



ANNUAL
WATER
QUALITY
REPORT

Water testing performed in 2009



Presented By:
**PORTSMOUTH
WATER DIVISION**
[www. cityofportsmouth.com](http://www.cityofportsmouth.com)

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Maintaining High Standards

This report covers all testing performed between January 1 and December 31, 2009. The City is committed to producing drinking water that meets and exceeds all state and federal drinking water standards. We continually strive to adopt new and better methods for delivering the best quality drinking water to you. As new drinking water challenges emerge, we remain vigilant in maintaining high standards of source water protection, water conservation, community education, and serving the needs of our water users.

Important Health Information

Some people may be more vulnerable to contaminants that may be found 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 of infection. 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 www.epa.gov/safewater/hotline/.



Community Participation

Please share with us your thoughts about the information in this report. Well-informed customers are our best allies. You are invited to voice your concerns at any regularly scheduled City Council meeting. Meetings are usually scheduled twice each month on Monday evenings starting at 7:00 p.m. at Portsmouth City Hall, 1 Junkins Avenue, Portsmouth, NH. Meeting dates can be found on our website at www.cityofportsmouth.com or by calling (603) 431-2000 for the date of the next meeting. New Castle Water Works customers should call (603) 431-6710 for meeting dates and times.

System Improvements

The City of Portsmouth initiated a capital project funded in part by the State Revolving Loan Fund to replace the existing Madbury Water Treatment Plant with a new water treatment facility to better meet current water quality needs and regulations. Based on a pilot study, the City selected a Dissolved Air Flotation (DAF) clarification and filtration plant as the most cost-effective treatment technology for meeting water quality goals.

In addition to the new treatment plant construction, a parallel project is underway to update the intake structure at the Bellamy Reservoir to reduce the effects of stratification of raw water which impacts treatment efficiency at the plant. A reservoir aeration system was designed to pre-treat the anoxic water conditions that are experienced seasonally in the reservoir. In addition, an adjustable intake structure was designed to draw raw water from different elevations in the reservoir to improve water quality when the reservoir is stratified.

In 2005, the City of Portsmouth instituted a city-wide sustainability initiative with the goal of improving energy efficiency and sustainability on all municipal buildings and projects. Several sustainable design aspects are integrated in the new Madbury Water Treatment Plant to comply with this initiative. Design items include daylight harvesting for building heat during winter months, solar panels for solar hot water collection, heat pumps that utilize the raw water stream for HVAC, in addition to many others. It is anticipated that the new facility will be the first drinking water treatment plant in New Hampshire to achieve LEED certification.

The project is currently under construction and the forecast for completion is Spring 2011.

Questions?

For more information about this report, or for any questions relating to your drinking water, please call Peter Rice, P.E. City Engineer for the Water/Sewer Divisions, at (603) 427-1530. New Castle customers should call Brad Meade at (603) 431-6710.



Substances That Could Be in Water

The U.S. EPA requires the following standard language in our annual report.

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 in untreated 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.

Leak Detection

Keeping over 180 miles of drinking water pipes intact is a difficult job, but the City began a program in March 2010 to identify leaks within the water distribution system. The City acquired several leak location loggers to assist in identifying possible leaks and enhancing water conservation.

About the New Castle Water Works Violation

During 2009, New Castle Water Works failed to monitor for the Stage 2 Disinfection By-Product Rule in the Standard Monitoring Plan for an Initial Distribution System Evaluation (IDSE) and report the results to the NHDES by January 1, 2010. This was an administrative violation and at no time was the New Castle customer at risk. New Castle has taken steps to conduct the IDSE monitoring and complete the required reporting.

How Is My Water Treated and Purified?

The City's water treatment process consists of a series of steps. First, raw water is drawn from the Bellamy Reservoir. The water then goes to a mixing tank where polyaluminum chloride and sodium hydroxide are added. The addition of these substances causes small particles to adhere to one another (called floc), making them heavy enough to settle out of the water. Powdered activated carbon is added (seasonally) to control taste and odor. The water is then filtered through layers of fine sand. As smaller, suspended particles are removed, turbidity disappears leaving clear water. Sodium hypochlorite (bleach) is added at this point for disinfection. (We carefully monitor the amount of sodium hypochlorite, adding the lowest quantity necessary to protect the safety of your water without compromising taste.) Finally, sodium hydroxide (used to adjust the final pH and alkalinity), fluoride (used to prevent tooth decay), and a corrosion inhibitor (used to protect distribution system pipes) are added before the water is pumped to water storage tanks and into your home or business.

Where Does My Water Come From?

The main source of Portsmouth water is the Bellamy Reservoir located in Madbury and Dover. The water is piped to a water treatment plant in Madbury, where it is treated, filtered, and disinfected. This location is also the site of the City's Madbury Wells 2, 3 and 4. From this site, water is pumped under pressure to consumers in Madbury, Dover, and Durham and then to a booster pumping station in Newington. It is then pumped to consumers in Newington, Portsmouth, Greenland, Rye, and the New Castle Water Works. Many consumers are also served by the City's groundwater well sources. These wells include the Collins and Portsmouth Wells in Portsmouth and the Greenland Well in Greenland. The Pease International Tradeport is served by the Haven, Smith, and Harrison wells.

Rain Barrels

Portsmouth water system customers can purchase 60 gallon rain barrels at a reduced price, allowing them to collect and store rainwater for such uses as irrigating lawns and gardens while saving on water bills and reducing stormwater runoff. Thanks to \$55,000 dollars in federal stimulus funding, customers can pre-order up to two re-used plastic barrels for just \$30 dollars (half the market price) online. The cost will be added to your monthly water and sewer bill. The Portsmouth water system services Portsmouth, Newington, Greenland, New Castle, and parts of Rye. Placing a rain barrel beneath the gutters of a home can save about 1,300 gallons of water during the summer months. To order, see www.cityofportsmouth.com/publicworks/ws-barrels.htm and for more information call (603) 427-1530.

Source Water Assessment

The New Hampshire Department of Environmental Services (NHDES) has conducted a source water assessment of our water system. A copy is available for viewing at the Portsmouth Water Division's office at 680 Peverly Hill Road. Please call (603) 610-7497 for an appointment to view the report. You may also visit the Drinking Water Source Assessment Reports website at <http://des.nh.gov/organization/divisions/water/dwgb/dwspp/reports/part1.htm>.

Lead and Drinking Water

The U.S. EPA requires the following standard language in our annual report.

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. Portsmouth Water Division is 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.

Sampling Results

During the past year we have taken hundreds of water samples in order to determine the presence of any biological, inorganic, volatile organic, or synthetic organic contaminants. The tables below show only those contaminants that were detected in the water. The state allows us to monitor 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 is included, along with the year in which the sample was taken.

REGULATED SUBSTANCES											
				Portsmouth Water Division		New Castle		Pease Tradeport			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2006	15	0	2.78	ND–2.78	NA	NA	NA	NA	No	Erosion of natural deposits
Arsenic (ppb)	2007	10	0	2.1 ¹	ND–2.1	NA	NA	1.1 ²	ND–1.1	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2009	2	2	0.0194	ND–0.0194	NA	NA	0.0076	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Combined Radium (pCi/L)	2006	5	0	2.8	0.57–2.8	NA	NA	NA	NA	No	Erosion of natural deposits
Haloacetic Acids [HAA] (ppb)	2009	60	NA	23 ³	9.9–46	36 ³	18.8–43.2	NA	NA	No	By-product of drinking water disinfection
Methyl tertiary-butyl ether (MTBE) (ppb)	2009	13	13	0.6	ND–0.6	NA	NA	NA	NA	No	Gasoline additive. Fueling spills, leaking underground storage tanks
Nitrate (ppm)	2009	10	10	3.7	0.13–3.7	NA	NA	2.3	0.24–2.3	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2009	80	NA	44 ³	12.1–90.5	62 ³	33.2–104.2	NA	NA	No	By-product of drinking water chlorination
Turbidity ⁴ (NTU)	2009	TT	NA	1.39	0.07–1.39	NA	NA	NA	NA	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2009	TT	NA	96.68	NA	NA	NA	NA	NA	No	Soil runoff
Uranium (pCi/L)	2006	30	0	2.47	ND–2.47	NA	NA	NA	NA	No	Erosion of natural deposits
Tap water samples were collected for lead and copper analyses from sample sites throughout the community											
				Portsmouth Water Division		New Castle		Pease Tradeport			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH% TILE)	SITES ABOVE AL/ TOTAL SITES	AMOUNT DETECTED (90TH% TILE)	SITES ABOVE AL/ TOTAL SITES	AMOUNT DETECTED (90TH% TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2007	1.3	1.3	0.185	0/30	0.116 ⁵	0/10 ⁵	0.6	0/10	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (ppb)	2007	15	0	5	0/30	5 ⁵	0/10 ⁵	5	0/10	No	Corrosion of household plumbing systems; Erosion of natural deposits

UNREGULATED SUBSTANCES (PORTSMOUTH WATER DIVISION)

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppb)	2009	1.6	ND–1.6	By-product of drinking water disinfection
Bromoform (ppb)	2009	0.8	ND–0.8	By-product of drinking water disinfection
Chloroform (ppb)	2009	7	ND–7	By-product of drinking water disinfection

INITIAL DISTRIBUTION SYSTEM EVALUATION (PORTSMOUTH WATER DIVISION) ⁶

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Haloacetic Acids [HAA]–IDSE Results (ppb)	2009	63.6	7.0–63.6	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes]–IDSE Results (ppb)	2009	81.7	7.3–81.7	By-product of drinking water disinfection

¹ Samples collected in 2008 and 2009 at the Madbury Water Treatment Plant (WTP) were Not-Detected (ND) for arsenic.

² Sample collected in 2009 at the Harrison Well was Not-Detected (ND) for arsenic.

³ Amount Detected identified as the highest running annual average.

⁴ The Madbury Water Treatment Plant exceeded the 1 NTU turbidity level on October 22, 2009, for fifteen minutes at 1.39 NTU due to a coagulant feed system malfunction. The monthly standard of 0.30 NTU for October 2009 was met at 99.49 percent, which exceeds treatment regimens. This was not an emergency; at no time did customers need to boil water or take corrective action. The staff took appropriate action and rectified the situation, and at no time was disinfection compromised. Turbidity is a measure of the cloudiness of the water. It is monitored by surface water systems because it is a good indicator of water quality and thus helps measure the effectiveness of the treatment process. High turbidity can hinder the effectiveness of disinfectants.

⁵ Sampled in 2008

⁶ We were required by the U.S. EPA to conduct an evaluation of our distribution system. This is known as an Initial Distribution System Evaluation (IDSE) and is intended to identify locations in our distribution system that have elevated disinfection by-product concentrations. Disinfection by-products (e.g., HAAs and TTHMs) result from continuous disinfection of drinking water and form when disinfectants combine with organic matter that naturally occurs in the source water.

Definitions

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.

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.

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).

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