



ANNUAL  
**WATER REPORT**

*Water testing  
performed in 2010*



*Presented By* \_\_\_\_\_  
**Portsmouth Water Division**  
[www.cityofportsmouth.com](http://www.cityofportsmouth.com)

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## Quality First

This report covers all water quality testing performed between January 1 and December 31, 2010. The City is committed to producing drinking water that meets and exceeds all State and Federal drinking water standards. We remain vigilant in meeting the challenges of new regulations, source water protection, water conservation, and community outreach and education while continuing to serve the needs of all of our water users.

### Where Does My Water Come From?

The main source of Portsmouth water is the Bellamy Reservoir located in Madbury, NH and Dover, NH. 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.

The New Hampshire Department of Environmental Services (NHDES) has conducted a source water assessment of our water system. A copy of the report 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> and click on Portsmouth.



## Community Participation

Please share with us your thoughts about the information in this report. After all, 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](http://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.

## Water Conservation

You can play a role in conserving water and save yourself money in the process by becoming conscious of the amount of water your household is using and by looking for ways to use less whenever you can. It is not hard to conserve water. Here are a few tips:

- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So get a run for your money and load it to capacity.
- Turn off the tap when brushing your teeth.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank. Watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
- Use your water meter to detect hidden leaks. Simply turn off all taps and water-using appliances. Then check the meter after 15 minutes. If it moved, you have a leak.

## Important Health Information

The U.S. Environmental Protection Agency (U.S. EPA) requires the following standard language in our annual report. 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>.

## 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, several upgrades at the Bellamy Reservoir were completed in 2010. These upgrades included changes to the intake structure at the Bellamy Reservoir to reduce the effects of stratification of raw water which impacts treatment efficiency at the plant; a new reservoir aeration system designed to pretreat the anoxic water conditions that are experienced seasonally in the reservoir; and an adjustable intake structure 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 water treatment plant in New Hampshire to achieve LEED certification.

The project is currently under construction and is forecast for completion in Summer 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 Might Be in Drinking 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.

## Lead in Home Plumbing

The U.S. Environmental Protection Agency 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 in your household plumbing, 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](http://www.epa.gov/safewater/lead).

## How Is My Water Treated and Purified?

The 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 (which is a measure of the cloudiness of the water) disappears, and clear water emerges. 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 (to adjust the final pH and alkalinity), fluoride (to prevent tooth decay), and a corrosion inhibitor (to protect distribution system pipes) are added before the water is pumped to water storage tanks and into your home or business.

## 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 (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 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 all industrial, commercial, and institutional facilities in the service area to make sure that all potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test each backflow preventer to make sure that it is providing maximum protection.

For more information, review the Cross-Connection Control Manual from the U.S. EPA's Web site at <http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm>. You can also call the Safe Drinking Water Hotline at (800) 426-4791.

## 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.

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 <sup>1</sup> (ppb)	2010	10	0	1.7	ND–1.7	NA	NA	ND	NA	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2010	2	2	0.0144	ND–0.0144	NA	NA	0.0160	0.0076–0.0160	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Bis (2-ethylhexyl) Phthalate (ppb)	2010	6	0	NA	NA	NA	NA	2.2	ND–2.2	No	Discharge from rubber and chemical factories
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] <sup>2</sup> (ppb)	2010	60	NA	24.5	6.1–40.0	30	19–44	2.6	2.6–2.6	No	By-product of drinking water disinfection
Nitrate (ppm)	2010	10	10	2.9	ND–2.9	NA	NA	2.3	0.11–2.3	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Oxamyl [Vydate] (ppb)	2010	200	200	1.0	ND–1.0	NA	NA	NA	NA	No	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes
TTHMs [Total Trihalomethanes] <sup>2</sup> (ppb)	2010	80	NA	36.2	11.3–73.4	53	24.7–97.1	17.8	17.8–17.8	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2010	TT	NA	3.1	1.5–3.1	NA	NA	NA	NA	No	Naturally present in the environment
Turbidity <sup>3</sup> (NTU)	2010	TT	NA	0.84	0.05–0.84	NA	NA	NA	NA	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2010	TT	NA	98.88	NA	NA	NA	NA	NA	No	Soil runoff
Uranium (ppb)	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)	2010	1.3	1.3	0.13	0/30	0.116 <sup>4</sup>	0/10 <sup>4</sup>	0.19	0/10	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (ppb)	2010	15	0	1	0/30	5 <sup>4</sup>	0/10 <sup>4</sup>	ND	0/10	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES											
				Portsmouth Water Division		Pease Tradeport					
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE		
Copper (ppm)	2010	1.0	NA	0.2438	ND–0.2438	0.0150	ND–0.0150	No	Corrosion of household plumbing systems; Erosion of natural deposits		
Manganese (ppm)	2010	50	NA	0.1286	ND–0.1286	0.1593	ND–0.1593	No	Leaching from natural deposits		

## UNREGULATED SUBSTANCES (PORTSMOUTH WATER DIVISION)

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
<b>Bromodichloromethane</b> (ppb)	2010	6.4	ND–6.4	By-product of drinking water disinfection
<b>Chloroform</b> (ppb)	2010	49	ND–49	By-product of drinking water disinfection
<b>Dibromochloromethane</b> (ppb)	2010	1.4	ND–1.4	By-product of drinking water disinfection

<sup>1</sup> Samples collected in 2010 at the Madbury Treatment Plant (WTP) were Non-Detect (ND) for arsenic.

<sup>2</sup> Amount detected identified as the highest running annual average. 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.

<sup>3</sup> 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.

<sup>4</sup> New Castle Copper and Lead samples collected in 2008 and scheduled to be resampled in 2011.

## 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. Secondary MCLs (SMCL) are set for the control of 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.

**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.

