Village of Benzonia
2016 Annual Water Quality Report

Why am I receiving this report?

Congress passed the Safe Drinking Water Act and gave the U.S. Environmental Protection Agency (EPA) the job of making rules - National Primary Drinking Water Regulations (NPDWR) - to ensure that drinking water in the U.S. is safe.

In 1996 Congress passed amendments that require drinking water systems to give consumers important information about their water, including where it comes from, what is in the water, and how your water quality compares with federal standards.

This report is brought to you by the Village of Benzonia in accordance with the EPA 40 Code of Federal Regulation, NPDWR Parts 141 and 142.

What if I have questions about my water?

For more information about your water, call (231) 882-9981 and ask for Mr. Phil Boman. Leave a message if necessary and Mr. Boman will call you back. Or you may contact Ms. Amy Vail at the Michigan Department of Environmental Quality (MDEQ) at 231-876-4481.

Where does our water come from?

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or from human activity.

Your water is groundwater that is produced from 3 municipal wells. The wells are 98, 215, and 300 feet deep. The Village's newest well (Well No. 3) was brought on-line in July 2015. Well No. 3 was installed as part of a water system improvements project that included a new well and well house, new watermain, and painting of the water tank interior. The Village completed the water system improvements project to ensure that the Village water system continues to provide high quality drinking water to Village residents.

The State performed an assessment of our source water in 2003 to determine the susceptibility of the source water to contamination from identified sources. The susceptibility rating is on a seven-tiered scale from "very-low" to "very-high" based primarily on geologic sensitivity, water chemistry and contaminant sources. The susceptibility of our source water is “moderate”. We are making efforts to protect our groundwater by implementing and maintaining a Wellhead Protection Program for the Village of Benzonia. If you would like to know more about the Village’s Wellhead Protection Program, a copy of our Wellhead Protection Plan is located at the Village Hall.

Why must you treat my water?

Drinking water, including bottled water, may reasonably be expected to contain at least a small amount 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 Environmental Protection Agency's Safe drinking Water Hotline (800-426-4791).

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Your water is pumped from the municipal wells and treated in two ways. The water is first treated to prevent precipitation of iron. This is done through the addition of polyphosphates. Second, chlorine is added to the water for disinfection.

What contaminants might be in water?

Contaminants that may be present in source water before we treat it include:

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

Are there contaminants in Benzonia's water?

Last year, as in years past, your tap water met all Environmental Protection Agency's drinking water health standards. Benzonia vigilantly safeguards its water supplies and once again, we are proud to report that our system has not violated a maximum contaminant level of any water quality standard. This brochure is a snapshot of last year's water quality. Included are details about where your water comes from, what it contains, and how it compared to standards. We are committed to providing you with this information because informed customers are our best allies.

Is our water safe for everyone?

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 transplant, 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. EPA/CDC 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.

Contact Information

- **Village of Benzonia, Phil Boman, (231) 882-9981**
- **MDEQ, Amy Vail (231) 876-4481**
- **EPA Safe Drinking Water Hotline: (800) 426-4791**
- **EPA Website: www.epa.gov/OGWDW**
- **MDEQ Website: www.michigan.gov/deq/0,1607,7-135-3313_3675---,00.html**

Drinking Water Quality 2016

The tables below summarize groundwater analyses conducted on samples collected from your drinking water supply wells. You will note that the analyses did indicate the presence of some constituents for which analyses were performed. The concentrations identified do not necessarily indicate that the water poses a health risk. The State allows us to monitor for certain compounds less than once per year because the concentrations of these compounds are not expected to vary significantly from year to year. All of the data are representative of the water quality, but some are more than one year old.

Distribution System

Bacteriological	Units	Sample Date	Benzonia's Water	MCL(AL)	Detection Range	Violation	Typical Sources
Total Coliform	colonies /100 ml	Monthly	ND	0	ND-ND	NO	Naturally present in the environment

Metals	Units	Sample Date	Benzonia's Water	MCL(AL)	Detection Range	Violation	Typical Sources
Lead**	mg/l	Aug 2015	0.0016*	0.015	ND-0.0016	NO	Naturally present in the environment, Piping
Copper	mg/l	Aug 2015	0.220*	1.3	ND-0.220	NO	Naturally present in the environment, Piping

***** Maximum concentration observed

****** 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 Village of Benzonia 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 you 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 (800-426-4791) or at http://water.epa.gov/drink/info/lead/index.cfm.

Disinfection Byproducts	Units	Date Tested	Benzonia's Water	MCL(AL)	Detection Range	Violation	Typical Sources
Total Trihalomethanes	mg/l	3/3/2016	0.0064	0.08	ND-0.0064	NO	Byproduct of drinking water disinfection
Total Haloacetic Acids	mg/l	3/3/2016	0.002	0.06	ND-0.002	NO	Byproduct of drinking water disinfection

Regulated Chemical Contaminants	MRDL	MRDLG	Benzonia's Water	Sample Date	Violation	Typical Sources
Free (or Total) Chlorine Residual (ppm)	4	4	Range= 0.2-0.8 RAA=0.5	Monthly	NO	Disinfectant added to control microbes

Samples Collected at Well No. 1

Partial Chemistry	Units	Date Tested	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Chloride	mg/l	4/5/2016	9	250	NO	Road salt, natural deposits, water softeners
Fluoride	mg/l	4/5/2016	0.2	4	NO	Erosion of natural deposits
Hardness	mg/l	4/5/2016	159	250	NO	Erosion of natural deposits
Calcium	mg/l	4/5/2016	33	250	NO	Erosion of natural deposits
Magnesium	mg/l	4/5/2016	19	NA	NO	Erosion of natural deposits
Iron	mg/l	4/5/2016	0.2	0.3	NO	Naturally present in the environment
Sodium	mg/l	4/5/2016 10/16/2016	6 5.8	250	NO	Road salt, natural deposits, water softeners
Sulfate	mg/l	4/5/2016	16	400	NO	Erosion of natural deposits
Nitrate	mg/l	4/5/2016	<1.0	10	NO	Fertilizer, sewage, manure spreading
Nitrite	mg/l	4/5/2016	<0.05	1	NO	Fertilizer, sewage, manure spreading

Volatile Organic Compounds (VOCs)	Units	Sample Date	Benzonia's Water	Violation	Typical Sources
VOCs	mg/l	12/17/2012	ND	NO	Gas stations, urban storm water runoff

Synthetic Organic Compounds (SOCs)	Units	Sample Date	Benzonia's Water	Violation	Typical Sources
Carbamates	mg/l	6/26/2012	ND	NO	Agriculture
Herbicides	mg/l	6/26/2012	ND	NO	Agriculture
Pesticides	mg/l	6/26/2012	ND	NO	Agriculture

Radioactive Contaminants	Units	Sample Date	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Radium 226	pCi/L	4/5/2016	0.2 +/- 0.7		NO	Erosion of natural deposits
Radium 228	pCi/L	4/5/2016	0.4 +/- 0.5		NO	Erosion of natural deposits
Combined Radium	pCi/L		<1.8	5	NO	Erosion of natural deposits
Gross Alpha (Radiological)	pCi/L	4/5/2016	1.0 +/- 0.8	15	NO	Erosion of natural deposits

Regulated Chemical Contaminants	Units	Sample Date	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Arsenic	mg/l	4/11/2011	<0.005	0.010	NO	Erosion of natural deposits
Barium	mg/l	6/10/2009	0.07	2	NO	Discharge of drilling wastes; Erosion of natural deposits
Cyanide	mg/l	8/13/2014	ND	0.2	NO	Discharge of industrial chemical waste

Samples Collected at Well No. 2

Partial Chemistry	Units	Date Tested	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Chloride	mg/l	4/5/2016	55	250	NO	Road salt, natural deposits, water softeners
Fluoride	mg/l	4/5/2016	0.2	4	NO	Erosion of natural deposits
Hardness	mg/l	4/5/2016	183	250	NO	Erosion of natural deposits
Calcium	mg/l	4/5/2016	68	250	NO	Erosion of natural deposits
Magnesium	mg/l	4/5/2016	28	NA	NO	Erosion of natural deposits
Iron	mg/l	4/5/2016	0.3	0.3	NO	Naturally present in the environment
Sodium	mg/l	4/5/2016 10/6/2016	33 35	250	NO	Road salt, natural deposits, water softeners
Sulfate	mg/l	4/5/2016	27	400	NO	Erosion of natural deposits
Nitrate	mg/l	4/5/2016	4.9	10	NO	Fertilizer, sewage, manure spreading
Nitrite	mg/l	4/5/2016	<0.05	1	NO	Fertilizer, sewage, manure spreading

Volatile Organic Compounds (VOCs)	Units	Sample Date	Benzonia's Water	Violation	Typical Sources
VOCs	mg/l	5/7/2015	ND	NO	Gas stations, urban stormwater runoff

Synthetic Organic Compounds (SOCs)	Units	Sample Date	Benzonia's Water	Violation	Typical Sources
Carbamates	mg/l	5/11/2015	ND	NO	Agriculture
Herbicides	mg/l	5/10/2015	ND	NO	Agriculture
Pesticides	mg/l	5/11/2015	ND	NO	Agriculture

Arsenic	Units	Sample Date	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Arsenic	mg/l	5/2/2011	<0.005	0.010	NO	Erosion of natural deposits
Barium	mg/l	6/10/2009	0.04	2	NO	Discharge of drilling wastes; Erosion of natural deposits
Cyanide	mg/l	8/13/2014	ND	0.2	NO	Discharge of industrial chemical waste

Radioactive Contaminants	Units	Sample Date	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Gross Alpha (Radiological)	pCi/L	4/5/2016	1.1 +/- 0.6	15	NO	Erosion of natural deposits

Samples Collected at Well No. 3

Partial Chemistry	Units	Date Tested	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Chloride	mg/l	5/3/2016	<5	250	NO	Road salt, natural deposits, water softeners
Fluoride	mg/l	5/3/2016	0.2	4	NO	Erosion of natural deposits
Hardness	mg/l	5/3/2016	162	250	NO	Erosion of natural deposits
Calcium	mg/l	5/3/2016	31	250	NO	Erosion of natural deposits
Magnesium	mg/l	5/3/2016	21	NA	NO	Erosion of natural deposits
Iron	mg/l	5/3/2016	<0.1	0.3	NO	Naturally present in the environment
Sodium	mg/l	5/3/2016 10/6/2016	6 6.4	250	NO	Road salt, natural deposits, water softeners
Sulfate	mg/l	5/3/2016	12	400	NO	Erosion of natural deposits
Nitrate	mg/l	5/3/2016	<1.0	10	NO	Fertilizer, sewage, manure spreading
Nitrite	mg/l	5/3/2016	<0.05	1	NO	Fertilizer, sewage, manure spreading

Radioactive Contaminants	Units	Sample Date	Benzonia's Water	MCL(AL)	Violation	Typical Sources
Radium 226	pCi/L	3/3/2016 5/3/2016 7/13/2016 10/6/2016	0.4 +/- 0.1 0.1 +/- 0.07 0.2 +/- 0.3 01. +/- 0.5		NO	Erosion of natural deposits
Radium 228	pCi/L	3/3/2016 5/3/2016 7/13/2016 10/6/2016	0.3 +/- 0.4 0.2 +/- 0.5 0.4 +/- 0.5 0.4 +/- 0.5		NO	Erosion of natural deposits
Combined Radium	pCi/L		<1.5	5	NO	Erosion of natural deposits
Gross Alpha (Radiological)	pCi/L	3/3/2016 5/3/2016 7/13/2016 10/6/2016	0.0 +/- 0.6 6.3 +/- 1.3 0.7 +/- 0.9 0.0 +/- 0.8	15	NO	Erosion of natural deposits

Terms:

- **Maximum Contaminant Level (MCL):** 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 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 drinking water disinfectant below which there is no known or expected risk to heath. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

- **Action Level (AL):** The concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.

- **Not Detected (ND):** The parameter was not detected at concentrations above the laboratory method detection limit, which is below the Action Level or Maximum Contaminant Level.

Abbreviations:

- **NA:** Not Applicable.
- **ppm:** parts per million or milligrams per liter(mg/l).
- **RAA:** Running annual average