THE EAST LANSING—MERIDIAN WATER & SEWER AUTHORITY

2016 Drinking Water Quality Report for The City of East Lansing & Meridian Township

Why you should read this report!

This report presents important information on the quality of your drinking water. It also discusses where the water originates, and how it's made consistently plentiful, reliable and pleasant, and then provided to your tap every day.

While much of the content of this report is required by regulation, the Authority has included other important information about this critical resource that may be of interest to you. The Authority supports and encourages your understanding about our water quality and, in this report, is attempting to convey this information in a clear and useful format. We also want to enlist your help in protecting and preserving this resource, now and for the future.

From a regulatory standpoint, the Michigan Department of Environmental Quality (MDEQ) and US Environmental Protection Agency (EPA) oversee the quality and availability of the drinking water that is produced by the Authority. In calendar year 2016, the drinking water produced by the Authority was in compliance with all State and Federal regulations, with one exception. There was one violation of a Turbidity Treatment Technique, described more fully on page 3, which resulted in a temporary boil water advisory. The Authority is committed to your safety, and has taken steps to ensure this does not happen again.

To help ensure the water supply is reliable and adequate, the Authority employs operations and maintenance staff that maintain proficiency through continuous training and education programs and MDEQ certification. Through this process, the staff stays current with the best practices and evolving regulations governing your tap water.

We encourage public interest and participation in decisions affecting your drinking water. Regular Authority Board meetings normally occur at 7:30 a.m. on the third Thursday of each month. These meetings are held at the Water Conditioning Plant, 2470 Burcham Drive. The public is welcome. For current information on meeting times and dates call (517) 337-7535.

Hidden Lakes ■ Meridian Township

WHERE DOES OUR WATER COME FROM?

The East Lansing—Meridian Water and Sewer Authority was formed as a joint venture of the City and Township to address the water supply and quality needs for both communities. In 1972, the Water Conditioning Plant was built and it has provided softened water to both systems since then. Each community owns and operates its separate water distribution utility.

Groundwater is pumped to the conditioning plant from 29 wells that are approximately 400 feet deep. Lime is added to the water to remove the excess hardness and Ferric Chloride is added to treat very fine particulate. The water then passes through sand filters to remove any cloudiness that was not taken out during the chemical treatment part of the process. Through this method, the excess hardness is removed and recycled for agricultural soil amendment or other beneficent uses; not disposed of into the sewer or drain as in-home water softeners do.

Although the source-water is very pure, we add Chloramine to ensure the water is thoroughly disinfected and stays fresh as it is delivered to your home or business. We also add Fluoride for the prevention of tooth decay, especially for children.

In 2016, the Authority processed and pumped 2.1 billion gallons of treated water to the two communities. In the water production process, our operators run numerous routine chemical analyses to ensure the water stays fresh and pleasant tasting. Other more sophisticated testing is performed by us through outside labs for a wide range of regulated and unregulated contaminants. Through this testing, we verify that the water consistently meets state and federal drinking water standards.

In This Report

The table on page 3 lists some constituents that were detected, and shows what the regulatory limits are. With the exception of the Turbidity incident described on page 3, no contaminant concentration exceeded these regulatory limits.

Note: The Authority purchases water from the Lansing Board of Water and Light (LBWL) to supply the southern portion of Meridian Township. Water quality data for the LBWL is included in this report.

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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 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 (Center for Disease Control) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline (800-426-4791).

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).

Sources of drinking water: *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, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.*

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 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 farming, storm water runoff, residential or business.

Organic Chemical Contaminants including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

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

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. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Information regarding lead in drinking water

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 Authority 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 at 1-800-426-4791or at www.epa.gov/safewater/lead.

Additional information about lead in the East Lansing—Meridian Water Systems can be found on our website, at https://www.cityofeastlansing.com/600/Annual-Water-Quality-Report.

WATER QUALITY DATA

As noted above, EPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The tables on pages 3 & 4 list all of the drinking water contaminants that we detected during the 2016 calendar year. Although many more contaminants were tested, only those substances listed were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels.

Unless otherwise noted, the data presented in the table is from testing done January 1—December 31, 2016. The EPA or the State allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, may be more than one year old.

In this table you will find terms and abbreviations that might not be familiar to you. To help you better understand the information, please refer to the following definitions of terms used in the table.

DEFINITIONS

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other required adjustments.

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 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 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 health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Level 1 Assessment: A study of the water supply to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment: A very detailed study of the water supply to identify potential problems and determine (if possible) why an E-coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions. (No Level 1 or Level 2 Assessments were required on our system.)

Note: There is a Key to terms or units used in the Table, located on Page 4 of this report.

Water Quality Data and Test Results

Contaminants		Last Tested	Unit	MCL , TT or MRDL	MCLG or MRDLG	Detected In Your Water	Range	Violation No/Yes	Typical Source of Contamination
Disinfectants and Disinfection By-Products									
(There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants)									
1 Chloramines (as Cl_2) -Plant tap		12/31/16	ppm	4	4	RAA = 1.15	0.88 - 1.64	No	Water additive used to control microbes
1 Chloramines (as Cl_2) -Distribution		12/21/16	ppm	4	4	RAA = 0.61	0.01 - 2.00	No	
Haloacetic Acids (HAA5)		10/13/16	ppb	60	NA	Highest LRAA = 5.5	ND - 7	No	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes]		10/13/16	ppb	80	NA	Highest LRAA = 15.8	11.8 - 20.9	No	By-product of drinking water disinfection
Total Organic Carbon		10/12/16	ppm	TT	NA	1.73	0.5 - 1.73	No	Naturally present in environment
The Total Organic Carbon was measured each quarter, and because the level is low, there is no requirement for TOC removal.									
Inorganic Contaminants									
2 Fluoride	ELMWSA	12/31/16	ppm	4.0	4.0	0.74	0.23 - 0.74	No	Erosion of natural deposits; Discharge from fertilizer and aluminum factories.
	LBWL	7/7/16	ppm	4.0	4.0	.56	0.0 - 0.56	No	
Barium	ELMWSA	9/10/15	ppm	2	2	.07	-	No	Discharge from drilling wastes; Discharge from metal refineries; Erosion of natural Deposits.
	LBWL	7/25/12	ppm	2	2	.022	0.015 - 0.022	No	
Radiological Contaminants									
Radium 226 & 228	ELMWSA	9/2/14	pCi/L	5	0	3.13	N/A	No	Erosion of natural deposits
	LBWL	7/7/16	pCi/L	5	0	ND	N/A	No	

	MCL	MCLG	Detected In Your Water	Range	Sample Date	Violation: No/Yes	Typical Source of Contaminant
Turbidity	TT = 1.0 NTU	0	> 1.6 NTU	NA	8/5/16	**Yes** (See Note 3)	Soil runoff
	TT = < 95% of samples below 0.3 NTU	0	>99%	NA	August, 2016	No	

From January 1, 2016 to March 31, 2016:

Microbial Contaminants	MCL	MCLG	% Detected	Violation: No/Yes	Typical Source of Contaminant
Total Coliform Bacteria	> 5% of monthly samples positive	0	1.16%	No	Naturally present in the environment.
Fecal coliform & E-*coli*	Routine and repeat sample total coliform positive, and one is also fecal or E-coli positive	0	0	No	Human and animal fecal waste.

From April 1, 2016 to December 31, 2016:

Microbial Contaminants	MCL or TT	MCLG	Highest % Detected	Violation: No/Yes	Typical Source of Contaminant
Total Coliform Bacteria	TT	N/A	1.14%	No	Naturally present in the environment.
E. coli in the distribution system (positive samples)	See E. coli note below	0	0	No	Human and animal fecal waste.
Fecal Indicator—E. coli at the source (positive samples)	TT	N/A	0	NO	

E. coli violation occurs if: (1) routine or repeat samples total coliform-positive and there is E. coli-positive, or (2) supply fails to take all required repeat samples following an E. coli-positive routine sample, or (3) supply fails to analyze total coliform-positive repeat sample for E.coli.

NOTES

1 Chloramine was calculated using the running annual average (RAA).

2 The Authority strives to maintain an optimum Fluoride level of 0.6-0.7 ppm in the distribution system. The Authority did not feed supplemental Fluoride from February through December while the Fluoride feed equipment was down for repairs. During this time, the Fluoride level averaged 0.4 ppm. The LBWL's Dye Conditioning Plant was not feeding supplemental Fluoride from March through December while the Fluoride feed equipment was down for repairs.

3 > 99% of the samples were below the TT value of 0.3. A value less than 95% constitutes a TT violation. The highest single measurement was >= 1.6 NTU. Any measurement in excess of 1.0 NTU is a violation unless otherwise approved by the state. The following table describes the violation and corrective actions taken:

TT Violation	Explanation	Length	Health Effects Language	Response and Correction
Surface water treatment rule filtration and disinfection violation.	On August 5, 2016 an inadvertent backwash of an operating Filter occurred, causing a release of turbidity into the tap water.	The turbidity exceeded the regulatory limit for 6 hours.	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	A "boil water" advisory was issued for all customers until the safety of the water could be verified. Bacteriological samples were taken throughout the distribution systems on two consecutive days. No samples showed the presence of bacterial contamination and with MDEQ's concurrence, the boil water advisory was lifted after approximately 50 hours. Electrical interlocks were installed to prevent backwashing of an operating Filter, and Plant Procedures were updated.

Monitoring and Reporting to the DEQ Requirements: The State and EPA require us to test our water on a regular basis to ensure its safety. With the single exception of the Turbidity Treatment Technique Violation described above, we met all monitoring and reporting requirements for 2016. We will update this report annually and will keep you informed of any problems that may occur throughout the year, as they happen. This report will not be sent to you unless you contact us and request one. Copies are available the Water Conditioning Plant, (517) 337-7535.

Subject to Action Level	Last Tested	Unit	AL	MCLG	90th Percentile (90% of Samples below this value)	# Samples Above AL	Violation No/Yes	Typical Source of Contamination
Lead and Copper								
Lead	9/22/15	ppb	15	0	ND	1	No	Corrosion of household plumbing
Copper	9/22/15	ppb	1300	1300	33	0	No	Corrosion of household plumbing

Special Monitoring and Unregulated Contaminant Monitoring

As part of an on-going evaluation program the EPA has required us to monitor some additional contaminants/chemicals. Information collected through the monitoring of these contaminants/chemicals will help to ensure that future decisions on drinking water standards are based on sound science.

Name	Last Tested	Unit	Reported Level	Range	
				Low	High
The following unregulated contaminants were detected by ELMWSA					
Sodium (typical source is erosion of natural deposits)	8/23/16	ppm	37	37	37
Chlorate	9/2/15	ppb	93	34	180
Chromium (total chromium)	9/2/15	ppb	.5	.4	.5
Chromium—6 (hexavalent chromium)	9/2/15	ppb	.33	.24	.38
Molybdenum	9/2/15	ppb	5.3	4.6	5.8
Strontium	9/2/15	ppb	436	190	513
The following unregulated contaminants were detected by LBWL					
Sodium (typical source is erosion of natural deposits)	7/7/16	ppm	120	82	120
Chlorate	2015	ppb	174	32	330
Chromium (total chromium)	2015	ppb	.2	.2	.3
Chromium—6 (hexavalent chromium)	2015	ppb	.2	.14	.24
Molybdenum	2015	ppb	1.1	0	1.2
Strontium	2015	ppb	166	120	210
Vanadium	2015	ppb	.3	.2	.4
1,4-Dioxane	2015	ppb	0.14	0.14	0.14

Infants and children who drink lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink water over many years could develop kidney problems or high blood pressure.

KEY to Water Quality Table

AL	= Action Level
ELMWSA	= East Lansing-Meridian Water & Sewer Authority
LBWL	= Lansing Board of Water and Light
LRAA	= Locational Running Annual Average
MCL	= Maximum Contaminant Level
MCLG	= Maximum Contaminant Level Goal
MRDL	= Maximum Residual Disinfectant Level
MRDLG	= Maximum Residual Disinfectant Level Goal
NA	= Not Applicable
ND	= Not Detected
NR	= Not Regulated
NTU	= Nephelometric Turbidity Unit
pCi/L	= Picocuries per Liter
ppb	= parts per billion, or micrograms per liter (µg/l)
ppm	= parts per million, or milligrams per liter (mg/l)
RAA	= Running Annual Average
TT	= Treatment Technique

You Can Help Protect the Water Supply for Our Communities!

The water source for our communities is groundwater, and it is drawn from deep wells drilled several hundred feet into the Saginaw Sandstone Aquifer. This aquifer is a porous water bearing geologic formation that underlies central Michigan and is capable of yielding an abundant supply of fresh water. Water drawn from the aquifer is replenished or recharged from local surface sources like streams, lakes, wetlands or permeable soils.

Lake Lansing Park North

In 2003, the Authority participated in a source water assessment performed by the MDEQ, to determine the aquifer's susceptibility to contamination. The susceptibility rating is on a seven-tiered scale from "very low" to "very high" based primarily on geologic sensitivity, well construction, water chemistry and contamination sources. The susceptibility rating of our source is "high", which means ***"substances may easily pass through the soil in groundwater recharge areas and contaminate our drinking water source".***

For our part, the Authority, the City of East Lansing and Meridian Township are participating in Michigan's Wellhead Protection Program. Wellhead protection is a set of activities and management practices to identify recharge areas and protect the public groundwater supplies from contamination. The City of East Lansing and Meridian Township have had an active State of Michigan approved wellhead protection plan since 2000. The two communities have also been involved in undertaking a program to protect the groundwater in the area by identifying and properly abandoning unused private wells. If you would like to know more about the report, contact Clyde Dugan at (517) 337-7535.

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Ultimately, the responsibility for protecting this vital resource rests with all of us!

So, what can "I" do, that will actually make a difference?

At home or at work:

- Properly recycle or dispose of wastes and don't let them get into the water, especially pharmaceuticals or liquids like solvents, oils or fuels.
- Treat all land, lawns and flower beds as if they were your garden; use only treatments that are essential and use them prudently and sparingly. Otherwise, they may enter your food or water supply.
- Report all spills so they can be properly cleaned up before they enter lakes, streams or the groundwater.
- Identify any abandoned wells so they can be removed and properly sealed.
- Support community efforts in proper urban planning and development controls so groundwater recharge areas are preserved and protected.

For additional information, contact Clyde Dugan or Mike Mulder at (517) 337-7535.