

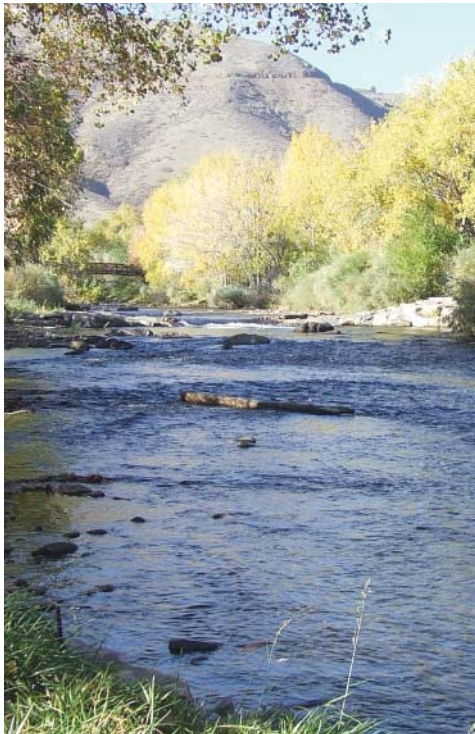
A photograph of a hazy, foggy landscape. In the center, a large, cylindrical water tower sits atop a grassy hill. The foreground is filled with dark green evergreen trees, and a portion of a house with a blue roof is visible on the right. The overall atmosphere is misty and serene.

2011

CITY OF GOLDEN

Water Quality Report

The City of Golden is committed to providing its customers with a healthy and dependable drinking water supply. Along with an annual summary of your water quality, we try to provide updated information about the water you drink every day, what's new for drinking water regulations and current information about your water supply source. 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 and click on Environmental Services under the City Services tab.



Clear Creek - Our Mountain Water Source

Golden's drinking water source is predominantly 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. Water quality in Clear Creek may also be influenced by rock or landslides, run-off from deciduous and evergreen forested areas, animal activity or by substances that are a result of human activity.

Contaminants that may be present in source waters include:

- Bacteria and viruses from wastewater treatment plants, individual septic systems, livestock operations and wildlife.
- Salts and metals from highway/road maintenance and construction operations, mine waste piles, active and abandoned mines or mine cleanup sites, oil and gas production, farming and stormwater runoff.
- Organic contaminants, including synthetic and volatile organic chemicals which are by-products of industrial processes and petroleum production, or may come from petroleum spills from gas stations, traffic accidents

or leaking aboveground or underground storage tanks.

- Radioactive contaminants that are naturally occurring or can be the result of mining activity or oil and gas production.
- Pesticides and herbicides from residential lawns, agricultural activities or stormwater runoff.

The Colorado Department of Public Health and Environment has 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 www.cdphe.state.co.us/wq/sw/swaphom.html or may be obtained by contacting the City of Golden Environmental Services Division at 303-384-8181.

Water Quality and Your Health

Testing for Lead and Copper in Drinking Water

Monitoring for lead and copper helps water systems determine if their treatment techniques at the plant are providing water that remains at optimum quality all throughout the distribution system including reservoirs, tanks and pipes. Water Treatment Plant Operators must ensure that the water coming out of your tap is the same as the water leaving the plant. Water can change as it travels through the system and can become “corrosive” at the wrong pH or if there are not enough dissolved solids in the water. This can cause lead and copper to leach from your household piping.

Lead and copper samples are taken at the treatment plant and out in the community at several designated sampling sites. You may be one of the 32 households we visit every three years.

Because lead and copper is tested out in the system, the EPA sets criteria at an “Action Level” (AL) rather than a “Maximum Contaminant Level” or MCL. An exceedance is determined by the highest concentration of either lead or copper that exceeds the AL in more than 10 percent of the samples tested. Any exceedance will automatically trigger changes in how the plant treats water. These may include installing additional treatment for corrosion control or even replacing some water mains.

Since the Lead and Copper Monitoring Rule went into effect in 1991, the City has not had a single exceedance for Lead or Copper. Water treated here has been carefully balanced before entering the system. As a result, the State of Colorado only requires Golden to monitor every three years. For more information on lead and copper in drinking water go to: <http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/index.cfm> or call the Water Quality Laboratory at 303-384-8182.

FACTS ABOUT LEAD IN DRINKING WATER

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 to provide you with 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 two 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.

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 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**.

2011 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 2011 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 Vicki Coppage at 303-384-8182.

Organic/Inorganic	Sample Date	Average	Range Found	MCL	MCLG	No Violations	Common Sources
Barium, ppm	5-5-11	0.036	n/a	2	2		Natural Erosion
Fluoride, ppm	quarterly	0.75	0.25 - 1.02	4	4		Natural Erosion
Nitrate, ppm	5-5-11	0.2	n/a	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	1.48	1.0 - 2.1	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 Disinfectant 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	2-3-2011	2.7	2.7 - 2.7	15	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 0.42 ntu	Maximum of 1.0 ntu at any time		Natural Run-off

Each month, 95% of all measurements must be below 0.3 NTU with no one measurement over 1.0 NTU. In 2011, all months were in 100% compliance except for June which was 99%.

Monitored at consumer taps

Disinfection By-Products	Sample Date	Average	Range Found	Highest RAA	MCL	MCLG	No Violations	Common Sources
Total Trihalomethanes, ppb	quarterly - RAA	39.7	21.8 - 82.2	50.1	80	n/a		By-product of Chlorination
Total Haloacetic Acids, ppb	quarterly - RAA	13.9	9.4 - 22.5	14.23	60	n/a		By-product of Chlorination
Chlorine (free), ppm	throughout the year	0.93	0.35 - 1.3	n/a	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	2011-2013	less than 1	0	15		Corrosion of household plumbing
Copper, ppm	2011-2013	0.026	0	1.3		Corrosion of household plumbing

The requirement to monitor for lead and copper at consumer taps has been reduced to once every three years. 30 Golden households were sampled in 2011 and are scheduled to be sampled again in 2014.

Other Monitoring Results

Monitored leaving the Water Treatment Plant

Substance	Sample Date	Average	Range Found	MCL	SMCL	Common Sources
Hardness, ppm	weekly	96	30 - 151	n/a	None	Erosion of Natural Deposits
Potassium, ppm	5-5-11	3.3	n/a	n/a	None	Erosion of Natural Deposits
Zinc, ppm	5-5-11	0.055	n/a	n/a	5	Erosion of Natural Deposits
Sodium, ppm	5-5-11	30.9	n/a	n/a	None	Erosion of Natural Deposits
Chloride, ppm	5-5-11	45	n/a	n/a	250	Erosion of Natural Deposits
Sulfate, ppm	5-5-11	91.8	n/a	n/a	250	Erosion of Natural Deposits
pH, su	daily	8.5	7.9 - 8.9	n/a	6.5 - 8.5	Treatment
Manganese	5-5-11	0.008	n/a	n/a	0.05	Treatment

Laboratory staff performs hundreds of drinking water tests on a daily, weekly, monthly and annual basis. Samples are taken in Clear Creek, through every step of the treatment process and at consumer taps.

Glossary of Terms and Definitions

90th Percentile:

The point at which 90 percent of all values fall at or below this level.

Action Limit (AL):

The concentration, which if exceeded, triggers a treatment modification. 90 percent of households tested must be below the AL.

CDC: Centers for Disease Control and Prevention

EPA: U.S. Environmental Protection Agency

FDA: U.S. Food and Drug Administration

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

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 (MRDL):

The highest level of a disinfectant allowed in drinking water.

Maximum Residual Disinfectant Level Goal (MRDLG):

The level of drinking water disinfectant below which there is no known health risk.

n/a: - not applicable

NTU: nephelometric turbidity unit, used to measure water clarity

pCi/L: picocuries per liter, used to measure radioactivity

ppb: part per billion - corresponds to 1 inch in 16,000 miles

ppm: part per million - corresponds to one inch in 16 miles

Running Annual Average (RAA):

Annual average based on weekly, monthly or quarterly monitoring.

Secondary Maximum Contaminant Level (SMCL):

Non-enforceable levels that primarily affect the aesthetic quality of drinking water.

Secondary Maximum Contaminant Level Goal (SMCLG):

The desirable goal, but not enforceable.

su: standard units

Treatment Technique (TT):

A required process intended to reduce the level of a contaminant in drinking water instead of a MCL.

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.

Have You Seen These Around The City?

You may have seen these green boxes around Golden and maybe you have one in front of your house or on your street. They are sampling hydrants for drinking water potability tests. There are 18 sample hydrants placed throughout the City and each is sampled at least once a month.



Who is required to take samples?

All cities that provide drinking water are required by the State of Colorado and the EPA to sample and test the water flowing through the distribution system and delivered to their citizens.

What are the sampling requirements?

The amount of samples taken per month is determined by the population served. It can range from one sample per month for small systems, to hundreds of samples for larger systems. The City of Golden is required to sample 30 sites each month.

Why is sampling performed?

Golden's Water Quality Specialists collect samples and test them for the presence of bacteria in drinking water using coliform bacteria as an indicator organism. Coliforms are a broad class of bacteria found in our environment and their presence may indicate a source of contamination.

Drinking water must be free of coliforms at all times, ensuring that there is not a pathway for microbial contamination in our drinking water supply.

Where and how are samples obtained?

Water suppliers generally use existing water outlets, which may be faucets located on the outside of houses or inside a business, or, ideally, dedicated sampling stations. Water is run for at least three minutes to ensure the sample is from the water main in the street.

Dedicated sample hydrant stations like the one pictured above are a reliable way to sample because they solve the problem of limited home access, and the possibility of false contamination from outdoor hose bibs, sprinkler systems and whole house solar systems.

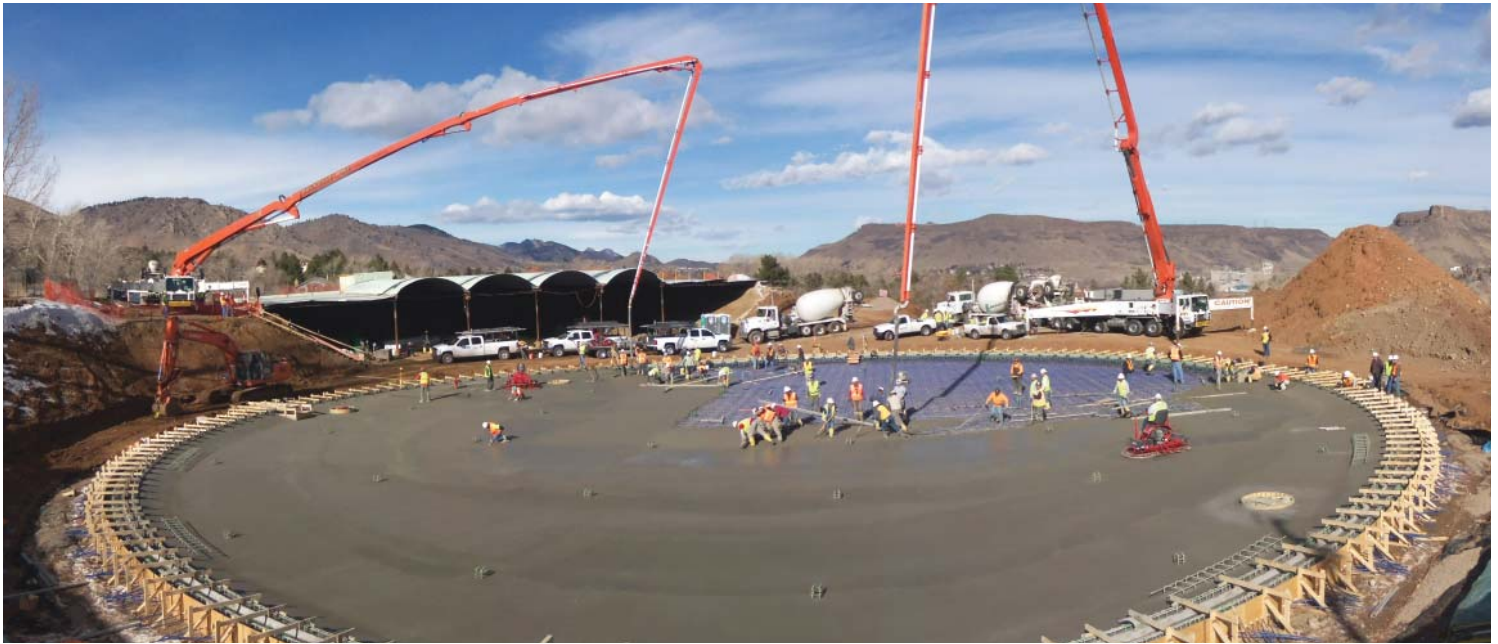
Frazzled by Frazzle Ice

The intake structure for Golden's Water Treatment Plant is about a half mile west of Golden on Clear Creek. If you have walked to the end of the Clear Creek trail past Grant Terry Park you have been there. Most of the year it is a beautiful shady spot, but for a few months in the winter it can be brutally cold. Located on the North side of Lookout Mountain, it gets only a few minutes of sunshine per day in the winter, leaving a layer of ice. It can also cause Frazzle Ice (or slushy stuff) to form, creating more problems than solid ice.

For treatment, water must flow down the pipe that lies beneath the trail all the way to the Water Treatment Plant settling ponds. When there is surface ice on the creek, water running underneath can travel into the intake structure and to the ponds without any problems.

Frazzle ice is a different story. Frazzle ice occurs when the temperature of the water begins to approach the freezing point and ice crystals begin to take shape. This icy slush is the same temperature and nearly the same density as the cold water and therefore doesn't float up to the surface. It stays suspended and flows wherever the water flows. As it enters the pipe, it begins to stack up. Water slowly passes through it, stacking up more and more frazzle ice and compacting it until the water can no longer flow. This causes the pipe to clog and prevents water from flowing to the Water Treatment Plant.

The Utility Division has battled this phenomenon for many years in the early part of winter. Occasionally, portable pumps are installed in the river just above the campground in order to keep the water supply flowing. In 2006, an Emergency Pump station was installed near the 6th Avenue overpass as an alternative method of supplying water to the Water Treatment Plant. This station can only be used when the normal diversion structure is inoperable and has helped tremendously during times when Clear Creek looks like a river of slush.



Workers spreading concrete as the floor of the new tank is being poured.

New Water Storage Reservoir for Beverly Heights

In September 2011, the City started work on a major water project that will replace an aging water storage reservoir on the west side of town. The old tank, on 19th Street at the entrance to Lookout Mountain Road, has been in service since the 1950s. The south half of that partitioned rectangular tank was recently demolished. The new circular concrete tank being built on that site will have a service lifetime of approximately 100 years. Here are some interesting statistics on the new tank:

- At completion, it will contain 1,800 cubic yards of concrete.
- The tank has 112 tons of rebar and almost 26 miles of post tensioning cable for structural support.
- 700 sheets of plywood will be used for deck shoring.
- The tank is called The 6,000 South Tank.

The 6,000 refers to its elevation, and the tank that was there was the southernmost of two tanks in the early days of the system.

The old reservoir had a capacity of 3.8 million gallons but not all of that could be used because it leaked. The new tank will only have a capacity of 2.2 million gallons, but almost that entire volume will be used, making it more efficient.

Scheduled for completion in July, the tank will be covered and seeded with natural grasses so it will blend in with the surrounding environment. At that time, the north side of the old tank will be demolished and the area filled in. Potential future uses for the site are being evaluated.

This project, along with others, is all part of the effort to maintain the City's water infrastructure in good working order.



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.

The City frequently schedules tours of the Water Treatment Plant. If you or your group or class are interested, please call 303-384-8186 to make an appointment.

**For more information,
contact:**



City of
Golden

PUBLIC WORKS DEPARTMENT
ENVIRONMENTAL SERVICES DIVISION

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ESPAÑOL

Este informe contiene información importante acerca de su agua potable. Si usted no puede leer este informe, por favor busque la ayuda de alguien que puede traducir.

