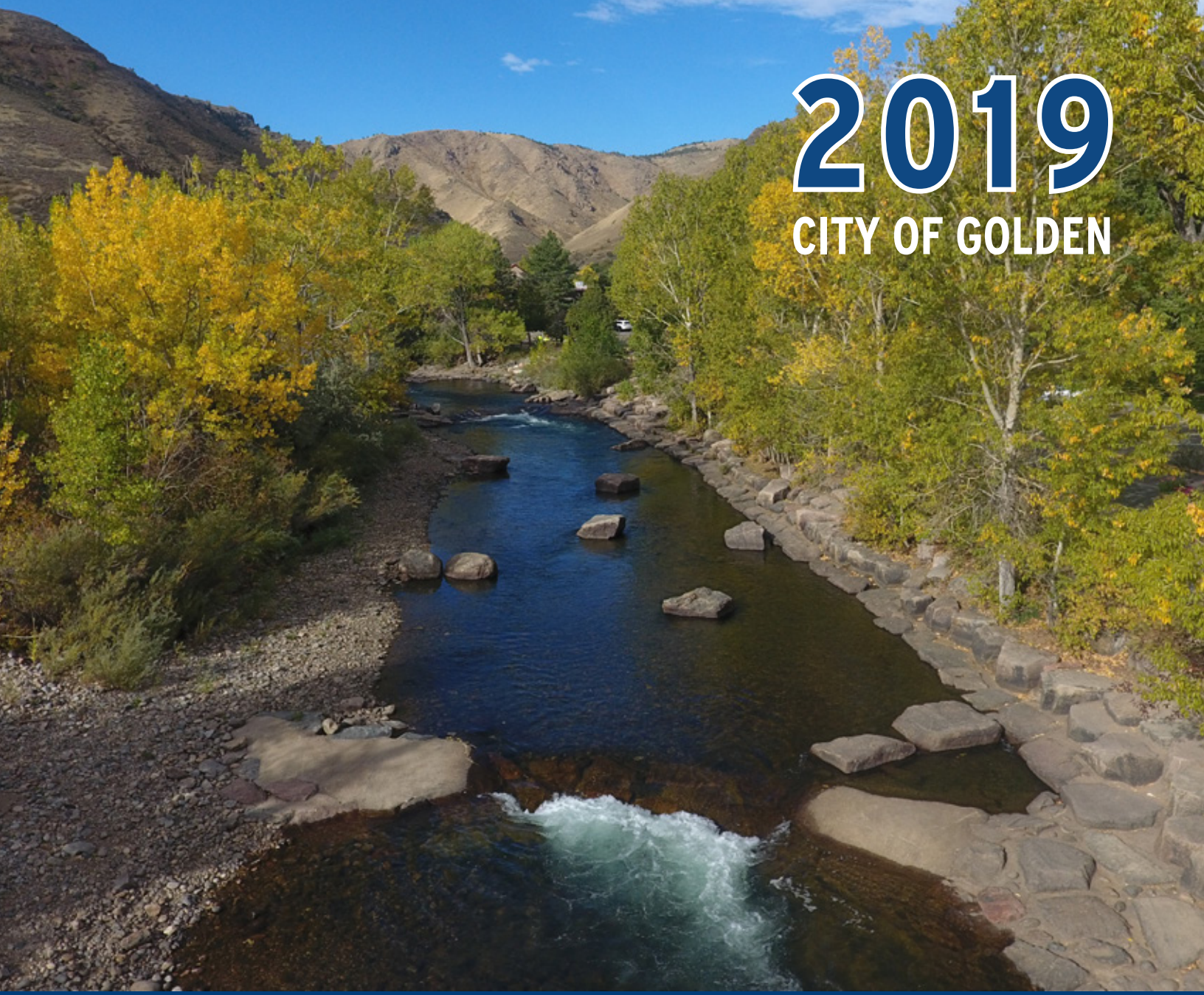


2019
CITY OF GOLDEN

Water Quality Report

The City of Golden is committed to providing its customers with safe and dependable drinking water. This is your annual summary of drinking water quality along with updated information about Golden's water treatment plant, water service lines, and Clear Creek – our raw water supply. We hope you will find this report useful and welcome any comments you may have. The Environmental Services Division can be reached at 303-384-8181 or to learn more, go to www.cityofgolden.net/DrinkingWater.

Clear Creek – Our Mountain Water Source

Golden's drinking water source is predominately snowmelt from Clear Creek and its tributaries. As it flows through the watershed, it dissolves naturally occurring minerals and, in some cases, radioactive materials from rock surfaces and the riverbed, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- **Microbial contaminants:** viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants:** salts and metals, which can be naturally occurring or result from urban storm water runoff; industrial or domestic wastewater discharges; oil and gas production, mining, or farming.
- **Pesticides and herbicides:** may come from a variety of sources, such as agriculture, urban storm water runoff, and residential uses.
- **Radioactive contaminants:** can be naturally occurring or be the result of oil and gas production and mining activities.
- **Organic chemical contaminants:** including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also may come from gas stations, urban storm water runoff, and septic systems.

In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment (CDPHE) prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Drinking water sources are susceptible to contamination from a wide variety of natural and man-made origins. Potential contaminant sources for Golden include anything likely to manufacture, produce, use, store, dispose, or transport regulated and unregulated contaminants of concern. These sources are divided into discrete or dispersed sources.

Discrete contaminant sources generally include facility-related operations from which the potential release of contamination would be confined to a relatively small area.

Potential discrete contaminant sources in our source water area have been identified as:

- Environmental Protection Agency (EPA) Superfund sites
- EPA abandoned contaminated sites
- EPA hazardous waste generators
- EPA chemical inventory/storage sites
- Permitted wastewater discharge sites
- Aboveground, underground, and leaking storage tank sites

- Solid waste sites
- Existing/abandoned mine sites

Dispersed contaminant sources generally include broad-based land uses and miscellaneous sources from which the potential release of contamination would be spread widely over a relatively large area.

Potential dispersed contaminant sources in our source water area have been identified as:

- Commercial/industrial/transportation
- High and low intensity residential land use
- Urban recreational grasses or fallow
- Quarries/strip mines/gravel pits
- Row crops
- Pasture/hay
- Deciduous, evergreen, and mixed forests
- Septic systems
- Oil/gas wells
- Road miles

The CDPHE provided consumers with a Source Water Assessment Report that is specific to Golden's raw water supply. The report is not an indication of the current quality of our water source, but provides a screening level evaluation of potential impacts to Clear Creek and rates the possible susceptibility to those sources. Information from the report is available to Golden to develop and implement water management strategies in order to optimize treatment and protect the quality of our drinking water. The report is available online at http://wqcdcompliance.com/ccr or may be obtained by contacting the City of Golden Environmental Services Division at 303-384-8181.

Water Quality and Your Health

LEAD – WHAT YOU NEED TO KNOW

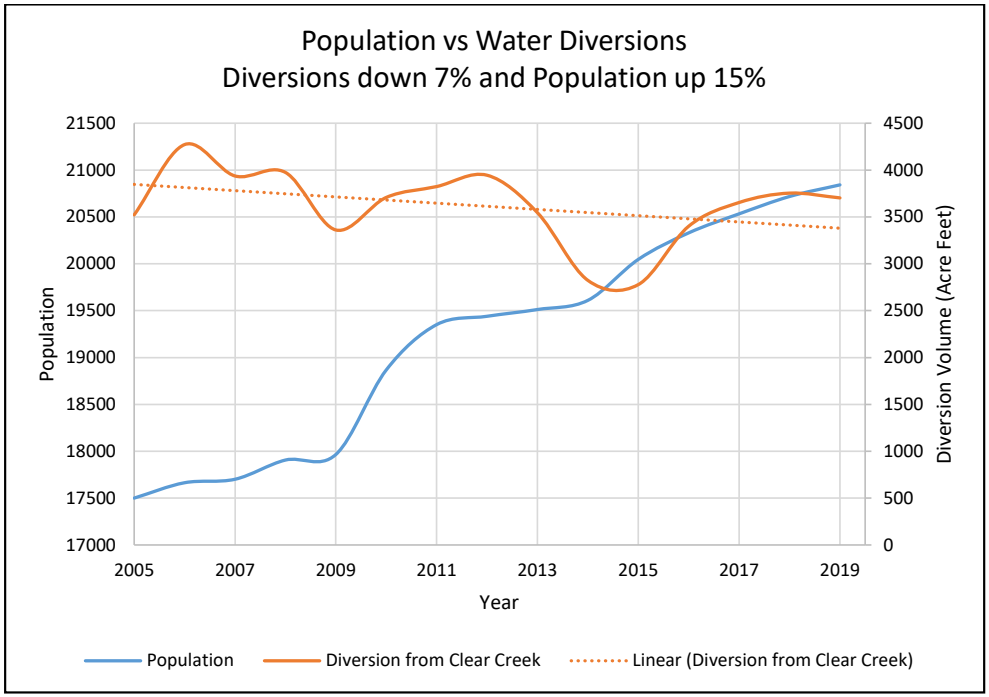
Young children and pregnant women are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than other homes in the community as a result of materials used in your home's plumbing. The City of Golden is responsible for providing high quality drinking water, but cannot control the variety of materials used in water service lines and home plumbing components. You can minimize your exposure by flushing your tap for 30 seconds to 2 minutes before using water for cooking or drinking. If you are concerned about levels of lead in your home, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize your exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at www.epa.gov/safewater/lead.

If You Have Special Health Concerns:

Both public and bottled water supplies may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. However, some people may be more vulnerable to contaminants in drinking water than the general population. Immuno - compromised individuals such as persons undergoing chemotherapy, persons who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, and some elderly and infants can be particularly at risk for infection. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia or other microbiological contaminants, call the EPA Safe Drinking Water Hotline toll free at **1-800-426-4791** or visit http://water.epa.gov/drink/contaminants.

Good News! Golden Reduces Water Use

As Golden grows, our annual diversions from Clear Creek continue to decline...



...And we can point to several factors for this reduction in water use. The City's proactive Utility Replacement Program has greatly reduced leaks and waste in the distribution system. Conservation and efficiency programs have also lowered water use via low-flow toilets, high efficiency washers, and xeric landscaping. The biggest savings in Golden's overall water consumption can be attributed to the change in irrigation area and irrigation methods.

By looking at summer flows, considering the effects of climate change and weather patterns, we can see a large reduction in daily demand of about 8%. The annual diversions are down around 7%. When we look at daily sewer flows, which are more constant throughout the year, we see about a 5% reduction.

Seeing trends like this is encouraging and the City of Golden will remain dedicated to raising awareness of the importance of water conservation and helping its residents use water more efficiently.

2019 Water Quality Monitoring Results

The following tables contain the results of all substances that are regulated by State and Federal law that were detected in Golden's water during the 2019 monitoring period. Most of the monitoring performed by Golden's Environmental Services lab results in non-detect levels allowing the City to perform reduced monitoring for substances that pose no risk to our system. Some of those results will show dates that may be more than a year old.

Detected Regulated Substances

Monitored leaving the Water Treatment Plant

For more information, call the Water Quality Lab at 303-384-8181.
Or contact Stephanie Crabtree at 303-384-8184.

Organic/Inorganic	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Barium, ppm	Yearly	0.02	0.02 - 0.02	2	2		Natural erosion
Fluoride, ppm	Yearly	0.31	0.31 - 0.31	4	4		Natural erosion
Nitrate, ppm	Yearly	0.1	0.1 - 0.1	10	10		Fertilizer run-off
*Total Organic Carbon (TOC), ratio *(TOC, reported as a ratio, must remain above 1.0 for optimal water treatment.)*	Monthly - RAA	1.44	1.00 - 2.02	TT	TT		Naturally present in the environment

**Golden uses enhanced treatment to remove the naturally occurring organic compounds that can combine with disinfectants to form disinfection by-products. The ratio of TOC removal measures our compliance with this treatment technique.*

Radionuclides	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Combined Radium (226 & 228) pCi/L	2-3-2011	0.1	0.1 - 0.1	5	n/a		Erosion of natural deposits
Gross Alpha Particles pCi/L	7-12-2017	<1.1	<1.1 - <1.1	15	n/a		Erosion of natural deposits
Combined Uranium pCi/L	7-12-2017	<0.7	<0.7 - <0.7	20	n/a		Erosion of natural deposits

Turbidity	Sample Date	Result	Treatment Requirement	No Violations	Common Sources
Turbidity, NTU *(Measure of the cloudiness of water. It is a good indicator of the effectiveness of our filtration system)*	6 times per day	highest single reading 0.437 ntu in Sept. 2019	Maximum of 1.0 ntu at any time *Turbidity must be less than 0.3 NTU for 95% of measurements taken each month.*		Natural run-off

Monitored at consumer taps

Disinfection By-Products	Sample Date	Highest	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Total Trihalomethanes, ppb	Quarterly	74.2	40.16	Total Range 24.6 - 74.2	80	n/a		By-product of chlorination
Total Haloacetic Acids, ppb	Quarterly	11.3	8.3	Total Range 4.2 - 11.3	60	n/a		By-product of chlorination
Chlorine (free), ppm	Throughout the year	n/a	0.86	0.5 - 1.06	MRDL 4	MRDLG 4		Drinking water disinfectant

Running Annual Average for THM's must be less than 80 ppb. Running Annual Average for HAA's must be less than 60 ppb.

Lead and Copper	Sample Date	Concentration at 90th Percentile	Number of Exceedences at 90th Percentile	AL	No Violations	Common Sources
Lead, ppb	6/3/19 - 8/7/19	0	0	15		Corrosion of household plumbing
Copper, ppm	6/3/19 - 8/7/19	0.05	0	1.3		Corrosion of household plumbing

The City of Golden is now required to monitor for lead and copper at consumer taps once a year. 32 Golden households were sampled in 2019.

Other Monitoring Results and Secondary Contaminants**

Monitored leaving the Water Treatment Plant

**Secondary standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor or color) in drinking water.

Substance	Sample Date	Average	Range Found	MCL	SMCL	Common Sources
Alkalinity, ppm	Weekly	40.5	19 - 62	n/a	None	Erosion of natural deposits
Chloride, ppm	Quarterly	43.7	9.2 - 97.3	n/a	250 ppm	Erosion of natural deposits
Hardness, ppm	Weekly	125	38 - 192	n/a	None	Erosion of natural deposits
Iron, ppm	Monthly	<0.01	<0.01 - <0.01	n/a	0.3 ppm	Erosion of natural deposits
Manganese, ppm	Monthly	0.009	<0.005 - 0.019	n/a	0.05 ppm	Treatment
pH, su	Weekly	8.3	7.4 - 8.8	n/a	6.5 - 8.5 su	Treatment
Potassium, ppm	Quarterly	2.8	1.3 - 3.9	n/a	None	Erosion of natural deposits
Sodium, ppm	Yearly	10.6	10.6 - 10.6	n/a	None	Erosion of natural deposits
Sulfate, ppm	Quarterly	85.8	29.4 - 123.4	n/a	250 ppm	Erosion of natural deposits
(TDS), ppm	Quarterly	222	82 - 392	n/a	500 ppm	Erosion and storm water runoff
Zinc, ppm	Monthly	0.06	0.023 - 0.11	n/a	5 ppm	Erosion of natural deposits

Unregulated Contaminants***

**EPA has implemented the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act. EPA uses the results of UCMR monitoring to learn about the occurrence of unregulated contaminants in drinking water and to decide whether or not these contaminants will be regulated in the future. We performed monitoring and reported the analytical results of the monitoring to EPA in accordance with its Unregulated Contaminant Monitoring Rule (UCMR). Once EPA reviews the submitted results, the results are made available in the EPA's National Contaminant Occurrence Database (NCOD) (epa.gov/dwucmr/national-contaminant-occurrence-database-ncod). Consumers can review UCMR results by accessing the NCOD. Contaminants that were detected during our UCMR sampling and the corresponding analytical results are provided below.

Contaminant Name	Year	Average	Range Low - High	Sample Size	Unit of Measure
Manganese	2019	0.005	0.002 - 0.007	4	mg/l
HAA5	2019	9.095	6.56 - 13.54	16	ug/L
HAA6 Br	2019	14.44	8.76 - 21.96	16	ug/L
HAA9	2019	20.16	13.36 - 25.74	16	ug/L

If you have any questions, please contact the Water Treatment Plant at 303-384-8187 or online at **www.cityofgolden.net/WTP**.

Glossary of Terms and Definitions

- **Maximum Contaminant Level (MCL) –**
  The highest level of a contaminant allowed in drinking water.
- **Treatment Technique (TT) –**
  A required process intended to reduce the level of a contaminant in drinking water.
- **Health-Based –**
  A violation of either a MCL or TT.
- **Non Health-Based –**
  A violation that is NOT a MCL or TT.
- **Action Level (AL) –**
  The concentration of a contaminant which, if exceeded, triggers treatment and other regulatory requirements.
- **Maximum Residual Disinfectant Level (MRDL) –**
  The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **Maximum Contaminant Level Goal (MCLG) –**
  The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **Maximum Residual Disinfectant Level Goal (MRDLG) –**
  The level of a drinking water disinfectant, below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Violation –**
  Failure to meet a Colorado Primary Drinking Water Regulation.
- **Formal Enforcement Action –**
  Escalated action taken by the State (due to the risk to public health, or number or severity of violations) to bring a non-compliant water system back into compliance.
- **Variance and Exemptions (V/E) –**
  Department permission not to meet a MCL or treatment technique under certain conditions.
- **Gross Alpha –**
  Gross Alpha particle activity compliance value. It includes radium-226, but excludes radon 222, and uranium.
- **Picocuries per liter (pCi/L) –**
  Measure of the radioactivity in water.
- **Nephelometric Turbidity Unit (NTU) –**
  Measure of the clarity or cloudiness of water. Turbidity in excess of 5 NTU is just noticeable to the typical person.
- **Compliance Value –**
  Single or calculated value used to determine if regulatory contaminant level (e.g. MCL) is met. Examples of calculated values are the 90th Percentile, Running Annual Average (RAA) and Locational Running Annual Average (LRAA).
- **Average (x-bar) –**
  Typical value.
- **Range (R) –**
  Lowest value to the highest value.
- **Sample Size (n) –**
  Number or count of values (i.e. number of water samples collected).
- **Parts per million = Milligrams per liter (ppm = mg/L) –**
  One part per million corresponds to one minute in two years or a single penny in $10,000.
- **Parts per billion = Micrograms per liter (ppb = ug/L) –**
  One part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.
- **Level 1 Assessment -**
  A study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
- **Level 2 Assessment -**
  A very detailed study of the water system to identify potential problems and determine (if possible) why Ecoli MCL violation has occured and/or why total coliform bacteria have been found in our water system on multiple occasions.
- **Not Applicable (N/A) –**
  Does not apply or not available.

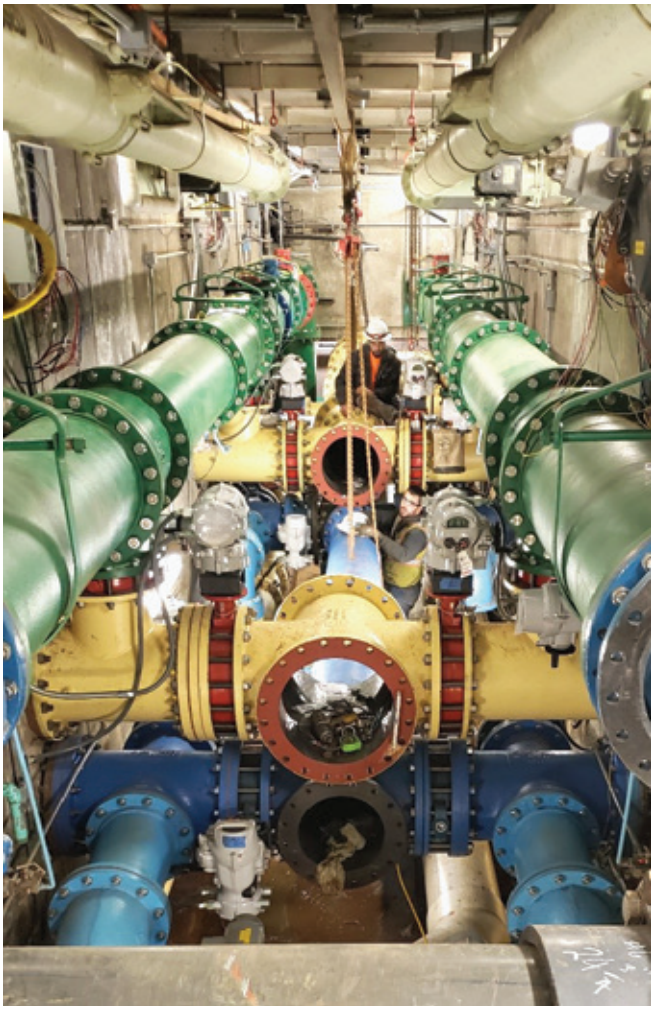
In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment (CDPHE) prescribes regulations that limit the amount of certain contaminants in the treated water provided by public water systems such as Golden's. The Food and Drug Administration (FDA) sets similar limits for contaminants in bottled water that must provide the same protection for consumers. However, the regulations and testing requirements are much less stringent than for tap water.

Water Treatment Plant - Filter Gallery Improvement Project

Before - Temporary piping & empty filter gallery at the start of the project.

In Spring of 2019, planning for the Water Treatment Plant Filter Gallery Improvement Project began. There are six filters at the water treatment plant with an additional two empty filter bays for future expansion. The filters are the final barrier between non-potable and potable water by removing particles to ensure disinfection is effective and regulations are met. Behind every filter is a series of ductile iron and steel piping, valves and actuators (devices that operate valves), all of which control the flow of water into and away from each filter. Most of the piping dates back to 1991 and was nearing the end of its useful life.

Water treatment plant staff and design engineers understood early on that this particular project presented many challenges. Project plans needed to consider how plant staff would continue to operate the water plant and ensure sufficient storage in the distribution system for all users while also allowing the contractor enough down time to pull and replace pipe and valves between filter runs. After months of scrutinizing details and devising options with the contractor, engineer and water plant staff, a comprehensive plan was laid out. As of May 1, 2020, the project reached 90% completion, with a projected full completion date of May 31, 2020. This upgrade will help guarantee many more successful years of filter operations and treatment process control at the water plant.



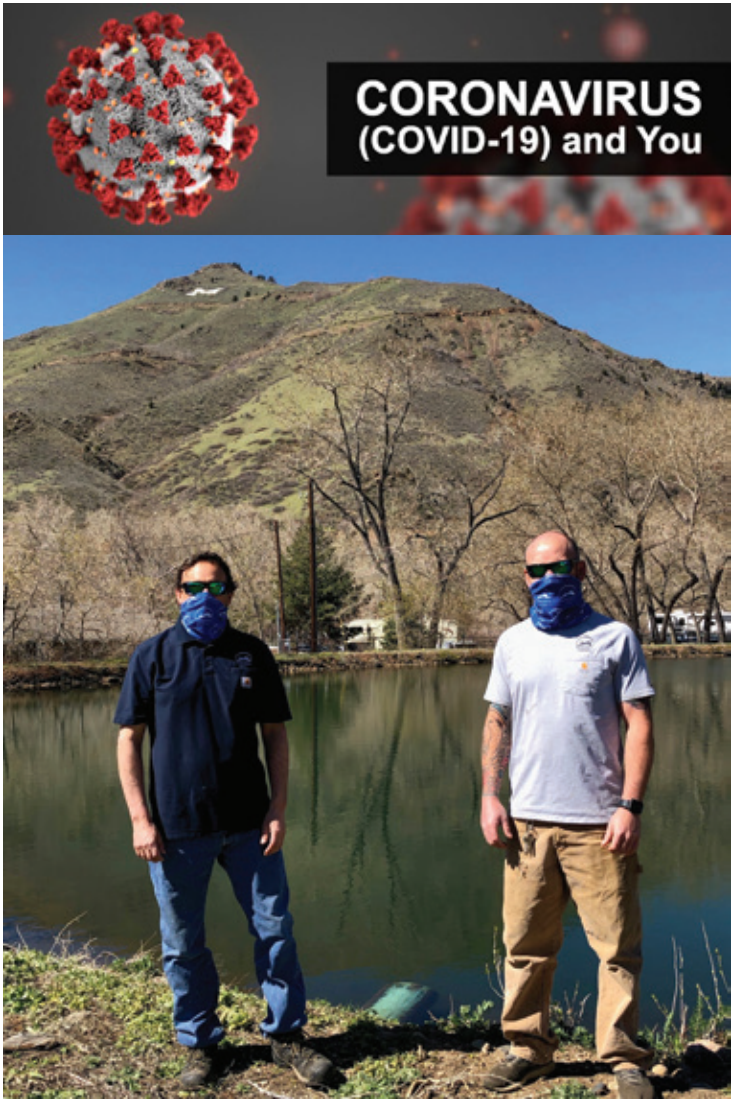
After - Making progress replacing all of the piping.

COVID-19, Golden Water Treatment Plant & Water Quality

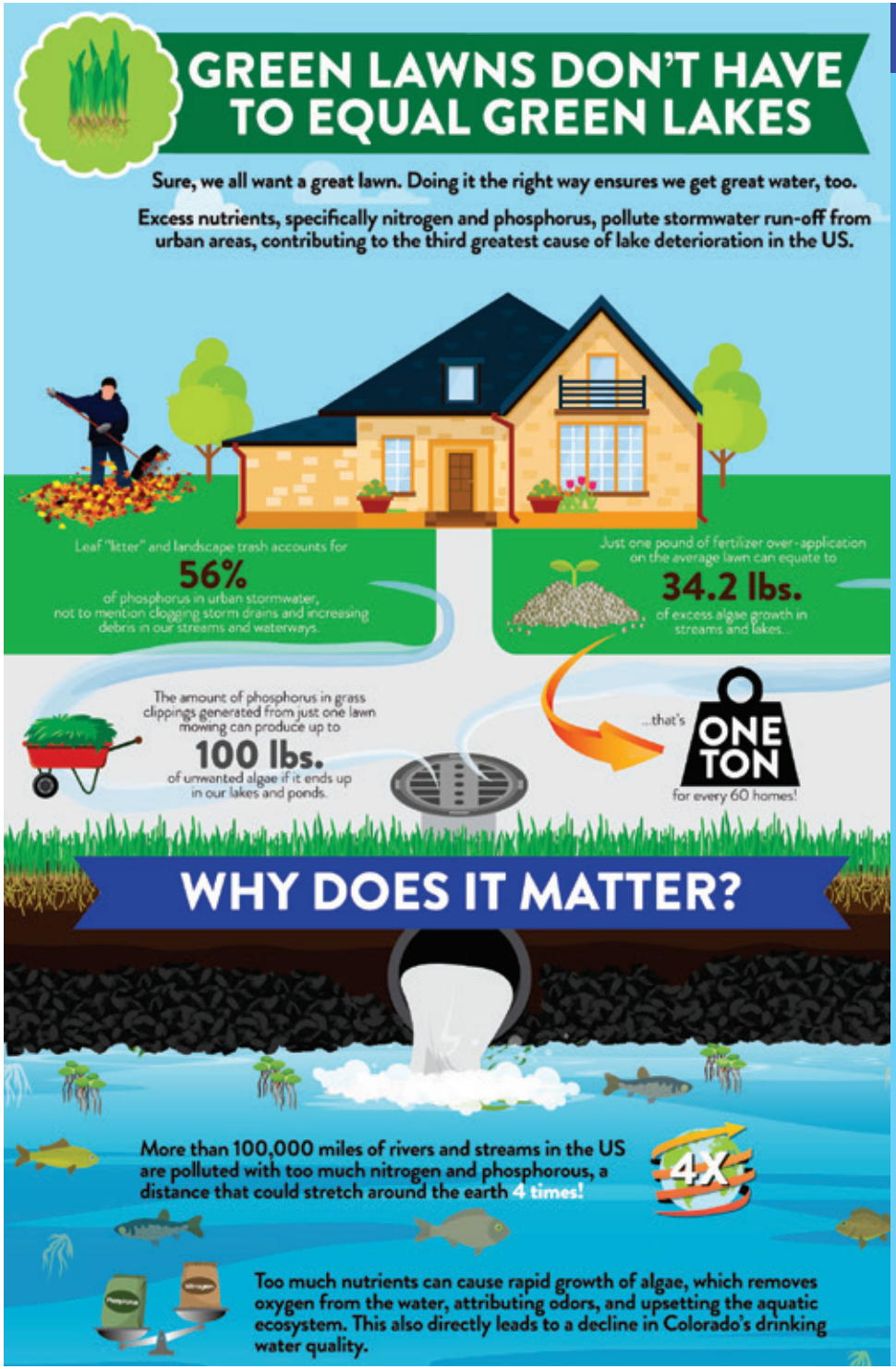
Earlier this year when the Colorado Governor issued a stay at home order to slow the spread of COVID-19, the employees of the water utility were designated as "essential critical infrastructure workers". Water plant operators, laboratory personnel and the utility crew kept working to make sure that Golden residents and businesses would have safe drinking water. The plant superintendent worked out contingency measures and crafted a continuity of operations plan to make sure we were proactively addressing the challenges the pandemic created. Since we only staff the water plant to have one licensed operator running the plant at any time, the most serious challenge we potentially faced was absenteeism should staff become ill or need to take leave to care for family. We focused on keeping all employees healthy and safe, which involved social distancing, face coverings, staggered shifts, more intense cleaning protocols of common spaces, and daily communication between departments. We also worked with our suppliers to ensure the necessary chemicals and products required to keep the plant and lab operating were on hand and available.

The water treatment plant had another obstacle, as you may have read in the article describing the recent filter gallery improvement project. The time sensitive project of replacing all of the piping, valves and actuators below our filters needed to be complete before summer irrigation increased flow demands on the plant. Coordinating with the outside contractor to finish the project safely and on schedule while having the necessary personal protective equipment when we were unable to meet social distancing recommendations was key due to the very tight workspace and nature of the project. We were all reliant on each other to stay healthy so we did not lose operators to illness and to ensure our contractors were available to wrap up the project. As of the time of this article, we have been able to keep everyone healthy and keep the project on schedule.

The EPA stated that "public water systems have a heightened responsibility to protect public health because unsafe drinking water can lead to serious illness and access to clean water for drinking water and handwashing is critical during the COVID-19 pandemic". The Golden water treatment plant and water quality lab are committed to continue to operate the utility to provide safe drinking water to Golden residents and complete all regulatory sampling, testing, and reporting of results to the state through this crisis.



Tony Doukas (Lead WTP Operator) and Sal Ingenthrone (Plant Mechanic).



WHAT YOU CAN DO

Dispose Properly

- Compost or bag your leaves and grass clippings.
- Don't blow grass clippings into the street.
- Hand pull weeds when possible.
- Sweep up any spills or overspray of fertilizers on sidewalks or streets.

Fertilize Efficiently

- Fertilizing in the early fall promotes healthy root systems – leading to stronger, more resilient lawns and plants.
- Watch the weather and make sure to not apply when storms will be approaching.

Turn It Down

- Adjust sprinkler systems based on weather, repair leaks, and reduce runoff.
- Don't powerwash debris into the street.
- Adjust fertilizer spreaders to apply the correct amount over areas. Fertilizer bags typically provide this information or ask the local garden center.

Choose Wisely

- Perform soil testing to determine the right amount of fertilizers to apply.
- Consider using slow-release fertilizers with water-insoluble or slowly-soluble nutrients.
- Planting species that are native to the region can decrease the amount of turf, water and fertilizer needed.

CSC

COLORADO STORMWATER COUNCIL

For more information, contact:

City of Golden
PUBLIC WORKS DEPARTMENT
ENVIRONMENTAL SERVICES DIVISION

1445 10TH ST. GOLDEN, CO 80401
303-384-8181
www.cityofgolden.net/DrinkingWater

The City of Golden is an active member of the Upper Clear Creek Watershed Association – a management agency dedicated to protecting the water quality in Clear Creek.

INFORMACIÓN IMPORTANTE ACERCA DE LA CALIDAD DEL AGUA

Para recibir la versión en español del Reporte de Calidad de Agua de 2019 de City of Golden, visite www.cityofgolden.net/CalidaddeAgua.