



System Name: Berlin Water Works

EPA ID: #0231010

Water Quality Report – 2013 --For Calendar Year 2012

What is the water quality of my drinking water?

This year the Berlin Water Works has continued to make improvements in the distribution system by installing 12,409 feet of new water mains. The Berlin Water Works has also continued to optimize the treatment of the water delivered to the customers. Because of these improvements we continue to successfully pass lead and copper testing. We had to issue a Boil Water Order in the month of April but an immediate retest of the water proved the water to be safe to drink and the boil order was lifted three days later, we believe the bad test results were the result of handling the sample bottles. It is with great pleasure that we say, that this report shows our drinking water continues to improve and is safe to drink.

What is the source of my water?

The primary source is water from the East Branch of the Upper Ammonoosuc River that has been flocculated, clarified, filtered, treated, and disinfected by chlorination. The pH is raised with Sodium bicarbonate and sodium hydroxide as corrosion inhibitor to minimize lead and copper from the tap water. The systems demand average daily flow is 0.73 million gallons per day. There is an alternate groundwater source; the Brown Farm Well, a 1 million gallon per day source that can supplement the water needed for the City residents, on an as needed basis.

Why are contaminants in my water?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the US Environmental Protection Agency's Safe Drinking Water Hotline (1-800-426-4791).

How can I get involved?

If you have any questions, please contact the Berlin Water Works Office at 752-1677. You are welcome to attend regular meetings of the Board of Water Commissioners held at 12:00 pm on the 3rd Wednesday of every month at the 55 Willow Street Office. Commissioners are Lucien Langlois, Michael Caron, Paul Poulin, and David Bertrand.

Other information: Berlin water is tested for a very large number of contaminants, including microbiological contaminants, radioactive contaminants, inorganic contaminants, synthetic organic contaminants (including pesticides and herbicides), and volatile organic contaminants. If no contaminants were detected, we are not required to list the contaminant in this report. Information on test results can be obtained upon request at our main office at 55 Willow Street. Berlin water is also continuously monitored for turbidity and residual chlorine, guaranteeing a safe drinking water. This is verified by the State of New Hampshire DES required sampling of ten locations at various points in the city for bacteria, every month of the year.

Do I need to take special precautions?

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 can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Definitions:

MCLG: Maximum Contaminant Level Goal, or 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.

MCL: Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. They are set as close to the MCLGs as feasible using the best available treatment technology.

AL: Action Level, or the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.

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

MRDLG: Maximum residual disinfectant level goal or the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants (for water systems that use chlorine).

MRDL: Maximum Residual Disinfectant Level or the highest level of a disinfectant allowed in drinking water. There is convincing evidence that the addition of a disinfectant is necessary for control of microbial contaminants (for water systems that use chlorine).

Abbreviations:

ppm: parts per million **ppb:** parts per billion **ppt:** parts per trillion **ppq:** parts per quadrillion **pCi/L:** pico curies per liter **NTU:** Nephelometric Turbidity Unit

NA – Not applicable **nd:** not detectable at testing limits **AL:** Action Level **TT:** Treatment Technique

Sample Dates: The results for detected contaminants listed below are from the most recent monitoring done in compliance with regulations ending with the year 2012. Results prior to 2012 will include the date the sample was taken. The State of New Hampshire allows water systems to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Thus some of the data present, though representative, may be more than one year old.

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.

VIOLATIONS						
VIOLATIONS	Date of Violation	Explain Violation	Length of violation	Action taken to resolve	Health Effects (Env-Dw 811.21)	
Public Notice 4/8/12	12/21/11	Fecal Bacterial Hit	3 days	Retested and found to be a false positive. Possible handling error in laboratory. Changed laboratories	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely-compromised immune systems. "Inadequately treated water may contain disease causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."	
DETECTED WATER QUALITY RESULTS						
Contaminant (Units)	Level Detected	MCL	MCLG	Violation YES/NO	Likely Source of Contamination	Health Effects of Contaminant
Microbiological Contaminants						
Total Coliform Bacteria	4/17/12 1	< 40 samples >1 is positive	0	NO	Naturally present in the environment	Coliforms are bacteria that are naturally present and are used as an indicator that other; potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
Total Organic Carbon (ppm)	0 to 1.76 Avg value = 1.14	TT	N/A	NO	Naturally present in the Environment	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver, or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Turbidity (NTU)	0.02 to 0.30	TT	N/A	NO	Soil runoff	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Fecal Coliform, E. Coli Bacteria	4/17/12	0	0	YES	Human and animal fecal waste	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely-compromised immune systems.
Inorganic Contaminants						
Arsenic	9/7/12 0.001	10	0	NO	Erosion of natural deposits: runoff from orchards; runoff form glass and electronics production wastes	(5 ppb through 10 ppb) While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the

						current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems. (above 10 ppm) Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Barium (ppm)	9/17/12 0.004	2	2	NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium (ppb)	9/17/12 0.001	4	4	NO	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Cadmium (ppb)	9/17/12 0.001	5	5	NO	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chlorine (ppm)	0.36 to 2.00	MRDL =4	MRDLG =4	NO	Water additives used to control microbes	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Copper (ppm)	9/18/12 0.08 to 1.10 90 th Percentile =0.67 ppm	AL=1.3	1.3	NO	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
Fluoride (ppm)	9/17/12 0.17	4	4	NO	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Lead (ppb)	9/18/12 0.001 to 0.032 90 th Percentile = 12ppb	AL=15	0	NO	Corrosion of household plumbing systems, erosion of natural deposits	(15 ppb in more than 5%) Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water.

						Additional information is available from the Safe Drinking Water Hotline (800-426-4791). (above 15 ppb) Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury (inorganic) (ppb)	9/17/12 0.0001	2	2	NO	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate (as Nitrogen) (ppm)	9/26/12 12/19/12 0 to 0.50	10	10	NO	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	(5 ppm through 10ppm) Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider. (Above 10 ppm) Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Selenium (ppm)	9/17/12 0.001	50	50	NO	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium (ppb)	9/17/12 0.005	2	0.5	NO	Leaching from ore- processing sites; discharge from electronics, glass and drug factories	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

Volatile Organic Contaminants

Benzene (ppb)	9/17/12 0.50	5	0	NO	Discharge from factories; leaching from gas storage tanks and landfills	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
1,2-Dichloroethane (ppb)	9/17/12 0.50	5	0	NO	Discharge from industrial chemical factories	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
1,2-Dichloropropane (ppb)	9/17/12 0.50	5	0	NO	Discharge from industrial chemical factories	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Haloacetic Acids (HAA) (ppb)	17 to 50 Avg. value =29	60	N/A	NO	By-product of drinking water disinfection	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene (ppb)	9/17/12	100	100	NO	Discharge from rubber and plastic factories; leaching from landfills	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
1,2,4-Trichlorobenzene (ppb)	9/17/12 0.50	70	70	NO	Discharge from textile-finishing factories	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

1,1,2-Trichloroethane (ppb)	9/17/12	5	3	NO	Discharge from industrial chemical factories	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
Total Trihalomethanes (TTHM) (Bromodichloromethane Bromoform Dibromomethane Chloroform) (ppb)	27 to 63 Avg. value = 44	100/80	N/A	NO	By-product of drinking water chlorination	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Vinyl Chloride (ppb)	9/17/12 0.50	2	0	NO	Leaching from PVC piping; discharge from plastic factories	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (total contaminants listed below) M/P-Xylenes O-Xylene (ppm)	9/17/12 0.50	10	10	NO	Discharge from petroleum factories; discharge from chemical factories	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

Description of Drinking Water Contaminants:

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. Contaminants 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, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water 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 storm water runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The United States Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Radon: Radon is a radioactive gas that you can't see, taste or smell. It can move up through the ground and into a home through cracks and holes in the foundation. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. It is a known human carcinogen. Breathing radon can lead to lung cancer. Drinking water containing radon may cause an increased risk of stomach cancer. Presently the EPA is reviewing a standard for radon in water.

Lead: 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. This water system is responsible for high quality drinking water, but can not control the variety of materials used in your plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing cold water your tap for at least 30 seconds before using water for drinking or cooking. Do not use hot water for drinking and 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 <http://www.epa.gov/safewater/lead>.

Source Water Assessment Summary:

The NH Department of Environmental Services has prepared a Source Water Assessment Report for the source(s) serving this community water system, assessing the sources' vulnerability to contamination. The results of the assessment, prepared on 9/26/0, are as follows:

The Ammonoosuc River Raw source, received 0 (zero) high susceptibility ratings, 0 (zero) medium susceptibility ratings, and 11 (eleven) low susceptibility ratings. The Brown Farm Well received 3 (three) high susceptibility ratings, 2 (two) medium susceptibility ratings, and 7 (seven) low susceptibility ratings.

The complete Assessment Report is available for review at Berlin Water Works office. For more information call (603) 752-1677 or visit NH Department of Environmental Services Drinking Water & Groundwater Bureau web site at <http://des.nh.gov/organization/divisions/water/dwgb/dwspp/dwsap.htm>