2019 Fort Collins Drinking Water Quality Policy Annual Report

Fort Collins Water Treatment Facility

In October 1993, Fort Collins City Council Resolution 93-144 adopted the Drinking Water Quality Policy (Attachment A) to ensure the continuous delivery of high-quality drinking water to Fort Collins Utilities' (Utilities) customers. This 26th annual report is a requirement of the Drinking Water Quality Policy and summarizes the actions taken in support of policy goals during 2019.

GOAL 1

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

Reliability, Capacity and Redundancy

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

In 2019, the plant produced 8.0 billion gallons of drinking water. Peak day production occurred Aug. 20 at 44.7 million gallons per day, or 51% of plant capacity. At this rate, available treated water storage would meet 18.0 hours of peak demand, exceeding the benchmark of storage capacity for 12 hours of peak demand.

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 that helps ensure the provision of safe drinking water to the community and that standards are met for community firefighting and emergency needs.

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 facility from Xcel to Fort Collins Utilities Light & Power. This project was completed in 2019 and the facility is now a Fort Collins Utilities customer. In addition to increasing system reliability, this change also has created a more collaborative environment for efficiency projects and communication and will likely be a more friendly environment for future additional on-site renewable electricity generation projects.

Figure 1. The Microhydro Generator

The Microhydro project was completed in 2019. The generator uses the pressure of the incoming Horsetooth raw water source to generate electrical energy. Testing and commissioning began in February, with the project fully online, including data collection, in May. The generator meets 20% of the facility's electrical demand.

Regulatory Changes

EPA published the revised lead/copper rule in November. The proposed rule addresses lead service line inventory and replacement, monitoring in schools and licensed daycare facilities, as well as a change in public notification. The final rule from EPA is expected in 2020 and may or may not contain different language/provisions. Some of the final rule's new requirements apply to the City of Fort Collins as soon as three years after rule publication; others apply later. A consultant has been hired to perform a gap assessment and provide recommendations for compliance strategies.

Approximately every five years, EPA requires utilities across the nation to monitor for a list of unregulated contaminants in the source and/or finished water. The list varies each monitoring period and the results help EPA determine which contaminants warrant future regulation. Monitoring for the most current list began in 2019 and will continue into 2020 (see table 1).

In 2019, Utilities participated in a stakeholder group to help formulate a regulation on Technically Enhanced Naturally Occurring Radioactive Material (TENORM) in water residuals. The draft regulation focuses on Radium and its progeny. As it is currently worded, the City's water residuals would be exempt from the regulation.

Table 1

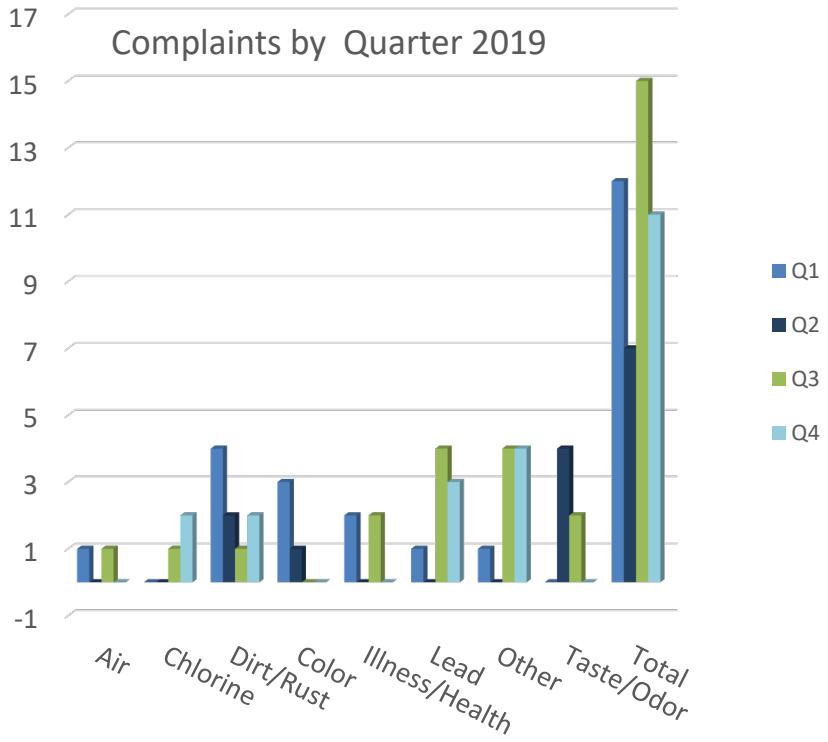
UNREGULATED CONTAMINANTS						
Contaminant	**Year**	**Average**	**Range**	**Number of Samples**	**Unit of Measure**	**Sample Site**
Bromochloroacetic Acid	2019	1.2	0.6-1.6	16	ug/L	Distribution System
Bromodichloroacetic Acid		1.0	0.5-1.6			
Dichloroacetic Acid		9.3	3-13			
Trichloroacetic Acid		11.8	9.8-14			
Manganese		1.1	1-1.2	2		Finished Water
TOC		2400	1700-2900	4		Raw Water

The following contaminants were also monitored but not found above the detection limit: chlorodibromoacetic acid, dibromoacetic acid, monobromoacetic acid, monochloroacetic acid, tribromoacetic acid, germanium, bromide, anatoxin-a, cylindrospermopsin, total microcystin, alpha-hexachlorocyclohexane, chlorpyrifos, dimethipin, ethoprop, oxyfluorfen, profenofos, tebuconazole, total permethrin, tribufos, 1-butanol, 2-methoxyethanol, 2-propen-1-ol, butylated hydroxyanisole, o-toluidine, and quinolone.

Water Quality Complaints

In 2019, the City received 45 drinking water quality complaints, equating to a rate of 0.35 per 1,000 customers. This was a decrease of 28 complaints, or 38%, from 2018 and remains well under benchmark goals. Staff responded to 30 of the complaints on-site to talk with customers and collect water samples. Based on the 2017 Benchmarking Manual from the American Water Works Association, 23 other participating utilities had a median number of technical water complaints of 5.4 per 1,000 customer accounts. The "best" quartile rate observed by other participating utilities was 1.1 per 1,000. At 0.35 per 1,000, the City of Fort Collins was "better than the best."

Figure 2



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.

The quality of Fort Collins drinking water remains very high. During 2019, the plant produced an average filtered water turbidity of 0.032 NTU, which is far below our maximum goal of 0.10 NTU. The system maintained disinfectant levels well above the minimum 0.2 mg/L level required by regulation at all times.

Staff developed plans for source redundancy during the planned Horsetooth shutdown by Northern Water in 2020.

Code Updates

- Updated the Plant Investment Fee Water Resource Requirement to split the, “Greek Letter Housing,” category into two subcategories, “dormitory (commercial),” and, “multi-family.”
- Revised and published Water, Wastewater and Stormwater Development Construction Standards.
- Updated and received Council approval of Cross-Connection Manual.

Partnership for Safe Water (PSW)

The Water Treatment Facility maintained its President’s Award status for 2019, for the fourth year in a row. 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 customers, beyond the requirements of the EPA regulations. While the Director’s Award, which has been maintained by the Water Treatment Facility for the last 20 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 have set a goal of achieving the Excellence in Water Treatment Award, the second tier of Phase IV, and the highest level achievable in the program, in 2021.

The PSW is an alliance of six drinking water organizations including the EPA. 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 City’s distribution system was awarded the Partnership’s Director’s Award for distribution excellence in 2015 and has maintained that status in 2016 - 2019.

Environmental Management System

The Water Treatment Facility has established a formal Environmental Management System (EMS) that is certified to conform to the ISO 14001:2015 standard.

A key aspect of the EMS is reduction in energy use 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. Electrical power purchased from the grid was reduced from 2018 by 18.3% percent. This large reduction is mostly due to the commissioning of the Microhydro project. The microhydro generator is now producing over 20% of the facility's energy needs. The solar field at the facility was originally built under a power purchase agreement, the term of which has expired. Facility staff negotiated the purchase of the solar field infrastructure. Between the solar field and the microhydro unit, nearly 25% of the facility's energy needs is generated on site through renewable sources. Purchased energy use levels equate to a 39% reduction in greenhouse gas footprint from 2005 levels, which greatly exceeds the City's Climate Action Plan goal of 20% reduction by 2020.

Plant staff continue to pursue energy efficiency improvements to reduce the greenhouse gas footprint and control operating costs associated with energy.

Another significant aspect of our EMS is waste stream management, of which treatment residual solids make up 96%. Cooperation began with the Low Impact Design program to provide some of this material for testing as treatment media for removal of phosphorous from stormwater runoff. If successful, this beneficial use has the potential to divert 100% of the total residuals generated from the landfill. This program has successfully completed the laboratory research portion and has moved into the full-scale pilot phase of the program.

Environmental Leadership Program

The Environmental Leadership Program (ELP) is a statewide environmental recognition and reward program administered by the CDPHE 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 14001:2015 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 Quality Monitoring

Utilities collaborates with other local drinking water providers and water stakeholders to monitor water quality trends in the Poudre River, Big Thompson River and Horsetooth Reservoir. Monitoring includes more than 25 different chemicals and physical and microbiological contaminants at 35 locations throughout our source watersheds. As in previous years, 2019 water quality data indicated that the City's source watersheds continue to provide high-quality water.

Upper Cache la Poudre River

Since 2008, the Utilities Watershed Program has led the collaborative upper Cache la Poudre Water Quality Monitoring Program. Partner utilities include the City of Greeley and Soldier Canyon Water Authority. This monitoring program assists partners in meeting current and future drinking water treatment goals by reporting seasonal, short term and long-term trends in source water quality. Seasonal, annual and five-year water quality reports are available on the Watershed Program website, *fcgov.com/upper-poudre-monitoring*.

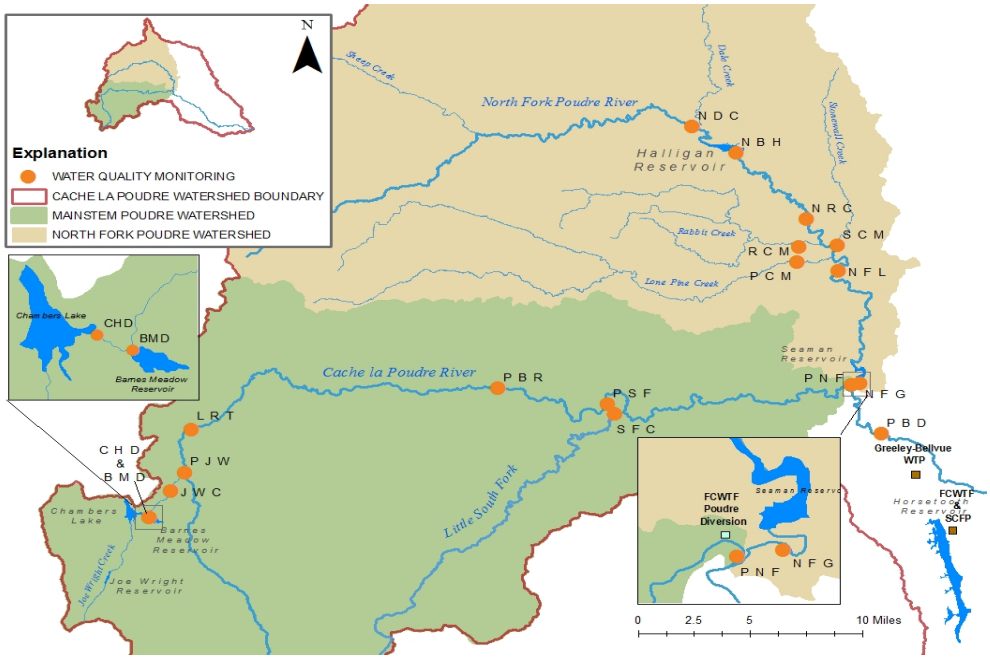


Figure 3. Map showing the locations of Upper Cache la Poudre River Monitoring Program study sites within the Poudre River Watershed.

Horsetooth Reservoir

Utilities has actively monitored the water quality in Horsetooth Reservoir since the mid-1980s. In 2015, Utilities entered into a cost-share agreement with Northern Water for the monitoring of Horsetooth Reservoir water quality to conserve resources. Northern provides up-to-date information about water quality conditions, periodically analyzes data and writes trend reports. In exchange for these services, the Fort Collins Water Quality Lab provides chlorophyll-*a* analysis for up to 200 samples collected from sites within Northern Water's monitoring network as an in-kind contribution to the program. Northern Water's water quality network includes streams, canals, lakes and reservoirs throughout the Colorado Big-Thompson and Windy Gap projects. Water quality data and Northern Water's most recent Horsetooth water quality report are available at *northernwater.org/WaterQuality/MonitoringPrograms.aspx*.

Big Thompson River Watershed

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, City of Loveland, Northern Water, Weld County and Soldier Canyon Water Authority. The BTWF manages a routine water quality monitoring program, through a contract with the U.S. Geological Survey, on the Big Thompson River, a major component of the C-BT system, which delivers water to Horsetooth Reservoir. Northern Water also monitors additional C-BT Project canals and reservoirs upstream of Horsetooth. This collaborative approach to monitoring large watersheds reduces sampling costs and provides a significant shared knowledge base between partners. For more information, visit *btwatershed.org*.

Source Water Protection

The City of Fort Collins' drinking water supply comes from two sources: the upper Cache la Poudre River (Poudre River) and Horsetooth Reservoir. Beginning as rain and snow in the mountains, Poudre River water originates on the eastern slope of the Continental Divide, northwest of Fort Collins. Horsetooth water is delivered from the Colorado River Basin on the western slope via the Colorado-Big Thompson (C-BT) Water Project.

In 2016, with assistance from the Colorado Rural Water Association, Utilities, CDPHE and a local steering committee completed a Source Water Protection Plan (SWPP) for the Poudre River and Horsetooth Reservoir. 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."

The SWPP (*fcgov.com/source-water-monitoring)* identifies potential sources of contamination to water supplies; ranks those sources according to risk to the City's drinking water infrastructure and source water quality; and identifies best management practices to mitigate those risks. The Watershed Program plans to update the SWPP in 2021.

Forest Health/Wildfires – High Priority

Forest health and the threats of water quality pollution and damage to the City's drinking water infrastructure from future wildfires continues to be a high priority threat to the City's source water supplies.

Since 2013, Utilities has worked collaboratively with the Coalition for the Poudre River Watershed (CPRW) and other stakeholders to improve the health and resiliency of the Poudre River. The City provided an initial two years of funding for establishing the organization and retains a reserved seat on CPRW's Board of Directors alongside other partner utilities and stakeholders.

In 2016, CPRW worked with community stakeholders to complete the Poudre River Watershed Resiliency Plan (*poudrewatershed.org)*, which is used by Utilities to prioritize watershed protection projects in the watershed.

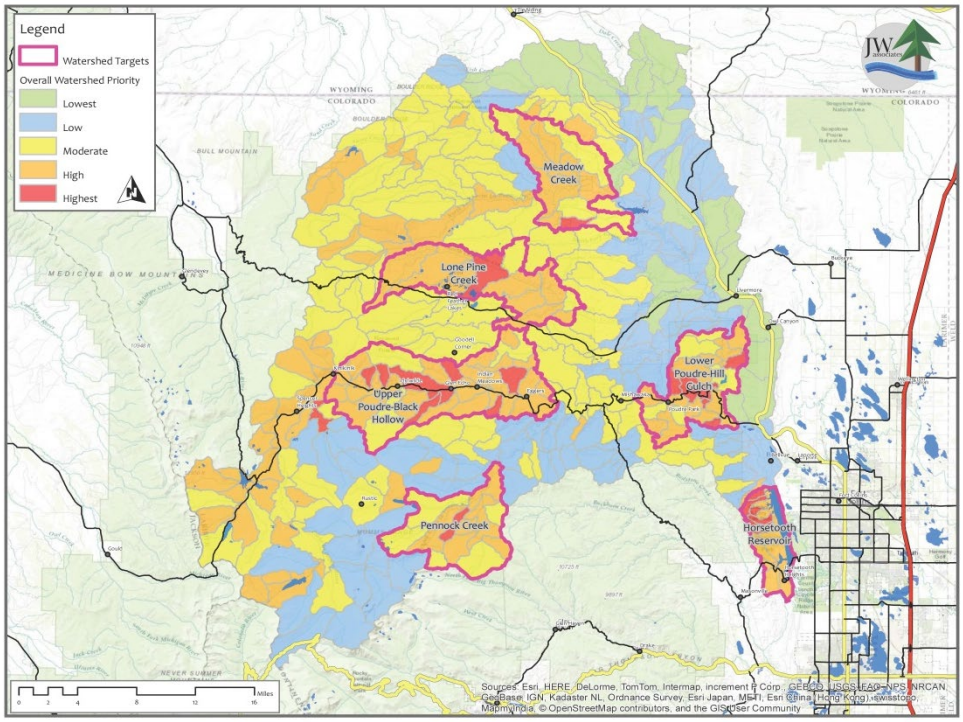


Figure 4. Map showing the forest health and wildfire risk reduction priority watersheds that were identified as part of the Upper Poudre Watershed Recovery and Resiliency Plan.

Utilities continues to allocate funding for collaborative wildfire restoration and mitigation projects to protect our source watersheds. Restoration efforts have largely focused on projects within the 2012 High Park Fire burn area to control soil erosion. Unnamed Tributary-3 is a small tributary to the Poudre River near the Munroe Tunnel Inlet. Heavy debris flows from the drainage following the High Park Fire completely clogged the tunnel, interrupting water supply and damaging infrastructure. The drainage was identified as a high priority for restoration following the fire due to its instability and risk for additional erosion. In 2012, CPRW began a multiyear

project with Fort Collins Utilities and other partners to stabilize the drainage. The project was completed in the Spring of 2019.

Figure 5. Project partners and volunteers work together to stabilize the Unnamed Tributary-3 drainage

In addition, several forest thinning projects have successfully been completed outside of the burn area to reduce fuel loads and mitigate the risk of future large, high-severity wildfires that could impact our source water. The 2017 Elkhorn Creek Forest Health Initiative is a great example of a collaborative project that successfully reduced fuels in a priority area of the Poudre River. The project was completed using funding, labor and equipment from more than a dozen partners, including Utilities. Wildfire risk was significantly reduced with treatments that included hand thinning, piling and burning; mechanical treatment; and prescribed fire. The successes of this project provided a project implementation template that was used at a larger scale on additional wildfire mitigation projects within the Elkhorn Creek Watershed and Lory State Park on the west side Horsetooth Reservoir in 2019.

Figure 6. Forest fuels reduction efforts within the Elkhorn Creek drainage

The Lory State Park Project was a cost-share collaborative wildfire mitigation project including the Colorado State Forest Service, Colorado Parks and Wildlife, Peaks to People Water Fund, Northern Water and Fort Collins Utilities that was completed in 2019. Approximately 146 priority acres were treated, primarily by mastication, with some areas of hand thinning and slash piling. Fort Collins Utilities contributed $20,000 to this project.

The 2019 North Rim Road wildfire mitigation project, located to the south of and above Elkhorn Creek, was funded by Fort Collins Utilities ($42,000), the Colorado State Forest Service ($42,000), and the Colorado Department of Local Affairs ($130,000). Approximately 85 acres were treated at the project site, on two private properties adjacent to US Forest Service lands. Most of the treated area was masticated, with the remainder treated by hand thinning and slash piling. Slash piles will be burned during late spring of 2020 by the Forest Stewards Guild. The before and after treatment photos demonstrate the effectiveness of these treatments in reducing forest fuels.

Figure 7. Forest treatment crews create slash piles (left) and burn piles (right)

The Watershed Program also continues to participate in the Northern Colorado Fireshed Collaborative (NCFC), which consists of local federal natural resource agencies, state agencies, local government, researchers, community groups and non-profits. NCFC partners work closely together to prioritize and align their wildfire mitigation projects to achieve broader landscape level watershed protection and further leverage project funding.

Utilities' Watershed Program completed a Drinking Water Infrastructure Wildfire Risk Assessment for the Cache la Poudre River in 2019. The study combined site visits and desktop analyses to determine a range of best management practices designed to reduce the risk damage from future wildfires to key infrastructure, such as intakes, diversions, pipelines, reservoirs, ditches and diversions. The study also identified additional wildfire mitigation priorities near key infrastructure such as Joe Wright Reservoir and Halligan Reservoir. The Watershed Program is currently pursuing cost-share collaborative wildfire mitigation projects to address these concerns.

Figure 8. Photos show a diversion tunnel, reservoir and section of pipe that were evaluated as part of the Drinking Water Infrastructure Wildfire Risk Assessment.

The Watershed Program is currently pursuing agreements with the U.S. Forest Service, Fort Collins Conservation District, Big Thompson Conservation District and the Big Thompson Watershed Coalition that will allow the City to fund additional wildfire mitigation projects across both the Poudre River and Big Thompson River Watersheds.

State Highways – Moderate Priority

State highways were identified in the SWPP as a moderate threat, in part, due to chemical spills from vehicle accidents. To address this threat, the Watershed Program completed a Source Water Spill Response Plan in 2019 to reduce the risk of spills to the City's Horsetooth and Poudre River drinking water supplies. The Source Water Spill Response Plan includes procedures, methods, equipment and other necessary information to help Utilities prepare for and respond to water contamination from chemical spills within its source water protection areas (SWPAs). The Watershed Program has facilitated a staff training for the Source Water Spill Response Plan, which was implemented in January 2020.

Figure 9. Photos show a truck accident in 2009 next to the Poudre River (left) that resulted in an asphalt spill and spill contaminant booms (right) were deployed to contain the spill.

Abandoned and Active Mines – Low Priority

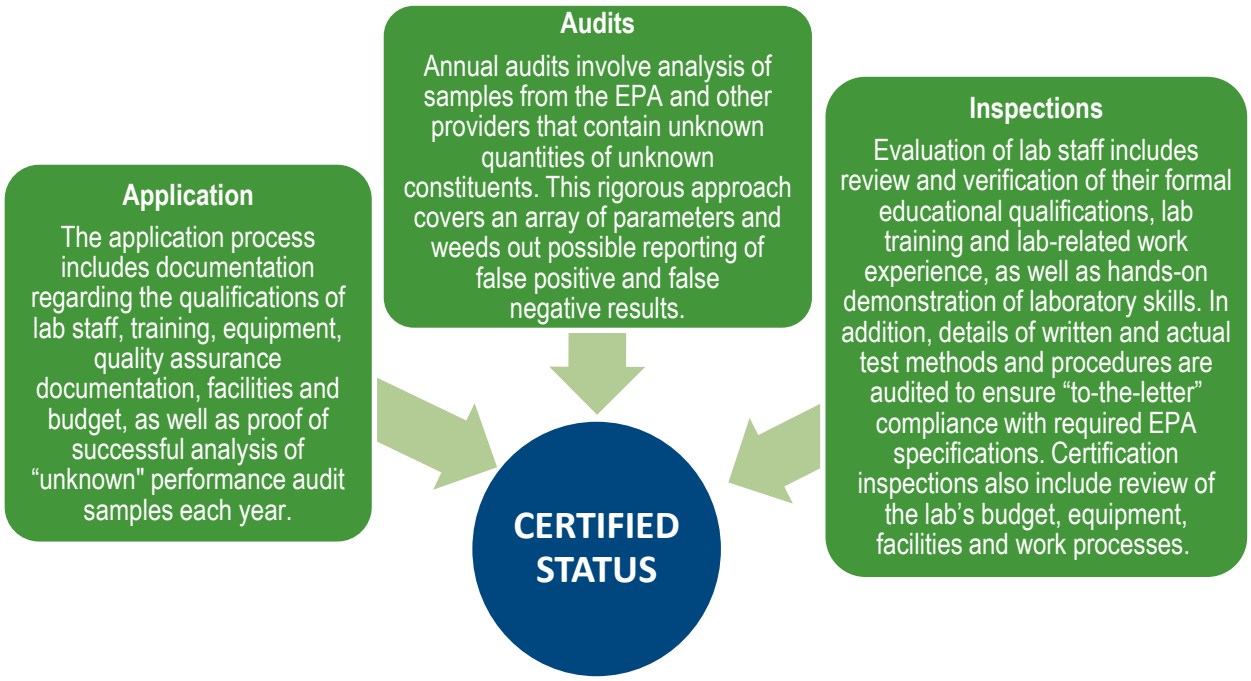
The SWPP identified abandoned and active mines as a high priority threat. Staff further researched this threat with an abandoned mine inventory and assessment in September 2016 to determine whether heavy metals from mine sites are a risk to our infrastructure and source water quality in the Poudre River. The study concluded that there is no known mine drainage to the Poudre River or its tributaries, which was consistent with metals data from routine Poudre River monitoring from 2008-2016. Fort Collins' water supplies are currently considered at low risk of contamination from historical mining activity.

Certified Laboratory

The City 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 10 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 multistep process shown in Figure 10 on the next page.

Figure 10 – Certified Status Achievement Process



The Water Quality Services Division completed a master plan in 2017, which included a condition assessment of the Water Quality Lab and evaluated different alternatives for renovation or replacement. Opportunities for constructing a new combined laboratory currently are being explored.

Asset Management

Utilities continued risk-forecasting efforts within its water production and distribution asset base throughout 2019. 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 2019 highlights:

- Staff continued to add asset information to the IBM Maximo Enterprise Asset Management System for the Water Treatment Facility and the distribution system.
- Continued using data from the IBM Maximo Enterprise Asset Management System to analyze and benchmark maintenance metrics. We continue to exceed our benchmark goal of four planned maintenance events for every one corrective maintenance event.
- Completed converting all reporting to the new ICONICS database and the APEX client on the new database servers, the final step before completely decommissioning the old Viewpoint system and Discoverer software client.
- Completed 2,580 Planned Maintenance Work Orders and 88 Corrective Maintenance Work Orders; This is a rate of 97% planned maintenance, which exceeds our target of at least 80% planned maintenance.
- Operations piloted feeding chlorine dioxide to the Poudre through run-off; This allowed us to consistently treat a higher blend (40/60) without a significant decrease in filter run times or seed-in times; Note: We had higher demands then normal during this year's runoff.
- Worked together with the Tri-Districts and North Poudre Irrigation Company to run water through the Pleasant Valley Pipeline.
- Hired and trained a new full-time hourly for solids management.
- Hired and trained three new plant operators.
- Created popup alarms and provided operator response training for all regulatory process variable instrumentation.
- Did media treatments on all filters except 18 thru 23.
- Drained and washed the Contact Chlorine Basin after its first full year of operation.
- Completed and tested pumping improvements to the on-site reservoir drain system pond.
- Began cleaning the T3/T4 side of Flowblend.

Figure 11 – Flowblend Basin

- Cleaned the east backwash return pond in June and the west backwash return pond in October.
- Participated in the development of a Geosmin & 2-Methylisoborneol (MIB) protocol.
- Repaired the bottoms of solids ponds numbers 1 and 2.
- Purchased anthracite for topping off filters.
- Implemented an on-site valve exercising program using Maximo.
- Removed the media from filter number 7
- Isolated and washed both sides of Foothills Reservoir and Goathill Reservoir.
- Conducted a comprehensive inspection of the east side of Foothills Reservoir.
- Using the Echosmart probe optimized filter bed expansion during back wash in filter 1-8.
- Used full-scale piloting to determine the best filter loading rate for process improvement.
- Operations optimized train flocculator speeds after the PLC replacement projects.

Figure 12 - Flocculator

- Replaced the Motor Control Center at the High Service Pump Station.
- Operations floated Goathill using the Foothills system for about a month.
- Due to Maximo equipment critical asset evaluation, the maintenance team started replacing equipment past due date.
- Added new lime injection points for better process control.
- Operations and maintenance continued to battle lime issues all year after receiving a lime batch containing gravel.
- Upgraded lime system with filters for reliability.
- Added a redundancy turbidimeter to the Combined Filter Effluent (CFE) area.
- The maintenance team did Water Quality Lab improvements and supported contractors doing the Water Quality Lab project upgrades.
- Moved the lab ICPMS to the admin basement and back to the Water Quality Lab.
- Provided input and support for conversion of the plant's power source from Xcel to Fort Collins Light & Power.
- Finished installing safety side hatches in lime day tanks.

- Repaired eight air-wash valves for process reliability.
- Replaced all Hach 1720 E turbidimeters with LASER units for reduced risk and improved plant reliability.
- Cleaned two alum tanks and shipped off the waste.
- Cleaned out the old outside alum tank, shipped off waste and removed the tank.
- Pressure tested the carbon feed line and cored for a new injection point.
- Re-piped the carbon feed system for more flow and better accuracy.
- Painted main switchgear to EGU151.
- Painted Plant outbuildings.
- Added a TOC analyzer to the Chlorine Contact Basin.
- Supported the Microhydro electric generator installation with shutdowns, upgrades and numerous meetings.
- Conducted fluorescent-to-LED lighting upgrades all year numerous areas.
- Blower room floors were painted and cleaned up.
- A new emergency portable power generator was purchased, wired, checked and put into service.
- F702 project bypass flowmeter and valves.
- Yard marking valves 95% complete.
- Completed Joe Wright Dam Inspection with State, including outlet.
- Inspected Joe Wright Emergency Spillway and underdrains.
- Extended Joe Wright Emergency Spillway underdrains.
- Replaced Decking on Cookhouse and Bunkhouse cabins on Michigan Ditch;.
- Cleaned Pleasant Valley Pre-Sedimentation Basin.

Figure 13 – Pleasant Valley Pre-Sedimentation Basin

- Replaced hand railing on footbridge at Joe Wright.
- Programmable Logic Controllers 10, 21, 23, 24, 25 and 26 were updated to new Programmable Logic Controllers (PLC);
- Replaced Train 4 sludge removal equipment and repaired Train 4 flocculation basin concrete.
- Replaced media in filters 18-23.
- Rehabilitated Filter 7 with new wall coatings, new underdrains and new media.
- Replaced Fluoride tank.
- Installed new clear-well bypass valves (YDV911 & YDVBD) and flowmeter (F702) and calibrated F701.
- Cored the clearwell for new injection point.
- Commissioned Microhydro electric power generator.
- Completed switch of electrical power provider from Xcel to Fort Collins Light & Power.
- Replaced doublewide side-by-side door in Dechlorination building with an overhead door.

- Remodeled many office areas, the Source of Supply offices and conference room and the lunchroom with new furniture, paint and tile.
- Replaced the bisulfite day tank and plumbing.
- Extended operators on blow-off valves on 24-inch Poudre line.
- Repaired leak on 24-inch line in Bellvue.
- Fully implemented a new Laboratory Information System (LIMS). This is a database to manage analyses in all the laboratories.
- Inspected 267 bypasses on meters sized 1.5 inches and larger to ensure the valves were properly positioned and secured.
- Performed 156 meter inspections and installed 101 meters on new construction single-family, multifamily residential and commercial services.
- Tested 1,377 water meters.

Distribution System Maintenance

The Water Distribution crews are responsible for the operation and maintenance of 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.

System Statistics

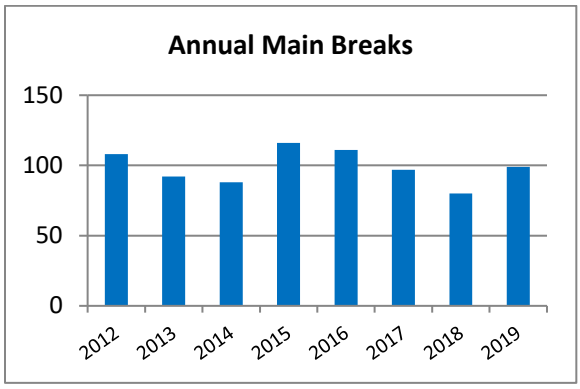
- 546 miles of water mains
- 832 water main locator stations
- 498 cathodic protection test stations
- 13,423 valves
- 3,832 fire hydrants
- 39,241 service lines

Figure 14

Figure 15 – Repairing a main leak

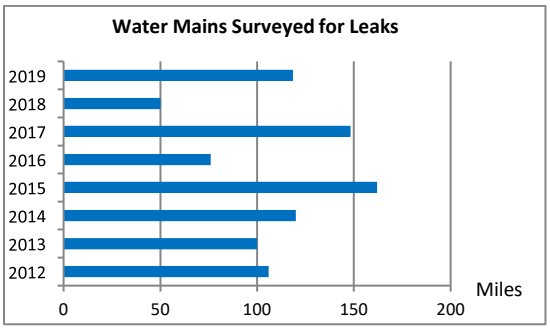
In 2019, the group was responsible for responding to 1,009 customer complaints during regular hours and 275 after hours. They repaired 70 valves, 26 fire hydrants, 46 service lines and 26 service leaks. Additionally, 99 water main breaks were repaired: 59 were electrolysis, 33 were beam breaks, five were longitudinal breaks and two were miscellaneous repairs to the water mains.

Figure 15



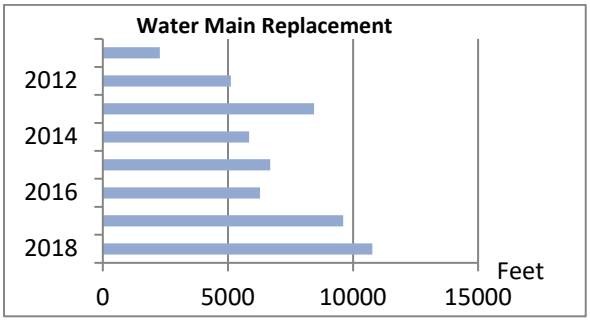
- Crews performed maintenance checks on 383 valves and 53 fire hydrants.
- Crews flushed the water mains on the east side of the water distribution system from College Avenue to Northern Lights, operating 1,084 fire hydrants during that program.
- Leak detection operations were performed on 118.5 miles of water main and 397 cathodic protection test station readings were collected.
- Cross Connection Control performed 902 backflow surveys and inspections.

Figure 17



- Crews supported Connexion by reviewing permits and standbys making sure separation requirements were being met and restoration of potholing our utilities was completed correctly.
- Construction crews replaced a total of 6,754 feet of water main and installed 36 new valves and nine fire hydrants during our annual water distribution system replacement program.

Figure 18



Additional distribution maintenance information is available in the asset management section on the previous two pages.

Following is a list of replacement projects:

- Busch Court – 1800 and 1900 blocks, 1,161 LF
- 2500 E. Prospect Rd. – OCR Parking Lot, 350 LF
- 200 Block Red Cedar Circle – Red Cedar Circle to Blue Spruce Drive, 782 LF
- Goshawk Drive – 4400 Block Goshawk Drive – 733 LF
- Warbler Drive – 4300 Block Warbler Drive, 602 LF
- Hummingbird Drive - 4300 block Hummingbird Drive, 1,243 LF
- North Shields Street – 500 Block North Shields Street alley, 460 LF

Figure 19 – Laying new water main

Certified Operators

The Water Treatment Facility operators are certified by the Colorado Water and Wastewater Facility Operators Certification Board as certified water professionals. As of 2019, the Director of Plant Operations (operator in responsible charge, or ORC), Manager of Plant Operations, both Lead Plant Operators, and three of our eight Plant Operators had earned ‘A’ certification, the highest level of Water Treatment Plant Operator certification, which also carries the professional credential, “Certified Water Professional.” The other five operators have obtained either ‘D’ or ‘C’ level certification and are progressing on schedule toward certification at the ‘A’ level. All staff in the operations on-call rotation are certified ‘A’ operators. Operation of the Water Treatment Facility requires supervision by a certified Water Treatment Plant Operator A.

Operation of our pump stations and storage reservoirs requires supervision by a certified Water System Operator 3. The Director of Plant Operations (ORC) holds a level 4 distribution system Operator Certification, as does the Manager of Plant Operations. Several plant operators and other staff also are certified distribution system operators, varying from level 1 to level 4.

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. Two maintenance staff hold level D certifications, as do both Chemists. 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
- Occupational Health and Safety Technician
- Journeyman Electrician
- DOT Certification
- ASE Mechanic Certification

The Water Field Operations Manager (ORC) holds a level 4 Water System Operator certification. All crew chiefs are certified to at least level 2, many to level 4, and most crew members hold certification varying from level 1 to level 4. Operation of our distribution system requires supervision by a certified Water System Operator.

This report was compiled by the Water Production Division in collaboration with:

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