Presented By

Town of Ipswich Water Department

ANNUAL WATER QUALITY REPORT

Water Testing Performed in 2016

PWS ID#: 3144000

We've Come a Long Way

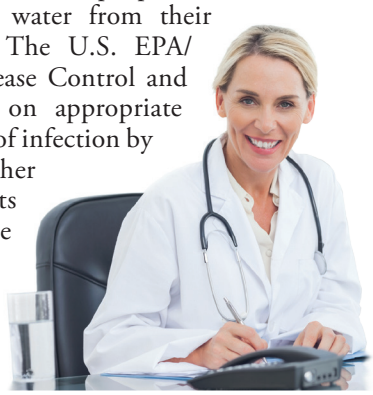
Once again we are proud to present our annual water quality report covering the period between January 1 and December 31, 2016. In a matter of only a few decades, drinking water has become exponentially safer and more reliable than at any other point in human history. Our exceptional staff continues to work hard every day—at any hour—to deliver the highest quality drinking water without interruption. Although the challenges ahead are many, we feel that by relentlessly investing in customer outreach and education, new treatment technologies, system upgrades, and training, the payoff will be reliable, high-quality tap water delivered to you and your family.

Community Participation

You are invited to participate in our public forum and voice your concerns about your drinking water and water supply. Water Subcommittee meetings are held periodically during the year. Please contact Victoria Halmen, W & WW Director, at (978) 356-6635, ext. 2108, for dates and times of the meetings. Water issues, including projects and upgrades, are also presented at Town Meetings in May and October, each year.

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.



Substances That Could Be in Water

To ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) 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 and, in some cases, radioactive material, and can pick up 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 which 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.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Water Treatment Process

The surface water treatment process consists of a series of steps. First, the water in Dow Reservoir is circulated and aerated with two solar-powered mixers, which start the oxidation process to remove high organic, iron and manganese levels that are present in the water, as well as BG Algae. The water then goes to the headworks of the WTP, where chlorine dioxide, chlorine, and sodium hydroxide (seasonally) are added to complete the oxidation process, provide initial disinfection, and raise alkalinity. During the next step, polyaluminum chloride is added in our rapid mixers. This addition causes small particles (called floc) to adhere to one another during the mixing process, making them heavy enough to settle into a basin from which this sediment is removed. After settling, the water is filtered through four feet of fine coal (granular-activated carbon). As smaller, suspended particles (called turbidity) are removed, the turbidity disappears and clear water overflows into our holding clearwell.

As the water collects in the clearwell, chlorine is added again as a precaution against any bacteria that may still be present. (We carefully monitor the amount of chlorine, 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 into the distribution system and water standpipes, and finally into your home, school, or business.

The treatment process of our ground water wells basically consists of the addition of chlorine (a precaution against bacteria), fluoride (used to prevent tooth decay), and a corrosion inhibitor (used to protect distribution system pipes). Although our ground water meets or exceeds all State and Federal Drinking Water quality standards, our ground water sources contain higher levels of minerals (i.e., iron, manganese, and calcium), which are not able to be removed by our ground water treatment.

Source Water Assessment

All of the sources in Ipswich have a "high" susceptibility to contamination due to the absence of hydrological barriers (i.e., a confining clay layer), which can prevent migration of contamination into the water system. A sources susceptibility to contamination, however, does not imply poor water quality.

In brief, Zone II contains potential sources of contamination, which, if present, could migrate and reach our source water. In Ipswich, Zone II is primarily a mixture of forests, agriculture, and residential land.

The State commends the Town's pursuit of purchasing land within the watershed areas, and on receiving a source protection grant through the DEP to develop a comprehensive surface water supply protection plan.

The complete Source Water Assessment Program (SWAP) report is available at the Utilities Department or online at www.mass.gov/eea/docs/dep/water/drinking/swap/nero/3144000.pdf.

Where Does My Water Come From?

The Town of Ipswich Water Treatment Plant draws water from Dow Reservoir and Bull Brook Reservoir, both located in the Parker River Watershed. The Town also draws water from five ground water sources to augment this supply: Mile Lane and Browns Wells (Parker River Watershed) and Essex Road, Fellows Road and Winthrop Estate Wells (Ipswich River Watershed). The Town makes every effort to monitor pumping and minimize withdrawals from the wells in the Ipswich River Watershed because of its fragile ecosystem.

Questions?

For more information about this report, or for any questions relating to your drinking water, please contact Victoria Halmen, W & WW Director, at (978) 356-6635, ext. 2108, or Joseph F. Ciccotelli, Water Superintendent, at (978) 356-6639.

The Benefits of Fluoridation

Fluoride is a naturally occurring element in many water supplies in trace amounts. In our system, the fluoride level is adjusted to an optimal level averaging 0.7 part per million (ppm) to improve oral health in children. At this level, it is safe, odorless, colorless, and tasteless. Our water system has been providing this treatment since 1971. There are more than 3.9 million people in 140 Massachusetts water systems and more than 184 million people in the United States who receive the health and economic benefits of fluoridation.

Managing Manganese Levels

Manganese is a naturally occurring mineral found in rocks, soil and ground water, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but can have undesirable effects on certain sensitive populations at elevated concentrations. The EPA and MassDEP have set an aesthetic-based Secondary Maximum Contaminant Level (SMCL) for manganese of 50 parts per billion (ppb), and health advisory levels. In addition, EPA and MassDEP have also established public health advisory levels. Drinking water may naturally have manganese and, when concentrations are greater than 50 ppb, the water may be discolored and taste bad. Over a lifetime, U.S. EPA recommends that people drink water with manganese levels less than 300 ppb and over the short term, U.S. EPA recommends that people limit their consumption of water with levels over 1000 ppb, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water with manganese concentrations over 300 ppb, nor should formula for infants be made with that water for longer than 10 days. See: http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_ccl_manganese_dwreport.pdf.

The Water Department continues to work with MassDEP, the Ipswich Health Director, the Massachusetts Department of Public Health (DPH), and its water quality consultant as we make every effort to reduce the manganese concentration within the distribution system.

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. 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/lead.

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; we feel it is important that you know exactly what, and how much, was detected.

The sample schedule also requires us to monitor for certain substances less often than once per year because the concentrations of those 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.

We participated in the 3rd stage of the EPA's Unregulated Contaminant Monitoring Rule (UCMR3) program by performing additional tests on our drinking water. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if EPA needs to introduce new regulatory standards to improve drinking water quality. Contact us for more information on this program.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2014	15	0	0.7	0.3–1.0	No	Erosion of natural deposits
Arsenic (ppb)	2015	10	0	2.5	2.0–3.0	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2016	2	2	0.012	0.011–0.013	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine Dioxide (ppb)	2016	[800]	[800]	180	130–280	No	Water additive used to control microbes
Chlorine (ppm)	2016	[4]	[4]	0.67	0.25–0.93	No	Water additive used to control microbes
Chlorite (ppm)	2016	1	0.8	0.23	0.03–0.61	No	By-product of drinking water disinfection
Fluoride (ppm)	2016	4	4	0.93	0.70–1.30	No	Water additive which promotes strong teeth
Haloacetic Acids [HAA] (ppb)	2016	60	NA	9.7	1.5–18.1	No	By-product of drinking water disinfection
Nitrate (ppm)	2016	10	10	1.19	0.25–4.4	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2016	2	NA	0.120	ND–0.283	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives.
TTHMs [Total Trihalomethanes] (ppb)	2016	80	NA	34.7	7.9–46.9	No	By-product of drinking water disinfection
Tetrachloroethylene (ppb)	2016	5	0	0.9	0.7–1.3	No	Discharge from factories and dry cleaners
Total Organic Carbon (ppm)	2016	TT	NA	1.18	0.35–2.31	No	Naturally present in the environment
Turbidity[1] (NTU)	2016	TT	NA	0.26	0.04–0.26	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2016	TT = 95% of samples meet the limit	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)	2016	1.3	1.3	0.597	0/60	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2016	15	0	9	0/60	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	76	33–120	No	Runoff/leaching from natural deposits
Color (Units)	2016	15	NA	5	1–10	No	Naturally occurring organic materials
Iron (ppb)	2016	300	NA	29	10–410	No	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2016	50	NA	34	10–908	No	Leaching from natural deposits
pH (Units)	2016	6.5-8.5	NA	7.3	6.4–7.9	No	Naturally occurring
Total Dissolved Solids [TDS] (ppm)	2016	500	NA	290	190–440	No	Runoff/leaching from natural deposits

UNREGULATED CONTAMINANT MONITORING RULE - PART 3 (UCMR3) [2]

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Chlorate (ppb)	2015	190	160–220	By product of drinking water disinfection; Agricultural defoliant
Chromium-6 (ppb)	2015	0.03	ND–0.07	Naturally occurring elements; Used in making steel and other alloys; Used for chrome plating, dyes and pigments, leather tanning, and wood preservation
Molybdenum (ppb)	2015	1.45	1.3–1.6	Naturally occurring element found in ores and present in plants, animals, and bacteria; Used as a chemical reagent
Strontium (ppb)	2015	61	58–63	Naturally occurring element; Used in the production of cathode-ray tube televisions
Vanadium (ppb)	2015	0.10	ND–0.20	Naturally occurring elemental metal; Used as a chemical intermediate and a catalyst

OTHER SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Hardness (ppm)	2016	55	32 - 73	Naturally present in the environment
Phosphate (ppm)	2016	0.70	0.50 - 0.84	Water additive used to control corrosion
Potassium (ppm)	2016	2.6	1.5 - 3.8	Naturally occurring element
Sodium (ppm)	2016	44	19 - 69	Naturally occurring element

[1] 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.

[2] Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist U.S. EPA in determining their occurrence in drinking water and whether future regulation is warranted.

Definitions

90th Percentile: Out of every 10 homes sampled, 9 were at or below this level.

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

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 the highest 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

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).

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.