TOWN OF BELLINGHAM

DEPARTMENT OF PUBLIC WORKS

Public Water System ID# 2025000

DRINKING WATER QUALITY AND CONSUMER INFORMATION REPORT
CALENDAR YEAR 2020

We are utilizing the electronic distribution method. This allows us to compile a much more thorough report at a lower cost to our customers.

Introduction

This is the annual water quality report card that we prepare and make available to our customers and the public. It contains information about the Bellingham water supply system and important information about the quality of the drinking water we distribute to our customers. If you read it each year, THANK YOU.

I suggest that everyone read the entire report, but if pressed for time, I hope you will at least scan the 2020 Water Quality Summary, which begins on Page 5. It details the results of our most recent water quality analysis.

The Town of Bellingham Department of Public Works (DPW) is committed to providing our customers with high-quality drinking water that meets or surpasses state and federal standards for quality and safety. We annually perform thousands of dollars' worth of water quality tests to ensure that we provide a sufficient quantity of safe drinking water to our customers.

Bellingham water is safe to drink. That is a task the Bellingham DPW must perform as a public water supplier under the Federal Safe Drinking Water Act. We are pleased to compile this annual report that summarizes the 2020 calendar year water quality testing and hope it reassures our customers of the safety of our tap water.

We supply it to about 5,800 homes and businesses through one hundred miles of pipes at a price that is 375 times lower than bottled water. All the water we pump into the distribution system must meet the strict drinking water safety guidelines.

If you want to know more about the Bellingham water supply system, have any questions about the report, or would be interested in volunteering to help with our water education programs, please call Donald DiMartino, Director of the Bellingham Department of Public Works, at 508-966-5813. The DPW office is located at 26 Blackstone Street, beside the Fire Station.

Our customers are also encouraged to participate in discussions about the water system and water quality issues by attending meetings of the Selectboard, which are usually held the first and third Mondays of each month at 7:00 PM in the municipal center. Meeting agenda items, minutes, and special workshops regarding the water system are posted on the town website.

Where does Bellingham get its drinking water and is it treated?

The Town of Bellingham's drinking water supply system includes sixteen groundwater wells, eight pumping stations, three storage tanks, approximately one hundred miles of water main, and sixty miles of water service pipes.

Twelve wells, which are controlled by four pumping stations, are located in the southern part of Town; they draw water from the Blackstone River basin's underground aquifer *(Active Wells Source ID's: 02G, 04G, 11G, 14G, 15G, 17G, 18G, 20G, 21G, & 22G – Inactive Wells Source ID's:03G, &13G)*. The Wrentham Road Filtration Plant treats water from these Blackstone River basin wells.

Four wells, each operated by its own pumping station, are located in the northern part of Town; they draw water from the Charles River basin's underground aquifer *(Active Wells Source ID's:05G, 08G, 12G, & 23G)*. The Hartford Ave Filtration Plant treats water from these Charles River basin wells.

The Hartford Ave and Wrentham Road Filtration plants are primarily designed to remove iron and manganese. Iron & Manganese is removed by oxidation and filtration. Oxidation is accomplished by adding oxidizing chemicals to the water. Oxidation causes the dissolved iron and manganese in our raw water to form into tiny particles which the filters can remove. At the Hartford Ave plant we oxidize with chlorine and potassium permanganate and use alum as a coagulant to enhance filtration and help remove organics. At Wrentham Road we only need to add Chlorine. Once particles have formed, the water passes through special filters specifically designed to capture iron and manganese particles. We have four filters at Wrentham Road and six at Hartford Ave. Each filter is backwashed on a routine schedule to clean and regenerate the filters. At both plants we also add caustic soda to increase the pH to enhance oxidation process.

Chlorine is vital to ensure proper oxidation to optimize filtration, but it is also a disinfectant. The water we discharge from the plants must have a residual chorine level that is established by regulation. The chlorine disinfectant provides protection against bacterial contamination in our drinking water distribution system.

The caustic soda is not only used to enhance oxidation. It is a critical chemical used to help us meet another regulatory requirement. Caustic soda increases the pH which controls corrosion in internal plumbing thereby reducing the lead and copper exposure for our drinking water customers.

The DPW has detailed maps showing these facilities. Anyone who would like to see a map or obtain a copy should contact the DPW.

Here is a simplified explanation of how water comes out of your tap. We pump water from wells to a treatment facility via raw water transmission mains. Once treated the water is pumped to our pipe network called the distribution system. Our standpipes are part of the distribution system and vital to allow us to maintain pressure in the system even when all pumps are off. Standpipes also play a key role in providing the high volume of water needed to fight fires. The pumps at our treatment facilities run when needed to keep our standpipes at a level that maintains pressure in the distribution system. The pressurized system allows water to come out of your tap when you turn it on and provide pressure and volume at our hydrants for firefighting.

What measures are taken to ensure that our water sources are protected?

In 2002, the Massachusetts Department of Environmental Protection (MassDEP) issued a draft of our Source Water Assessment and Protection (SWAP) Report. The SWAP program was established under the Federal Safe Drinking Water Act and it requires that every state inventory land uses within the recharge areas of all public water supply sources, assess the susceptibility of drinking water sources to be contaminated from these uses, and publicize the results to provide support for improved protection.

Some of the land uses that exist within our recharge areas include: auto body & repair shops, salvage yards, an old landfill, railroad tracks, hazardous material storage, industries and industrial parks, large quantity hazardous waste generators, and underground storage tanks. There are others but these are considered the highest threats.

A hard copy of our SWAP report is available upon request from the DPW (508-966-5813) or online at www.bellinghamma.org/Pages/BellinghamMA_DPW/swap.pdf. The report notes that all of our sources have a high susceptibility of future contamination. Unfortunately, MassDEP has not had the funding to update the report and some of the information is not current; however, it still contains a wealth of information about our source waters and potential risks to its quality.

It is impossible to eliminate all threats from past and present land use, but we have established protective land use restrictions that dramatically reduce our exposure to certain contaminants. We are well equipped to prevent future land uses that could further increase our susceptibility to aquifer contamination. Our key regulations include Board of Health Floor Drain Regulations, Water Resource Protection Bylaws, and the Water Resource District Zoning Map. The Bylaws, Ordinances, and Maps are available online at the Town's Website www.bellinghamma.org.

Our Zone II drinking water well recharge areas extend into Medway, Franklin, Milford, and Wrentham and are all protected by local bylaws except in Milford. We have requested the Town of Milford consider adding our Zone II to their water protection district. To date our Zone II areas within the borders of the Town of Milford do not have bylaw or zoning protection. The Zone II area of a few Blackstone and Franklin wells extend into Bellingham. The Blackstone and Franklin Zone II areas are covered by our Water Resource District Map and protective bylaws and regulations

Is our drinking water pure?

No. Pure water would be only hydrogen and oxygen, the compound H_2O. Drinking water can be expected to contain small amounts of some contaminants. This is also true for bottled water you may purchase. The presence of contaminants does not necessarily indicate that water poses a health risk. Sources of drinking water (tap water and bottled water) include rivers, lakes, reservoirs, streams, springs, and wells. As water travels over land or through the ground, it dissolves naturally occurring minerals and radioactive materials, and can be polluted by animal and human activity. More information on contaminants and potential health effects can be obtained by calling the US Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791) or on their website.

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 stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, and 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 can also come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants** -which can be naturally occurring or can be the result of oil and gas production and mining activities.

If our water is not pure, what is in it?

The answer to this question is the main purpose of this report. On Pages 5 and 6, you will see a section titled **The 2020 Water Quality Summary**. It provides the complete list of the contaminants detected in the water we provided to our customers in 2020. The list contains only the contaminants that were detected at levels above the "detection limit," which is the lowest concentration of a substance that today's laboratory technology can detect. We collected 976 water samples in 2020. Those samples were analyzed by Massachusetts-certified water testing laboratories for 100 various contaminants. The Water Quality Summary also reports detections of contaminants that we were not required to monitor for in 2020 but were detected during the most recent sampling round within the last five years. The date of sample collection is noted on the table. The frequency of monitoring is determined by regulation and MassDEP.

The contaminants on our MassDEP sampling schedule include total coliform bacteria, free chlorine residual, inorganic contaminants (IOCs), total trihalomethanes (TTHM), haloacetic acids (HAA5), total organic carbon (TOCs), radionuclides, nitrate, tetrachloroethylene (PCE), volatile organic compounds (VOCs), iron, manganese, arsenic, sodium, perchlorate, gross alpha, asbestos, atrazine, nitrite, radium 226 & 228, synthetic organic compounds (SOCs), and, per and polyfluoroalkyl substances (PFAS)

We performed Microscopic Particular Analysis (MPA) tests in the past at the request of MassDEP. MPA testing is done to verify that the water from our groundwater wells is not under the influence of surface water. All tests showed that our well water is not influenced by nearby surface water. This means the soils in our aquifers are acting as a good natural filter, which is common in New England.

There are allowable or safe levels of contaminants in water. How are these levels determined?

To ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) prescribes regulations and the Massachusetts Department of Environmental Protection (MassDEP) administers regulations that limit the amounts of certain contaminants allowed in water provided to public water systems customers. The USEPA sets Maximum Contamination Levels, Maximum Contamination Level Goals, Action Levels, and defines allowable testing procedures for over one hundred and sixty water contaminants. Food and Drug Administration (FDA) and Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water that provide the same protection for public health.

The USEPA and MassDEP are continuously studying contaminants that may be found in drinking water. Monitoring for new contaminants is proposed whenever a potential health risk is identified and when technology is available to yield reliable analytical results. The USEPA Unregulated Contaminant Monitoring Rule (UCMR) program is part of this effort. Bellingham has participated in this program over the last several years. We participated in UCMR4 sampling and analysis in 2020. Unregulated contaminants are those that do not yet have a drinking water standard set by the USEPA. The purpose of monitoring for these contaminants is to help USEPA decide whether the contaminants should have a standard. UCMR results are noted in this report on page 7.

Unregulated Contaminant Monitoring Rule Public Notification
Important Information about Your Drinking Water
Availability of Monitoring Data for Bellingham DPW

As required by US Environmental Protection Agency (EPA), our water system has sampled for a series of unregulated contaminants. Unregulated contaminants are those that don't yet have a drinking water standard set by EPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a public health protection standard.

What should I do?
You do not have to do anything but as our customers you have a right to know that these data are available.

You may share this information with other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, food establishments, medical facilities, and businesses).

For more information
For additional information on your water and the unregulated contaminants we sampled for, see your water department's Consumer Confidence Report (CCR), or called a water quality report, delivered by your water department by July 1 of each year. If you have any questions about your CCR, see the contact information below for your water department.

For information on the Unregulated Contaminant Monitoring Program, visit the MassDEP website (http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html) and navigate to Unregulated Contaminant Monitoring Program.

If you want to speak with someone at the water department about the results, please contact Don DiMartino at 508-966-5813 or 26 Blackstone Street, Bellingham, MA 02019-1505.

This notice is being sent to you by Bellingham DPW - PWS ID# 2025000 Date distributed: 6/30/2021

Recent studies show Per-and Polyfluoroalkyl Substances (PFAS) are causing a health risk. Thousands of products we all use daily contain PFAS compounds. They have been used in products since the 1950's. In the fall of 2020 MassDEP promulgated new regulations that establish a contamination limit, sampling procedures and public notification requirements for PFAS in drinking water. The USEPA had not set a standard for PFAS but is working towards drafting national regulations. Several other states are working on PFAS guidelines or regulations. Although not required by the regulation in 2020, we performed quite a lot of costly PFAS analysis. Our results have come back below the Massachusetts regulatory limit; however, we discovered some of sources supplying our Hartford Avenue WTF have levels of PFAS6 above the MCL. We have been blending the water as a treatment technique to reduce the levels below the MCL, and although our plant effluent results are below the limit, we are looking to move forward with projects to determine what it will cost to add PFAS removal to our treatment process.

This first step is called a Pilot Study. It will include performing small scale treatment and filtering to tests to determine the best means for us to remove PFAS. We requested a grant funding from MassDEP late in 2020 for the Pilot Study. We received word in early 2021 that our grant application was denied. Other communities are in much worse shape and needed the funding. Our next step will be to fund the Pilot Study ourselves, while pursuing grants if the opportunity arises. We plan to request funding for the Pilot Study at the Fall Town Meeting.

Regulations require that we include the following IMPORTANT paragraph:

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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 some infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control and Prevention (CDC) guidelines on lowering the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Below are some important definitions and abbreviations that will help you understand the 2020 Water Quality Summary that appears on the following pages.

- **MCL – Maximum Contamination Level**: The highest level of a contaminant in drinking water. MCLs are set as close to the MCLGs (see below) as feasible using the best available treatment technology.
- **MCLG – Maximum Contamination 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.
- **Action Level**: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
- **90th Percentile**: Out of every 10 homes sampled, 9 were at or below this level. This number is compared to the action level to determine lead and copper compliance.
- **ppm** is the abbreviation for parts per million. Parts per million is the same as milligrams per liter (mg/L) which is the scientific unit of measure for most contaminants.
- **ppb** is the abbreviation for parts per billion. A part per billion is the same as micrograms per liter (ug/L) which is the scientific unit of measure for some contaminants.
- **ppt is the abbreviation for parts per trillion.** A part per trillion is the same as nanograms per liter (ng/L) which is the scientific unit of measure for some contaminants.
- **pCi/L** is the abbreviation for picocuries per liter (a measure of radioactivity)
- **Highest RAA**: Highest running annual average of four consecutive quarters
- **Monthly %** is the percent of a month's system samples that indicate a presence of Total Coliform Bacteria.
- **MRDL - Maximum Residual Disinfectant Level:** MRDL is the highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **MRDLG** is the abbreviation for Maximum Residual Disinfectant Level Goal. MRDLG is the level of drinking water disinfectant below, which there is no known or expected risk to health. MRDLGs do not reflect the benefit of the use of disinfectants to control microbial contaminants.
- **SMCL – Secondary Maximum Contaminant Level:** These standards are developed to protect the aesthetic qualities of drinking water and are not health based.
- **ORSG – Mass Office of Research and Standards Guideline:** This is the concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.
- **Unregulated Contaminants:** Unregulated contaminants are those contaminants for which the USEPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist the USEPA in determining their occurrence in drinking water and whether future regulation is warranted. UCMR3 contaminants were sampled as part of the third cycle of the Unregulated Contaminant Monitoring Rule in 2015.
- **Level 1 Assessment:** A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
- **Level 2 Assessment:** A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

Bacteria Information

Each month we collect at least 40 tap water samples and test for total coliform bacteria as required by the Revised Total Coliform Rule. We also collect and test raw water samples from all active wells and the treated water at the filtration plants. All samples that show the presence of total coliform bacteria are automatically tested for possibly harmful E. coli, a fecal indicator.

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms in two samples in 2020; both samples tested negative for E Coli bacteria. Immediate confirmatory tests came back absents of any bacteria.

The 2020 Water Quality Summary

The water quality information presented in the following tables is from 2020 or from the most recent round of testing done in accordance with the regulations. Only the detected contaminants are shown.

Regulated Contaminant (Unit of Measurement)	*Date(s) Collected*	Highest Result or Highest RAA	*Range Detected*	*MCL or MRDL*	*MCLG or MRDLG*	*Violation (Y/N)*	*Possible Sources of Contamination*
Inorganic Contaminants							
Nitrate (ppm)	May 2020	1.20	0.33 – 1.20	10	10	*N*	*Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits*
Barium (ppm)	June 2018	0.059	0.022 – 0.059	2	2	*N*	*Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits*
Perchlorate(ppb)	September 2020	0.21	0.11-0.21	2.0	2.0	*N*	*Rocket propellants, fireworks, munitions, flares, blasting agents*
Radioactive Contaminants							
Radium 226 & 228 (pCi/L) (combined values)	Quarterly 2020	1.67	0.81 – 1.67	5	0	*N*	*Erosion of natural deposits*
Gross Alpha Activity	Quarterly 2020	3.6	0.0 – 3.6	15	0	*N*	*Erosion of natural deposits*
Disinfectants and Disinfection By-Products							
Total Trihalomethanes (TTHMs) (ppb)	Quarterly	58	10-90	80	-----	*N*	*Byproduct of drinking water chlorination*
Haloacetic Acids (HAA5) (ppb)	Quarterly	44	0-69	60	-----	*N*	*Byproduct of drinking water disinfection*
Chlorine (ppm) (free)	40 per Month	2.20	0-2.80	4.00	4.00	*N*	*Water additive used to control microbes*

Per- and polyfluoroalkyl substances (PFAS)						
Regulated Contaminant (Unit of Measurement)	*Date(s) Collected*	Result	*Range Detected*	*MCL or MRDL*	*Violation (Y/N)*	*Possible Sources of Contamination*
PFAS6 (ppt) (Total of PFOS, PFOA, PFHxS, PFNA, PFHpA, and PFDA)	October 2020	18	0-18	20	*N0*	Discharges and emissions from industrial and manufacturing sources associated with the production or use of these PFAS, including production of moisture and oil resistant coatings on fabrics and other materials. Additional sources include the use and disposal of products containing these PFAS, such as fire-fighting foams.

Info on PFAS6: Some people who drink water containing these PFAS in excess of the MCL may experience certain adverse effects. These could include effects on the liver, blood, immune system, thyroid, and fetal development. These PFAS may also elevate the risk of certain cancers.

PFAS6 was regulated on October 2, 2020. These results are from October 2 through December 31, 2020. Any detects before that time will be reported in the unregulated table on Page 7.

Unregulated (UCMR) and Secondary Contaminants

Unregulated Contaminant (Unit of Measurement)	Date(s) Collected	Range of Results Detected	Average Detected	SMCL	ORSG or USEPA Health Advisory	Possible Source
Sodium (ppm) (1)	June 2018	49.1-105	77.05	----	20	Discharge from the use and improper storage of sodium containing de-icing compounds or in water softening agents.
Manganese (ppb) (2)	Quarterly 2020	0-22	6.54	50	300-1000 (3)	Natural sources as well as discharges from industrial uses
Chlorate (ppb) (3)	Nov 2016	86-190	154	---	210	Agricultural defoliant; desiccant; disinfection by-product and used in the production of chlorine dioxide.
Total Haloacetic Acid (HAA5) (ppb) (4)	Feb& Aug 2020	9-64	27	1000	60	*Byproduct of drinking water disinfection*
Total Haloacetic Acid (HAA6Br) (ppb) (4)	Feb& Aug 2020	5-22	12	---	---	*Byproduct of drinking water disinfection*
Total Haloacetic Acid (HAA9) (ppb) (4)	Feb& Aug 2020	15-85	38	---	---	*Byproduct of drinking water disinfection*

(1) **About Sodium:** Some people who drink water containing sodium at high concentrations for many years could experience an increase in blood pressure.

(2) **About Manganese:**
   a. Use of water containing manganese at concentrations above the SMCL may result in aesthetic issues including the staining of laundry and plumbing fixtures and water with unpleasant bitter metallic, taste, odor, and/or black-brown color.
   b. USEPA has established a lifetime Health Advisory of 300 ppb and an acute Health Advisory for 1000 ppb.

(3) **About Chlorate:** People exposed to high concentrations of chlorate in drinking water could experience effects on the thyroid, blood and kidneys. Because it inhibits thyroid iodide uptake, people deficient in dietary iodide are most at risk of chlorate's thyroid effects, which in turn could impact fetal and neonatal development

(4) **About Total Haloacetic Acid (HAA5 / HAA6Br / HAA9):** Some people who drink water containing HAA5 at high concentrations above the MCL for many years could experience effects on the liver as well as an increased risk of cancer.

Unregulated Contaminant (Unit of Measurement) PFAS	Range of Results Detected	Average Detected	ORSG	Possible Sources	Health Effects
Perfluorobutanesulfonic Acid – PFBS (ppt)	0 - 3	1.8	XX		
Perfluorohexanoic Acid – PFHxA (ppt)	0 - 3	2.1	XX		

January through to October 1, 2020 detections of PFAS6 contaminants (before regulation was promulgated): In January 2020, MassDEP updated its PFAS6 Office of Research and Standards Guideline (ORSG) to 20 ng/L and in October 2020 the MCL was adopted.

PFAS6	0 - 18	10.7	20	Discharges and emissions from industrial and manufacturing sources associated with the production or use of these PFAS, including production of moisture and oil resistant coatings on fabrics and other materials. Additional sources include the use and disposal of products containing these PFAS, such as firefighting foams.	Some people who drink water containing these PFAS in excess of the ORSG may experience certain adverse effects. These could include effects on the liver, blood, immune system, thyroid, and fetal development. These PFAS may also elevate the risk of certain cancers.
Perfluorohexansulfonic Acid – PFHxS (ppt)	0 - 4	2.8	20		
Perfluoroheptanoic Acid – PFHpA (ppt)	0 - 2	0.2	20		
Perfluorooctanoic Acid – PFOA (ppt)	0 – 5	3.2	20		
Perfluorooctanesulfonic Acid – PFOS (ppt)	0 – 7	4.9	20		

Lead and Copper Information

	Date Collected	90th Percentile	Action Level (AL)	MCLG	Number of Samples	Number of Samples Above AL	Exceeded AL (Y/N)	Possible Source of Contamination
Lead (ppb)	2018	5.6	15	0	34	1	N	Corrosion of household plumbing
Copper (ppm)	2018	0.52	1.3	1.3	34	0	N	Corrosion of household 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. The Bellingham DPW is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When water has been sitting for several hours, you can minimize the potential 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.

Why doesn't tap water taste better?

To meet the extensive safe drinking water quality standards, most public water suppliers must add treatment chemicals to their source water. We add: sodium hydroxide to adjust the pH (acidity) of the water for corrosion control, potassium permanganate for iron and manganese removal and alum for filtration enhancement. We also add chlorine for disinfection. We must add enough chlorine at the filtration plants to maintain good disinfectant residuals at the outskirts of the system. These chemicals work very well to make tap water safe, but they can affect the water's taste and odor.

Bellingham's water is safe to drink and it's also economical. The average cost for a gallon of bottled water from a store is $1.50 and the average cost for a gallon of safe tap water is $0.005. That means bottled water costs 375 times more than the safe water coming from your tap. If you want to remove the chlorine odor, there are several products on the market that provide point of use filtering. Filtering systems with a charcoal element are very reliable at removing chlorine odor. Be aware that any filtering system must be maintained in order to work properly. Filters must be replaced at recommended intervals or risk being breeding grounds for bacteria.

How can drinking water become contaminated in the distribution system?

1. Stagnation & Discoloration

Water can deteriorate in the pipes before it gets to the tap. To avoid this, we routinely perform hydrant flushing, which cleans out any water that may be stagnating in the piping system and removes iron and manganese particles that coat the walls of water pipes. Iron and manganese can cause water discoloration. Our filtration plants provide water with greatly reduced levels of iron and manganese. The flushing along with the treatment plants operations has reduced our dirty water problem and complaints significantly.

We have also completed a few dead-end water main elimination projects. We have connected dead ends and reduce the likelihood of stagnation as well as provided redundancy and improved firefighting capabilities.

2. Corrosion (Lead and Copper)

Tap water can have high levels of lead and copper due to corrosion of building's internal plumbing pipes and fixtures. The regulations, known as the Lead and Copper Rule (LCR), require that we test samples from residential customer's water taps. This testing is performed to confirm our ability to control internal pipe and plumbing corrosion. The LCR is different from other USEPA drinking water regulations in that it uses an Action Level for the contaminant as opposed to a Maximum Contamination Limit. The way the LCR works is the Town must take residential first draw tap water samples from a specific list of homes that are the most likely to yield the highest lead and copper levels. The results are tabulated and the 90th percentile is compared with the Action Level. If the result is below the Action Level, no additional action is needed. If the result is above the Action Level, additional action is required to reduce the customers' exposure to these contaminants.

In the early 1990s, when the LCR took effect, we were exceeding the Action Level. In 1996 we constructed corrosion control facilities to feed sodium hydroxide (caustic soda) and balance the pH of the water and address the problem. Our results have been below the Action Level ever since. We continue to feed caustic soda at our two filtration plants which have replaced our corrosion control facilities. Since the mid 1990's we have controlled the corrosion by adjusting the pH and thereby kept our customer's exposure to lead and copper in drinking water well below acceptable levels.

Modifications to the plumbing code have reduced the amount of lead allowed in any plumbing fixture; however, these changes are relatively new. Older buildings plumbing fixtures are likely to contain lead. Drinking water regulations and plumbing code modifications have made significant advances in the reduction of Americans' exposure to lead in their drinking water.

Lead in school's drinking water has been a hot topic, mostly due to a significant break down of systems that occurred a few years back in Flint, Michigan. The Bellingham School Department has done extensive testing required by the State to ensure that our students are not being exposed to elevated lead levels.

3. Cross Connections - Backflow

The drinking water supply system can be contaminated if water from a customer's building flows back into the water supply system. This can occur if the water main pressure drops and the interior building plumbing is not properly installed or protected. Backflow occurs through a building's plumbing via a cross connections, which is a connection between a drinking water pipe and a non-potable source. Pollution can come from your own home. For instance, if you hook up a hose to a fertilizer sprayer and the water pressure drops suddenly (such as from a water main break or hydrant use in your area) the fertilizer may be sucked back into you water pipes through the hose.

While the potential for backflow through a cross connection seems remote, the consequences can be severe. Cross connection backflow has the greatest potential for contaminating YOUR water to the degree it can cause immediate illness or death. Imagine taking a drink of water that is laced with pesticides, lawn chemicals, or pool chemicals.

Some things you should do to prevent backflow at your home:

- The Bellingham DPW recommends the installation of backflow prevention devices, such as a low-cost hose bib vacuum breaker for all inside and outside hose connections (see the drawing on the next page). You can purchase this at a hardware store or plumbing supply store. This is a great way for you to help protect the water in your home as well as the drinking water system in our town.
- Never submerge a hose in soapy water buckets, swimming pools, sinks, drains, or chemicals.
- If you have an irrigation system that is connected to your drinking water supply, make sure it is protected with a backflow prevention device. Irrigation professionals know the requirements. Do it yourselfers need to be aware of the equipment needed to protect themselves from risk of contamination to drinking water from irrigation systems. The irrigation backflow prevention devices need to be tested annually to make sure they are providing the protection that is expected and required. Please contact the DPW office for more information and to be added to our annual reminder list.
- For additional information on cross connections and our cross-connection program, please contact the DPW and ask for the Cross Connection Control Program Coordinator.

Hose Bid Vacuum Breaker (Backflow Preventer)

To avoid backflow at non-residential properties and irrigation systems, the DPW administers the Cross-Connection Control Program. Under this program, commercial properties, and irrigation systems are routinely surveyed to be sure that special protective check valves are installed and maintained. The Cross-Connection Control Program and the Plumbing Code help to ensure that the risk from this form of system contamination is minimized or eliminated.

Is our drinking water system prepared for a crisis?

The Bellingham DPW is well prepared to handle most emergencies, from natural disasters and power outages to terrorist attacks and pandemics.

Our system has many sources, two filtration plants, and some auxiliary power capabilities, which makes it hard to knock us out completely. We have studied our system's vulnerable points and routinely discuss water system security at the Bellingham Emergency Planning Committee (BEPC) meetings. The BEPC holds table top exercises to test and critique our preparedness.

We also subscribed to an emergency phone call system. The "CODE RED" system can call every Bellingham phone number and deliver a specialized warning to all of our customers in minutes. If a health hazard ever occurs, the DPW will utilize this system and every other practicable means to notify and protect our customers. We used the CODE RED system to warn residents of relatively minor water main breaks and shutdowns, system changes that may trigger dirty water at customer taps, as well as for important notices unrelated to drinking water. We hope we never have to use this system to issue a "boil water order" or a "do not drink order", but it is very comforting to know that we have the tool to help us protect the health of our customers in case of a major crisis.

Bellingham had no drinking water regulation violations in 2020

Thank you for reading the 2020 Annual Water Quality Report. If you have any questions, please call Don DiMartino at 508-966-5813.