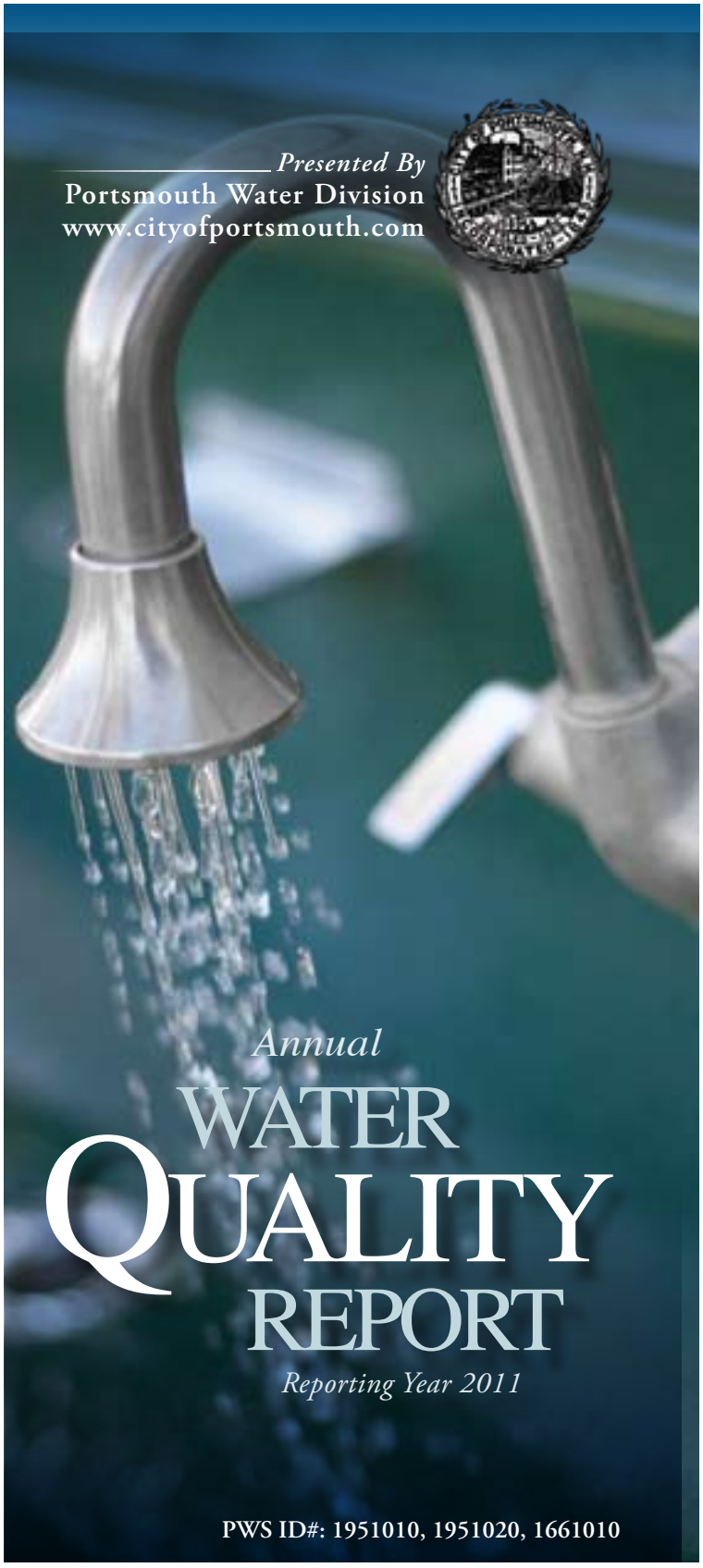
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Portsmouth Water Division
www.cityofportsmouth.com
Annual
WATER
QUALITY
REPORT
Reporting Year 2011
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## Meeting the Challenge

This report covers all water quality testing performed between January 1 and December 31, 2011. The City is committed to producing drinking water that meets all state and federal drinking water 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.

## 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 and click on Portsmouth.

## 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.

## 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.

## 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. The Portsmouth and Pease water systems are interconnected, which allows water to be transferred from one system to the other.

## 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 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.

## 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. We are 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/safewater/lead.

## 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.

## 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 Steve Tabbutt at (603) 431-6710.

## 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 website at http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm. You can also call the Safe Drinking Water Hotline at (800) 426-4791.

## 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. Prior to mixing, coagulation chemicals are added. The addition of these substances causes small particles to adhere to one another (called floc), making them easier to float to the surface in the Dissolved Air Floatation (DAF) system where they are skimmed off and sent to a drying bed. The water is then filtered through layers of anthracite and sand to remove smaller suspended particles, and 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 (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.

## New LEED-certified Water Treatment Plant

On Saturday, Nov. 19, 2011, the City of Portsmouth celebrated the opening of the Portsmouth Water System's new Madbury Water Treatment Plant, which will receive the prestigious Leadership in Energy and Environmental Design (LEED) silver certification.

The new $18-million plant is the culmination of eight years of planning, testing, design, and construction and replaces the 50-year-old plant at the same location. The plant provides improved reliability and will meet future and current regulatory requirements to deliver quality drinking water to the communities of Portsmouth, Newington, New Castle, and portions of Greenland and Rye in the Portsmouth Water System.

The new water treatment plant maintains a maximum treatment/pumping capacity of approximately 4 million gallons per day and was designed to use daylight harvesting for building heat during winter months, solar panels for solar hot water collection, and heat pumps that utilize the raw water for heating and cooling the facility. The plant also uses a state-of-the-art Dissolved Air Floatation (DAF) treatment system designed to be able to adapt to ever-increasing state and federal regulatory water quality requirements.

## 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 table below shows only those contaminants that were detected in the water. The state requires 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 are included, along with the year in which the sample was taken.

### REGULATED SUBSTANCES

| | | | | Portsmouth Water Division | | Pease Tradeport | | | |
|---|---|---|---|---|---|---|---|---|---|
| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | MCL [MRDL] | MCLG [MRDLG] | 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 | No | Erosion of natural deposits |
| **Arsenic**[1] (ppb) | 2010 | 10 | 0 | 1.7 | ND–1.7 | ND | NA | No | Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes |
| **Barium** (ppm) | 2011 | 2 | 2 | 0.0069 | ND–0.0069 | NA | NA | No | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits |
| **Nitrate** (ppm) | 2011 | 10 | 10 | 3.9 | ND–3.9 | 1.8 | ND–1.8 | No | Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits |
| **Total Organic Carbon** (ppm) | 2011 | TT | NA | 3.8 | 1.6–3.8 | NA | NA | No | Naturally present in the environment |
| **Turbidity**[2] (NTU) | 2011 | TT | NA | 1.38 | 0.04–1.38 | NA | NA | No | Soil runoff |
| **Turbidity** (Lowest monthly percent of samples meeting limit) | 2011 | TT | NA | 98.01 | NA | NA | NA | No | Soil runoff |
| **Uranium** (ppb) | 2006 | 30 | 0 | 2.47 | ND–2.47 | 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) | 2011[3] | 1.3 | 1.3 | 0.13 | 0/30 | 0.11 | 0/10 | 0.19 | 0/10 | No | Corrosion of household plumbing systems; Erosion of natural deposits |
| **Lead** (ppb) | 2011[3] | 15 | 0 | 1 | 0/30 | 2 | 0/10 | 0 | 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 |
| **Chloride** (ppm) | 2011 | 250 | NA | 270 | 22–270 | 140 | 1.8–140 | No | Runoff/leaching from natural deposits |
| **Copper** (ppm) | 2011 | 1.0 | NA | 0.0052 | ND–0.0052 | NA | NA | No | Corrosion of household plumbing systems; Erosion of natural deposits |
| **Manganese** (ppb) | 2011 | 50 | NA | 7.2 | ND–7.2 | NA | NA | No | Leaching from natural deposits |
| **Sulfate** (ppm) | 2011 | 250 | NA | 3.7 | ND–3.7 | NA | NA | No | Runoff/leaching from natural deposits; Industrial wastes |

### INITIAL DISTRIBUTION SYSTEM EVALUATION (IDSE)

| | | Portsmouth Water Division | | New Castle | | |
|---|---|---|---|---|---|---|
| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AMOUNT DETECTED | RANGE LOW-HIGH | AMOUNT DETECTED | RANGE LOW-HIGH | TYPICAL SOURCE |
| **Haloacetic Acids [HAA]–IDSE Results**[4] (ppb) | 2011 | 29.2 | 12–56 | 39 | 29.9–53.9 | By-product of drinking water disinfection |
| **TTHMs [Total Trihalomethanes]–IDSE Results**[4] (ppb) | 2011 | 36.9 | 17.2–76.2 | 59 | 40.4–101.52 | By-product of drinking water disinfection |

## UNREGULATED SUBSTANCES (PORTSMOUTH WATER DIVISION)

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AMOUNT DETECTED | RANGE LOW-HIGH | TYPICAL SOURCE |
|---|---|---|---|---|
| **Bromodichloromethane** (ppb) | 2011 | 4.2 | ND–4.2 | By-product of drinking water disinfection |
| **Chloroform** (ppb) | 2011 | 33 | ND–33 | By-product of drinking water disinfection |
| **Dibromochloromethane** (ppb) | 2011 | 0.5 | ND–0.5 | By-product of drinking water disinfection |
| **Sodium** (ppm) | 2011 | 22.6 | ND–22.6 | By-product of drinking water disinfection |

[1] Samples collected in 2011 at the Madbury Treatment Plant (WTP) were Non-Detect (ND) for arsenic.

[2] 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.

[3] Portsmouth and Pease Copper and Lead samples were collected in 2010 and are scheduled to be resampled in 2013.

[4] Amount detected identified as the highest running annual average. Water systems were required by the U.S. EPA to conduct an evaluation of their distribution systems. This is known as an Initial Distribution System Evaluation (IDSE) and is intended to identify locations in the distribution systems 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 which 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.