WaterSMART: Water & Energy Efficiency Grant Program

FY 2017

WEBER BASIN WATER CONSERVANCY DISTRICT

Secondary Metering, Fish Passage, and Solar Array/ Hydro Project

APPLICANT

Weber Basin Water Conservancy District
2837 East Highway 193
Layton, Utah 84040

PROJECT MANAGER

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Executive Summary

Applicant Info

Date: January 15, 2017

Applicant Name: Weber Basin Water Conservancy District

City, County, State: Layton, Davis, Utah

Project Manager:

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Project Funding Request: Funding Group II $1,000,000 Total Project Cost $2,500,070

Project Summary

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

Weber Basin Water Conservancy District (WBWCD or District) Secondary Water Metering, Fish Passage, & Solar Array/Hydro Project is packed with quantifiable sustainable water savings – conserving 1,339 acre-feet, improved energy efficiency – reducing 196,002 kW-hr in energy used for pumping, increasing renewable energy – generating 206,499 kW-hr from solar array and hydropower, and benefit important fish habitat – fish passage restoration to allow fish to pass upstream. The project will comprise of:

- installing 2,365 secondary meters, public involvement, and conservation education
- construction of a 20.7 kW Solar Array at the District's Davis North Water Treatment Plant (DNWTP) generating 29,411 kW-hr of energy
- upsizing a planned small hydroelectric generator at Causey Dam which is expected to be constructed in February of 2018 from a 20 kW to a 91 kW adding an additional 177,088 kW-hr annually of renewable energy
- include fish passage restoration by replacing an existing culvert at Dalton Creek to allow Bonneville cutthroat trout and bluehead sucker to pass upstream

The meters will be installed in the West Haven and Layton City retail secondary water service areas. The WBWCD project is one more step toward accomplishing the goals and priorities set forth in their System Optimization Review (SOR) developed in 2012.

Schedule

State the length of time and estimated completion date for the project

This project is ready to move forward as soon as it is awarded. An environmental document will be prepared as part of the project, and it is anticipated that a Categorical Exclusion will be

approved based on the fact that the project will take place in previously disturbed areas and within existing road alignments.

At the time of award (June- Sept 2017) WBWCD will initiate conversation with Rocky Mountain Power on the construction of a 20.7 kW Solar Array at the District's Davis North Water Treatment Plant and the 91kW hydro turbine. A 404 permit to do the work in the Creek will be required, and application for this will be applied for at the same time.

The environmental document will take three to six months. The installation of the meters will take 24 to 36 months and will take place through the fall through spring months (October -April 2019 and then again October – April 2020). The education and information process will be ongoing with regular public information regarding the time and placement of the meters throughout the entire project. The 20.7 kW Solar Array at the District's Davis North Water Treatment Plant will be installed March 2018 and the 91 kW hydropower generator starting in February 2018.The culvert replacement will be reconstructed during the low water time for Dalton Creek. The project will be accomplished within the three-year allowance.

Estimated project schedule that shows the stages and duration of the proposed work, including yearly funding, major tasks, milestones, and dates:

SCHEDULE	Year 1 Reclamation Funding $300,000				Year 2 Reclamation Funding $400,000				Year 2 Reclamation Funding $300,000			
Milestone/Task	Sept –Oct 2017	Nov 2017 – J an 2018	Jan – April 2018	May – Sept 2018	Oct – Dec 2018	Jan – March 2019	April – May 2019	June – Sept 2019	Oct – Dec 2019	Jan –Mar 2020	April – Sept 2020	Oct 2020
Sign WaterSMART contracts												
Environmental Document prepared and approved by Reclamation												
Metering Project Installation Year 1												
Metering Project Installation Year 2												
Metering Project Installation Year 3												
20.7 kW Solar Array & 91 kW Hydro												
Construction Dalton Creek Culvert												
Final reporting and project close-out												

Please explain any permits that will be required, along with the process for obtaining such permits. Identify and describe any engineering or design work performed specifically in support of the proposed project.

A 404 permit to do the work in the Creek will be required, and application for this will be applied for at the same time.

Federal Facility

Whether or not the project is located on a Federal Facility

In 1949, the Unites States Congress authorized the Weber Basin Project (Project), which was a U.S. Bureau of Reclamation (Reclamation) project aimed at developing and effectively utilizing the available water resources within the Weber River Basin Drainage. The Weber Basin Water Conservancy District was subsequently created in June of 1950 by a decree of the Second District Court of Utah and under the guidelines of the Utah Water Conservancy Act. The District is the operating agency for the Weber Basin Project and is responsible for the sale and delivery of project water, operation and maintenance of project facilities and is contracted with the U.S. Government for repayment of reimbursable costs of the Project.

Background Data

Map

WBWCD is one of Utah's largest secondary water retailers and provides wholesale water to many retail water agencies across the Wasatch Front. WBWCD secondary service areas include Centerville, Farmington, North Layton and South Layton, Uintah Bench (which includes parts of South Ogden, Ogden, and Washington Terrace), West Bountiful, West Haven, and Woods Cross. See Attachment A for a Map of Secondary Service Area and Project Location.

Water Supply

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

» *Source of water supply and water rights involved*

Source	Maximum Yield (AF)	Reliable Yield (AF)
Project Stored Water	400,378	206,914
District Stored Water	12,917	12,917
Wells (both District and Project)	74,420	37,210
Stock Water	21,321	17,056
Decreed Water Rights	3,960	3,168
Totals:	**512,996**	**277,265**

Water resources of the area were extensively developed before initiation of the Weber Basin Project. Numerous private developments antedate the Federal projects. Prior federal Reclamation developments include the Weber River Project on the main stem of the Weber River and the Ogden River Project on the Ogden River. Also, as part of the Weber River and Ogden River Projects, water is diverted from the high reaches of the Weber River for multiple uses on the

Provo River. The Weber Basin Project supplements all of the previous undertakings, and its operation is correlated with users in approaching the full practicable development of the area's water resources. Water is delivered from the Weber River to the District via two aqueducts.

The Weber Aqueduct conveys irrigation water to lands on the Uintah Bench, and municipal and industrial water to Ogden and adjacent communities in Weber County. Part of the irrigation water is pumped to parcels above the aqueduct, and the remainder is delivered by a gravity pressure distribution system. At the terminal of the aqueduct, water is delivered to the District's Weber South Water Treatment Plant (WTP) from which it is treated then distributed to Ogden City and surrounding communities (an approximate population of 240,000 people).

Photo 1 Pineview Reservoir

The Davis Aqueduct extends to the south from the Weber Canyon along the foot of the Wasatch Mountains to North Salt Lake City. Part of the water is pumped for irrigation of lands above the aqueduct; the remainder of the water is sold by the District to irrigation companies, Improvement Districts, Sub-conservancy Districts and individual landowners. The remaining water is processed through the District's Davis North Water Treatment Plant for distribution to communities in North Davis County and through the Davis South Water Treatment Plant for communities in the south end of Davis County – combined communities of approximately 300,000. A large block of treated and untreated industrial water is also delivered to the several oil refineries in the extreme south end of Davis County.

In addition to surface water distribution, twenty-one deep wells relieve water shortages in dry periods and to meet peak water demands. Streams flowing from the face of the Wasatch Mountains toward the Great Salt Lake contribute small quantities of water for project use. The Ogden Valley Canal distributes Ogden River water to mountain valley lands near Huntsville and Eden.

Within the District’s service area there may exist the largest number of retail secondary water connections in the United States. The District has approximately 17,000 individual connections that are operated and maintained by the District, with many other irrigation companies having tens of thousands of residential connections in their own retail areas throughout Davis and Weber Counties. These secondary connections are a great asset to the residents they serve, however, there is little incentive to conserve because secondary water has been primarily unmetered, resulting in users not having known how much water they actually use. This is why the metering of these connections is so cost effective and beneficial in the reduction of overall per capita use and the extension of existing water supplies.

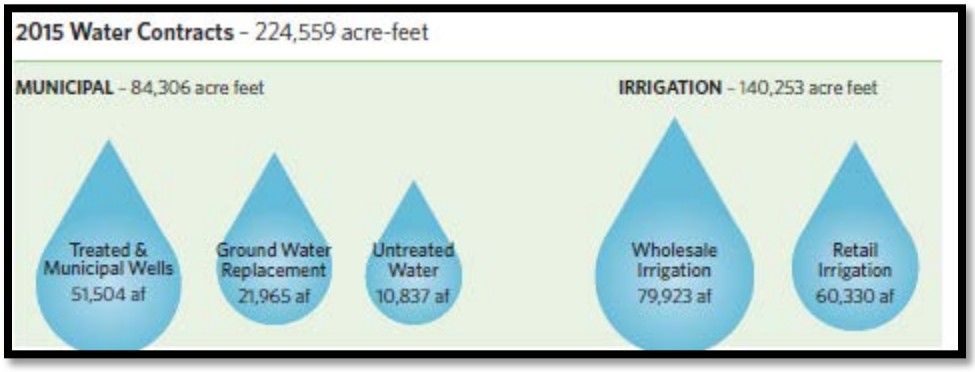
» *Current water uses and number of water users served*

Currently, District-administered water contracts totaled 224,195 acre-feet, with 85,126 acre-feet categorized as municipal and industrial (M&I) water, and the remaining 139,069 acre-feet categorized as irrigation. WBWCD serves a geographic area over 2,500 square miles, with five principle water uses:

1. **Wholesale Irrigation**: wholesale water is supplied to a number of irrigation suppliers along the Wasatch Front. These organizations then retail water to customers in their respective service areas. This use accounts for approximately 35% of the District's water contracts.
2. **Groundwater Replacement**: various drinking water purveyors and individuals (either residential or agricultural) with a water contract, which is then used in an exchange application to obtain approval from the State Engineer to drill a groundwater well to meet water supply needs. This use accounts for nearly 11% of WBWCD contracts currently.
3. **Retail Secondary Irrigation**: WBWCD provides residential customers with irrigation water in Davis and Weber counties via 211 miles of pipelines. This use accounts for roughly 26% of water contracts. They also deliver irrigation water to many irrigators and farmers in Box Elder, Davis, Morgan, Summit, and Weber Counties.
4. **Treated Municipal Water**: The District wholesales culinary water to nearly 50 cities and water improvement districts in Davis and Weber Counties via 69 miles of transmission lines. This use accounts for approximately 22% of the District's contracts.
5. **Untreated Industrial Water**: This use accounts for about 5% of the District's Contracts.

» *Current and projected water demand/ Potential shortfalls in water supply*

As of 2016, existing contracts obligated 83% of the District's reliable yield supply. Current population projections for the District's service area show the population nearly doubling between 2010 and 2060 (575,500 to 1,099,100). As this growth takes place, additional water supply will be necessary to meet anticipated demands even with the conservation goals of 25% reduction in per capita use by 2025 and 35% conservation by 2050 when compared with the year 2000 per capita use. Increased conservation will be critical and metering secondary connections as proposed in this project is one of the highest priorities of the District.



Water Delivery System

Describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (i.e., type, miles, and acres). For

municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.

Delivery System: In addition to the summary below WBWCD receives 5,000 acre-feet from Echo Reservoir that was acquired as part of the Weber Basin Project. They have also acquired 1,357 acre-feet of Weber River Stock in Echo. See Attachment B WBWCD Delivery System Information for a larger exhibit.

Pressurized Secondary System: The District has approximately 17,000 individual connections that are operated and maintained by the WBWCD. There are many other irrigation companies having tens of thousands of residential connections that are serviced by WBWCD wholesale water throughout Davis and Weber Counties. Within the District's service area there are over 100,000 secondary irrigation connections.

DAMS & RESERVOIRS

Name	Location	Type of Dam	Height (ft)	Total Capacity (AF)	Usable District Capacity (AF)	Acquisition Dates
Causey	Eastern Weber County	Earth & Rock	200	7,870	6,870	1962-1964
East Canyon	Southern Morgan County	Concrete Arch	245	51,200	20,100	1965-1967
Lost Creek	Eastern Morgan County	Earth & Rock	220	22,500	20,010	1964-1966
Pineview	Ogden Valley, Weber County	Earth & Rock	91	110,150	66,228	1955-1957
Smith & Morehouse	South-eastern Summit County	Earth & Rock	82	8,350	6,560	1984-1988
Wanship	Summit County	Earth & Rock	156	62,120	60,860	1954-1957
Willard	Southern Box Elder County	Earth	36	227,189	202,160	1957-1963

AQUIFER STORAGE & RECOVERY

Name	Location	Pond Area (acres)	Capacity (cfs)	Acquisition Dates
ASR	Weber County	7.5	10	2002

DIVERSIONS

Name	Location	Pass-Through Capacity (cfs)	Acquisition Dates
Ogden Valley	South Fork of Ogden River	2,000	1962-1964
Slaterville	Weber River west of Ogden	9,000	1956-1957
Stoddard	Weber River north of Morgan	6,000	1955-1956

HYDRO GENERATION POWER PLANTS

Name	Location	Type	Capacity (kw)	Acquisition Dates
Causey	Eastern Weber County	2 unit	2,100	1999-2000
Gateway	Mountain Green	1 unit	4,275	1957-1958
Wanship	Wanship	1 unit	1,950	1957-1958

CANALS, TUNNELS & PIPELINES

Name	Location	Type	Capacity (cfs)	Length (miles)	Acquisition Dates
Davis Aqueduct	Davis County	Concrete pipe	355	23.0	1954-1957
Gateway Canal	Morgan County	Concrete-lined	700	8.5	1954-1956
Gateway Tunnel	Morgan and Davis County	Concrete-lined	435	3.3	1952-1954
Layton Canal	Davis County	Earth-lined/concrete-lined/pipe	260	18.0	1962-1964
M&I Pipelines	Davis and Weber County	Varies 6"-48"	varies	80.0	1955-2012
Ogden Valley Canal	Weber County	Part earth-lined	35	9.2	1962-1964
Secondary Pipelines	Davis and Weber County	Varies 2"-36"	varies	325.0	1955-2012
Weber Aqueduct	Weber County	Concrete pipe	80	5.0	1954-1956
Western Summit County	Summit County	Ductile Iron	8.9	9.0	2013
Willard Canal	West Weber County	Earth-lined/concrete-lined	1,050	11.0	1961-1963

PUMPING PLANTS

Name	Location	Capacity (cfs)	Height of Lift (ft)	Acquisition Dates
Antelope Booster	Layton	22	50	1978
East Bountiful	Bountiful	18	475	1955
East Layton	Layton	9	65	1955
Gateway	Mountain Green	150	150	1995
Kanesville #1	West Haven	3	218	2000
Kanesville #2	West Haven	10	315	2001
Layton Canal	West Haven	260	23	1955
Old Post Rd Booster	Ogden	6	200	1980
Rockport	Wanship	25	45	2009
Roy Drought Relief	Roy	150	340	1981
Sand Ridge East	Layton	9	92	1955
Sand Ridge West	Layton	15	138	1955
South Davis	Bountiful	18	530	1955
Unitah Bench	South Ogden	18	365	1955
Val Verda	Bountiful	6	240	1955
West Haven #1	West Haven	10	218	2003
West Haven #2	West Haven	3	230	2010
Willard No. 1	West Weber County	500	45	1960
Willard No.2	West Weber County	250	20	1960

UNDERGROUND WATER WELLS

Name	Location	Type	Capacity (cfs)	Acquisition Dates
Ben Lomond	Harrisville	M&I	1.8	2001
Bountiful	Bountiful	M&I	5.2	1961
Clearfield #1	Clearfield	M&I	5.0	1961
Clearfield #2	Clearfield	M&I	5.0	1961
Davis Boulevard	Bountiful	M&I	2.2	2003
District Well #2	South Weber	M&I	11.0	1985
District Well #3	South Weber	M&I	10.0	1990
Fairfield	Layton	M&I	10.0	1992
Farmington #1	Farmington	Irrigation	5.0	1995
Farmington #2	Farmington	Irrigation	5.0	1996
Laytona	Layton	M&I	5.0	1958
Mills Park	West Bountiful	Irrigation	2.2	2011
North Ogden	North Ogden	M&I	1.8	1967
North Weber	Harrisville	M&I	1.6	2006
Orchard Dr. Well	Bountiful	M&I	0.8	1991
Riverdale	Riverdale	M&I	6.6	1960
South Weber #1	South Weber	M&I	10.0	1962
South Weber #2	South Weber	M&I	10.0	1962
Washington Terrace	Washington Ter.	Irrigation	4.0	2013
West Bountiful 5th South	West Bountiful	Irrigation	4.0	1992
West Bountiful Golf	West Bountiful	Irrigation	2.0	1993

WATER TREATMENT PLANTS

Name	Location	Capacity (MGD)	Acquisition Dates
Davis North WTP	Layton, Davis	46	1955
Davis South WTP	Bountiful, Davis	16	1955
East Canyon WTP	Jeremy, Summit	5.5	2013
Weber South WTP	Ogden, Weber	32	1955

AF=Acre Feet • CFS=Cubic Feet per Second • MGD= Million Gallons per Day

Energy Efficiency

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

The proposed project includes three areas of energy efficiency: 1) reduced pumping from reduced water usage on the West Haven secondary pumps 2) the construction of solar array at the District's Davis North Water Treatment Plant and 3) upsizing of a proposed small hydro unit at Causey Dam from 20kW to 91kW.

The estimated energy saved by reducing pumping is anticipated to be 196,002 kW-hr. The proposed solar array will provide approximately 29,411 kW-hr of energy per year that will be used to offset the energy demand that is used to operate various equipment at the Davis North Water Treatment Plant which treats surface water to EPA drinking water standards. Because of the large electrical use at the DNWTP and the adjacent District Administration Building, all of

the energy generated will be utilized on the site. It is estimated that the proposed solar project will offset approximately 45,000 lbs of CO2 per year when compared with coal plant generation. The proposed upsizing of the planned small hydroelectric unit at Causey Dam will increase energy generation by 177,088 kW-hr per year.

Relationship with Reclamation

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

WBWCD has collaborated with Reclamation on a number of recently completed and ongoing cooperative projects, including:

- Drought Contingency Plan 2016: This planning project received partial funding to help develop a drought plan for the entire District.
- The Secondary Water Meter Project: This project, which received partial funding through the 2016 WaterSMART program, is in the process of being completed with the installation of 1000 meters.
- Phase 3 Upper Willard Canal Lining and Water Marketing Project: This project, which received partial funding through the 2013 WaterSMART program has been completed.
- Phase 2 Upper Willard Canal Lining and Water Marketing Project: This project, which received partial funding through the 2012 WaterSMART program, has been finalized.
- Phase 1 Upper Willard Canal Lining and Water Marketing Project: This project, which received partial funding through the 2011 WaterSMART program, is currently underway and is being constructed. Construction is completed.
- The Layton Canal Lining and Water Marketing Project: This project, which received partial funding through the 2010 WaterSMART program, has been completed.
- The first Secondary Water Meter Project: This project, which received partial funding through the 2010 WaterSMART program, has been completed with the installation of 1000 meters.
- System Trunk-line Meter Project: Completed in 2009, this project involved installation of large meters and provides information for the water deliveries through the many of the large lines that service portions of the District's retail secondary water system.
- System Optimization Review (SOR) was completed in 2008; this project evaluated the efficiencies of the District's entire water storage and distribution system.
- Weber River Basin Aquifer Recharge Water Bank: This project, which was completed in 2009, received partial funding through the 2007 Water 2025 program.
- Gateway Canal Landslide Stabilization Projects: This is an ongoing collaboration.

Technical Project Description

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

The project includes activities that will conserve water through secondary water metering, incorporate renewable energy through solar and hydropower, and remove barriers to fish passage by replacing a culvert. The following is a description of each activity.

Secondary Water Metering

The District currently has a total of approximately 17,000 secondary connections. In 2008, WBWCD began metering secondary connections, and to date, they have installed about 3,300 meters with plans to continue metering another 2,000 this coming year. The goal is to have all secondary connections on the District system metered so that users can be more accountable for the water they use. The proposed project will include installing 2,365 additional end user meters. Approximately 1,796 of the proposed 2,365 meters are located in West Haven secondary service area which is currently served by 3 booster pump stations (one is currently not used). These booster pump stations pump water from canals for distribution within the pressurized secondary system. Pumping this water requires a significant amount of energy. Therefore significant energy savings will be realized along with water savings. It is anticipated that energy savings from reduced pumping will be 196,002 kW-hr per year.

In Utah, it is estimated that approximately 60%-67% of all per capita water use is used to water landscapes. WBWCD is committed to reducing water usage and has made strides to reach a goal of reducing all water usage 25% by 2025 and 35% by 2050 using the year 2000 as the base year. To achieve this goal, WBWCD knows there needs to be a push to significantly decrease residential outdoor water use in order to maintain water deliveries by 2025. Over the past ten years, they have incorporated many methods of conservation. However, the two that have proven to have the greatest impact on conservation have been metering secondary water and public education. Metering secondary water can have and has had a profound impact on helping educate users how much they are really using as opposed to how much they actually need to use to water their lawns and gardens.

As on past meter installation projects, WBWCD will purchase the water meters and the AMR radio transmitters for the Project. Thus it will reduce costs and properly correlate the meters to the appropriate address where they will be installed.

Prior to any physical construction or disruption to individual yards, a public involvement information campaign will be organized to identify and inform all users who will be affected. The District will also provide the time frame for installation and what benefits will come as a result of having an individual meter on their connection. The contractor will pass out door hangers prior to construction in any given areas to inform homeowners of their presence in the areas where they will be working, providing at least 48 hours lead time to installation on their parcel.

Renewable Energy

Incorporated as part of this project is the construction of a 20.7 kW Solar Array at the District's Davis North Water Treatment Plant (DNWTP). The proposed solar array will provide approximately 29,411 kW- hr of energy per year. In addition, the District is proposing to upsize a planned small hydroelectric unit at Causey Dam which is expected to be constructed in February of 2018. The existing small hydroelectric unit is funded by a previous WaterSMART grant. As the preliminary design of the hydroelectric unit has proceeded, it has been found that

by upsizing piping to be used for the winter bypass; additional flow can be passed through the new hydroelectric unit. The originally planned unit was to be a 20kW unit that would produce approximately 68,000 kW-hr per year. The District is proposing to upsize the piping from 6" to 12" and upsize the hydroelectric unit from 20kW to 91kW as part of this project. The 91kW equipment will produce 245,088 kW-hr annually which is an ADDITIONAL 177,088 kW-hr annually compared to only installing the 20kW hydro unit as was previously planned.

Fish Passage

Included within this proposed project is improvements to Dalton Creek which crosses the Gateway Canal which is a critical feature of the Weber Basin Project. The purpose of the project will be to restore fish passage by replacing an existing culvert with an arch type structure that will return the Dalton Creek to its natural gradient and allow Bonneville cutthroat trout to pass upstream. Because of the size, slope, and drop at the end of the existing culvert across the Gateway Canal, the Utah Division of Wildlife Resources considers Dalton Creek totally blocked to spawning Bonneville cutthroat trout.

Evaluation Criteria

Evaluation Criteria A: Quantifiable Water Savings

Quantifiable Water Savings

Describe the amount of water saved. *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. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.*

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

Within WBWCD's West Haven service area, approximately 3,300 acre-feet of water is delivered annually. This entire amount is delivered to secondary irrigation users. The irrigation water services 2,000 connections. Currently, 204 of the 2,000 connections are equipped with a meter. The proposed project will complete the metering within the West Haven service area and meter a portion of the Layton Secondary System. Approximately 569 connections within the Layton area will be metered. Based off of data from the Uintah Bench service area (an area similar in soil types and lot sizes to the Layton area) secondary users use on average 1.07 acre-feet per secondary connection making the estimated secondary use of those connections 608 acre-feet per year (569 x 1.07 = 608 acre-feet). For this Project, the total water supply that will be considered is 3,300 + 608 = 3,908 acre-feet/year. The Project will be installing 2,365 additional meters.

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

Water is being overused on lawns, gardens, concrete sidewalks, and pastures. In some possible cases, the secondary system has been used to irrigate row crops and pastures.

- ***Where will the conserved water go?***

Water conserved through this project will be banked and used for future growth needs and to supply new connections and future demand needs within the District's service area. Water not required for the project area will remain in the system as stored water or instream flows. It is also possible that saved water could go to meet needs in other areas of the District.

Municipal Metering:

Municipal metering projects can provide water savings when individual user meters are installed where none exist to allow for a unit or tiered pricing when existing individual user meters are replaced with advanced metering infrastructure (AMI) meters, and when new meters are installed within a distribution system to assist with leakage reduction. To receive credit for water savings for a municipal metering project, an applicant must provide a detailed description of the method used to estimate savings, including references to documented savings from similar previously implemented projects. Applicants proposing municipal metering projects should address the following:

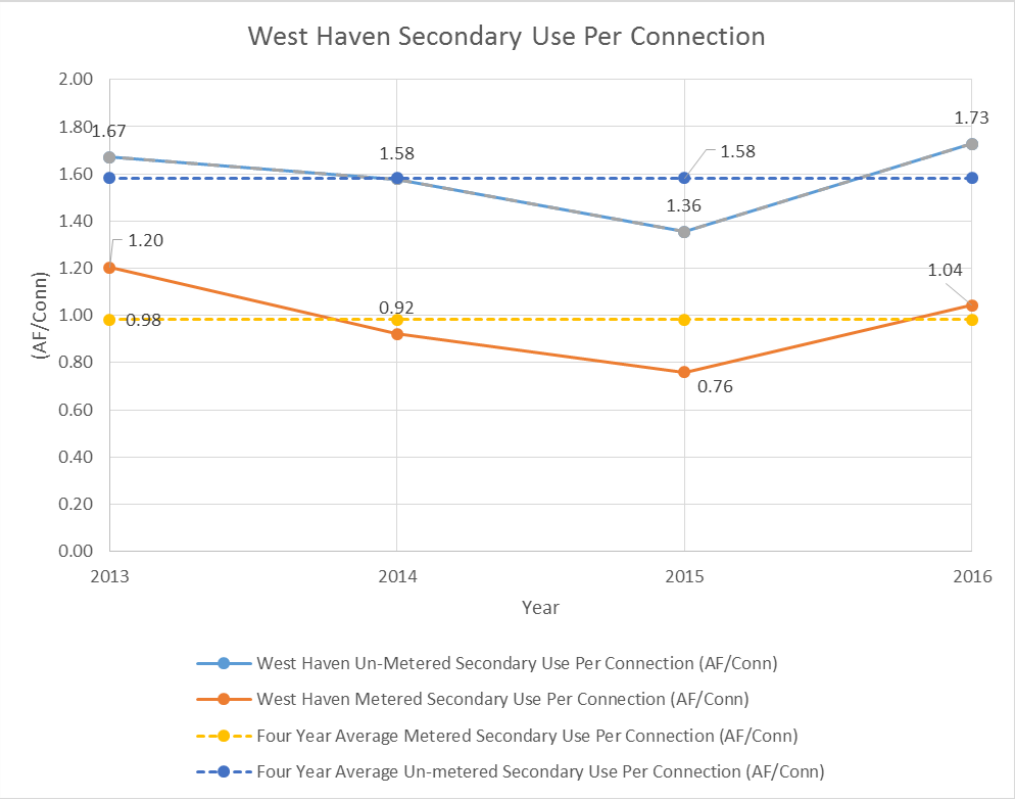
(a) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

It is estimated the proposed project will conserve 1,339 AF/yr. (Calculations 1, 2, 3 and 4).

Approximately 1,796 of the proposed 2,365 meters to be installed will be completed in WBWCD's West Haven secondary service area. This area typically has larger lot sizes and consistently has the highest use per secondary connection within WBWCD's secondary service areas and is therefore a high priority to be addressed by the District.

Meter data from 2013 – 2016 has shown that secondary users in West Haven that have a secondary meter use significantly less water than those who are not metered at this time. Based on the available data (2013-2016) from existing metered end user connections in the West Haven service area metered end user connections used on average 0.98 AF/connection/yr. During the same time period, un-metered secondary connections are estimated to have used on average 1.58 AF/connection/yr. The 1.58 AF/connection/yr was calculated using flow data at the 3 pump stations that service the West Haven service area. From the total flow in, water consumed by metered end user connections was removed. The remaining water is used by the West Haven retail secondary unmetered service connections. Figure 1 below shows the secondary water use by year for both metered and un-metered connections. On average, metered secondary connections used 0.60 AF/Conn less than un-metered connections.

Figure 1 West Haven Secondary Use Per Connection



The District believes additional conservation is possible beyond the observed 0.60 AF/conn/yr if users continue to respond to the targets they are being given for appropriate use. For the meters to be installed in Layton, 0.46 AF/ Conn savings was used based on estimated savings in the District's Uintah Bench service area (see additional detail on the Uintah Bench service area calculations in (c) below).

The following calculations show the anticipated water savings for the proposed meter project.

Calculation 1. Documented Water Use Reduction for Metered Secondary Connections in West Haven

1.58 AF/conn/yr – 0.98 AF/conn/yr = 0.60 AF/conn/yr Water Savings

Calculation 2. Anticipated Water Savings for Proposed West Haven Meters

1,796 new meters x 0.60 AF/conn/yr savings = 1,077.6 AF/yr.

Calculation 3. Anticipated Water Savings for Proposed Layton Meters

569 new meters x 0.46 AF/conn/yr savings = 261.7 AF/yr.

Calculation 4. Total Anticipated Water Savings for Proposed Meter Project (Layton + West Haven)

261.7 AF/yr. + 1,077.6 AF/yr = 1,339 AF/yr

(b) How have current distribution system losses and/or the potential for reductions in water use by individual users been determined?

Water reductions for individuals in the proposed Project are being based on actual 2012-2016 metered connection data that are located within the project area. As was shown in the above calculations, there is an impact from having a meter on a water connection and showing water users what they use. Without usage information from the meter, people assume they are using a reasonable amount of water. However, when the actual usage is known, coupled with help and information on proper landscape water needs, data shows that water use in metered areas has decreased. The calculation for how much each user can reduce usage is based on average use from what has been seen and recorded. However, it is believed that even greater savings can be achieved due to user demographics in remaining unmetered areas, parcel sizes, site locations and other factors that can play a role in high usage. WBWCD is confident that there will be substantial water savings with each new meter based on the historical data on meters already installed within the Weber Basin service area.

Current distribution system losses are unknown, however are expected to be low since the West Haven area is the most recently constructed secondary service area in the District. The District has experienced little to no leaks within this distribution system.

(c) For installing individual water user meters, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.

The District has approximately 3,300 secondary meters over their entire secondary service area. The first 1,000 meters were installed in part with WaterSMART FY2010 grant funding. Since then, the District has been installing additional meters each year in smaller numbers. All new subdivisions and new service connections to the District's system are now required to install individual meters which accelerate the accomplishment of the goal that all District service connections be metered.

Data is available for all meters installed, but to have some consistency over time the District used data from a group of 1,057 meters that have usage records from 2012-2016. Data was collected and compiled in hourly increments to analyze and determine the effectiveness of these 1,057 meters, during the irrigation seasons of the past five years. In addition to usage data, the District has used mapping technology to identify the parcel size and the area of each parcel that would be considered to be "irrigated area" (everything that is not a physical structure or hardscape surfaces).

The five tables below show data from the 1,057 meters over the four-year period from 2012-2016. Each of these connections has data for this entire period. The data represents the same metered parcels for all years. The tables show the total amount of water allocated to the properties in the area, their actual use, and the use as a percentage of the allocation. The number and percent of properties that exceed the allocation are also shown.

Table 1 2012 Meter Data

2012 Meter Data								
Allocation Amounts	**# of Properties**	**Alloc. (AF)**	**Estimated Need (AF)**	**Use (AF)**	**% of Alloc.**	**% of Need**	**Exceeding Allocation**	
Washington Terrace	263	259.5	141.2	199.4	77	142	48	18%
South Ogden (Ph. 1)	292	251.9	155.0	228.6	91	148	81	28%
South Ogden Badgers	48	35.3	17.3	36.4	103	211	23	48%
South Weber	356	436.2	284.9	323.2	74	113	65	18%
South Ogden Ph. 2	98	86.8	64	85.8	99	134	43	44%
Total	**1,057**	**1,069.7**	**662.2**	**874.0**	**89%**	**150%**	**260**	**25%**

Table 2 2013 Meter Data

2013 Meter Data								
Allocation Amounts	**# of Properties**	**Alloc. (AF)**	**Estimated Need (AF)**	**Use (AF)**	**% of Alloc.**	**% of Need**	**Exceeding Allocation**	
							#	**%**
Washington Terrace	263	259.5	141.2	162.0	62	115	16	6%
South Ogden (Ph. 1)	292	251.9	155.0	172.8	69	111	42	14%
South Ogden Badgers	48	35.3	17.3	25.7	73	148	11	23%
South Weber	356	436.2	284.9	249.8	57	88	18	5%
South Ogden Ph. 2	98	86.8	64	65.1	75	102	17	17%
Total	**1,057**	**1,069.7**	**662.2**	**675.3**	**67%**	**113 %**	**104**	**10%**

Table 3 2014 Meter Data

2014 Meter Data								
Allocation Amounts	**# of Properties**	**Alloc. (AF)**	**Estimated Need (AF)**	**Use (AF)**	**% of Alloc.**	**% of Need**	**Exceeding Allocation**	
							#	**%**
Washington Terrace	263	259.5	141.2	150.6	58	107	14	5
South Ogden (Ph. 1)	292	251.9	155.0	162.2	64	105	43	15
South Ogden Badgers	48	35.3	17.3	23.2	66	134	6	13
South Weber	356	436.2	284.9	235.8	54	83	20	6
South Ogden Ph. 2	98	86.8	64	58	67	91	10	10
Total	**1,057**	**1,069.7**	**662.2**	**629.9**	**62%**	**104%**	**93**	**9%**

Table 4 2015 Meter Data

2015 Meter Data								
Allocation Amounts	**# of Properties**	**Alloc. (AF)**	**Estimated Need(AF)**	**Use (AF)**	**% of Alloc.**	**% of Need**	**Exceeding Allocation**	
							#	**%**
Washington Terrace	263	259.5	141.2	124.8	48	88	4	2

South Ogden (Ph.1)	292	251.9	155.0	131.7	52	85	14	5
South Ogden Badgers	48	35.3	17.3	19.9	56	115	3	6
South Weber	356	436.2	284.9	192.8	44	68	10	3
South Ogden Ph. 2	98	86.8	64.0	46.5	54	73	4	4
Totals	**1057**	**1069.7**	**662.2**	**515.5**	**49%**	**80**	**35**	**3%**

Table 5 2016 Meter Data

2016 Meter Data								
Allocation Amounts	**# Of Properties**	**Alloc. (AF)**	**Est Need (AF)**	**Use (AF)**	**% of Alloc.**	**% of Need**	**Exceeding Allocation**	
							#	**%**
Washington Terrace	263	259.5	115.4	148.9	57	129	10	4%
South Ogden Ph. 1	292	251.9	126.7	183.1	73	145	52	18%
South Ogden Badgers	48	35.3	14.1	25.8	73	183	8	17%
South Weber	356	436.2	222.4	247.9	57	111	25	7%
South Ogden Ph. 2	98	86.8	52.3	62.2	72	119	13	13%
Total	**1057**	**1069.7**	**530.9**	**667.9**	**63%**	**129**	**108**	**10%**

The relatively dry conditions from 2012 - 2015 has brought a lot of media attention to water supply and water usage which could have brought more awareness to the general public which may have had an influence on behavior and water reductions from year to year during that time period.

Each year the estimated need remains the same because it is based on the historical average reference rates with parcel size. The majority of users exceed the estimated need. The estimated need is listed on every metered customer's monthly usage report and is almost always less than the allotted amount they have for their parcel. See Attachment C Sample Monthly Usage Statement

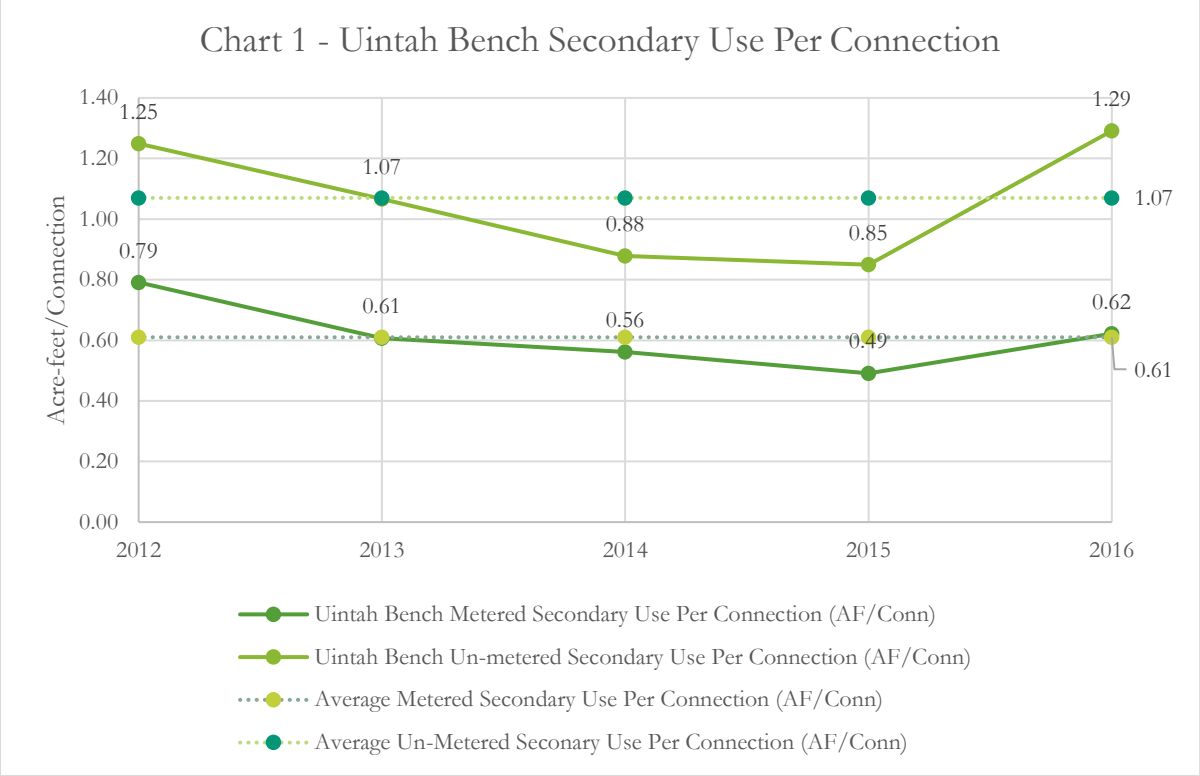
The estimated need is based on the moisture needs of turf, which has the highest water demand in any landscape. The assumption is made that the entire landscape area is turf, which gives users a generous amount of water for different landscape needs. Considering that most yards are not 100% turf (turf requiring the highest water demand of landscape irrigation) and that other landscaping plants are more water efficient (trees, shrubs, gardens), it is a reasonable goal to have users reduce water consumption to meet and exceed their estimated need.

Table 6 below offers a side-by-side comparison of the 2012-2016 irrigation seasons again using the metered data group for calculation. On average, customers are using less than the traditional allocation which is 3 acre-feet per gross acre, per year. Average usage compared to estimated need over the five years shows a significant improvement. Users complying with the volume given them as the estimated demand shows a significant improvement from 145% in 2012 to just 90% in 2015 but due to the hot and dry summer of 2016 increased to 125%.

Table 6 Water Use Comparisons of Metered Connections in 2012-2016

	2012	2013	2014	2015	2016
Used Gallons	284,912,371	220,146,962	205,346,968	168,066,551	217,748,680
Used AF	874	675.3	629.9	515.5	667.9
Gross Acreage	324.4	324.4	324.4	324.4	324.4
Used AF / Gross Acreage	2.69	2.08	1.94	1.59	2.06
Landscaped Area	225.3	225.3	225.3	225.3	225.3
Used AF/ Landscaped Area	3.9	3	2.8	2.3	3.0
Estimated Need (Gal)	215,886,557	215,886,557	215,886,557	215,886,557	215,886,557
Percentage Used / Est. Need (Weighted)	145.00%	117.40%	109.71%	90.24%	125.82%
Average % Allocation Used (Weighted)	83.00%	64.00%	59.60%	50.18%	65.15%
Average Allocation	1.0 AF	1.0 AF	1.0 AF	1.0 AF	1.0 AF
Total Allocation	1074.0 AF	1074.0 AF	1074.0 AF	1074.0 AF	1074.0 AF

This data seems conclusive in showing that having a meter and receiving usage information promotes accountability and will cause behavior changes in usage to occur when users are given a target, however it does not show the difference in use between metered secondary connections and un-metered secondary connections. To understand the water savings for a secondary metering project the District has used pump and transmission line meter data to determine un-metered secondary use by subtracting out metered uses. For example, in the Uintah Bench Service area metered end user connections used on average 0.61 AF/connection/yr. During the same time period, un-metered secondary connections are estimated to have used on average 1.07 AF/connection/yr. The 1.07 AF/connection/yr was calculated using flow data for the Weber Aqueduct, the District's Washington Terrace Well and Burch Creek which all feed the Uintah Bench service area. From the total flow in, water delivered to the District's South Weber Water Treatment Plant, water consumed by metered end user connections and water wholesaled to other entities were removed. The remaining water is used by the Uinta Bench retail secondary unmetered service connections. Chart 1 below shows the secondary water use by year for both metered and un-metered connections. On average, metered secondary connections used 0.46 AF/Conn less than un-metered connections. An interesting item to note is that the summer of 2016 which was a hot and dry summer in northern Utah caused an increase in water use across the District's service area, however the metered secondary irrigation users did not increase their use as much as un-metered users did.



A similar analysis has been completed for the West Haven secondary service area and was shown previously in part (a) above.

(d) If installing distribution main meters result in conserved water, please provide support for this determination (including, but not limited to leakage studies, previous leakage reduction projects, etc.). Please provide details underlying any assumptions being made in support of water savings estimates (e.g., how leakage will be reduced once identified with improved meter data).

This project does not deal with the installation of main distribution meters, however the project will accomplish end-user metering of the entire West Haven secondary system. This will allow the District to understand if any water is currently being lost to leaks (as mentioned previously it is not expected that a significant amount of water is being lost to leaks because of the age of the system). If system losses are found, steps will be taken to find and repair leaks or to search for and correct any unauthorized connections that may have been made to the system.

(e) What types (manufacturer and model) of devices will be installed and what quantity of each?

WBWCD is currently approving the installation of the Sensus Iperl meter for the traditional 1-inch connections. In the case that a service requires more flow than a 1-inch meter can supply, the Elster EvoQ4 meter will be used. However, there will only be a few of these meters. The approved EvoQ4 meter for larger connections comes in 2-inch and 4-inch size. The EvoQ4 meters are compatible with the AMR radio transmitter currently used to gather meter usage data and the fixed network AMI system the District will be implementing in the coming year. The new AMI system will continue to provide usage data in hourly increments, which is important to the District. The WBWCD can use the hourly data to track irrigation timing and volume of water used at irrigation times. This proposed Project will involve the installation of approximately 650 meters and radio transmitters during year one and roughly 850 each year for years two and three.

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

At the completion of each year of the Project WBWCD will have water usage data from every meter installed. The data will be in hourly increments from April 15 to October 15. The data will also include a monthly consumption value. Water savings will not be fully known after just one irrigation year. However, the usage will continue to be gathered every year and comparisons made to show how water use will adjust and decrease over time. It has been seen that simply having a meter installed has helped users quantify their usage and alter their behaviors. The historical data shows that most users have been responsive and appreciative of receiving monthly water use statements, and have reduced water usage as a result.

WBWCD will be able to use historical trunk line meter data to compare usage from years prior to metering with years following metering. If weather is significantly different between years, evapotranspiration rates can be used to normalize data. Comparing historical water use to use after full implementation of the meter project will more accurately depict what impact the installation of individual meters has on the entire system.

Evaluation Criterion B: Water Sustainability Benefits Expected to Result from the Project

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

Will the project commit conserved water to instream flows? If so, please address the following:

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

  The development of this project will allow for more water to be saved and held in Echo and Rockport Reservoirs and within the Weber River system. After talking with Clint Brunson, the Aquatics Habitat Restoration Biologist with Utah Division of Wildlife Resources (UDWR) and Paul Burnett, with Trout Unlimited, it was indicated that if the District could allow more water to run down the Weber River during the irrigation season it would help the Bonneville Cutthroat Trout and Bluehead Sucker which are listed on the state's sensitive species list. It is proven and documented that by allowing for more available water to stay within the habitat areas for longer periods of time species are benefited.

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

  WBWCD is committed to working with the UDWR and Trout Unlimited to continue to be a partner with Trout Unlimited and UDWR as they the work with the graduate student to project for the bluehead sucker in the Weber River.

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

  Based on information obtained from UDWR, there are recently documented occurrences of the Bonneville Cutthroat Trout within a 2-mile radius of the Weber River in the area near Echo Reservoir. As well as recent occurrences for the bald eagle and Bluehead Sucker within ½ mile of the Echo reservoir all of which are included on the Utah Sensitive Species List. The proposed project on Dalton Creek will enhance the habitat for the Bonneville Cutthroat Trout and the Bluehead Sucker. In addition, the water savings which will be realized from this project will benefit the species listed above, because it is proven and documented that by allowing for more available water to stay within the habitat areas for longer periods of time, these species are benefited.

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

  The Bonneville cutthroat trout and the 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. The conservation agreements and strategies stipulate how those measures should be implemented. Low stream flows affect many aspects of the Weber River. Stable and connecting flows between those habitats are a fundamental requirement for those conservation actions to be successful. UDWR feels that projects that enhance the continuity and maintenance of flows within the Weber River are a step in the right direction.

- *Will the increased instream flows result in benefits to habitat or other ecological benefits? If so, describe these benefits. Will the flows specifically benefit federally designated critical habitat?*
  No known federally designated critical habitats will be specifically targeted for this project. However, there are federally listed and endangered (E), threatened (T), and candidate (C) species that could be positively affected by additional water supply. The U.S. Fish and Wildlife Service identify these species as known and are believed to be in Davis, Weber, Morgan and Summit Counties include:
  (C) Greater Sage-Grouse (Centrocercus urophasianus)
  (C) Yellow-Billed Cuckoo (Coccyzus americanus)
  (C) Least Chub (Lotichthys phlegethontis)
  (E) June Sucker (Chasmistes liorus)

(T) Canada Lynx (Lynx canadensis)

Stable and connecting flows in the Weber River system are a fundamental requirement for conservation actions to be successful. Therefore, most any project that enhances the continuity and maintenance of flows within the Weber River is a step in the right direction. As WBWCD and UDWR work cooperatively to protect and conserve the native species – Bonneville cutthroat and bluehead sucker – and their habitats other known federally listed habitats will be benefited.

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

  Within the Weber River Watershed Plan of 2014, it says 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 for more water to remain in the Weber River, Echo, East Canyon and other reservoirs, recreational opportunities will be benefited, water quality will be improved, recreation fishing will be sustainable and economic development will continue.

For Task B activities with benefits unrelated to water savings (e.g., habitat improvements, or installation of fish bypasses or fish screens), describe the activities and associated benefits in detail.

Please address the following:

- *Will the project benefit federally-recognized candidate species? Will the project directly accelerate the recovery of, threatened or endangered species or address designated critical habitat*? *Is the project expected to have other fish and wildlife benefits?*

  The project will restore fish passage by replacing an existing culvert with an arch type structure that will return the Dalton Creek to its natural gradient and allow Bonneville Cutthroat Trout to pass upstream. Because of the size, slope, and drop at the end of the existing culvert across the Gateway Canal, the Utah Division of Wildlife Resources considers Dalton Creek totally blocked to spawning Bonneville Cutthroat Trout. Little information is known about the Bluehead Sucker, but these improvements will likely also provide improved habitat for this Utah Sensitive Species.

Evaluation Criteria C: Energy-Water Nexus

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

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

The proposed project also includes the construction of a 20.7 kW Solar Array at the District's Davis North Water Treatment Plant (DNWTP). The proposed solar array will provide approximately 29,411 kW-hr of energy per year. This power will be used to offset energy demand that is used to operate various equipment at the DNWTP that is used to treat surface water to EPA drinking water standards. Because of the large electrical use at the DNWTP and the adjacent District Administration Building, all of the energy generated will be utilized on the site. It is estimated that the proposed solar project will offset approximately 45,000 lbs of CO2 per year when compared with coal plant generation.

In addition, the District is proposing to upsize a planned small hydroelectric unit at Causey Dam which is expected to be constructed in February of 2018. The existing small hydroelectric unit is funded by a previous WaterSMART grant – funded in 2016. As the preliminary design of the hydroelectric unit has proceeded, it has been found that by upsizing piping to be used for the winter bypass; additional flow can be passed through the new hydroelectric unit. The originally planned unit was to be a 20kW unit that would produce approximately 68,000 kW-hr per year. The District is proposing to upsize the piping from 6" to 12" and upsize the hydroelectric unit from 20kW to 91kW – see note below – as part of this project. The 91kW equipment will produce 245,088 kW-hr annually which is an ADDITIONAL 177,088 kW-hr annually compared to the previously planned project. By optimizing the Causey Small Hydro project, additional energy will be generated which will be used to offset the District's current winter power use at its water treatment plants and other large facilities.

Total additional power production capacity: 20.7 kW + 71kW***** = 91.7 kW

Note:** ***Because the 2016 WaterSMART Grant had proposed a 20kW unit only a 71kW will be calculated in order not to count the energy produced by the 20kW unit twice.

Total new annual energy generation: 29,411 kW-hr + 177,088 kW-hr = 206,499 kW-hr

Describe the amount of energy generated. *For projects that implement renewable energy systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

The proposed solar array will operate year around and will provide approximately 29,411 kW- hr of energy annually. By upsizing the hydroelectric unit from 20kW to 91kW as part of this project the hydropower generator, now operating year around, will provide approximately 177,088 kW-hr annually.

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

It is estimated that the proposed solar project will offset approximately 45,000 lbs of CO2 per year when compared with coal plant generation. The 91kW equipment will produce 245,088 kW-hr annually which is an ADDITIONAL 177,088 kW-hr annually compared to the currently planned project. By optimizing the Causey Small Hydro project, additional energy will be generated which will be used to offset the District's current winter power use at its water treatment plants and other large facilities.

This renewable energy sources will both be able to operate during the winter months. The balance of power generated that is not being used at the Causey Dam, and Powerhouse can potentially be used at other District facilities or be sold back to the power provider - Utah Association of Municipal Power Systems (UAMPS) or Rocky Mountain Power. This facility will help reduce the need to use more fossil fuels to meet the energy demands of WBWCD.

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

Yes, WBWCD now uses energy which is generated at three power generation facilities. Gateway Power Plant and Wanship Power Plant were constructed as part of the Weber Basin Project. Causey Power Plant was built in 1999 at Causey Dam which is part of the Weber Basin Project. Power generated at these facilities is used to supply Weber Basin Project power requirements such as project wells, treatment facilities, and pumping stations. Since the energy currently used at Causey Dam and Powerhouse in the winter are energy from Reclamation project energy production, installing this new hydroelectric facility will allow this energy to power other District facilities.

•Anticipated beneficiaries, other than the applicant, of the renewable energy system

The power generated will enable WBWCD to offset the large electrical use at the DNWTP and the adjacent District Administration Building, all of the energy generated by the solar array will be utilized on the site. It is estimated that the proposed solar project will offset approximately 45,000 lbs of CO2 per year when compared with coal plant generation. The hydropower generated will be used to run other facilities in the District or sell back to the power provider - Utah Association of Municipal Power Systems (UAMPS) or Rocky Mountain Power, thus benefiting on a small scale the population along the Wasatch Front.

•Expected water needs of the renewable energy system

The 91kW turbine hydropower generator will be operated by existing required winter flows. No additional water will be needed to operate solar array or the hydropower generator and, the generator will not deplete any water resources.

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

Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping).
•Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.

Table 7 Energy Savings Summary

2017 Energy Savings Summary								
			Anticipated AF/Conn Savings		0.60			
		*Annual Pumping Volumes and Energy Use is based off of records from 2013-2015						
	Large Project							
			Total Volume Pumped Annualy (Acre-Feet)	Total Power Consumed for Pumping Annually (kW-hr)	Anticipated new meters in Service Area	Anticipated water Savings in Service Area (Acre-Feet)	Anticipated Energy Savings (kW-hr)	
West Haven Pumps			2,863	520,805	1,796	1078	**196,002**	

Approximately 1,796 of the proposed 2,365 meters are located in the West Haven service area which requires pumping to supply and pressurize the irrigation system. Total water savings for these 1,796 meters is expected to be 1,078 acre-feet/year (0.60 acre-feet/conn/yr. x 1,796 connections = 1,078 acre-feet/year). See Table 7 above.

In 2016, a total of 520,805 kW-hr of electricity was required from April through October to pump approximately 2,863 acre-feet of water to the West Haven service area. A one-to-one correlation between the amount of water saved to the amount of water pumped exists. Therefore, an energy savings of 196,002 kW-hr (1,078 acre-feet x 520,805 kWh/2,863acre-feet) would be realized each year from the reduction in 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?

The reduction in water use due to the proposed metering project will decrease the amount of time the West Haven Pump Stations pumps will need to run to satisfy water demands. The West Haven area is served by 3 pump stations however only 2 are currently operated. The operational pump stations and the sizes of pumps are as follows:

West Haven Pump Station-

- One 150 Horsepower Pump
- Two 75 Horsepower Pumps

Hooper Reservoir Pump Station –

- One 100 Horsepower Pump

•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 estimated at the point of diversion.

•Does the calculation include the energy required to treat the water?

No, the water used in the West Haven secondary system is not treated.

•Will the project result in reduced vehicle miles driven, in turn reducing carbon emissions? Please provide supporting details and calculations. 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).
Yes, the proposed meters will be equipped with endpoints that will communicate with a fixed network AMI system. This will allow District Personnel to understand demands and at times troubleshoot issues from the office rather than requiring a 15-mile one-way trip to the West Haven area.

Also, the proposed solar array will provide approximately 29,411 kW- hr of energy per year. It is estimated that the proposed solar project will offset approximately 45,000 lbs of CO2 per year when compared with coal plant generation.

Evaluation Criterion D: Addressing Adaptation Strategies in a WaterSMART Basin Study

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

  Within the Colorado River Basin; Water Supply and Demand Study updated in 2013 there are 27 options submitted that related to municipal and industrial (M&I) conservation to reduce demand in areas receiving Colorado River supply. Many of these options were related to specific M&I conservation programs (e.g., metering, water accounting, and loss control, public education, leak detection, irrigation efficiency, etc.) or targeted specific M&I water use sectors (e.g., golf courses, industrial use) that might provide additional opportunities for conservation in the Colorado River Basin (Basin) as a whole. WBWCD is adjacent to but not within the Colorado River Basin. However, the Weber River Basin is within Reclamation's Upper Colorado Region.

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

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

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

incorporating public conservation information programs which will be part of the metering portion of the project.

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

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

  If water within the District's boundaries can be better managed and conservation goals achieved with the current water supply, there would be less of a need to seek for additional water supplies such as the proposed Bear River project which will serve the Bear River Basin, Weber River Basin as well as the Jordan River Basin (which is partially served by Colorado River Water).

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

  WBWCD has participated in reviewing and commenting on the Colorado River Basin Water Supply and Demand Study 2013 and on the Weber River Basin Plan of 2009. WBWCD and other Reclamation projects that have interests in the Weber River Basin submitted an application for a basin study specific to the Weber River Basin in 2016 however this application was unsuccessful.

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

  This project will require the collaboration with WBWCD as they are a major water seller in the basin. It will also allow for cooperation between all of the cities and counties in which their secondary pressurized system is located.

Evaluation Criterion E: Expediting Future On-Farm Irrigation Improvements

- *Include a detailed listing of the fields and acreage that may be improved in the future.*
  N/A
- *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*

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

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

  N/A

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

  N/A

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

  N/A

Evaluation Criterion F: Implementation and Results

Subcriterion No. F.1: Project Planning

Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a WaterSMART Basin Study)? Please self-certify, or provide copies of these plans where appropriate, to verify that such a plan is in place.

Provide the following information regarding project planning:

Weber Basin Water Conservancy District has a water conservation plan that has been implemented, updated and submitted in 2013 to the Utah State Division of Water Resources as well as the Bureau of Reclamation (Provo Area Office). The District has also completed a System Optimization Review (SOR) for an overall planning and projecting of future water needs and demands. In addition, the proposed project WBWCD is currently underway to prepare a Drought Contingency Plan funded by Reclamation. This plan will allow them to develop better understanding of the impact of drought and strategies to plan for sustainable water demands and water supplies as they continue to change. Within the Drought Contingency Plan water conservation will be an important action in mitigating for future droughts. With conservation being the key – secondary metering will permit the District to enforce water restrictions during times of Drought which they are currently not able to do.

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

The District SOR has identified canal lining and metering projects as the top two priorities. This application addresses metering projects. The District has also developed a water conservation plan that was most recently updated in 2013. Retail secondary irrigation metering is one of the priority items listed in the District's water conservation plan. Metering fits into conservation as well as water management plans that will assist the District in accounting for current water use while planning how to meet the needs of future demands. With the development of the Drought Contingency Plan WBWCD will be able to continue their goals of the SOR and water conservation plan and help them meet other goals of the State.

(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 proposed project will assist the District in meeting its conservation goals, which is also the State of Utah's goal of a 25% reduction in per capita use by 2025. In the District's area with current unmetered secondary water, the greatest potential for conservation comes with

accountability and end user knowledge of how much they use. Data that is presented in the proposal also shows the conservation savings which will be achieved to benefit the District and to benefit surrounding areas and other water purveyors to meet water conservation goals, environmental improvement goals and energy reduction goals by reduced pumping costs.

Subcriterion No. F.2: Support and Collaboration

» *Does the project promote and encourage collaboration among parties?*

– *Is there widespread support for the project?*

WBWCD, the cities in the service area, and other irrigation companies in the District support the improvements because they will help move the state of Utah and WBWCD closer to their goal of 25% in reduced water use by 2025. Letters of support for WBWCD project include Weber County, Division of Water Resources, Utah Division of Wildlife Resources, and Trout Unlimited and can be found under Letters of Support.

– *What is the significance of the collaboration/support?*

Currently, the District delivers water to many cities, sub-conservancy districts and private irrigation companies. The District has the highest percentage of secondary water use in the United States. This is the primary reason that emphasis has been made, and the accountability for this water at the user level is such a priority. This project will allow the District to work with these other entities and lead the way in improving the efficiency of the secondary water systems within District boundaries.

It will also increase water use awareness among residential water users in a way that could not be achieved in any other way. The District believes that this project, along with other conservation goals and activities will help prevent a water-related crisis or conflict because it will provide more water to be available for future needs and growth which is projected to double along the Wasatch Front by 2060. The future customers in the District's service area can be more aware of their water use, and it will be easier to help them reduce if they fall into a category of excessive use.

– *Will the project help to prevent a water-related crisis or conflict?*

The proposed project will reduce the potential for water-related conflict. The District serves one of the fastest growing regions in the Western United States, with the population of the region (and thereby the demand for water) expected to increase by 20-30% by 2025. Due to this rapid growth, there is an increasingly volatile balance between the demand for irrigation water, and the rapidly increasing demand for additional municipal and industrial (M&I) water; particularly in years of drought contribute substantially to the District's conservation efforts and will help to alleviate potential future conflicts.

– *Is there frequently tension or litigation over water in the basin?*

There is always anxiety when it comes to water. Natural disasters, drought, residential users over watering, and un-maintained canals and ditches seem to be the major factors in developing tension within any service area. WBWCD has had its share and, will continue to feel the pressure, especially as demands for more water, come from expanding residential growth. During the Dam Safety work that was being performed at

Echo Reservoir the stress and strain was intense. It was anticipated that things would lighten up but the persistence of the drought, early spring runoff, and a dryer than normal summer – tensions reared its ugly head once again.

- *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

  WBWCD has already seen conservation improvements by others i.e. Davis and Weber Counties Canal Company – large piping and metering projects in 2014 and 2015. Other improvements – Echo Canal Company, Haights Creek Irrigation Company, Hoytsville Ditch Company and many others are working to try to make a difference within the WBWCD service area by piping, pressurizing systems, and metering their systems.

Subcriterion No. F.3: Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved, marketed, or better managed, or energy 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. They include renewable energy that will be generated and water that is saved and/or better managed.

Energy Generated Performance Measures

The energy produced by the solar array and hydro will be metered. The metered output will be recorded monthly and compared to the estimation of power generated in this application.

Water Savings and/or Better Water Management Performance Measures

This proposed Project will be measured for success by the reading and logging of the data from the installed meters which will be logged monthly by an AMI system. The information gathered will be in hourly intervals and will be analyzed and compared over time to show and track water savings. As WBWCD logs hourly incremental data from the meter they are able to compare allocations with actual usage. This will allow them to determine if the allocations are too large, and use the collected water usage data to tailor and target water conservation educational material to users that may not understand or may not recognize they need assistance in reducing usage. Current usage is based on trunk line and facility meters in the area. This produces an average use per un-metered connection in the area. Once meters are installed, water savings will be quantified using the individual meters and new measures for targeting high use can be developed and implemented and the direct water savings will be tracked.

All of this will be documented for the water users and sent to them for their information using the Water User Monthly Statement. See Attachment C Sample Water User Statement.

Evaluation Criterion G: Additional Non-Federal Funding

WBWCD is requesting $1,000,000 or 40% from Reclamation. WBWCD will be responsible for the remaining $1,500,070.00 or 60% of the total project costs.

$1,500,070 Non-Federal Funding
$2,500,070 Total Project Cost = **60%**

Evaluation Criterion H: Connection to Reclamation Project Activities

(1) How is the proposed project connected to Reclamation project activities?

This project is directly related to Reclamation activities since the water supplying the West Haven, and Layton area is part of the Weber Basin Project. Much of the infrastructure, pumping, and other activities are connected to Reclamation-owned land, facilities, and infrastructure that the District operates to provide the water where needed.

(2) Does the applicant receive Reclamation project water?

All the water received in the Layton area is original Weber Basin Project water and much of the water in the West Haven area is from Reclamation projects. Weber Basin is the central entity for Reclamation Project water for the entire region.

(3) Is the project on Reclamation project lands or involving Reclamation facilities?

The metering of the proposed project **will not** take place on Reclamation project lands but will have an effect on Reclamation facilities due to the decrease in water needed over the long term. Reduced usage equates to increase in storage, increase in water marketing, a decrease in pumping and a less cost to upsize and improve existing infrastructure to carry additional water to meet the future demands. The proposed Causey Small Hydro Optimization will be located at an existing Reclamation facility, the Causey Powerhouse.

(4) Is the project in the same basin as a Reclamation project or activity?

The proposed project is within the WBWCD District boundaries which is a Reclamation project.

(5) Will the proposed work contribute water to a basin where a Reclamation project is located?

This proposed project will serve to support Reclamation objectives and will augment water supplies in the Weber Basin area, thus reducing future conflicts for water to this area. Water saved in this project will be used for future demands in the Weber Basin service area, which is part of a Reclamation project.

(6) Will the project help Reclamation meet trust responsibilities to Tribes?

This proposed project will not affect responsibilities to Tribes.

Environmental and Cultural Resources Compliance

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

   The project will require only a minimal level of earthwork to install meters. There will be some excavation of the existing connection to all allow for a meter pit to be installed. No animal habitats will be negatively impacted, and work impacts will be very minimal even to existing landscapes. The work within Dalton Creek will have all the required permits and approvals.

2. *Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?*

   WBWCD is not aware of any impacts concerning threatened or endangered species in this area.

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

   WBWCD is not aware of any impacts to wetlands in this area.

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

   The original District/Reclamation Project began in the late 1950's and continued over several year periods in the early 1960's. Since then additional infrastructure with conveyance canals and pipes have been added to meet the growing population water needs.

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

   There will be no significant modifications to the main conveyance system within the metering portion of the project. All changes will happen at the point of delivery to individual parcels. The 20.7 kW solar array will be located on an existing building at the WBWCD treatment facility. The hydro 91 kW will be constructed within the Causey Powerhouse. The reconstruction of the culvert in Dalton Creek will go through all necessary permitting processes and approvals.

6. *Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.*

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

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

   WBWCD is not aware of any impacts to any archeological sites. An archeological resource inventory will be completed as part of the submitted environmental document.

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

   The project would not require a right-of-way or relocations from adjacent properties and would have no impact on residential uses within the study area.

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

   No.

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

    No.

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.

WBWCD has already initiated conversation with Reclamation on the development of the small hydro unit at Causey Dam. The proposed unit will fall under an existing agreement WBWCD has with Reclamation to produce power at the site. Rocky Mountain Power and UAMPS will need to approve the proposed construction drawings for the Causey Small Hydro Optimization and the proposed Solar Array at DNWTP.

A building permit may be required for the installation of the Solar Array. WBWCD will work with Layton City to obtain all necessary approvals and permits.

A 404 permit to do the work in the Creek will be required, and application for this will be applied for at the same time

West Haven City and Layton City will be involved and notified of all metering project implications and timelines. Any concerns they have will also be addressed prior to the project construction. WBWCD will work with homeowners to minimize installation impacts and provide an improved service connection.

Letters of Project Support

- Utah Division of Wildlife Resources – Clint Brunson, Aquatics Habitat Restoration Biologist
- Resolution of support from Natural Resources Committee and the Legislature of the state of Utah
- Trout Unlimited – Paul Burnett
- Division of Water Resources – Eric Millis, Director
- Weber County – Kerry Gibson, Weber County Commission, Chair
- West Haven City – Sharon Bolos, Mayor

GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

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

January 6, 2017

Darren E. Hess, P.E.
Assistant General Manager, Strategic Initiatives
Weber Basin Water Conservancy District
2837 East Highway 193
Layton, Utah 84040

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

Dear Mr. Hess:

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

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

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

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 culvert in Dalton Creek that needs to be modified to allow better access for adult spawning Bonneville cutthroat trout. Our data demonstrates that Dalton Creek is the one of four most utilized streams for this spawning cutthroat trout population. The UDWR and Trout Unlimited (TU) have worked together with Weber Basin Water Conservancy District and the modification of this culvert would remove the last barrier to movement and allow access to all cutthroat trout. Both the UDWR and TU are fully committed to partner with the Weber Basin Water Conservancy District to ensure that the work in Dalton Creek is completed, thus allowing spawning access to this stream. This project will help ensure that Bonneville cutthroat trout 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

CONCURRENT RESOLUTION ENCOURAGING UNIVERSAL METERING OF WATER SYSTEMS

2016 GENERAL SESSION

STATE OF UTAH

Chief Sponsor: Scott K. Jenkins

House Sponsor: Lee B. Perry

LONG TITLE

General Description:

This resolution encourages public water suppliers to implement universal metering.

Highlighted Provisions:

This resolution:

- notes that, as the second most arid state in the country, Utah needs to conserve water;
- states that when citizens know how much water they are using, they tend to voluntarily conserve that water; and
- encourages public water suppliers to implement metering on all retail public and private water systems.

Special Clauses:

None

Be it resolved by the Legislature of the state of Utah, the Governor concurring therein:

WHEREAS, Utah is the second most arid state in the country;

WHEREAS, the citizens of Utah must do everything they can to conserve water resources;

WHEREAS, water managers from around the state have indicated that when customers know how much water they are using and how much water they need to be using, most customers voluntarily adjust their water usage;

WHEREAS, many secondary water and some culinary systems in the state are not

metered, which means residents have no idea how much water they are using;

WHEREAS, metering water systems is one tool in the conservation toolbox; and

WHEREAS, if more citizens in Utah knew how much water they were using, they would voluntarily conserve:

NOW, THEREFORE, BE IT RESOLVED that the Legislature of the state of Utah, the Governor concurring therein, encourages public water suppliers to implement metering on all retail public and private water systems.

BE IT FURTHER RESOLVED that a copy of this resolution be sent to the Utah Association of Conservation Districts, the Utah League of Cities and Towns, the Rural Water Association of Utah, the Utah Association of Special Districts, and the Utah Water Users Association.

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

January 3, 2017

Tage I. Flint, General Manager/CEO
Weber Basin Water Conservancy District
2837 East Hwy 193
Layton, UT 84040

Dear Tage,

Trout Unlimited (TU) is pleased to support Weber Basin Water Conservancy District's (WBWCD) proposal for funding under the Bureau of Reclamation's WaterSMART water efficiency grants program and collaborate with WBWCD on conservation actions to benefit native fish. Trout Unlimited has worked closely with the WBWCD on a number of conservation activities within Utah's Weber River basin, including the development of the state water strategy, the Weber River Partnership and several on-the-ground projects that have improved watershed conditions, water quality and habitat for native fish.

We applaud the actions that WBWCD has taken to improve the infrastructure needed to measure water demand and use, as well as your actions to utilize the metering data and work with end users to help them become more efficient.

As a conservation organization with an emphasis on conserving and restoring coldwater watersheds that support wild and native trout, TU has a vested interest in developing strategies with improving water efficiency in the Weber River Basin. The Weber River is an important water source for many communities in northern Utah, and the fisheries in the Weber River are important to northern Utah's economy, they provide important recreational opportunities, they represent a unique ecological history and they serve as indicators of a healthy watershed.

We strongly support your grant application and appreciate the advancements you continue to make at improving water use efficiency in the Weber River Basin.

Sincerely,

Paul Burnett
Utah Water and Habitat Program Director
801-436-4062

GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Water Resources
ERIC L. MILLIS
Division Director

January 11, 2017

Tage I. Flint, General Manager/CEO
Weber Basin Water Conservancy District
2837 East Hwy 193
Layton, UT 84040

Tage:

The Utah Division of Water Resources is in support of your grant application to the Bureau of Reclamation Water and Energy Efficiency Grants Program. We encourage your efforts to increase the efficiency of your system to conserve water and energy. A 2015 state water audit identified universal metering as an important water conservation and accountability strategy. Your efforts to expand secondary water metering are in line with that recommendation.

The Division recognizes the importance of water conservation and efficiency. The water saved by these secondary water meters will benefit water providers, users, and the regional environment. The Division has enjoyed working with Weber Basin to ensure water is managed as responsibly and efficiently as possible.

We support your grant application and appreciate the advancements it will make in water savings and improving water efficiencies within the service area boundary of Weber Basin Water Conservancy District.

Sincerely,

Eric L. Millis, P.E.
Director

1594 West North Temple, Suite 310, PO Box 146201, Salt Lake City, UT 84114-6201
telephone (801) 538-7230 • facsimile (801) 538-7279 • TTY (801) 538-7458 • *www.water.utah.gov*

WEBER COUNTY

Matthew G Bell
Commissioner
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January 11, 2017

Tage I. Flint, General Manager/CEO
Weber Basin Water Conservancy District
2837 East Hwy 193
Layton, UT 84040

Dear Tage,

Weber County is pleased to write in support of your grant application being submitted to the Bureau of Reclamation Water and Energy Efficiency Grants Program. We applaud your efforts to increase the efficiency of your system to conserve valuable water and energy. We understand that this metering project will meter all water supplied to the resident and inform the resident through a monthly statement of how much water they are using. This information will then be used by the resident to help them adjust their watering schedules and conserve water.

Weber County recognizes the importance of water conservation in our often water-short basin. The water saved through these improvement projects will provide benefit to water users and the regional environment. Weber Basin continues to be a valuable partner promoting wise water uses in our community.

We strongly support your grant application and appreciate the advancements it will make in water savings and improving water efficiencies in the District boundary of Weber Basin Water Conservancy District.

Sincerely,

Kerry W. Gibson
Weber County Commissioner

WEST HAVEN CITY

MAYOR
Sharon Bolos

COUNCIL MEMBERS
Stephanie Carlson
Shawn Smith
Randy Hunter
Dawnell Musselman
Summer Palmer

4150 SOUTH 3900 WEST
WEST HAVEN, UT 84401
PHONE: 801-731-4519
FAX: 801-731-1002
http://www.westhavencity.com

January 17, 2017

Tage I. Flint, General Manager/CEO
Weber Basin Water Conservancy District
2837 East Hwy 193
Layton, UT 84040

Dear Tage,

West Haven City is pleased to write in support of your grant application being submitted to the Bureau of Reclamation Water and Energy Efficiency Grants Program. We applaud your efforts to increase the efficiency of your system to conserve valuable water and energy. We understand that this metering project will meter all water supplied to the resident and inform the resident through a monthly statement of how much water they are using. This information will then be used by the resident to help them adjust their watering schedules and conserve water.

West Haven City recognizes the importance of water conservation in our often water-short basin. The water saved through these improvement projects will provide benefit to water users and the regional environment. Weber Basin continues to be a valuable partner promoting wise water uses in our community.

We strongly support your grant application and appreciate the advancements it will make in water savings and improving water efficiencies in the District boundary of Weber Basin Water Conservancy District.

Sincerely,
WEST HAVEN CITY

Sharon Bolos, Mayor

Official Resolution

Weber Basin Water Conservancy District will submit the official resolution within 30 days from the required due date.

Project Budget

Funding Plan and Letters of Commitment

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

   The District will fund all non-Federal contributions entirely with Weber Basin Water Conservancy District operating revenues.

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

   N/A

3. *What project expenses have been incurred*

   N/A

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

   N/A

5. *Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.*

   N/A

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

   N/A

FUNDING SOURCES	*FUNDING AMOUNT*
Non-Federal Entities	*$1,500,070.00*
Non-Federal Subtotal	*$1,500,070.00*
Other Federal Entities	*$0.00*
Other Federal Subtotal	*$0.00*
Requested Reclamation Funding	*$1,000,000.00*
Total Project Funding	*$2,500,070.00*

FUNDING SOURCES	% of Total Project Cost	Total Cost by Source
Recipient Funding	60%	$1,500,070.00
Reclamation Funding	40%	$1,00,000.00
Other Federal Funding	0%	$0.00
Totals	100%	$2,500,070.00

Funding Group II Request			
	Year 1 (FY 2016)	Year 2 (FY 2017)	Year 3 (FY 2018)
Funding Request	$300,000.00	$400,000.00	$300,000.00

Budget Proposal

Budget Item Description	Computation		Quantity Type	Total Cost
	$/Unit	Quantity		
Salaries & Wages	$0.00	-	-	$0.00
Fringe Benefits	$0.00	-	-	$0.00
Travel	$0.00	-	-	$0.00
Equipment	$0.00	-	-	$0.00
Supplies and materials	$0.00	-	-	$0.00
Contractual /Construction				
Year 1 Oct 2017 – Sept 2018				
1" End User Secondary Meter – West Haven	$980.00	769	EA	$753,620.00
Dalton Creek Fish Passage Culvert	$30,000.00	1	EA	$30,000.00
Causey Hydroelectric Optimization*	$66,200.00	1	EA	$66,200.00
Year 2 Oct 2018 – Sept 2019				
1" End User Secondary Meter – West Haven	$980.00	1000	EA	$980,000.00
DNWTP 20.7kW Solar Project	$61,170.00	1	EA	$61,170.00
Year 3 Oct 2019 – Sept 2020				
1" End User Secondary Meter - Layton	$1,040.00	596	EA	$584,080.00
Other				
Environmental Report (1%)	$25,000	1	EA	$25,000.00
Total Direct Costs				$2,500,070.00
Indirect Costs	$0.00	-	-	$0.00
			Total Project Costs	**$2,500,070.00**

Note: *Estimated cost is based on costs to increase the size of turbine/generator and increase the size of piping and associated valves to handle larger flows. Environmental has already been approved for the turbine/generator site.

Budget Narrative

Salaries & Wages

No WBWCD Salaries or Wages will be included. All services will be contracted. WBWCD'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 required.

Equipment

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

Materials and Supplies

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

Contractual

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

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

Contractual will include installing 2,365 meters and boxes, culvert in Dalton Creek and install the solar array and hydropower turbine.

Environmental and Regulatory Compliance Costs

The environmental document for this project will be minimal in that all of the metering and hydro portions of the project will be within previously disturbed areas. The hydro portion has already been approved as part of a previous WaterSMART grant awarded in 2016. The culvert portion of the project will be in conjunction with UDWR. The cost was included as 1% of the project at $25,000.

Reporting

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

Other Expenses

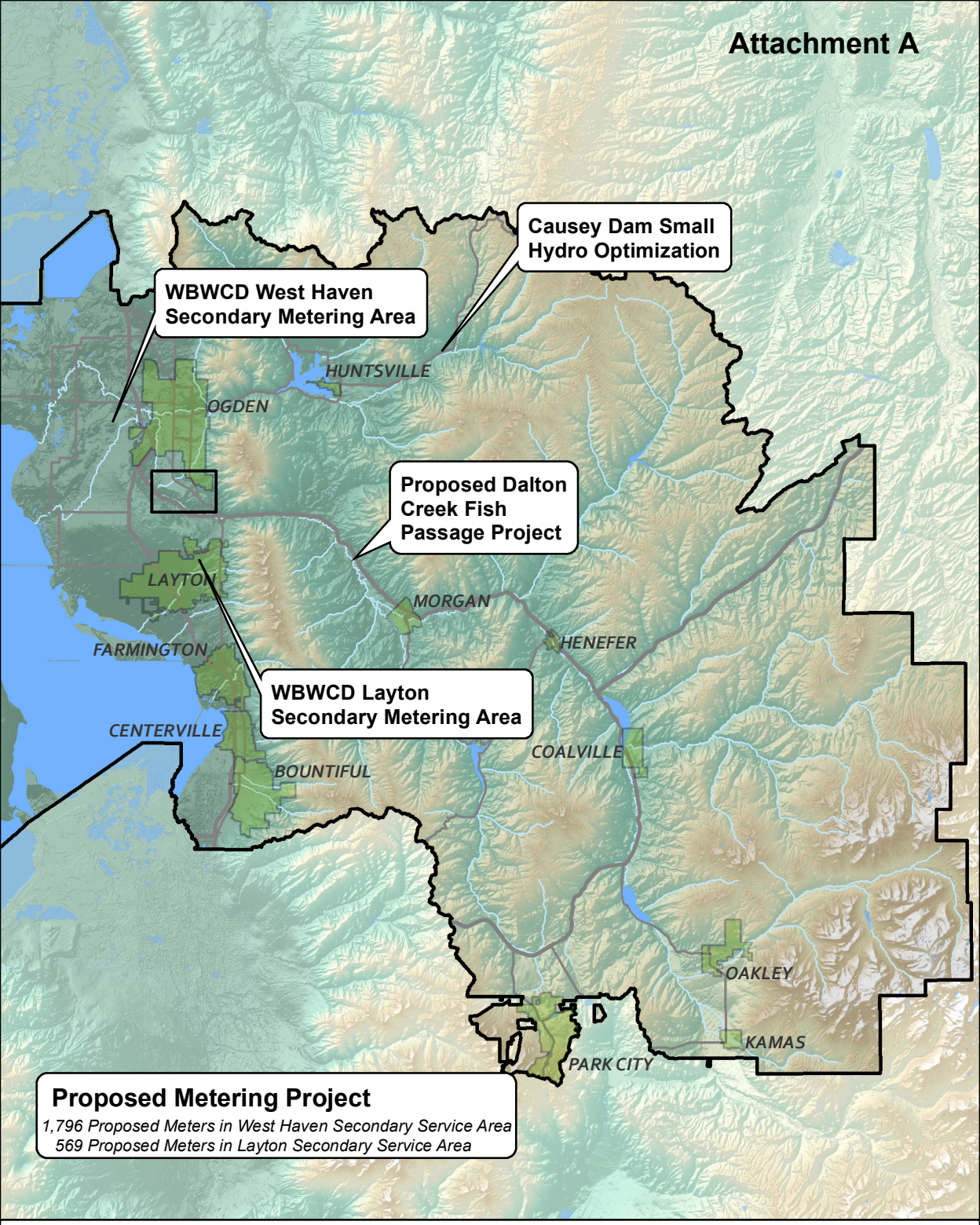
No other expenses will be part of the project.

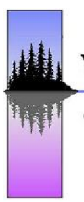
Indirect Costs

No indirect costs will be part of the project.

Total Costs

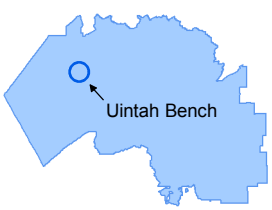
WBWCD Portion	Fed Portion	Total
$1,500,070	$1,000,000	$2,500,070





WEBER BASIN WATER CONSERVANCY DISTRICT

0 5 10 Miles



Weber Basin Service Area

Attachment B Delivery System Information

Weber Basin Water Principal Infrastructure

DAMS & RESERVOIRS

Name	Location	Type of Dam	Height (ft)	Total Capacity (AF)	Usable District Capacity (AF)	Acquisition Dates
Causey	Eastern Weber County	Earth & Rock	200	7,870	6,870	1962-1964
East Canyon	Southern Morgan County	Concrete Arch	245	51,200	20,100	1965-1967
Lost Creek	Eastern Morgan County	Earth & Rock	220	22,500	20,010	1964-1966
Pineview	Ogden Valley, Weber County	Earth & Rock	91	110,150	66,228	1955-1957
Smith & Morehouse	South-eastern Summit County	Earth & Rock	82	8,350	6,560	1984-1988
Wanship	Summit County	Earth & Rock	156	62,120	60,860	1954-1957
Willard	Southern Box Elder County	Earth	36	227,189	202,160	1957-1963

AQUIFER STORAGE & RECOVERY

Name	Location	Pond Area (acres)	Capacity (cfs)	Acquisition Dates
ASR	Weber County	7.5	10	2002

DIVERSIONS

Name	Location	Pass-Through Capacity (cfs)	Acquisition Dates
Ogden Valley	South Fork of Ogden River	2,000	1962-1964
Slaterville	Weber River west of Ogden	9,000	1956-1957
Stoddard	Weber River north of Morgan	6,000	1955-1956

HYDRO GENERATION POWER PLANTS

Name	Location	Type	Capacity (kw)	Acquisition Dates
Causey	Eastern Weber County	2 unit	2,100	1999-2000
Gateway	Mountain Green	1 unit	4,275	1957-1958
Wanship	Wanship	1 unit	1,950	1957-1958

CANALS, TUNNELS & PIPELINES

Name	Location	Type	Capacity (cfs)	Length (miles)	Acquisition Dates
Davis Aqueduct	Davis County	Concrete pipe	355	23.0	1954-1957
Gateway Canal	Morgan County	Concrete-lined	700	8.5	1954-1956
Gateway Tunnel	Morgan and Davis County	Concrete-lined	435	3.3	1952-1954
Layton Canal	Davis County	Earth-lined/concrete-lined/pipe	260	18.0	1962-1964
M&I Pipelines	Davis and Weber County	Varies 6"-48"	varies	80.0	1955-2012
Ogden Valley Canal	Weber County	Part earth-lined	35	9.2	1962-1964
Secondary Pipelines	Davis and Weber County	Varies 2"-36"	varies	325.0	1955-2012
Weber Aqueduct	Weber County	Concrete pipe	80	5.0	1954-1956
Western Summit County	Summit County	Ductile Iron	8.9	9.0	2013
Willard Canal	West Weber County	Earth-lined/concrete-lined	1,050	11.0	1961-1963

PUMPING PLANTS

Name	Location	Capacity (cfs)	Height of Lift (ft)	Acquisition Dates
Antelope Booster	Layton	22	50	1978
East Bountiful	Bountiful	18	475	1955
East Layton	Layton	9	65	1955
Gateway	Mountain Green	150	150	1995
Kanesville #1	West Haven	3	218	2000
Kanesville #2	West Haven	10	315	2001
Layton Canal	West Haven	260	23	1955
Old Post Rd Booster	Ogden	6	200	1960
Rockport	Wanship	25	45	2009
Roy Drought Relief	Roy	150	340	1981
Sand Ridge East	Layton	9	92	1955
Sand Ridge West	Layton	15	138	1955
South Davis	Bountiful	18	530	1955
Unitah Bench	South Ogden	18	365	1955
Val Verda	Bountiful	6	240	1955
West Haven #1	West Haven	10	218	2003
West Haven #2	West Haven	3	230	2010
Willard No. 1	West Weber County	500	45	1960
Willard No.2	West Weber County	250	20	1960

UNDERGROUND WATER WELLS

Name	Location	Type	Capacity (cfs)	Acquisition Dates
Ben Lomond	Harrisville	M&I	1.8	2001
Bountiful	Bountiful	M&I	5.2	1961
Clearfield #1	Clearfield	M&I	5.0	1961
Clearfield #2	Clearfield	M&I	5.0	1961
Davis Boulevard	Bountiful	M&I	2.2	2003
District Well #2	South Weber	M&I	11.0	1985
District Well #3	South Weber	M&I	10.0	1990
Fairfield	Layton	M&I	10.0	1992
Farmington #1	Farmington	Irrigation	5.0	1995
Farmington #2	Farmington	Irrigation	5.0	1996
Laytona	Layton	M&I	5.0	1958
Mills Park	West Bountiful	Irrigation	2.2	2011
North Ogden	North Ogden	M&I	1.8	1967
North Weber	Harrisville	M&I	1.6	2006
Orchard Dr. Well	Bountiful	M&I	0.8	1991
Riverdale	Riverdale	M&I	6.6	1960
South Weber #1	South Weber	M&I	10.0	1962
South Weber #2	South Weber	M&I	10.0	1962
Washington Terrace	Washington Ter.	Irrigation	4.0	2013
West Bountiful 5th South	West Bountiful	Irrigation	4.0	1992
West Bountiful Golf	West Bountiful	Irrigation	2.0	1993

WATER TREATMENT PLANTS

Name	Location	Capacity (MGD)	Acquisition Dates
Davis North WTP	Layton, Davis	46	1955
Davis South WTP	Bountiful, Davis	16	1955
East Canyon WTP	Jeremy, Summit	5.5	2013
Weber South WTP	Ogden, Weber	32	1955

AF=Acre Feet • CFS=Cubic Feet per Second • MGD= Million Gallons per Day

Attachment C

WEBER BASIN WATER CONSERVANCY DISTRICT

2837 East Highway 193 • Layton, Utah 84040 • Phone (801) 771-1677 • (SLC) 359-4494 • Fax (801) 544-0103

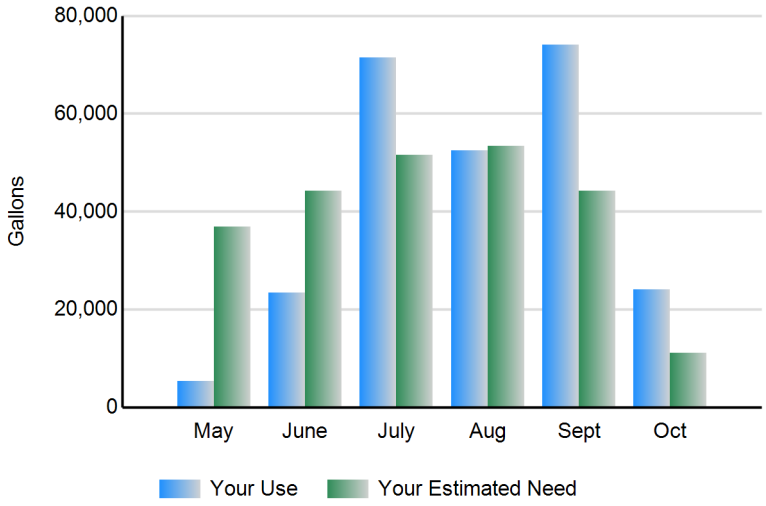
Report Date: 10/06/2015

Weber Basin Water Conservancy District
MEASURE THE DIFFERENCE
Learn More. Use Less.

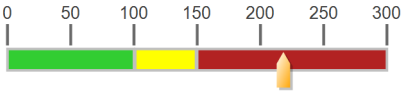
Sample User
123 Sample St.
Sample City, USA

SECONDARY WATER USE REPORT

Meter Number: 2010310892		Usage period: 9/14/2015 through 10/1/2015					
Previous Meter Read		**Current Meter Read**		**Water Used This Month**	**Elapsed Days**	**Average Daily Use This Month**	**Year to Date Use**
Date	**Reading**	**Date**	**Reading**				
09/14/15	1,562,725	10/01/15	1,586,829	24,104 gal.	17	1,418 gal.	250,716 gal.



Your Landscape Area (sq ft)	Your Water Need Based on Your Landscape Area This Month	This Months % of Use to Est. Need
11,882	11,050 gal.	218



Your landscape area is derived from aerial imagery and encompasses your entire lot according to county records, excluding your home and driveway footprint. Estimated need is calculated from 30yr average evapotranspiration values for each month.

If you would like to receive this report by email, contact us at conservation@weberbasin.com with your name and account number, or call us at 801-771-1677.

Thank you for your efforts in helping to conserve water this year. As one of our planet's most precious natural resources, we need all the help we can get!

Weber Basin advises opening your main irrigation valve to allow your system to drain properly now that our system has been shut down. It should be closed again by April 1st, 2016 to prevent water from entering your system without your knowledge prior to next years irrigation startup.

If you have questions or comments on this report, please contact us @ 801-771-1677.

Weber Basin's
Water Conservation Learning Garden
2837 E. Hwy 193, Layton Utah