



## **CITY OF MASON WATER QUALITY REPORT FOR CALENDAR YEAR 2010**

We are very pleased to provide you with this year's Annual Quality Water Report. We want to keep you informed about the excellent water and services we have delivered to you over the past year. Our goal is and always has been, to provide to you a safe and dependable supply of drinking water. Our water source is obtained from seven wells located within the City. These wells have been installed over the years in accordance with the isolation and construction requirements of the state regulatory agency (Department of Natural Resources Environmental). The City's wells are relatively deep with the water drawn from the Saginaw Sandstone Formation except for Well No. 1. The depth of the rock wells range from 215 feet to 400 feet. There is considerable impermeable material above the water bearing formation at each of these wells, and this protects the quality of the water from surface contaminants. Well No. 1 is quite shallow, and City employees monitor the water from this well closely to make certain all water quality standards are met.

The City's water department has completed a wellhead protection plan and continues to work on the management of the well head protection areas around the City's wells.

We have a source water assessment plan available at our office that provides more information such as potential sources of contamination. Our rating from the DEQ in 2007 for susceptibility is Moderately High. The City has abandoned the one and only well that was within a high risk area in 2007. Our hope is to get a better rating for 2011. Our source water assessment is on file at the Mason Water Treatment Plant Office at 1413 Avery Ln. Mason Mi. 48854.

A system wide evaluation was done in 2008 by the DEQ and the City of Mason water supply was given a rating of Satisfactory, this is the best rating that a water supply can receive.

## DEFINITIONS OF TERMS USED

In the table below you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

*Non-Detects (ND)* - laboratory analysis indicates that the constituent is not present.

*Parts per million (ppm) or Milligrams per liter (mg/l)* - one part per million corresponds to one minute in two years or a single penny in \$10,000.

*Parts per billion (ppb) or Micrograms per liter* - one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

*Picocuries per liter (pCi/L)* - Pico curies per liter is a measure of the radioactivity in water.

*Action Level* - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

*Treatment Technique (TT)* - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

*Maximum Contaminant Level (MCL)* The "Maximum Allowed" (MCL) is 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 "Goal" (MCLG) is 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. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

*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.

*Running Annual Average (RAA)* - four quarter running annual average for chlorine residual in the distribution system.

## CONTAMINANT INFORMATION

The Federal Safe Drinking Water Act by definition says that everything in drinking water other than H<sub>2</sub>O is a contaminant. While this makes it easier for the U.S. Environmental Protection Agency (EPA) to write regulations, it means we all see and hear about contaminants in our drinking water. These contaminants include hardness, iron, and manganese which may cause aesthetic problems for consumers when present. These aesthetic constituents of drinking water which are present in the City of Mason's drinking water are not related to health considerations.

As water travels over the surface of the land or through the ground, it dissolves natural occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. 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. Information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800) 426-4791.

## MICROBIOLOGICAL CONTAMINANTS

The routine test to evaluate the bacteriological quality of drinking water is to analyze routine water samples for the presence of Total Coliform Bacteria, which is an indicator organism that is used as a health standard. The City's monitoring schedule for bacteria requires the collection of eight water samples from the distribution system each month to be analyzed for Total Coliform Bacteria in a properly certified laboratory. This means the City collected 108 samples from the water distribution system this year. All 108 samples came back negative for the presence of Total Coliform Bacteria. The City of Mason also collected samples from the wells and raw water main each month and they also came back negative.

## INORGANIC CHEMICAL CONTAMINANTS

**Table No. 1**

Water Quality Report for 2010  
City of Mason – CCR

Contaminant	MCLG	MCL	Highest Measured Concentration	Range	Major Source in Drinking Water
Fluoride* Before Treatment	4 ppm	4 ppm	0.49 ppm	0.24- 0.49 ppm	Erosion of Natural Deposits
Nitrate as N		10 ppm	ND for 2010	ND	
Selenium		.05 ppm	0 .001ppm(2008)	0 -.001ppm	

**Table No. 2**

Water Quality Report for 2010

City of Mason -CCR

Regulated Contaminant	MCL	MCLG	Highest Level Detected	Range	Sample Date	Violation Yes / No	Typical Source of Contaminant
Arsenic* (ppb)	10	0	ND	0	9/14/09	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2	2	.16	0-.16	9/09/08	No	Discharge of drilling wastes; Discharge of metal refineries; Erosion of natural deposits
Chromium (ppb)	100	100	ND	ND	9/09/08	No	Discharge from steel and pulp mills; Erosion of natural deposits
Fluoride (ppm)	4	4	1.07	.71-1.07	2010	No	Erosion of natural deposits. Discharge from fertilizer and aluminum factories.
TTHM - Total Trihalomethanes (ppb)	80	N/A	12.1 ppb	9.9-12.1 ppb	9/9/09	No	Byproduct of drinking water disinfection
HAA5 Halo acetic Acids (ppb)	60	N/A	8 ppb	7-8 ppb	9/9/09	No	Byproduct of drinking water disinfection
Chloramines (ppm)	MRDL	MRDLG	N/A	N/A	N/A	N/A	Water additive used to control microbes
	4	4					
Chlorine (ppm)	MRDL	MRDLG	1.13	.49-1.13	2010 RAA	No	Water additive used to control microbes
	4	4					

Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.

Total Trihalomethanes (TTHMs). Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

Haloacetic Acids (HAA5). Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of cancer

Chlorine. Concentrations above the MRDL may result in eye/nose irritation; stomach discomfort, and anemia.

Radioactive Contaminant	MCL	MCL G	Highest Level Detected	Range	Sample Date	Violation Yes / No	Typical Source of Contaminant
Alpha emitters (pCi/L)	15	0	2.8	1.6-2.8	1/13/2009	No	Erosion of natural deposits
Combined radium (pCi/L)	5	0	1.2	1.2	11/5/1010	No	Erosion of natural deposits
Special Monitoring and Unregulated Contaminant **			Average Level Detected	Range	Sample Date	Typical Source of Contaminant	
Sodium (ppm)			23	23	2010	Erosion of natural deposits	
Hardness (ppm)			342	342	2010	Erosion of natural deposits	
Iron(ppm)			ND	ND	2010	Erosion of natural deposits	
Sulfate(ppm)			37	37	2010	Erosion of natural deposits	
Contaminant Subject to AL	Action Level	90% of Samples < This Level	Range	Sample Date	Number of Samples Above AL	Typical Source of Contaminant	
Lead (ppb)	15	2	0.0-50(ppb)	7/1/09-12/31/09	***1	Corrosion of household plumbing systems; Erosion of natural deposits	
		2	0.0-42(ppb)	1/1/2010-6/30/2010	1		
Copper (ppm)	1.3	1.1	0.0-3.57(ppm)	7/1/09-12/31/09	2	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives	
		1.1	0.0-2.57(ppm)	1/1/2010-6/30/2010	3		

\* These arsenic values are effective August 10, 2007. Until then, the MCL is 50 ppb and there is no MCLG.

\*\* Unregulated contaminants are those for which EPA has not established drinking water standards. Monitoring helps EPA to determine where certain contaminants occur and whether it needs to regulate those contaminants.

\*\*\* This site was re-sampled and found to be considerably under the action limit.

Microbial Contaminants	MCL	MCLG	Number Detected	Violation Yes / No	Typical Source of Contaminant
Total Coliform Bacteria	1 positive monthly sample (5% of monthly samples positive)	0	0	No	Naturally present in the environment
Fecal Coliform and <i>E. coli</i>	Routine and repeat sample total coliform positive, and one is also fecal or <i>E. coli</i> positive	0	0	No	Human and animal fecal waste

Combined Radium 226/228. Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

Copper. Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

**Raw Water:** is the water that comes from all the wells to the water plant in one pipe before treatment.

**Finished Water:** is the water that has been treated and is going out to the customer.

The City's finished water was tested for inorganic chemicals during 2010. The water was tested for iron, chloride, hardness, sodium, and sulfate, which are chemical constituents often found in groundwater. These are of aesthetic concern rather than health concern. For people concerned about their sodium intake, the results from the sodium tests were 23ppm. Herbicides, Pesticides, and Carbamates were tested in 2009 from the finished water tap and all results came back as Not Detected.

The Raw water coming into the plant was tested for Herbicides, Pesticides, and Carbamates in 2009 all results came back Not Detected. There was one positive test result for nitrate in 2008. However, the one positive result was only 1.1 ppm which is well below the MCL. There were no positive results for nitrite or nitrate in 2009.

The EPA has considered developing a maximum contaminant level (MCL) for sulfate since high concentrations may cause diarrhea. The EPA requires that customers be notified of the sulfate concentrations in the City's water even though the sulfate concentration in the water from the finished water is far below the Secondary MCL of 250 ppm. The Sulfate results for 2010 were 37 ppm which is well below the secondary MCL.

## LEAD AND COPPER

Water systems are required to collect samples or have samples collected from customers' taps after the water has been held in the internal home piping system for at least six hours. There is no measurable lead or copper in the water as it leaves the water plant. Historical monitoring indicates no lead or copper in the water within the distribution system either. Therefore, this is actually a check on the corrosivity of the water in the home piping system. This monitoring is normally completed by asking selected customers to collect the samples from their home taps at the first flush of the water in the morning. The selection of customers to collect these samples is based on the type of piping in the house and the location within the distribution system.

The federal action level requires that 90% of the samples collected be less than 15 ppb for lead and 1.3 ppm for copper.

In the most recent round of 40 sample points, the 90 percentile for lead was 2 ppb which is below the action level. The 90 percentile for copper was 1.1 ppm which is below the action level. There was one water sample that was above the action limit. Water samples from 2 residences in the City exceeded the action level for copper. The owners of these residences were notified of the results by City staff.

This monitoring program assesses an absolutely worst case situation. EPA requires samples be collected after the water has been in the pipe/faucet for at least six hours. Then, a first flush sample is drawn. The action level is based on a person potentially obtaining an entire day's drinking water from the first liter of water coming from the tap.

The City continues to work to improve its corrosion control treatment since the action level for copper has been slightly exceeded in some monitoring cycles. The analyses for lead were far below the action level. The samples for lead and copper analysis are collected by homeowners, and their cooperation in this activity is critical. Follow-up investigation of the sample points where past analytical results were above the 1.3 ppm action level for copper indicated some of the samples were of softened water. Water treated in home zeolite softeners tends to be more corrosive. Increased effort will be made to assure that future samples are NOT of water treated in a home softener. Neither should samples be collected from basement taps which have not routinely been in use for extended periods of time.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Mason is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

## **ORGANIC CHEMICAL CONTAMINANTS**

All seven wells used to serve the public are routinely monitored for 64 volatile organic chemicals and 75 synthetic organic chemicals. The volatiles include such chemicals as gasoline derivatives and industrial solvents. Well Nos. 1, 3, 4, 5, 6, 7, were tested during the 2008 calendar year for volatile organic chemicals and only two were found. The two chemicals found were Chlorodibromomethane at 0.0006 mg/l. and Total Trihalomethanes at 0.001 mg/l. these are well below the MCL of 0.080 for both. The seven City wells are monitored on a quarterly rotating basis established by the state.

## **RADIOACTIVE CONTAMINANTS**

The City's drinking water was tested in 2010 for Radium 226 + Radium 228 in accordance with state and federal regulations. The results from quarterly testing at the water treatment plant show Radium 226 =.7(+.3) pCi/L and Radium 228=.5 (+.7) pCi/L for a combined level of 1.2pCi/L which is well under the MCL of 5 pCi/L. This shows that the water treatment plant is doing the job by design. This MCL has been established at, or near, the lower limit of detection for the laboratories. Radium is a natural contaminant in groundwater.

### **What does this mean?**

This is not an immediate risk. If it had been, you would have been notified immediately. However, some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

## **EPA REQUIRED HEALTH INFORMATION**

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people, such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some of the elderly, and infants can be particularly at risk from infections. Those listed above should seek advice about drinking water from their health care providers. EPA and/or U.S. Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791). Cryptosporidium is not a concern in Mason since the City's water is obtained from properly constructed wells as opposed to surface water.

## **PROBLEMS OVERCOME DURING 2010**

In the second half of 2009, the Copper test results in the distribution system pulled from residents houses at the 90th percentile were 1.1 ppm. In the first half of 2010, the Copper results were also 1.1 ppm. These results are below the action limit, and have resulted in reduced required monitoring by the MDEQ. This reduction in monitoring requirements will help the City to save valuable resources and time that was normally spent on collection and reporting results for these tests.

If you are concerned with the copper content of your home's drinking water, it is suggested you allow the water to run one to two minutes before drawing water for drinking or cooking.

## **OTHER IMPORTANT ACTIVITIES OF YOUR WATER SYSTEM PROFESSIONALS**

The City of Mason water department is working to improve storm water and well head protection activities in 2010. Staff is refining operations of the water treatment plant to try to make it operate as efficiently as possible for 2011.

## **TELEPHONE CONTACT FOR THE SYSTEM**

Mr. Ken Baker, Superintendent of Public Works, is responsible for the operation of the water system and can be reached at (517) 676-1319

## **SUMMARY**

The water supply in the City meets or exceeds state and federal drinking water quality standards. Regulations at the federal level in particular are continuing to become more detailed and stringent.

The City wants to provide citizens with the information desired regarding their drinking water. It will be necessary to upgrade the system or provide more complete treatment capabilities in the future. Your support will be necessary in order for the drinking water supply to continue to meet all quality standards and provide the desired service. Please let us know your thoughts.

## **Where Do I Get This Report**

This report will be posted on the City of Mason web site at <http://mason.mi.us> and published in the Community News Paper. This report is available at, Mason City Hall, 201 West Ash Street Mason Mi, 48854. This report will not be mailed. A reference to this report will also be posted on the City of Mason's TV Channel 21, and put on the bottom of your water bills.