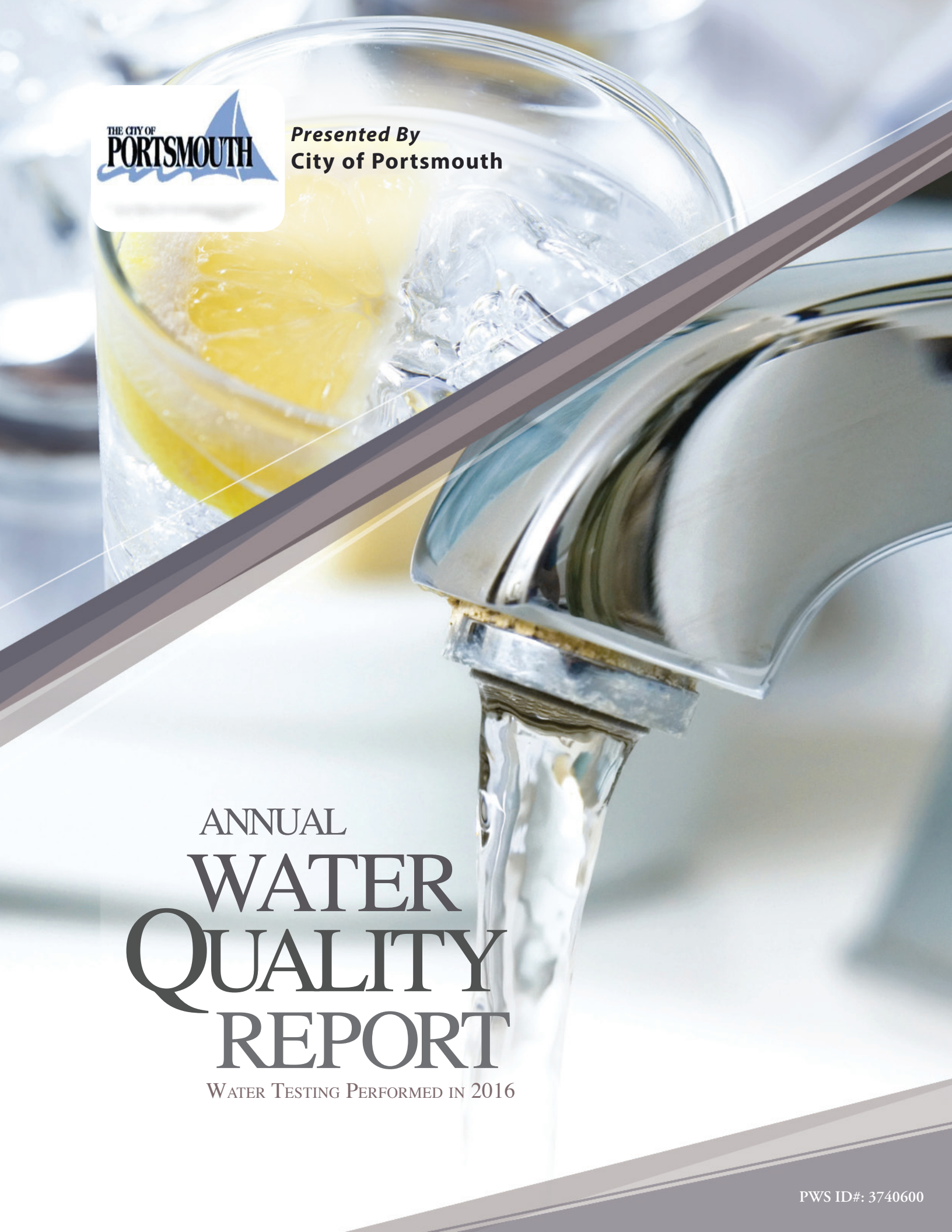

THE CITY OF PORTSMOUTH

Presented By
City of Portsmouth

ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2016

PWS ID#: 3740600

We've Come a Long Way

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 to deliver the highest quality drinking water without interruption to your homes and business. We continue to remain vigilant in meeting goals of source water protection, water conservation, and community education while continuing to serve the needs of all of our water users.

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.

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. Lake Kilby Water Treatment Plant 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 www.epa.gov/lead.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration 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, in some cases, radioactive material, and 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 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.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Water Main Flushing

Distribution 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 refreshing the water in the mains to maintain consistent water quality.

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 and/or chloramines, contributing to the growth of microorganisms within distribution system. 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. The Department of Public Utilities is currently implementing its unidirectional flushing program. Please visit the department's webpage at www.portsmouthva.gov/354/Public-Utilities to learn more. Please contact us if you have any questions or are experiencing issues in your area.

Source Water Description

Your tap water comes from four surface lakes; Lakes Meade, Cohoon, Speight's Run and Kilby and five deep wells. Portsmouth's water treatment facility has the capacity to treat 32 million gallons of water each day and serves approximately 150,000 customers in Portsmouth, Chesapeake and Suffolk.

Source Water Assessment

The Source Water Assessment Plan (SWAP) is available at our watershed office (757) 539-2201 ext. 222. The SWAP 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.

The State drinking water program has found that our drinking water is potentially most susceptible to agriculture, urban, and forestry runoff. However, we have not detected any contaminants from these sources in our drinking water. If you would like to review the Source Water Assessment Plan, please feel free to contact our watershed office during regular office hours.

For More Information

At the City of Portsmouth Department of Public Utilities, we value our customers and work hard to ensure your satisfaction. If you have questions or comments about this report or other issues concerning water quality, please call us or the other sources of water quality information listed below:

City of Portsmouth
Water Quality
(757) 539-2201, ext. 235

Additional sources of information regarding water quality may be found at:

Virginia Department of Health
Office of Water Programs
(757) 683-2000

U.S. Environmental Protection Agency Safe Drinking Water Hotline
(800) 426-4791

This Water Quality Report as well as other City issues can also be viewed at our website. Please visit us at www.portsmouthva.gov.

Tip Top Tap

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. Flushing regularly with hot water will help to minimize these issues.

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 screen as they could be pieces of plastic from the hot water heater dip tube. Faucet gaskets can break down and cause black, oily slime. If you find this slime, replace the faucet 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. It is recommended to 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 filter!)

Protecting Your Water

Bacteria are a natural and important part of our world. There are around 40 trillion bacteria living in each of us; without them, we would not be able to live healthy lives. Coliform bacteria are common in the environment and are generally not harmful themselves. The presence of this bacterial form in drinking water is a concern, however, because it indicates that the water may be contaminated with other organisms that can cause disease.

In 2016, the U.S. EPA passed a new regulation called the Revised Total Coliform Rule, which requires additional steps that water systems must take in order to ensure the integrity of the drinking water distribution system by monitoring for the presence of bacteria like total coliform and *E. coli*. The rule requires more stringent standards than the previous regulation, and it requires water systems that may be vulnerable to contamination to have in place procedures that will minimize the incidence of contamination. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment of their system and correct any problems quickly. The U.S. EPA anticipates greater public health protection under the new regulation due to its more preventive approach to identifying and fixing problems that may affect public health.

Our goal is to produce the highest-quality drinking water and minimize all potential pathways of contamination into our distribution system, and this new rule helps us to accomplish that goal.

Water Treatment Process

The treatment process consists of a series of steps. First, water is drawn from our lakes at various intakes. It is here where oxidation takes place. We use permanganate to oxidize the source water for iron and manganese removal. In addition, this chemical helps with taste and odor caused by naturally occurring organic matter found in the source water. The water then goes through a rapid mix where a coagulant, aluminum sulfate, is added. The addition of this substance initiates the coagulation process. Coagulation is the process that causes very small suspended particles to attract one another and form larger particles accomplished by the addition of a chemical.

The water is then sent to a contact basin where caustic is added for pH control. From there the water is sent to the clarifiers. At the head of each clarifier, polymer and carbon are added, initiating the flocculation process. The flocculation process converts small, suspended particles into larger, more settleable clumps, referred to as floc. The clarifiers act as large settling basins in which water is retained to allow the floc to settle out by gravity. The water is then sent to multimedia filters for filtration and where liquid chlorine is added for disinfection. Fluoride is added by the addition of well water that has naturally occurring levels of fluoride. Finally, the water is pumped to one of two clear well holding tanks where ammonia is added before pumping to the distribution system. The ammonia is added to the chlorinated water forming chloramines, which maintain a longer residual in the distribution system and reduce the amount of disinfection byproducts formed.

This treatment process has proven to be very effective at producing high-quality drinking water that meets and exceeds all Federal testing standards.

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.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2016	2	2	0.027	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Beta/Photon Emitters[1] (pCi/L)	2016	50	0	3.3	NA	No	Decay of natural and man-made deposits
Chloramines (ppm)	2016	[4]	[4]	2.6	2.12–4.1	No	Water additive used to control microbes
Combined Radium[2] (pCi/L)	2016	5	0	0.1	NA	No	Erosion of natural deposits
Fluoride (ppm)	2016	4	4	0.77	0.51–2.66	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] (ppb)	2016	60	NA	49	23–55	No	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes] (ppb)	2016	80	NA	46	23–51	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2016	TT	NA	2.28	1.58–3.22	No	Naturally present in the environment
Turbidity[3] (NTU)	2016	TT	NA	0.16	0.02–0.16	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2016	TT = 95% of samples </= 0.3NTU	NA	100	NA	No	Soil runoff

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	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2015	1.3	1.3	0.17	0/58	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2015	15	0	<1	1/58	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)	2016	250	NA	18	NA	No	Runoff/leaching from natural deposits
pH (Units)	2016	6.5-8.5	NA	7.35	7.1–8.1	No	Naturally occurring
Sulfate (ppm)	2016	250	NA	53	NA	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2016	500	NA	174	194–362	No	Runoff/leaching from natural deposits

NON-REGULATED PARAMETERS

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Alkalinity (ppm)	2016	72	62–128	Naturally occurring
Calcium Hardness (ppm)	2016	22	11–24	Naturally present in sedimentary rocks
Conductivity (µS/cm)	2016	326	284–417	Naturally occuring
Corrosion Index (Langlier)	2016	-1.21	-1.98–-0.77	Naturally or industrially influenced balance of hydrogen, carbon, and oxygen in the water; Affected by temperature and other factors
Ortho-Phosphate (ppm)	2016	0.12	NA	Naturally occurring in rocks and other minerals
Total Sodium (ppm)	2016	57.4	37.5–89.3	Naturally occurring

[1] The MCL for beta particles is 4 mrem/year. U.S. EPA considers 50 pCi/L to be the level of concern for beta particles.
[2] 0.1 pCi/L is for Raduim 226. Raduim 228 is <0.9 pCi/L.
[3] Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system.

Definitions

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

µS/cm (microsiemens per centimeter): A unit expressing the amount of electrical conductivity of a solution.

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

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

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.

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