

Annual
WATER
QUALITY
REPORT

Reporting Year 2013



Presented By
Town of Orleans Water Department

PWS ID#: MA4224000

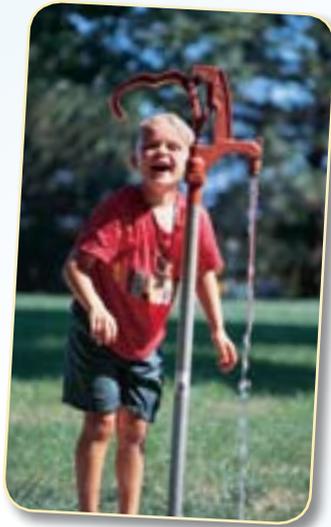
There When You Need Us

We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2013. 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 to assist you should you ever have any questions or concerns about your water.

Get Involved!

You are invited to participate in our Board of Water & Sewer Commissioners meetings and voice your concerns about your drinking water. We meet the 3rd Wednesday of each month beginning at 1:30 p.m. in the Nauset meeting room at Orleans Town Hall, 19 School Road, Orleans, MA.



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>.

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) 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.

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 stormwater 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 stormwater 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 stormwater 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.

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 or at www.epa.gov/safewater/lead.

Where Does My Water Come From?

The Town of Orleans has eight groundwater wells that pump water from the Monomoy Lens, the second largest of six aquifers located on the Cape. Wells #1 - 6 and 8 are located on approximately 500 acres of town-owned land off Route 28, and well #7 is located on approximately 38 acres of town-owned land off Quanset Road. The Town of Orleans restricts any activities on these properties that could potentially contaminate the wells.

Benefits of Chlorination

Disinfection, a chemical process used to control disease-causing microorganisms by killing or inactivating them, is unquestionably the most important step in drinking water treatment. By far, the most common method of disinfection in North America is chlorination.

Before communities began routinely treating drinking water with chlorine (starting with Chicago and Jersey City in 1908), cholera, typhoid fever, dysentery, and hepatitis A killed thousands of U.S. residents annually. Drinking water chlorination and filtration have helped to virtually eliminate these diseases in the U.S. Significant strides in public health are directly linked to the adoption of drinking water chlorination. In fact, the filtration of drinking water plus the use of chlorine is probably the most significant public health advancement in human history.

How chlorination works:

Potent Germicide Reduction in the level of many disease-causing microorganisms in drinking water to almost immeasurable levels.

Taste and Odor Reduction of many disagreeable tastes and odors like foul-smelling algae secretions, sulfides, and odors from decaying vegetation.

Biological Growth Elimination of slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks.

Chemical Removal of hydrogen sulfide (which has a rotten egg odor), ammonia, and other nitrogenous compounds that have unpleasant tastes and hinder disinfection. It also helps to remove iron and manganese from raw water.

Source Water Assessment

A Source Water Assessment Plan (SWAP) is available at our office. This plan is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area, and a determination of the water supply's susceptibility to contamination by the identified potential sources.

According to the Source Water Assessment Plan, our water system had a susceptibility rating of "high" based on the presence of one gas station in South Orleans. The Town of Orleans Fire Department closely regulates this one high threat, which has in recent years been upgraded with double-lined tanks. In addition, past engineering studies have shown that contamination to the largest part of our water supply is highly unlikely due to the direction of groundwater flow.

The Source Water Assessment Plan is available at the Orleans Water Department or online at <http://www.mass.gov/eea/docs/dep/water/drinking/swap/sero/4224000.pdf>.

QUESTIONS?

Your water bills pay to keep our community tap water safe, reliable, and there for us 24/7. For more information about what your tap water delivers, call the Water Superintendent, Todd Bunzick, at (508) 255-1200.

20-Year Asset Management Planning

In 2013, the Town of Orleans water department contracted with Wright-Pierce engineering to provide a 20-year Asset Management plan to include:

- Perform a condition assessment of all water system assets
- Develop level of service goals and objectives for the water system
- Develop a financial plan to meet the department's goals and objectives

Because the water system is relatively new (1963), the extensive need to replace aging infrastructure that is facing many communities today is not a challenge for Orleans at this time. However, continued investment in our system is needed to maintain it and to prepare for the future and to provide the reliable service our customers expect. With that in mind, a 20-year capital improvement plan was developed with improvements and recommendations prioritized based on the likelihood or consequence of failure as well as other criteria. For the implementation of these improvements and recommendations outlined in the report, revenue requirements for funding the 20-year plan were incorporated into a 20-year financial plan for presentation to the Orleans Board of Selectmen and the Orleans Finance Committee in a joint meeting on March 12, 2014. This plan is a working document that will be referred to and updated regularly over the next 20 years.

TipTopTap

The most common signs that your faucet or sink is affecting the quality of your drinking water are discolored water, sink or faucet stains, a buildup of particles, unusual odors or tastes, and a reduced flow of water. The solutions to these problems may be in your hands.

Kitchen sink and drain

Hand washing, soap scum buildup, and the handling of raw meats and vegetables can contaminate your sink. Clogged drains can lead to unclean sinks and backed up water in which bacteria (i.e., pink and black colored slime growth) can grow and contaminate the sink area and faucet, causing a rotten egg odor. Disinfect and clean the sink and drain area regularly. Also, flush regularly with hot water.

Faucets, screens, and aerators

Chemicals and bacteria can splash and accumulate on the faucet screen and aerator, which are located on the tip of faucets and can collect particles like sediment and minerals resulting in a decreased flow from the faucet. Clean and disinfect the aerators or screens on a regular basis.

Check with your plumber if you find particles in the faucet's screen as they could be pieces of plastic from the hot water heater's dip tube. Faucet gaskets can break down and cause black, oily slime. If you find this slime, replace the faucet's gasket with a higher-quality product. White scaling or hard deposits on faucets and shower heads may be caused by hard water or water with high levels of calcium carbonate. Clean these fixtures with vinegar or use water softening to reduce the calcium carbonate levels for the hot water system.

Water filtration/treatment devices

A smell of rotten eggs can be a sign of bacteria on the filters or in the treatment system. The system can also become clogged over time so regular filter replacement is important. (Remember to replace your refrigerator filters!)

Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The tables below show only those contaminants that were detected in the water. The state requires us to monitor for certain substances less often 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 Regulation (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 the EPA needs to introduce new regulatory standards to improve drinking water quality. Any UCMR3 detections are shown in the data tables in this report. 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	1.51	0.70–1.51	No	Erosion of natural deposits
Barium (ppm)	2013	2	2	0.0039	0.0030–0.0039	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2013	[4]	[4]	0.72	0.64–0.87	No	Water additive used to control microbes
Combined Radium (pCi/L)	2012	5	0	0.84	0.34–0.84	No	Erosion of natural deposits
Fecal Indicators [<i>E. coli</i> , enterococci, or coliphage] Ground Water Rule (# positive samples)	2013	TT	NA	0	NA	No	Human and animal fecal waste
Fecal coliform and <i>E. coli</i> (# positive samples)	2013	0	0	0	NA	No	Human and animal fecal waste
Haloacetic Acids [HAAs]–Stage 1 (ppb)	2013	60	NA	2	ND–4	No	By-product of drinking water disinfection
Haloacetic Acids [HAAs]–Stage 2 (ppb)	2013	60	NA	3.6	1.9–3.6	No	By-product of drinking water disinfection
Nitrate (ppm)	2013	10	10	0.98	0.12–0.98	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2013	2	NA	0.06	ND–0.06	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
TTHMs [Total Trihalomethanes]–Stage 1 (ppb)	2013	80	NA	10	4–35	No	By-product of drinking water disinfection needed to kill harmful organisms. TTHMs are formed when source water contains large amounts of organic matter.
TTHMs [Total Trihalomethanes]–Stage 2 (ppb)	2013	80	NA	27	10–27	No	By-product of drinking water chlorination
Total Coliform Bacteria (# positive samples)	2013	1 positive monthly sample	0	1	NA	No	Naturally present in the environment

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%TILE)	SITES ABOVE AL/ TOTAL SITES	EXCEEDANCE	TYPICAL SOURCE
Copper (ppm)	2013	1.3	1.3	0.140	0/31	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2013	15	0	0	0/31	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
Aluminum (ppb)	2013	200	NA	6.8	ND-16	No	Erosion of natural deposits; Residual from some surface water treatment processes
Chloride (ppm)	2013	250	NA	28	21-35	No	Runoff/leaching from natural deposits
Copper (ppm)	2013	1.0	NA	0.0247	0.0049-0.052	No	Corrosion of household plumbing systems; Erosion of natural deposits
Iron (ppb)	2013	300	NA	290	ND-880	No	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2013	50	NA	20	ND-84	No	Leaching from natural deposits
pH (Units)	2013	6.5-8.5	NA	6.2	5.6-7.3	No	Naturally occurring
Sulfate (ppm)	2013	250	NA	7.2	4.8-11	No	Runoff/leaching from natural deposits; Industrial wastes

UNREGULATED CONTAMINANT MONITORING REGULATION 3¹

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Chlorate (ppb)	2013	76	46-110	Agricultural defoliant or desiccant; Disinfection by-product; Used in production of chlorine dioxide
Chromium (total) (ppb)	2013	0.34	0.20-0.54	Naturally occurring element; Used in making steel and other alloys; Chromium-3 or -6 forms are used for chrome plating, dyes, and pigments, leather tanning, and wood preservation
Chromium-6 (ppb)	2013	0.25	0.16-0.38	Naturally occurring element; Used in making steel and other alloys; Chromium-3 or -6 forms are used for chrome plating, dyes, and pigments, leather tanning, and wood preservation
Strontium (ppb)	2013	29	22-33	Naturally occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions
Vanadium (ppb)	2013	0.17	ND-0.36	Naturally occurring elemental metal; used as vanadium pentoxide, which is a chemical intermediate and a catalyst

¹Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of monitoring unregulated contaminants is to assist the 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 that 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. Secondary MCLs (SMCLs) are established to regulate for the aesthetics of water (i.e., taste and odor).

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).

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