2016 Fort Collins
Drinking Water Quality Policy
Annual Report

The new chlorine contact basin nearing completion

In October 1993, Fort Collins City Council Resolution 93-144 adopted the Drinking Water Quality Policy (Attachment A). The purpose of the policy is to ensure the continuous delivery of high quality drinking water to Fort Collins Utilities' (Utilities) customers. This 23rd annual report is a requirement of the Drinking Water Quality Policy and summarizes the actions taken in support of policy goals during 2016.

GOAL 1

The City will provide water services that meet or exceed customer expectations for quality, quantity and reliability.

Reliability, Capacity and Redundancy

Fort Collins Utilities owns an 87 million gallon per day capacity drinking water treatment facility and operates it 24 hours a day, seven days a week, to ensure that a continuous supply of high quality drinking water is delivered to our customers. Utilities staff is available at all times to respond to customer complaints and concerns regarding drinking water quality and reliability of service.

The treatment plant has multiple systems and processes in place to provide high reliability with low risk of failure. For example, Utilities has two water sources, three raw water pipelines, multiple chemical storage tanks, delivery systems, treatment trains, filters and storage reservoirs.

Utilities also has a robust asset management and preventative maintenance program, which helps ensure the provision of safe drinking water to the community and that standards are met for community firefighting and emergency activities.

In an effort to increase reliability of electrical power to the Water Treatment Facility, the Water Production Division submitted a budget offer in 2016 to switch power suppliers for the Water Treatment Facility from Xcel to City of Fort Collins Light and Power. This budget offer was approved and staff is currently pursuing this change. This is a politically complicated process with many collateral effects. However, staff is confident we will be able to account for and accommodate all requirements to complete this project in 2018. In addition to increasing system reliability, this change will also create a more collaborative environment for use of renewable electricity generation on site.

Solar panels at the Water Treatment Facility

Emergency Response Plan Update

Utilities performed a vulnerability assessment on the water system in 2015. Consultants analyzed the system from raw water supply through distribution and delivery to the customer taps, including business processes such as billing and customer service. They looked for areas where the system is potentially vulnerable to damage from either natural disasters or man-made events.

This information was used in 2016 to write a new Emergency Response Plan, which will provide guidance for response to emergent events. Staff will be trained on the new plan, with tabletop exercises to be conducted on annual basis to ensure ongoing staff familiarity with the plan.

Regulatory Changes

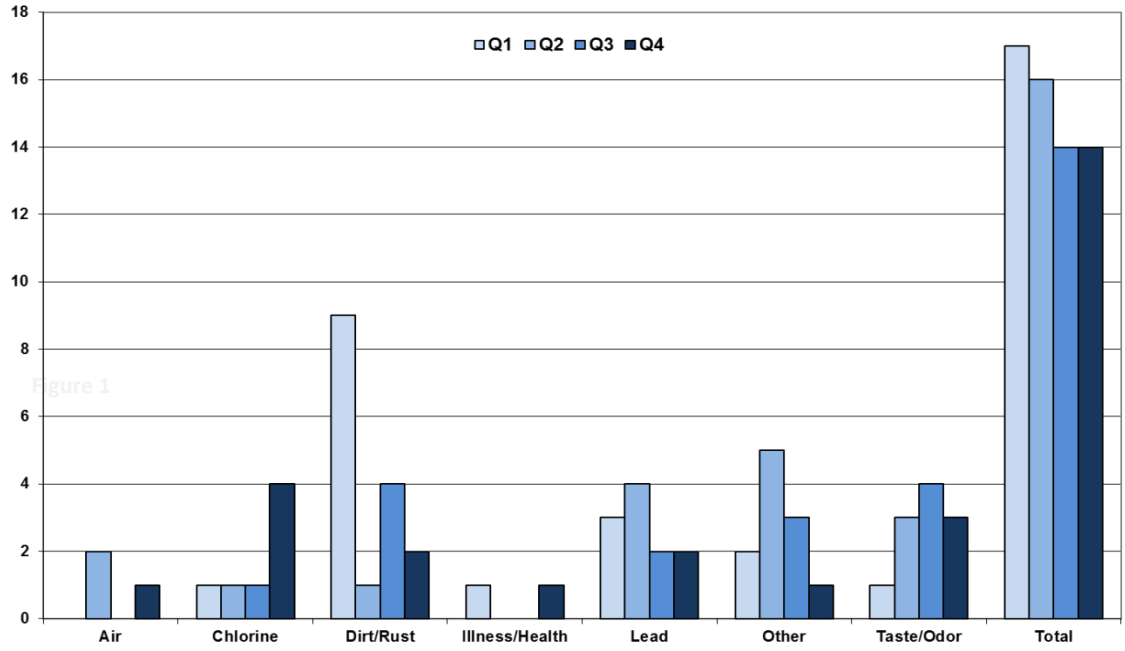
Although there were no regulatory changes to operations in 2016, staff participated in regulatory development meetings with the Colorado Water Quality Control Division (the Division). The focus was to provide input to the Division as they prepared comments to the EPA regarding the content of the draft lead rule. Comment topics included public education requirements and the inclusion of options for water systems that do not have lead service lines in their distribution systems. It is anticipated that the proposed rule will focus on the removal of lead service lines; Utilities is unaware of any lead service lines in the City's distribution system. It is anticipated that EPA will publish the proposed rule towards the end of 2017.

Late in 2016, the Division increased Utilities' lead and copper monitoring requirement (in homes) from once every three years to once per year, beginning with 2017 monitoring.

Water Quality Complaints

In 2015, the City received 61 drinking water quality complaints, equating to a rate of 1.75 per 1,000 customers. This was a 50% increase from 2015, but is still well under benchmark goals. Staff responded to 43 of the complaints in person at the site to talk with customers and collect water samples. Based on the most recent *QualServe* report from the American Water Works Association, 49 other participating utilities had a median number of technical water complaints of 5.31 per 1,000 customer accounts. The "best" quartile rate observed by other participating utilities was 2.06 per 1,000; at 1.75 per 1,000, the City was "better than the best."

Figure 1 – 2016 Complaint Types by Quarter



GOAL 2

The City will protect and maintain high water quality in the development of all codes, policies, plans and specifications related to the acquisition, production and delivery of water services to its customers.

Greater Achievements in the Partnership for Safe Water

The Water Treatment Facility reached a new milestone in the Partnership for Safe Water (PSW) in 2016, by achieving the President's Award. The President's Award is the first tier of Phase IV of the PSW, which is the final phase. The Award is bestowed upon top-tier water plants that have demonstrated commitment to providing superior quality water to their customers, beyond the requirements of the United States Environmental Protection Agency (USEPA) regulations. While the Director's Award, which was obtained by the Water Treatment Facility for the previous 16 years, requires higher performance of the overall filtered water quality, the President's Award requires the performance of each individual filter to be evaluated. Only 36 treatment facilities throughout the nation have achieved this level of recognition. Staff will evaluate the Facility's readiness to proceed to the Excellence in Water Treatment Award in 2017, which is the second tier of Phase IV of the partnership, and the highest level recognized.

The PSW is an alliance of six drinking water organizations including the USEPA. This voluntary program strives to enhance water quality through continuous optimization of treatment processes. Operators, managers and administrators are provided self-assessment and optimization tools to improve performance above and beyond current and proposed regulatory levels.

The PSW was originally designed with a focus on the treatment of drinking water, but has expanded to inspire and recognize excellence in distribution systems. The distribution system was awarded the Partnership's Director's Award for distribution excellence in 2015. The award was conferred after a comprehensive, independent review of our city-wide water quality by a national panel. The review was based in part on water samples collected throughout the distribution system by the City's Water Quality Lab. We are the first utility in Colorado to receive the new Partnership for Safe Water Director's Award for distribution excellence! A short video (Barbara Martin from the American Water Works Association talks about Fort Collins water quality) about the award is here:

https://www.youtube.com/watch?v=87u14Ym0DSM

Environmental Management System

The Water Treatment Facility has established a formal Environmental Management System (EMS) that is certified to conform to the ISO 14001:2004 standard.

A key aspect of the EMS is reduction in energy usage and greenhouse gas footprint. In support of this, the facility has participated in the Colorado Industrial Energy Challenge, sponsored by the Colorado Governor's Energy Office and the U.S. Department of Energy. The Facility achieved a 1.77 percent reduction in purchased electrical usage from 2015, which is a 24 percent reduction from 2005 levels. This exceeds the City's Climate Action Plan goal of 20 percent reduction by 2020.

The ISO standard was updated in 2015 and the Water Treatment Facility Core EMS team is diligently working to update our system to conform to the new standard.

Plant staff continue to pursue energy efficiency improvements in order to reduce the greenhouse gas footprint and control operating costs associated with energy in the face of rising treated water demands.

Environmental Leadership Program

The Environmental Leadership Program (ELP) is a statewide environmental recognition and reward program administered by Colorado Department of Public Health and Environment's Sustainability Program.

The ELP offers benefits and incentives to members that voluntarily go beyond compliance with state and federal regulations and who are committed to continual environmental improvement.

As the result of process improvements and the ISO 14001:2004 certification of the EMS, the facility has received and maintained recognition as an ELP **Gold Leader**.

GOAL 3

The City's water supply, treatment, storage, delivery, and laboratory facilities will be planned, designed, constructed, maintained, staffed, and operated to assure safe, reliable and cost-effective service to the residents of Fort Collins and all those served by the City's water utility.

Source Water Protection Efforts

In 2016, Fort Collins Utilities, with assistance from the Colorado Rural Water Association, completed a Source Water Protection Plan (SWPP) for the City's two major drinking water supplies–Horsetooth Reservoir and the Upper Cache la Poudre River. This document guides the City's water quality monitoring and water supply protection priorities and directly supports the City's Drinking Water Quality Policy:

> "The City will protect raw water sources from contamination or any other activities that would diminish the quality of water provided to customers, or that would result in increased treatment costs."

Through the SWPP development process, public water providers identify potential sources of contamination to water supplies, rank those sources according to risk and identify best management practices to mitigate those risks. The Fort Collins SWPP identifies historical and active mines and forest health/wildfires as the top threats to Horsetooth and the Poudre River water supplies. For the full SWPP report, visit: *fcgov.com/source-water-monitoring*.

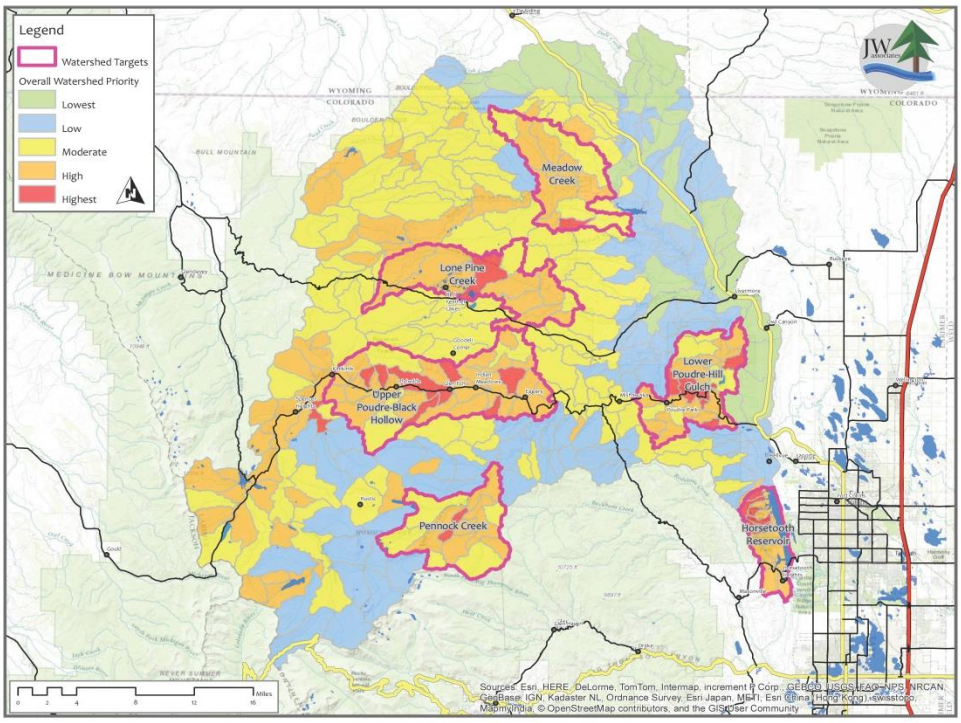
In response, the City developed a mine assessment and action plan and conducted water quality monitoring in drainages throughout the Upper Cache la Poudre (CLP) Watershed with identified historic mining. This monitoring effort revealed no indication of contamination from mine drainage in the Upper CLP. The Watershed Program concluded the legacy of historical mining is no longer a priority issue of concern.

Coalition for the Poudre River Watershed

The Coalition for the Poudre River Watershed (CPRW) was formed in 2013 following the Hewlett Gulch and High Park Fires to address post-fire restoration needs. City of Fort Collins, City of Greeley and Larimer County provided the initial 2-year funding commitments for the development period and retained fixed seats on the Board of Directors through September 2015. In 2016, a professional services agreement was enacted to guide the City's ongoing funding and involvement with CPRW. The City retained a reserved seat on the Board of Directors in 2016 and will continuing working with CPRW through 2017. Future involvement and support will be determined based upon program performance and project relevance to Utilities interests in protecting water supply and quality.

In 2016, the CPRW worked with community stakeholders to complete the Upper Poudre Watershed Recovery and Resiliency Plan. This plan identifies remaining post-wildfire restoration needs and prioritizes areas for future forest health and wildfire risk reduction projects based on watershed conditions and values at risk. For more information on CPRW and the Upper Poudre Watershed Recovery and Resiliency Plan as well as CPRW members and partnerships, visit: [*poudrewatershed.org*](poudrewatershed.org).

Figure 2



Upper Poudre Watershed overall priority watersheds and target areas for forest health and wildfire risk reduction projects outlined in the Upper Poudre Watershed Recovery and Resiliency Plan.

Watershed Monitoring Activities

Cache la Poudre River

Since 2008, the Utilities Source Watershed Program has partnered with the City of Greeley and the Tri-Districts in the Collaborative Upper Cache la Poudre (CLP) Water Quality Monitoring Program in the shared interest of sustaining this pristine water supply. This program assists partners in meeting current and future drinking water treatment goals by reporting current water quality conditions and trends in the Upper CLP watershed and issues that potentially impact watershed health. Seasonal, annual and 5-year water quality reports are available on the Source Watershed Program website: fcgov.com/upper-poudre-monitoring.

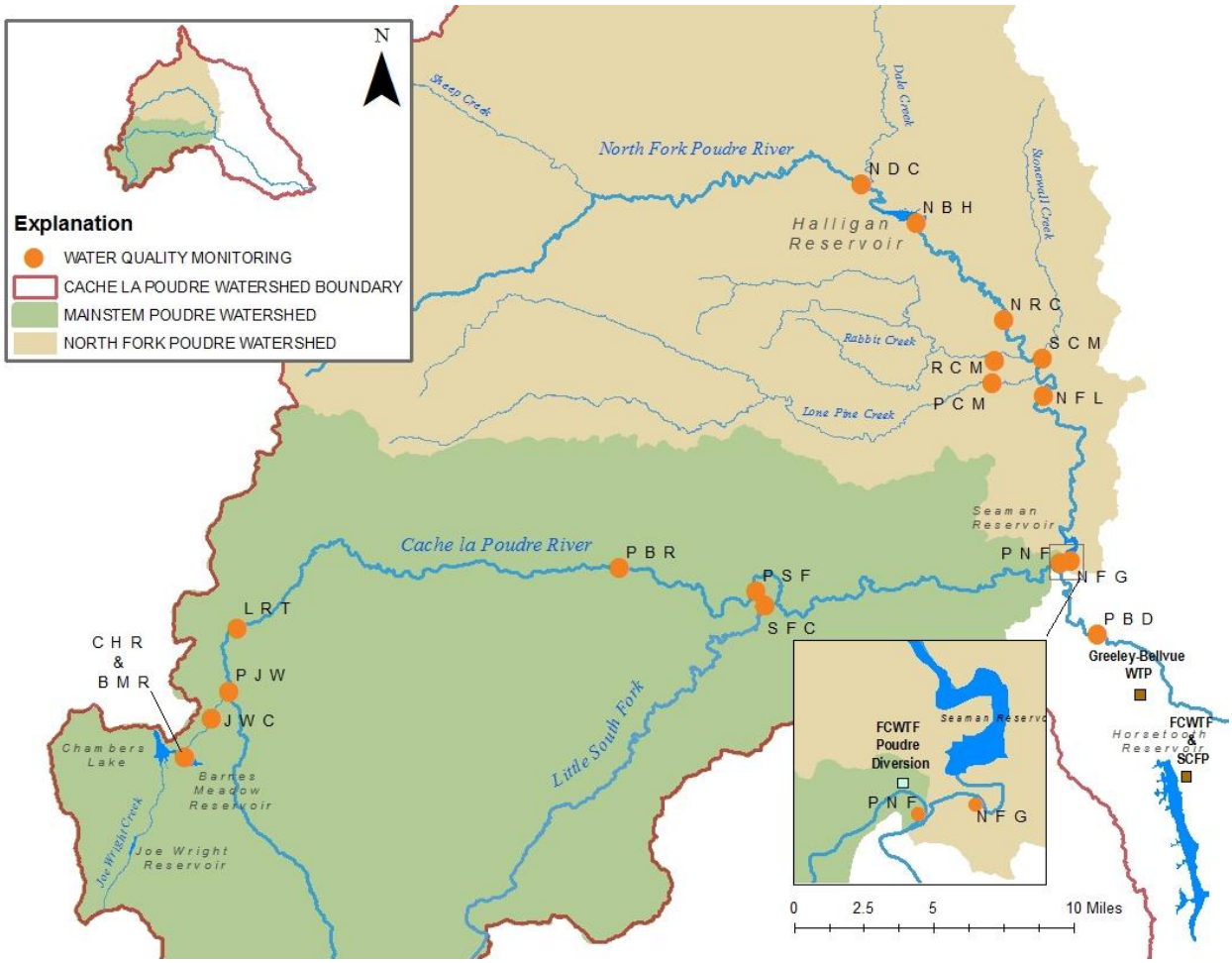


Figure 3

Horsetooth Reservoir

Fort Collins Utilities has actively monitored the water quality in Horsetooth Reservoir since the mid-1980s. In 2016, Utilities continued its cost-share agreement with Northern Water for the monitoring of Horsetooth Reservoir water quality. Utilities receives up-to-date information about water quality conditions in Horsetooth Reservoir. In exchange for monitoring services, the Fort Collins Water Quality Lab is providing in-kind contribution of chlorophyll-*a* analysis for samples collected from sites within Northern's monitoring network. Northern Water monitors water quality in streams canals, lakes and reservoirs throughout the Colorado Big-Thompson and Windy Gap projects. The value of these analytical services is approximately $3,930.

Water quality data and Northern Water's tri-annual water quality reports are available at:

northernwater.org/WaterQuality/MonitoringPrograms.aspx

Utilities Watershed Program staff sampling water from Horsetooth Reservoir.

Big Thompson Watershed Forum

Fort Collins Utilities is a major funder and member of the Board of Directors for the Big Thompson Watershed Forum (BTWF), along with the City of Greeley, the Tri-Districts, City of Loveland, Weld County and Northern Water. The BTWF manages a routine water quality monitoring program, through a contract with the US Geological Survey, on the Big Thompson River, a major component of the Colorado-Big Thompson (C-BT) system, which delivers water to Horsetooth Reservoir. Northern Water also monitors additional C-BT Project canals and reservoirs upstream of Horsetooth. This sustainable approach to monitoring large watersheds reduces sampling costs and provides a significant shared knowledge base. For more information, visit: *btwatershed.org*.

Certified Laboratory

The City of Fort Collins is required to comply with state and federal drinking water standards. These standards mandate that a *certified* laboratory perform all regulatory compliance testing. The City's Water Quality Lab staff provides state-certified regulatory compliance testing and reporting for Utilities as well as ten other regional water agencies.

The Water Quality Lab first achieved certification in bacteriology testing in 1978. Since that time, the lab has gained certified status for a large array of water quality tests. Certified status is achieved through a multi-step process:

Figure 4 – Certified Status Achievement Process

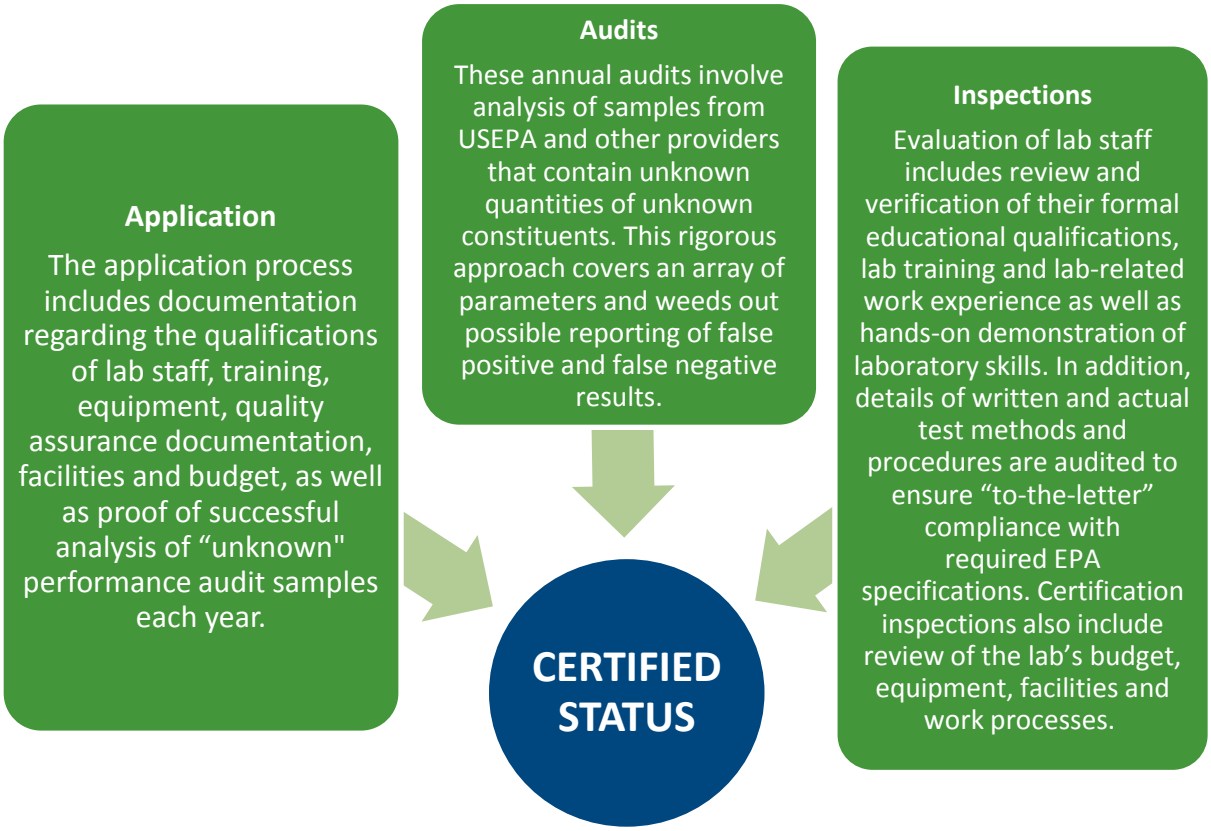


Figure 4

The Water Quality Services Division will be working with a consultant to complete a master plan in 2017. This will include a condition assessment of the Water Quality Lab and will result in a five year plan for maintaining the lab's capability to provide necessary services. The process will consider such options as renovation of the current building, building a new facility, or combining with the Pollution Control Lab into one facility.

Asset Management

Utilities continued risk-forecasting efforts within its water production and distribution asset base throughout 2016. The Asset Management risk forecast is a process to evaluate the condition of the equipment, piping and facilities, the types of risks associated with the system and determinations as to timeline for replacement.

Some 2016 progress highlights:

- Staff continued to add asset information to the IBM Maximo Enterprise Asset Management System for the Water Treatment Facility and the distribution system. Staff refined methodologies for classifying assets and maintenance performed on assets to provide better data for use in planning.

- Continued using data from the IBM Maximo Enterprise Asset Management System to analyze and benchmark maintenance metrics. Data shows that we are exceeding our benchmark goal of 4 planned maintenance event for every 1 corrective maintenance event.

- The Water Treatment Facility completed multiple asset replacement projects that had been identified in the Master Plan, including critical upgrades to the electrical systems.

- Replaced media and recoated walls in six filters.

- Completed minor repairs to the East and West storage reservoirs on the Water Treatment Facility site, as recommended in the previous inspections.

East Reservoir Influent pipe before and after coating.

- Extended permanent power to the Goathill Reservoir, previously powered only by small solar panels and a propane powered generator.

- Commissioned the new Chlorine Contact Basin, which is now online and functioning as designed.

Effluent piping from the new Chlorine Contact Basin

- In 2016, we replaced 7,751 linear feet, or 1.47 miles, of water mains out of 550 total miles of pipe in the system. This equates to an annual replacement rate of ~0.27 percent. The 2016 replacement rate was 16 percent higher than the 2014 replacement rate. Plans are being developed to increase this rate to 1 percent replacement per year by 2020.

- 76 miles of water distribution pipes were checked for leaks.

- Performed 482 Backflow and Cross Connection Surveys.

Pleasant Valley Pre-Sedimentation Basin

In 2013, a pre-sedimentation basin was put in service ahead of the Pleasant Valley pipeline as a water quality buffer between the pipeline and the canal carrying water to the pipeline from North Poudre Irrigation Company's Munroe Diversion off the Poudre River. A sediment removal study continued in 2016 comparing multiple water quality parameters between the influent and effluent of the basin to further verify the efficiency of the basin and its value in protecting water quality for our customers. Data demonstrated a 49 percent reduction of total suspended solids (TSS) in the effluent of the basin as compared to the influent. The basin capture an estimated 18 tons of sediment during operations in 2016.

The Pleasant Valley Pre-Sedimentation Basin

Chlorine Contact Basin

The Water Treatment Facility is nearing completion of construction on the Chlorine Contact Basin. The basin was brought online in February 2017 and is performing as designed. All that remains at this time is earthwork and landscaping. This heavily baffled basin provides sufficient detention time prior to the drinking water storage reservoirs to meet the disinfection contact times required by state regulations at all production rates. Previously, a portion of the volume of the storage reservoirs was reserved to meet these requirements. With the commissioning of this 2-million gallon basin, the Water Treatment Facility gains back nearly 10 million gallons of usable storage capacity in our reservoirs. This project is on-track to be completed under budget with a minor schedule extension.

State Certified Operators

The treatment facility operators are certified by the Colorado Water and Wastewater Facility Operators Certification Board as certified water professionals. The plant superintendent and all plant operators have earned the highest level of classification, 'A'. Operation of the Water Treatment Facility requires supervision by a certified Operator A. The Water Production Manager holds a B level certification and is testing for the A. Several personnel are also certified distribution system operators, varying from level I to level IV. Operation of our pump stations and storage reservoirs requires supervision by a certified Operator III. Additionally, several non-operations personnel hold operator certifications. Other plant personnel are encouraged to pursue certification as plant operators, as well as other professional certifications that increase their skills. One staff member holds Professional Operator (PO) certification through the Certification Council for Environmental Professionals. Other certifications held by plant staff include:

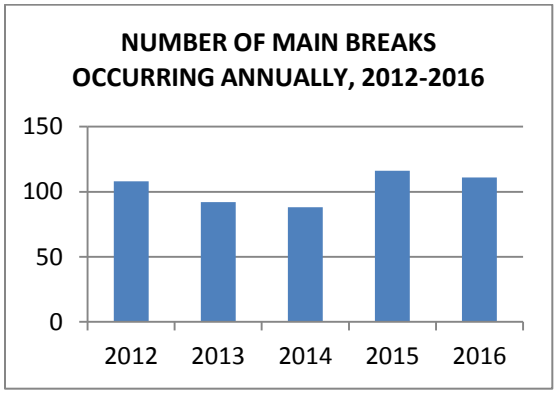
- Professional Engineer
- Certified Control Systems Technician
- Certified Water Quality Analyst
- Hazardous Materials Technician
- Journeyman Electrician
- DOT Certification
- ASE Mechanic Certification

Distribution Maintenance System

The Water Distribution Crews are responsible for the operation and maintenance of 539.03 miles of water mains, 701 locator stations, 490 cathodic protection test stations, 12,701 valves, 3,763 fire hydrants and 38,469 water service lines in the City's water distribution system.

Some of the main responsibilities of the group are to manage, implement, and set annual goals for defined maintenance programs. In 2016, the group was responsible for responding to 955 customer complaints during regular hours and 285 after hours. They also repaired 179 valves, 109 fire hydrants, 67 service lines, and 21 service leaks. Additionally, 111 water main breaks were repaired. Of which 63 were electrolysis, 40 were beam breaks, and 8 were longitudinal breaks. In addition, 8 miscellaneous repairs were made to the water mains.

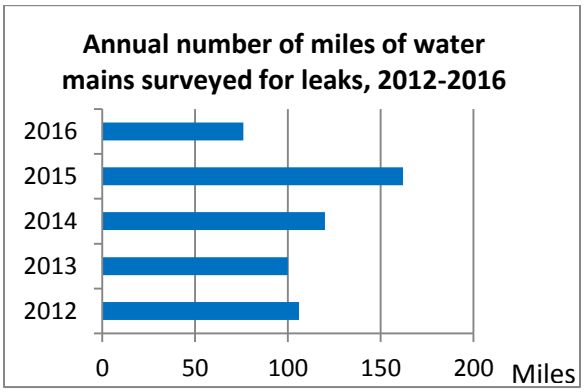
Figure 5



Maintenance performed by the crews during 2016, includes maintenance checks on 2,559 valves, 103 air valves, and 1,634 fire hydrants. The crews also flushed the water mains on the west side of the water distribution system from Overland Trail to College Avenue and operated 1,050 fire hydrants during that program. Leak detection operations were performed on 76 miles of water main along with 482 backflow surveys and inspections and took 387 cathodic protection test station readings.

Construction Crews replaced a total of 7,751 feet of water main and installed 119 new valves and 14 fire hydrants during our annual water distribution system replacement program.

Figure 6



Following is a list of replacement projects:

1. Stover Street Laurel to Myrtle - 762'
2. Oxford Lane/Lemay Avenue to Oxford Court - 2,587'
3. Mathews Street/Olive Street North to 207 Mathews Street - 418'
4. Pine Street 200 block - 106'
5. Boltz Drive/Lemay Avenue to Camelot - 1,067'
6. Camelot Dive/Mansfield to Parkview - 1,330'
7. Howes Street/Mountain Avenue to Oak Street - 630'
8. Silver Creek Drive/Lakeshore Drive to South end of Lakeshore Drive - 410'
9. 350 East Horsetooth Road (Marriot Hotel parking lot) JFK PKWY - 442'

This report was compiled by the Water Production Division with contributions from:

- Water Quality Services Division
- Environmental Regulatory Affairs Division
- Water Field Operations Service Unit