# THE CITY OF LUDINGTON

400 S. Harrison Street • Ludington, MI 49431 • 231.845.6237

## 2020 Drinking Water Quality Report

**Drinking Water**

Water is a necessity for every home and business. The City of Ludington is dedicated to providing safe and abundant drinking water to all residents and customers.

Every year, a Consumer Confidence Report (also known as the annual drinking water quality report) for the City of Ludington's public water system is provided to federal and state regulatory agencies, the local health department, and all water customers. The City of Ludington is once again pleased to share that the drinking water meets all federal and state requirements. Details are included in this report.

If you have any questions about this report or your water quality, please contact Jamie Hockemeyer Water Treatment Plant Superintendent at (231) 843-8830. If you want to learn more about the operation of City government, please attend any of the regularly scheduled City Council meetings which are held at 6:30 p.m. on the second and fourth Monday of every month in the Council Chamber at City Hall.

The City of Ludington routinely monitors for contaminants in drinking water according to federal and state laws and sampling directives. The 2020 Water Quality Results Table found on pages 4 and 5 show the results of monitoring during the period of January 1 - December 31, 2020 (unless noted). Additional information is provided on pages 6-10.

Drinking water, including bottled water, may be reasonably expected to contain at least small amounts of contaminants. The presence of contaminants does not necessarily indicate the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the United States Environmental Protection Agency (US EPA) Safe Drinking Water Hotline at 1-800-426-4791 or the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) Environmental Assistance Center (EAC) at 1-800-662-9278.

**Source Water**

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and aquifers. As water travels over the surface of the land or through the ground, it naturally dissolves, can take on minerals, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Source water for the City of Ludington and customers supplied in the City of Scottville, Pere Marquette Township, Amber Township, Victory Township, and West Shore Community College is drawn through two different intake structures in Lake Michigan and treated at the City of Ludington Water Treatment Plant located on Lakeshore Drive. The primary intake is a below lake bottom style infiltration bed covering about an acre in size. The secondary intake is a wood crib cover construction used to supplement the primary intake for added capacity.

EGLE performed an assessment of the city's source water in 2003 to determine the susceptibility or the relative potential of contamination. The susceptibility rating is on a six-tier scale from "very-low" to "very-high" based primarily on geologic sensitivity, water chemistry, and contamination sources. The susceptibility of the intakes to potential contamination is moderate. An effort has been made to protect our source water by creating, implementing, and updating a Surface Water Intake Protection Plan (SWIPP).

**Individuals with Special Health Needs**

For those individuals with special health issues and concerns, the following information contains US EPA water use guidelines which may be applicable. Some people may be more vulnerable to contaminants in drinking water than others. Immuno-compromised persons include those undergoing chemotherapy, those who have had an organ transplant, people with HIV/AIDS or other immune system disorders, the elderly, and infants. These individuals should seek advice about drinking water from their health care provider.

Guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants can be obtained by calling the US EPA Safe Drinking Water Hotline at 1-800-426-4791, EGLE EAC at 1-800-662-9278, or the Centers for Disease Control and Prevention (CDC) at 1-800-232-4636.

**Possible Contaminants Present in Source Water**

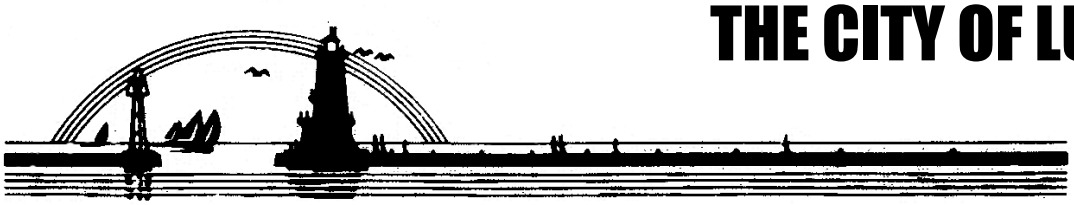
Microbial contaminants such as viruses, protozoa, and bacteria may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. Inorganic contaminants such as salts and metals, can be naturally-occurring or result from urban storm water run-off, industrial, or domestic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

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

**Water Treatment and Distribution**

The City of Ludington operates an 8.0 million gallon per day capacity conventional treatment facility which is staffed by a team of 8 licensed operators. This facility operates 24 hours a day – 7 days a week and uses coagulation, flocculation, sedimentation, and filtration treatment processes to provide high quality aesthetically pleasing drinking water for the community. Approximately 1,050,584,000 gallons were produced in 2020.

The distribution system is comprised of elevated storage tanks, ground storage reservoirs, miles of watermain ranging from 4 inch to 20 inch in diameter, watermain valves, curb-stop valves, hydrants, and service line connections. This system provides reliable and abundant water for consumption, hygiene, cleaning, and fire-fighting capabilities for the community.



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**Glossary of Terms and Abbreviations**

**Non-Detect (ND):** the contaminate is not present.

**NA:** Not applicable.

**Parts per million (ppm) or Milligrams per liter (mg/L):** A measure of the concentration of a contaminant in water. One part per million is equivalent to one minute in two years, or one inch in sixteen miles.

**Parts per billion (ppb) or Micrograms per liter (µg/L):** A measure of the concentration of a contaminant in water. One part per billion is equivalent to one minute in 2,000 years, or one inch in sixteen thousand miles.

**Parts per trillion (ppt) or Nanogram per liter (ng/L):** A measure of the concentration of a contaminant in water. One part per trillion is equivalent to one drop of water in 20 Olympic-size swimming pools.

**Nephelometric Turbidity Unit (NTU):** Turbidity is a measure of the clarity of the water. We monitor turbidity because it is a good indicator of the effectiveness of our filtration system. Turbidity in excess of 5.0 NTU is just noticeable to the average person.

**Action Level (AL):** 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 highest level of a contaminant that is allowed in drinking water per primary drinking water regulations. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

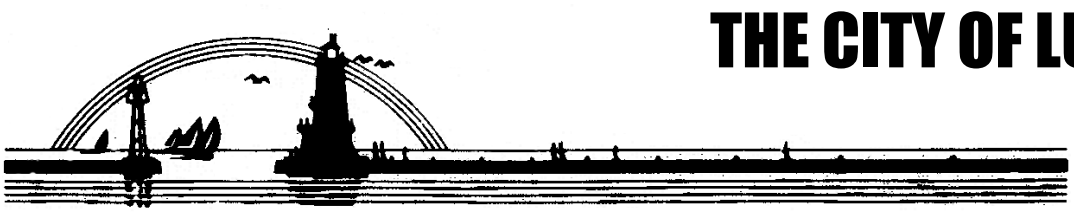
**Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water per primary drinking water regulations. 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):** The average of analytical results for samples obtained during the calendar year.

**Locational Running Annual Average (LRAA):** The average of analytical results for samples obtained at a particular monitoring location during the previous four calendar quarters.



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## 2020 Water Quality Results Table

**Regulated Monitoring at the Treatment Plant**

| Contaminate | Units | Range Detected | Level Detected | MCL | MCLG | Violations | Year Sampled | Possible Sources of Contaminate |
|---|---|---|---|---|---|---|---|---|
| Antimony | ppm | ND | ND | 0.006 | 0.006 | No | 2020 | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder |
| Arsenic | ppm | ND | ND | 0.010 | 0 | No | 2020 | Erosion of natural deposits; runoff from orchards, runoff from glass and electronics production wastes |
| Barium | ppm | 0.02 | 0.02 | 2 | 2 | No | 2020 | Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits |
| Beryllium | ppm | ND | ND | 0.004 | 0.004 | No | 2020 | Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries |
| Cadmium | ppm | ND | ND | 0.005 | 0.005 | No | 2020 | Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints |
| Chromium | ppm | ND | ND | 0.1 | 0.1 | No | 2020 | Discharge from steel and pulp mills; erosion of natural deposits |
| Cyanide | ppm | ND | ND | 0.2 | 0.2 | No | 2020 | Discharge from steel/metal factories; discharge from plastic and fertilizer factories |
| Gross Alpha | pCi/L | 1.93 | 1.93 | 15 | 0 | No | 2018 | Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation |
| Mercury | ppm | ND | ND | 0.002 | 0.002 | No | 2020 | Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands |
| Nitrate | ppm | 0.40 | 0.40 | 10 | 10 | No | 2020 | Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits |
| Nitrite | ppm | ND | ND | 1 | 1 | No | 2020 | |
| PFAS | ppt | ND | ND | Multiple | NA | No | 2020 | Fire suppression foam; household products |
| Radium 226 & 228 (combined) | pCi/L | 0.74 | 0.74 | 5 | 0 | No | 2018 | Erosion of natural deposits |
| Selenium | ppm | ND | ND | 0.05 | 0.05 | No | 2020 | Discharge from petroleum refineries; erosion of natural deposits; discharge from mines |
| Thallium | ppm | ND | ND | 0.002 | 0.0005 | No | 2020 | Leaching from ore-processing sites; discharge from electronics, glass, and drug factories |
| Total Organic Carbon [2] | ppm | 1.5 - 2.5 | 1.8 | TT | NA | No | 2020 | Naturally present in the environment |
| Total Xylenes | ppm | ND | ND | 10 | 10 | No | 2020 | Leaks and spills from gasoline and petroleum storage tanks |
| Turbidity [1] | ntu | 0.02 - 0.06 | 0.04 | TT=1 | NA | No | 2020 | Soil run-off, suspended matter in lake water |

# 2020 Water Quality Results Table (continued)

## Regulated Monitoring in the Distribution System

| Contaminate | Units | Range Detected | Level Detected | MCL | MCLG | Violations | Year Sampled | Possible Sources of Contaminate |
|---|---|---|---|---|---|---|---|---|
| Fluoride | ppm | 0.65 - 0.78 | 0.70 | 4 | 4 | No | 2020 | Water additive which promotes strong teeth |
| Free Chlorine Residual [4] | ppm | 0.10 - 1.86 | 1.18 | **MRDL**=4 | **MRDLG**=4 | No | 2020 | Used to disinfect drinking water |
| Haloacetic Acids [3] | ppb | 4.22 - 21.0 | 13.0 | 60 | 0 | No | 2020 | Formed when chlorine is added to water with naturally occurring organic material |
| Total Trihalomethane [3] | ppb | 28.4 - 63.0 | 50.0 | 80 | 0 | No | 2020 | |

| Contaminate | Units | Range Detected | 90th Percentile | AL | MCLG | Violations | Year Sampled | Possible Sources of Contaminate |
|---|---|---|---|---|---|---|---|---|
| Copper [5] | ppm | ND - 0.043 | 0.0 | 1.3 | 1.3 | No | 2020 | Corrosion of household plumbing system |
| Lead [5] | ppb | ND - 2.7 | 2.0 | 15.0 | 0 | No | 2020 | Corrosion of household plumbing system |

## Unregulated Monitoring

| Contaminate | Units | Range Detected | Avg. Level Detected | MCL | MCLG | Violations | Year Sampled | Possible Sources of Contaminate |
|---|---|---|---|---|---|---|---|---|
| Calcium | ppm | 36.0 | 36.0 | NA | NA | No | 2020 | Erosion of natural deposits |
| Chloride | ppm | 20.0 - 30.0 | 24.3 | NA | NA | No | 2020 | Erosion of natural deposits and run-off |
| Iron | ppm | ND | ND | NA | NA | No | 2020 | Erosion of natural deposits |
| Magnesium | ppm | 12.0 | 12.0 | NA | NA | No | 2020 | Erosion of natural deposits |
| Nickel | ppm | ND | ND | NA | NA | No | 2020 | Erosion of natural deposits, household plumbing |
| Sodium | ppm | 10.0 | 10.0 | NA | NA | No | 2020 | Erosion of natural deposits |
| Sulfate | ppm | 20.0 - 30.0 | 25.3 | NA | NA | No | 2020 | Erosion of natural deposits |

**Footnotes [x]:**

*1. Turbidity is a measurement of water clarity. We monitor turbidity because it is a good indicator of our filtration process. The turbidity measurements must be less than or equal to 0.3 ntu in 95% of all samples taken each month and shall never exceed 1 ntu at any time.*

*2. The level detected shown for Total Organic Carbon (TOC) is the running annual average calculated quarterly.*

*3. The level detected shown for Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5) is the running annual average calculated quarterly.*

*4. The level detected shown for Free Chlorine Residual was calculated using a running annual average.*

*5. Collected from 21 homes that met the EGLE Tier 1 Site criteria (single family residence with lead service line). Utilized 1st & 5th Liter Method.*

**No Maximum Contaminate Level (MCL) Violations**

As shown in the 2020 Water Quality Results Table there are no MCL violations and the City of Ludington's drinking water meets or exceeds all Federal and State requirements. More information about contaminants and potential health effects can be obtained by calling the US EPA Safe Drinking Water Hotline at 1-800-426-4791 or EGLE EAC at 1-800-662-9278.

MCLs are set at very stringent levels. To understand the possible health effects described for many regulated contaminates, a person would have to drink two (2) liters of water every day, which is approximately eight (8) - 8-ounce glasses of water, at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect.

**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 household plumbing. The City of Ludington is responsible for providing high quality drinking water, but cannot control the variety of materials used in household plumbing components.

Lead in drinking water is rarely the sole cause of lead poisoning, but it can add to a person's total lead exposure. All potential sources of lead in the household should be identified and removed, replaced or reduced. When water has been sitting for several hours the potential for lead exposure can be minimized by flushing the tap for 30 seconds to 2 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, it is recommended that you run your water for at least 5 minutes to flush water from both your home plumbing and the lead service line. If there is a concern about lead in the water of your household, testing may be an option.

Information on lead in drinking water, testing methods, and steps to take to minimize exposure are available by calling US EPA Safe Drinking Water Hotline at 1-800-426-4791, EGLE EAC at 1-800-662-9278, or District Health Department #10 at 231-845-7381.

Lead and copper sampling takes place every 3 years per regulatory requirements of the US EPA and EGLE Lead and Copper Rule (LCR). Regulatory sampling was completed in 2020 and will take place again in 2023. Voluntary exploratory sampling takes place annually. Residents selected for this sampling will be contacted by the City of Ludington Water Treatment Plant Superintendent by mail.

**Distribution System Material Inventory**

The City of Ludington is currently working with residents to identify and replace lead service lines per the EGLE Revised Lead and Copper Rule. At this point in time, we currently have 4,445 services lines in the distribution system and 1,761 of those have been identified as meeting the lead service line criteria. City staff are continuously working to determine the material of the remaining 1,578 unknown service lines.

**The Cross Connection Control Program**

The Cross Connection Control Program is designed to protect the city's water supply from any unwanted flow from residential, commercial, or industrial customers. A cross-connection is a link or potential link between potable (safe) water and any source containing water or other substances that are not safe for human consumption. The Utility Maintenance department oversees inspection and testing of devices used to prevent cross connections throughout the community as required by federal and state requirements.

**PFAS**

Per and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that include PFOA, PFOS, GenX, and many other chemicals. PFAS compounds have been manufactured and used in a variety of industries in the United States since the 1940s. Products that contain PFAS include: fire-fighting foams, stain repellents, nonstick cookware, waterproof clothing, food wrappers, and many other household products.

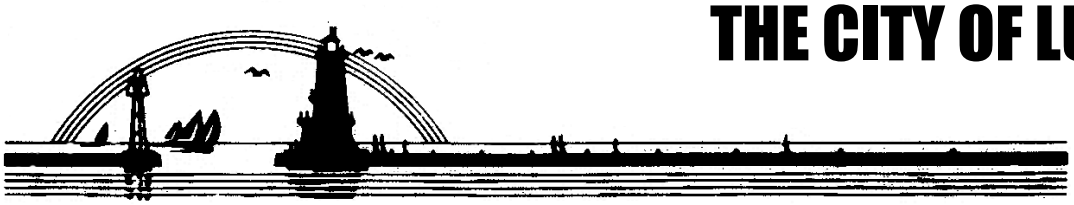
EGLE in collaboration with the Michigan PFAS Action Response Team (MPART) and contracted environmental engineering firm AECOM monitored all 1,114-community water supplies during the Statewide Testing Initiative in 2018 and 2019. **Results from the 2018-2019 Statewide Testing Initiative showed non-detect for PFAS compounds in our treated water collected at the entrance point to the distribution system at the water treatment plant.**

In 2020, EGLE implemented a new PFAS rule which includes enforceable primary drinking water standard maximum contaminate levels (MCL) for 7 PFAS compounds shown in the table below:

| Regulated Contaminate | MCL (ng/L or ppt) |
|---|---|
| Perfluorononanoic Acid (PFNA) | 6 |
| Perfluorooctanoic Acid (PFOA) | 8 |
| Perfluoroctane Sulfonic Acid (PFOS) | 16 |
| Perfluorohexane Sulfonic Acid (PFHxS) | 51 |
| HexaFluoropropylene Oxide Dimer Acid (HFPO-DA) | 370 |
| Perfluoropropylene Sulfonic Acid (PFBS) | 420 |
| Perfluorohexanonic Acid (PFHxA) | 400,000 |

Per the new EGLE PFAS rule that took effect in August 2020, The City of Ludington was required to monitor for PFAS again in 2020. Samples were collected in November 2020 at the water treatment plant and analyzed by a Michigan-based certified contracted laboratory.

**Results from November 2020 showed non-detect for PFAS compounds in our treated water collected at the entrance point to the distribution system at the water treatment plant.**



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**US EPA UCMR**

The US EPA Unregulated Contaminant Monitoring Rule (UCMR) samples public water systems nationwide to collect data for contaminants which are suspected to be present in drinking water and do not currently have health-based standards set under the Safe Drinking Water Act (SDWA). Every 5 years, US EPA issues a new list of no more than 30 unregulated contaminates to be monitored by public water systems and analyzed by certified contracted laboratories.

Based on population served by the public water system and their respective source water type (surface water, ground water, or ground water under direct influence of surface water), US EPA follows the National Sample Assessment Monitoring Design and randomly selects which public water systems will be participating and which of the 30 unregulated contaminates they will sample for.

The 30 contaminants monitored for during UCMR 4 (January 2018 - December 2020) included: 10 cyanotoxins, 2 metals, 8 pesticides, 1 pesticide manufacturing byproduct, 3 brominated haloacetic acid groups, 3 alcohols, and 3 other semi-volatile chemicals. In addition, 2 indicators- total organic carbon and bromide were also selected.

The City of Ludington participated in UCMR 4 in 2020 after being selected by US EPA to conduct assessment monitoring for cyanotoxins in our treated water collected at the entrance point to the distribution system at the water treatment plant.

***Table summarizing results of this assessment monitoring:***

**Results showed non-detect (below the minimum reporting level of the laboratory method used) for all sampling events.**

UCMR 5 (2023-2025) is currently under development and the final rule is anticipated to be published in late 2021. More information can be found at www.epa.gov

| Collection Date | Contaminate | Minimum Reporting Level (MRL) | Results |
|---|---|---|---|
| 3/3/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 3/16/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 4/7/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 4/20/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 5/4/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 5/18/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 6/8/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |
| 6/23/2020 | Total Microcystin | *0.3 ug/L or ppb* | ND (below MRL) |
| | Cylindrospermopsin | *0.09 Ug/L or ppb* | ND (below MRL) |
| | Anatoxin-A | *0.03 ug/L or ppb* | ND (below MRL) |

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**EGLE DWEHD Cyanotoxin Monitoring**

In June 2020, the Drinking Water and Environmental Health Division (DWEHD) of EGLE sent out a formal invitation for select public water systems to voluntarily participate in a cyanotoxin monitoring program during the harmful algal bloom season. This monitoring program included analysis of source and treated water to determine public water system vulnerability during the timeframe in which harmful algal blooms (HAB) may occur. The City of Ludington elected to participate in the monitoring program. Samples collected were analyzed by the Michigan Department of Health and Human Services (MDHHS) laboratory.

***Table summarizing results of this monitoring program:***

**Results showed non-detect (below the reporting level of the laboratory method used) for all sampling events.**

| Collection Date | Contaminate | Reporting Level (RL) | Sample ID | Results |
|---|---|---|---|---|
| 7/20/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |
| 8/3/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |
| 8/17/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |
| 8/31/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | Not Analyzed |
| | | | Treated Water | ND (below RL) |
| 9/14/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |
| 9/28/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |
| 10/12/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |
| 10/26/2020 | Total Microcystin | 8.0 ng/L or ppt | Source Water | ND (below RL) |
| | | | Treated Water | ND (below RL) |

**Fluoride**

Fluoridation is performed at the water treatment plant for dental health purposes. The CDC has the following advice for parents of infants; "The proper amount of fluoride from infancy through old age helps prevent and control tooth decay. Recent evidence suggests that mixing powdered or liquid infant formula concentrate with fluoridated water on a regular basis may increase the chance of a child developing the faint white markings of very mild or mild enamel fluorosis. Parents should follow the advice of the formula manufacturer and their child's doctor for the type of water appropriate for the formula they are using. Parents and caregivers of infants fed primarily with formula from concentrate who are concerned about the effect that mixing their infant's formula with fluoridated water may have in developing enamel fluorosis can lessen this exposure by mixing formula with low fluoride water most or all of the time." http:// www.cdc.gov/fluoridation/safety/infant_formula.htm.

In 2015, the US Department of Health and Human Services (DHHS) determined 0.7 ppm (mg/L) of fluoride in water to be the optimal level. The City of Ludington has been awarded the CDC's Annual Water Fluoridation Quality Award for the last 10 years running. The MDHHS Oral Health Program has also congratulated us for achieving this annual award.

**General Water Quality Parameters**

Average Finished Water Total Hardness= 139 mg/L or ppm (as $CaCO_3$)

Average Finished Water Total Alkalinity= 110 mg/L or ppm (as $CaCO_3$)

Average Finished Water pH= 7.9

**History of the Ludington Water Treatment Plant**

The City of Ludington has been providing water from Lake Michigan to the public for well over 100 years!

Before 1970, water was pumped from Lake Michigan through a crib intake to the City and surrounding communities.

In 1970, a new conventional surface water treatment plant with clarifiers and filters, buried intake, low lift pump station, wash-water recovery tank, sludge lagoons, high service pump station, and storage reservoir were built. This marked a dramatic improvement in water quality and capacity.

In 1998, the water treatment plant was upgraded to include new treatment chemical storage and feed equipment, an emergency backup generator, and variable frequency drives in the low lift pump station. This marked improvement in operational capability, safety, and reliability.

During 2006-2007, improvements were made to the high service pumps and discharge piping to the distribution system. This marked improvement in pumping capacity and redundancy.

During 2016-2019, the water treatment plant was upgraded again. Flocculation basins and inclined plate settlers replaced the existing clarifiers. Two additional filters, a larger emergency backup generator, new high service pumps with variable frequency drives, new chemical storage, and updated feed equipment were all installed.

This marked improvement in treatment of source water and increased the treatment capacity of the water plant as required by EGLE to meet our water demand by the City and surrounding communities.