



**2017**  
Annual Summary



**WEBER BASIN WATER**  
**CONSERVANCY DISTRICT**

# General Manager's Message



## **Tage I. Flint, PE**

*General Manager/CEO*

Mr. Flint has worked in the water industry for 30 years. He is a registered professional engineer and resides in Davis County.

As you look through the pages of this report, I believe you will see some trends within our operations which are indicators of our future. As the data pages show, 2017 brought higher than normal precipitation in an otherwise dry string of years, accompanied by growth of our customer base. Secondly, the outstanding work by our employees is oriented towards the repair and replacement of our vast infrastructure. Nearly every page exhibits work on existing canals, wells, pipelines, treatment plants, power stations, and the like. Let's not forget the important progress we are experiencing in water conservation, which is still our largest water development project for the future.

Keeping up with a growing population and with an aging network of infrastructure incorporates much of our time and energy. All the while, our operations maintain a high standard of quality and reliability. After two years of effort, District employees, along with accompanying oversight from our Board of Trustees, completed an extensive Capital Assets Plan. The plan indicates the volume of annual waterworks repair and replacement will increase steadily over the next several decades. This, along with the need for new capacities, will challenge our budgets and continue serious discussions with our customers about water rates and responsible bonding. The good news is that we have a manageable plan that will take us through another half century of reliable service.

As the task gets larger, I have confidence that we have the right employee expertise, management team, and Board of Trustees to handle the demands of the future.

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# 2017 Board of Trustees

The Board of Trustees is the governing body of the District and consists of representatives from Davis, Morgan, Summit and Weber counties. After receiving recommendations from the County Commissions, the Governor of the State of Utah appoints Trustees, who are then confirmed by the Senate. The Board appoints a General Manager who serves as the Chief Executive Officer of the District. The General Manager also serves as the Treasurer and Secretary of the District.

## **Kyle R. Stephens**

*Trustee, Davis County*

Mr. Stephens was appointed to the Board to represent Davis County. He is the past Deputy Commissioner of Agriculture for the State of Utah and is very active in the community. Mr. Stephens served as President of the Board in 2017.



## **Dave Ure**

*Trustee, Summit County*

The representative of Summit County, Mr. Ure is a rancher and past dairy farmer. He is currently Director of School and Institutional Trust Lands Administration and served in the Summit County Council and Utah House of Representatives for several years.



## **Kerry W. Gibson**

*Trustee, Weber County*

Mr. Gibson represents Weber County. He owns and operates a large dairy in West Weber and a local convenience store. He was a three term State Representative and is currently serving as a Weber County Commissioner.



## **John Petroff, Jr.**

*Trustee, Davis County*

Mr. Petroff was appointed to represent Davis County. He is a successful private business owner. He also served as Mayor of West Point City and completed two terms of service as a Davis County Commissioner.



## **Jay V. Christensen**

*Trustee, Weber County*

Appointed to the Board as a representative of Weber County, Mr. Christensen has many years' experience in the water industry and serves on various water boards. He also has a successful career with Great Salt Lake Minerals and is a past Plain City Councilmember.



## **Kym O. Buttschardt**

*Trustee, Weber County*

Mrs. Buttschardt was appointed to the Board to represent Weber County. She owns several successful local restaurants and is a CPA. She is an Ogden native who is very active in the community.



## **Dee Alan Waldron**

*Trustee, Morgan County*

The representative from Morgan County, Mr. Waldron is a successful private business owner and farmer. He is a past Morgan County Commissioner and serves as a director on several local water boards.



## **Paul C. Summers**

*Trustee, Davis County*

Mr. Summers represents Davis County. Before retirement, he spent 13 years with the Utah Division of Water Resources and 20 years in the engineering consulting business. He is a licensed civil engineer in the State of Utah.



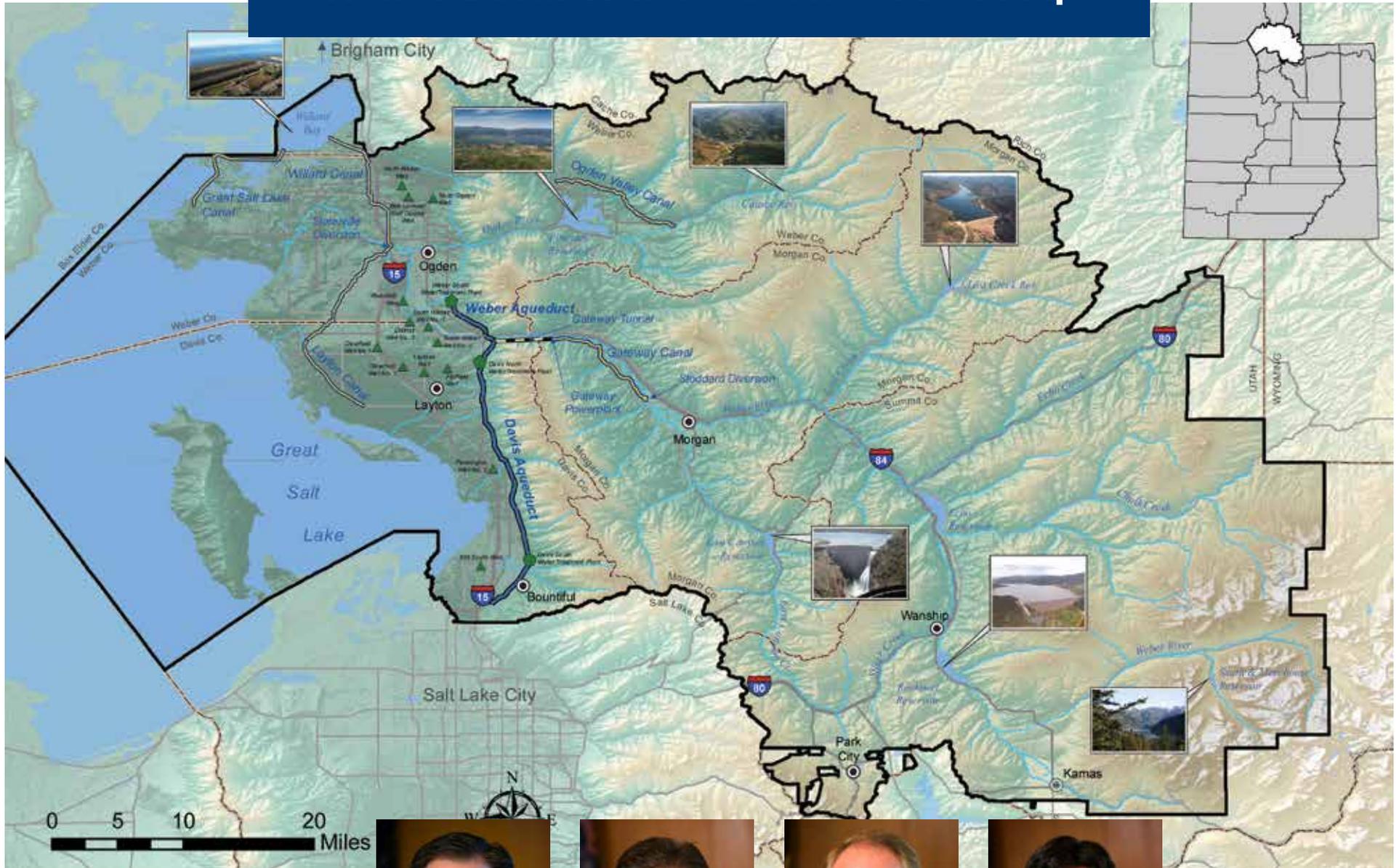
## **Marlin K. Jensen**

*Trustee, Weber County*

Mr. Jensen represents the Ogden Valley area of Weber County. He is a retired attorney and participates in a family farming enterprise. He also serves as a member of the Utah State Board of Regents.



# Weber Basin Water • Service Area Map



## Executive Staff



**Tage I. Flint, PE**  
General Manager/CEO



**Mark D. Anderson, PE**  
Assistant General Manager/CTO



**Scott W. Paxman, PE**  
Assistant General Manager/COO



**Darren E. Hess, PE**  
Assistant General Manager

**Brittney Bateman**  
Programs Manager/  
Executive Envoy

**Krysta Countryman**  
Administrative Specialist



## **Sherrie A. Mobley, Manager/CAO**

Calysta Bravo, Accountant

Becky Delius, Purchasing Asst./RRA Specialist

Deena Harris, Customer Service Specialist

Kendall Searle, Contracts Administrator

**The Administration Department is responsible for many District functions and is a key part of the successful operation of the District. It manages thousands of customer service calls each year by utilizing a customized work order management system that allows for better communication between the departments and has resulted in improved time management. This department oversees the Reclamation Reform Act, which is a federal law administered by the Bureau of Reclamation. A final RRA audit is scheduled in 2018 due to the recent debt satisfaction of the original Project contract obligation. It is anticipated all RRA forms requirements will be rescinded after the audit is deemed closed. The Administration Department continues to perform all accounting duties with precision. It also manages tens of thousands of water purchase contracts and assists other departments as needed.**

# 2017 Water Contract Activity

The District supplies five categories of water to its customers including wholesale and retail agricultural irrigation, wholesale and retail secondary irrigation, treated municipal and industrial, untreated industrial and municipal, and groundwater replacement. During 2017, the District's total water sales reached 226,170 acre-feet. The diagram below shows the quantities sold of each category. The District's customers who purchase this water are listed in subsequent pages.

**Wholesale and Retail Agricultural Irrigation:** The District is a source of economical irrigation water purchased by irrigation companies and supplied to individual farmers in Box Elder, Davis, Morgan, Summit and Weber counties. The District also delivers irrigation water directly to many farmers in those same areas.

**Wholesale and Retail Secondary Irrigation:** Many residents of Davis and Weber counties enjoy the use of Weber Basin water to irrigate their lawns and gardens. The District provides secondary water directly to many residents from Ogden to Woods Cross and wholesales to various water companies and districts that then retail to customers in their respective service areas.

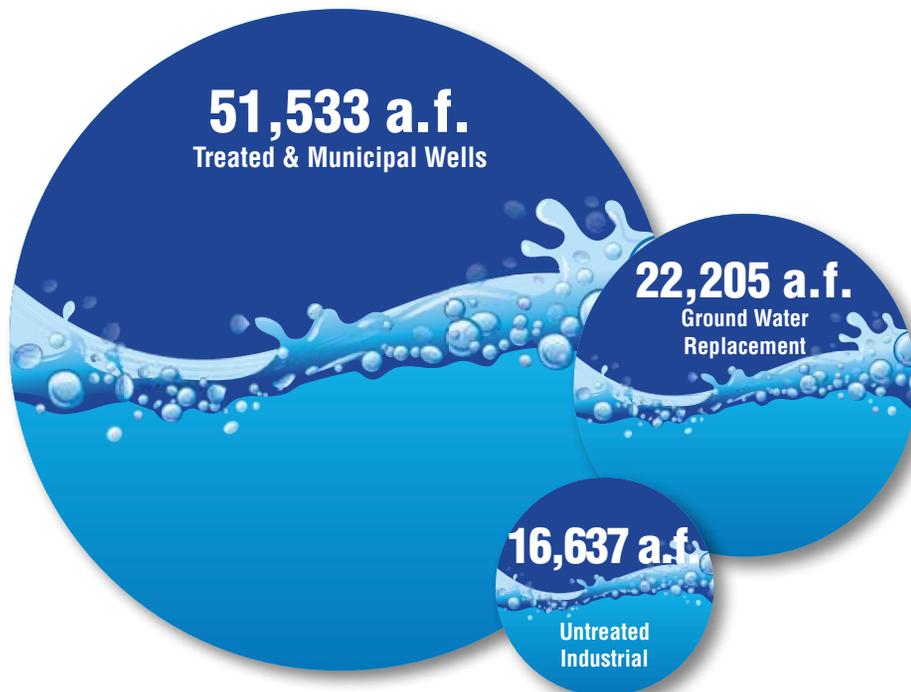
**Treated Municipal and Industrial:** The District wholesales drinking water to almost every city and water improvement district in Davis and Weber counties. The District also supplies drinking water in Summit County and directly to some industries. Depending on the entity, either all or a part of their drinking water supply is provided by the District.

**Untreated Municipal and Industrial:** Many industries in Davis and Weber counties rely on water supplied by the District for their manufacturing, processing, and other uses. The District supplies water to entities in Summit County to treat for residential use.

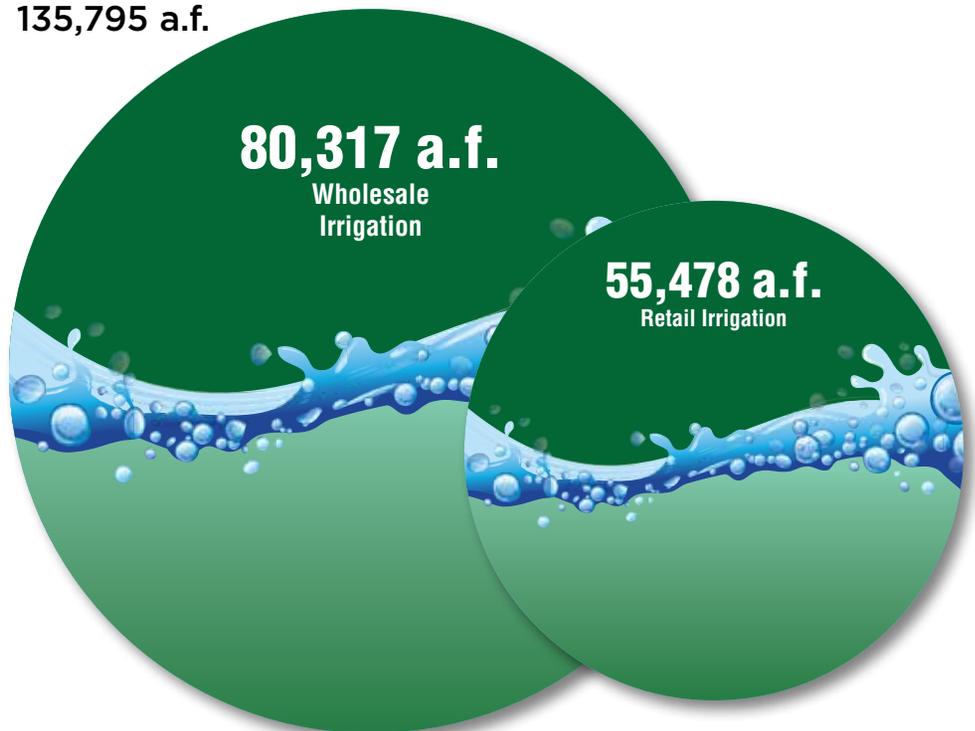
**Groundwater Replacement:** Many residents within the District do not have access to a municipal or community water system and must depend on alternative sources for their domestic water. Additionally, some municipalities and public water systems located away from main waterways require groundwater for which no new appropriations are given. Utilizing District owned reservoir storage rights, drinking water purveyors and individuals contract with the District for a water supply which, along with an approved exchange application from the State Division of Water Rights, permits drilling of a well to meet their needs.

## 2017 Water Contracts • 226,170 acre feet

**Municipal**  
90,375 a.f.



**Irrigation**  
135,795 a.f.



# Finance and Human Resources Department

**John K. Davis, Controller/CFO**

Kathy Wood, Human Resource Specialist

The District ended the year with 88 full-time and 3 part-time employees. A total of 19 positions were filled during the year, including 2 new positions in the Conservation and Administration departments. Scott Rackham, Mark Clark, Lou Eddy, David Fisher, Britt DeJong, and Jeff Morgan retired after successful careers with the District. With exception to David Fisher, all retiree positions were filled by existing employees through internal promotion and one new hire. We welcomed nine additional employees to the District during the year to replace employees filling other positions or leaving the District. At the end of the year, we had two vacant full-time positions. Fourteen seasonal employees were hired to work in the conservation garden, perform water audits, maintain the District's right-of-way properties, assist in delivery of secondary and irrigation water, assist in repairing leaks, and perform other miscellaneous projects.

The District expanded the Tap Into Health wellness program in 2017 to encourage employees to be active and live healthy lifestyles. The program focused on six categories ranging from preventative care to financial wellness. The District hosted our second annual Wellness Week during which employees participated in a biometric screening, blood drive, health risk assessment, and fitness activities.

In April, the District worked closely with our workers' compensation provider to form a safety committee to enhance and monitor the safety program. The safety committee met quarterly to set and review safety goals designed to improve employee safety. During the year, the District trained employees on several topics including asbestos awareness, carpal tunnel syndrome, and proper use of respirators.

## Financial Information

Fiscal Year (FY) 2017 showed a 5.9% increase in Total Revenues from \$32,665,768 in FY 2016 to \$34,604,061 in FY 2017. The difference was due to an increase in water sales revenue of approximately \$1.4 million. The District expended approximately \$7.3 million on capital projects during FY 2017 which included, among others, the Willard Canal Lining Project, District Well #2 Rehabilitation, South Ogden & Uintah Bench Meter Projects, West Haven Project Pipelines, 12th Street Pipeline Project, Aqueduct Rehabilitation Project, Wanship Hydro-Electric Conversion and Gateway Hydro-Electric Rehabilitation.

The District did not issue any bonds during FY 2017; however, in August 2017 (FY 2018) bonds were issued to: refund the 2009A and 2009C bond issues; retire the Federal Government loan obligation; provide funding for planned capital projects; and, establish an escrow account to retire the 2009B bonds. All bond and loan obligations were met in a timely matter during the 2017 fiscal year, and the District's debt service coverage rate of 1.60 was well above the bond covenant rate of 1.25.

# STATEMENT OF SOURCES AND USES OF FUNDS

Fiscal Year Ended June 30, 2017

**SOURCES:**

Water Sales	\$22,958,477
Taxes & Fee-in-lieu of taxes	9,716,998
Interest	644,648
Miscellaneous	1,283,938
Net Use of Loan/Bond Proceeds and Reserves	5,716,191

**TOTAL REVENUE AND  
LOAN/BOND PROCEEDS/RESERVES** **\$40,320,252**

**USES:**

Water Payments, Assessments, & Water Stock Purchases	\$1,083,184
Interest Expense	4,077,678
Operating Expenses	21,166,140
Utilities	697,820
Loan & Bond Payments	5,969,181
Capital Improvements	7,326,249
Added to Reserves	0

**TOTAL EXPENDITURES** **\$40,320,252**

# STATEMENT OF NET POSITION

Fiscal Year Ended June 30, 2017

**ASSETS:**

Current Assets	\$49,755,019
Sinking Fund & Reserve Fund Assets	31,869,603
Property & Equipment (less accumulated depreciation)	277,135,135
Pension Charge - Deferred Outflows of Resources	1,951,182

**TOTAL ASSETS  
& DEFERRED OUTFLOWS OF RESOURCES** **\$360,710,939**

**LIABILITIES & NET POSITION:**

Current & Other Liabilities	\$9,085,245
Long-Term Obligations	131,264,691
Bond Premium - Deferred Inflows of Resources	6,150,333
Pension Credit - Deferred Inflows of Resources	441,372
Refunding Credit - Deferred Inflows of Resources	570,041
Net Position	213,199,257

**TOTAL LIABILITIES & NET POSITION** **\$360,710,939**





## Jonathan Parry, PE, Manager

Gary Allen, SCADA Specialist

Mike Alverson, GIS/IT Supervisor

Zeke Bardwell, Inspector

Briant Jacobs, PE, Engineer

Marc Montgomery, Inspector

Riley Olsen, PE, Engineer

Greg Pierce, SCADA/Programming Supervisor

Sam Sorensen, PE, Engineer

Talon Thurgood, GIS/IT/Property Management Specialist

The Engineering Department is responsible for ensuring the District's capability to reliably and efficiently meet existing and future water demands throughout the District's service area. This is accomplished through the completion of capital improvement projects involving District and Weber Basin Project facilities, in addition to the rehabilitation and maintenance of existing infrastructure. Additional tasks performed by the Engineering Department include subdivision reviews as new developments require the expansion of the District's existing secondary systems, management of all license agreements which are used any time another entity encroaches upon District or Bureau of Reclamation (BOR) facilities, assisting in the procuring of federal grants in order to rehabilitate existing facilities, and seismically retrofit them as necessary, and providing technical assistance to the other departments within the District as they perform their respective duties. In accomplishing these tasks, the Engineering Department has the opportunity to interact on a regular basis with many other engineering consultants and contractors that enable the completion of this important work.



## Introduction

This year the District continued work on the rehabilitation of various District wells, pipelines and reservoir sites, expansion of secondary meters on the irrigation system, and fencing of various facilities throughout the District.

The District has continued to work towards greater redundancy to the culinary system through both the rehabilitation and construction of new wells. The District's culinary water model, utilized in planning and design, was updated to be reflective of current operations and demands.

The Engineering Department has worked with various engineering consultants and contractors, in addition to District M&I, Irrigation and Maintenance personnel in order to complete these projects. These projects enable the District to increase water supply and water quality, raise the level of reliability, and improve the District's infrastructure to maintain a high level of service to our customers.

## ENGINEERING PROJECTS

### Bountiful Well Pump Assessment and Repair Project

The District solicited bids from qualified well equipment contractors and contracted for pulling of the existing equipment from the well, inspection and assessment of the existing pump and other equipment, cleaning of the well casing, pump testing, and reinstallation of a new pump, column pipe, and pump shaft.

### Combe Reservoir Filter

The District designed a filter and drain for the dam at the south end of Combe Reservoir where seepage had been daylighting. The filter and drain were installed to filter the seepage and prevent erosion of fine material from inside the dam. The work was performed in-house by the District's Maintenance Department.

### Davis South Water Treatment Plant Mechanical Dewatering Project

The District solicited Statements of Qualification from consultants and contracted for the design of a new mechanical dewatering facility at the Davis South Water Treatment Plant in Bountiful. The contracted work includes analysis of various types of mechanical dewatering technology, selection of the best technology for this application, and design of the new facility and integration of the new mechanical dewatering equipment.





### 2017 District Fencing Project

The District solicited bids from qualified fencing contractors and contracted for the installation of new/replacement fencing at the District's 18.8/18.9 reservoirs, 18.5 Reservoir, Centerville Reservoir, Slaterville Diversion Structure, along the Willard Canal in Marriot-Slaterville, Uintah Bench Upper Reservoir, and Willard Pumping Plant #1.



### Fairfield Well Assessment and Repair Project

The District solicited bids from qualified well equipment contractors and contracted for the pulling of a short length of column pipe and shafting from the well for inspection, repairs to existing equipment, reinstallation of existing column pipe and shafting, and proper adjustment of the equipment.



### North Weber Well Assessment and Repair Project

The District solicited bids from qualified well equipment contractors and contracted for the pulling of the existing equipment from the well, inspection and assessment of the existing pump and other equipment, cleaning of the well, and reinstallation of a new pump, motor, and column pipe.



### Ogden Valley Canal Enclosure Design Project

The District solicited Statements of Qualification from consultants and contracted for the design of the piping of the Ogden Valley Canal. This includes survey of the entire length of canal, geotechnical analysis along the alignment, selection of pipe material and size, and design of the alignment, road crossings, drainage crossings, and customer turnouts along the new pipeline.



### Phase 5 Willard Canal Lining Project

The District contracted for the design of Phase 5 of the Willard Canal Lining project. It then solicited bids from pre-qualified contractors and contracted for the earthwork, installation of an underdrain system, installation of a maintenance access ramp into the canal, and installation of concrete lining of 2,000 lineal feet of canal in Marriot-Slaterville starting at 400 North.





## Potable Water Model Update Project

The District solicited Statements of Qualification from consultants and contracted for the calibration and update of the District's potable water system hydraulic model. The contracted work included the collection of field data, calibration of the model using the field data, generating model scenarios for current demands and future planning horizons, and using the model to identify and propose solutions to deficiencies in the District's systems at each planning horizon. The project also included a workshop to teach District staff to use the updated model.



## Security Gate Replacement and Upgrade Project

The District solicited bids from qualified security gate contractors and contracted for the replacement of the automatic security gates at the Weber South, Davis North, and Davis South water treatment plants. The project also included installation of new automatic gates east of the SOLA building at the Davis North Water Treatment Plant, as well as at the District's landfill in Uintah.



## Willard Bay South Marina Filter

The District designed a filter and drain for the dam at the South Marina of Willard Bay where seepage had been daylighting. The filter and drain will be installed to filter the seepage and prevent erosion of fine material from inside the dam.



## Sunset Well Rehabilitation Project

The District solicited Statements of Qualification from consultants and contracted for the design of a new pump station and equipping of the Sunset Well. The Sunset Well is leased by the District from Sunset City through an Agreement signed in 2015. After the discovery of water quality issues and the expenses associated with mitigating said issues, it was determined the project was not in the best interest of the District to complete at this time. Instead, the District will continue to lease the well from the City, but will not move forward with rehabilitation and equipping until demands in the area necessitate its completion.



## UDOT Projects

The District has worked with UDOT on several projects during 2017 and will continue to work with them in the coming years on large projects such as Highway 89 and the West Davis Corridor. Work has included inspection and design review, utility conflict resolution, and relocation design work.



### Wanship Hydro

The District worked with Rocky Mountain Power (RMP) in retrofitting the District's existing 46kV substation at Wanship to 12.47kV. This work was necessitated due to RMP's transmission line project that converted its line from 46kV to 138kV.

### Lost Canyon Standby Generator

The District purchased a standby generator to be placed at the Lost Canyon pump facility. This generator will provide backup power to District pumps that supply water to Mountain Regional Water's pump station which ultimately conveys water to the Snyderville Basin. The generator is scheduled to be delivered on site at the end of December. The District is currently bidding installation services to be completed by the end of January 2018.



### Davis North Water Treatment Plant Sedimentation Basin 1 and 2 Concrete Repair

Existing catwalks located above the western most sedimentation basins at the Davis North Water Treatment Plant, are severely damaged and require demolition and replacement for both operational purposes and safety. The concrete ceiling on the vault, located between the two basins, also requires replacement. The District is working with a contractor to have this work completed.



### Conservation Building Architectural Services

The District solicited Statements of Qualification from consultants and contracted for architectural services to be rendered for the design and construction of a conservation building. This work is expected to continue through the beginning of 2018 with bidding documents available in the summer of 2018.



### Davis Aqueduct Maintenance Project

The District designed and installed two accesses to the Davis Aqueduct. These accesses were needed to be able to reach several stretches of the aqueduct that had previously been inaccessible to perform cleaning and joint repair. The District also cleaned and sealed approximately 244 joints while the aqueduct was offline. The District inspected several thousand feet of previous joint sealing projects and identified several joints that required warranty work.





## Multihazard Mitigation Plan Update

The District's Multihazard Mitigation Plan expired and required updating. This year the District revisited the old plan and made updates. The District received FEMA money to perform the update. The plan update has been approved by FEMA and will be adopted by the District in 2018.



## Secondary Water Metering Project-Phase 6 (Uintah Bench Area)

The District installed end-user meters in the Uintah Bench area. This was the District's largest meter installation project to-date with 1,050 meters being installed. This project leveraged BOR grant funding (WaterSMART) in addition to District funds to complete this project. Grant funding includes installations over a three-year period. This project encompasses year one of the three.



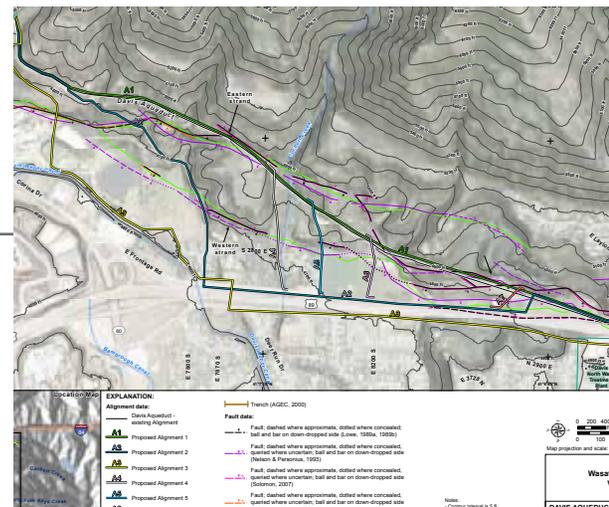
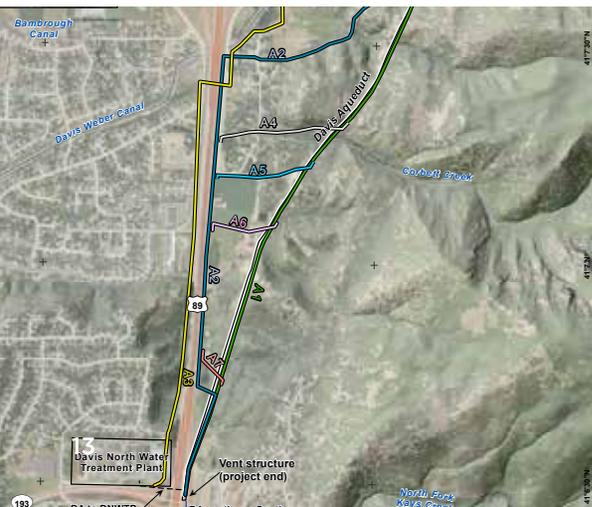
## Davis South Backwash Tank

The District started the process of installing a new backwash tank at the Davis South Water Treatment Plant. The new tank will be designed with seismic consideration and will be a glass-fused to steel tank. The foundation will be constructed by year end, and the tank will be erected in the spring of 2018.



## Davis Aqueduct Reach 1 Alignment Study

The District began an alignment study for the eventual construction and design of a redundant line of the Davis Aqueduct from the bifurcation structure to the 1.9 turnout which serves the Davis North Water Treatment Plant. The parallel pipe will increase the capacity to the plant and provide redundancy to the water system. The study will be concluded by the end of January 2018. This alignment study includes a scope of work that will address natural hazard and seismic conditions and make design recommendations to accommodate hazards that will be encountered during construction.





## Secondary Water Metering Project- Phase 7 (West Haven)

The District was successful in obtaining another three-year WaterSMART grant from the BOR for the installation of meters in the West Haven area. It is projected that 766 meters will be installed with this phase of the meter installation project.



## East Layton Pipeline Rehabilitation

The District has started the design of the rehabilitation of approximately 5,400 feet of 27-inch and 30-inch pipe. To date the District has assessed several different technologies and construction methods for the completion of this work. An initial camera inspection was also performed to verify the legitimacy of design considerations being reviewed.



## Drought Relief Pipeline Repair

The District designed and replaced a 40-foot section of 60-inch diameter PCCP pipeline. This section of pipeline was damaged during the installation of adjacent utilities. The District had a new section of steel line fabricated with an access hatch and drain. The District's Maintenance staff performed the installation of the pipeline.



## Weber South Backwash Tank Repair

The District was successful in obtaining FEMA grant funds for the seismic retrofit of the District's Weber South Water Treatment Plant backwash tank. This work consisted of the construction of a new foundation ring, proper anchorage of the tank to the foundation, modification of overflow piping, and recoating of the tank for corrosion protection.

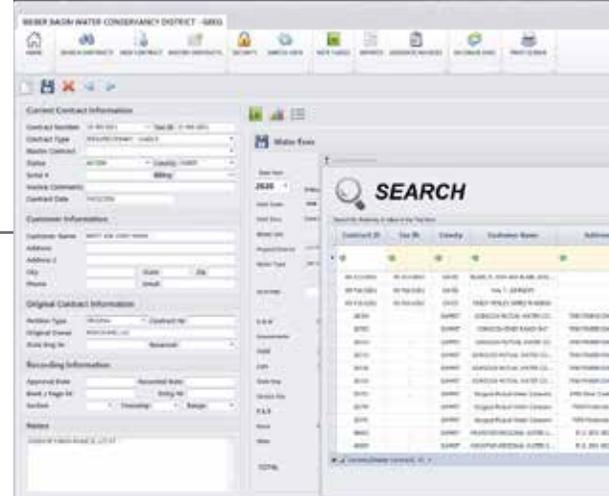




# GIS/IT/SCADA

## Capital Asset GIS Database Project

The District's Geographic Information System (GIS) database was updated with capital asset data. A web application was created that allows users to query specific features or pull up attribute tables and zoom to feature locations. The web app gives the user the ability to export tables to Excel. An attribute assistant tool was also implemented and formulas were created that link related fields that change as the data is updated.



## Water Contract System Upgrade

The District was using a software package that was outdated, making management of water allocations and contracts difficult. The software was becoming unusable on some newer versions of Windows. During the summer and fall of 2017, this software was completely rewritten to ensure all users were able to access all functions within the program. This software package also has the highly technical task of interfacing with our accounting system to ensure proper amounts are invoiced to customers and annual billings are accurate. As part of this upgrade and anticipating future needs, the database was upgraded to a version utilizing current technology standards and practices. This task was completed entirely in-house without the need for outside consultants.



## SCADA System Upgrade

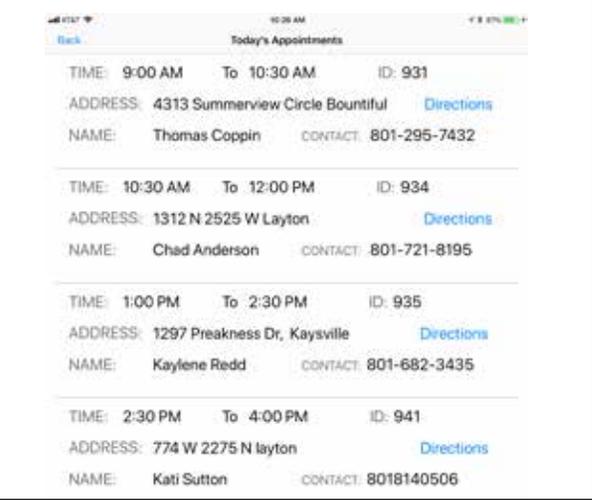
Three of the District's water treatment plants received software and hardware upgrades to their SCADA (Supervisory Control and Data Acquisition) systems this year. The new software and hardware will allow the water treatment plants to remain up to date with current technology standards and allow for future expansion.



## AMI Network

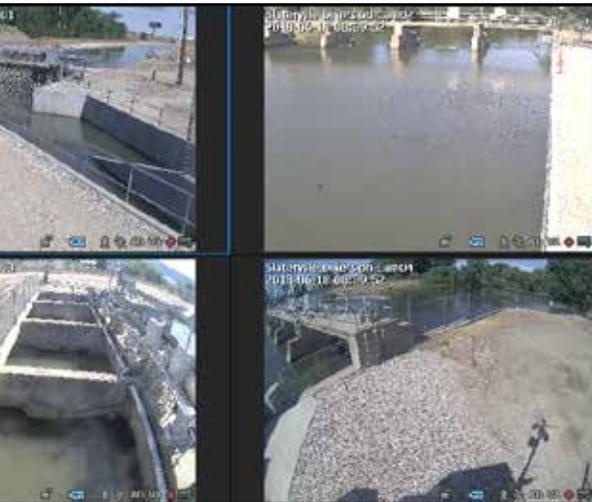
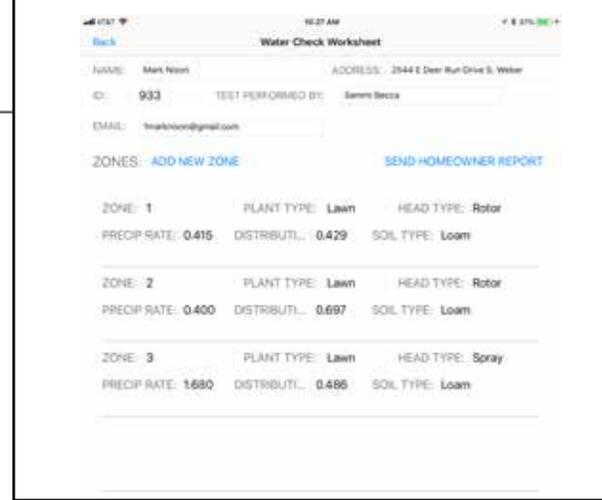
Anticipating future needs for our secondary water metering system, the District installed four AMI (Automated Meter Infrastructure) towers in the Wasatch Front service area. These towers use radio transmission to communicate with each individual meter and give near real time consumption information, any alarms or status updates from the meter, and help better manage the meter network remotely. Future projects will include making culinary trunk line meters available on this network. This technology is considered to be leading edge, and the District has already seen great benefits from its use this year.





## Water Audit iOS App

Each year conservation staff completes hundreds of customer-requested water audits. These audits allow the customer to receive a better understanding of how their irrigation system is performing, what types of soils and grasses they have, and how much water they should be applying to their landscape. Historically, staff has simply written down the information and delivered it to the customer. Staff would then come back to the office and enter the information into the computer. This year, a new iOS app was written to completely automate this process. Water audits are now scheduled online by staff, or when a customer submits an irrigation controller rebate. These appointments automatically appear on the iPad within the iOS app. Once the appointment is chosen, the audit is performed with all the customer's landscape type, sprinkler type, and zone distribution uniformity automatically saved to our databases for future retrieval. Once the audit is complete, an automated email is sent to conservation staff and the customer with a detailed report containing suggested irrigation intervals and times specific to their property.



## Remote Site Cameras

The District installed real time remote monitoring cameras at several locations this year. These cameras allow authorized users to view various District sites any time of day. The cameras have proved to be invaluable for employees in managing time and resources. Future sites are currently in the planning stages.



## Meter Software and Database

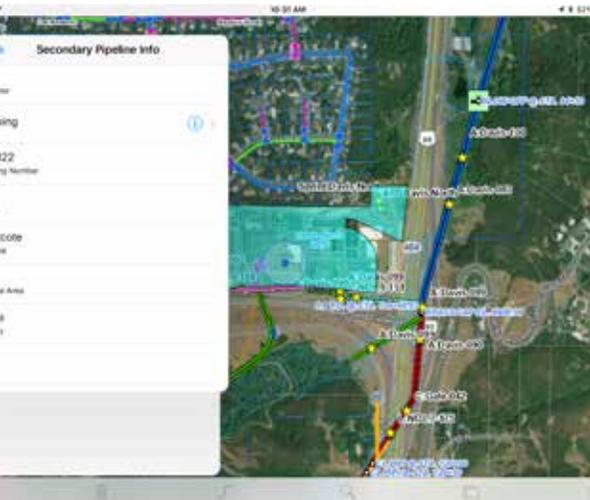
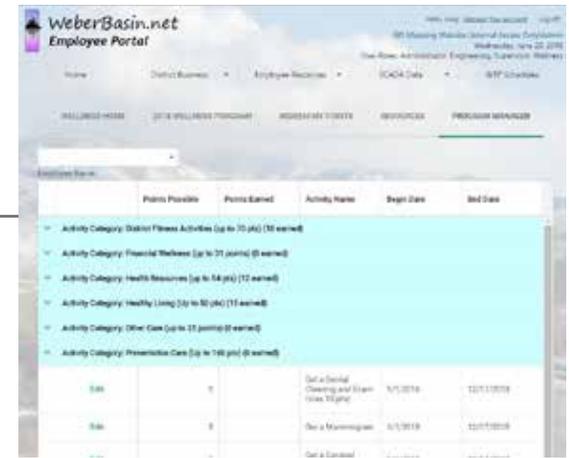
Further upgrades were made to the District's in-house developed meter software. This software manages all meter account information and readings. The upgrades completed this year relate to interfacing with our new AMI network. The system now successfully communicates with two distinct meter reading systems. Additional updates relating to viewing historical account meter data, running checks on the database, analyzing incoming information, and processing account name changes were also made. The database that stores this information was upgraded and moved to a new, more compatible server. This will allow for seamless future upgrades and increased performance.





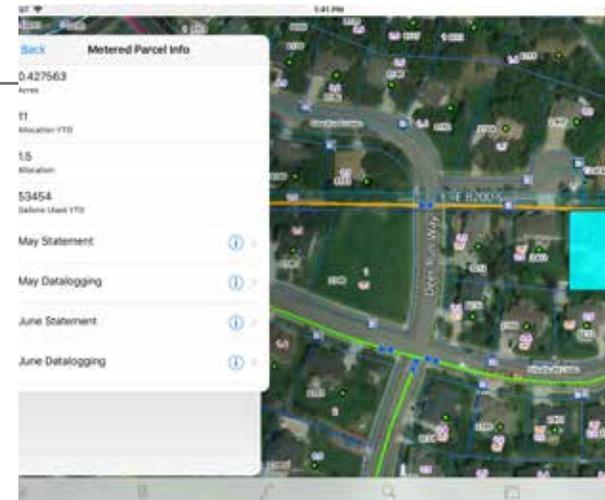
## Wellness Portal

A new section was made on the Employee Portal to allow District employees to track and utilize wellness points they earn throughout the year. The website shows how employees are performing in each category and allows them to redeem their points for available gift cards, similar to online shopping. This site also allows for employees to view valuable wellness related resources and tools. The website allows select District staff to manage the input of points and keeps all the information in a centralized database.



## Mapping iOS App

The mapping application available on all iPads and iPhones required a substantial upgrade this year. The app was four years old and, due to new technology standards and hardware, the app required upgrading. The bulk of the upgrade was mainly under the hood (moving from a 32-bit to a 64-bit environment), but some new features were added. The ability to share scanned as-built drawings and increased app stability were also obtained during the upgrade.



## GIS Server Upgrade

The GIS (Geographic Information System) server underwent an upgrade this year. The server was outdated and needed to be replaced due to the increase demand placed on it. A substantial increase in speed and performance was gained with this new server.



## Work Order Management System

A new system for entering, tracking, and completing work orders for the District was implemented. This new system allows for integration of work orders with our procurement system to allow easier tracking of costs related to specific jobs. It will also integrate with the GIS system to identify problem areas on infrastructure and facilities.





Photo Credit: Gordon Barrow

# Construction and Maintenance Department

## M. Troy Stout, PE, Manager

Ruger Barber, Seasonal Worker  
Jack Bussberg, Maintenance Worker  
Jordan Clontz, Crew Chief, Preventative Maintenance  
Jared Cooper, Seasonal Worker  
Jake Cragun, Maintenance Worker  
Tracy Hess, Seasonal Worker  
Russell Fearn, Crew Chief, Work Orders  
Braden Gapinski, Seasonal Worker  
Ellie Hansen, Seasonal Worker  
Jacob Jaques, Crew Chief, Special Projects  
Nolan Kelley, Maintenance Superintendent  
Christopher Kendall, Warehouse Inventory Control

Damon Knechtel, Seasonal Worker  
Layne Leonard, Maintenance Worker  
Kasey Monson, Mechanic  
Trase Penman, Crew Chief, Rights-of-Way  
Kenny Schow, Maintenance Worker  
Tristian Trussell, Maintenance Worker  
Scott Wilson, Crew Chief, Special Projects  
Jared Woolsey, Welder

**The Construction and Maintenance Department is responsible for sustaining and preserving all District facilities and infrastructure while providing key support to all District systems. The Construction and Maintenance Department is purposefully separated into five divisions: Special Projects, Work Orders, Preventive Maintenance, Mechanical Maintenance, and Right of Way and Facility Maintenance. The department is well positioned to perform wide ranging tasks including executing and ensuring quality pipeline repairs, installation of critical pipeline construction, well planned building construction, general facility upgrades, and prudent infrastructure rehabilitation.**

**With these historical maintenance practices performed by the separate department divisions, it is notable that various facility components are more than 60 years old and are reaching the end of their useful lives. Continued maintenance, rehabilitation, and improvements are necessary to ensure reliable operation of the water distribution systems. To endure meeting customer needs and conservation goals, water infrastructure requires consistent monitoring, maintenance, rehabilitation, and eventual replacement. Under the District's current asset management plan, the condition of existing infrastructure is assessed to forecast short and long-term capital replacement needs. These reviews provide District personnel the opportunity to establish budgets and schedules associated with rehabilitation projects while ensuring adequate funding sources are planned and in place for replacement of existing assets reaching the end of their useful life.**

**The proactive assessment and upkeep of District infrastructure aids in averting costly unexpected / emergency repairs, minimizes unexpected service disruptions, reduces maintenance deferrals, and provides a reliable and safe water system for customers.**



## SPECIAL PROJECTS

The Special Projects Division acts as a primary foundation for the department that is supported by a fleet of heavy equipment and well trained, experienced staff. With this foundation, the division is able to execute key maintenance and rehabilitation focused projects for the District's eight large reservoirs and associated dams, related canal distribution systems, and other significant facilities spread throughout the District's five county service area. These projects range from dam improvements and modifications, conveyance structure rehabilitations and cleaning, river channel modifications and fortifications, to emergency response for operations support. Representative projects completed by this Division during the 2017 calendar year are below.



### Wanship Spillway Stilling Basin - Debris Removal and Condition Assessment

During previously completed underwater diving inspections by the Bureau of Reclamation, it was identified the submerged Wanship Spillway stilling basin with concrete dentates had accumulated substantial debris that could impact performance of the structure and cause damage during higher runoff periods. The purpose of this project was to remove all accumulated material and perform a condition assessment while dewatered to ensure long term proper function of the energy dissipating structure. The basin was cleared of debris and a condition assessment performed documenting the structure's good condition prior to refill.



### Willard Canal Silt Removal

During routine operation of the Willard Canal since its construction in 1962, siltation caused by suspended sediments within the Weber River has gradually impacted the capacity of the canal system. As a part of routine maintenance and in preparation for installation of a future reinforced concrete liner system, accumulated sediment was removed over a stretch of 2,000 lineal feet exposing the original clay liner. This resulted in approximately 9,000 cubic yards total being removed with an average depth of four feet across the canal floor.



### Ogden Valley Canal Liner Replacement

In an effort to improve the overall condition of the earthen Ogden Valley Canal system, a section of the existing liner was replaced and the adjacent access road upgraded. Over a stretch of approximately 1,400 lineal feet, portions of the existing liner system that was in poor and loose condition was removed by track-hoe. Overgrowth vegetation that was further compromising liner performance and restricting flow capacity was also removed from the canal banks and transition areas. Once removed, imported clay was conditioned onsite then placed and compacted. Given the sloped terrain of the area surrounding the canal and the age of the unimproved access, road improvements were also completed.



## Fish Ladder Installation Project at Jacobs Creek

With District conservation staff working alongside the State of Utah Division of Wildlife Resources and Trout Unlimited, and permitting through the Army Corps of Engineers, a fish passage improvement project was undertaken at Jacobs Creek Crossing under the Gateway Canal. After design was completed, District Maintenance staff undertook an effort to install in-channel and bank restoration measures to reestablish fish passage at the upper Jacobs Creek culvert. The purpose of the Jacobs Creek Fish Passage Project was to reconnect spawning habitat for Bonneville Cutthroat Trout (BCT) living in the Weber River by providing fish passage at the Upper Jacobs Creek Culvert. BCT in the Weber River migrate out of the river into tributaries to spawn, with Jacobs Creek being one of the most important tributaries for BCT.



## Slaterville Diversion Gravel Removal

The Slaterville Diversion serves as a critical facility to District operations. During high runoff periods a significant amount of alluvial materials are transported within the river system and build up both upstream and downstream of the structure. Left unaddressed, these river materials would adversely impact diversions off the river and compromise the integrity of the gated system. Approximately 6,000 cubic yards of material was successfully removed and placed in specific locations on the north and south banks of the river system.



## Drought Relief Pipeline Replacement

The Drought Relief System, with its associated 60-inch diameter transmission pipeline, delivers vital irrigation water to agricultural based customers throughout the valley. After the line was damaged by a third-party, a 40 feet section of the line was removed and replaced with a new section of line that included manhole access improvements and an 8-inch diameter drain line to the Drought Relief Reservoir.



## Gateway Canal Culvert Crossing Improvements

Along the Gateway Canal system, located in the mountain base areas of Morgan County, there are frequent under crossings that allow water passage to the lower valley and Weber River. With normal age and routine concrete deterioration, it was determined a concrete headwall on the downhill side had spent its useful life and required replacement. It was decided the best long-term value and solution would be to replace with an extended pipe system surrounded by rip-rap and an improved drainage path.





## PREVENTATIVE MAINTENANCE

The Preventative Maintenance Division has been tasked with the central mission of maintaining assets in their peak performance condition, extending their operational life, and providing the customer the best management practices available and applicable to the asset. This directly involves and includes assessment, maintenance, rehabilitation, replacement, and improvement of the District infrastructure.

With this group of varied facilities, one area of common concern for the division is centered on minimizing the effects of age, wear, corrosion, and fatigue cracking on operational assets in primarily water delivery systems. With these life cycle areas considered, the division performs well in maximizing asset life, ensuring asset operational reliability, assessing annualized maintenance costs, and maintaining asset replacement criteria to ensure a cost effective well-managed program. These focal points of the division are continually considered for rehabilitation versus replacement with their related impacts to long term cost and system reliability.



### Geneva Rock Products Meter Vault Replacement

During assessment of a meter vault for a wholesale municipal and industrial water customer, it was determined the system had reached the limits of effective life and rehabilitation was not a prudent long-term option. The vault was redesigned by maintenance staff, outages coordinated with the customer and operations, and installed by maintenance personnel with a wax tape coating system to ensure long term reliable operation for the new replacement system.





# WORK ORDERS

The Work Orders Division provides critical support to District operations with wide ranging responsibilities and capabilities that aids in overall operations and facilities. This support ranges from meter repairs, valve installations, facility maintenance, to canal cleaning and repairs covering District wide assets. As retail operations continue to be outsourced to local agencies, the division continues to transition from retail focused repair projects to larger regionalized projects and pipeline repairs.



## Gateway Canal Caulking and Panel Replacements

To preserve the condition of the Gateway Canal concrete liner system and to delay a more substantial improvement project, the existing system is dewatered for an annual maintenance outage to address any issues that may have developed during the prior irrigation season. During the 2017 outage, approximately 2,100 lineal feet of the canal system received caulk application with an additional 13 concrete panels replaced in various locations.



## Stoddard Horseshoe Silt Removal

As the primary source of water for the District is diverted from the Weber River, the sediment laden water flows through a widened channel (Horseshoe Channel) over a stretch of 1,200 lineal feet to intentionally settle out suspended silts and clays and prevent transport into District canal systems, pipelines, water treatment plants, and pump stations. By capturing the sediments prior to entrainment within the distribution systems, significant cost savings are achieved compared to physical removal methods from canal systems, pipelines, and exponentially increased process requirements at the water treatment plants. During 2017, approximately 600 lineal feet of the channel was cleaned resulting in approximately 5,000 cubic yards removed.



## Culinary Line Improvements near Cherry Lane and Mahogany Drive

During routine operations of the District's existing 16-inch diameter culinary line in the Fruit Heights area near Cherry Lane, seeps were identified that surfaced on the surrounding ground level. After exposing the seep area and isolating the system, a best fit repair for current industry practices was applied, the area back filled and the system returned to service.





### **Culinary Line Improvement near Old Post Road**

A seep was identified on an existing 18-inch culinary line in South Ogden near Old Post Road. The system repair was completed in a short amount of time with minimal disruption to customers. Given the location of various conveyance facilities located in reduced access areas, this project provided an opportunity to assess the existing buried system and allow for timing of replacement plans and schedules.



### **Raw Water Line Improvement on 400 North Davis Boulevard**

Another repair made by this division was on an existing 60-inch raw water line in the Bountiful area. The successful system improvement was completed in a short amount of time with minimal disruption to operations. Given the location of the repair and interior work required, all required and prudent safety protocols were strictly adhered to with the work successfully completed without incident or concern.



### **Culinary Line Improvement on 12th Street**

Required repairs were conducted on an existing 20-inch culinary line in the West Weber area near 12th Street. Another best fit repair was made, the area back filled, and the system returned to service.



### **Golf Course Secondary Meter Replacement**

In assessing secondary water meters that have fulfilled their useful life, the division oversaw and executed the replacement of a 6-inch diameter meter for a local municipality owned golf course. This project was successfully installed during the irrigation off season.





## RIGHT OF WAY AND FACILITY MAINTENANCE

With District facilities, including reservoirs, dams, canal systems, pipelines, and service lateral systems, that are protected by varying land rights, it is imperative to both protect the asset from expansive vegetation growth ranging from noxious weeds to tree growth as well as to protect from unauthorized encroachment. Management of the corridors allows for proper technical inspections to be completed, shields against potential invasive growth that could compromise structures or facilities, and protects right of ways that safeguard adequate access to facilities.

A portion of the Division's activities specifically includes responsibility for vegetation management at the Wasatch Front Regional Alignment facilities in Davis and Weber counties, various canal and pipeline system corridors, and at multiple dam and reservoir sites. The Division actively maintains District properties to the benefit of surrounding communities, system operators, and ultimately to the end use customers throughout multiple counties. During winter months, this Division transitions to provide critical support to other areas within the Maintenance Department in executing cold weather-related projects while successfully managing a snow removal program to maintain safe and clear accesses to all facilities.

In supporting efforts to minimize the spread of noxious weeds throughout the District's service area, District personnel in this division undergo routine training to maintain certifications and are active proponents for minimizing the spread of vegetation that is harmful to local communities, requires significant control efforts, and adversely impacts District right-of-way corridors. District staff actively also encourage revegetation of disturbed project lands to ensure maintenance of native grasses and plants that are a benefit to our neighbors as well as the affected assets that overall optimize future maintenance efforts.



### Tree and Large Vegetation Removal Near Willard and Gateway Canals

During the 2017 season, the Right of Way Division undertook a large effort to clear additional vegetation near the Willard and Gateway canals. These efforts resulted in areas with improved overall corridors, enhanced maintenance and inspection accesses, and reduced long term propagation of expansive vegetation.





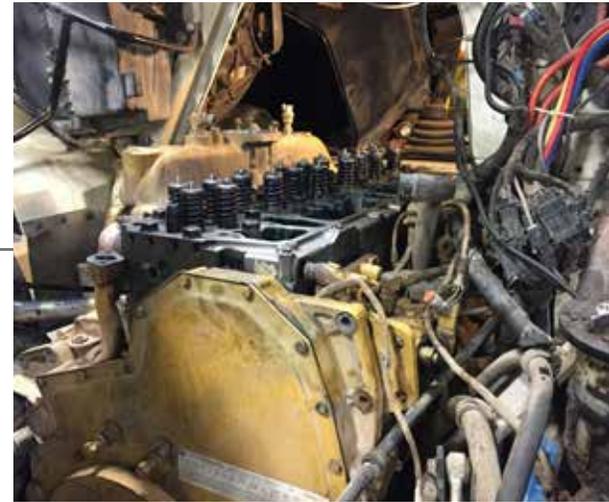
## MECHANICAL MAINTENANCE

The Mechanical Maintenance Division is responsible for keeping the District's wide-ranging equipment and vehicle fleet in top operating condition and readily available for routine tasks as well as prepared for quick response to unexpected operational occurrences. This is successfully accomplished through routine and precise maintenance of the construction equipment fleet, diesel generator systems, and overall well managed preventative maintenance based programs. The Mechanical Maintenance Division is well positioned and trained to proactively respond to mechanical failures that can occur with large industrial equipment working in rigorous environments inherent with expansive river distribution systems and associated dams that include high elevation reservoirs with seasonally harsh conditions.



### 963 CAT Track Loader Repair

During routine cleaning of the Slaterville Diversion following a significant spring runoff period, the CAT 963 track loader suffered a cracked yoke idler support requiring significant repair and tear down of the system. The division was able to quickly diagnose affected parts, make recommendations for a replacement part plan, and execute the repair in a reasonable manner on a heavy industrial piece of equipment. These capabilities provide for quick response on technical repairs that would otherwise expose the District to increased costs subject to third party schedules.



### International 7600 Dump Truck Engine Repairs

The District maintains a fleet of six dump trucks that provide critical sustenance to District wide projects and maintenance related efforts. During routine assessment of the 7600 International dumptruck, a condition was observed by District staff that was diagnosed as not existent by a local service center. Based on past experience, it was persisted by District staff that further diagnostics be conducted which led to the diagnosis that a significant mechanical failure of a valve and cam shaft had occurred. Due to this persistence, complete catastrophic irreparable damage to the engine was avoided. The Mechanical Maintenance staff assessed the overall condition of the affected components as diagnosed, procured the necessary parts, and rebuilt the engine cost effectively and returned the truck back to service shortly thereafter.



### Large Trailer Pump Shaft Repair

With large water conveyance facilities to maintain, a large trailered pump system has been valuable for various maintenance dewatering related activities. During dewatering of an isolated section of the Willard Canal, the drive shaft failed and a quality and expedited repair was completed by Mechanical Maintenance personnel at a low cost. This allowed the maintenance project to continue with minimal interruption and increased the service life of the pump equipment.

# Water Supply and Power Department

## Chris C. Hogge, PE, Manager

Gordon Barrow, Irrigation Operator/Damtender  
Casey Bitton, Electrician  
Casey Folkman, Power Plant Operator/Damtender  
David Giles, Electrician  
Alan Hatch, Irrigation Operator  
Jeff King, Irrigation Operator  
Ben Love, Irrigation Operator, Lead  
Michael Midgley, Superintendent  
Chad Montgomery, Power Plant Operator/Damtender  
Jason O Bray, Electrician, Lead  
Lee Smith, Irrigation Operator  
Ken Turner, Electrician, Lead  
Bob Waldron, Power Plant Operator/Damtender

**The Water Supply and Power Department operates facilities which control the storage and conveyance of all raw water supplied to District customers within its boundaries. These operations include operation of all storage and diversion dams for water storage and flood control purposes, canals, aqueducts, irrigation trunklines, laterals and pumpstations. Department personnel also operate and maintain hydropower generation facilities at Wanship and Causey dams and at the terminal of the Gateway Canal. The hydroplants provide the majority of the power needs of the District. Electricians within the department troubleshoot and maintain all electrical facilities throughout the District.**



The snowpack accumulation in the winter of 2016-17, for the Weber and Ogden river drainages, provided approximately 130% of normal snow water equivalent (SWE) as of April 1, 2017. The early April projections for runoff during the April through July time period ranged between 140% and 180% of normal.

The above described snowpack totals and subsequent runoff resulted in the need for considerable flood control releases from upstream reservoirs on both the Ogden and Weber rivers beginning in the month of February through the spring runoff period. These high river flows resulted in significant effort from District personnel and equipment to manage the high flows as well as the debris and gravels at the Stoddard and Slaterville diversion dams. The capacity of the Willard Canal was utilized during much of March and later in the spring to pass as much as 1,000 cfs of the flood waters through the canal and Willard Bay. This allowed lower Weber River (below Slaterville) flows to be below extreme flood levels during the runoff.



Storage at the upstream reservoirs on the Weber and Ogden rivers was coordinated with the flood control releases to allow all upstream reservoirs to fill. Additionally, the District was able to fulfill the first fill requirements at Willard Bay since the 2-foot raise of the AV Watkins dam. This raise allowed for the short-term storage of an additional 20,000 acre-feet at Willard Bay.

The District was able to provide all contracted water and continue into the fall of 2017 with considerably higher than normal holdover for the coming year.

In 2017, the combined power generation of Wanship, Gateway, and Causey hydropower plants totaled 25.9 million kWh while the District's power demand was approximately 21.5 million kWh. The higher than normal runoff allowed for the increase in power generation and also a decrease in power demand for District operations.



In addition to normal in-season operating maintenance and procedures, the District's system operators focused their off-season efforts on maintenance and rehabilitation of meters, pumps, PRVs and other operational facilities in preparation for the coming season.

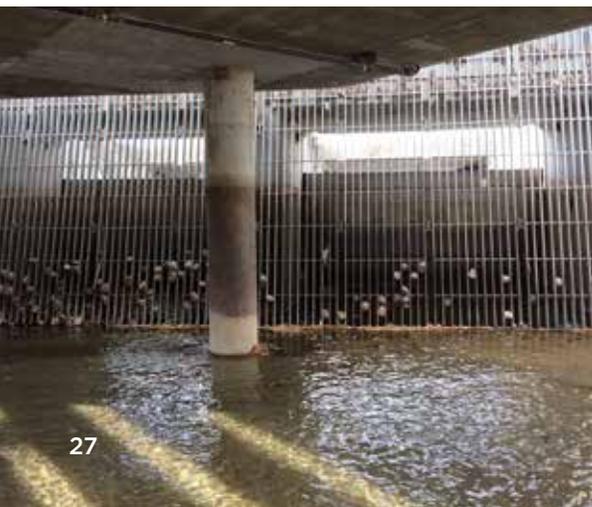
The District was able to complete significant other projects related to long term maintenance. During the winter of 2017 into early April, District electricians and power plant operators upgraded Hydropower Unit 1 at Gateway with the assistance of the Leffel Co.



During the summer and fall, the District coordinated with Rocky Mountain Power as it replaced a 46KV line with a 138KV transmission line and completely replaced the District's substation and reconnected our hydropower unit at Wanship to a 12.5KV distribution line.

Additional rehabilitation work, including the replacement of concrete liner and sealing of liner cracks on the Gateway Canal, was completed in the fall.

District personnel also completed additional cleaning of the Willard Canal and removal of large amounts of sediment at Slaterville in preparation for the coming year. As always, substantial coordination and cooperation between all departments within the District, as well as consultants and contractors hired by the District and associated agencies, were required to successfully complete these projects.



## Irrigation Company Water Use - AF

Contracting Entity	Contract Amount	Delivery Loss	Net Useable	Contracting Entity	Contract Amount	Delivery Loss	Net Useable
Benchland Irrigation	4,475	448	4,027	North Morgan Irrigation	160	16	144
Bountiful Irrigation	17,500	1,600	15,900	North Round Valley	150	15	135
Centerville Duel Creek	2,891	264	2,627	North Salt Lake (Foxboro)	800	0	800
Chalk Creek Irrigation	643	64	579	Oakridge Country Club	500	50	450
CO-OP Farms Irrigation	300	30	270	Ogden River Water Users	3,705	283	3,422
Croyden Irrigation	450	45	405	Peterson Irrigation	614	61	553
Davis & Weber Counties Canal	836	0	836	Pintail Duck Club	100	10	90
Downs Creek Irrigation	100	10	90	Roy Water Conservancy District	365	0	365
East Porterville Irrigation	200	20	180	Salmaho Irrigation	167	17	150
East Wanship / Gibbons & Pace	100	10	90	So. Davis County WID	3,210	321	2,889
Eden Irrigation	1,200	120	1,080	South Morgan Water Company	400	40	360
Emmertsen Irrigation	100	10	90	South Ogden Conservation District	2,345	234	2,111
Felt, Peterson, Slater Irrigation	100	10	90	South Weber WID*	2,223	0	2,223
Haight's Creek Irrigation	7,008	692	6,316	Sun Hills Golf Course	496	37	459
Hill A.F.B. Golf Course	640	64	576	Syracuse City	1,113	111	1,002
Hill Field at 193	139	14	125	Uintah Mountain Streams	200	20	180
Hooper Irrigation	5,663	566	5,097	Valley View Golf Course	373	37	336
Huntsville Irrigation	600	60	540	Warren Irrigation	700	70	630
Huntsville So Bench Irrigation	600	60	540	Weber Basin Job Corps	300	30	270
Kays Creek Irrigation	2,000	200	1,800	Weber-Box Elder Cons. Dist.	4,233	199	4,034
Kaysville Irrigation	1,691	178	1,513	Weber Canal Company	200	20	180
Lagoon Amusement Park	225	23	202	Welch Field Ditch	240	24	216
Layton Canal & Irrigation Co.	5,491	549	4,942	West Bountiful Golf Course	294	29	265
Littleton-Milton Irrigation	300	30	270	West Hoytsville Irrigation	300	30	270
Middle Fork Irrigation	830	83	747	West Wanship Irrigation	150	15	135
Mountain Valley Canal Irrigation	1,297	130	1,167	Wilson Irrigation	1,500	150	1,350
Mountain View Irrigation	100	0	100	<b>Totals</b>	<b>80,317</b>	<b>7,099</b>	<b>73,218</b>

\*Contract is a D&W stock exchange (370.5 D&W Shares) • D&W issued 6 AF of water per share in 2017.  
The following entities added to their contracts during 2017:  
Weber-Box Elder Conservation District (86) • Davis & Weber Counties Canal (18)

# Project Power Operations

## PEAK PROJECT POWER LOAD - KW

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<b>Peak Power Load (KW)</b>	1,920	1,546	1,464	1,684	3,772	4,992	5,863	5,992	5,539	2,025	2,341	1,757

## PROJECT POWER GENERATION - KWH

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
*Net Generation													
Causey Plant	-15,600	436,000	1,105,700	1,368,700	1,386,900	1,211,600	558,000	501,400	412,600	393,000	74,500	-16,500	<b>7,416,300</b>
Net Generation													
Gateway Plant	-15,600	-12,080	-9,840	880,440	2,939,750	2,298,120	1,866,560	1,745,500	1,456,740	362,420	-13,600	-17,900	<b>11,480,510</b>
Net Generation													
Wanship Plant	-21,120	405,230	768,110	681,620	1,048,170	1,185,820	740,500	-240	364,400	598,500	966,800	248,300	<b>6,986,090</b>
<b>Total Output</b>	<b>-52,320</b>	<b>829,150</b>	<b>1,863,970</b>	<b>2,930,760</b>	<b>5,374,820</b>	<b>4,695,540</b>	<b>3,165,060</b>	<b>2,246,660</b>	<b>2,233,740</b>	<b>1,353,920</b>	<b>1,027,700</b>	<b>213,900</b>	<b>25,882,900</b>
Project Use	954,432	820,210	841,059	801,005	1,868,543	2,541,937	3,993,259	3,936,652	2,384,570	1,230,466	1,220,620	964,852	<b>21,557,605</b>
Delivered to CRSP	-991,152	-427,060	-82,789	761,055	1,445,983	-509,319	-1,329,592	-639,310	590,674	-259,700	-11,652	-734,452	<b>-3,091,005</b>

\* Not Added to CRSP

## WATER USED FOR POWER GENERATION - AF

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Causey	0	2,932	7,960	8,940	9,238	7,972	3,714	3,446	3,220	3,054	728	0	51,204
Gateway	0	0	-	6,831	22,035	17,809	15,461	14,935	12,041	3,117	0	0	92,229
Wanship	0	3,210	8,156	9,470	10,998	11,400	7,962	0	3,703	5,957	9,066	2,792	72,714
<b>Total</b>	<b>0</b>	<b>6,142</b>	<b>16,116</b>	<b>25,241</b>	<b>42,271</b>	<b>37,181</b>	<b>27,137</b>	<b>18,381</b>	<b>18,964</b>	<b>12,128</b>	<b>9,794</b>	<b>2,792</b>	<b>216,147</b>

# Reservoir Operations

## Storage Content as of Last Day of Month - AF

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Causey	4,788	4,664	6,904	6,909	6,964	6,829	6,688	5,672	4,461	3,275	3,825	4,627
East Canyon	23,770	29,280	35,360	41,670	48,730	48,250	44,370	37,930	34,450	34,820	36,200	37,040
Echo	30,710	37,240	34,580	49,130	73,060	72,470	54,640	33,490	23,710	28,760	40,880	46,840
Lost Creek	12,590	13,900	13,060	16,020	20,370	19,900	17,870	15,920	15,070	15,038	15,320	15,530
Pineview	70,690	61,150	55,570	74,450	109,580	109,290	98,840	85,380	74,220	70,230	63,950	67,720
Smith-Morehouse	5,290	5,726	5,691	4,614	7,797	7,698	7,072	5,084	4,336	4,095	4,144	4,105
Wanship	31,720	35,270	26,610	27,240	50,350	60,430	57,370	55,920	55,980	55,620	51,420	51,330
Willard	159,183	197,244	199,452	199,851	221,465	203,164	189,430	174,434	172,436	168,448	167,050	165,154
<b>Total</b>	<b>338,741</b>	<b>384,474</b>	<b>377,227</b>	<b>419,884</b>	<b>538,316</b>	<b>528,031</b>	<b>476,280</b>	<b>413,830</b>	<b>384,663</b>	<b>380,286</b>	<b>382,789</b>	<b>392,346</b>

## Total Releases - As Of The Last Day Of The Month - AF

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Causey	434	3,058	8,494	17,228	29,532	10,920	3,714	3,446	3,220	3,054	1,096	496	84,692
East Canyon	372	336	3,360	3,876	4,500	5,592	6,026	6,946	4,064	966	456	434	36,928
Echo	0	4,348	31,962	12,784	18,386	50,684	30,308	27,796	19,618	4,918	0	0	200,804
Lost Creek	496	448	7,634	9,380	8,062	2,888	2,782	2,630	1,628	680	540	506	37,674
Pineview	8,141	58,210	81,859	54,252	40,495	28,015	16,294	16,844	15,133	9,740	12,548	656	342,187
Smith-Morehouse	465	420	2,995	5,690	13,762	16,936	2,482	2,740	1,640	1,052	480	462	49,124
Wanship	1,550	4,160	17,628	9,500	15,061	35,350	11,695	6,133	5,708	6,407	9,238	3,990	126,420
Willard	292	5,026	51,180	43,906	1,938	19,297	8,752	7,560	2,316	1,488	1,364	1,316	144,435
<b>Total</b>	<b>11,750</b>	<b>76,006</b>	<b>205,112</b>	<b>156,616</b>	<b>131,736</b>	<b>169,682</b>	<b>82,053</b>	<b>74,095</b>	<b>53,327</b>	<b>28,305</b>	<b>25,722</b>	<b>7,860</b>	<b>1,022,264</b>

# Municipal and Industrial Water

## Brad D. Nelson, PE, Manager

Nate Allison, Water Treatment Plant Operator  
Jeff Connor, Water Treatment Plant Manager  
Amanda Delgado, Chemist  
Michelle Deras, Water Quality Specialist/Environmental Analyst  
Bart Fearn, Supervisor/Water Treatment Plant Operations  
Nate Frew, Water Treatment Plant Manager  
Spencer Gatten, Chemist  
Dean Gifford, Water Treatment Plant Operator  
Kevin Green, Water Treatment Plant Operator  
Thomas Hamblin, Water Treatment Plant Operator  
Casey Hayes, Water Treatment Plant Operator  
Kelly Holmes, Chemist  
Geoffrey Howell, Water Treatment Plant Operator  
John Jacobson, Water Treatment Plant Operator  
Tyler Jensen, Water Treatment Plant Operator  
Brett Kennedy, Water Treatment Plant Maintenance  
Rex Lee, Water Treatment Plant Operator  
Adam Moulding, Water Treatment Plant Operator  
Douglas Parslow, M&I Distribution Operator, Lead  
Aaron Pearce, Water Treatment Plant Operator  
Todd Pollock, Water Treatment Plant Operator  
Scott Rackham, Water Treatment Plant Operator  
Auggie Rose, Water Treatment Plant Manager  
Clay Schmalz, Foreman/Treatment Plant Maintenance  
Ian Smith, Water Treatment Plant Operator  
Mitch Sorenson, Solids Handling Specialist  
Paul Spens, M&I Pipeline Operator  
Chase Tate, Water Treatment Plant Operator  
Shane Visser, Water Treatment Plant Operator  
Jeff Weyburn, Water Treatment Plant Operator

**The Municipal and Industrial Water Department is responsible for all water treatment, distribution, and laboratory functions of the District. The department oversees four water treatment plants, nineteen deep groundwater wells, a state-certified water quality laboratory and a distribution system consisting of pump stations, fluoride feed buildings, and 86 miles of pipeline.**

**The department is also responsible for staying current on all regulations and conducting all compliance sampling.**



Photo Credit: Zeke Bardwell



Photo Credit: Marc Montgomery

The M&I Department is comprised of 31 employees who operate 3 surface water treatment plants (plants), 18 deep groundwater wells, miles of distribution pipelines ranging in size from 12-48 inches in diameter, and an environmental laboratory. Each of these employees work tirelessly to ensure the highest quality drinking water is provided to our customer agencies 24 hours a day, 365 days a year. The plants treat water primarily from the Weber River system and have a current combined treatment capacity of 94 million gallons per day. All plants use both chlorine as hypochlorite and ultraviolet (UV) light to ensure thorough disinfection to our customer agencies.

The District once again won the best tasting treated surface water for the Intermountain Section AWWA. The 2017 water year showed a slight increase, around 3%, in overall demand of treated drinking water from the previous year. The daily peak production was approximately 76 million gallons per day. Groundwater wells comprised approximately 9% of the District's total deliveries for the year with the remainder coming from the District's water treatment plants.

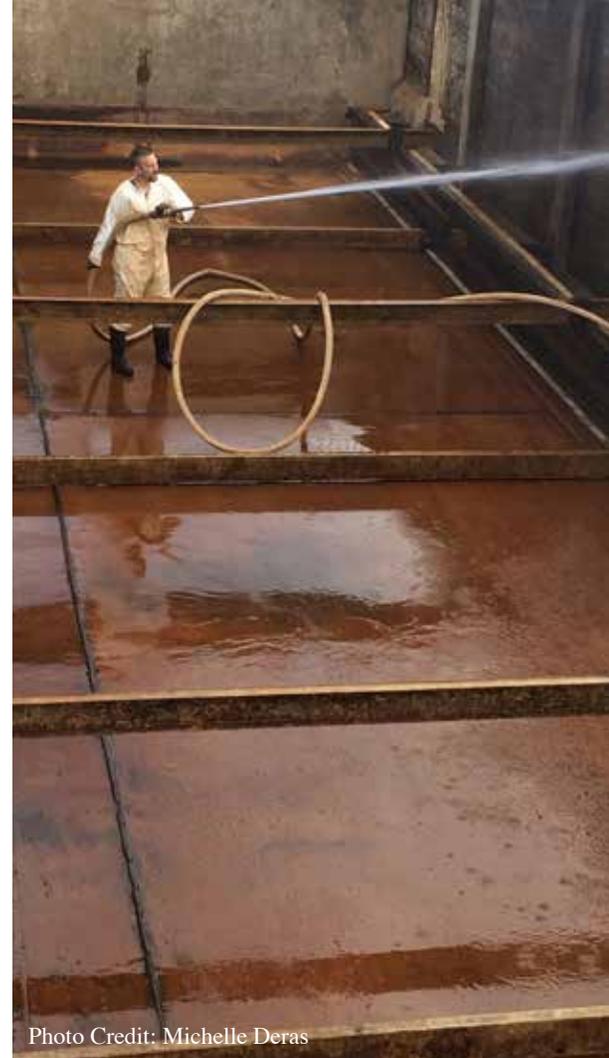


Photo Credit: Michelle Deras



Photo Credit: Bart Fearn



Photo Credit: Bart Fearn

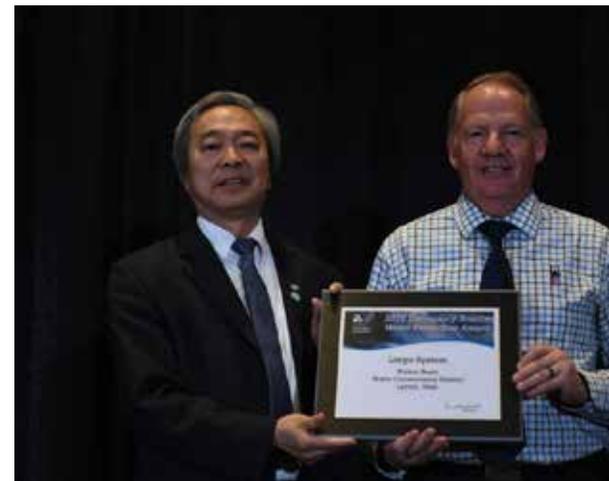




Photo Credit: Michelle Deras

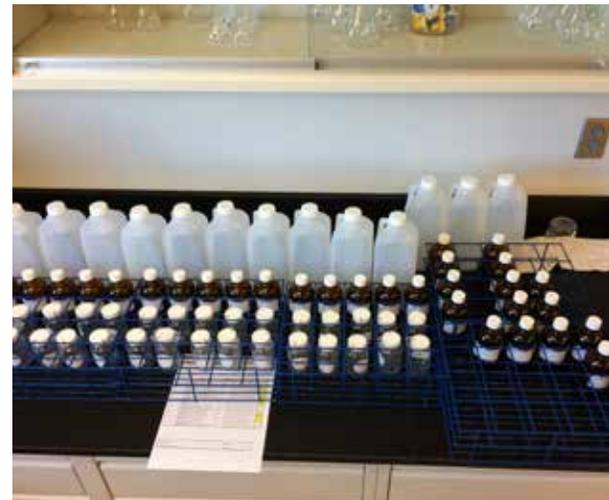
## Weber Basin Water Quality Laboratory

The Weber Basin Water Quality Laboratory (WBWQL) is an integral part of District operations and supports the District's overall scope of delivering the highest quality drinking water while sustaining and protecting the Weber Basin watershed. The WBWQL is a Utah State certified laboratory meeting all National Environmental Laboratory Accreditation Conference (NELAC) requirements. The laboratory uses certified methods to produce scientifically defensible analytical data on drinking and source waters for the District, Weber Basin Water Quality Council, stakeholders, federal, state, public water systems, and private citizens.



The WBWQL conducts over 20 certified methods and procedures for all environmental tests and calibrations. In 2017, the lab analyzed an impressive 10,336 samples, including over 200 lead samples for local schools. Sample sites include both District and public water system's source, treatment, and distribution samples. Approximately 20 analyses are conducted for each sample including: organic, inorganic, metals and bacteriological testing providing over 30,000 quantitative and qualitative water quality analysis certified by the State of Utah under the Safe Drinking Water Act (SDWA), Clean Water Act (CWA), and Resource Conservation and Recovery Act (RCRA).

In 2017, the laboratory implemented routine monitoring for the presence of microcystin, a cyanotoxin produced by certain algae species, at the head waters to our treatment facilities. Generally, the predominant risk to cyanotoxins is through direct exposure from swimming or ingesting lake water during Harmful Algae Blooms (HABs). Although, we have not detected microcystin in our waters, the District will maintain the ability to test source and drinking waters for algal toxins.



All laboratory methods incorporate: sampling, handling, storage, preparation, analysis, and statistical calculation procedures. Instructions, standards, manuals, and reference data relevant to the methods are developed as Standard Operating Procedures (SOP). Each staff member is trained and participates in both watershed and water treatment sampling and analysis which has proven to be advantageous in obtaining the best data quality. Our chemists not only maintain the ability to collect samples as needed, but experience first-hand visual and analytical assessments which helps them comprehend the data and quickly recognize concerns.

The WBWQL actively supports the community and public water systems we serve by conducting certified drinking water analysis required for state regulations, moreover, the lab supports non-regulated community members that have concerns about the water quality of their private wells. The lab staff will briefly discuss water quality concerns and recommend the best analysis. The staff actively participates in public education events and laboratory tours to express how much we enjoy doing interesting, important, and exciting research.



Photo Credit: Zeke Bardwell

# Summary of M&I Water Contracts - AF

## UNTREATED WATER

CONTRACTING ENTITY	CONTRACT AMOUNT
BIG WEST OIL	100.00
CHEVRON, USA	1,200.00
GREAT SALT LAKE MINERALS	7,980.00
MOUNTAIN REGIONAL SSD	2,100.00
NORTH SALT LAKE CITY	30.00
OGDEN CITY	1,500.00
PARK CITY	2,900.00
PARSONS	22.00
SUMMIT WATER DIST. COMPANY	800.00
TESORO	5.00
<b>TOTAL UNTREATED</b>	<b>16,637.00</b>

## TREATED WATER

CONTRACTING ENTITY	CONTRACT AMOUNT
<b>DAVIS COUNTY</b>	
BOUNTIFUL CITY	1,000.00
CENTERVILLE CITY	500.00
CHEVRON, USA	2,000.00
CLEARFIELD CITY	5,348.00
CLINTON CITY	1,630.00
FARMINGTON CITY	501.00
FRUIT HEIGHTS CITY	745.00
GENEVA ROCK	44.00
HILL AIR FORCE BASE	1,018.79
KAYSVILLE CITY	2,500.00
LAYTON CITY	6,873.00
MIDA-FALCON HILL	5.00
MUTTON HOLLOW WID	220.00
NORTH SALT LAKE CITY	2,015.00
SOUTH DAVIS COUNTY WID	360.00
SOUTH WEBER CITY	966.65
SUNSET CITY	1,400.00
SYRACUSE CITY	1,925.00
TESORO	5.00
WASATCH INTEGRATED WASTE MGMT	353.00
WEBBS CANYON WATER COMPANY	9.00
WEBER BASIN JOB CORP	60.00
WEST BOUNTIFUL CITY	750.00
WEST POINT CITY	700.00
WOODS CROSS CITY	100.00
<b>TOTAL DAVIS COUNTY</b>	<b>31,028.44</b>

## TREATED WATER CONT.

CONTRACTING ENTITY	CONTRACT AMOUNT
<b>MORGAN COUNTY</b>	
REPLACEMENT WATER	2,033.50
<b>SUMMIT COUNTY</b>	
REPLACEMENT WATER	13,070.50
<b>WEBER COUNTY</b>	
BLUE MOUNTAIN INC	10.00
BONA VISTA WATER IMP. DIST	3,786.00
GREAT SALT LAKE MINERALS	850.00
HOOPER WATER IMP. DISTRICT	101.35
OGDEN CITY	7,000.00
PLEASANT VIEW CITY	275.00
RIVERDALE CITY	1,165.00
ROY CITY	3,263.00
SOUTH OGDEN CITY*	785.00
TAYLOR-WEST WEBER WID	509.40
UINTAH CITY	448.00
UINTAH HIGHLANDS WID	247.00
WASHINGTON TERRACE CITY	1,000.00
WEBER COUNTY-MOULDING	5.00
WEST WARREN-WARREN WID	500.00
WESTERN ZIRCONIUM	560.00
REPLACEMENT WATER	7,100.75
<b>TOTAL WEBER COUNTY</b>	<b>20,504.75</b>
<b>TOTAL REPLACEMENT WATER</b>	<b>22,204.75</b>
<b>TOTAL TREATED WATER</b>	<b>51,533.19</b>
<b>TOTAL UNTREATED &amp; TREATED</b>	<b>90,374.94</b>

\* Amount of Burch Creek water treated for South Ogdan City: 832.56 acre-feet

The following entities added to their contracts during 2017:  
Taylor West Weber (27), Summit Water Dist. Company (100), South Weber City (16.65)

# Net Production of Culinary Water from Treatment Plants & Wells - AF

MONTH	WEBER SOUTH PLANT		DAVIS NORTH PLANT		DAVIS SOUTH PLANT		PRODUCTION TOTAL OF ALL TREATMENT PLANTS	PRODUCTION TOTAL OF ALL WELLS	GROSS TOTAL PRODUCTION OF WELLS & TREATMENT PLANTS
	TOTAL MONTHLY PRODUCTION	% OF PLANT CAPACITY	TOTAL MONTHLY PRODUCTION	% OF PLANT CAPACITY	TOTAL MONTHLY PRODUCTION	% OF PLANT CAPACITY			
JAN	657.00	21.90%	1,374.42	31.82%	238.99	15.42%	2,270.41	0.00	2,270.41
FEB	562.00	18.73%	1,394.33	32.28%	216.22	13.95%	2,172.55	9.07	2,181.62
MAR	582.00	19.40%	1,350.77	31.27%	238.06	15.36%	2,170.82	74.92	2,245.74
APR	476.00	15.87%	1,604.68	37.15%	275.59	17.78%	2,356.27	0.00	2,356.27
MAY	878.00	29.27%	2,120.70	49.09%	500.22	32.27%	3,498.93	35.96	3,534.89
JUN	1,248.00	41.60%	2,806.66	64.97%	821.25	52.98%	4,875.90	715.17	5,591.07
JUL	1,425.00	47.50%	2,698.78	62.47%	948.42	61.19%	5,072.20	910.71	5,982.91
AUG	1,361.00	45.37%	2,685.13	62.16%	914.18	58.98%	4,960.31	1,066.33	6,026.64
SEP	1,020.00	34.00%	1,950.29	45.15%	646.07	41.68%	3,616.36	661.97	4,278.33
OCT	806.00	26.87%	1,450.53	33.58%	573.50	37.00%	2,830.03	105.81	2,935.84
NOV	709.00	23.63%	1,335.88	30.92%	470.03	30.32%	2,514.91	0.00	2,514.91
DEC	725.00	24.17%	1,458.35	33.76%	273.32	17.63%	2,456.67	74.06	2,530.73
<b>TOTAL</b>	<b>10,449.00</b>		<b>22,230.52</b>		<b>6,115.85</b>		<b>38,795.36</b>	<b>3,654.00</b>	<b>42,449.36</b>

**PERCENT OF INDIVIDUAL PLANT PRODUCTION COMPARED TO TOTAL PLANT PRODUCTION:**

	<u>PRODUCTION% OF TOTAL</u>	
WEBER SOUTH PLANT	10,449.00	26.93%
DAVIS NORTH PLANT	22,230.52	57.30%
DAVIS SOUTH PLANT	6,115.85	15.76%
<b>TOTAL</b>	<b>38,795.36</b>	<b>100.00%</b>

**PERCENT OF PRODUCTION COMPARED TO TOTAL PLANT AND WELL PRODUCTION:**

	<u>PRODUCTION % OF TOTAL</u>	
WEBER SOUTH PLANT	10,449.00	24.62%
DAVIS NORTH PLANT	22,230.52	52.37%
DAVIS SOUTH PLANT	6,115.85	14.41%
WELLS	3,654.00	8.61%
<b>TOTAL</b>	<b>42,449.36</b>	<b>100.00%</b>

**MONTHLY CAPACITY:**

WEBER SOUTH PLANT	32 MGD	3,000 ACRE-FEET	22,500 GPM
DAVIS NORTH PLANT	46 MGD	4,320 ACRE-FEET	32,000 GPM
DAVIS SOUTH PLANT	16 MGD	1,550 ACRE-FEET	11,250 GPM
WELLS	35.6 MGD	3,387 ACRE-FEET	24,720 GPM
<b>TOTAL CAPACITY</b>	<b>129.6 MGD</b>	<b>12,257 ACRE-FEET</b>	<b>90,470 GPM</b>

# Water Pumped from Wells - AF

CULINARY WELLS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
BEN LOMOND	0	0	0	0	0	60.5	85.49	120.36	82.37	0	0	0	348.72
CLEARFIELD #1	0	0	0	0	0	0	0	0	0	0	0	0	0
CLEARFIELD #2	0	0	0	0	0	0	0	318.37	290.77	88.68	0	0	697.82
DAVIS BOULEVARD	0	0	0	0	0	0	0	0	0	0	0	18.43	18.43
DISTRICT WELL #2	0	0	0	0	0	139.24	165	432.46	190.49	0	0	0	927.19
DISTRICT WELL #3	0	0	0	0	0	0	0	0	0	0	0	0	0
FAIRFIELD	0	0	0	0	0	379.1	477.57	0	0	0	0	0	856.67
LAYTONA	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH OGDEN	0	0	0	0	35.96	97.97	81.21	78.6	49.55	0	0	0	343.29
NORTH WEBER	0	0	0	0	0	38.36	83.17	83.47	16.88	0	0	0	221.88
ORCHARD DR.	0	0	0	0	0	0	18.27	33.07	31.91	17.13	0	0	100.38
RIVERDALE	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH DAVIS	0	9.07	74.92	0	0	0	0	0	0	0	0	55.63	139.62
SOUTH WEBER #1	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH WEBER #2	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>9.07</b>	<b>74.92</b>	<b>0</b>	<b>35.96</b>	<b>715.17</b>	<b>910.71</b>	<b>1,066.33</b>	<b>661.97</b>	<b>105.81</b>	<b>0</b>	<b>74.06</b>	<b>3654</b>

IRRIGATION WELLS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Farmington Well #1	0	0	0	0	0	0	0	0	0	0	0	0	0
Farmington Well #2	0	0	0	0	0	0	0	0	0	0	0	0	0
Mills Park Well	0	0	0	0	0	56.4	85.1	98.6	30.3	0	0	0	270.4
Washington Terrace Well	0	0	0	215.8	241.4	255.8	89.8	0	0	0	0	0	802.8
West Bountiful 5th South	0	0	0	0	0	0	0	0	0	0	0	0	0
West Bountiful Golf Well	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>215.8</b>	<b>241.4</b>	<b>312.2</b>	<b>174.9</b>	<b>98.6</b>	<b>30.3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1073.2</b>

*These wells are some of the facilities which are operated by project generated power.*

# Strategic Initiatives

Amy Derrick, Tour Guide  
Lucy Gelb, Conservation Programs Analyst/GIS Specialist  
Liberty Hamilton, Tour Guide  
Corinne Hoffmann, Tour Guide  
Derek Johnson, PE, Water Resource/Environmental Analyst  
David Rice, Water Conservation Programs Coordinator  
Abby Smith, Meter Technician  
Janice Terry, Assistant Coordinator, Water Conservation Programs  
Marci Wood, Conservation Garden, Lead

**The District is continually developing new strategies to conserve water and extend existing water supplies. Effective planning is essential to create programs that will extend limited water supplies and defer costly new infrastructure. It is imperative to educate the public and help them understand that water is a limited resource in the mountain west and that individual water conservation plays a large role to meet future water demands. The District continues to develop new ideas and new education programs to help the public understand their role to meet future water demands. The District also works with professionals and agencies throughout the state to develop new initiatives to increase the public's awareness of critical water issues and develop new strategies to solve them.**

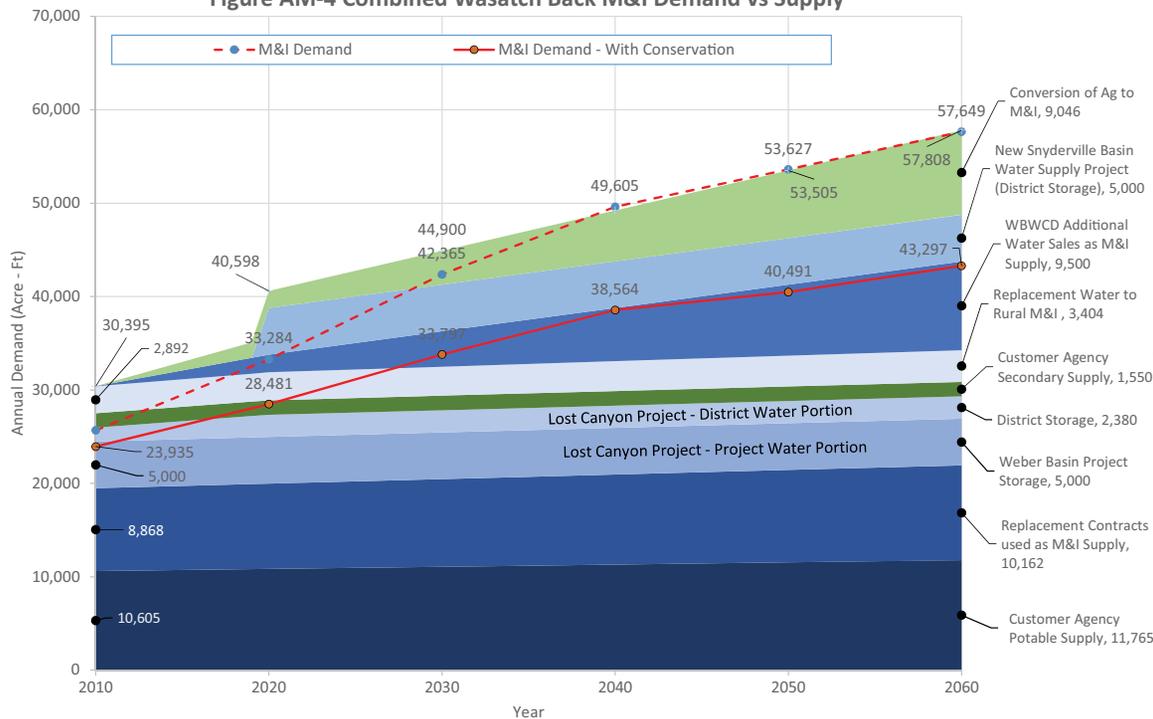




## Water Reuse Feasibility Study

In 2017 the District received partial grant funding for the WBWCD Water Reuse Feasibility Study. The study will provide a detailed look at the feasibility of water reuse at five existing water treatment facilities in the Wasatch Front area of Davis and Weber counties. The study will evaluate infrastructure needed, potential places of use, as well as potential environmental impacts and political challenges. The District has selected a consultant who will continue the study throughout 2018 and early 2019.

Figure AM-4 Combined Wasatch Back M&I Demand vs Supply



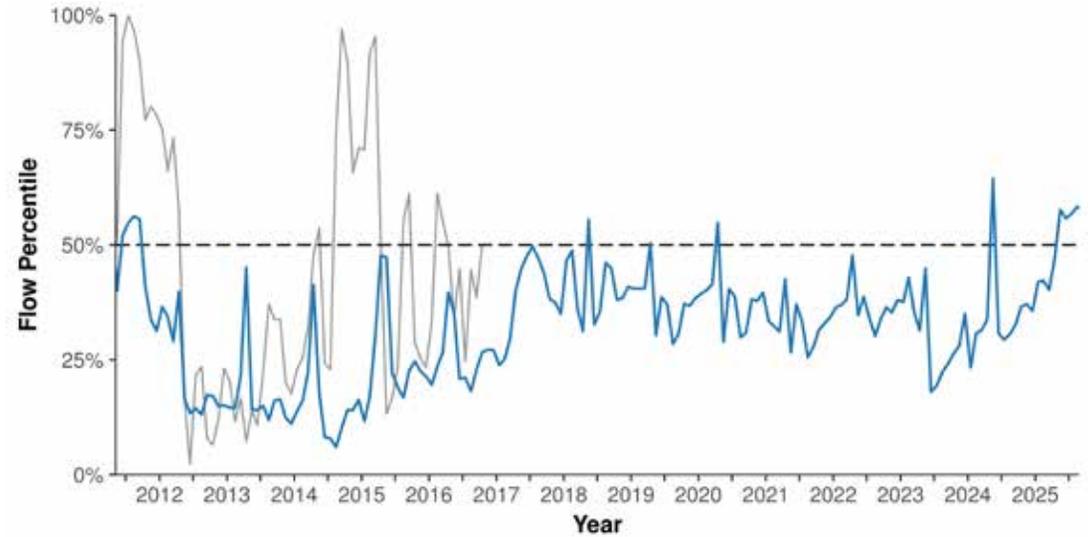
## Update of Supply and Demand Study

In 2017, new population projections for the State of Utah were released by the University of Utah's Kem C. Gardner Policy Institute. These projections provide county-level projections of population growth through the year 2065. These latest projections were used to update projected water demands in the District's latest Supply and Demand Study. In addition, some updates were completed to future water supplies based on information from the District's ongoing Drought Contingency Plan.

## Drought Contingency Plan

The District is collaborating with Utah State University, Utah Division of Water Resources, Western Water Assessment, and JUB Engineering to prepare a Drought Contingency Plan for the District service area. This project has included extensive involvement of stakeholders in our service area including irrigation districts, municipal water providers, industrial water users, and environmental interests.

This document will be one of the first of its kind within Utah and will help the District and other water users in the area to better understand the risks of drought and how to better monitor for drought. Additionally, the Drought Contingency Plan will identify mitigation actions that can be implemented before a drought to lessen the impacts of drought as well as response actions to help us better manage drought conditions. The Drought Contingency Plan will be completed in late 2018.



## Peak Demand Evaluation and Infrastructure Plan

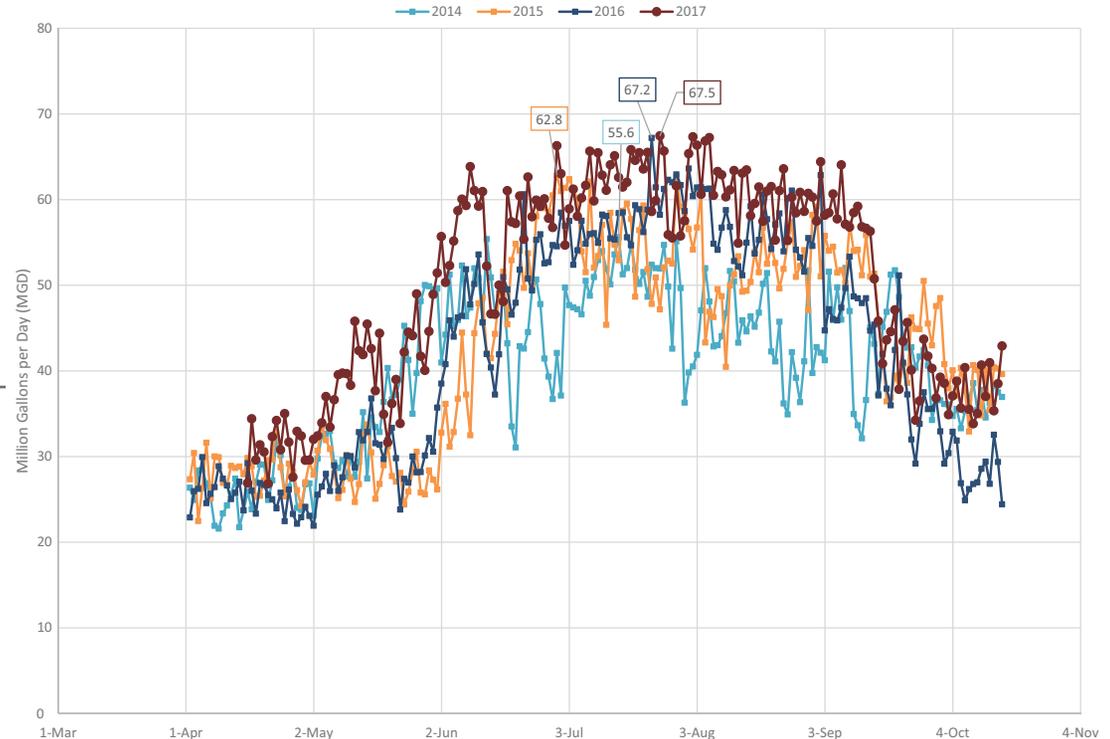
District staff has prepared a draft Infrastructure Plan for the District's major raw water conveyance infrastructure, water treatment facilities, culinary water storage, and culinary water distribution infrastructure. We have updated the District's culinary water system computer model and determined capital improvements necessary to meet future population growth. When finalized, this document will provide guidance on timing of water treatment facility upgrades including the proposed Weber West Water Treatment Plant.

## Resource Plan

The District's Resource Plan has been prepared to provide an overview of current issues, challenges and opportunities we face as the District works to develop sufficient water supplies and facilities to meet the needs of the growing population within its boundaries. The resource plan provides a summary of:

- The latest population projections, projected water demands, and supplies for its service area.
- An overview of major projects needed to meet future conditions.
- A review of conservation programs and metering projects the District is engaged in to help residents in its service area use water more efficiently.
- The status of environmental and recreation issues and opportunities the District is involved in within its service area.

Figure 3-1 WBWCD Central Area Potable Water Production 2014- 2017





# Water Conservation

As one of the largest water purveyors in the State of Utah, the District is very concerned about future water supply for all the various needs. Water conservation plays a key role in meeting long term water needs in our communities and extending supplies, all while deferring costly new development projects. The District is a participating member of the Governor’s Water Conservation Team, with a goal to reduce water use 25% by the year 2025, using the year 2000 as the base comparison year. In addition, the District has its own conservation programming to educate and encourage water use efficiency and reduce waste. The following are some of the elements of the District’s Conservation efforts:

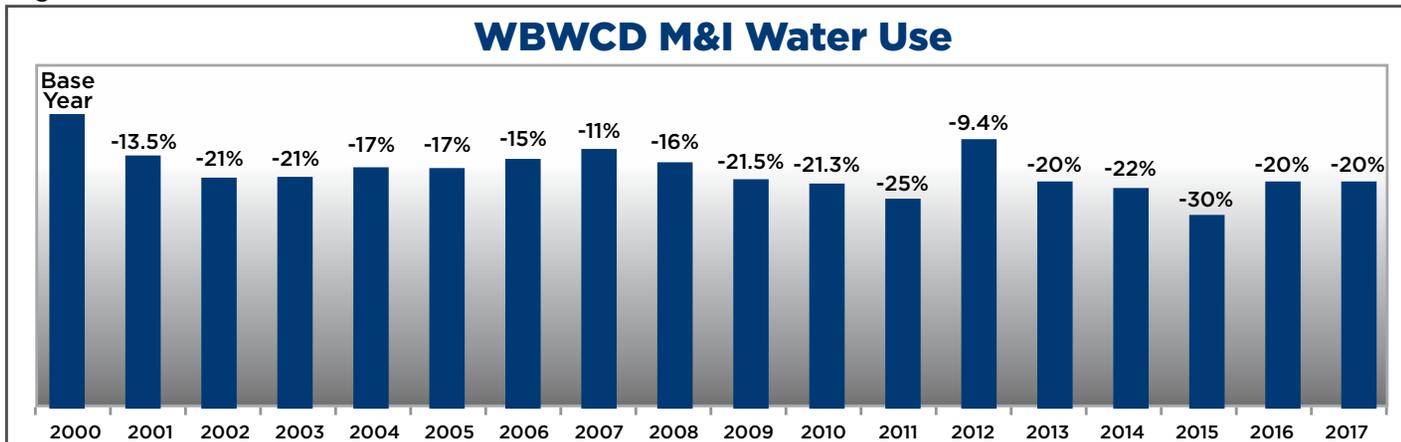
- Ongoing public education and information campaigns which includes:
  - o Billboards and UTA Bus advertising
  - o Deseret Digital online advertising
  - o Social media and District website messaging
  - o Print ads in local direct mail deliveries
  - o Booth and community event participation
  - o Brochures and landscaping guides
- Ongoing implementation and enforcement of time of day watering practices
- The use of ordinances and rate structures to encourage conservation within each of the cities
- Studies on the accuracy and effectiveness of “smart” irrigation controllers
- Rebates for various smart irrigation controllers
- The Water Check program for Davis, Morgan, Summit, and Weber County residents.
- Metering secondary irrigation water to increase end user accountability and education
- The Learning Garden, a free water conservation demonstration garden
- Free landscape classes and Garden Fairs
- Participation with other large water districts in the Localscapes program

## 2017 Activities

## Number Participating

Visitors to the Learning Garden (Estimated)	9,000+
Free Landscape Class Attendance	835
Garden Fair Participation (Estimated)	1,500
Residential Water Audits Completed	346
Secondary Water Metering (Installed to Date)	5,470
Smart Controller Rebates	1,410
Davis School District Tours (Visitors)	3,720
Special Group Tours or Group Events (Scouts, Women’s, Other)	500+
Other Booths or Events in Community	2,800+

Figure 1



Over the last several years, the District has seen significant reductions in water use, despite population growth and several drier than normal years. Figure 1 shows the reduction in deliveries since 2000. The District’s conservation programs play a large role in future water supply and providing water for anticipated growth and additional demands over the next several decades. Conservation education along with technology will provide needed reductions with the end goal of changing the behavior and attitudes of water users and having a water supply that will meet future needs.

\*Not adjusted for population growth for this time period



## The Learning Garden

The District's Learning Garden is two and a half acres of landscaped gardens that showcase water-wise plants and landscaping principles. The largest potential for water savings exists in landscape water use, and the demonstrations help educate the public in water conservation practices in their landscapes with proper plant selection and proper irrigation. The garden is located at the District headquarters site in Layton and each year draws several thousand visitors. The garden is free to the public and is typically open from 8:00 a.m. to 8:00 p.m., April to October, and 8:00 a.m. to 5:00 p.m. during winter months.

Visit the District website at [www.weberbasin.com/conservation](http://www.weberbasin.com/conservation) for the current garden schedules and activities.



Photo Credit: Emma Thompson

## Secondary Water Metering

The District provides secondary water to over 18,000 connections in Davis and Weber counties. The District began metering connections in 2008 and has installed approximately 6,000 meters to date. The goal is to meter all secondary connections on the District's system. As part of metering secondary water, each metered user receives a usage report each month that shows how much water they have used in comparison to what should have been used based on the parcel size, proper watering practices and recent weather patterns. The information provided helps to adjust their watering schedule to better meet landscape needs while reducing excess water and waste.

The District has seen very positive results from the metering projects with metered users saving 35% compared to non-metered use. The District will continue to move forward with secondary water metering as additional funding is secured each year.



Photo Credit: Michelle Deras



# Water Education Outreach

**Weber Basin Water Conservancy District is committed to education with regards to water resources and the ongoing work of delivering water to communities. Great effort is given to ongoing training and teaching of employees and the community as a whole about our water resources and how to manage water effectively and efficiently.**

## **Water Treatment and Distribution Operator Training**

The District provides annual training for water system operators throughout the District. The classes and materials are free of charge and run twice a week through February and March. The attendees are given study materials, presentations, and training to prepare them for the State of Utah's certification exam or for Continuing Education Credits (CEUs). The instructors for the class include District staff, Utah Division of Drinking Water staff, county health officials, equipment and material vendors, as well as other experts in the field of water treatment and distribution. Over 100 attendees participate from many cities each year which helps keep qualified, educated operators at the controls of water treatment and water delivery.



Photo Credit: Marci Wood





## Emergency Preparedness Program

The District continues to participate in emergency preparedness events throughout the year throughout Davis and Weber counties. The purpose of our participation has been to inform the public about drinking water, where it comes from, how it's treated, how to store water at home for emergencies, and why conservation is important in terms of water supply and management. The public has shown great interest in this topic especially during times of economic instability and the increased frequency of natural disasters throughout the world. Church groups, civic groups and others plan and host these events. The District will continue to participate and actively inform the public about water related issues.



## Watershed Protection

Water quality in the watershed, especially for a drinking water source, is a very important issue. The District has organized a Watershed Protection Coalition for the Weber River Watershed. There are many federal, state and local government agencies involved, as well as other private organizations and individuals. The Coalition is active in monitoring projects that may impact the water quality, as well as promoting projects that improve water quality. The District is also very involved with other water quality groups, such as the East Canyon Watershed Committee, the Echo and Wanship TMDL Committee, the Ogden River Restoration Group, and the Summit County Water Quality Advisory Committee.



## Water Fairs

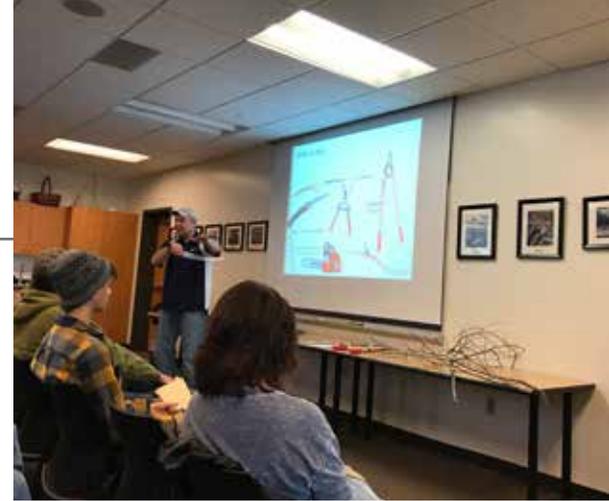
The District's conservation, laboratory, and treatment plant personnel regularly participate in educational and public outreach activities throughout the year. Davis, Weber, Summit, and Cache counties, as well as various school districts, host water fairs annually for fourth graders to provide hands-on educational activities for the local elementary schools. At these fairs, our employees demonstrate a model of the water treatment process that takes muddy water through the different stages of water treatment to make clean drinking water. Attendees learn about water quality, water conservation, recreation opportunities, and wildlife.





## Conservation Classes

The District offers free landscaping and garden classes at the Learning Garden. These classes range from vegetable gardening to landscape design and focus on plant material, irrigation, and maintenance. Each year there are hundreds of participants that take advantage of well-planned and up to date information taught by highly qualified professionals. Classes are available to anyone that wants to attend, and a new schedule is available each spring at [www.weberbasin.com/conservation](http://www.weberbasin.com/conservation).



## District Facilities Tours

District staff conducts tours of the water treatment plants for many different school groups, scout troops, university classes, and individuals. The District has partnered with Wasatch Integrated Waste and Davis Sewer District in agreement with Davis School District to pay for busing and substitute teachers so that school groups, primarily 4th and 7th graders, can tour the water treatment plant and Learning Garden. Thousands of students each year visit the treatment plant.



Each group continues to express their amazement of the complexities of the water treatment process and cleanliness of the facilities. Students also learn about their water source and supply as they visit the District's treatment plant in Layton. Tours are usually available by appointment during the day or early evening. Each year the District also invites city leaders and state legislators on general District facility tours that are informative for city leaders to help them make better decisions regarding water policy. The tours are well received and extremely successful.



## Promotion of Recreation

The District has participated with Ogden City and various counties in providing river flows and other operations that facilitate public recreation. Some events include kayaking, winter sports, and marathons. The reservoirs on the Ogden and Weber rivers provide some of the best recreation locations for boating, water sports, fishing and camping areas.



The District works with Utah State Parks, American Land and Leisure, and NTS to provide many recreational opportunities within District boundaries involving the Ogden and Weber rivers and reservoirs on those rivers. The District works with state and local officials to keep these facilities at their best.

The health and viability of the fisheries within the river basin is also a priority of the District, and the District has been involved with the Division of Wildlife Resources and other stakeholders along the river to promote minimum flow levels as well as better water quality.



Photo Credit: Greg Pierce

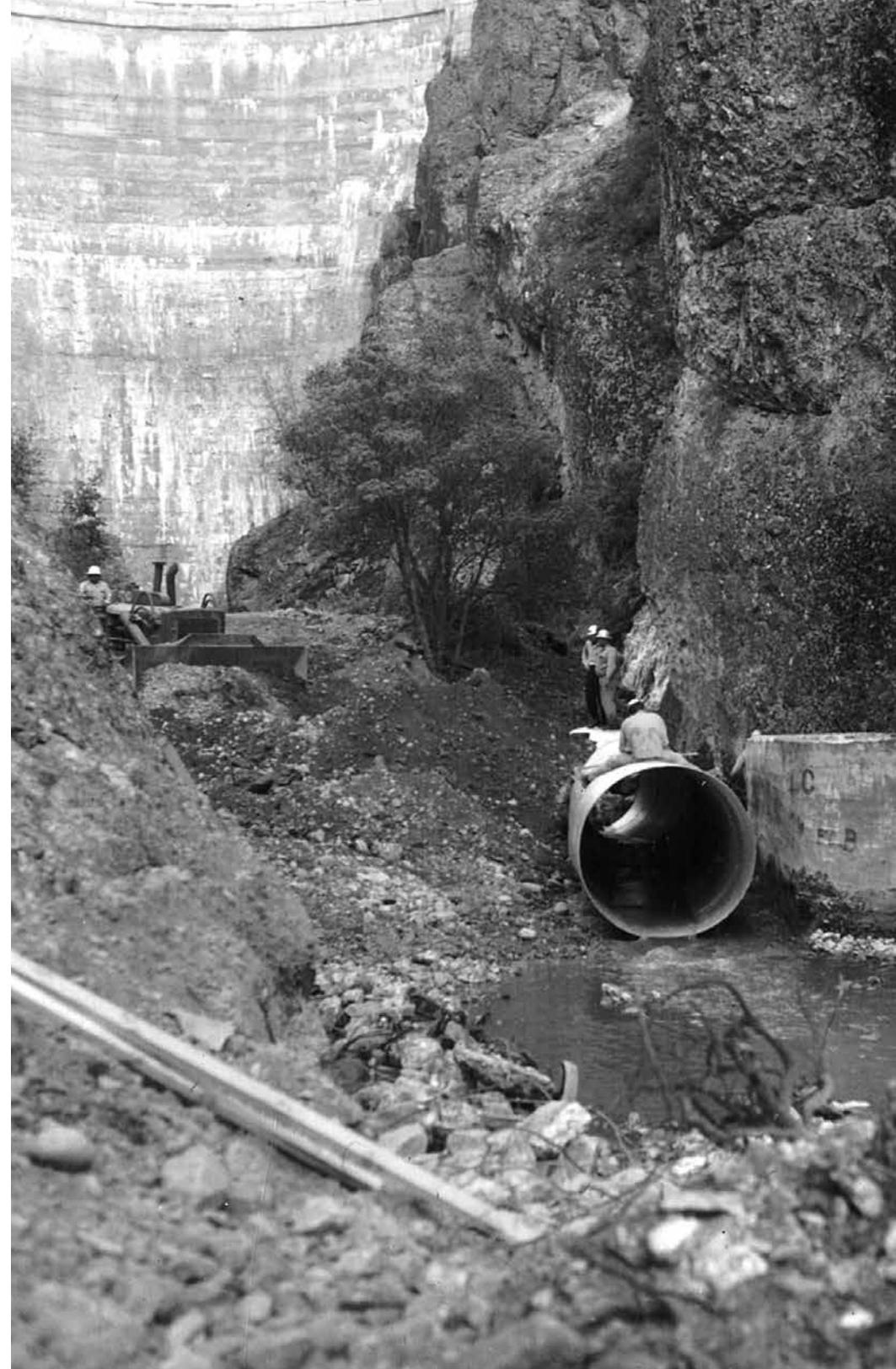
Photo Credit: Noke Kelley

# The History of Weber Basin Water Conservancy District

Weber Basin Water Conservancy District (the District) has the regional water supply responsibilities for Davis, Weber, Morgan, Summit, and Box Elder counties. The District wholesales water to and develops additional supplies for cities, districts, and companies within those counties. Those agencies in turn distribute and retail to their respective customers. Within the District's boundaries, there are over 2,500 square miles of land. The District is unique in that it provides many categories of water including drinking water, agricultural water, urban secondary water, industrial water, and replacement water. Weber Basin delivers more than 225,000 acre-feet of water annually: 90,000 acre-feet for municipal and industrial uses and 135,000 acre-feet for irrigation, which includes secondary pressure irrigation systems.

The District is governed by a nine-member Board of Trustees: three from Davis County, three from Weber County, one from Ogden Valley, one from Morgan County, and one from Summit County. The General Manager for the District is Tage I. Flint. Under his direction, there are three Assistant General Managers, Mark Anderson, Scott Paxman, and Darren Hess; John Davis, the Controller and Human Resource Manager; and five Department Managers: Sherrie Mobley, Administration Manager; Troy Stout, Maintenance Manager; Chris Hogge, Water Supply and Power Manager; Brad Nelson, Municipal & Industrial Water Manager and Jon Parry, Engineering Manager.

The United States Bureau of Reclamation began planning for the Weber Basin Project in 1942, and Congressional authorization of the Project was received in 1949. The Weber Basin Water Conservancy District was created on June 26, 1950, by a decree of the Second District Court of Utah, under the guidelines of the Utah Water Conservancy Act. The District was formed to act as the local sponsor of the federal project and to further supply water resources to the population within its boundaries.





The original Weber Basin Project was constructed by the Bureau of Reclamation from 1952 through 1969 and includes canals, power plants, irrigation and drainage systems, and six major reservoirs on the Ogden and Weber rivers. Three of the six reservoirs—Wanship, Lost Creek, and East Canyon along with the non-District Echo Reservoir—regulate the flow of the Weber River before it emerges from its mountain watershed to the Wasatch Front. Causey and Pineview reservoirs regulate the flow of the Ogden River before it emerges from its watershed and joins the Weber River. Willard Bay, the largest reservoir, is an off-stream project that stores water from the lower reaches of both the Ogden and Weber rivers for uses and exchanges on the Wasatch Front. Subsequent to the original Project, the District constructed a seventh dam, Smith and Morehouse, on the upper reach of the Weber River in Summit County.



The complex transmission system that was constructed as part of the Project includes facilities such as Gateway Canal and Tunnel, the Weber and Davis aqueducts, Ogden Valley Canal and Diversion Dam, Slaterville Diversion Dam, and Stoddard Diversion Dam as well as dozens of secondary reservoirs and many miles of canals, pipelines, and other laterals. Hydropower stations located at Causey Dam, Wanship Dam, and Gateway Canal generate power for District consumption and excess power sales.

In order to repay all of the original Project costs and operate and maintain (O&M) all Project facilities, the District entered into several contracts with the United States. Funding for repayment and O&M of the federal project and the development and O&M of other water sources and facilities is generated from water sales and the original ad valorem tax on properties within District boundaries that was approved by voters in 1952 and again in 1961.

In addition to supplying water, the District also provides other District-wide and statewide services. District facilities are used for flood control during wet seasons, recreation, stream flow management, and watershed protection. Thousands of recreation visitor-days are logged every year at the reservoirs for camping, fishing, boating, and assorted water sports. River releases for fishery management and kayaking are made annually by the District, and water supplies are also used to maintain several wildlife management areas.



Future issues for the District center around development of sufficient water supplies and facilities to meet the needs of the growing population within its boundaries. Water conservation plays an increasingly important role as new sources are likely to be difficult and expensive to develop. Water demands on the District are projected to double in the next 50 years even with the assumption that the existing per capita use will reduce significantly. These projections, along with the constant need to upgrade and rehabilitate existing infrastructure, push the financial needs projections to more than six billion dollars over the next 50 years. Beyond conservation, new projects will include completion of groundwater drilling, change of use of local river supplies, and possibly a large regional importation project.



# Weber Basin Water Principal Infrastructure

## DAMS & RESERVOIRS

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

## AQUIFER STORAGE & RECOVERY

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

## DIVERSIONS

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

## HYDRO GENERATION POWER PLANTS

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

## CANALS, TUNNELS & PIPELINES

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

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## 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
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 Davis	Woods Cross	M&I	5.2	1961
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

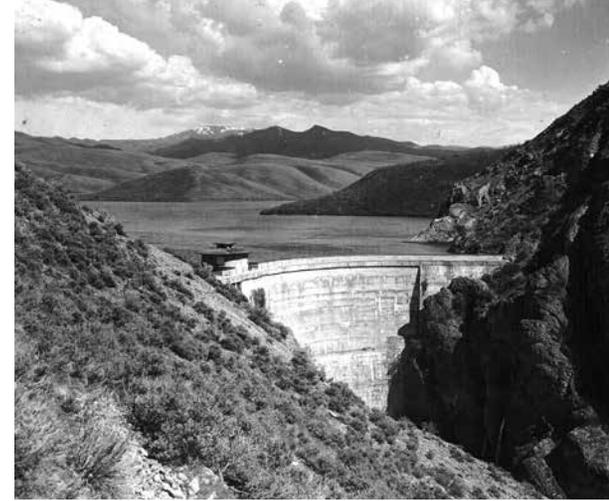
## WATER TREATMENT PLANTS

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



**WEBER BASIN WATER  
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