

A close-up photograph of a glass of lemonade with ice and a faucet pouring water. The glass is on the left, filled with a yellow liquid, ice cubes, and a slice of lemon. The faucet is on the right, with water dripping from it. The background is a soft-focus kitchen sink. A diagonal grey band runs across the image from the top right to the bottom left.

*Presented By*  
**Town of Middleborough  
Water Department**

ANNUAL  
**WATER  
QUALITY  
REPORT**

WATER TESTING PERFORMED IN 2016

## We've Come a Long Way

Once again we are proud to present our annual water quality report covering the period between January 1 and December 31, 2016. In a matter of only a few decades, drinking water has become exponentially safer and more reliable than at any other point in human history. Our exceptional staff continues to work hard every day—at any hour—to deliver the highest-quality drinking water without interruption. Although the challenges ahead are many, we feel that by relentlessly investing in customer outreach and education, new treatment technologies, system upgrades, and training, the payoff will be reliable, high-quality tap water delivered to you and your family. 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.

## Where Does My Water Come From?

Town of Middleborough Water Department customers receive their water from 11 ground water sources, which produced over 616 million gallons of water in 2016. The East Grove Street, Rock #1 and #2, East Main Street #1 and #2, Tispaquin #1 (off-line) 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 on the Internet, go to the U.S. EPA's Surf Your Watershed at [www.epa.gov/surf](http://www.epa.gov/surf).

## 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 at <http://water.epa.gov/drink/hotline>.



## Substances That Could Be in Water

To ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribes 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.

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:

**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 may result from urban storm-water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

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

**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 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.

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.

## Water Main Flushing

**D**istribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use, and avoid using hot water to prevent sediment accumulation in your hot water tank.

Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

## Lead in Home Plumbing

**I**f 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 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 or at [www.epa.gov/lead](http://www.epa.gov/lead).



## Community Participation

**T**he Middleborough Board of Selectmen oversee the operations of the Middleborough Water Department. During the months of September through May, the Middleborough Board of Selectmen meet weekly, on Monday evenings at 7:00 p.m. Meetings are held twice a month during the months of June, July, and August. Meetings are held at the Town Hall in the Selectmen's Meeting Room. The public is encouraged to attend these open meetings. Meetings are also televised on the local public access station.

## Water Treatment Process

**I**n order to meet State and Federal requirements for public drinking water, we treat our source water before supplying it to customers. All of the 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 Well supplies are filtered for iron and manganese removal.

### Capital Improvement Program

Planned capital improvements to the water system include: (1) construction of a new iron and manganese filtration plant at the East Main #1 and #2 Well supplies (this new plant will replace the existing, aging treatment methods at these sites, and will ensure Middleborough continues to be supplied with high-quality water into the future); (2) construction of a new well supply; and (3) construction of a new elevated storage tank to replace the existing Fire Tower Elevated Tank. Construction of the treatment plant is currently underway. Construction of the new well supply pumping station and storage tank will commence later in 2017. Other water main replacement projects (Forest Street) are beginning the construction process.

## Manganese

**M**anganese is a naturally occurring mineral found in rocks, soil and groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but can have undesirable effects on certain sensitive populations at elevated concentrations. The U.S. EPA and MassDEP have set an aesthetics-based Secondary Maximum Contaminant Level (SMCL) for manganese of 50 µg/L (micrograms per liter), or 50 parts per billion (ppb), and health advisory levels. In addition, U.S. EPA and MassDEP have also established public health advisory levels. Drinking water may naturally have manganese and, when concentrations are greater than 50 ppb, the water may be discolored and taste bad. Over a lifetime, U.S. EPA recommends that people drink water with manganese levels less than 300 ppb and over the short term, U.S. EPA recommends that people limit their consumption of water with levels over 1000 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.

## School Drinking Water Program

The Middleborough Water Department and School Department participated in the Massachusetts Assistance Program for Lead in School Drinking Water Program in 2016. The program tested all locations where students had access to drinking water or where water was used for food preparation or medical care (nurse's offices). Results from Memorial Early Education Center, HB Burkland and MK Goode Elementary School Complex, and Nichols Middle School indicated all samples were below the MassDEP Action Level for lead and copper in drinking water. Results from Middleborough High School indicated four (4) sample sites that were above the Action level for lead and copper in drinking water. Corrective action, in accordance with MassDEP guidance, resulted in removing two locations from service, modifying operational practices at one site, and posting a "Hand Washing Only" sign at the fourth site. All remaining locations at the High School were below the MassDEP Action Level for lead and copper in drinking water. Additional information is available at the Middleborough School Department website: [www.middleboro.k12.ma.us/](http://www.middleboro.k12.ma.us/).

## Monitoring Waivers

The Town of Middleborough received a monitoring waiver for the following contaminants:

<b>Arsenic</b>	all well supplies
<b>Inorganics</b>	all well supplies, except East Grove Street Well
<b>Synthetic Organic Compounds</b>	all well supplies, except East Grove Street Well
<b>Volatile Organic Compounds</b>	Plympton Street Well

Department of Environmental Protection because these contaminants have not been detected in past samplings. These waivers were effective through the 2016 calendar year.

## To The Last Drop

The National Oceanic and Atmospheric Administration (NOAA) defines drought as a deficiency in precipitation over an extended period of time, usually a season or more, resulting in a water shortage, causing adverse impacts on vegetation, animals, and/or people. Drought strikes in virtually all climate zones, from very wet to very dry.

There are primarily three types of drought: Meteorological Drought, which refers to the lack of precipitation, or the degree of dryness and the duration of the dry period; Agricultural Drought, which refers to the agricultural impact of drought, focusing on precipitation shortages, soil water deficits, and reduced ground water or reservoir levels needed for irrigation; and Hydrological Drought, which pertains to drought that usually occurs following periods of extended precipitation shortfalls that can impact water supply (i.e., stream flow, reservoir and lake levels, ground water).

Drought is a temporary aberration from normal climatic conditions; thus, it can vary significantly from one region to another. Although normally occurring, human factors, such as water demand, can exacerbate the duration and impact that drought has on a region. By following simple water conservation measures, you can help significantly reduce the lasting effects of extended drought.

To learn more about water conservation efforts, check out U.S. EPA's Water Conservation Tips for Residents at [www.epa.gov/region1/eco/drinkwater/water\\_conservation\\_residents.html](http://www.epa.gov/region1/eco/drinkwater/water_conservation_residents.html).

## What's a Cross-connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (back-pressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (back-siphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection.

For more information on backflow prevention, contact the Safe Drinking Water Hotline at (800) 426-4791.



## Test Results

Our water is monitored for many different kinds of contaminants on a very strict sampling schedule. The information below represents only those substances that were detected; our goal is to keep all detects below their respective maximum allowed levels. 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 3rd stage of the EPA's Unregulated Contaminant Monitoring Rule (UCMR3) program by performing additional tests on our drinking water. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if EPA needs to introduce new regulatory standards to improve drinking water quality. Contact us for more information on this program.

### REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2012	15	0	1.9	ND-1.9	No	Erosion of natural deposits
Combined Radium (pCi/L)	2015	5	0	1.46	1.35-1.46	No	Erosion of natural deposits
Haloacetic Acids [HAA] (ppb)	2016	60	NA	8.5	1.2-17	No	By-product of drinking water disinfection
Perchlorate (ppb)	2016	2	NA	0.10	0.10-0.10	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
TTHMs [Total Trihalomethanes] (ppb)	2016	80	NA	33	7.9-41	No	By-product of drinking water disinfection

### Tap Water Samples Collected for Lead and Copper Analyses from Sample Sites throughout the Community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	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	EXCEEDANCE	TYPICAL SOURCE
Chloride (ppm)	2016	250	NA	105.8	22.1-289.0	No	Runoff/leaching from natural deposits
Iron (ppb)	2016	300	NA	0.72	ND-9830	Yes	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2016	50	NA	0.28	ND-1960	Yes	Leaching from natural deposits
pH (Units)	2016	6.5-8.5	NA	7.6	6.5-9.4	No	Naturally occurring

### UNREGULATED SUBSTANCES <sup>1</sup>

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppb)	2016	2.6	ND-2.6	By-product of drinking water disinfection
Bromoform (ppb)	2016	1.7	ND-1.7	By-product of drinking water disinfection
Chloroform (ppb)	2016	4.2	ND-4.2	By-product of drinking water disinfection
Dibromochloromethane (ppb)	2016	2.5	ND-2.5	By-product of drinking water disinfection
Sodium (ppm)	2016	74.4	35.2-150	Sodium is a naturally occurring substance in the environment

## UNREGULATED CONTAMINANT MONITORING RULE - PART 3 (UCMR3) <sup>1</sup>

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH
Chlorate (ppb)	2014	78	ND-430
Chromium [Total] (ppb)	2014	0.23	0.2-0.5
Chromium-6 (ppb)	2014	0.1	ND-0.22
Cobalt (ppb)	2014	1.2	ND-4.6
Molybdenum (ppb)	2014	<1.0	ND-1.1
Strontium (ppb)	2014	66	ND-140
Vanadium (ppb)	2014	0.1	ND-0.22

<sup>1</sup> 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.

## Definitions

**90th Percentile:** Out of every 10 homes sampled, 9 were at or below this level.

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

**LRAA (Locational Running Annual Average):** The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as LRAAs.

**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):** SMCLs are established to regulate the aesthetics of drinking water like appearance, taste and odor.