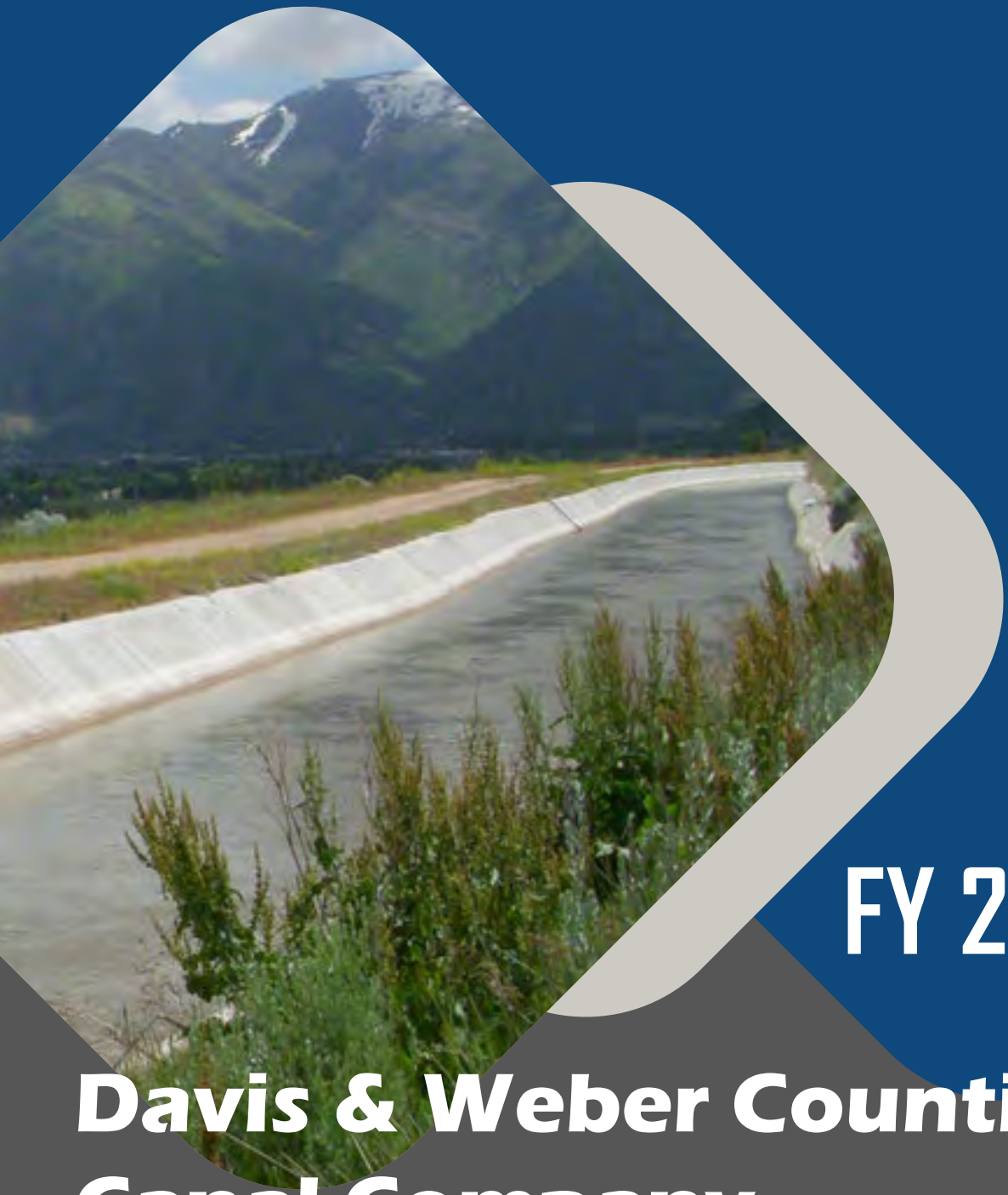
WaterSMART: Water and Energy Efficiency Grants - NOFO No. R22AS00023



FY 2022

Davis & Weber Counties Canal Company

Canal Enclosure and Solar Energy Project

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Applicant Info

Date: November 3, 2021

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

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

Project Manager:

Jonathan Frazier, P.E.
Project Manager
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Applicant Category: Category A

Project Funding Request: Funding Group II, $1,500,000; Total Project Cost $3,000,000

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 838 acre-feet of water. The project consists of enclosing 1,650 feet of a failing liner with an 8 ft. x 7 ft. precast concrete box culvert and replacing 880 feet of corroding metal pipe with 66-inch reinforced concrete pipe. With the development of this project, the lower 22,425 feet of the main canal will be mostly enclosed, reducing losses and improving safety. In addition, a 10.3 kW solar array will be installed at the DWCCC maintenance building and shops to generate 16,723 kilowatt hours (kWh) of energy per year. The DWCCC project is 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 July 2022****.*

The environmental report was previously completed, and a FONSI was issued for this project about six 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 2022 and the final design to take place from September 2022 – June 2023. The design is estimated to take eight to twelve months. The box culvert and concrete pipe portion of the project will need to be installed outside of the irrigation season and is anticipated to be installed from October 2023 – March 2024 and October 2024 – March 2025. The solar portion of the project will be constructed in June/August 2024. The project will be accomplished within the three-year allowance. The project will be completed by September 2025.

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 better management of DWCCC's water, allowing water to stay in the reservoir longer during the irrigation season, which will benefit the habitats and recreational opportunities within the reservoirs.

Project Location

Provide detailed information on the proposed project location or project area including a map showing the specific geographic location. For example, {project name}is located in {state and county} approximately {distance} miles {direction, e.g., northeast} of {nearest town}. The project latitude is {##°##'N} and longitude is {###°##'W}.

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 25a is {112°1'29"W} {41°9'1"N}, Segment 29 is { 41°8'1"N} {12°1'35"W}, and Segment 49 is {111°58'40"W} {41°5'34"N}. An overview of the entire service area is shown in the attached maps. See Attachment A – Project Location Map and Attachment B – Detailed Project Maps.

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 three separate areas along the lower main canal in Sunset and Layton, Utah. They are Segments 25a, 29, and 49 as defined in their SOR. The project will consist of replacing 1,650 feet of deteriorating open canal liner with an 8 ft. x 7 ft. precast concrete box culvert and 880 feet of corroding metal pipe with 66-inch reinforced concrete pipe. In addition, DWCCC will install a 10.3 kW solar array located at the canal works building, generating 16,723 kilowatt-hours (kWh) of energy per year.

- **Segment 25a** is located in Sunset and consists of an open concrete canal liner installed when U.S. interstate 15 (I-15) was initially constructed and required the DWCCC canal to be relocated. The concrete in this segment of the canal is cracked, has no waterstop at the joints, and is deteriorated or missing in some locations. This segment is bounded on the west by I-15 and on the east by Hill Air Force Base. Due to the cracks, broken liner, and sandy soils, a substantial amount of water is being lost. The Utah Department of Transportation (UDOT) plans to relocate I-15 over the top of the canal for a portion of segment 25b and to replace the open liner with a box culvert. DWCCC

wants to extend this box culvert through segment 25a, which will replace and enclose this entire segment of open canal and so UDOT can connect to their improvements at the same time.

- **Segment 29** is located in Sunset and consists of an open concrete canal liner that was installed when the Sunset Reservoir was constructed in the early 1990s. This open canal is located near businesses and Main street in Sunset. This area has no water-stop in the joints and constantly loses water. At the beginning of each irrigation season when water enters the canal, leakage water appears in an apartment complex downhill of the canal. DWCCC expends resources and energy (a sump pump runs all summer) to address the leakage every year. This section of the canal is also approximately 18 inches below the adjacent Segments of the canal. The drop in liner elevation in this section causes sediment buildup within the canal, resulting in maintenance issues and water loss.

- **Segment 49** is located in Layton and consists of a 54-inch aluminized steel pipe (ASP). The pipe is corroding and needs to be replaced. It is located in the backyard areas between two residential subdivisions, and the pipe leaks into backyards.

Photo 4 Segment 49

Over the past sixteen 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. This project is identified in DWCCC's System Optimization Review (SOR) as high priority projects which 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 losses by 838 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 838 acre-feet of water per year, based on 34,000 acre-feet of water flow through this area annually. This is an approximate 2.5% 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 liner in the canal into the ground, being lost to evaporation, and taken up by vegetation. The soils around the canal are granular and allow the water to pass through very quickly.

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 properties 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, within commercial areas, and in highly density residential areas.

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 flows through the canal are tracked and monitored. An inflow-outflow model over an irrigation season was used to calculate the water savings. Under the Canal Lining and Piping section below, the calculations and assumptions have been documented for the estimated water savings. In May 2017, DWCCC met with the Bureau of Reclamation, which performed a Water Conservation Verification study. This Study verified water loss estimates for a similar WaterSMART project within the same canal and for over an equivalent length. The calculated water losses that DWCCC used were compared to the Reclamation Water Conservation Verification study, and their conclusion corresponded with DWCCC's calculations. See Attachment C – Reclamation Verification Report Section.

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 average annual water savings is 838 acre-feet. During the irrigation season, DWCCC monitors the inflow-outflow along the 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. The flow measurements were compiled every month, showing the water used at each turnout and how much water entered the system. To determine project water losses, DWCCC used an inflow-outflow method over the entire season. The total amount metered at all the turnouts was subtracted from the 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. The total amount delivered through the turnouts was 25,853 acre-feet. From these measurements, we

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.

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**
Difference or Water Lost to System	**4,040**

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 20th rather than on October 15th. The irrigation season was 86.34% (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% 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 larger amount of water loss compared to the results of the 2021 measurements. Therefore, the water savings presented will be conservatively low compared to an average irrigation season.

Water Loss of the Canal Per-foot

The main canal below the Roy Flume has 8,950 feet of unlined or deteriorating liner that the water must pass through to deliver to DWCCC users. The water loss calculations on a per-foot basis are being distributed equally across the main canal. Given these components, the water loss per foot is as follows: 4,679 acre-feet / 8,950 feet = 0.523 acre-feet per foot of canal.

Project Water Losses

This project will enclose 1,650 feet of an old open canal and replace 880 feet of deteriorated metal pipe within the main canal. The projected water savings of the open liner are 863 acre-feet (1,650 ft. * 0.523 acre-feet per foot). The deteriorated metal pipe is also losing water, and in its current condition, we were unable to adequately measure the water losses in the deteriorated pipe. The 863 acre-feet are conservative and would be increased by the water

lost through the 880 feet of deteriorated metal pipe. Using a 3 percent loss for reinforced concrete box culvert, the net water savings for the project will be 838 acre-feet per water season. 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.

As stated previously, in May 2017, the Bureau of Reclamation completed a Water Conservation Verification of a DWCCC WaterSMART Canal Piping Project. This WaterSMART project piped 950 feet of open canal. Reclamation concluded that the 950 feet of canal would have a water savings of 548 acre-feet. See Attachment C – 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 and gives a calculated water loss of 952 acre-feet for 1,650 feet of canal.

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.*

   An inflow/outflow test was done over the entire 2021 irrigation season. A known quantity of water passed the Roy Flume at the start of the lower portion of the canal. The water used at each turnout was subtracted from the total that was passing through the Roy Flume, giving the total water that was lost to the system. There are currently fourteen continuously metered turnouts on the canal and seven turnouts with weirs and flumes. DWCCC took daily measurements on all the non-continuously recorded turnouts to quantify how much water passed through each turnout. These readings were taken each month to determine water lost within the system. These calculations were used to calculate the water lost in the system.

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)?*

   Reinforced concrete box culvert and reinforced concrete pipe, both with gasketed joints, will be used. Both materials have an estimated loss factor of minus 3 percent. 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 in 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?*

   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; this gives 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 every month and will allow the Company to monitor and measure the benefits of the project to the water losses of the system.

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

The canal will be enclosed with an 8 ft. x 7 ft. precast concrete box culvert, and 66-inch diameter reinforced concrete pipe, 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 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 to add additional panels as funds were provided. It is a seamless system that does not require other equipment or meters to install additional panels.

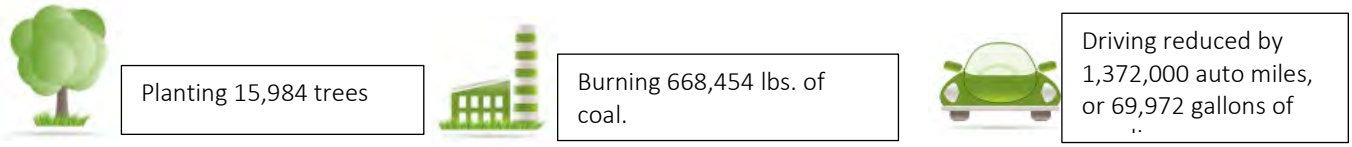
Photo 5 Existing Solar Array

This project will add to that existing solar array by installing an additional 10.3 kW in solar panels. With the development of the solar array, DWCCC will now be able to utilize the power on-site of their maintenance building and shops, reducing cost of outside power sources throughout the entire 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 10.3 kW solar panel array at the DWCCC Sunset Reservoir. The proposed solar array will provide approximately 16,723 kWh per year that will be used to offset energy demands. Within many other WaterSMART projects, DWCCC has implemented hydropower as a source of renewable energy to run meters, automated headgates, and other equipment during the irrigation season. With the development of the 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. It is estimated that the proposed solar project will offset approximately 34,000 lbs. of CO2 per year, reducing DWCCC's carbon footprint.

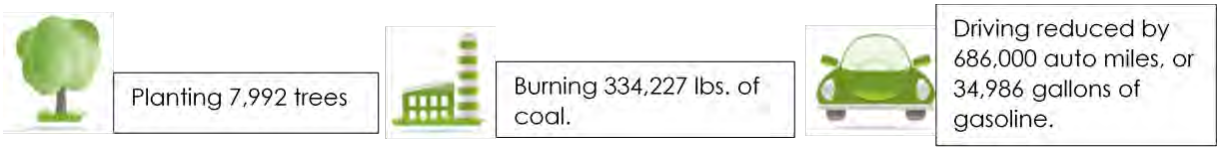
In 2018, DWCCC installed a similar-sized solar array in the same location where the new solar array will be installed. With the addition of these new solar panels to their existing solar array, DWCCC will provide a reduction to its carbon footprint that is equivalent to:



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*

It is estimated that the proposed solar project will offset approximately 34,000 lbs. of CO2 per year compared with coal plant generation, reducing DWCCC's carbon footprint. Over the life of the solar array system (20 years), the reduction of DWCCC's carbon footprint is equivalent to:



Master Electrical Service provided the carbon footprint equivalent information above. The 10.3 kW solar array will operate year-round and will generate 16,723 kWh per year of renewable power.

- *Expected environmental benefits of the renewable energy system*

  This project will reduce 34,000 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.

- *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.

Photo 6 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 34,000 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. The 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 1,650 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 person-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 DWCCC's solar arrays and small hydro's adds up to over 59,032 kW hours of renewable energy each year. It is estimated that the proposed 10.3 kW solar panel array in this project will offset approximately 34,000 lbs. of CO2 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: two 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.

  This 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.*
  The completion of this project will reduce the time, energy, and money spent to monitor these critical sections of the canal on a daily basis 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 by half (7,360 miles) per irrigation season. In that case, we will realize savings that will consist of the following: The savings will be in fewer vehicle miles traveled, reduced gasoline consumption, decreased CO2 pollutants released, and more person-hours saved.

  Traveling only once a day at 40 miles per round trip would equate to a savings of 7,360 miles per irrigation season. Calculation of CO2 and social cost of the Carbon-based emissions on 3% discount rate per ton and price for gasoline comes from FHWA Benefits Cost Analysis Resource Guide.

  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 3.500 per gallon
  - » Assume a Social Cost of Carbon discounted at 3% per ton

  Gasoline cost savings: Savings of $1,840.00
  (14 mpg / 7360 = 526 gallons of gas x 3.50 cost per gallon = $1,840.00 in savings)

  Pollution savings: Savings of 10.8 metric tons of CO2 per year, equating to a Social Cost of Carbon per ton at $22.80, which equals savings of $246.00 per year saved. Discounted by 3% is $238.85. Not to mention fewer carbon emissions into the atmosphere and stratosphere. This analysis does not include the savings for monitoring the pump stations and automated traveling screens twice daily.
- *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).*
  The development of this project will allow for 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 then 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 purposes like recreation, the environment, or to improve water quality. Within the Weber River Watershed Plan of 2014, it states that "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. 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, therefore 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 some 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 ended up having 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 own electric pumps, reducing the additional expenses from $274,000, down to about $96,000 for the same period of time.

- *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 this past 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.

- *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 838 acre-feet of water to be saved for future use or stored for more extended periods of time.

- *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 a broken-up open canal with a precast box culvert and replace corroding metal pipe with concrete pipe. The open canal and corroding metal pipe loses essential water to leaks, seepage, and root uptake. Enclosing the canal and replacing the metal pipe will allow the water being lost to be used by farmers and secondary water

irrigators. This will provide additional water for use in times of drought and will enable users to exercise their water rights more fully.

The conserved water 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 can be considered, allowing prolonged and better-balanced stream flows of available water. The conserved water will enable flows to remain in the river system for more extended periods and be held for longer in the season in the Echo and East Canyon Reservoirs.

- *Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*
  The development of this project will allow for 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 then the existing canal system to the current users.
- *Indicate the quantity of conserved water that will be used for the intended purpose(s).*
  The 838 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 to ensure that WBWCD's resources are made 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 every year.

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

The project will install a 10.3 kW solar panel array at the DWCCC Sunset Reservoir. The proposed solar array will provide approximately 16,723 kWh per year that will be used to offset energy demands. Within many other WaterSMART projects, DWCCC has implemented hydropower as a source of renewable energy to run meters, automated headgates, and other equipment during the irrigation season. With the development of the 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. It is estimated that the proposed solar project will offset approximately 34,000 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 adds up to over 59,032 kW hours of renewable energy each year. It is estimated that the proposed 10.3 kW solar panel array project will offset approximately 34,000 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.*

There are many low- and moderate-income homes located near the open canal that have been impacted by seepage losses and an increase in water table height. This project will reduce these impacts on residents as it reduces the chance for water in their basements and continuous running of their sump pumps.

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

DWCCC's service area includes Roy City and Sunset City, both of which are considered entitlement cities and qualify for HUD's CDBG program funds.

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.*

N/A.

(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 larger 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?*
   The project will enclose broken up open canal with precast box culvert and replace corroding metal pipe with concrete pipe. Enclosing the canal and replacing the metal pipe will allow the water being lost 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 more fully exercise their water right.

   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 can be considered, which would allow prolonged and better-balanced stream flows for available water. The conserved water will enable flows to remain in the river system for longer 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 and leaking pipes causes seepage and could result in a breach, which could have a significant impact on residential areas. It will disrupt services to many communities and agricultural users. This project will secure the main canal and reduce the seepage into businesses, backyards, and fields.

   There is always tension when it comes to water. Natural disasters, drought, and un-maintained canals and ditches seem to be the major factors in developing tension 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. Lack of water due to the drought and seepage losses within the main canal have increased conflicts between residents, businesses, and DWCCC staff.

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 that are continually encroaching on the agricultural lands.

DWCCC provides water to approximately 60 different ditches and turnouts. The canal system is elevated so that 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 made safe, and water can be delivered efficiently.

The Company is aware of a few local farm projects that are 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 who have an interest in on-farm efficiency projects. See Attachment D – 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 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 have a strong interest to meet 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 D – 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 complement the on-farm project by maximizing efficiency in the area? If so, how?*
    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 creation of additional water resources through conservation that will benefit future water development needs. Better use of the water will come about by reducing water wasting and losses due to seepage. This documentation was outlined in detail within the Quantifiable Water Savings section of this application.

- *Please provide a map of your water service area boundaries. If your project is selected for funding under this FOA, 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 E – 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 F – 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 Waters 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 that this project will help implement is to reduce outdoor use through monitoring and 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 a number of 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 of the 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.

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

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.
- The design includes a topographic survey, 30% design review and stakeholder coordination, 50% design review, 90% 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. A SWPPP permit and UDOT encroachment permit will be required.

- *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; construction/installation (50% complete); and construction/installation (100% complete)*
  The anticipated schedule is as follows:

  April 2022 – June 2023
  - Contracting and Environmental Assessment: April 2022 – June 2023
  - Design: August 2022 – June 2023

  July 2023 to September 2023
  - Advertising and Bidding: July 2023
  - Award and Construction Contracting: September 2023

  October 2023 to September 2025
  - Construct Canal Enclosure: October 2023 to March 2024 and October 2024 to March 2025
  - Final Grading, Surface Restoration: April 2024 to August 2025
  - Construct Solar: June 2024 to August 2024

- Project Closed Out: September 2025

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 Waters 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 they would like to implement, most of which this project will help to satisfy. The specific goal that this project will help implement is to reduce outdoor use through monitoring and 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?*
  DWCCC Board is comprised of many shareholders and other water entities that participate in the development and update of their plans.

- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*
  Many DWCCC's shareholders include cities and other irrigation companies that have made significant improvements to 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 G – Letters of support.

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

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

$$\frac{\$1{,}500{,}000\ NonFederal\ Funding}{\$3{,}000{,}000\ Total\ Project\ Cost} = 50\%$$

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. 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.

Figure 2 Daily Turnout Measurement Sheet

Byram Estates	Measurements (CFS)	Estimated Delivery (CFS)	Total Estimated Delivered (Acre-Feet)	Flow Alotment (CFS per day)	Total Alotment (Acre-Feet)	Running Total Available (Acre-Feet)
April 15, 2013				-	-	-
April 16, 2013				4.64	9.19	9.19
April 17, 2013				4.64	18.39	18.39
April 18, 2013				4.64	27.58	27.58
April 19, 2013				4.64	36.78	36.78
April 20, 2013				4.64	45.97	45.97
April 21, 2013				4.64	55.17	55.17
April 22, 2013				4.64	64.36	64.36
April 23, 2013				4.64	73.56	73.56
April 24, 2013				4.64	82.75	82.75
April 25, 2013				4.64	91.95	91.95
April 26, 2013				4.64	101.14	101.14
April 27, 2013				4.64	110.34	110.34
April 28, 2013				4.64	119.53	119.53
April 29, 2013				4.64	128.73	128.73
April 30, 2013				4.64	137.92	137.92

Figure 2 Summary Sheet

Gate	Estimated Water Delivered (Acre-Feet)	Water Allocated To Date (Acre-Feet)	Water Allocated For Year (Acre-Feet)	Difference Column 1-2 (Acre-Feet)	Total Remaining for Year Column 3-1 (Acre-Feet)
WBWCD Gateway					
WBWCD Roy Pond					
Byram Estates					
North Fluma					
North 10					
North 11					
Roy WCD					
Sunset Res					
Gate 03A					
Gate 8					
Gate 11					
Gate 15					
Gate 16					
Gate 18					
Gate 19					
Gate 23E					
Gate 23W					
Gate 24A					
Gate 25					
Gate 27					
Gate 30IF					
Gate 30IS					
Gate 33					
Layton Res					
West 05 Butler					
West 05 Kap					
Totals					

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 completion of the project. 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. The metered output will be recorded monthly and compared to the estimation of power generation in this application. This information will be provided in an annual report to the DWCCC Board of Directors.

Water Savings and Better Water Management Performance Measures

The System Optimization Review identifies the water tracking and water usage procedures for the DWCCC canal. These are the same procedures that were followed to calculate the water losses in this application. The same methods will be used to measure the actual water saved/better managed after completing this project.

A season-long inflow and outflow summary of the lower portions of the canal will be taken
There is a meter on the main canal, called the "Roy Flume," at the start of the lower portion of the canal. 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. Each month, the flow measurements will be taken and used to determine how much water has passed 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. A portion of the gate usage tracking sheet is shown in Figure 3, Daily Turnout Measurement Sheet.

The individual gates are combined into a summary of all gates on the lower canal. The sheet in Figure 4 Summary Sheet is a sample of how the information will be recorded. This summary sheet 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 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 their own Construction Reserve Account and staff time will be over and above the cost of the project 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 make an application to the Division of Water Resources next year for a loan if needed. It is anticipated that DWCCC will have its own funds available, but if required, 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.*
  None.

- *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	$1,500,000
Costs to be paid by the applicant	$1,500,000
Value of third party contributions	$0
Total Project Cost	**$3,000,000**

Table 2 – Budget Proposal

Budget Item Description	Unit	Quanity	Unit Price	Total Cost
Salaries and Wages				**$0.00**
Fringe Benefits				**$0.00**
Travel				**$0.00**
Equipment				**$0.00**
Supplies and Materials				**$0.00**
Contractual /Construction				**$2,991,000**
Segment 25a: 8'x7' Box Culvert from Roy RR Crossing to Proposed I-15 Crossing				
Budget Item Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
Mobilization	EA	1	$133,700.00	$133,700.00
Traffic Control	EA	1	$12,600.00	$12,600.00
Storm Water Pollution Prevention Plan (SWPPP)	EA	1	$13,480.00	$13,480.00
Clear and Grub	EA	1	$11,190.00	$11,190.00
Remove Existing Concrete Canal Liner	LF	1300	$22.00	$28,600.00
8'x7' Precast Box Culvert	LF	1300	$802.00	$1,042,600.00
Imported Backfill Material	CY	6680.00	$26.00	$173,680.00
Foundation Material and Leveling Course	LF	1300	$24.00	$31,200.00
Surface Restoration	EA	1	$13,800.00	$13,800.00
Pothole Utilities	HR	10	$300.00	$3,000.00
Connect to Existing Box Culvert	EA	1	$10,000.00	$10,000.00
Exit Transition Structure	EA	1	$48,600.00	$48,600.00
30" Diameter Access Manhole	EA	3	$2,600.00	$7,800.00
Solar Power Generation	kW	10.3	$3,500.00	$36,050.00
Construction Subtotal				**$1,566,300.00**
Design	EA	7%		$109,600.00
Construction	EA	7%		$109,600.00
Reporting	HR	12	$125.00	$1,500.00
Total				**$1,787,000.00**
Segment 29: 8'x7' Box Culvert in Front of Sunset Reservoir				
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
Mobilization	LS	1	$36,000.00	$36,000.00
Traffic Control	LS	1	$5,430.00	$5,430.00

Storm Water Pollution Prevention Plan (SWPPP)	LS	1	$3,630.00	$3,630.00
Clear and Grub	LS	1	$3,020.00	$3,020.00
Remove Existing Concrete Canal Liner	LF	350	$22.00	$7,700.00
8'x7' Precast Box Culvert	LF	350	$802.00	$280,700.00
Imported Backfill Material	CY	2201.15	$26.00	$57,230.00
Foundation Material and Leveling Course	LF	350	$24.00	$8,400.00
Surface Restoration	LS	1	$3,720.00	$3,720.00
Pothole Utilities	HR	10	$300.00	$3,000.00
Entrance Transition Structure	LS	1	$31,460.00	$31,460.00
Sunset Reservoir Turnout	LS	1	$44,510.00	$44,510.00
Connect to Existing Box Culvert	LS	1	$10,000.00	$10,000.00
30" Diameter Access Manhole	EA	1	$2,600.00	$2,600.00
Construction Subtotal				**$497,400.00**
Design	LS	7%		$34,800.00
Construction	LS	7%		$34,800.00
Total				**$567,000.00**

Segment 49: Replace 54" CMP with 66" RCP 650 West to Sunriver

Description	Unit	Quantity	Unit Price	Amount
Mobilization	LS	1	$36,000.00	$36,000.00
Storm Water Pollution Prevention Plan (SWPPP)	LS	1	$9,130.00	$9,130.00
Clear and Grub	LS	1	$7,570.00	$7,570.00
Remove 54" CMP	LF	880	$40.00	$35,200.00
66" Diameter Class III RCP (Includes Bends)	LF	880	$321.00	$282,480.00
Imported Backfill Material	CY	2904.62	$26.00	$75,520.00
Foundation Material and Leveling Course	LF	880	$24.00	$21,120.00
Surface Restoration	LS	1	$4,100.00	$4,100.00
Pothole Utilities	HR	10	$300.00	$3,000.00
8ft x 8ft Manhole	EA	2	$11,690.00	$23,380.00
36" Diameter Access Manhole	EA	2	$6,600.00	$13,200.00
650 West, Traffic Control	LS	1	$6,720.00	$6,720.00
650 West, Culvert and Asphalt Demolition	LS	1	$10,940.00	$10,940.00
650 West, Granular Borrow Backfill	Tons	220	$24.00	$5,280.00
650 West, Untreated Base Course	Tons	160	$28.00	$4,480.00
650 West, Hot-mix Asphalt	Tons	60	$180.00	$10,800.00
650 West, Temporary Asphalt Patch	Tons	30	$210.00	$6,300.00
650 West, Asphalt Painting	LS	1	$1,580.00	$1,580.00
Remove and Replace Curb and Sidewalk	LF	40	$50.00	$2,000.00
Construction Subtotal				**$558,800.00**
Design	LS	7%		$39,100.00
Construction	LS	7%		$39,100.00
Total				**$637,000.00**

Third-Party Contributions				**$0.00**
Other				**$9,000.00**
Environmental Document Update	HR	72	$125.00	**$9,000.00**
Total Direct Costs				**$3,000,000.00**
Indirect Costs				**$0.00**
Type of rate	Percentage	$base		$0.00

Total Estimated Project Costs	$3,000,000.00

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 cost of the project 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

In order to determine unit costs which were included in the cost estimate for this project, DWCCC relied upon contract unit prices from similar projects bid in September 2021, September 2020, October 2019, and October 2018. 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 of the components to furnish and install all the equipment. Generally, the low bidder will be selected based on a determination of acceptable qualifications.

Contractual cost includes design at approximately 7 percent and construction observation at approximately 7 percent. 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 additional information. Therefore, 72 hours at $125.00 = $9,000 will be included in this project.

Other Expenses

Environmental is included under other expenses based on Reclamation preparing the review of the existing approved environmental document.

Indirect Costs

No other expenses are included.

Total Costs

DWCCC Portion: $1,500,000	Fed Portion: $1,500,000	Total: $3,000,000

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 and replacing the metal pipe. 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 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 pipe 1,650 feet of old concrete liner and replace 880 feet of deteriorated metal pipe through Sunset and Layton with an 8 ft. x 7 ft. precast concrete box culvert, and 66-inch reinforced concrete pipe. It will add 10.3kW to a solar array at the DWCCC 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 having completed the Environmental Document and submitting it to Reclamation, DWCCC is not aware 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 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. A SWPPP permit and UDOT encroachment permit will be required.

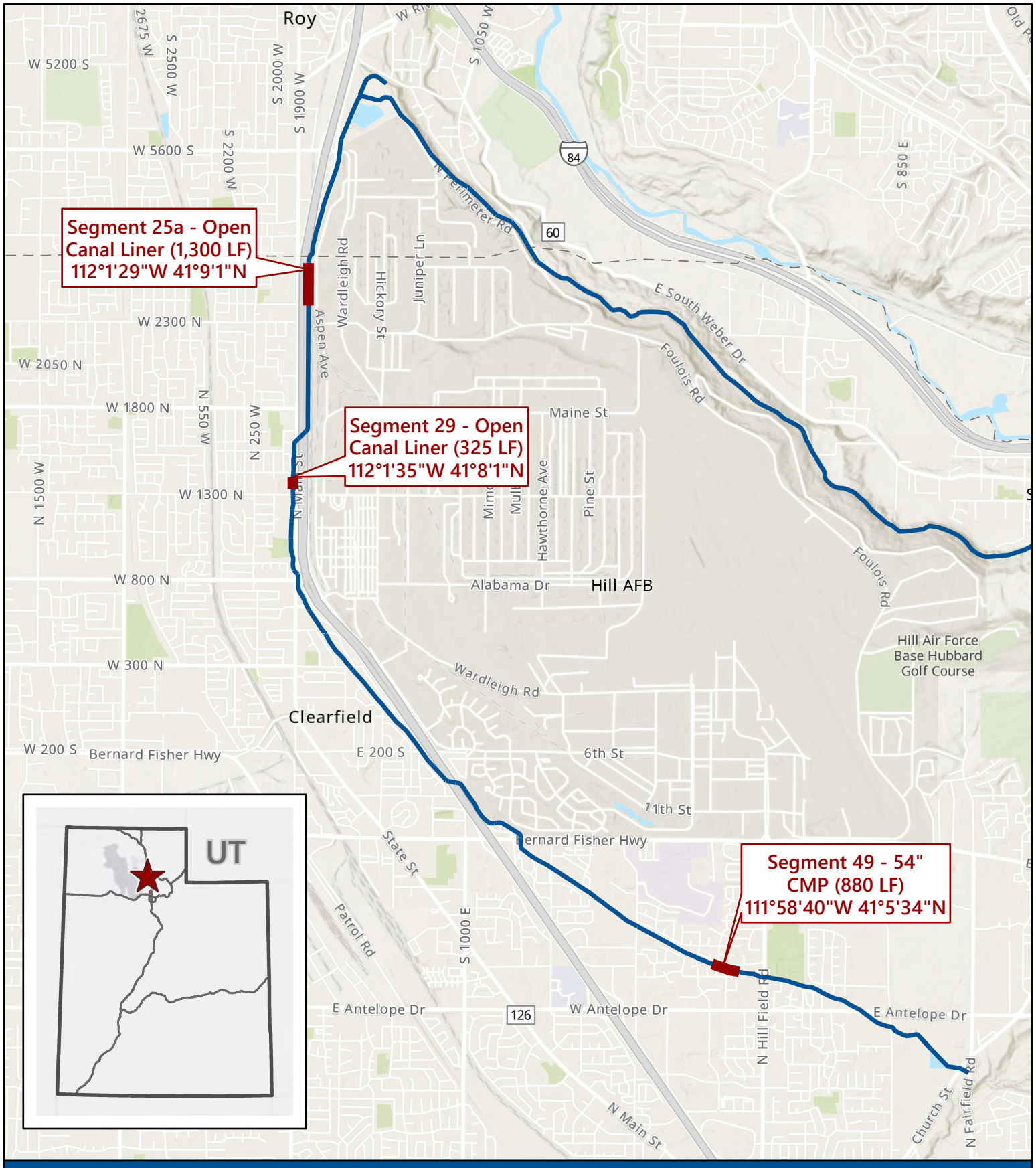
Letters of Project Support and Letters of Partnership

Include letters from interested stakeholders supporting the proposed project.
Letters of Support from the following are included in Attachment G – Letters of Support:

- Trout Unlimited – Paul Burnett, Weber River Project Coordinator
- Utah Division of Wildlife Resources – Clint Brunson, Aquatics Habitat Restoration Biologist
- Weber Basin Water Conservancy District – Darren Hess, PE, Assistant General Manager/COO
- Weber River Water Users Association – Theo G. Cox, President

Official Resolution

Include an official resolution adopted by the applicant's board of directors or governing body, or, for State government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of a financial assistance award under this NOFO. The official resolution may be submitted to bor-sha-fafoa@usbr.gov up to 30 days after the application deadline.
The Official Resolution for the Davis and Weber Counties Canal Company project will be submitted within 30 days after the application deadline.



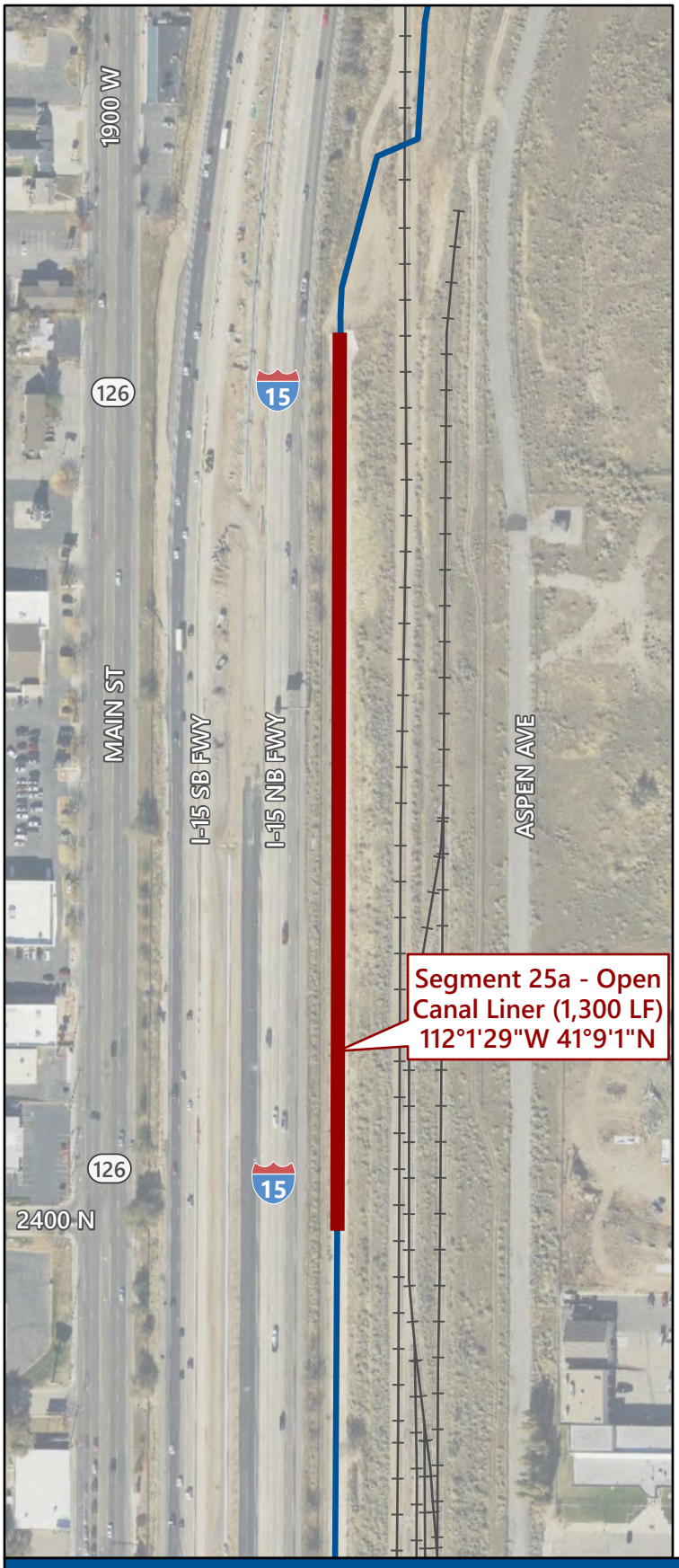
DAVIS & WEBER COUNTIES CANAL CO.
PROJECT LOCATION

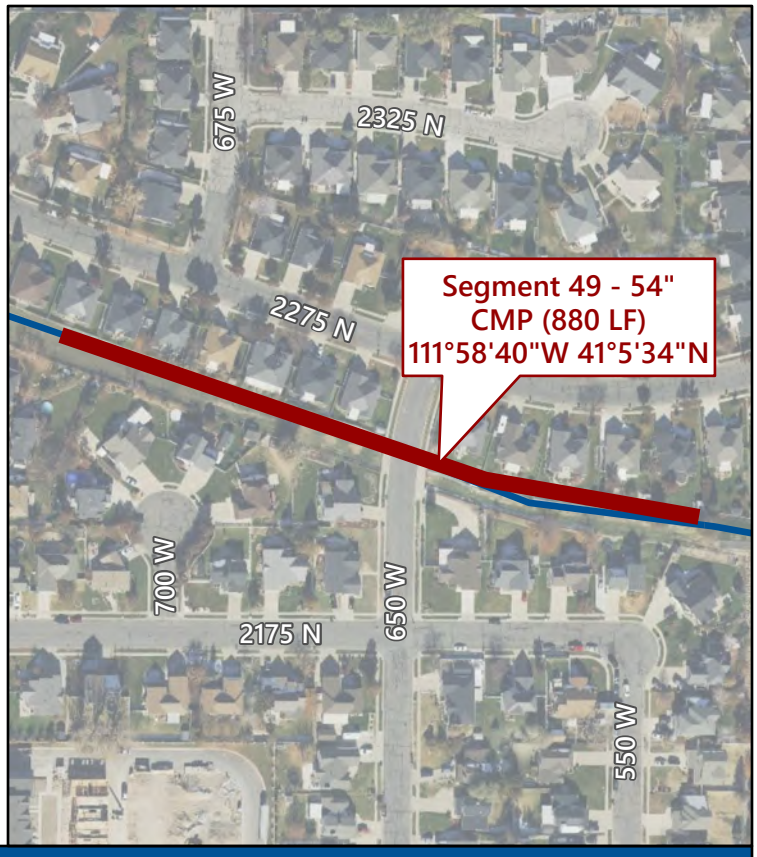
0 0.75 Miles

N

WaterSMART: Water and Energy Efficiency Grant

10/26/2021





DAVIS & WEBER COUNTIES CANAL CO.
PROJECT DETAIL

0 250 500
Feet

N

WaterSMART: Water and Energy Efficiency Grant

10/26/2021

RECLAMATION

Managing Water in the West

Water Conservation Verification of Davis & Weber Counties Canal Company Canal Piping Project

Davis County, UT* near *Salt Lake City, UT

Upper Colorado Region

U.S. Department of the Interior

Bureau of Reclamation

Technical Service Center

Water, Environmental, & Ecosystems Division

Water Resources Planning & Operations Support Group

May 2017

Water Conservation Verification of Davis & Weber Counties Canal Company Canal Piping Project

Davis County, UT* near *Salt Lake City, UT

Upper Colorado Region

Brandon House, Hydrologic Engineer

Mark Spears, Hydraulic Engineer

U.S. Department of the Interior

Bureau of Reclamation

Technical Service Center

Water, Environmental, & Ecosystems Division

Water Resources Planning & Operations Support Group **May 2017**

Acronyms and Abbreviations

ADCP	acoustic Doppler current profiler
AFY	acre-feet per year [L3/T]
cfs	cubic feet per second [L3/T]
DWCCC	Davis & Weber Counties Canal Company
ET	Evapotranspiration
ft	feet [L]
hrs	hours [T]
in	inches [L]
mi	miles [L]
PVC	Polyvinyl Chloride
Reclamation	Bureau of Reclamation
SMART	Sustain and Manage America's Resources for Tomorrow
WEEG	Water and Energy Efficiency Grant

Contents

List of Figures

Introduction

Davis & Weber Counties Canal Company (DWCCC) received funds for a surface water conservation project from the Bureau of Reclamation's (Reclamation) Fiscal Year 2016 WaterSMART Water and Energy Efficacy Grants (WEEG) cost-share program under funding opportunity number R16-FOA-DO-004 – reference code WEEG-76. The project is located in central-northern UT, 26 miles (mi) north of Salt Lake City, UT in Clearfield, UT (Figure 1). DWCCC will use the funds to pipe 950 feet (ft) of open, concrete-lined canal and construct a small hydropower station. DWCCC estimates that piping the canal will conserve 144 acre-feet per year (AFY) of surface water, and the hydropower station will generate 21,600 kilowatt hours of power per year.

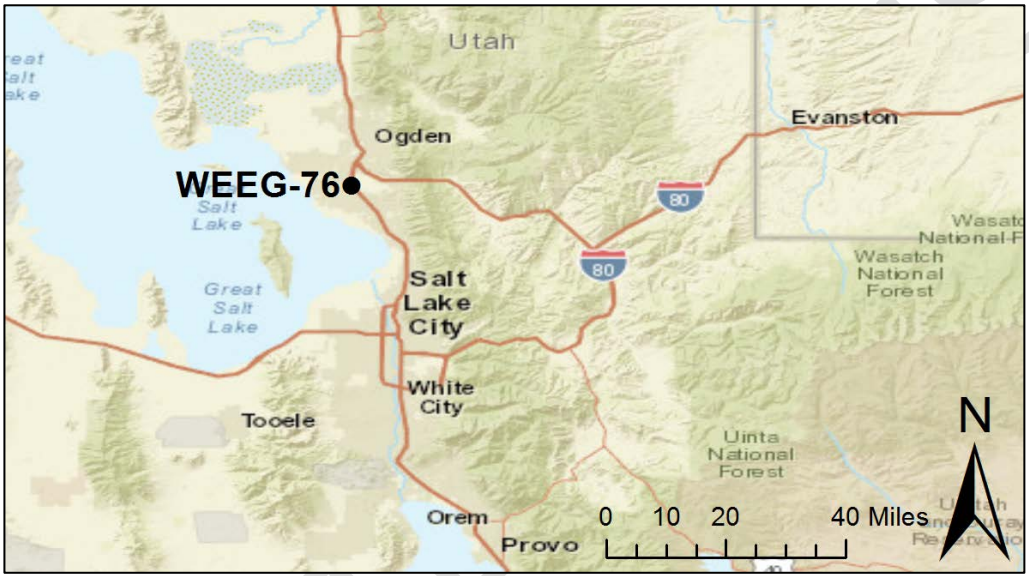


Figure 1 – Canal piping project vicinity in central-northern Utah

Every year after WEEG recipient selection is completed, several recipients are selected to have a Reclamation representative visit the recipient and verify the amount of water expected to be conserved by the project. Verification is done to improve WEEG selection criteria for future funding opportunities and the results do not affect receipt of funds from current or future grants.

Verification of hydropower generation is outside the scope of this project; therefore, this work will focus on the surface water conservation realized from piping the 950 ft reach of canal – the reach of interest (Figure 2). The reach of interest will have the current 100-year-old concrete liner replaced with a reinforced concrete box culvert. Piping canals is known to conserve surface water by (1) eliminating evapotranspiration (ET) from the canal water surface and from plants near the canal and (2) eliminating seeping of water from the canal into the material surrounding the canal [*Jensen et al.*, 1967]

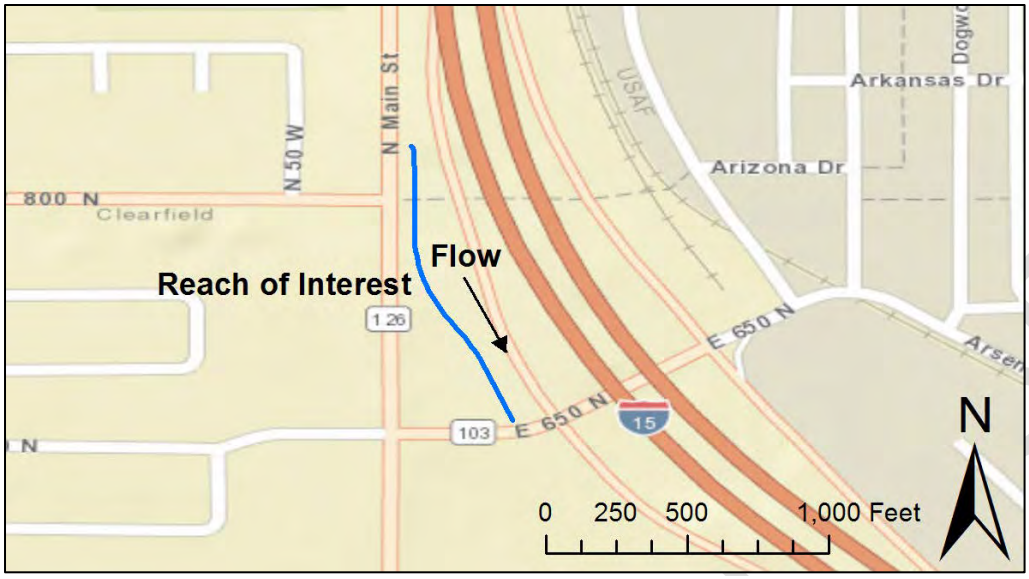


Figure 2 - Reach of Interest. The open, concrete-lined canal reach which is to be piped with WEEG funds. Surface water flow is from north to south. The reach is 950 ft long.

Background

DWCCC presents their method used to estimate current surface water losses from seepage and ET over the reach of interest in their grant application. From analysis of multiple years of supply and delivery data, it is estimated that the system-wide losses per foot of canal are 0.156 AFY. DWCCC estimates the reinforced concrete pipe will be 97% effective at mitigating surface water losses. As 950 ft of canal is to be converted to pipe, an expected 144 AFY of surface water will be conserved.

Methods

To estimate the amount of water expected to be conserved by lining the reach of interest, Reclamation used a method based on the continuity equation. The continuity equation states that, assuming no change in storage, the discharge of water entering a system (inflow) must be equal to the discharge of water exiting the system (outflow) (Figure 3). In this case the “system” is the reach of interest. It is assumed that the water entering the canal via the upstream end is the only inflow. Other possible inflows include precipitation and groundwater; however, the assumption that these inflows are, at the very least, negligible is likely valid as: no precipitation occurred during the measurement and the groundwater table in the region is below the canal bottom elevation. Seepage, ET, and the volume of water exiting the reach of interest are assumed to be the only outflows. The lumped outflows of seepage and ET can be estimated by measuring the upstream and downstream discharges (Figure 3).

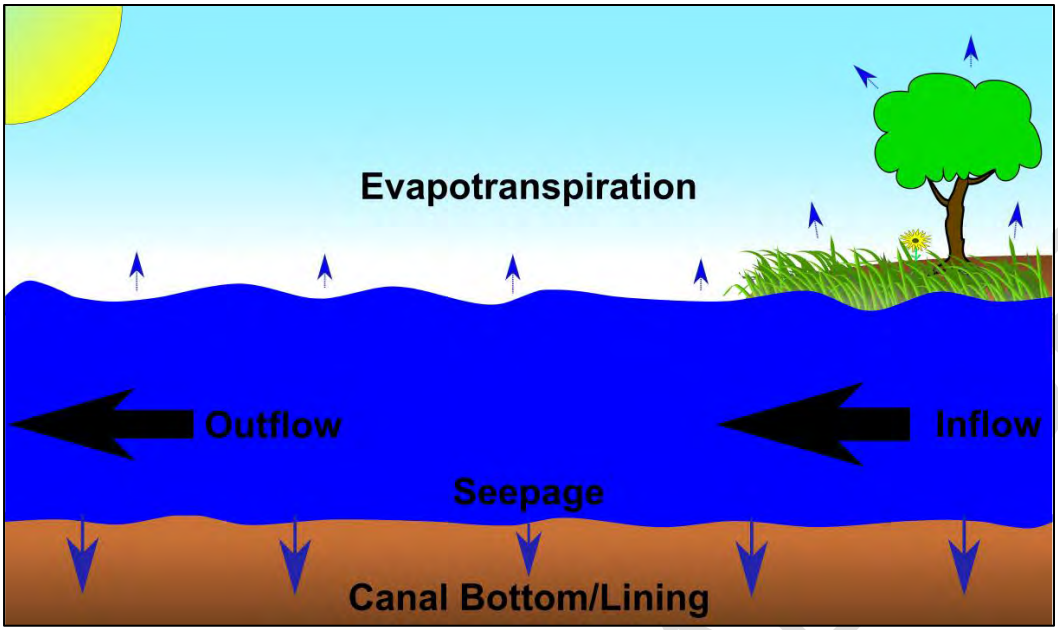


Figure 3 - Schematic depiction of the inflows and outflows of the reach of interest. The lumped outflows of seepage and ET can be estimated by measureing inflow and outflow.

Data Collection

Measurement Equipment Theory

Discharge measurements were made using a StreamPro (*Teledyne RD Instruments*) piston-type, acoustic Doppler current profiler (ADCP) (Figure 4) and companion data collection software *WinRiver II* (*Teledyne RD Instruments*). The ADCP measures water velocity at discrete depth intervals as it traverses the canal profile. Velocities are measured by emitting high frequency sound waves and measuring the frequency shift of the reflected wave. Depth of the velocity measurement is calculated by the two-way travel time of the wave. The cross section of the canal, perpendicular to the direction of flow, is discretized into cells. The velocity within each cell is approximated from multiple measurements by the ADCP. After a traverse is complete, the discharge over the measured portion of the canal cross section can be calculated by summing the products of the velocity and area of each cell (Figure 5). Due to ADCP measurement constraints, portions of flow through the top, bottom, and sides of the canal cross-section cannot be measured. The discharge through these areas is approximated. Discharge near the banks is estimated by assuming a triangular cross-sectional area with dimensions of the depth measured by the ADCP near the bank and the user measured distance from

Figure 4 – Teledyne RD Instruments' StreamPro ADCP. Similarly equipped to model used. [*Teledyne Marine*, 2004].

the ADCP to the bank. The velocity through the triangular area is approximated using the average velocity in the nearest ensemble of cells and a scaling factor of 0.35 [*Teledyne RD Instruments*, 2008]. The velocity through the top and bottom is estimated by fitting a best-fit power curve to the measured velocity profile. The curve is then extrapolated to the water surface and canal bottom. The top and bottom areas are calculated by user entered values and ADCP measurements.

When collecting measurements, it is desirable for the canal to be straight and unobstructed for approximately 10x the canal width upstream of the measurement location. This allows flow to be conditioned by reducing turbulence and interaction with the hyporheic zone[1]. Absence of vegetation also increases measurement accuracy. Vegetation can cause turbulence and interfere with sound waves generated by the ADCP.

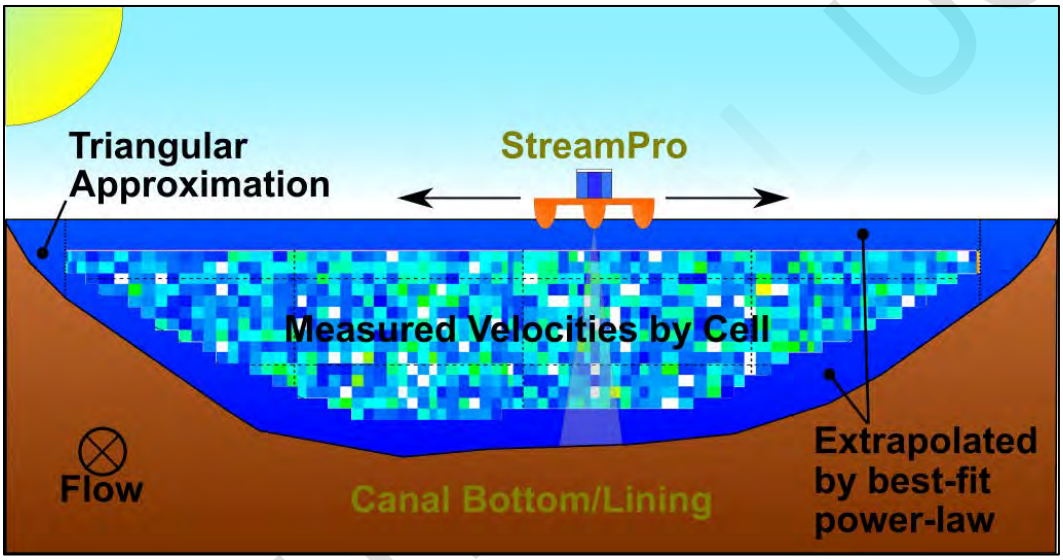


Figure 5 - Schematic depiction of the StreamPro collecting a measurement and the resulting discretization of the flow into cells. The colors of the cells represent varying velocities. The discharge through the area around the perimeter of the cells, in blue, is estimated. Flow direction in the canal is into the page.

Measurement Site Selection & Description

Reclamation Hydrologic Engineer, Brandon House, visited the reach of interest on the morning of May 18, 2017 to collect inflow/outflow discharge measurements. Due to damage from heavy equipment to the existing concrete liner, DWCCC installed a temporary polyvinyl chloride (PVC) lining on the lower third of the reach of interest – reducing seepage losses in this section (Figure 6). Any measurements including flow through the PVC lined reach would underestimate seepage losses. A downstream measurement location was selected just upstream of the PVC lined reach (Figure 6). A section of canal just upstream of the reach of interest had similar properties (aged, fractured concreate liner) and so was included in the measurement plan. DWCCC had been running water in the canal for at least several days prior. Pressure transducers were submerged in the canal near each measurement location to record absolute pressure for the duration of all the discharge measurements.

[1] The hyporheic zone is a subsurface volume of porous media beneath and alongside a stream/canal through which surface water readily exchanges.

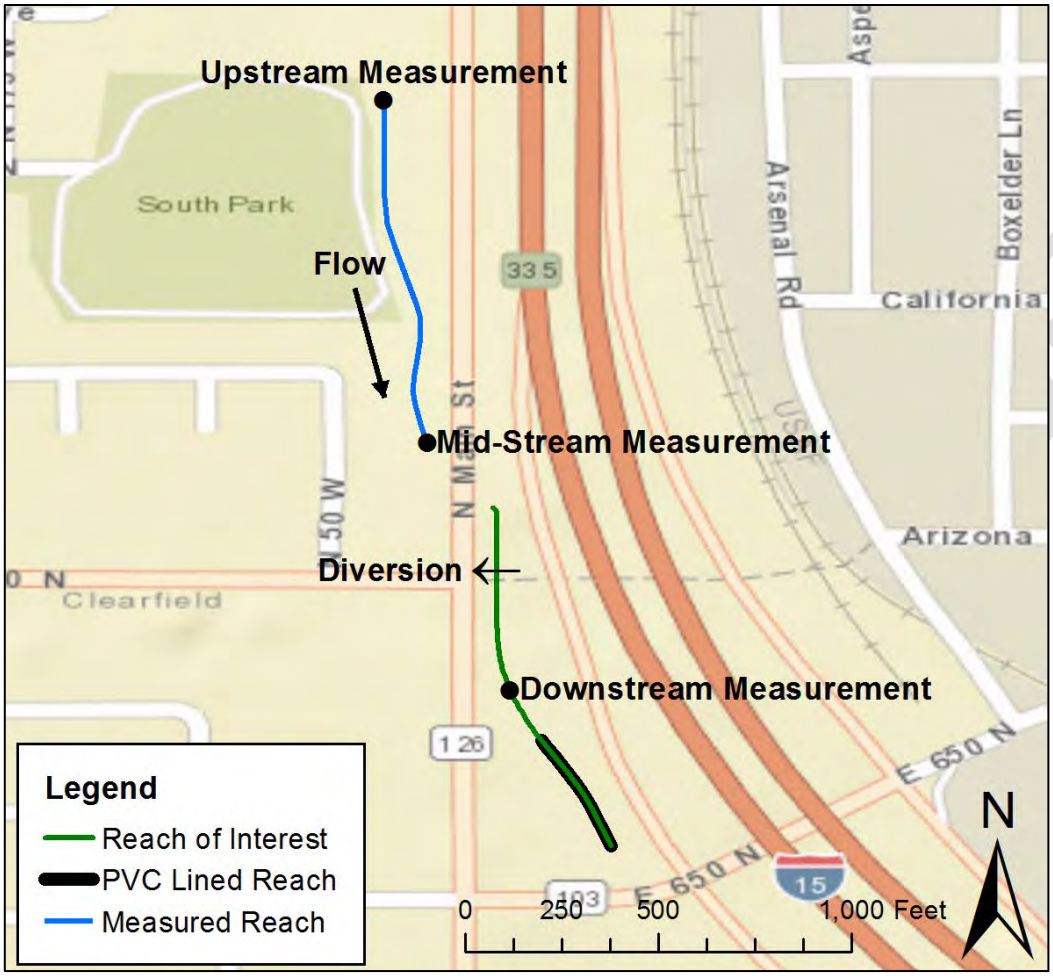


Figure 6 - Location of discharge measurements. The blue line represents the reach of canal between the upstream and mid-stream discharge measurement locations – the measured reach. The measured reach is approximately 0.17 mi long.

The canal was straight and had minimal flow disruptions just upstream of the mid-stream and upstream measurement locations. A slight bend was located just upstream of the downstream measurement location, but likely had little influence on measurement accuracy. Sparse vegetation was present in the fractures of the concrete lining near all measurement sites. This was most prevalent on the right bank of the upstream measurement site (Figure 7). High turbidity did not allow visual inspection for vegetation on the submerged portion of the canal lining. A gauged diversion of approximately 8 cfs was located between the mid-stream and downstream measurement locations (Figure 6)

After a measurement location was selected, stakes with pulleys were pressed into the canal banks opposite each other (Figure 8). A rope was looped through the pulleys spanning the canal. The StreamPro was tethered to a fixed point on the rope. Excess tether rope was looped around the StreamPro control housing. This increased stability of the float by causing it to sit lower in the water. The bounding edges for the traverse were located by positioning the StreamPro as near the canal banks as possible while maintaining enough water depth to be discretized into two cells. This location was marked on the tether rope for repeatability. Data collection was then initiated. Per standard practice, a minimum of ten measurements were collected at each bank with the float stationary at the beginning and end of each traverse [*Mueller and Wagner*, 2009]. Using the tether rope, the StreamPro was traversed across the canal at a velocity at least

3x less than the water velocity. Several traverses were collected at each location.

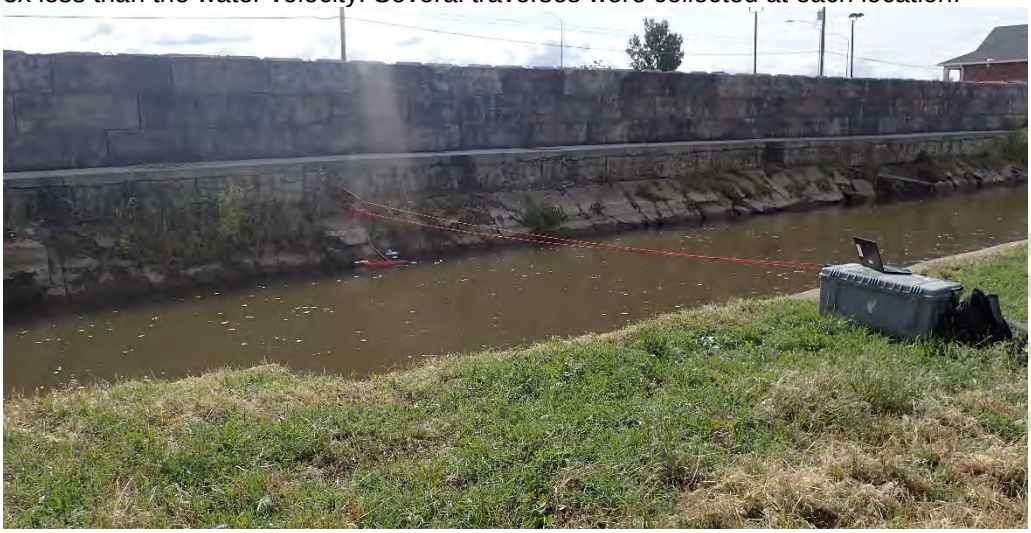


Figure 7 - Upstream measurement location. Note vegetation growing in cracks of fractured concrete liner. ADCP is in boom position.

Figure 8 – Mid-stream measurement location data collection setup. Note highly fractured concrete liner. ADCP is mounted in boom position.

Two discharge measurements were collected at the upstream location (Figure 7) and one each at the mid-stream (Figure 8) and downstream (Figure 9) locations. Field review of

the difference between the first upstream and downstream discharge measurements, adjusted for the diverted flow, would indicate that the reach between the measurement points was gaining water. This is more likely a result of the dynamics of the canal system from varying inflows or inaccuracy of the diversion measurement. Field review of the difference between first upstream and mid-stream measurements also would indicate that the reach between the measurements was gaining water. Again, this is more likely the result of canal flow conditions changed in the time between when the measurements were collected. Therefore, an additional discharge measurement was collected at the upstream location (Figure 7).

Figure 9 - Downstream measurement location. Black line indicates approximate location of measurement.

Data Processing

Data from a weather station 3 mi east of the field site indicated an increase in barometric pressure during field measurement collection (Automated Weather Observing System, Station ID: KHIF). Pressure transducer data was adjusted for this increase using the slope of the best fit line to the weather station barometric pressure data. Transducer recorded absolute pressure was parsed into barometric and water pressures by subtracting the transducer reading immediately prior to submerging the transducer in the canal. The resulting adjusted pressure was then converted to an approximate depth of water. To ease comparison between measurement locations, water depth data was converted to change in water depth since a common start time.

ADCP discharge data were processed using *WinRiver II* (*Teledyne RD Instruments*). Four transects were collected at the up-stream location, and six at the mid- and down-stream measurement locations (Figure 6). Inclusion of multiple measurements at the canal banks has the potential to compound errors. Defining subsections of each transect which excluded several, redundant bank measurements was also found to increase total discharge agreement between transects. A combination of transects which had good total discharge agreement were selected for inclusion in the average for the final, total discharge. Due to the possibility of traverse directional bias (i.e. travel from the left to the

right bank or visa-versa), an equal number of left and right transects were included in the final discharge measurement.

Assuming the transect total discharge measurement population is normally distributed, 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*) [*Spiegel et al.*, 2013]. The *t* distribution was used in place of the Normal distribution since *n* is less than 30. Standard deviations were calculated by *WinRiver II* and measurement summaries presented in Appendix A (page 14). The confidence intervals are then calculated by:

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

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 the two total discharge means ($\bar{X}_1$ and $\bar{X}_2$):

$$\bar{X}_1 - \bar{X}_2 \pm t_c \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}} \quad \text{(Equation 2)}$$

In this case, the difference between the two total discharge means will be the measured losses.

Results

The canal lining was highly fractured in all observed sections (Figure 7, Figure 8, and Figure 9). Vegetation was growing in most of the fractures.

Change in water depth, in inches (in), near the upstream (blue), mid-stream (red), and downstream (green) discharge measurement locations are presented in Figure 10. Dashed, vertical lines bound the periods of time during which discharge measurements were collected. The color of the dashed lines corresponds to the measurement location.

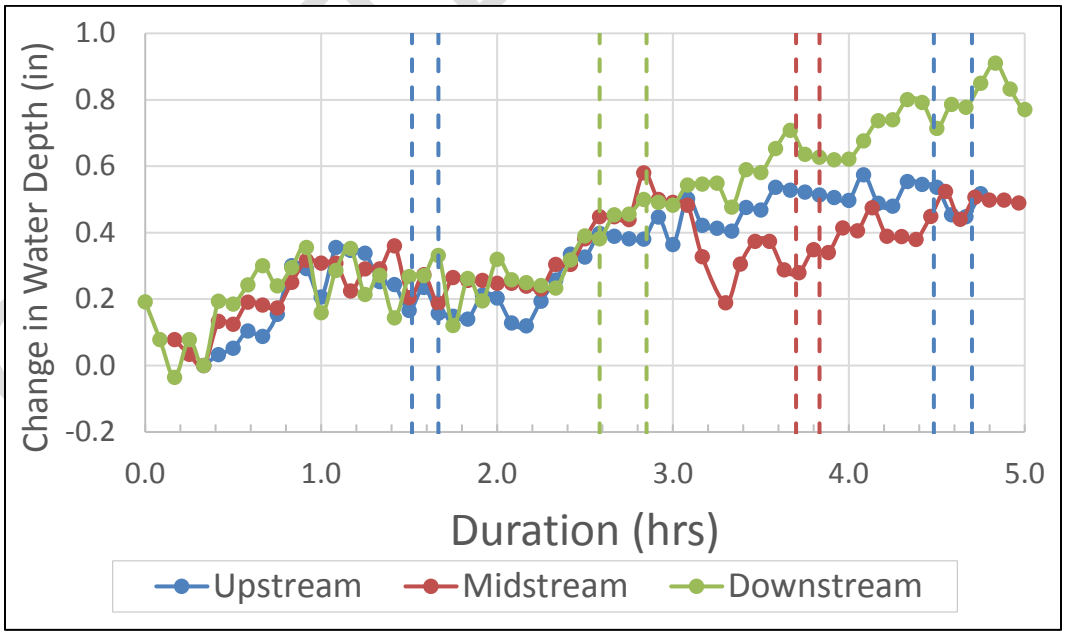


Figure 10 - Change in water depth adjusted for increasing atmospheric pressure and zeroed at a common time. Dashed lines bound canal discharge measurements at the color corresponding location.

Total measured discharge from the three measurement sites is presented in sequential order in Table 1. Eighty-percent confidence intervals were calculated using the *t* distribution (Equation 1)$\bar{X} \pm t_c \frac{S}{\sqrt{n}} \bar{X} \pm t_c \frac{S}{\sqrt{n}}$. Summary details for each measurment can be found in Appendix A (page 14).

Table 1 – Discharges from the three measurement locations and associated 80% confidence intervals.

First Upstream Discharge (cfs):	55.7 ± 1.21
Downstream Discharge (cfs):	48.6 ± 0.64
Mid-Stream Discharge (cfs):	59.2 ± 0.62
Second Upstream Discharge (cfs):	60.7 ± 0.76

Discussion

Though the submerged portion of the lining could not be seen, it is not unreasonable to assume it is in similar condition to the exposed lining. Fractures impair the linings effectiveness at reducing seepage since surface water can flow through these cracks. Fractures also provide areas for vegetation to take root, increasing transporation water losses.

The increase in canal water depth from 2.2 hours (hrs) to 2.6 hrs indicate that the first upstream discharge measurement was collected under different flow conditions than the subsequent three measurements (Figure 10). This is supported by the 5.0 cfs increase between the first and second upstream measurements (Table 1). Therefore, the first upstream measurement is not a reasonable inflow for comparison to the mid- and down-stream measurements. The continued water depth increase at the downstream location from 2.3 hrs on, after the up- and mid-stream locations stabilize, could indicate a steady decrease in the discharge of water being diverted at the diversion site (Figure 10). Due to this uncertainty, the downstream measurement was not used.

Based on the above decisions, the second upstream and mid-stream measurements were used to estimate losses for the reach of interest. The difference of the up- and mid-stream discharge measurements indicate 1.47 ± 0.98 cfs in losses over the measured reach under these flow conditions (Equation 2)$\bar{X}_1 - \bar{X}_2 \pm t_c \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$ (Equation . The losses were then normalized for the length of the measured reach to account for the difference in length from the reach of interest. With 80% confidence, this yields approximate annual surface water loss of 565 ± 378 AFY (Table 1 and Table 2).

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

Second Upstream Discharge (cfs):	60.7 ± 0.76
Mid-Stream Discharge (cfs):	59.2 ± 0.62
Measured Reach Losses (cfs):	1.47 ± 0.98
Irrigation Season Duration (days):	183
Measured Reach Length (mi):	0.17
Reach of Interest Length (mi):	0.18
Annual Loss (AFY):	**565 ± 378**

Conclusions

The measured surface water losses are assumed to be entirely from seepage and ET. By piping the reach of interest it is assumed that the seepage losses will be mitigated and ET losses eliminated. DWCCC assumes reinforced concrete pipe is 97% effective at reducing seepage. Based on review of testing requirements for pressurized, non-cylindrical reinforced concrete pipe, this effectiveness is reasonable [*American Water Works Association*, 2008]. With 80% confidence, the canal piping project will result in a surface water savings of **548 ± 367 AFY**. This is 280% ± 255% more than the estimated surface water savings of 144 AFY stated in DWCCC's grant application.

There is a high level of uncertainty in these results due to variability between transect discharge measurements (Appendix A), the relatively low losses discharge compared to the total discharge, and the number of measurements. The cause of uncertainty is that each transect does not measure the same total discharge. The greater the central tendency of the total discharge measurements the less uncertainty. This uncertainty is amplified by the low discharge of losses relative to the total discharge. Taken individually, the confidence intervals for the total discharge values are tight (± 1.3% and ± 1% for upstream and mid-stream discharge, respectively). However, when the difference of these is calculated, the uncertainty is amplified relative to the discharge of annual losses (± 67%). Uncertainty can be reduced by collecting additional transect measurements; however, this was not deemed necessary to accomplish the project scope.

The scope of this work is to verify that the grant recipient's estimate of annual losses is reasonable. The low-end of the 80% confidence interval results in a conservation of surface water which is 26% greater than that estimated by DWCCC. It is recommended that DWCCC's grant application surface water conservation estimate be considered reasonable.

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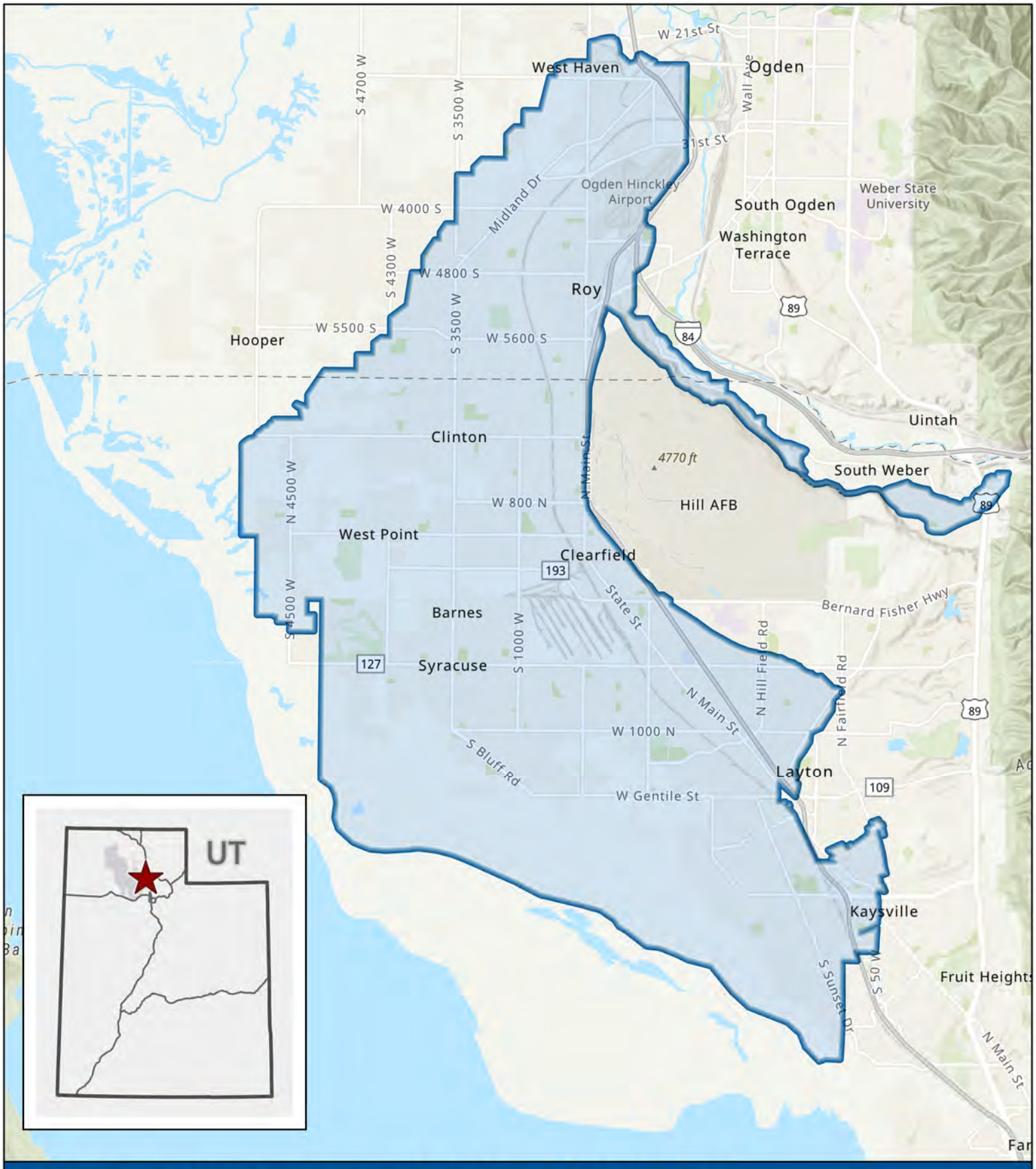
Davis and Weber Counties Canal Company (DWCCC) On-farm
Intent Signatures - Canal Enclosure and Small Hydro Project
FOA# BOR-DO-22

Landowner Name	Claimable Acreage	Landowner Signature I have an interest to install a high-efficiency irrigation system when sufficient water quantity, quality, and application requirements are met.
Mike Kotsonis	160	Mike Kotsonis
The Nature Conservancy	500	Mike Kotsonis
Roberts Family Farms	78	Dig B. Roberts
Day Farms	200	Thomas Day



DAVIS & WEBER COUNTIES CANAL CO. SERVICE AREA

0 1 2
Miles

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WaterSMART: Water and Energy Efficiency Grant

11/1/2021

PROPOSED CANAL IMPROVEMENTS

Based on the water model and the needs of each segment of the canal, a list of current infrastructure conditions and projects has been generated. This table assumes the life of concrete liner is 40 years and the life of pipe/box culverts is 80 years. This is longer than the typical 30-year life expectancy of concrete liner and 50-year life for most pipes and box culverts. These timelines are only estimates and will vary depending upon construction techniques, maintenance activities, exposure to the elements, abrasion, root intrusion, freeze/thaw conditions, etc.

Projects that have been completed on the canal since 1999 do not have replacement cost estimates associated with them. However, the cost for installation when the improvements were installed is shown in the table. These projects should have at least a 30-year design life. Given the current replacement needs on the canal system, and anticipated available funding, definitive planning for replacement of those recently installed improvements was not considered feasible at this time. The total costs incurred from 1999 to 2021 for these recent replacements could be used to establish a template for future replacement costs.

The Overall Canal System Summary showing the stationing, flow rates, existing conditions, proposed canal improvements, and construction costs for each segment is contained in Appendix E. Maps showing the Long Term Plan are contained in Appendix I.

PROJECT PRIORITIES

The project segments have been prioritized based on the hydraulic model, visual inspections, DWCCC staff, and current conditions. Initially the list was divided into two groups:

1. High Priority List: This list consists of projects that are considered to be possible safety concerns, indicate high losses of water, or are so deteriorated that replacement is the only option. The order for the high priorities list should be reviewed regularly, at least annually. Projects may move up the list in importance based on adjacent development along the canal, maintenance of vegetation, ability to clean, energy development opportunities, better conservation, prevention of water seepage, protection of the environment, and other factors.

2. Watch List: This list consists of projects that will be needed either when the existing facilities have reached the end of their useful life, which may be out 30 years or longer, or when extra capacity in the canal is needed. Within the projects on this list, there are several segments with aging concrete liner that are currently in satisfactory condition. The watch list will be evaluated on a bi-yearly basis to document deterioration, seepage losses, and hillside or slope movement along the canal, and if needed, the projects could be moved to the priorities list.

Since the initial System Optimization Review in 2013 DWCCC has continuously addressed priority projects. Nearly all of the High Priority List projects have been completed, which necessitated revising the priority criteria. The priority projects have now been organized as follows:

1. Construction List: This list contains the projects that are currently funded. They are in various stages of planning, design, and construction.

2. Priority List: This list consists of projects that have exceeded their useful life, projects that will reach the end of their useful life within 10 years, or projects that will be required when extra capacity in the canal is needed. The list will be evaluated on a bi-yearly basis to document deterioration, seepage losses, and hillside or slope movement along the canal. Projects may move up the list in importance based on adjacent development along the canal, maintenance of vegetation, ability to clean, energy development opportunities, better conservation, prevention of water seepage, protection of the environment, and other factors.

The Project Priorities List showing the Construction List and Priority List is contained in Appendix F. A detailed Engineer's Opinion of Probable Cost for each segment on the Project Priorities is included in Appendix G.

Funding

The projected construction years set with each project are based on DWCCC being able to fund an average of $500,000 per year for infrastructure replacements. This funding would consist of funds collected from assessments, loans, private partnership participation, or grants. DWCCC will continue to seek grants wherever possible to complete the projects on the priorities list. If future evaluation of the condition of facilities indicates that the anticipated time frames are not going to provide needed service, funding will need to be increased. Additionally, already completed improvements should be depreciated and funding established for their eventual replacement.

WATER SAVINGS

Based on the system water loss information collected in 2017, approximately 4,000 acre-feet of water would be conserved by completing the projects identified in the Master Plan.

SCADA SYSTEM

DWCCC installed a SCADA system in 2005. As segments are completed along the canal, any new meters and control structures are connected to the SCADA system. The cost for these improvements are included in the individual segments.

HYDROPOWER GENERATION

A feasibility study has been completed to evaluate possible locations for power generation along the canal. Two scenarios for hydropower were identified and evaluated. The first scenario involved a specific site that would create a 1.3 megawatt hydropower plant at an existing penstock location in Riverdale. The second scenario involved multiple locations along the canal that investigated the feasibility for creating power using low head turbines in the main canal and box culverts. The feasibility study for the hydropower is attached in Appendix H.

MASTER PLAN UPDATES

As part of DWCCC's commitment to water conservation and safe operation of their facilities through developed communities within their service area, this report will be updated approximately every 5 years. As projects are completed and as conditions change along the canal, the priority projects and rankings will be evaluated and revised. Cost estimates will be updated approximately every 5 years or as needed to ensure that costs are reflecting actual construction costs for planning and projection purposes. Projects will be evaluated to determine if any additional concerns need to be addressed as part of the project and of the overall system's efficiency.

Davis & Weber Counties Canal Company
Priority Projects

10/14/2021

Orange - Under construction
Yellow - Funded and in design
Green - Priority projects
Blue - Will be constructed by UDOT

Construction List

Priority	Segment #	Stationing Start	Stationing End	Length (ft)	Current Condition	Proposed Improvement	Estimated Replacement Year	Estimated Replacement Cost	Location and Description
1	43	725+50	742+50	1,700	Open Liner	Box Culvert	2021	$ 2,148,904	Clearfield, Gate 23E to SR 193
2	45	743+50	756+75	1,325	1999 84" Al. Steel	Box Culvert	2021	$ 1,509,030	Clearfield, Replace 84" at Tai Pan Trading
3	42	714+25	725+50	1,125	Open Liner	Box Culvert	2021	$ 1,630,045	Clearfield, I-15 to Gate 23E
4	30	604+75	611+25	650	Open Liner	Box Culvert	2022	$ 1,009,174	Sunset, South of 1300 North (Uhaul)
5	31	611+25	615+00	375	3-60" Al Steel Pipes	Box Culvert	2022	$ 560,467	Sunset, Replace 60" CMP at Uhaul
6	48	800+00	815+00	1,500	2000 54" CMP	1-66" RCP	2022	$ 1,081,088	Layton, Replace Existing 54" CMP
			Total	6,675			Total	$ 7,938,707	

Priority List

Priority	Segment #	Stationing Start	Stationing End	Length (ft)	Current Condition	Proposed Improvement	Estimated Replacement Year	Estimated Replacement Cost	Location and Description
1	21a	425+00	425+00	650	72" Rivited Steel Pipe	HDPE	2030	$ 356,045	Penstock Pipe
2	29	601+25	604+75	350	1993 Liner	Box Culvert	2024	$ 594,201	Sunset, In front of Sunset Pond
3	49	815+00	823+80	880	2000 54" CMP	1-66" RCP	2024	$ 633,882	650 West to Sunriver Townhomes
4	25a	533+50	546+50	1,300	Open Liner	Box Culvert	2023	$ 1,779,588	Railroad to Proposed I-15 Crossing
5	25b	546+50	563+75	1,725	Open Liner	Box Culvert	2023	$ 2,356,406	Proposed I-15 Crossing
6	25c	563+75	585+00	2,125	Open Liner	Box Culvert	2030	$ 2,899,331	Proposed 1800 North Crossing
7	23b	487+40	497+00	960	1988 Open Liner	Box Culvert	2033	$ 1,484,528	Roy Sub Turnout to 5600 South Box
8	23a	471+00	487+40	1,640	1988 Open Liner	Box Culvert	2036	$ 2,438,756	Breach Box Culvert to Roy Sub Turnout
9	27	590+50	593+75	325	Open Liner	Box Culvert	2037	$ 586,819	Sunset, Parallel SR126 by Sunset Pond
10	28	593+75	601+25	750	2011 Open Liner	Box Culvert	2038	$ 1,110,139	Sunset, By Sunset Pond
11	37	643+00	652+00	900	2011 Open Liner	Box Culvert	2039	$ 1,287,526	Clearfield, 650 N to Bruce St
12	38	652+00	666+75	1,475	1988 Open Liner	Box Culvert	2041	$ 2,391,839	Clearfield, Bruce St to 300 N
13	58	901+30	903+75	245	Open Ditch	1-48" RCP	2041	$ 193,560	End of canal after Church Street Pond
14	21	392+00	458+00	6,600	2000 102" Dia Pipe	Box Culvert	2048	$ 9,912,350	Riverdale, 102" AL Pipe
15	14	282+25	293+80	1,155	1993 Open Liner	Box Culvert	2049	$ 2,139,617	South Weber, Open Liner
16	20	374+75	392+00	1,725	1992 Open Liner	Box Culvert	2051	$ 3,061,414	Riverdale, Open Liner
17	8	140+84	144+68	384	1998 Open Liner	Open Liner	2051	$ 285,333	South Weber, Open Liner
18	18	335+00	352+40	1,740	1995 Open Liner	Open Liner	2052	$ 1,407,693	South Weber, Open Liner
19	52	832+20	852+40	2,020	1991 54" RCP	1-66" RCP	2053	$ 1,406,957	Northridge High School
20	26	585+00	590+50	550	Box Culvert	UDOT Box Culvert	2054	$ 1,106,293	Sunset 1600 North SR 126
21	44	742+50	743+50	100	Box Culvert	UDOT Box Culvert	2054	$ 316,230	Clearfield, SR 193
22	51	830+60	832+20	160	Box Culvert	UDOT Box Culvert	2054	$ 322,682	North Hill Field Crossing
23	54	862+00	864+80	280	Box Culvert	UDOT Box Culvert	2055	$ 506,273	Antelope Drive
			Total	33,221			Total	$ 38,577,461	
		Total Construction and Priority List		39,896		Total Construction and Priority List		$ 46,516,167	

Paul Burnett
Trout Unlimited
5279 South 150 E
Ogden, UT 84405
(801) 436-4062

Oct 18, 2021

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

Dear Mr. Smith:

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

Trout Unlimited has been working on the ground with a number of partners throughout the Weber River Basin, including the Utah Division of Wildlife Resources, agricultural producers and water users to protect and restore populations of Bonneville cutthroat trout and bluehead sucker though habitat restoration, fish passage and water efficiency projects. The bluehead sucker and Bonneville cutthroat trout populations have declined and are in jeopardy and petitions for listing under the Endangered Species Act are possible if pro-active measures are not taken. Understandably, all partners in the watershed benefit by preventing the listing of imperiled species, but beyond that, we believe that many watershed partners also greatly value the fact that these species persist in the Weber River, a sign of the great resilience of these native species and a reflection of the rich economic vitality they bring to our communities. Nevertheless, these species need our help and a cohesive strategy through the Weber River Partnership broadens the scope of our actions on the ground to provide broad benefits to all stakeholders in the Basin.

Trout Unlimited is encouraged by and supportive of your proposed project to improve the water conveyance within your system by enclosing the canal near SR-193 under the WaterSMART water and energy efficiency program. We believe this project contributes to the

overall goals of the species conservation by improving conveyance of diverted water providing more opportunity to improve the resiliency of native fish populations.

We support your proposal and are committed to working with the Davis and Weber Counties Canal Company on this efficiency project if our assistance is needed. We look forward to the continued collective progress, working in partnership with your organization on the broader goals of improving communication, coordination and collaboration within the Weber River Basin.

With Kind Regards.

Paul Burnett
Utah Water and Habitat Program Director
Trout Unlimited
5279 South 150 East
Ogden, UT 84405

GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Wildlife Resources
MICHAL D. FOWLKS
Division Director

Oct 18, 2021

Richard D. Smith, P.E.
General Manager
Davis &Weber Counties Canal Company
138 West 1300 North
Sunset, Utah 84025

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

Dear Mr. Smith:

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

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

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

1594 West North Temple, Suite 2110, PO Box 146301, Salt Lake City, UT 84114-6301
telephone (801) 538-4700 • facsimile (801) 538-4709 • TTY (801) 538-7458 • *www.wildlife.utah.gov*

UTAH DNR WILDLIFE RESOURCES

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

Sincerely

Clint Brunson
Aquatics Habitat Restoration Biologist
Utah Division of Wildlife Resources

WEBER BASIN WATER CONSERVANCY DISTRICT

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

Tage I. Flint
General Manager/CEO

October 25, 2021

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 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 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/dh

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

October 18 ,2021

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

Theo G. Cox
President