

The City of Portage provides this Annual Drinking Water Quality Report for review by Portage Water System customers, pursuant to requirements of the Federal "Safe Drinking Water Act." The City of Portage welcomes this opportunity to demonstrate the excellent level of water quality delivered to Portage residents and water utility customers.

Portage Water Meets or Exceeds all Federal and State Quality Requirements

The water source for the Portage utility is groundwater from the Kalamazoo-Portage and Schoolcraft aquifers. Aquifers are water bearing formations beneath the surface of the earth that consist of sand and gravel deposited by glacial activity. The city water system uses 20 groundwater wells with pumping capacities ranging from 330 to 3,700 gallons per minute. The water is treated with chlorine, fluoride and phosphate. The city closely monitors the source water and the treated drinking water to ensure that a high level of quality and safety is maintained.

To ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water supplies. Food & Drug Administration regulations establish limits for contaminants in bottled water that provide the same protection for public health.

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. More information about contaminants and potential health effects

can be obtained by calling the United States Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791) or at <http://www.epa.gov/safewater>.

Suez Water Environmental Services, Inc. (operator of the city sewer & water utilities) routinely monitors for constituents/substances in the drinking water according to federal and state laws. The results of monitoring efforts for the period of January 1 to December 31, 2018 are provided in the table at the end of this report.

All drinking water sources contain naturally occurring levels of dissolved minerals and, in some cases, radioactive material. However, the presence of these minerals in small amounts is not a concern to the health and well-being of Portage utility customers.

Substances that may be present in source water include:

- » Microbial substances, such as viruses and bacteria, which may come from septic systems, sewage treatment plants, agricultural livestock operations and wildlife.
- » Inorganic substances, such as salts and metals, can be naturally-occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming
- » Pesticides and herbicides may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.
- » Organic chemical substances, including synthetic and volatile organic chemicals, are by-products of industrial processes, petroleum production, gas stations, urban stormwater runoff and septic systems.
- » Radioactive substances can occur naturally or be the result of oil and gas production or mining activities.

QUESTIONS CONCERNING WATER QUALITY AND OTHER UTILITY SERVICES MAY BE DIRECTED TO THE FOLLOWING PERSONNEL:

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The Portage City Council meets twice monthly on Tuesdays at 7 PM in Council Chambers at Portage City Hall (7900 South Westnedge Avenue).

As indicated in the water monitoring results on the following pages, the city water system had no Maximum Contaminant Level (MCL) violations during 2017. Through monitoring and testing, some substances have been detected; however, the concentrations found are well below the regulatory standards and not harmful to customers. The city was issued a reporting violation by the MDEQ for a late submittal of synthetic organic chemical water sample test results.

The MCL established for each substance is set by the EPA at a very stringent level. To understand the possible health effects described for many regulated substances, a person would have to drink two liters of water containing the substance at the MCL every day for a lifetime to have a one-in-a-million chance of having the described health effect.

While Portage drinking water meets EPA standards for arsenic, it does contain low levels of arsenic. EPA standards balance the current understanding of possible health effects of arsenic against the cost of removing arsenic from drinking water. The EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

The City of Portage, to address water sources with higher arsenic levels, constructed a 5.7 million-gallon-a-day water treatment facility at the Garden Lane Well Field in 2010. The Garden Lane Water Treatment Facility removes arsenic, iron and manganese from the water and provides a dependable supply of water, meeting all EPA regulations.

There are no detectable levels of lead in the City of Portage water system. 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 Portage is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. When water has been sitting (not running) for several hours, the potential for lead exposure can be minimized by flushing the tap for 30 seconds to 2 minutes before using the water for drinking or cooking. Water users concerned about lead in drinking water may wish to have the water tested. Additional information on lead in drinking water, testing methods and steps to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at <http://water.epa.gov/drink/info/lead>.

Some people may be more vulnerable to substances 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 and 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 Center for Disease Control (CDC) may be contacted at 800-342-2437. Guidelines on appropriate means to lessen the risk of infection by microbiological substances are also available from the EPA Safe Drinking Water Hotline at (800) 426-4791.

Protecting Our Groundwater Source

The Michigan Department of Environmental Quality performed source water assessments of all public water supplies to assess their susceptibility to contamination in 2003. The susceptibility rating, primarily based on geologic sensitivity and sources of contamination, uses a six-tiered scale from very low to very high. Based on the evaluation criteria, the assessment performed by the Michigan Department of Environmental Quality rated the susceptibility of the ten City of Portage well sites as high. Questions regarding the Source Water Assessment may be directed to staff listed on the front page of this report.

The city has taken proactive steps to protect the groundwater, including the city's Wellhead Protection Program, Stormwater Management Plan, Mandatory Sanitary Sewer Connection Program, Consolidated Drain Regional Stormwater Facility, and South Westnedge Avenue Stormwater Treatment Enhancement Project.

The **Wellhead Protection Program** helps identify sources of pollution that could potentially impact the groundwater supply. The program delineates measures that protect the groundwater from contamination. An updated Wellhead Protection Program was completed by the City of Portage and approved by the MDEQ in 2015.

The **Stormwater Management Plan** is a proactive plan developed to protect city groundwater resources. The plan defines the method of stormwater disposal in relation to the proximity of well sites or groundwater use. While it may impose additional cost to developments and businesses in Portage, the plan is a valuable tool used to protect the groundwater source from surface water runoff in commercial and industrial areas.

The **Mandatory Sewer Connection Program** eliminates the use of septic tanks and drain fields for wastewater disposal, as sanitary sewer service is made available. This helps eliminate the potential for groundwater contamination due to substances in the wastewater. As a result of this important program, more than 90 percent of all Portage residents utilize the city sanitary sewer system.

The **Consolidated Drain Regional Stormwater Facility** treats stormwater runoff from nearby commercial properties by removing sediment, grit, fertilizer, and other pollutants resulting in much cleaner water being discharged to Portage Creek.

The **South Westnedge Stormwater Treatment Enhancement Project** treats stormwater runoff from South Westnedge Avenue between West Centre Avenue and Garden Lane. The project eliminated direct stormwater discharges into Portage Creek resulting in much cleaner water discharged into Portage Creek.

Water Monitoring Terms

The Water Monitoring Results shown in the tables may contain terms and abbreviations you might not be familiar with. To help you better understand these terms, the following definitions are provided:

Action Level (AL) - the concentration of a substance which, if exceeded, triggers treatment or other requirements which a water system must follow.

Detect (D) - laboratory analysis indicates the substance is present.

Maximum Contaminant Level (MCL) - the highest level of a substance 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 substance in drinking water below which there is no known or expected risk to health. MCLGs allow for an extra margin of safety.

Maximum Residual Disinfection Level (MRDL) - 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.

Maximum Residual Disinfection 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.

Non-Detect (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 (ug/L) - 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) - picocuries per liter is a measure of the radioactivity in water.

Likely source of substance - if detected, where a substance may come from.

Unregulated Contaminant Monitoring Rule

In 2013, the USEPA required monitoring for 21 new substances. The substances are not regulated and the monitoring requirement was introduced to allow for research into possible

future health risks in drinking water supplies. There are no current contaminant levels for these substances. Nine of the 21 substances on the list of unregulated contaminants was found in the city water supply. The nine substances found, plus sodium, are shown in the table below.

Unregulated Contaminants					
Substance	Highest Level Detected	Range Detected	Unit of Measurement	Likely Source of Substance	Health Effects
1, 4-Dioxane	0.13 ppb	Non-Detect to 0.13 ppb	Parts per billion	Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics and shampoos	Probable human carcinogen (sufficient evidence from animal studies and inadequate/no epidemiologic studies)
Chlorate	4.3 ppm	Non-Detect to 4.3 ppm	Parts per million	Agricultural defoliant or desiccant; disinfection byproduct; used in production of chlorine dioxide	Associated with enlarged thyroid and mineralization
Hexavalent Chromium	0.22 ppb	Non-Detect to 0.22 ppb	Parts per billion	Naturally-occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation	Associated with intestinal lesions
Chromium	0.24 ppb	Non-Detect to 0.24 ppb	Parts per billion	Naturally-occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation	Associated with intestinal lesions
Molybdenum	1.8 ppb	Non-Detect to 1.8 ppb	Parts per billion	Naturally-occurring element found in ores and present in plants, animals and bacteria; commonly used form molybdenum trioxide used as a chemical reagent	Associated with increased uric acid levels; Not classifiable as to human carcinogenicity
Strontium	230 ppb	67 to 230 ppb	Parts per billion	Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions	Associated with rachitic bone (rickets); Not classifiable as to human carcinogenicity
Vanadium	0.31 ppb	Non-Detect to 0.31 ppb	Parts per billion	Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst	Associated with altered kidney function indicated by increased blood urea, mild tissue changes
Chloromethane	0.28 ppb	Non-Detect to 0.28 ppb	Parts per billion	Halogenated alkane; used as foaming agent, in production of other substances, and by-product that can form when chlorine used to disinfect drinking water	Associated with mild neurological effects
1,1-Dichloroethane	0.11 ppb	Non-Detect to 0.11 ppb	Parts per billion	Halogenated alkane; used as a solvent	Possible human carcinogen
Sodium	86 ppm	Non-Detect to 86 ppm	Parts per million	Naturally present in the environment	N/A

Annual Water Monitoring Results

Inorganic Substances

Substance	Violation Y/N	Highest Level Detected	Range Detected	Unit of Measurement	Maximum Contaminant Level Goal	Maximum Contaminant Level	Likely Source of Substance
Fluoride	No	0.71 ppm	Non-Detect to 0.71 ppm	Parts per million	4 ppm	4 ppm	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (As Nitrogen)	No	2.5 ppm	Non-Detect to 2.5 ppm	Parts per million	10 ppm	10 ppm	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Arsenic	No	1.5 ppb	1.1 ppb to 1.5 ppb	Parts per billion	0 ppb	10 ppb	Naturally present in the environment

Radioactive Substances

Substance	Violation Y/N	Highest Level Detected	Range Detected	Unit of Measurement	Maximum Contaminant Level Goal	Maximum Contaminant Level	Likely Source of Substance
Alpha Emitters (last tested in 2017)	No	2.0 pCi/L	Non-Detect to 2.0 pCi/L	Picocuries per liter	0 pCi/L	15 pCi/L	Erosion of natural deposits

Disinfection Byproduct Monitoring

Substance	Violation Y/N	Range Detected	Annual Average	Unit of Measurement	Maximum Contaminant Level Goal	Maximum Contaminant Level	Likely Source of Substance
Total Trihalomethane	No	3.3 ppb to 3.8 ppb	3.5 ppb	Parts per billion	N/A	80 ppb	Byproduct of disinfection
Haloacetic Acids (HAA5s)	No	Non-Detect	Non-Detect	Parts per billion	N/A	60 ppb	Byproduct of disinfection
Substance	Violation Y/N	Range Detected	Running Annual Average	Unit of Measurement	Maximum Disinfection Residual Level Goal	Maximum Disinfection Residual Level	Likely Source of Substance
Total Chlorine Residual	No	0.03 ppm to 2.20 ppm	0.76 ppm	Parts per million	4 ppm	4 ppm	Water additive used to control microbes

Lead and Copper Monitoring

Substance	Violation Y/N	Level Detected at 90th Percentile	Unit of Measurement	Number of Samples Above Action Level	Maximum Contaminant Level Goal	Action Level	Likely Source of Substance
Lead (last tested in 2017)	No	< 1	Parts per billion	0	0.0 ppb	15 ppb	Lead solder used in plumbing
Copper* (last tested in 2017)	No	570 ppb	Parts per billion	1	1,300 ppb	1,300 ppb	Copper pipes used in plumbing

*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.