

Presented By
Town of Middleborough
Water Department



ANNUAL WATER QUALITY REPORT

REPORTING YEAR 2018

Our Mission Continues

We are once again pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2018. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

Please remember that we are always available should you ever have any questions or concerns about your water. For more information about this report, or for any questions relating to your drinking water, please call Michael Bumpus, Water Superintendent, at (508) 946-2482.

Source Water Assessment

A source water assessment has been completed for the Middleborough Water Department. The assessment has identified various activities to be monitored to maintain water quality. Susceptibility ratings were high for 8 of 11 wells and moderate for the remaining 3 wells in town. These ratings are due to the absence of natural barriers to contamination in the aquifers that supply these wells, which makes them vulnerable. Copies of the assessment are available from the DEP website at <http://www.mass.gov/ceal/docs/dep/water/drinking/swap/sero/4182000.pdf>.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (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 <http://water.epa.gov/drink/hotline>.



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Water Treatment Process

In order to meet state and federal requirements for public drinking water, we treat our source water before supplying it to customers. All well supplies are treated for pH adjustment with potassium hydroxide, and sodium hypochlorite is added for disinfection purposes. Additionally, the East Grove Street and East Main Street #1 and #2 (treatment system currently not in use) well supplies are filtered for iron and manganese removal.

Capital Improvement Program

Capital improvements to the water system include:

- A new iron and manganese filtration plant at the East Main #1 and #2 well supplies. Construction of the treatment plant was completed in December 2018. This new plant replaced the existing, aging treatment methods at these sites and will ensure Middleborough continues to be supplied with high-quality water into the future.
- A new well supply and a new elevated storage tank to replace the existing fire tower elevated tank. Construction of the new well supply pumping station and storage tank will commence in 2019. Construction of the water main to serve the new pumping station began in 2018. The Bishop Street water main was replaced in 2018; construction has begun on other water main replacement projects (Forest and Myrtle Streets).

Community Participation

The Middleborough Board of Selectmen oversees the operations of the Middleborough Water Department. From September through May, the board meets Mondays at 7:00 p.m. Meetings are held twice a month during June, July, and August. Meetings are held at the Town Hall, 10 Nickerson Avenue in the Selectmen's Meeting Room and www.middleborough.com/257/Board-of-Selectmen. The public is encouraged to attend these meetings, which are also televised on the local public access station.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Radioactive Contaminants, which can be naturally occurring or may 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 which may also come from gas stations, urban stormwater runoff, and septic systems;

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Source water include:

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. Substances that may be present in source water include:

indicate that the water poses a health risk.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the Massachusetts Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (EPA) (EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

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Where Does My Water Come From?

Town of Middleborough Water Department customers receive their water from 11 groundwater sources, which produced over 607 million gallons (or an average of 1.66 million gallons per day) in 2018. The maximum amount for a single day was 2.84 million gallons. The East Grove Street, Rook #1 and #2, East Main Street #1 and #2, Tispaquin #1 (offline) and #2, Cross Street, Plympton Street, Miller Street, and Spruce Street wells are located within the Taunton River Basin.

To learn more about our watershed online, go to the U.S. EPA's Surf Your Watershed at www.epa.gov/surf.

Manganese

Manganese is a naturally occurring mineral found in rocks, soil, groundwater, and surface water. It is necessary for proper nutrition and part of a healthy diet, but it can have undesirable effects on certain sensitive populations at elevated concentrations. U.S. EPA and DEP have set an aesthetics-based SMCL for manganese of 50 micrograms per liter, or 50 parts per billion (ppb). In addition, DEP Office of Research and Standards has set a drinking water guideline for manganese (ORSG) that closely follows the U.S. EPA public health advisory.

Drinking water may naturally have manganese, and when concentrations are greater than 50 ppb, the water may be discolored and taste bad. U.S. EPA recommends that people drink water with manganese levels less than 300 ppb over a lifetime. In the short term, U.S. EPA recommends that people limit their consumption of water with levels over 1,000 ppb, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water with manganese concentrations over 300 ppb, nor should formula for infants be made with that water for longer than 10 days. The ORSG differs from U.S. EPA's health advisory because it expands the age group to which a lower manganese concentration applies from less than 6 months to up to 1 year to address concerns about children's susceptibility to manganese toxicity.

For more information, please see U.S. EPA Drinking Water Health Advisory for Manganese at http://www.epa.gov/safewater/ccl/pdfs/reg-determine/support_cc1_magnese_dwreport.pdf and DEP ORSG for Manganese at <http://www.mass.gov/ceal/docs/dep/water/drinking/alpha/ihru-z/mangorgs.pdf>.



Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule, and the water we deliver must meet specific health standards. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). 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. During 2014, we participated in the US EPA 3rd stage of the Unregulated Contaminant Monitoring Program (UCMR3). Included in that monitoring were Per- and Polyfluoroalkyl substances (PFASs). Testing for PFBS, PFHpA, PFHxS, PFNA, PFOA, and PFOS were None Detected. US EPA has set a Health Advisory of 70 ppt for PFOS and PFOA and MassDEP's Office of Research and Standards has set an ORSG of 70 ppt for PFOA, PFOA, PFNA, PFHxS and PFHpA individually or as a group.

The state recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

We participated in the fourth stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR4) program by performing additional tests on our drinking water. UCMR4 sampling benefits the environment and public health by providing the U.S. EPA with data on the occurrence of contaminants suspected to be in drinking water in order to determine if U.S. EPA needs to introduce new regulatory standards to improve drinking water quality. Unregulated contaminant monitoring data are available to the public, so please feel free to contact us if you are interested in obtaining that information. If you would like more information on the U.S. EPA's Unregulated Contaminants Monitoring Rule, please call the Safe Drinking Water Hotline at (800) 426-4791.

REGULATED SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Combined Radium (pCi/L)	2015	5	0	1.46	1.35–1.46	No	Erosion of natural deposits
Ethylbenzene (ppb)	2018	700	700	118	NA	No	Discharge from petroleum refineries
Haloacetic Acids [HAAs] (ppb)	2018	60	NA	14.7	1.0–37.0	No	By-product of drinking water disinfection
Nitrate (ppm)	2018	10	10	2.41	0.940–2.41	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2018	2	NA	0.341	0.110–0.340	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
Styrene ¹ (ppb)	2018	100	100	11.2	NA	No	Discharge from rubber and plastic factories; Leaching from landfills
TTHMs [Total Trihalomethanes] (ppb)	2018	80	NA	36.8	6.0–54.0	No	By-product of drinking water disinfection
Toluene ¹ (ppm)	2018	1	1	0.313	NA	No	Discharge from petroleum factories
Xylenes ¹ (ppm)	2018	10	10	1.13	NA	No	Discharge from petroleum factories; Discharge from chemical factories

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2016	1.3	1.3	0.53	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2016	15	0	3	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2018	250	NA	128.5	27.7–293.0	No	Runoff/leaching from natural deposits
Iron (ppb)	2018	300	NA	205	20–940	No	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2018	50	NA	99.99	ND–437.0	No	Leaching from natural deposits
pH (Units)	2018	6.5–8.5	NA	7.28	6.40–7.70	No	Naturally occurring

UNREGULATED SUBSTANCES ³				
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
1,2,4-Trimethylbenzene ¹ (ppb)	2018	70.8	NA	NA
1,3,5-Trimethylbenzene ¹ (ppb)	2018	19.1	NA	NA
Bromodichloromethane (ppb)	2018	4.2	ND–11.3	By-product of drinking water disinfection
Bromoform (ppb)	2018	0.5	ND–2.1	By-product of drinking water disinfection
Chlorodibromomethane ¹ (ppb)	2018	0.9	NA	NA
Chloroform (ppb)	2018	7.3	ND–39.9	By-product of drinking water disinfection
Dibromochloromethane (ppb)	2018	2.7	ND–9.1	By-product of drinking water disinfection
Isopropylbenzene ¹ (ppb)	2018	2.2	NA	NA
Sodium (ppm)	2018	94.9	43.8–156.0	Naturally occurring
n-Butylbenzene ¹ (ppb)	2018	0.9	NA	NA
n-Propylbenzene ¹ (ppb)	2018	16.6	NA	NA
o-Chlorotoluene ¹ (ppb)	2018	17.7	NA	NA
p-Chlorotoluene ¹ (ppb)	2018	1.9	NA	NA
tert-Butylbenzene ¹ (ppb)	2018	15.6	NA	NA

OTHER UNREGULATED SUBSTANCES ³				
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
1-Butanol (ppb)	2018	0.112	ND–2.23	NA
Bromochloroacetic Acid (ppb)	2018	2.101	ND–3.850	NA
Bromodichloroacetic Acid (ppb)	2018	1.398	ND–2.320	NA
Chlorodibromoacetic Acid (ppb)	2018	0.903	0.359–1.160	NA
Dibromoacetic Acid (ppb)	2018	0.9	ND–2.3	NA
Dichloroacetic Acid (ppb)	2018	3.114	ND–11.800	NA
HAA6Br (ppb)	2018	5.41	2.72–7.32	NA
HAA9 (ppb)	2018	11.24	4.03–26.13	NA
Germanium (ppb)	2018	0.015	ND–0.301	NA
Methyl tertiary butyl ether [MTBE] ⁴ (ppb)	2017	1.1	ND–1.1	Fuel additive; Leaks and spills from gasoline storage tanks
Monochloroacetic Acid (ppb)	2018	0.6	ND–7.7	NA
Trichloroacetic Acid (ppb)	2018	4.3	ND–24.2	NA

¹ Results of repeat sampling at East Main Street Water Treatment Plant in January 2019 were below the detection limit.

² The value reported under Amount Detected for TOC is the lowest ratio of percentage of TOC actually removed to the percentage of TOC required to be removed. A value of greater than 1 indicates that the water system is in compliance with TOC removal requirements. A value of less than 1 indicates a violation of the TOC removal requirements.

³ Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist U.S. EPA in determining their occurrence in drinking water and whether future regulation is warranted.

⁴ U.S. EPA has established a lifetime health advisory for MTBE of 0.3 mg/l (300 ppb) and an acute health advisory at 1.0 mg/l (1,000 ppb).

Definitions

90th %ile: Out of every 10 homes sampled, 9 were at or below this level. This number is compared to the Action Level to determine lead and copper compliance.

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

MCL (Maximum Contaminant Level): 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.

MCLG (Maximum Contaminant Level Goal): 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.

MRDL (Maximum Residual Disinfectant Level): 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.

MRDLG (Maximum Residual Disinfectant Level Goal): 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.

NA: Not applicable.

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

pCi/L (picocuries 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): These standards are developed to protect aesthetic qualities of drinking water and are not health based.

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

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 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 (800) 426-4791 or at www.epa.gov/safewater/lead.

Violation Type: Groundwater Rule

Explanation: E. coli was detected in a raw water sample from Rock Well #2. Water from all supplies is chlorinated prior to distribution. No treated distribution system samples tested positive for E. coli.

E. coli was detected in a raw water sample from East Grove Street Well. Water from all supplies is chlorinated prior to distribution. No treated distribution system samples tested positive for E. coli.

Date and Length of Violation: Rock Well #2, June 19, 2018 - 2 days; East Grove Street Well, August 20, 2018 - 2 days

Steps Taken to Correct Violation: Wells were immediately taken offline, and DEP was consulted. Public Notification occurred. The Water Department is currently providing 4-log treatment at the East Grove Street Well and is in the process of obtaining DEP approval of 4-log treatment at Rock Wells #1 and #2.

Health Effect: Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

