



City of Helena

Water Quality

**Treatment
Sampling
Monitoring**

**Department of Public Works
Helena Water Treatment Division**



2005 Annual Water Quality Report

The goal of the Helena Water Treatment Division is to ensure customer satisfaction by consistently delivering high quality water today and in the future.

The City of Helena provides more than 29,000 customers with an average of 5.5 million gallons of water each day. This City utility supplies water directly to homes and businesses throughout Helena through metered service connections. Water is delivered to the City's fire hydrants, to ensure the safety of our residents. The water distribution system connects to 9,300 service taps. The total annual gallorage from all sources for 2004 is 2.018 Billion Gallons with a maximum production of 15.7 Million Gallons, in a single day.

In 2004, Helena once again met all state and federal standards for clean water. The City is pleased to offer this report to the community detailing the workings of the utility and the results of water quality testing.

Water System -- To meet Helena's daily water needs, the Helena Water Treatment Division of the Department of Public Works operates two surface water treatment plants; the Missouri River Water Treatment Plant located at 2560 Canyon Ferry Road, whose source is the Missouri River east of Helena; and, the Ten Mile Water Treatment Plant west of Helena at 1115 Rimini Road, whose source is the Tenmile Creek drainage west of Helena. The Ten Mile Water Plant is in operation all year while the MRTP is used primarily during the summer months for peak demands. As a minor source of supply, groundwater is provided from the Hale system, which consists of the Oro Fino collector located southwest of Helena in the Oro Fino Gulch area, and, the Eureka well located at Cruse and Park Streets. The division's two treatment plants are maintained, evaluated, and upgraded to stay abreast of advancements in technology, health science, and safe drinking water regulations. Water treatment involves complex chemistry, specialized equipment and computerized controls. Helena's staff of water treatment operators are tested and certified by the State of Montana and are kept current in their skills with continuing education and training.

The City has recently completed a \$1.1 million dollar project to rehabilitate and modify existing filters at the Missouri River Treatment Plant. This will assure compliance with regulatory requirements for safe drinking water for many years. \$650,000 was provided by a grant from the federal government through the Water Resources Development Act. These new improvements are currently in operation at the Missouri River Water Treatment Plant.

The City is preparing to move forward with the next phase Missouri River Water Plant upgrade to continue to provide the safest and highest quality potable water to it's residents and customers, with the addition of a larger Clearwell and Pumping Station at the Missouri River Water Treatment Plant. This improvement will increase the capacity and extent the life of the existing facility. The improvements will be partially funded with Federal STAG Grants obtained for Helena by direct appropriation from Congress.

This past year the City of Helena has renegotiated a contract with the US Bureau of Reclamation for purchase of Missouri River water from the Canyon Ferry Reservoir. The existing 40-year contract expired at the end of 2004 and the new contract will extend for another 40 years, provisions for contact renewals indefinitely. This will assure a stable supply of treatable water to the year 2045 and beyond for a growing City.

Water Treatment -- This process consists of a series of steps. Each refining the quality of the source water. First aluminum sulfate and cationic polymer are added to the influent water, causing small particles to adhere to each other and making them heavy enough to settle into a basin or collect on a special media. The particles as sediment are then flushed to waste lagoons. The water is then filtered through layers of fine anthracite and silicate sand removing suspended particles. During filtration turbidity is removed and clear water emerges. Prior to the water being sent the distribution system, a small amount of chlorine is added to ensure the water remains free of any virus or bacteria.

Sampling -- The highly trained and certified staff of the water treatment division sample water regularly for quality testing. Sampling includes the following:

Daily	Chlorine residuals, turbidity, pH, temperature, and color.
Weekly	Bacteria (total coliform).
Quarterly	Trihalomethanes, Haloacetic Acids.
Yearly	Inorganic, volatile organic contaminants, synthetic organic contaminants, nitrates, lead and copper (every 3 years), radioactivity (every 4 years).

Monitoring -- both the State Environmental Lab (Cogswell Building) and the Energy Lab in Helena are the heart of Helena's quality assurance program. Their testing by certified chemists and technicians follows precise procedures established by the U.S. Environmental Protection Agency (EPA).

Listed below are the substances, **which were detected** and analyzed, by the State Environmental Lab and the Energy Lab for the Helena Water Treatment Division. The maximum contaminated levels (MCL) apply to the water within our distribution system after treatment including groundwater sources. This table shows the results of our monitoring for the period of January 1 to December 31, 2004.

Tenmile, MRTP, Hale/Eureka Water Sources

TEST RESULTS								
Contaminant	Violation Y/N	Sample Date	Highest Level Detected	Range Detected	Unit Measurement	MCLG	MCL	Likely Source of Contamination
Microbiological Contaminants								
1. Turbidity Tenmile Water Plant Missouri River Water Plant	N N	Aug. 24, 04 Sept. 17, 04	0.29 0.20	100% of samples taken meet state requirements	NTU	NA	0.30	Soil runoff.
2. Total Organic Carbon Tenmile Water Plant Missouri River Water Plant	N N	RAA RAA	3.62 1.73		ppm	NA	TT	Naturally present in the environment.
3. Chlorine Residual Tenmile Water Plant	N	RAA	0.65		ppm	MRDLG=4	MRDL=4.0	Water additive to control microbes.
Inorganic Contaminates								
4. Arsenic Missouri River Water Plant Tenmile Water Plant Hale / Eureka	N N N	July 10, 04 July 10, 04 July 10, 04	ND ND ND		ppb	NA	10	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
5. Copper	N	Sept.08, 02	0.42 90th % of samples taken	No samples exceeded the Action Level.	ppm	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives.
6. Lead	N	Sept. 08, 02	6 90th % of samples taken	No samples exceeded the Action Level.	ppb	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits.
7. Nitrate plus Nitrite as N Missouri River Water Plant Tenmile Water Plant Hale / Eureka	N N N	July 05,04 Aug.29, 04 July 17,04	0.21 0.06 1.16		ppm	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
8. Fluoride Tenmile Water Plant Missouri River Water Plant	N N	Aug. 29,04 July 05, 04	0.14 1.03		ppm	4	4	Erosion of natural deposits; discharge from fertilizer and aluminum factories
Volatile Organic Contaminants (voc's)								
9. Total Trihalomethanes Tenmile Water Plant Missouri River Water Plant Hale/Eureka	N N N	RAA RAA RAA	41.0 42.0 4.0	22.0 – 51.0 19.0 - 51.0 3.0 – 13.0	ppb		80.0 RAA	By-product of drinking water chlorination.
10. Total Haloacetic Acid Tenmile Water Plant Missouri River Water Plant Hale / Eureka	N N N	RAA RAA RAA	38.0 42.0 1.0		ppb		60.0 RAA	By – product of drinking water chlorination

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Turbidity is a measurement of the cloudiness of the water. This is monitored as a good indicator of the effectiveness of our filtration system. The specified limit of Turbidity is 0.3 NTU in the clearwell and sample measurements were below the limits 100% of the time.

There have been many questions about the hardness and pH of the City's water. Hardness is a characteristic of water caused mainly by the salts of calcium and magnesium. The MCL for hardness is 300 mg/L. The water from the Tenmile Treatment Plant has a hardness of 26.0 mg/L. Water from Eureka Well is 240.0 mg/L. Water from Ore Fino is 192.0 mg/L. Water from the Missouri River Plant is 174.0 mg/L. The pH is the measurement of the intensity of the basic or acidic condition of the water. The pH may range from 0 to 14, zero is most acidic, 14 is most basic, and 7 being neutral. Natural waters usually have a pH between 6.5 to 8.5. Water from the Tenmile Plant and the Missouri River Plant have a pH of 7.2 to 7.5. Water from Eureka well has a pH of 7.2; the pH of the Oro Fino water is 7.4.

Helena's drinking water meets or exceeds all federal and state requirements. No water quality standards were violated with regular sampling and testing. We have learned through our monitoring and testing that some contaminants have been detected and are listed in the above test results. The EPA has determined that your water IS SAFE at these levels.

Radon has been detected in all Montana's surface and ground water sources. The radon detection ranged from a low of 220 pCi/L to a high of 1770 pCi/L. Radon is a radioactive gas that you can't see, taste, or smell. It normally is found underground and can move up through the ground and into a home through cracks and holes in the foundations. The EPA is proposing an MCL of 300 pCi/L in drinking water with an alternative MCL of 4000 pCi/L for those systems or states that implement a Multi-Media Mitigation Program, which is a public awareness program. **There is no federal regulation for radon levels (MCL) in drinking water as of this printing.** Exposure to air transmitted radon over a long period of time may cause adverse health effects. For additional information call the state radon program at 444-5318 or call the EPA's Radon Hotline (1-800-SOS-RADON).

*Abbreviated Definitions:

AL	Action level. The concentration of a contaminant, which if exceeded, triggers treatment or other requirements, which a water system must follow.
NA	Not Available.
BG	Billion Gallons.
MG	Million Gallons.
TT	Treatment Technique. Required process intended to reduce the level of a contaminant in drinking water.
ppm or mg/L	Parts Per Million. One part per million corresponds to one minute in two years or a single penny in \$10,000.
ppb	Parts Per Billion. One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
NTU	Nephelometric Turbidity Unit. A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
pCi/L	Picocuries per liter--measure of radioactivity in water.
MCL	Maximum Contaminant Level. Highest allowable amount of a contaminant that is allowed in drinking water.
MCLG	Maximum Contaminant Level Goal. Level of a contaminant in drinking water below which no known or expected risk to health exists. MCLG's allow for a margin of safety
MRDL	Maximum Residual Disinfectant Level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that the addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum Residual Disinfectant Level Goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contamination.
RAA	Running Annual Average.
ND	Not Detected

All sources of drinking water are subject to potential contamination by constituents that are naturally occurring or man made. Those constituents can be microbes, organic or inorganic chemicals, or radioactive materials.

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the **Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791**.

The MCL's are set by the USEPA and State of Montana at levels, which assure public health and safety with a very low risk of health impacts.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The EPA and Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the **Safe Drinking Water Hotline (1-800-426-4791)**.

If you have any questions about this report or concerning your water utility, please contact Donald Clark, Water/Wastewater Treatment Superintendent at 447-1593 or Fax 447-1600 or e-mail dclark@ci.helena.mt.us To learn more about the City of Helena and the City's Water Utility, visit our web site at <http://www.ci.helena.mt.us>

Prepared and updated April 1, 2005 by
Doug Hahn-----Water Plant Operator III
John Schwartz-----Water Production Supervisor
Donald Clark-----Water/Wastewater Treatment Superintendent

Hardness of the Helena Waters		
Source Water	Level Detected mg/L	Converted to Grains / Gallon
Tenmile Water Plant	26.0	1.5
Missouri River Plant	174.0	10.2
Eureka Well	240.0	14.0
Oro Fino	192.0	11.2