BENTON CHARTER TOWNSHIP

ANNUAL Water Quality Report for 2018

JUNE 2019

The purpose of this report is to provide you with information about the quality of the drinking water produced by the Benton Charter Township Water Treatment Plant during the 2018 calendar year. This information is a snapshot of the quality of the water we provided to you in 2018. Included are details about where your water comes from, what it contains, and how it compares to United States Environmental Protection Agency (U.S. EPA) and Michigan Department of Environment, Great Lakes and Energy (EGLE) standards. We welcome this opportunity to provide you with the information about your water in this report which is prepared and distributed annually. Questions regarding this report can be directed to the Benton Charter Township Water Plant.

Your water comes from Lake Michigan, an excellent raw water source. Lake Michigan water flows through an off shore intake structure and pipeline to a shore well pump station where the water is screened to remove the largest particles. Pumps at the shore well station transfer the untreated raw water to the treatment plant. At the treatment plant the raw water is filtered through membrane microfiltration units and sodium hypochlorite, which contains chlorine, is applied for disinfection. Chlorine is the most commonly used disinfectant because of its effectiveness, cost, and availability. Fluoride is also added for dental protection. After filtration, the treated water enters the storage reservoir from which another set of pumps transmits the finished tap water through the distribution system to the community.

Raw Water Pump Station

Benton Charter Township Water Treatment Plant

Water Treatment Plant and System Maintenance

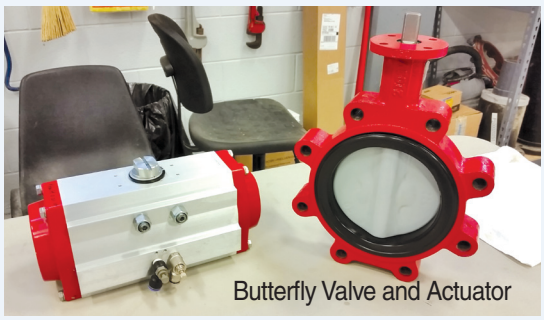
Water Treatment:

The Township's Water Treatment Plant utilizes microfiltration to filter the water and sodium hypochlorite (bleach) as a disinfectant. The filter modules are capable of removing particles larger than 0.04 microns which includes Cryptosporidium, Giardia Cyst, bacteria, and many other microorganisms that may be present in the water. In comparison, a human hair ranges in size from 17 – 181 microns. The sodium hypochlorite, acting as a disinfectant, deactivates microorganisms small enough to pass through the filter pores.


Filters

Maintenance at the water plant is a continuous exercise. There are numerous components that compose the treatment process and equipment. Individual units such as valves, valve actuators, chemical feed pumps, neutralization pumps, air compressors, and associated elements at times need to be repaired, rebuilt, or replaced. Recently an air compressor used for pneumatic control systems and process air was replaced. Additionally, a worn process pump along with the pump motor was removed from service, rebuilt, and returned to service. Further pump and plant maintenance and upgrades continue.


Pump Maintenance


Butterfly Valve and Actuator

Distribution System:

The Township has over 77 miles of water distribution system mains ranging in size from 4" to 20". There are 1089 valves throughout the system and 704 fire hydrants. BCT serves 2346 residential households together with 604 commercial customers with meter sizes ranging from three quarters of an inch to eight inches.

The distribution system also is comprised of several water storage facilities and pumping stations located throughout the township which include a 1 million gallon reservoir at the water plant, a 0.8 million gallon in ground reservoir and pump station and a 4.0 million gallon stand pipe.


Distribution Pipe

Distribution System Projects and Maintenance:

Two water main improvement projects were planned for 2018. A water main extension project on Crystal Avenue to Napier Avenue was completed in 2018. A second project to replace a section of water main along M-63 from Higman Park Drive to Rocky Gap Road was started with completion in Spring of 2019.

Additionally, the Euclid Standpipe was taken out of service for maintenance. The standpipe was drained, and inspected in conjunction with the installation of a mixer to improve water quality.

Benton Charter Township is fortunate to be in a position to continually make improvements to its critical water system infrastructure.

Lead in Drinking Water:

Information About Lead:

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 Benton Charter Township Water Treatment Plant 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 (800-426-4791)** or at **http://www.epa.gov/safewater/lead**.

In 2018, Benton Charter Township conducted lead and copper sample monitoring from previously established monitoring sites with favorable results ranging from not detected to 2 ppb for lead. Results for copper ranged from not detected to 350 ppb.

In 2019 Benton Charter Township will conduct a preliminary Distribution System Materials Inventory (DSMI) based on available information to ensure that distribution system components and service lines are properly identified and inventoried. A final DSMI will be completed by the end of 2024. As of May, 2019, there are zero number of known lead service lines and 2950 number of service lines of unknown material. The total number of service lines in the BCT distribution system is 2950.

How Lead Gets into Drinking Water:

Lead is not present in the BCT Water Plant treated water when the water is pumped from the plant into the distribution system. Lead can enter drinking water, when plumbing materials that contain lead corrode, releasing the lead into the water. The most common source of lead in drinking water are lead pipes, brass or chrome-plated brass faucets and fixtures, and plumbing with lead solder. In homes with lead pipes that connect the home to the water main, also known as lead services lines, these pipes are typically the most significant source of lead in the water. Lead pipes are more likely to be found in older communities. Among homes without lead service lines, the most common problem is with brass or chrome-plated brass faucets and plumbing with lead solder. Homes built before 1986 to 1988 are more likely to have pipes, plumbing fixtures, and solder containing lead than newer homes and homes with updated plumbing fixtures and piping.

Recent Use of Lead in Service Lines and Plumbing Fixtures Timeline:

The use of lead for plumbing materials dates back to the beginning of plumbing from the Roman Empire. Lead is a chemical element with the symbol Pb from the Latin word plumbum. Plumbum is the origin of the words plumber and plumbing.

While this is an approximate timeline of when lead was being phased out for drinking water service lines and plumbing fixtures, there may be exceptions as to how plumbing regulations and practices were actually followed.

Pre 1950's - Lead was frequently used in service lines, interior piping, fixtures, valves, and in brass alloys used in plumbing applications. Lead was considered easy to use, durable, cost effective, and readily available. Lead was added to brass to aid in the manufacturing of brass fixtures.

1950's - About the mid 1950's, lead service lines were being phased out. Not uncommon for lead goosenecks and galvanized to still be used at that time. Service line material was often dependent on local utility and plumbing practices and materials that may have been on hand for repairs and new connections.

1986 - Federal lead ban for drinking water lines. 8% lead by weight could still be used in brass for drinking water fixtures and valves.

1988 - Michigan's lead ban took effect. Leaded solder, lead pipe, and brass fittings with more than 8% lead content by weight outlawed.

Post 1990 - Even less likely for solder containing lead to be used for soldering copper pipes used in household plumbing and drinking water applications.

1988 to 2014 - Allowable content of 8% lead, by weight, in brass plumbing fixtures and valves used in drinking water is permitted.

2014 forward - Only .25% lead by weight, in the wetted perimeter materials, permitted in drinking water fixtures and valves and 0.2 percent for solder and flux.

In 2014 The Safe Drinking Water Act (SDWA) reduced the maximum allowable lead content -- that is, content that is considered "lead-free" -- to be a weighted average of 0.25 percent calculated across the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures and 0.2 percent for solder and flux.

Monitoring and Reporting to EGLE Requirements:

The State and EPA require us to test our water on a regular basis to ensure its safety. Benton Charter Township met all monitoring and reporting requirements for 2018.

We will update this report annually and will keep you informed of any problems that may occur throughout the year, as they happen. Copies of this report are available at the Benton Charter Township Hall.

We invite public participation in decisions that affect drinking water quality. Benton Charter Township Board Meetings are held the 1st and 3rd Tuesday of each month at 5:30 pm. For more information about your water, or the contents of this report, contact the Benton Charter Township Water Treatment Plant at 269-925-4057. For more information about safe drinking water, visit the **U.S. Environmental Protection Agency at www.epa.gov/safewater/** or the **Michigan Department of Environment, Great Lakes, and Energy (EGLE)** at **https://www.michigan.gov/egle/**

Cross Connections, Contamination and Backflow Prevention:

Water distribution systems are a network of storage tanks, valves, pumps, and pipes that transport potable water to consumers. A **cross connection** is a connection or arrangement of piping, plumbing devices, or equipment through which water of questionable quality, wastes, bacteria, chemicals, or other contaminants could enter the potable (drinking) water supply.

Cross connections make possible for contamination to enter a potable water supply. The contaminant enters the potable water system when the pressure of the polluted source exceeds the pressure of the potable source. The action may be called **backsiphonage** or **backflow**, essentially it is reversal of the hydraulic gradient that can be produced by a variety of circumstances.

Backsiphonage is the reversal of flow in a system caused by a negative pressure. Some examples of when backsiphonage can occur are during watermain breaks, firefighting events or during an interruption in the water supply.

Backpressure is the reversal of flow in a system due to an increase in the downstream pressure above that of the supply pressure. Backpressure could be caused by a high-pressure boiler or a booster pump.

Some common sources of cross connections around the home are lawn sprinkling systems, toilets, laundry sinks, frost proof yard hydrants, and hose bibs. Hoses connected to lawn chemical sprayers or submerged in swimming pools are examples of cross connections. In commercial and industrial settings, some sources of cross connections are beverage dispensers, cooling towers, heat exchangers and fire protection systems.
Public health officials and Water Distribution Professionals are concerned about crossconnections in plumbing systems and in the public drinking water supply distribution systems. Such cross connections, which make possible the contamination of potable water, is ever-present and has the potential to cause disease outbreaks and or severe health issues. The problem is a dynamic one, piping systems are continually being installed, altered, or extended.

Backflow can be prevented by using the appropriate backflow prevention device. The simplest prevention system is an air gap, which is a physical separation between the out flow of the pipe or hose and the above the flood level rim of the sink, tank, or pool. At your home a hose bib vacuum breaker installed on the outdoor spigot or laundry sink faucet will prevent backsiphonage. More sophisticated backflow-prevention devices are mandatory for certain industrial and commercial operations, such as restaurants and factories.

BCT has a cross connection control program that includes periodic testing of commercial backflow devices by certified technicians. Buildings and processes requiring backflow prevention devices are identified, inspected and monitored.

Homeowners that get their drinking water from a public water system are required by the "Michigan Safe Drinking Water Act" to maintain their plumbing systems in a manner free of cross connections.

For more information, you can call the **Safe Drinking Water Hotline** at **800-426-4791** or review the Cross Connection Control manual at the **US EPA** website: **https://nepis.epa.gov/Exe/ZyPDF.cgi/2000262T.PDF?Dockey=2000262T.PDF**

Water Conservation Tips for Consumers

Did you know that the average U.S. household uses approximately 400 gallons of water per day or 100 gallons per person per day? Luckily, there are many low-cost and no-cost ways to conserve water. Small changes can make a big difference-try one today and soon it will become second nature.

- *Take short showers- A 5 minute shower uses 4 to 5 gallons of water compared to up to 50 gallons for a bath.*
- *Shuting off water while brushing your teeth, washing your hair, and shaving can save up to 500 gallons a month.*
- *Use a water-efficient showerhead. They are inexpensive, easy to install, and can save you up to 750 gallons a month.*
- *Run your clothes washer and dishwasher only when cleaning a full load. You may save up to 1,000 gallons a month.*
- *Water plants only when necessary.*
- *Fix leaking toilets and faucets. Faucet washers are inexpensive and take only a few minutes to replace. To check your toilet for a leak, place a few drops of food coloring in the tank and wait. If it seeps into the toilet bowl without flushing, you have a leak. Fixing it or replacing it with a new, more efficient model can save up to 1,000 gallons a month.*
- *Adjust sprinklers so only your lawn is watered. Apply water only as fast as the soil can absorb it and during the cooler parts of the day to reduce evaporation.*
- *Teach your kids about water conservation to ensure a future generation that uses water wisely. Make it a family effort to reduce next month's water bill!*

Visit **www.epa.gov/watersense** for more information.

General Information

Contaminants and their presence in water: 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 **EPA's Safe Drinking Water Hotline (800-426-4791)**.

Vulnerability of sub-populations: 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 systems 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)**.

Sources of drinking water: The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. Our water comes from Lake Michigan, a surface water. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water 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 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 storm water runoff, and septic systems.

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

Turbidity in Water:

Turbidity is a measure of the cloudiness of water. Turbidity is measured in NTUs: Nephelometric Turbidity Units. The instrument used for measuring turbidity is called or turbidimeter.

Turbidity has no health effects but can interfere with disinfection and provide a medium for microbial growth. Turbidity is used to indicate water quality and filtration effectiveness and may indicate the presence of disease-causing organisms. Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Fluoride in Drinking Water:

In October of 2018 the Michigan Department of Health and Human Services awarded Benton Charter Township a Water Fluoridation Quality Award from the U.S. Center for Disease Control and Prevention (CDC). Fluoridation is the adjustment of fluoride in the drinking water to a level that is affective for preventing tooth decay. The award recognizes those communities that achieved excellence in community water fluoridation by maintaining a consistent level of fluoride in drinking water throughout 2017, the most recent year for which data is available.

According to the CDC, water fluoridation is one of the best investments that a community can make in maintaining oral health of its citizens. It is equally as effective in preventing cavities in children and adults. Fluoridation is also highly cost effective. Studies continue to show that for every dollar a community invest in water fluoridation, twenty dollars are saved in dental treatment cost.

Water Quality Data

The table on the facing page lists all the drinking water contaminants that were detected during the 2018 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done January 1 – December 31, 2018. The State allows the monitoring of certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. All of the data is representative of the water quality, but some are more than one year old. Chlorine is a monthly average, and TTHM, with HAA5, are sampled quarterly, results are reported as "Running Annual Averages" (RAA).

Terms and abbreviations used on the facing page

Maximum Contaminant Level Goal (MCLG): 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 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 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.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

N/A: Not applicable

ND: not detectable at testing limit

ppb: parts per billion or micrograms per liter

ppm: parts per million or milligrams per liter

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

PFAS in Drinking Water

Per- and polyfluoroalkyl substances (PFAS), sometimes called PFCs, are a group of chemicals that are resistant to heat, water, and oil. PFAS have been classified by the United States Environmental Protection Agency (U.S. EPA) as an emerging contaminant on the national landscape. For decades, they have been used in many industrial applications and consumer products such as carpeting, waterproof clothing, upholstery, food paper wrappings, fire-fighting foams, and metal plating. They are still used today. PFAS have been found at low levels both in the environment and in blood samples from the general U.S. population. These chemicals are persistent, which means they do not break down in the environment. They also bioaccumulate, meaning the amount builds up over time in the blood and organs. Although our understanding of these emerging contaminants is constantly evolving, elevated levels of PFAS have the potential to cause increased cholesterol, changes in the body's hormones and immune system, decreased fertility, and increased risk of certain cancers. Links to these health effects in humans are supported by epidemiologic studies and by laboratory studies in animal models. Michigan Department of Environment, Great Lakes, and Energy (EGLE) has coordinated a statewide initiative to test drinking water from all schools that use well water and community water supplies for PFAS. MDEQ is taking this precautionary step to testing these drinking water sources to determine if public health actions are needed. PFOA and PFOS were not detected in samples collected in July 2018 from the Benton Charter Township raw water intake and finished tap water. EGLE is conducting additional testing in 2019.

If any resident has additional questions regarding this issue, the State of Michigan Environmental Assistance Center can be contacted at 800-662-9278. Representatives may be reached to assist with your questions Monday through Friday, 8:00 AM to 4:30 PM. Also available is the Michigan PFAS Action Response Team (MPART) web site: **https://www.michigan.gov/pfasresponse/**

Benton Charter Township

Regulated Contaminant	MCL, TT, or MRDL	MCLG or MRDLG	Your Water	Range	Year Sampled	Violation Yes/No	Typical Source of Contaminant
Inorganic Contaminants:							
Barium (ppm)	2	2	0.2	N/A	2018	No	Discharge of drilling wastes; Discharge of metal refineries; Erosion of natural deposits
Nitrate (ppm)	10	10	0.6	N/A	2018	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Fluoride (ppm)	4	4	0.76	N/A	2018	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Sodium[1] (ppm)	N/A	N/A	10	N/A	2018	No	Erosion of natural deposits.
Disinfectants & Disinfection By-Products:							
TTHM - Total Trihalomethanes (ppb)	80	N/A	70.4	34.2 - 85.8*	2018	No	Byproduct of drinking water disinfection.
HAA5 Haloacetic Acids (ppb)	60	N/A	25.5	14 to 45	2018	No	Byproduct of drinking water disinfection.
Chlorine[2] (ppm)	4	4	0.98	0.84 - 1.19	2018	No	Water additive used to control microbes.

*Although we had TTHM sample results above the MCL, we continue to sample quarterly and did not violate the Safe Drinking Water Act. TTHM is sampled quarterly, results are reported as "Running Annual Averages" (RAA)

Inorganic Contaminant Subject to AL	Action Level	MCLG	Your Water[3]	Range of Results	Year Sampled	# of Samples Above AL	Typical Source of Contaminant
Lead (ppb)	15 ppb	0 ppb	2 ppb	ND - 2 ppb	2018	0	Corrosion of household plumbing systems; Erosion of natural deposits
Copper (ppm)	1.3 ppm	1.3 ppm	0.19 ppm	ND – 0.35 ppm	2018	0	Corrosion of household plumbing systems; Erosion of natural deposits

Regulated Contaminant	MCL	MCLG	Your Water	Range	Year Sampled	Typical Source of Contaminant
Microbiological Contaminant subject to Treatment Technique:						
Turbidity (NTU)	TT= 1 NTU[4] TT=percentage of samples less than 0.3 NTU	0	0.09 NTU 100%	0.03 - 0.09 NA	2018	Soil Runoff

[1] Sodium is not a regulated contaminant.
[2] The chlorine level detected, "Your Water", was calculated using a running annual average. The RAA is calculated quarterly using monthly averages for the last 12 months.
[3] 90 percent of the samples collected were at or below the level reported for our water.
[4] 1 Nephelometric Turbidity Unit (NTU), and samples for turbidity must be less than or equal to 0.3 NTUs in at least 95 percent of the samples in any month. 100% of the samples were below the TT value of 1. A value less than 95% constitutes a TT violation. The highest single measurement was 0.09. Any measurement in excess of 5 is a violation.

What are PPM and PPB?

Parts per million (ppm) and parts per billion are units used to measure the concentration of a substance in water. One part per million equals 1000 parts per billion. Following are some examples that illustrate how small a ppm and ppb actually are:

One part per million (ppm) is the same as:

- 1 inch in 16 miles
- One penny in $10,000
- 32 seconds out of a year
- 1 drop of water in a washing machine

One part per billion (ppb) is the same as:

- 1 inch in 16,000 miles
- One penny in $10,000,000
- 3.2 seconds out of 100 years
- 1 drop of water in a swimming pool

BENTON CHARTER
TOWNSHIP

1725 Territorial Road
Benton Harbor, MI 49022

Contact Information:

Benton Charter Township Water Plant
(269) 925-4057
waterplant@bentonchartertownship-mi.gov

Water Plant Operators:

NAME	CERTIFICATION
Brian Schmidt	F-1, S-2
Sam Loiacano	F-3, S-4
Loren Johnson	F-3
Tim Copeland	F-4P, S-1

Distribution System Operators:

NAME	CERTIFICATION
Mike Baldwin	S-1
Ben Bowers	S-3
Chuck Wutzke	S-3
Chase Moxley	S-4

Benton Charter Township Hall General Water Service & Billing Information:

1725 Territorial Road
Benton Harbor, MI 49022
(269) 925-0616