

REPORT ON WATER QUALITY



Norfolk DPW - Water Division

2016 

PWS ID: #2208000

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The Norfolk Department of Public Works (DPW) is pleased to provide you with this 2016 Report on Water Quality. The Norfolk DPW continuously strives to produce the highest quality water possible to meet or surpass everyday water quality standards. We are committed to supplying our customers with a safe and adequate water supply at reasonable cost. This report includes information from 2016 and other years.

In order to ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and the Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in water provided by Public Water Systems (PWS). The standards we operate under were enacted by the U.S. Congress as the Safe Drinking Water Act (SDWA) of 1974, and were amended in 1986 and 1996. The Food and Drug Administration (FDA) and the Massachusetts Department of Public Health (MDPH) regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

We encourage public interest and participation in our community's decisions affecting drinking water. Meeting dates for the Board of Selectmen are posted at the Town Hall and published on the town's website, www.virtualnorfolk.org. The Norfolk DPW is located at 33 Medway Branch, off of Boardman Street. If you would like to know more about the Norfolk water supply, or if you are interested in participating in the decision making process, please contact us at (508) 528-4990 with questions, comments or concerns.

Over the past several years the Water Division has been working with our consultants and MassDEP to identify potential new sources of water. The need for this new source was based off of a water supply assessment completed by Environmental Partners Group and WhiteWater Inc which determined that the town's current sources have diminishing capacity, and with the largest source off line the town could not maintain adequate supply on their own. After reviewing several areas of town and narrowing down potential sites it was determined that a site off Holbrook Street was the best option. In June of 2016 a number of 2" test wells were installed on site and tested, which proved that this site not only provided the highest capacity, but the best water quality. A plan and timeline were submitted to MassDEP for approval to install 6" and 8" production wells on this property to perform the proper pump testing to obtain approvals. The plan was approved and the wells installed. After some initial testing we found the wells to be very good and will be submitting permitting for longer pump tests and to utilize the location as a well field. Once approved, we will proceed with the next steps in the approval process.

The town has realized an improvement in unaccounted-for-water (UAW) from 52% in 2009 down to 9% in 2016. As a result of this UAW improvement, the total water pumped has dropped from 257.3 million gallons in 2009 to 155 million gallons in 2016. Less pumping results in operational cost savings in maintenance, electricity use, and chemical addition. The goal is to minimize leaks and maximize metering accuracy and is an on-going challenge. To this end, the water division works closely with our consultant to perform town wide leak detection twice per year. Once identified, the Water Division diligently manages the repairs. The number of leaks detected and repaired has dropped overall from 127 in 2009 to 5 in 2016. Daily monitoring of residential and commercial meters is performed to maintain accuracy in water consumption.

Water Source & Treatment

Norfolk's water is supplied from four gravel-packed wells that draw from the Charles River Watershed. Gold Street Wells, 2208000-01G and 2208000-03G, which are located near the intersection of Medway Street and Myrtle Street; and the Spruce Road Wells, 2208000-02G and 2208000-04G, located at the intersection of Mirror Lake Avenue and Spruce Road.

Your water is delivered to your home through 57 miles of water main and stored in two 1.0 million gallon storage tanks. The Pondville Tank is located off Sharon Avenue, and the Weeber Tank is located off Meetinghouse Road behind Town Hall.

In addition, the town of Norfolk maintains permanent interconnections with the town of Wrentham, the town of Franklin, and the town of Walpole. Additional emergency hydrant-to-hydrant interconnection can be made with the town of Medfield.

In order to meet state and federal requirements for public drinking water, our source water receives treatment before it is supplied to our customers. The pH of the water at both well locations is increased by using sodium hydroxide to reduce its corrosiveness in household plumbing and orthophosphosphate is added to sequester iron and manganese, as well as to coat the water mains to assist with corrosion control. At Spruce Road, aeration removes dissolved CO₂, thus raising pH and reducing radon, and is disinfected with a state-of-the-art UV (ultraviolet) light system. Testing throughout the water system has shown that this treatment has been effective at reducing lead and copper concentrations. Chlorination systems are also used at both pump station locations. All chemicals are approved for water treatment by one or more of the following organizations: National Sanitation Foundation International (NSF), or UL, both accredited by the American National Standards Institute (ANSI). Chemicals also have to meet performance standards established by the American Water Works Association.

NORFOLK WATER DEPARTMENT 2016 CCR TABLES

WATER QUALITY SUMMARY: Although we ran hundreds of tests, we only list the substances that were at or above minimum detection limits. Unless otherwise noted, sample dates are for the year 2016 or within 5 years if we tested negative, or were not required to test in 2016 for previously detected contaminants.

Regulated Inorganic Contaminants	Date(s) Collected	MCL	MCLG	Highest Result	Detected Range	Major Sources	Violation (Y/N)
Nitrate (ppm)	4/25/16	10	10	2.66	2.49-2.66	Runoff from fertilizer use; leaching from septic tanks; natural deposits	N
Barium (ppm)	5/21/14	2	2	0.038	0.038	Erosion of natural deposits	N
Perchlorate (ppb)	4/20/15	2	--	0.249	n/a	Rocket propellants, fireworks, munitions, flares, blasting agents	N

Radioactive Contaminants	Date(s) Collected	MCL	MCLG	Highest Result	Detected Range	Major Sources	Violation (Y/N)
Gross Alpha (pCi/l)	4/20/15	15	0	0.18	n/a	Erosion of natural deposits	N
Radium 226 & 228 (pCi/l)	4/20/15	5	0	0.52	n/a	Decay of natural and manmade deposits	N

Lead and Copper*	DATE COLLECTED	90 th PERCENTILE	Action Level (AL)	MCL G	# SITES TESTED	# SITES ABOVE AL	TYPICAL SOURCE OF CONTAMINATION	Exceeds AL (Y/N)
Lead (ppb)	9/27/16 – 9/30/16	0	15	0	20	0	Corrosion of household plumbing systems	N
Copper (ppm)	9/27/16 – 9/30/16	0.11	1.3	1.3	20	0	Corrosion of household plumbing systems	N

*Lead and copper compliance is based on the 90th percentile value, which is the highest level found in 9 out of every 10 homes sampled. This number is compared to the action level for each contaminant. **TESTING FOR 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 home plumbing. Norfolk DPW 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 or at <http://www.epa.gov/safewater/lead>.

We are program to conduct town-wide hydraulic system flushing twice per year to ensure that the water mains are clean and maximum water quality is maintained in the water distribution system. Isolated dirty water complaints are also handled on a case-by-case basis and usually the result of iron and/or manganese build-up. The flushing program is designed to minimize these occurrences. In the course of the flushing work, hydrant and gate valve maintenance items are identified and scheduled. We also continue to maintain and upgrade the pump station operations including well pumps, chemical feed pumps, water quality monitoring devices, and water system (SCADA) controls.

In the event of emergency water demand, the Town has constructed interconnecting vaults with the surrounding towns of Wrentham and Franklin. Norfolk occasionally supplies MCI-Norfolk with water via an interconnection vault in the event that they have an emergency.

Please keep in mind that during the long, hot summer months, all residents should do their best to conserve water. Per the town's Water Management Act Permit (#9P-2-20-208.01) and town by-law, water use restrictions are in place due to water supply issues and permit restrictions. Non-essential outdoor water uses that are subject to mandatory restrictions include:

- Irrigation of lawns via sprinklers or automatic irrigation systems, and
- Pool filling

NORFOLK WATER DEPARTMENT 2016 CCR TABLES (continued)

Unregulated and Secondary Inorganic Contaminants	Date Collected	Detected Range	Average	SMCL	ORSG	Possible Sources
Sulfate (ppm)	3/3/15 9/15/15	19 – 20	19.5	250	--	Natural sources
Sodium* (ppm)	3/3/15 9/15/15	7.4 – 13	10.2	--	20	Natural sources; runoff from road salt
Iron (ppb)	2016	ND – 250	52.9	300	--	Naturally occurring, corrosion of cast iron pipes
Manganese **(ppb)	2016	ND – 359	83.4	50	300	Erosion of natural deposits

*Sodium-sensitive individuals, such as those experiencing hypertension, kidney failure, or congestive heart failure, should be aware of the levels of sodium in their drinking water where exposures are being carefully controlled.

**EPA has established a lifetime health advisory (HA) of 300 ppb for manganese to protect against concerns of potential neurological effects. Manganese is a naturally occurring mineral found in rocks, soil, groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet but it can have undesirable effects on certain sensitive populations at elevated concentrations. US EPA and MassDEP have set an aesthetics-based secondary maximum contaminant level (SMCL) for manganese of 0.05 mg/L (50 ug/L or 50 ppb). In addition, MassDEP's Office of Research and Standards (ORS) has set a drinking water guideline (ORSG) of 0.3 mg/L (300 ug/L or 300 ppb) that closely follow EPA's public health advisory for manganese.

Drinking water may naturally have manganese and when concentrations are greater than 50 ug/L (50 ppb) the water may be discolored and taste bad. Over a lifetime, EPA recommends that people drink water with manganese levels less than 300 ug/L (300 ppb) and over the short term, EPA recommends that people limit their consumption of water with levels over 1000 ug/L (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 ug/L (300 ppb), nor should formula for infants be made with that water for longer than 10 days. The ORSG differs from EPA's health advisory because it expands the age group to which a lower concentration applies from children less than 6 months of age to children up to 1 year of age to address concerns about children's susceptibility to manganese toxicity.

Disinfection Byproducts	Date(s) Collected	MCL	MCLG	Highest RAA*	Detected Range	Major Sources	Violation (Y/N)
Total Trihalomethanes (ppm)	2016	80	0	40.0	22.8 – 40.0	Byproduct of drinking water chlorination.	N
Haloacetic Acids (ppm)	2016	60	0	8.1	2.2 – 8.1	Byproduct of drinking water chlorination.	N

*RAA – Running Annual Average – not required to test regularly; results are for one quarter in 2016.

Disinfectant	Date(s) Collected	MCL	MCLG	Highest RAA	Detected Range	Major Sources	Violation (Y/N)
Free Chlorine (ppm)	Monthly 2016	4	4	0.28	0.16 – 0.39	Water additive used to control microbes.	N

Bacteria	Highest # of Positive Samples in a Month	MCL	MCLG	Possible Sources	Violation (Y/N)
Total Coliform (TC) Bacteria 2016	0	1	0	Naturally present in the environment	N

Total Coliform: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. Your water source is tested monthly and has been found to be free of these contaminants.

Terms and Abbreviations used in the Tables:

AL = Action Level – The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow.

MCL = Maximum Contaminant Level – The highest level of a contaminant in drinking water. MCLs are set as close to the MCLGs (see below) 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 expected risk to health. MCLGs allow for a margin of safety.

MRDL = Maximum Residual Disinfection Level – The highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG = Maximum Residual Disinfection Level Goal – The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known or expected health risk. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

ND = Non-detect.

TT = Treatment technique.

Total Coliform = A bacteria that indicates other potentially harmful bacteria may be present.

Unregulated contaminants – These are substances without MCLs for which EPA requires monitoring. For some of these substances, the Massachusetts Office of Research and Standards (ORS) has developed state guidelines or secondary MCLs.

SMCL = Secondary Maximum Contaminant Level – Standards are developed to protect the aesthetic qualities of drinking water and are not health based.

ORSG = Massachusetts Office of Research and Standards Guideline – This is the concentration of a chemical in drinking water, at or below which, adverse, non-cancer health effects are likely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.

pCi/l = Picocuries per liter (measure of radioactivity)

ppm = Parts per million, or milligrams per liter (mg/l)

ppb = Parts per billion, or micrograms per liter (ug/l)

mrem/yr = millirems per year (a measure of radiation absorbed by the body)

90th Percentile = The highest value found out of 90 percent of the samples taken in a representative group. Nine out of every 10 homes sampled were at or below this level.

Sources of Drinking Water and Drinking Water Contaminants:

The sources of drinking water in the United States (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.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses 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 runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, and farming.
- **Pesticides and herbicides**, may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- **Organic chemical contaminants**, include synthetic and volatile organic chemicals that 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** can be naturally occurring or be the result of oil and gas production, and mining activities.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contamination. 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 (1-800-426-4791) or the Massachusetts Department of Environmental Protection (DEP) 617-292-5885. <http://www.mass.gov/eea/agencies/massdep/>

Contamination from Cross Connection:

Cross-connections that could contaminate drinking water distribution lines are a major concern. A cross-connection is 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 (backpressure). 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 (backsiphonage).

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 lay on the ground may be contaminated by fertilizers, cesspools or garden chemicals. We recommend the installation of hose bibb type vacuum breakers on all outside spigots. This will protect you, the homeowner, against the potential cross connection contamination of your outside garden hose.

Community water supplies are continually jeopardized by cross-connection unless appropriate valves, know as backflow prevention devices, are installed and maintained. The Town of Norfolk has an active cross connection control program. We survey all industrial, commercial and institutional facilities in the service area to insure that all potential cross-connections are identified, eliminated or protected by a backflow preventer. We currently test approximately 54 backflow devices as required by Mass DEP and the Cross Connection Control Section (310 CMR 22.22) of the Commonwealth of Massachusetts Drinking Water Regulations that they are providing maximum protection. The tests are performed once or twice per year, depending on the level of threat. In the event that a test fails, it is promptly repaired or replaced and retested.

Is Our Water Safe for Everyone?

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 from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

SWAP (Source Water Assessment and Protection):

The Massachusetts DEP has prepared a Source Water Assessment Program (SWAP) Report for Norfolk DPW. The report assesses the susceptibility of public water supplies to contamination and makes recommendations. This report is available from WhiteWater, Inc. located at 253B Worcester Road, Charlton, MA, Norfolk DPW, Board of Health and also at the DEP website: <http://www.mass.gov/eea/docs/dep/water/drinking/swap/cero/3208000.pdf>.

A susceptibility ranking of **high** was assigned to both wells in our system by the DEP due to the absence of hydro-geologic barriers (i.e. clay). Both Spruce Road and Gold Street wells are gravel-packed and presently meet all US Environmental Protection Agency (EPA) and MA DEP drinking water quality standards.

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius (400 ft) and a Zone II protection area. Zone I is owned and controlled by the Norfolk DPW and limited to only water supply activities. Zone II is defined as the primary recharge area for each well. To ensure wellhead protection, all construction plans in Norfolk are reviewed by the DPW with emphasis given to those in close proximity to Zone II.

In concert with its certified operator, WhiteWater, Inc., the Norfolk DPW is addressing the concerns as stated in the SWAP Report and welcomes your input to our planning. If you have any questions please contact Robert J. McGhee, Director of Public Works, at (508) 528-4990.

Department of Public Works Contact Information:

The Norfolk water system is operated and maintained by the Department of Public Works, Water Division. If you have any questions about this report, please contact: Robert J. McGhee, Director of Public Works at 508-528-4990.

Department of Public Works, 33 Medway Branch Road, Norfolk, MA 02056; office hours are Monday through Friday, 8:00 am to 3:30 pm; 508-528-4990. For water problems outside of normal hours, please contact the Norfolk Police Department at 508-528-3206 and one of our representatives will contact you immediately.