and explain how the project will be affected if such funding is denied.*
  DWCCC will apply to the Division of Water Resources next year for a loan, if needed. They will facilitate the loan requirements from the Division.

In addition, identify whether the budget proposal includes any project costs that have been or may be incurred prior to award. For each cost, describe:

- *The project expenditure and amount.*
  N/A.
- *The date of cost incurrence.*
  N/A.
- *How the expenditure benefits the Project.*
  N/A

Budget Proposal

Table 1 – Total Project Cost Table

Source	Amount
Costs to be reimbursed with the requested Federal funding	$1,800,000
Costs to be paid by the applicant	$2,700,000
Value of third party contributions	$0
Total Project Cost	**$4,500,000**

Table 2 – Budget Proposal

Budget Item Description	Computation		Unit Price	Total Cost
	Unit	Quantity		
Salaries and Wages				$0.00
Fringe Benefits				$0.00
Travel				$0.00
Equipment				$0.00
Supplies and Materials				$0.00
Contractual /Construction				**$4,494,000.00**
Segment 38: 8'x6' Box Culvert from Bruce Street to 300 North				
Mobilization	EA	1	$203,100.00	$203,100.00
Storm Water Pollution Prevention Plan (SWPPP)	EA	1	$18,450.00	$18,450.00
Clear and Grub	LF	1370	$12.00	$16,440.00
Pothole Utilities	HR	40	$430.00	$17,200.00
Remove Existing Concrete Canal Liner	LF	1370	$37.00	$50,690.00
Foundation Material and Leveling course	LF	1370	$27.00	$36,990.00
8'x6' Precast Box Culvert	LF	1370	$865.00	$1,185,050.00
Imported Backfill Material	CY	13907.951	$41.00	$570,226.00
Surface Restoration	LF	1370	$35.00	$47,950.00
Entrance Transition Structure	EA	1	$70,000.00	$70,000.00
Exit Transition Structure	EA	1	$52,000.00	$52,000.00
30" Diameter Access Manhole	EA	3	$3,600.00	$10,800.00
South 18 Canal Turnout	EA	1	$56,300.00	$56,300.00
Connect to Small Canal Turnouts	EA	2	$7,100.00	$14,200.00
Bruce Street, Traffic Control	EA	1	$11,000.00	$11,000.00
Bruce Street, Bridge and Asphalt Demolition	EA	1	$43,000.00	$43,000.00
Bruce Street, Granular Borrow Backfill	CY	900	$50.00	$45,000.00
Bruce Street, Untreated Base Course	Tons	300	$28.00	$8,400.00
Bruce Street, Curb and Gutter	LF	84	$67.00	$5,628.00
Bruce Street, Sidewalk	LF	84	$69.00	$5,796.00
Bruce Street, Temporary Asphalt Patch	SY	180	$46.00	$8,280.00
Bruce Street, Hot-mix Asphalt	SY	180	$62.00	$11,160.00
300 North, Traffic Control	EA	1	$11,000.00	$11,000.00
300 North, Bridge and Asphalt Demolition	EA	1	$43,000.00	$43,000.00
300 North, Granular Borrow Backfill	CY	900	$50.00	$45,000.00
300 North, Untreated Base Course	Tons	420	$28.00	$11,760.00
300 North, Curb and Gutter	LF	110	$67.00	$7,370.00
300 North, Sidewalk	LF	110	$69.00	$7,590.00
300 North, Temporary Asphalt Patch	SY	240	$46.00	$11,040.00
300 North, Hot-mix Asphalt	SY	240	$62.00	$14,880.00
Solar Power Generation	kW	20	$3,800.00	$76,000.00
Segment 23b: 8'x7' Box Culvert from 5440 South to 5600 South				
Mobilization	EA	1	$93,000.00	$93,000.00

Storm Water Pollution Prevention Plan (	EA	1	$8,500.00	$8,500.00
Clear and Grub	LF	625.00	$20.00	$12,500.00
Pothole Utilities	HR	10	$430.00	$4,300.00
Remove Existing Concrete Canal Liner	LF	625.00	$37.00	$23,125.00
Foundation Material and Leveling Course	LF	625.00	$27.00	$16,875.00
8'x6' Precast Box Culvert	LF	625.00	$922.00	$576,250.00
Imported Backfill Material	CY	8118.29	$41.00	$332,850.00
Surface Restoration	LF	625.00	$40.00	$25,000.00
Entrance Transition Structure	EA	1	$70,000.00	$70,000.00
Connect to Existing Box Culvert	EA	1	$9,000.00	$9,000.00
30" Diameter Access Manhole	EA	2	$3,600.00	$7,200.00
Traffic Control	EA	1	$11,000.00	$11,000.00
Remove and Replace Existing Fence	LF	1400	$22.00	$30,800.00
Pedestrian Bridge Demolition	EA	1	$5,000.00	$5,000.00
Design/Construction Management/Reporting for Both Segments 38 and 23b				
Design Segment 38	EA	7%	$190,100.00	$190,100.00
Design Segment 23b	EA	7%	$85,800.00	$85,800.00
Construction Management Segment 38	EA	7%	$190,100.00	$190,100.00
Construction Management Segment 23b	EA	7%	$85,800.00	$85,800.00
Reporting Segment 38 & 23b	HR	24	$125.00	$3,000.00
Third-Party Contributions				**$0.00**
Other				**$6,000.00**
Environmental Document	HR	48	$125.00	$6,000.00
Total Direct Costs				**$4,500,000.00**
Indirect Costs				**$0.00**
Type of rate	Percentage	$base		$0.00
Total Estimated Project Costs (Rounded Down)				**$4,500,000.00**

Budget Narrative

Salaries and Wages

No DWCCC Salaries or Wages will be included. All services will be contracted. DWCCC's staff time will be over and above the project cost and will not be counted toward the project cost.

Fringe Benefits

No fringe benefits will be required.

Travel

No travel will be necessary.

Equipment

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

Materials and Supplies

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

Contractual

To determine unit costs included in the project's cost estimate, DWCCC relied upon contract unit prices from similar projects bid in July 2022, September 2021, and September 2020. Items bid match the bid items from these projects.

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

Contractual cost includes design at approximately 7 percent and construction observation at approximately 7 percent for each Segment. A contractor will be hired to install and build all other items listed. The project will go through the Company's required procurement and bidding process.

Third-Party In-Kind Contributions

N/A.

Environmental and Regulatory Compliance Costs

The environmental document for this project was included in a previously completed report and has been approved by Reclamation. Reclamation may require an update and additional information for the environmental review therefore, 48 hours at $125.00 = $6,000 will be included in this project for those updates.

Other Expenses

The environmental costs are included in the budget under Other Expenses.

Indirect Costs

No other expenses are included.

Total Costs

DWCCC Portion: $2,700,000	Fed Portion: $1,800,000	Total: $4,500,000

Environmental and Cultural Resources Compliance

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

DWCCC has an approved Environmental Report for this project. Impacts will be those associated with enclosing the open canal. The proposed project improvements will take place entirely within the existing canal corridor. In the past, similar projects have had minimal impacts. This proposed area of the canal to be improved has established access, allowing work within the recognized easement/right-of-way of the project. The surface vegetation will be restored upon completion of the project.

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?

After having completed the Environmental Document and submitting it to Reclamation, DWCCC is not aware of any impacts concerning threatened or endangered species in this area.

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

After having completed the Environmental Document and submitting it to Reclamation, DWCCC is not aware of any impacts to wetlands in this area.

When was the water delivery system constructed?

The canal system was originally built in 1884 with concrete liner constructed around 1910 to 1920. Many improvements have been made over the years. As part of the completed environmental document, the required historical documentation for the canal has been finalized.

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

The proposed project will enclose 1,995 feet of old open concrete-lined canal through Roy and Clearfield with an 8-foot by 7-foot and 8-foot by 6-foot precast concrete box culvert. It will add 20.1 kW to a solar array on the roof of the DWCCC maintenance building and shop at the Sunset Reservoir. As part of the completed environmental document, the required historical documentation for the canal has been completed.

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.

After completing the Environmental Document and submitting it to Reclamation, DWCCC is unaware of any building, structures, or features that would qualify. A cultural resource inventory was completed as part of the submitted environmental document.

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

After having completed the Environmental Document and submitting it to Reclamation, DWCCC is not aware of any impacts to or locations of archeological sites.

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

No, the project will not require right-of-way or relocations from adjacent properties and will have no negative impact on residential properties or uses within the study area.

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

No.

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. The project will help with the control of noxious weeds and invasive trees. The project will allow DWCCC to have better access to the canal for weed control.

Required Permits or Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.

Permits from local communities may be required based on needed access. Clearfield City will require a road excavation permit, and a SWPPP permit will be required. Both permits will be applied for by the successful contractor after a notice to proceed has been

Overlap or Duplication of Effort Statement

There are no other applications that have been submitted or that will be submitted for this project to request federal funding.

Conflict of Interest Disclosure Statement

There is no actual or potential conflict of interest at the time of submission.

Uniform Audit Reporting Statement

DWCCC was not required to perform a single audit for this past year.

Certification Regarding Lobbying

Please see the GG Lobbying Form V1.1 Certification Regarding Lobbying.

Letters of Project Support and Letters of Partnership

Include letters from interested stakeholders supporting the proposed project.

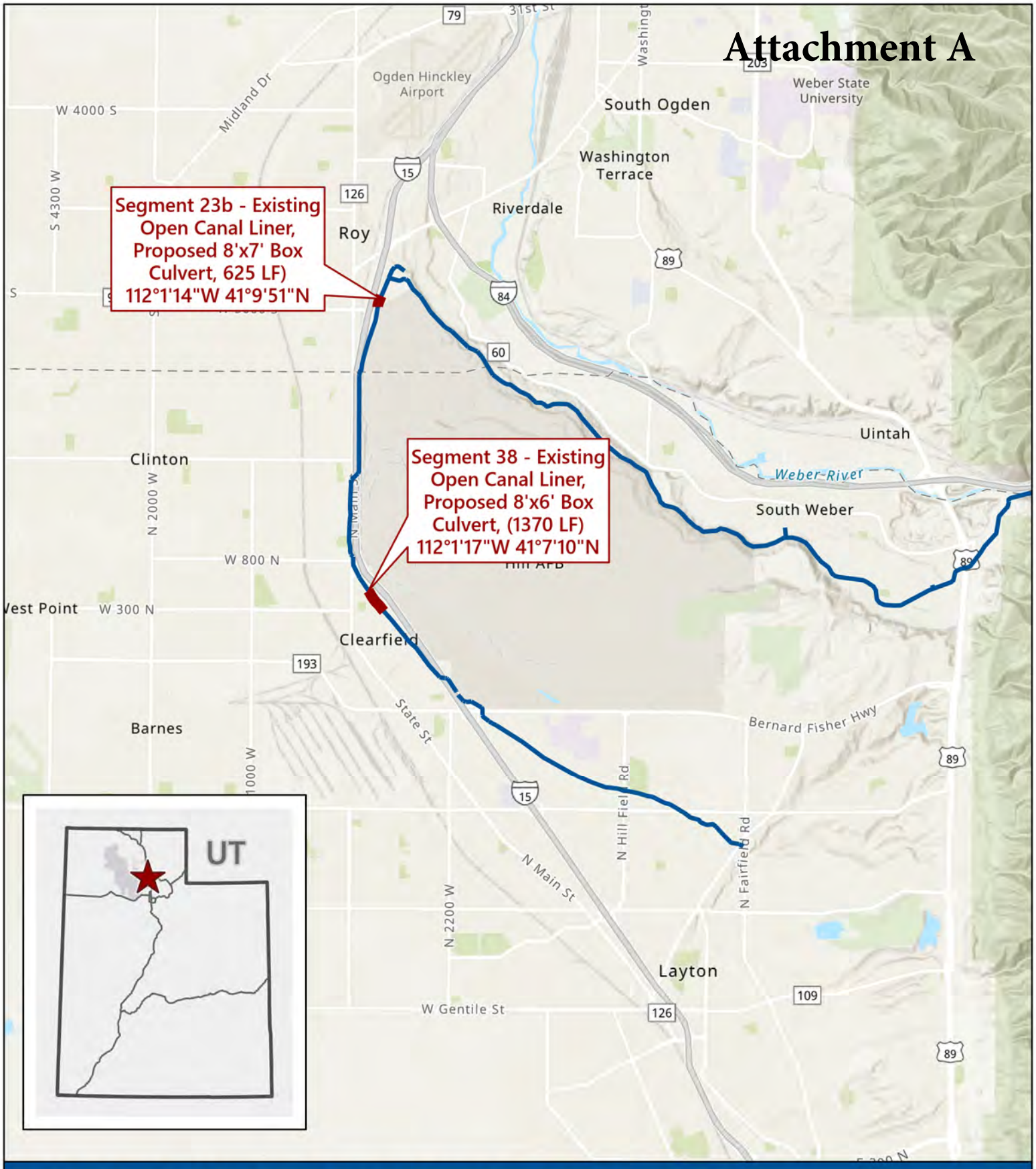
Letters of Support from the following are included in Attachment K – Letters of Support:

- Trout Unlimited – Tanner Cox, Weber River Project Coordinator
- Weber Basin Water Conservancy District – Darren Hess, PE, Assistant General Manager/COO
- Weber River Water Users Association – Robert Whiteley, President
- Roy Water Conservancy District – Rodney Banks, General Manager

Official Resolution

The Official Resolution for the Davis and Weber Counties Canal Company project will be submitted within 30 days after the application deadline.

Attachment A



DAVIS & WEBER COUNTIES CANAL CO.
PROJECT LOCATION

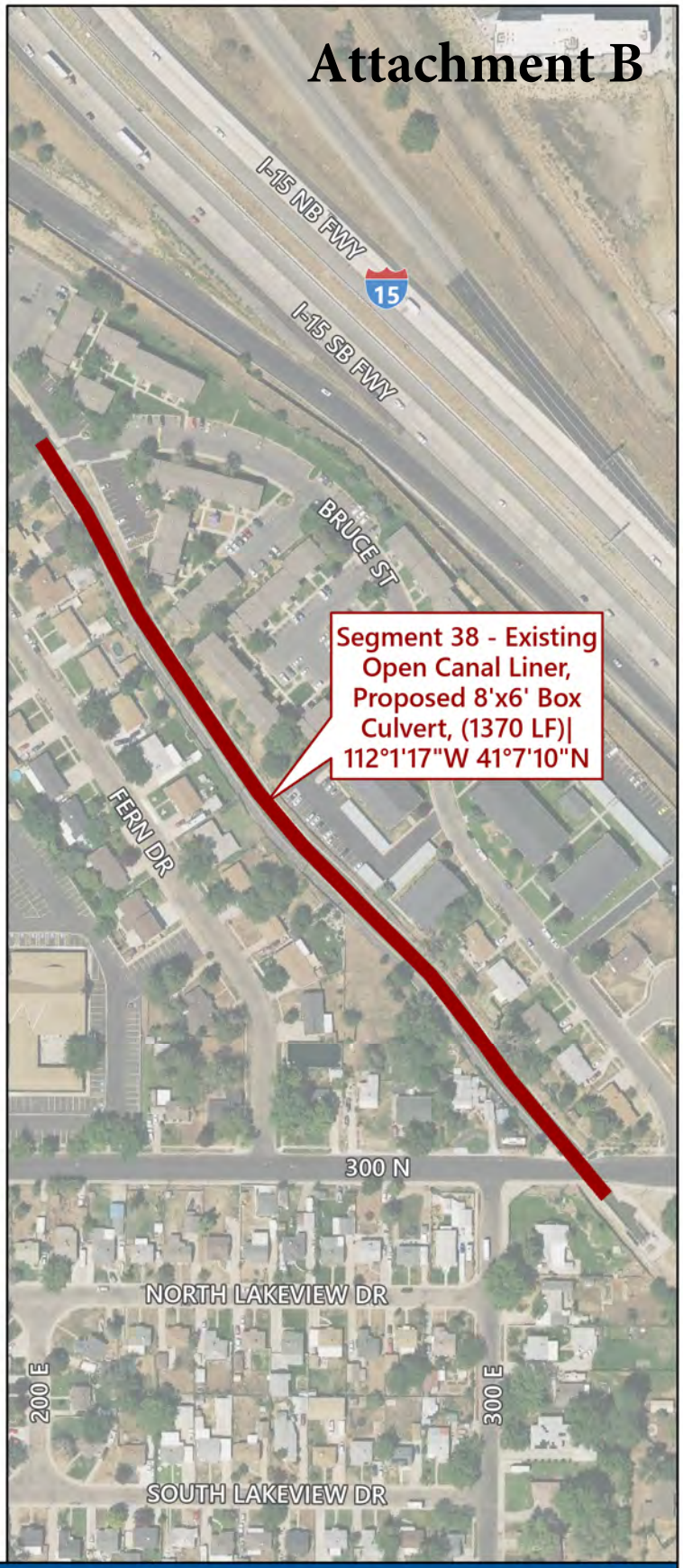
0 1.25
Miles

N

WaterSMART: Water and Energy Efficiency Grant

7/18/2022

Attachment B



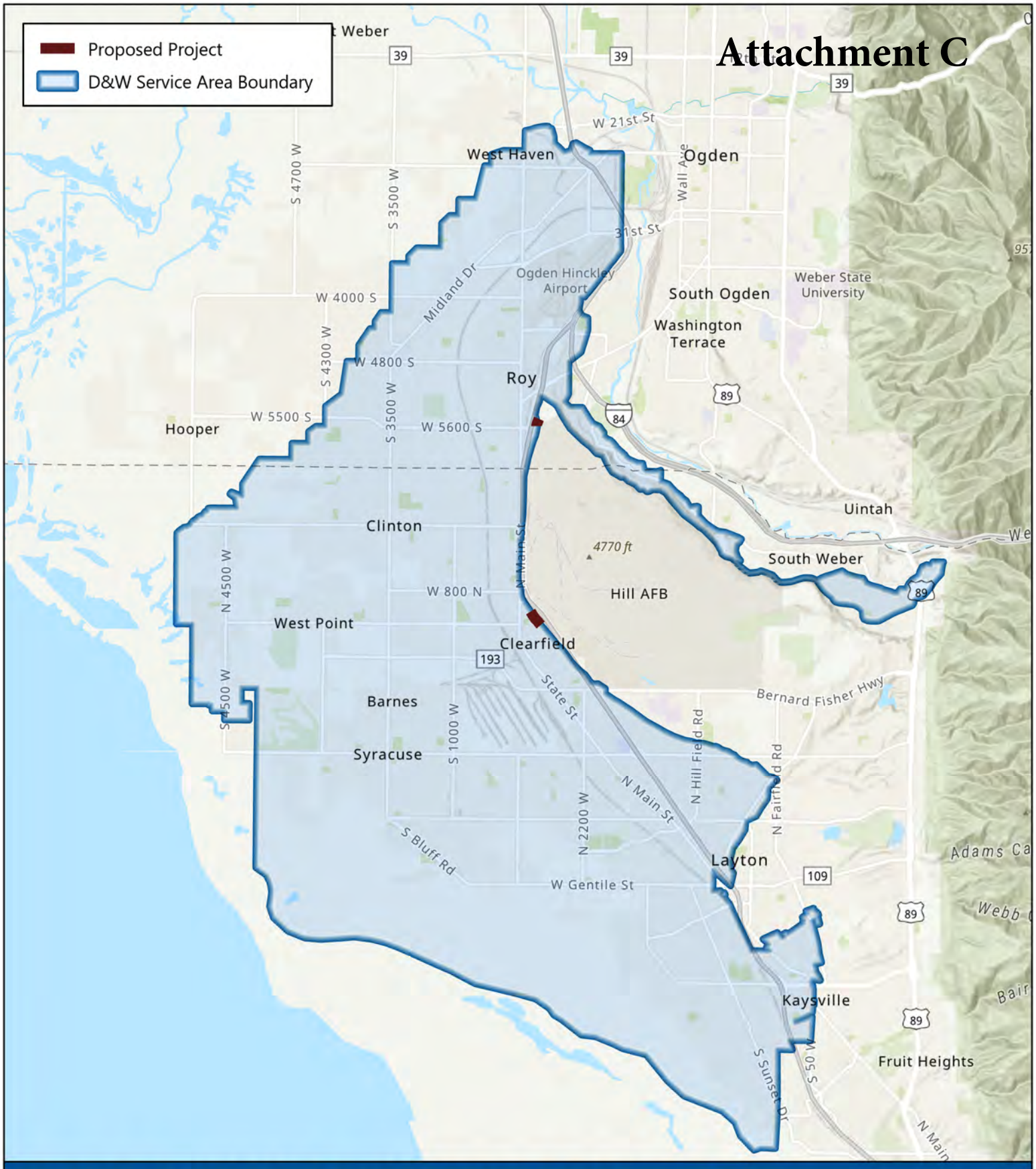
DAVIS & WEBER COUNTIES CANAL CO.
PROJECT DETAIL

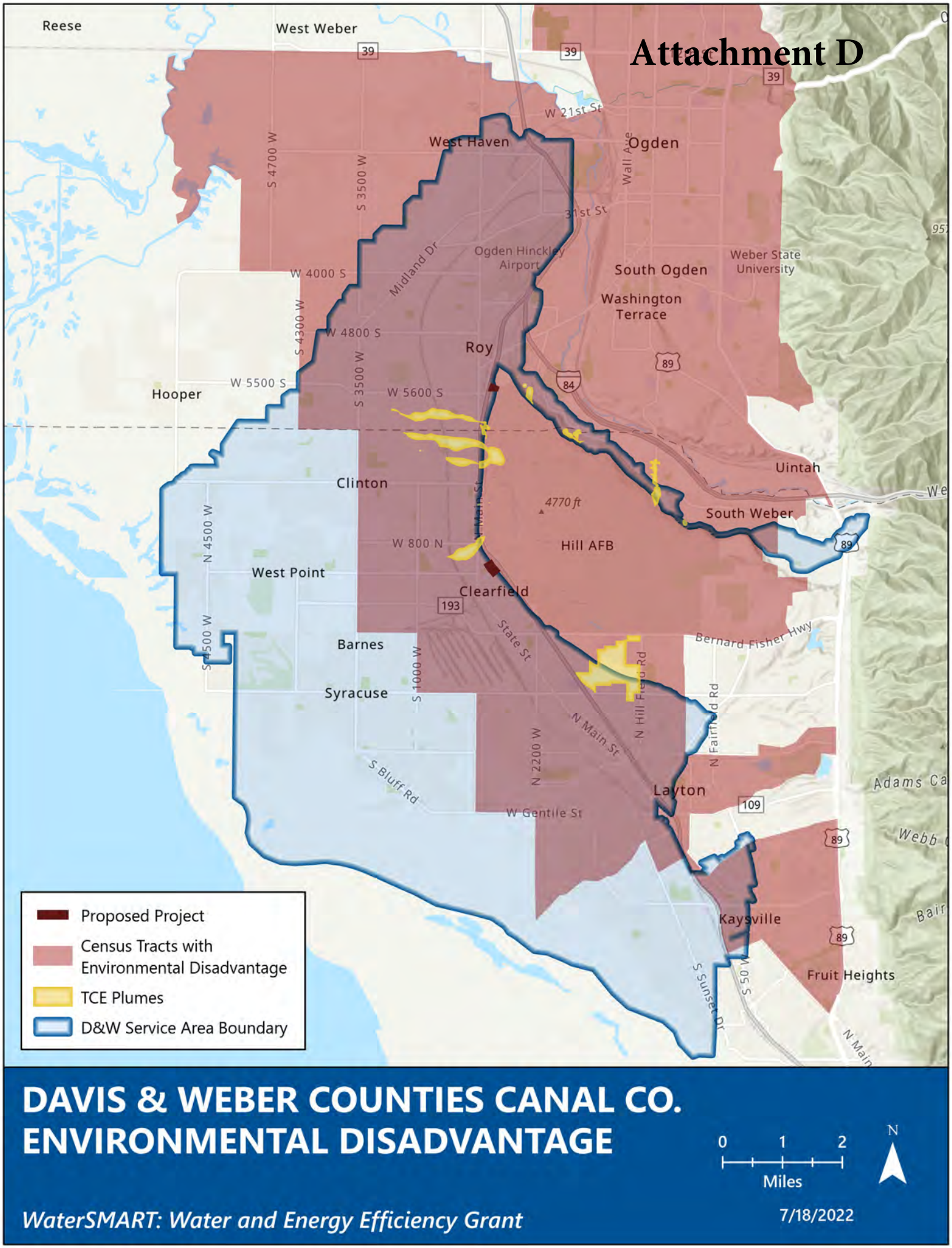
0 100 200
Feet

N

WaterSMART: Water and Energy Efficiency Grant

7/18/2022


Proposed Project
D&W Service Area Boundary
Attachment C
West Haven
Ogden
South Ogden
Washington Terrace
Weber State University
Ogden Hinckley Airport
Roy
Hooper
Clinton
West Point
Barnes
Syracuse
Clearfield
Hill AFB
Uintah
South Weber
Layton
Kaysville
Fruit Heights
Midland Dr
W 21st St
31st St
W 4000 S
W 4800 S
W 5500 S
W 5600 S
W 800 N
S 4700 W
S 3500 W
S 4300 W
S 4500 W
N 4500 W
S 1000 W
N 2200 W
N Main St
State St
Wall Ave
N Hill Field Rd
N Fairfield Rd
S Bluff Rd
W Gentile St
Bernard Fisher Hwy
S Sunset Dr
S 50 W
4770 ft
39
84
89
193
109
DAVIS & WEBER COUNTIES CANAL CO.
SERVICE AREA
0 1 2
Miles
N
WaterSMART: Water and Energy Efficiency Grant
7/18/2022


Attachment D
Reese
West Weber
West Haven
Ogden
Hooper
Roy
Clinton
West Point
Barnes
Syracuse
Clearfield
Hill AFB
South Ogden
Washington Terrace
Weber State University
Ogden Hinckley Airport
Uintah
South Weber
Layton
Kaysville
Fruit Heights
Adams Ca
Webb
Bair
W 21st St
31st St
W 4000 S
W 4800 S
W 5500 S
W 5600 S
W 800 N
S 4700 W
S 3500 W
S 4300 W
S 4500 W
N 4500 W
S 1000 W
N 2200 W
Midland Dr
Wall Ave
N Main St
State St
Bernard Fisher Hwy
N Hill Field Rd
N Fairfield Rd
S Bluff Rd
W Gentile St
S 50 W
4770 ft
39
84
89
193
109
Proposed Project
Census Tracts with Environmental Disadvantage
TCE Plumes
D&W Service Area Boundary
DAVIS & WEBER COUNTIES CANAL CO.
ENVIRONMENTAL DISADVANTAGE
0 1 2
Miles
N
WaterSMART: Water and Energy Efficiency Grant
7/18/2022

ATTACHMENT E

2021 Inflow – Outflow Water Loss Infomation

Many factors moved DWCCC to go with the BOR Study to determine the water losses for this project. These factors include shortened irrigation season, severe drought, and limited ability to verify actual inflow and outflow flow measurements within the project area. During the irrigation season, DWCCC monitors the inflow-outflow along the entire lower 7.7 miles of the canal. There is a meter in the main canal called the "Roy Flume." This meter was verified in 2013 by an outside company and was tested to be accurate within 5 percent. DWCCC currently has fourteen continuously recording metered turnouts and seven turnouts with flumes and weirs as measuring devices along the lower portion of the canal. DWCCC took daily readings and measurements on all the non-SCADA recording flow measurement turnouts. Flow measurements were compiled monthly, showing the water used at each turnout and how much water entered the system. DWCCC used an inflow-outflow method to determine project water losses over the entire season. The total amount metered at all turnouts was subtracted from Roy Flume measurements to calculate how much water was lost to the system.

The total flow that passed through the Roy Flume in 2021 was 29,893 acre-feet, and the total amount delivered through the turnouts was 25,853 acre-feet. These measurements found that 4,040 acre-feet were lost through the 7.7 miles of the lower main canal system in 2021. Table 1 below shows the results of the system monitoring for 2021.

Shortened Irrigation Season Effect on Total Losses

The 2021 irrigation season was shortened by 25 days due to current drought conditions and a very hot and dry summer. The irrigation season ended on September 20 rather than on October 15. The irrigation season was 86.34 percent *(158 days / 183 days = 86.34%)* of a normal irrigation season. Had the irrigation season been the typical 183 days rather than 158 days, water losses would have been higher. The entire season's water losses in the canal system would have increased by the percentage that the irrigation season was shortened, equating to 4,679 acre-feet.

(4,040 acre-feet / 86.34% = 4,679 acre-feet).

Severe Drought

The annual water savings are based on measurements taken for the 2021 irrigation season. Due to severe drought conditions, DWCCC saw a 34 percent reduction in flow for 2021 compared to a five-year average. The total flow that passed through the Roy Flume in 2021 was 29,893 acre-feet, and the five-year average for this same location is 45,289 acre-feet. The average flow will result in a more significant amount of water loss compared to the results of the 2021 measurements. Therefore, the water savings will be conservatively low compared to an average irrigation season.

Table 1 Metering and System Monitoring

Gates	**Estimated Water Delivered (Acre-Feet)**
WBWCD Roy Pond	332
North Flume	246
Roy Water Cons.	5,118
Sunset Res	5,046
Gate 03A	0
Gate 8	256
Gate 9	6
Gate 11	241
Gate 15	1,448
Gate 18	3,167
Gate 19	63
Gate 23E	2,074
Gate 23W	3,360
Gate 24A	45
Gate 25	13
Gate 27	662
Gate 30	521
Gate 33	148
Layton Res	2,922
West 05 Butler	62
West 05 Kap	123
Totals	**25,853**
Total Water Delivered at Roy Flume	**29,893**

J-U-B ENGINEERS, INC.

J-U-B COMPANIES | THE LANGDON GROUP | GATEWAY MAPPING INC.

MEMORANDUM

DATE: July 19, 2022

TO: Rick Smith

CC:

FROM: Jonathan Frazier

SUBJECT: Segment 23b and Segment 38 Flow Measurements

On Friday, July 8, 2022, and Monday, July 11, 2022, J-U-B Engineers, Inc. performed discharge measurements on Segments 38 and 23b of the DWCCC SOR respectively. Discharge measurements were made using a StreamPro (*Teledyne RD Instruments*) piston-type, acoustic Doppler current profiler (ADCP) and companion data collection software WinRiver II (*Teledyne RD Instruments*). The discharge measurements were made at an upstream and downstream location for each reach of interest. The locations of the measurements are shown in Attachment A for Segment 23b and Segment 38. The output from the WinRiver II data processing is included in Attachment B. The collected data was also analyzed using USGS QRev *Software for Computation and Quality Assurance of Acoustic Doppler Current Profiler Moving-Boat Streamflow Measurements*. The output from the QRev analysis is included in Attachment C. Figures 1 and 2 show the typical setup of the ADCP flow meter at each respective Segment.

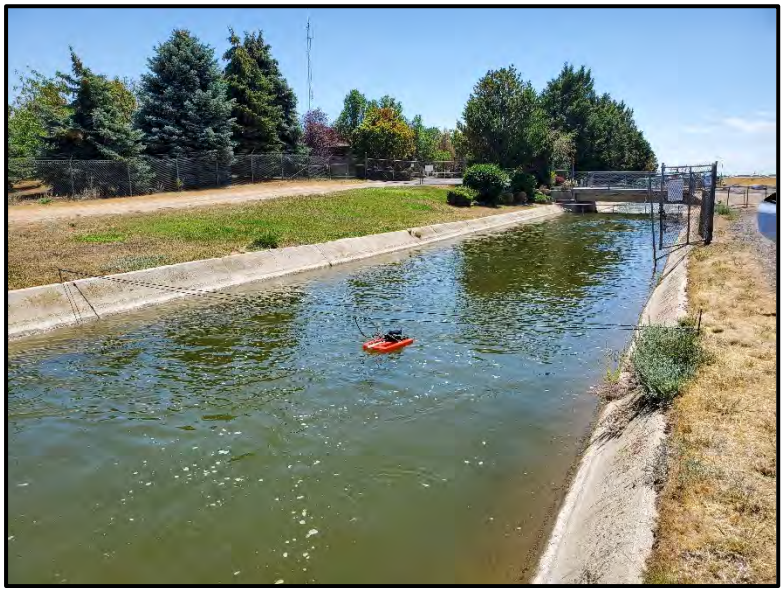


Figure 1 - ADCP flow meter at Roy Flume, upstream location of Segment 23b

Figure 2 - ADCP flow meter at 300 North, downstream location of Segment 38

The results of the discharge measurements are shown in Table 1.

Table 1 - Summary of WinRiver II Output with QRev Corrections

Location	Canal Station	Mean Discharge (Q)	Standard Deviation (S)	Sdev/M	Number of Transects (n)
Segment 23b					
Roy Flume	STA 487+90	113.0 cfs	5.420 cfs	4.8%	4
5600 South	STA 495+18	105.1 cfs	4.060 cfs	3.90%	6
Segment 38					
Bruce Street	STA 625+65	71.2 cfs	1.030 cfs	1.40%	6
300 North	STA 664+40	69.8 cfs	1.330 cfs	1.90%	6

Per the 2017 Bureau of Reclamation Water Conservation Verification of Davis & Weber Counties Canal Company Piping Project, the confidence intervals for the mean total discharge ($\bar{X}$) were calculated using the *t* distribution, standard deviation of the transect total discharge data sets (*S*), and the number of transects used in the mean total discharge calculation (*n*). The *t* distribution was used in place of the Normal distribution since *n* is less than 30. Standard deviations were calculated by *WinRiver II*. The confidence intervals were calculated by:

$$\bar{X} \pm t_c \frac{s}{\sqrt{n}} \qquad \text{(Equation 1)}$$

Where t_c is the *t* distribution critical value read from a table based on the desired confidence level and the degrees of freedom (*n*-1). The confidence interval for the difference between two total discharge means ($\bar{X}$ and $\bar{X}$):

$$\bar{X} - \bar{X} \pm t_c \sqrt{\frac{s^2}{n} + \frac{s_2^2}{n_2}} \qquad \text{(Equation 2)}$$

The results are presented in Table 2.

Table 2 - Estimation of surface water losses from the reach of interest with 80% confidence intervals

Segment 23b	
Upstream Discharge – Roy Flume (cfs):	113±4.44
Downstream Discharge – 5600 South (cfs):	105±5.00
Measured Reach Losses (cfs):	7.786±5.36
Irrigation Season Duration (days):	183
Measured Reach Length (ft)	728
Reach of Interest Length (ft)	625
Annual Loss (acre-ft per year):	**2,426±1,670**
Segment 38	
Upstream Discharge – Bruce Street (cfs):	71.2±0.62
Downstream Discharge – 300 North (cfs):	69.8±0.80
Measured Reach Losses (cfs):	1.367±1.01
Irrigation Season Duration (days):	183
Measured Reach Length (ft)	1,175
Reach of Interest Length (ft)	1,370
Annual Loss (acre-ft per year):	**578±427**
Total Annual Loss Combined Reaches (acre-ft per year):	**3,004±2,097**

There is a high level of uncertainty in these results due to the variability between transects discharge measurements and the large discrepancy between the discharge measurements between the Roy Flume and 5600 South. The difference between discharge measurements for Segment 38 appear to coincide with inflow-outflow calculations and previous estimates.

Weber River Project
WEBER RIVER WATER USERS ASSOCIATION
Established 1926
CONSERVE

Weber River Water Users Association

138 West 1300 North • Sunset, Utah 84015-2918 • p (801) 774-6373 • f (801) 774-5424 • WRWUA.org

July 13, 2022

Davis and Weber Counties Canal Company (D&W)
138 W. 1300 N.
Sunset, UT 84015

Re: Letter of Support for Water and Energy Efficiency Project

Dear D&W,

The Weber River Water Users Association (WRWUA) is pleased to write in support of your grant application being submitted to the Bureau of Reclamation for the Water and Energy Efficiency Grants Program. We applaud your efforts to enclose more of your canal to conserve irrigation water from evaporation and seepage losses.

WRWUA recognizes the importance of water preservation and conservation in our often water-short basin. The water saved through this improvement project will be of benefit to regional water users and the environment. We applaud your efforts to conserve one of our most precious natural resources.

D&W is a large shareholder of WRWUA, and every water savings secures water within the basin. We support this grant application and appreciate the advancements it will make in conserving valuable irrigation water resources.

Sincerely,
Weber River Water Users Association

Robert C. Whiteley
President

ROY WATER
CONSERVANCY DISTRICT
Conserve Every Drop

July 18, 2022

Mr. Rick Smith
General Manager
Davis & Weber Counties Canal Company
138 West 1300 North
Sunset, UT 84015-2918

Re: Letter of Support for Water and Energy Efficiency Project

Dear Mr. Smith,

Roy Water Conservancy District (RWCD) supports Davis and Weber Counties Canal Company's (D&WCCC) grant application being submitted to the Bureau of Reclamation for the Water and Energy Efficiency Grants Program. RWCD appreciates D&WCCC's efforts to enclose more of their canal to conserve irrigation water from evaporation and seepage losses.

RWCD recognizes the importance of water conservation in the often water deficient Weber River basin. The water saved through this improvement project will benefit regional water users and the environment. RWCD is the second largest shareholder in D&WCCC and every water savings effort helps to secure additional water within the Weber River basin. RWCD supports this grant application and appreciates the progress it will make in conserving valuable water resources.

Sincerely,

Rodney Banks

Rodney Banks
General Manager

5440 Freeway Park Drive • Riverdale, UT 84405 • Phone (801) 825-9744 • Fax (801) 779-9098 • www.roywater.com

WEBER BASIN WATER CONSERVANCY DISTRICT

2837 EAST HIGHWAY 193 • LAYTON, UTAH • PHONE (801)771-1677 • SLC (801) 359-4494 • FAX (801) 544-0103

Scott W. Paxman, PE
General Manager/CEO

July 14, 2022

Mr. Rick Smith, General Manager
Davis and Weber Counties Canal Company
138 West 1300 North
Sunset, UT 84015

RE: Letter of Support for Water and Energy Efficiency Project

Dear Rick,

Weber Basin Water Conservancy District (WBWCD) is pleased to write in support of your grant application being submitted to the Bureau of Reclamation for the Water and Energy Efficiency Grants Program. We appreciate Davis & Weber Counties Canal Company's (D&W) efforts to enclose more of your canal to conserve irrigation water from evaporation and seepage losses.

WBWCD recognizes the importance of water conservation in our often water-short basin. The water saved through this improvement project will benefit regional water users and the environment. WBWCD is a large shareholder in D&W, and every water savings effort helps to secure additional water within the basin.

We support this grant application and appreciate the advancements it will make in conserving valuable water resources.

Sincerely,

Darren E. Hess

Darren E. Hess, PE
Assistant General Manager/COO

DEH/sm

Tanner Cox
Trout Unlimited
215 North 200 East
Brigham City, UT 84302
(406) 596-1276

July 13, 2022

Rick Smith, PE General Manager
Davis and Weber Counties Canal Company
138 W 1300 N
Clearfield, UT 84015

Dear Mr. Smith:

Trout Unlimited has had the opportunity to be involved in the Weber River Partnership. The Weber River Partnership represents a broad array of interests within the basin. The Davis and Weber Counties Canal Company has brought valuable perspectives to the partnership. Through collaboration and communication of diverse stakeholders, the Weber River Partnership has made great progress to ensure the development of a cohesive vision that includes water security, agricultural interests, community development, and natural resources values.

Trout Unlimited has been working on the ground with several partners throughout the Weber River Basin, many of whom are members of the Weber River Partnership, to protect and restore populations of Bonneville cutthroat trout and bluehead sucker. Habitat restoration, fish passage, and water efficiency projects have made great strides towards improving resiliency of Bonneville cutthroat trout and bluehead sucker populations. However, these populations remain threatened by stream fragmentation (i.e., barriers to movement), water shortages, and habitat degradation. Without intervention, these populations are threatened and petitions for listing under the Endangered Species Act are possible. All partners in the watershed benefit by preventing the listing of imperiled species. More importantly, we believe that watershed partners value the fact that these species persist in the Weber River. A cohesive strategy through the Weber River Partnership maximizes the beneficial effects and broadens the scope of our actions on the ground to provide broad benefits to all stakeholders in the basin.

Trout Unlimited is encouraged by your continued commitment to maintain canal infrastructure and supportive of your proposed project to improve the water conveyance within your system by replacing old infrastructure using the WaterSMART Water and Energy Efficiency Program. We believe this project contributes to the overall goals of conserving imperiled species by improving conveyance of diverted water, which provides more opportunity to improve the resiliency of native fish populations.

We look forward to continuing collective progress with you and working in partnership with your organization on the broader goals of improving communication, coordination, and collaboration within the Weber River Basin.

Best regards,

Tanner L. Cox

Tanner L. Cox
Weber River Project Manager
Trout Unlimited
215 North 200 East
Brigham City, UT 84302