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Potable vs. Non-potable Water

Potable water is water that has been treated, is uncontaminated, and is safe to drink. Potable water meets the EPA's Primary Drinking Water Standards for human consumption.

Non-potable water is water that is untreated and unsafe to drink.

Annual Water Quality Report

The City of Golden is pleased to provide you with the Annual Water Quality Report. This report summarizes information about the quality of the water provided to customers in 2005. It contains important information about drinking water, where it comes from and how it is treated. **There were no violations in the levels of substances detected in Golden's drinking water during 2005.** Informed Golden consumers are the best advocates for safe drinking water and we welcome your input and feedback. The Environmental Services Division can be reached at 303-384-8181 or esdiv@ci.golden.co.us. Learn more online at www.cityofgolden.net.

Purple Pipes Mean Green

If you have walked along Clear Creek Trail beside the kayak course lately, you may have noticed a purple hydrant near the Public Works building. Likewise, if you have gone to the Ulysses batting cages, taken in a ball game at the Lions ball fields, or played frisbee in Lions Park, you may have seen purple plastic lids on irrigation control boxes in the grass. You may have even seen contractors laying purple pipe in the street and wondered what in the world the City was thinking.

The City was thinking green: greener grass and a little more green in citizens' pockets.

Purple is the designated color for non-potable water. Golden has been busy initiating an exciting new non-potable irrigation system that will save citizens thousands of dollars over time and provide a better irrigation system for local parks and facilities.

These facilities have historically been irrigated with potable water from the water treatment plant. There are ever-increasing costs associated with treating water due to water quality standards. There are also potential treatment plant and distribution expansion costs associated with providing potable water to a growing population. When considering these costs, it makes a lot of sense to reduce costs by watering the grass with non-potable water. Not only can the City provide more water without increasing storage or treatment capacity, the City can reduce costs by treating less water.

Consider these facts about using non-potable water to irrigate:

- Fossil Trace Golf Club has always used non-potable water to irrigate its lush fairways and greens.
- Farmers use non-potable water to irrigate their crops.
- Non-potable water is preferable for watering grass because it still contains nutrients that would have been removed to make the water safe to drink.
- The City conserves potable water by providing non-potable water for irrigation.
- Remember the purple pipes contain non-potable water, so PLEASE, don't drink from the sprinklers!

With these things in mind, the City recently installed non-potable irrigation systems in Lions Park, the ball fields, and the ball fields at 10th and Ulysses. The Golden Cemetery will be next to have purple pipes for irrigation installed.

The City has also installed a purple hydrant on 10th Street across from Lions Park used to dispense non-potable water for street sweepers, water trucks and other construction uses that don't require expensive potable water.



If You Have Special Health Concerns:

Because not all contaminants can be completely eliminated, all drinking water, including bottled water, 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.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised individuals such as 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 to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants, contact the EPA Safe Drinking Water Hotline toll free at 1-800-426-4791.

ESPAÑOL

Este informe contiene información importante sobre su agua de beber. Si no puede leer, por favor busque la ayuda de alguien que lo puede traducir.

Keep it Clean 'Cause We're All Downstream!

The City of Golden treats the surface waters of Clear Creek to provide drinking water. Golden has two separate sewer systems that impact water in Clear Creek—the storm sewer and the sanitary sewer.

The storm sewer system collects runoff from rain and snow melt. This runoff is transported across roads, down gutters and into storm drain inlets that empty into Clear Creek without any treatment.

The pollutants on surfaces such as yards, roads and parking lots build up over time. During storms and snow melt events, the pollutants are quickly washed off and efficiently delivered to water bodies like Clear Creek. These pollutants are of great concern due to their impact on water quality. As a result of local and national monitoring efforts, the City has a much better understanding of the nature and impacts of stormwater pollution and has confirmed that urban stormwater has a common signature: the same pollutants are found in stormwater no matter which region of the country is sampled. While the concentrations are notoriously variable from storm to storm, the typical stormwater sample is characterized by high levels of sediment, nutrients, organic carbon, trace metals (copper, zinc and lead), petroleum hydrocarbons, pesticides and fecal coliform bacteria.

Please remember these simple tips to protect the drinking water supply: fix car leaks, pick up pet waste, minimize the use of lawn and garden chemi-

icals, compost yard waste, and properly dispose of household chemicals.

The sanitary sewer system is separate from the storm sewer system. While surface runoff is discharged directly to Clear Creek, wastewater from inside the home and business is transported through pipes to the wastewater treatment plant. There, the wastewater is treated until it is clean enough to be

discharged back into Clear Creek. While the water from inside your home or office is treated, not all chemicals are easily removed from the wastewater during treatment. Therefore, you should take care to avoid putting strong cleaners or

Everybody lives in a watershed...

Everybody lives downstream...

Everybody has an impact, and

Everybody can make a difference.

— George Fleming

solvents down the drain. You can dispose of household chemicals at the Rooney Road Recycling Center. Please call 303-316-6262 for an appointment.



Water Notes

- The typical single-family home uses 101 gallons of water per day.
- A five-minute shower uses almost 25 gallons of water.
- An automatic dishwasher uses about 12 gallons of water per load, while hand-washing dishes use up to 20 gallons per load.
- One gallon of water weighs approximately 8 ½ pounds.

Glossary of Terms and Definitions (for chart on right)

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

C/100mls: Counts per 100 milliliters

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set at 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 or quarterly monitoring.

Secondary Maximum Contaminant Level (SMCL): Non-enforceable levels that primarily affect the aesthetic quality of drinking water.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water instead of a MCL.

DETECTED REGULATED SUBSTANCES

	Parameter	Detected Level	Range	MCL	MCLG	Sample Date	Violation? Y/N	Potential Sources
Regulated leaving the Treatment Plant	Barium, ppm	0.028	n/a	15	0	8-Mar-05	N	Decay of Natural Deposits
	Beta emitters, pCi/L	2.3	n/a	50	0	25-May-05	N	Decay of Natural Deposits
	Fluoride, ppm	0.69	0.34 - 0.94	4	4	monthly	N	Erosion of Natural Deposits
	Nitrate, ppm	0.32	n/a	10	10	18-Mar-05	N	Fertilizer Run-off
	Turbidity, NTU	0.255*	see note**	TT	None	23-May-05	N	Natural Run-off
	Radium, pCi/L	0.6	n/a	5	None	25-May-05	N	Decay of Natural Deposits
	Total Organic Carbon, ratio	1.3 [†]	1.3 - 2.6	TT	TT	monthly - RAA	N	Naturally present in the environment
	Parameter	Detected Level - RAA	Range	MCL	MCLG	Sample Date	Violation? Y/N	Potential Sources
Regulated in the Distribution System	Total Trihalomethanes, ppb	36.3	20.9 - 54.9	80	n/a	quarterly - RAA	N	By-product of Chlorination
	Total Haloacetic Acids, ppb	10.6	6.4 - 16.8	60	n/a	quarterly - RAA	N	By-product of Chlorination
	Chlorine (free), ppm	0.9	0.01 - 1.61	MRDL - 4	MRDLG - 4	quarterly - RAA	N	Drinking Water Disinfectant
	Parameter	Detected Level	Range	MCL	MCLG	Sample Date	Violation? Y/N	Potential Sources
	Total Coliforms, C/100mls	1***	n/a	less than 1	0	15-Apr-05	N	Naturally present in the environment
	Fecal Coliform, C/100mls	1***	n/a	less than 1	0	15-Apr-05	N	Human and animal fecal waste
Parameter	90th percentile value	Number of homes exceeding AL	AL	MCLG	Sample Date	Violation? Y/N	Potential Sources	
Regulated at Consumers tap	Lead, ppb	0	0	15	n/a	Sep-05	N	Corrosion of household plumbing
	Copper, ppm	0.044	0	1.3	n/a	Sep-05	N	Corrosion of household plumbing
	The requirement to monitor for lead and copper at consumer taps has been reduced to once every 3 years.							

* Highest single measurement for 2005. Monthly averages must be less than 0.3 ntu 95% of the time.

** 100 % of all turbidity measurements were less than 0.3 NTU in 2005

Turbidity is a measure of the cloudiness of water. We monitor for turbidity because it is a good indicator of the effectiveness of our filtration system.

*** Required follow-up testing indicated results were due to sampling error. Chlorine residual was normal.

[†] Ratio Must be equal to or greater than 1.0

DETECTED UNREGULATED SUBSTANCES

	Parameter	Average	Range	MCL	SMCL	Sample Date	Violation? Y/N	Potential Sources
Monitored leaving the Treatment Plant	Sodium, ppm	25.3	n/a	Not Regulated	None	6-Mar-05	n/a	Erosion of Natural Deposits
	Bromodichloromethane, ppb	5.5	n/a	Not Regulated	None	6-Mar-05	n/a	By-product of chlorination
	Chloroform, ppb	6.3	n/a	Not Regulated	None	6-Mar-05	n/a	By-product of chlorination
	Chlorodibromomethane, ppb	2.9	n/a	Not Regulated	None	6-Mar-05	n/a	By-product of chlorination
	Bromoform, ppb	0.85	n/a	Not Regulated	None	6-Mar-05	n/a	By-product of chlorination
	Radon, pCi/L***	2 (± 12)	n/a	Not Regulated	None	25-May-05	n/a	Erosion of Natural Deposits

***The test for radon has a high variability and therefore is reported as 2 pCi/L plus or minus 12 pCi/L. Because the test has a high margin for error, the result may be insignificant. Consumers should know that radon is a gas that you cannot see, taste or smell. Radon can be released into indoor air from showering, washing dishes or other household activities. However, in most cases, radon is not a problem in homes served by a public water supply. Radon is a known human carcinogen and if you have a concern about radon in your home, have the air tested. There are many low cost, easy to use radon test kits available to consumers. For additional information you can call the State of Colorado Radon Program at (303) 692-330 or EPA's Radon hotline at 1-800-SOS-RADON.

OTHER SUBSTANCES DETECTED - UNREGULATED BUT OF PUBLIC INTEREST

	Parameter	Average	Range	MCL	SMCL	Sample Date	Violation? Y/N	Potential Sources
Monitored in the Distribution System	Manganese, ppm	0.008	0.001 - 0.027	n/a	0.05	monthly	n/a	Erosion of Natural Deposits
	Iron, ppm	0.005	0.002 - 0.025	n/a	0.3	monthly	n/a	Erosion of Natural Deposits
	Aluminum, ppm	0.1	n/a	n/a	0.05-0.2	24-Mar-05	n/a	Erosion of Natural Deposits
	Zinc, ppm	0.09	n/a	n/a	5	24-Mar-05	n/a	Erosion of Natural Deposits

ppm?? One part per million (ppm) is equal to:

- 1 inch in 16 miles
- 1 cent in \$ 10,000
- 1 minute in two years

ppb?? One part per billion (ppb) is equal to:

- 1 inch in 16,000 miles
- 1 cent in \$ 10,000,000
- 1 second in 32 years
- The first 16 inches on a trip to the moon

Protecting Our Drinking Water

The Colorado Department of Public Health and Environment has provided consumers with a Source Water Assessment Report for our water supply. The purpose of the assessment is to analyze the potential susceptibility of the City of Golden's public drinking water source to contamination. The report also supplies pertinent information to help decision-makers develop and implement appropriate water quality management strategies to protect the water source. Copies of the report are available online at www.cdphe.state.co.us/wq/sw/swaphom.html or obtain one by contacting the City of Golden Environmental Services Division at 303-384-8181.



Water Notes

A typical household consumes approximately 30% of their water for outdoor use such as watering the lawn.

PILOT PROGRAM PROVIDES EDUCATIONAL AND RESEARCH BENEFITS

Golden's Water Plant continues to partner with Colorado School of Mines (CSM) with a program that allows hands-on, real-world educational opportunities for CSM students while providing beneficial research to the City of Golden's Water Plant through the Pilot Plant Laboratory.

The water treatment process involves removing dissolved Manganese from the drinking water. Manganese occurs naturally in Clear Creek and, while non-toxic, it can cause color and odor problems. Currently, the City removes 85% to 95% of the Manganese in the water by adding Potassium Permanganate, a pre-oxidant chemical, at the beginning of the treatment process. The required amount of chemical often varies given different water conditions, and operators must rigorously control and monitor dosage in order to achieve optimal performance.

During the 2005-2006 school year, CSM students and Golden staff evaluated enhancing the treatment process by establishing an additional barrier for Manganese. Seven students from CSM, Professor Jorg Drewes and Teacher's Assistant Tyson Ingels investigated whether the plant could employ "greensand filtration." This filtration process removes Manganese at the filter stage of treatment. If the City implements this additional treatment, it would effectively have **double barrier** protection from Manganese. More Manganese is removed with greensand filtration than without it! Hence, the additional barrier **improves manganese removal**. This additional barrier allows for a wider range of Permanganate doses and eases the burden on operations staff. There is potential **cost savings** because the filters are now doing part of the work of Manganese removal, thus reducing the amount of chemical needed. The class has again proved that by working together, the City of Golden and CSM are providing safe, high-quality drinking water and increasing the educational opportunities at CSM.

For additional information about the Colorado School of Mines' Environmental Science and Engineering department, visit their Web site at www.mines.edu/academic/envsci/.



Pilot Plant Class: Ben Johnson; George Burgermeister; Amanda Savage; Tyson Ingels, TA; Jorg Drewes, professor; Heidi Bauer; Jen Jeffers; and Katie Chamberlain.

Water Sources

Golden's drinking water source is exclusively Clear Creek and its tributaries. As it flows through the watershed, it may pick up substances from construction and highway maintenance, mining and remediation projects, land and rock slides, septic systems and pollutants transported by stormwater runoff. Contaminants that may be present in our raw water source include: bacteria and viruses, salts and metals, pesticides and herbicides from agricultural runoff, organics contaminants from petroleum spills and gas stations and radioactive contaminants that are naturally occurring or from mining activity.

In order to ensure that tap water is safe to drink, the EPA has set regulations that limit the amount of certain contaminants in water provided by public water systems.

Construction at the Water Plant

For many years the basins behind Public Works and Clear Creek RV Park have been uncovered. Uncovered, these basins attracted wildlife and other potential contaminants to the water supply. The open nature of these basins also presented an opportunity for vandals to breach security. In 2005, a cover was built over the top of the flocculation and sedimentation basins. Not only does this cover provide significant improvements to the protection and security of your drinking water, it also helps control the diurnal changes (the need for chemical adjustments due to daily cycles of low and high temperatures) in chemical treatment.

