

VERONA PUMPING STATION



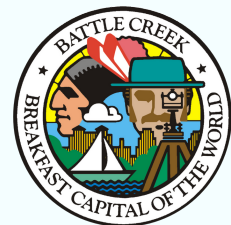
Verona Pumping Station is on Brigden Road, and is the place where we pump groundwater from the underground aquifer, treat it, and send those millions of gallons out to the community through a series of pipes. **Making this happen are**, from left to right, Mike, Josh, Bob, Chris, and John.

Annual Water Quality Report

City of Battle Creek | Reporting year 2022

PREPARED AND PRESENTED BY

City of Battle Creek
PWS ID# 0000450



City of Battle Creek water

Top service continues



For help in another language, please call the Department of Public Works at 269-966-3343. The city will provide interpretation at no cost to the caller.

Por consultas o asistencia en español, por favor comuníquese con el Departamento de Obras Públicas al (269) 966-3343. Se le conseguirá un intérprete de forma gratuita.

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Perry Hart
Utility Administrator

The City of Battle Creek is pleased to present our annual water quality report, with testing completed between Jan. 1 and Dec. 31, 2022.

We continue to dedicate ourselves to producing drinking water that meets all state and federal standards. We always look for, and use, new methods to deliver the best quality drinking water to you, our customers.

In 2022 we worked on the following projects, helping us meet the needs of our water customers:

- We worked with developers on the south edge of the city to help bring water utilities to the Redwood Apartments and the new Battle Creek Behavioral Health Center. Through this effort we were able to create a more redundant water system by creating continuous connections or loops, so that water is provided from multiple directions to minimize outages.
- With street improvements planned for the Capital Avenue SW corridor, we worked on replacing 20 water control valves within intersections. This work provides us confidence in operating the water system, renewing infrastructure in an efficient way, and creating greater redundancy and decreasing shutdown areas during maintenance and repair projects.
- In our continued effort to remove lead service lines from our water system, we and our contractors replaced 194 lead services. We also continued our effort to identify service line materials with our Vac & Verify process. This

effort will develop more accurate service line material inventory records, as required by the state Department of Environment, Great Lakes, and Energy Lead & Copper Rule. This also provides us valuable information for planning future street projects and service line replacements.

For more information about this report, or for other questions about your drinking water, within Battle Creek city limits, contact **Utility Administrator Perry Hart at 269-966-3481 or plhart@battlecreekmi.gov**.

If you live in the **City of Springfield**, call 269-965-2354.

If you live in **Emmett Township**, call 269-968-0241.

Sign up for Water Information System text and email notifications at battlecreekmi.gov/notifyme.

Have a water concern after hours, on weekends, or holidays? Call 269-966-3493.

The City Commission invites neighbors to give public comment during regular meetings, typically at 7 p.m. the first and third Tuesdays of each month at City Hall, 10 N. Division St. For agendas and more information, visit battlecreekmi.gov or call 269-966-3311.

Meetings stream live on the city's YouTube channel, on AccessVision cable, and at accessvision.tv.

IMPORTANT HEALTH INFORMATION



Some people may be more vulnerable to contaminants in drinking water than the general population.

Immunocompromised people, such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. Environmental Protection Agency and Centers for Disease Control and Prevention guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium*, and other microbial contaminants, are available from the **Safe Drinking Water Hotline** at 800-426-4791 or water.epa.gov/drink/hotline.

Infants and children who drink water containing lead could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities.

Adults who drink this water over many years could develop kidney problems or high blood pressure.

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.

Treating our water

The treatment process of our drinking water has a series of steps at our Verona facility on Brigden Drive.

First, we draw water from the groundwater aquifer, and send it to our Radon, Iron, and Manganese removal plant (we call this the RIM Plant). Once there, we add air through an aeration process that removes radon and oxidizes iron and manganese. These two processes help remove iron and manganese later in the treatment process. Aeration (adding air to the water) also makes the iron and manganese form larger particles, which are easier to remove.

Next, we filter the water to remove the iron and manganese through dual-media, rapid sand filters. After filtration, we add a small amount of phosphate product, to keep the water from corroding our system's pipes and plumbing, which benefits lead and copper control.

Next, we send the water to an underground reservoir. Finally, we add low doses of fluoride (for dental health) and chlorine (to disinfect), and we pump the water to our water towers, and into your homes and businesses.

Meter reading improvements

The city has worked to increase the efficiency of our public water supply metering system. Water meters record water use at all buildings supplied by city water.

In 2016, we implemented the fixed network read system, the Neptune 360, which has significantly reduced the amount of labor, travel time, vehicle wear and tear, and fuel use that was previously required to collect on-site meter readings. The water meters in homes are connected to the R900 components that send the water use information to 24 data collectors located throughout the city. We download that data weekly, directly from a cloud-based system, instead of requiring on-site visits inside customer's homes.

In addition to the significant savings in labor and equipment costs, we are now reading all 18,000+ meters at 95-100% accuracy, with minimal effort.

We share the water data with city Utility Billing, which allows for more timely water consumption data and helps settle any questions or challenges to a customer's water bill. **CONTINUED ON PAGE 6**

Where does my water come from?

The City of Battle Creek uses groundwater from the **Marshall Sandstone Aquifer**, drawn from the **Verona Well Field** in the northeast section of the city. This is our sole source of drinking water.

We constructed wells in the sandstone formation to collect the water stored there.



What is groundwater?

Groundwater is water beneath the surface of the earth that fills openings, known as pore spaces, in sand, gravel, or fractured rock. Groundwater begins as precipitation from snow or rain, which passes through the soil and accumulates in the pore spaces.

What is an aquifer?

When enough water accumulates to supply a well, it is considered an aquifer. The City of Battle Creek gets its water from a bedrock aquifer. We pump the water from 22 wells, with depths ranging from 100-150 feet.

Our Water Distribution and Meter Shop teams pose with one of our large display valves, outside the Department of Public Works on South Kendall Street.

Substances that could be in the water

To make sure tap water is safe to drink, the U.S. Environmental Protection Agency prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. One can reasonably expect drinking water, including bottled water, to contain at least small amounts of contaminants. The presence of these contaminants does not necessarily indicate the water poses a health risk.

The sources of drinking water - both tap and bottled - 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 - in some cases, radioactive material - and substances from animals, or human activity.

Substances that may be in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or 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/herbicides, which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic compounds, which are by-products of industrial processes and petroleum production, and may also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive contaminants, which can be naturally occurring, or may be the result of oil and gas production, and mining activities.

For more information about contaminants, and potential health effects, call the **U.S. EPA's Safe Drinking Water Hotline: 800-426-4791**.

City project will upgrade aging well casings

The Verona well fields are where our drinking water is withdrawn from the underground aquifer through well casings, treated, and pumped out into the city through hundreds of miles of underground pipes. Well casings are tube-shaped steel structures placed through several layers of soil to reach the targeted aquifer. An aquifer is an underground layer of water-bearing, permeable rock, rock fractures, or unconsolidated materials. The city withdraws its source water from the Marshall Sandstone Aquifer through 22 wells in three adjacent well fields. These wells were installed between the 1930s and the 1990s.

In December 2022 we received what is officially called a Significant Deficiency Violation Notice from the Michigan Department of Environment, Great Lakes and Energy (EGLE).

The words “deficiency” and “violation” from the state sound serious. You should know that the city contacted the state to report the issues we are seeing with our wells, which need to be corrected. We are seeing casing deterioration likely caused by installation methods, materials used, pumping patterns, and age.

Please know that City of Battle Creek water continues to be safe to drink, and high quality. Our water treatment staff has been conducting additional sampling and testing to ensure water quality is maintained since the discovery of the casing issues shared here. You can see our annual water testing in this and our previous water quality reports, available on our website at battlecreekmi.gov/waterqualityreports.

We discovered the problem conditions during well rebuilds when video technology allowed us to record videos of the wells being improved. With this discovery, we decided to have all 22 wells evaluated in the summer of 2022, showing us the extent of the casing conditions. We shared the inspection videos and a summary of our well conditions with the state. With our source water in question, we sought assistance from the district offices of EGLE, noting that this is a significant issue we need to correct.

If we don't fix the problem with the well casings, we risk contamination in our drinking water source.

There are three rules within the Safe Drinking Water Act that our planned project will correct.

First, location of wells, to make sure there is no contamination possible into the well, or the formations where we get our water. Second, location of wells in relation to flooding, to make sure the opening to the well is far enough from the level of potential flooding.

Verona is next to the Battle Creek River in the northeast part of the city. Third, well casing in rock formation, making sure a well in a rock formation has protective material above the aquifer, and protection from contamination.

We care a lot and are proud of our water quality, and our water staff has been proactive about our needs for our wells, and in communication with the state. We have an Administrative Consent Order with the state, which is an agreement between the city and state defining what we need to do to correct the well casing conditions.

We have a project planned to address this situation that is proposed to happen in two phases, with the first costing about \$10 million. The city commission approved bonds to cover this cost in March 2023. We also are applying for a low-interest state loan from the Drinking Water State Revolving Fund.

In this first phase, we will repair as many wells as we can, starting with those that can meet the maximum daily demand of drinking water in the city, especially as we move into the summer.

The work in phase two will depend on how many wells we can repair in phase one, will complete the well replacements, and will address any remaining needs in abandoning additional wells in our wellfields, to further protect our groundwater source.

Source water assessment

The state assessed our Columbia and Verona well field source water in 2003 to determine their relative potential for contamination. The susceptibility rating is on a seven-tier scale, from very low to very high, based primarily on geologic sensitivity, water chemistry, and contaminant sources.

The susceptibility rating for Verona is high. It is important to understand these ratings do not imply poor water quality, only the systems' potential to become contaminated in the assessment areas.

There are remedies in place for known contamination sources for Verona, to prevent municipal well contamination. The City of Battle Creek has not used the Columbia Well Field since 2003.

To further protect our drinking water sources, we developed a wellhead protection plan for both well fields. For more information, see battlecreekmi.gov/publicworks and click Environmental Services, or call Utility Administrator Perry Hart at 269-966-3481.

City teams win Hydrant Hysteria

Hydrant Hysteria is a competition hosted by the American Water Works Association, and measures a team's skill at assembling a fire hydrant quickly, completely, and accurately.

The teams use hydrants that are commonly used by communities, and judges test the assembled hydrants to make sure they would operate.

We also had water staff participate in the Meter Madness Challenge this year. Similar to the hydrant competition, participants have to do the same with a water meter.

These are fun ways to test water teams' great skills, and our city enjoys participating.

This year, our hydrant teams were thrilled to win the state competition in Lansing, back in February. Our meter competitor took second! They are headed to the national competition in mid-June!

FROM PAGE 3 - With this system, we are able to more accurately bill for water use, reduce water loss, and provide better customer service.

We have improved our ability to help commercial and residential customers pinpoint high water usage and active leaks in a timely fashion, and reduce water waste and potential property damage. We are in the process of changing out water meters, so they read down to the cubic foot of usage. This will help with detecting even smaller leaks in the system, resulting in savings in water and costs.



Battle Creek men's team - 1st place

Ben Blaniar and Andrew Matthews

Coach: Mark Olmstead

Final time: 1:01.78



Battle Creek women's team - 1st place

Melissa Whitcomb and Amber Whitcomb

Coach: Tara Reniger

Final time: 1:23.28

Battle Creek Meter Madness - 2nd place

Nate Main

Final time: 1:10

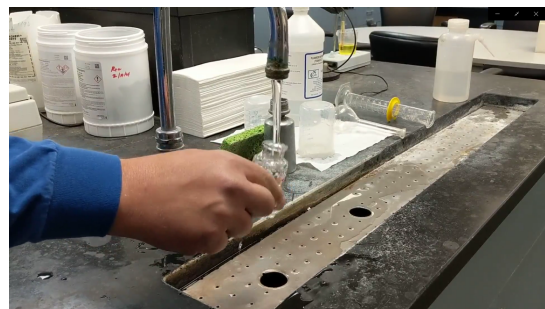
Water testing results (table next page)

We monitor our water for many different substances, on a strict sampling schedule. The water we deliver also must meet specific health standards.

The table on the next page shows those substances we detected in our water. You can request a complete list of our analytical results by calling 269-966-3481.

Remember that detecting a substance does **not** mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

The state recommends monitoring for certain substances less often than once per year, because the concentrations of those substances do not change frequently. In these cases, we show the most recent sample data, along with the year we collected it.



Water testing results

REGULATED SUBSTANCES		City of Battle Creek			City of Springfield						
Substance (Unit of measure)	Year sampled	MCL (MRDL) (MRDLG)	Amount detected	Range (low-high)	Violation	Amount detected	Range (low-high)	Violation	Typical source		
Chlorine (ppm)	2022	[4]	0.77	21-1.38	No	0.73	31-1.14	No	Water additive used to control microbes		
Fluoride (ppm)	2022	4	0.74	56-1.02	No	0.74	0.65-0.94	No	Erosion of natural deposits; water additive to promote strong teeth; discharge from fertilizer and aluminum factories		
TTHMs (ppb)	2022	80	Highest LRAA 61	37-66	No	76	48-100	No	By-product of drinking water chlorination		
HAAs (ppb)	2022	60	Highest LRAA 9.49	0.0-13	No	14	0.0-9.22	No	By-product of drinking water chlorination		
Total Coliform Bacteria (% positive samples)	2022	5%	0	NA	No	0	NA	No	Naturally present in the environment		
Tap water samples were collected for lead and copper analysis from sample sites throughout all three water systems.											
Substance (Unit of measure)	Year sampled	MCL (MRDL) (MRDLG)	90% Percentile value	Range (low-high)	Violation	90% Percentile value	Range (low-high)	Violation	Typical source		
Lead (ppb)	2022	15	2	0-13	No	0	0-0	No	Corrosion of household plumbing systems; erosion of natural deposits		
Copper (ppm)	2022	1.3	0.5	0.0-24	No	0.4	0.0-0.5	No	Corrosion of household plumbing systems; erosion of natural deposits		
SECONDARY SUBSTANCES (CITY OF BATTLE CREEK)											
Substance (Unit of measure)	Year sampled	AL	MCL (MRDLG)	Amount detected	Range (low-high)	Violation	Typical source	Substance	Amount detected	MCL (MRDLG)	Typical source
Sodium	2022	NA	NA	26	NA	No	Naturally present in the environment; road salting; septic systems	HFPO-DA	370	None	See and polyfluorinated substances PFAS are a large group of person-made chemicals that include perfluorooctanoic acid (PFCA) and perfluorooctanesulfonic acid (PFOS). PFAS have been used globally during the last century in manufacturing, firefighting, and thousands of common household and other consumer products. These chemicals are persistent in the environment and in the human body - meaning they don't break down and they can potentially affect the health of people who are frequently consumed by the potential effects of high concentrations of PFAS on human health.
Sulfate	2022	NA	NA	57	40-71	No	Runoff/leaching from natural deposits, industrial wastes	PFBS	430	None	
Chloride	2022	NA	NA	81	50-75	No	Runoff/leaching from natural deposits	PFNA	400000	None	
Gross Alpha (pCi/L)	2022	15	NA	1.2	0.5-1.9	No	Erosion of natural deposits	PFMS	51	None	
*Radium-226 (pCi/L)	2022	NA	NA	0.6	0.4-0.8	No	Erosion of natural deposits	PFMA	6	None	The Safe Drinking Water Act defines PFAS as per- and polyfluorinated substances.
*Radium-228 (pCi/L)	2022	NA	NA	1.1	0.4-1.8	No	Erosion of natural deposits	PFDA	8	None	
Combined Radium (pCi/L)	2022	5	0	1.7	1.0-24	No	Erosion of natural deposits	PFDS	1.6	None	
Information on PFAS is available on the State of Michigan website at michigan.gov/pfasresponse/drinking-water/ statewide survey.											

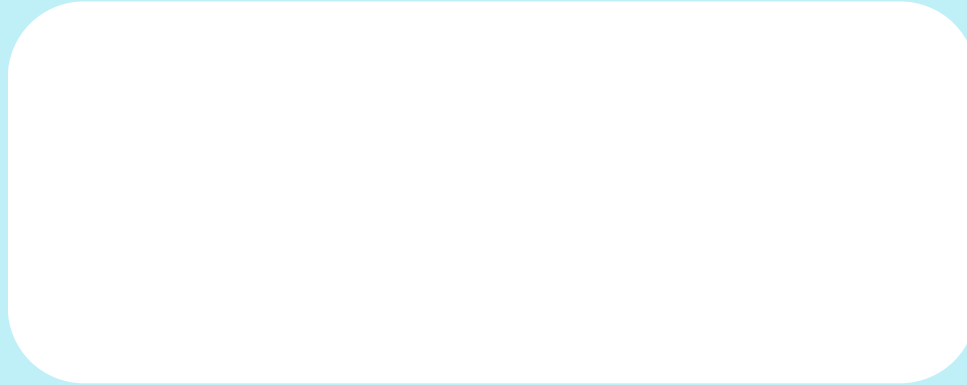
DEFINITIONS

- 90th %ile:** The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. It is equal to or greater than 90% of our lead and copper detections.
- AL: Action Level.** The concentration of a contaminant that, if exceeded, triggers treatment, or other requirements a water system must follow.
- HAAs:** Haloacetic Acids
- LRAA:** Locational Running Annual Average
- MCL: Maximum Contaminant Level.** The highest level of a contaminant allowed in drinking water. They are set as close as possible to MCLGs, using the best available treatment technology.
- MCLG: Maximum Contaminant Level Goal.** The level of a contaminant in drinking water below which there is no known or expected health risk. They allow for a margin of safety.
- MRDL: Maximum Residual Disinfectant Level.** The highest level of a disinfectant allowed in drinking water. Convincing evidence shows adding a disinfectant is necessary to control microbial contaminants.

- MRDLG: Maximum Residual Disinfectant Level Goal.** The level of a drinking water disinfectant below which there is no known or expected health risk. MRDLGs do not reflect the benefits of using disinfectants to control microbial contaminants.
- NA:** Not applicable
- pCi/L: Picouries per liter.** A measure of radioactivity.
- ppb: Parts per billion.** One part substance per billion parts water (or micrograms per liter).
- ppm: Parts per million.** One part substance per million parts water (or milligrams per liter).
- SMCL: Secondary Maximum Contaminant Level.** Standards developed to protect aesthetic qualities of drinking water, which are not health-based.
- TTHMs:** Total trihalomethanes



City of Battle Creek
 Department of Public Works - Water
 150 S. Kendall St.
 Battle Creek, MI 49037



Lead in home plumbing

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.

We are responsible for providing high quality drinking water, but we 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 two minutes before using water for drinking or cooking.

If you have a service line that is lead, galvanized, previously connected to lead, or unknown but likely to be lead, we recommend that you run your water for at least five minutes to flush water from both your home plumbing and the lead service line.

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** at 800-426-4791, or on the **U.S. EPA's website**, water.epa.gov/drink/info/lead.

Water system by the numbers



City of Battle Creek

19,531 total water services
 4,191 known lead services
 6,848 services of unknown material - unlikely to contain lead
 5,348 services of unknown material

City of Springfield

1,704 total water services
 14 known lead services
 1,302 services of unknown material - unlikely to contain lead
 0 services of unknown material

Emmett Township

935 total water services
 0 known lead services
 0 services of unknown material - unlikely to contain lead
 0 services of unknown material