



City of Helena

## **Water Quality**

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



# 2007 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 Public Water System Identification Number 0000241(PWSID# MT0000241) serves about 9300 residential and commercial accounts with a yearly average of 5.5 million gallons of water each day through metered service connections. Water is also supplied to fire hydrants that ensure the safety of homes and businesses. Last year, the Water Treatment Division produced a total of 2.01 Billion Gallons with a maximum production of 14.5 Million Gallons on a single day.

In 2006, the Helena Water Treatment Division once again met all state and federal standards for clean drinking water. Helena is pleased to offer this report to the community detailing the workings of our division and the results of the monitoring and testing. This year we are pleased to announce we had no violations from either Montana Department of Environmental Quality or from the United States Environmental Protection Agency.

**Water System --** To meet Helena's water needs, the Helena Water Treatment Division operates two surface water treatment plants; the Missouri River Treatment Plant located east of town, whose source is the Missouri River east of Helena; and; the Tenmile Water Treatment Plant west of Helena, whose source is the Tenmile Creek drainage west of Helena. These two sources are the City's primary supplies. The division's two treatment plants are operated, maintained, and upgraded as required to stay abreast of advancements in technology, health science, and governmental regulations. Additional water is produced from the Eureka well water collector system located at Cruse and Park Avenues. This pure groundwater source does not require further treatment.

Significant accomplishments were achieved in 2005 & 2006. A security improvement project was completed, with fencing, alarm, and access entry systems that provide better protection to the water supply and treatment infrastructure. Negotiation and renewal of a 40-year contract with the US Bureau of Reclamation for purchase of Missouri River water from the Canyon Ferry Reservoir was finalized. This new contract assures an adequate supply for our growing city through 2044 with the ability to renew the contract indefinitely. Also, the City completed a comprehensive Water Facilities Plan Update that defines needed improvements and capital expenditures for the next several years.

This year the City will begin a major upgrade to the Missouri River Treatment Plant to improve reliability, maintain regulatory compliance and meet future growth needs. The first phase will include a 1.5 million gallon Clearwell reservoir for disinfection and a new energy efficient High Zone Pumping Station. At the Tenmile Water Treatment Plant, new filtration media will be installed to replace media that is approaching its useful life. In addition, the City will be replacing several thousand feet of old water mains to improve system reliability and correct leakage.

**Water Treatment --** The City's treatment process consist of a series of steps to remove impurities and disinfect the untreated or raw water. When the raw water is first delivered to the treatment plants, chemicals are added that cause small particles to combine and become heavy (flocculation). Next the impurities are allowed to settle in sedimentation basins (Missouri River Treatment) or collect on special media (Tenmile Treatment). Then, the water is filtered through sand and anthracite coal filters to remove remaining small particles. Finally, a small amount of chlorine is added to the water and it is delivered to the City. These treatment processes are manned and operated by a team of highly trained, State certified water treatment professionals and assisted by computerized systems control and data acquisition.

**Sampling --** Regular sampling and testing is an important assurance of the quality of water. 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 Montana State Environmental Lab (Cogswell Building) and Energy Labs, Inc. on Helena are at the heart of our quality assurance program. Their independent 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 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, 2006.

## 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
<b>Microbiological Contaminants</b>								
1. Turbidity Tenmile Water Plant Missouri River Water Plant	N N	Dec 23, 06 July 30, 06	0.29 0.22	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	3.52 2.04		ppm	NA	TT	Naturally present in the environment.
3. Chlorine Residual Tenmile Water Plant	N	RAA	0.76		ppm	MRDLG=4	MRDL=4.0	Water additive to control microbes.
<b>Inorganic Contaminates</b>								
4. Arsenic Missouri River Water Plant Tenmile Water Plant Hale / Eureka	N N N	July 13, 06 July 13, 06 July 13, 06	0.2 0.2 0.2		ppb	NA	10	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
5. Copper	N	April 20, 06	.25 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	April 20, 06	1.5 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 13, 06 July 13, 06 July 13, 06	0.20 ND 1.42		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 Hale / Eureka	N N N	July 13, 06 July 13, 06 July 13, 06	0.10 0.8 0.2		ppm	4	4	Erosion of natural Deposits; discharge from Fertilizer and aluminum Factories
<b>Volatile Organic Contaminants (voc's)</b>								
9. Total Trihalomethanes Tenmile Water Plant Missouri River Water Plant Hale/Eureka	N N N	RAA RAA RAA	50.0 28.0 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	25.0 18.0 2.4		ppb		60.0 RAA	By – product of drinking water chlorination

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Turbidity is a measure of the clarity of water. We monitor this because it is a good indicator of the effectiveness of our filtration system. The specified limit for turbidity in our treatment process is 0.3 NTU and our turbidity measurements were less than this amount 100% of the time.

There have been many questions about the hardness and pH of the City's water. Hardness is a natural characteristic of water caused by dissolved 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 the Missouri River Plant is 174.0 mg/L.

pH is a measurement of acidity or causticity in water. The pH scale ranges from 0 to 14 where zero is most acidic, 14 is most caustic, and 7 is neutral. Natural waters typically have a pH between 6.5 to 8.5. Water from the Tenmile Plant and the Missouri River Plant has a pH of 7.2 to 7.5. Water from Eureka well has a pH of 7.2.

As can be seen from testing results, Helena's water system had no violations and is proud to report that your drinking water meets or exceeds all federal and state requirements. Monitoring and testing have shown however, that some regulated contaminants have been detected and these are noted in the above test results. The USEPA has determined that your water IS SAFE at these levels.

Radon is a naturally occurring radioactive gas in the earth's crust. It is soluble in water and is tasteless, colorless and odorless. We have detected radon in all Helena's surface and ground water sources. The radon detection ranged from a low of 220 pCi/L to a high of 1770 pCi/L. The EPA is proposing a 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 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).

Additional testing of our drinking water was taken by the EPA on April 28, 2000. These samples were taken during a period of high turbidity commonly seen in the early spring. During this period velocities increase several fold resulting in scouring in the distribution system. All samples taken were within compliance of all EPA and state drinking water regulations.

\*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, Fax 447-1600 or e-mail [dclark@ci.helena.mt.us](mailto: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 Feb 19, 2007 by  
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<b>Hardness of the Helena Waters</b>		
<b>Source Water</b>	<b>Level Detected mg/L</b>	<b>Converted to Grains / Gallon</b>
<b>Tenmile Water Plant</b>	<b>26.0</b>	<b>1.5</b>
<b>Missouri River Plant</b>	<b>174.0</b>	<b>10.2</b>
<b>Eureka Well</b>	<b>240.0</b>	<b>14.0</b>