

2019 Water Quality Report

MANCHESTER WATER DEPARTMENT



Your Water Quality

The Manchester Water Department is pleased to provide our customers with this annual report on the drinking water supplied to the residents of Manchester and our customers in portions of Glastonbury, Vernon and South Windsor. The information contained in this brochure is compiled from data collected during 2019 and explains where your water comes from, what tests were performed to ensure the safety of your water and where you can get more information about your water supply. We hope you will find this publication both interesting and helpful. ***We want to keep you informed about the quality of your drinking water.***

Sources of Drinking Water

Manchester's water supply includes both surface water from reservoirs and groundwater from wells. There are seven surface water reservoirs and ten active wells. Globe Hollow, Porter, Lydall #1 and #2 and Howard reservoirs are located in Manchester; Risley reservoir is located in Vernon and Buckingham reservoir is located in Glastonbury. The reservoirs supply the majority of water to our customers. The groundwater sources augment the surface water supply and are comprised of ten wells which are located throughout Manchester on New State Road, Love Lane, Parker Street, Progress Drive, Charter Oak Street and Fern Street.

The water from the reservoirs is piped to the water treatment plant on Spring Street, where the water is processed before it is sent into the water distribution system. The treatment process is comprised of ozonation, flocculation, sedimentation, filtration to remove impurities and disinfection to kill microbes that can cause illness. In 2011 an ozonation system was added to improve taste and odor and to provide an additional barrier of protection against waterborne disease carrying organisms. Lime is added to raise the pH and zinc phosphate is added to prevent corrosion of plumbing. The CT Department of Health requires that fluoride be added to help prevent tooth decay. Since groundwater supplies are naturally purified as they filter through the soil, little additional treatment is required. Treatment of groundwater supplies consists of disinfection, fluoridation and corrosion control. The Parker Street and New State Road Wells are also treated to remove low levels of volatile organic compounds.

The Water Distribution System

Drinking water flows to your home via a two hundred and fifty seven mile network of water mains, four booster pumping stations and ten distribution system storage tanks. Because of this interconnected system, water from more than one source may be delivered to some neighborhoods. The source of water is dependent upon your location in the distribution system *and* the time of year. Many of our customers experience a seasonal change in the water they receive due to the way we operate our water supply. To find out the source of your water please refer to the maps on the following page.

The Water Department uses both surface and groundwater in the summer to meet increased water demand. During the winter months the use of groundwater is reduced and the primary source is surface water. The blended water during the winter will consist of proportionately more water from the Globe Hollow Water Treatment Plant than during the summer, due to sprinkler systems and swimming pools driving demand. The maps indicate the change in these sources from winter to summer.

The Water Department produced a total of 1.7 billion gallons of water in 2019, or approximately 4.6 million gallons per day. On July 22, 2019 the department supplied 6.17 million gallons of water which was the highest single production day of the year. Overall, fifty two percent of the total water produced was supplied from reservoirs and the remaining forty eight percent was supplied by groundwater sources.

Source Water Assessment Program

A source assessment of the various water supplies used by the Manchester Water Department was completed by the Connecticut Department of Public Health, Drinking Water Division. The assessment reports are intended to provide an understanding of the potential risk of contamination based upon specific risk factors for surface and groundwater sources. Manchester's overall susceptibility to potential sources of contamination was considered to be low for its surface water supplies because more than fifty percent of the watershed is owned by the Town and is preserved as open space. The overall susceptibility to potential sources of contamination for the groundwater supplies was considered to be high because most land around the supplies is not owned by the Town. To control this risk the Town has adopted the regulations described below which are designed to protect the groundwater supplies.

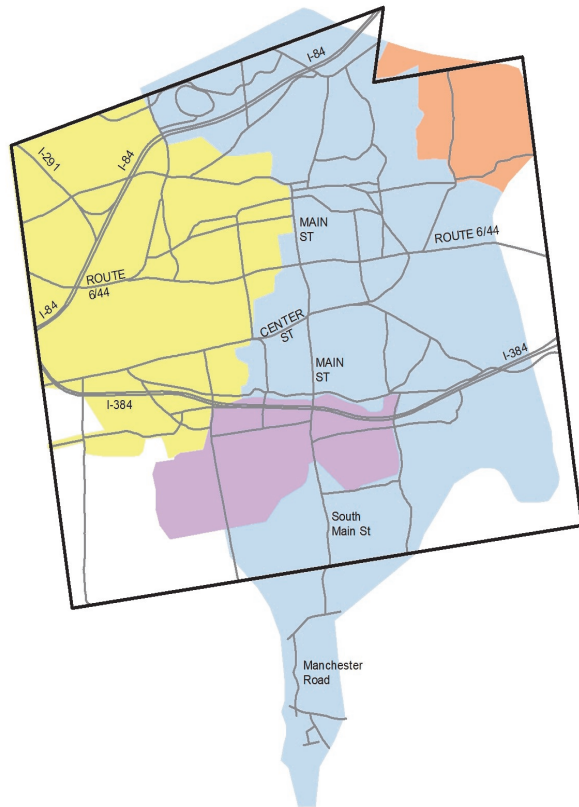
The Aquifer Protection Program, established by the State of Connecticut is used to identify critical water supply aquifers and to protect them from pollution by managing land use. Protection requires coordinated responsibilities shared by the state, municipality and water companies to ensure a safe and plentiful supply of public drinking water for present and future generations. These regulations can be viewed on the Town's website at <http://planning1.townofmanchester.org/index.cfm/development-applications-regulations-and-maps/aquifer-protection-agency/>

Information about COVID-19: The water delivered in our service area is disinfected with chlorine. Chlorine has been found to be very effective in killing coronaviruses and other similar viruses. The Water Department has been working diligently to maintain continuous operations during this difficult time and to continue to provide safe drinking water to our service area.

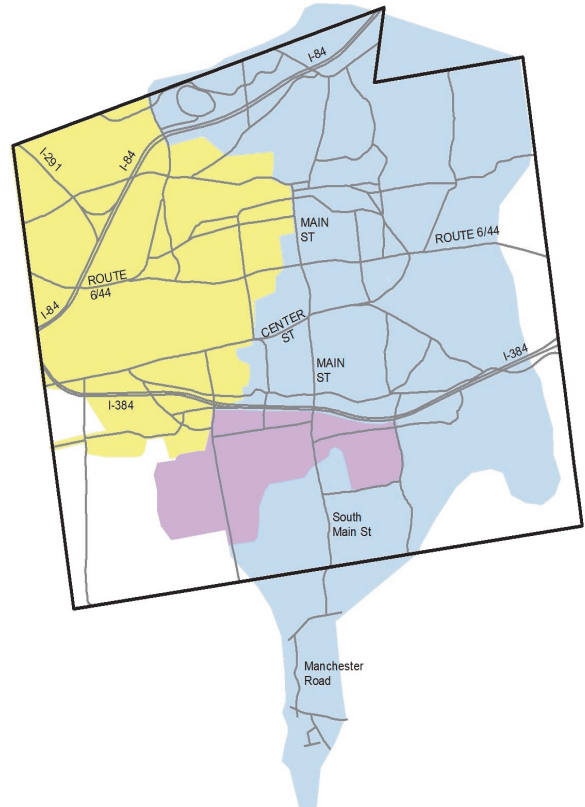
Water Conservation Tips *(Information Provided by the Environmental Protection Agency)*

- * Repair all leaks. A leaky toilet can waste 200 gallons of water per day. To detect leaks in the toilet, add food coloring to the tank. If the colored water appears in **the bowl**, the toilet is leaking.
- * When using a hose, control the flow with an automatic shut-off nozzle.
- * Water only when necessary. The most effective time is early in the morning; never on windy, rainy or very hot days. Use water efficient, slow soaking irrigation systems. Direct the water onto your plants, not the driveway or sidewalk.
- * Consider replacing your five-gallon per flush toilet with an efficient 1.6-gallon unit. This will permanently cut your water consumption by 25%. Purchasing a high efficiency washing machine will save over 50% in water and energy use.

Summer Water Supply



Winter Water Supply



- Globe Hollow Water Treatment Plant
- Globe Hollow Water Treatment Plant, Parker Street and Charter Oak Wells
- Globe Hollow Water Treatment Plant, Progress Drive and Charter Oak Wells
- New State Road and/or Love Lane Wells

The EPA wants you to know that...

Sources of drinking water (both tap and bottled) include lakes, ponds, reservoirs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in untreated source water include: Biological contaminants, such as viruses and bacteria, which may come from septic systems, agricultural livestock operations, and wildlife; Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban runoff, farming or industry; Pesticides and herbicides, which may come from a variety of sources such as agriculture or residential uses; Organic chemicals, including synthetic and volatile organics, which are by-products of industrial processes and can come from gas stations, urban storm-water runoff and septic systems; Radioactive materials, which can be naturally occurring or the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, the EPA prescribes regulations which limit the amount of certain contaminants that are allowed in water provided by public water systems. The Food and Drug Agency establishes limits of contaminants in bottled water. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some 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 from the EPA's Safe Drinking Water Hotline at 1-800-426-4791 or website at <http://water.epa.gov/drink/hotline/index.cfm>.

COVID-19: The COVID-19 virus has not been detected in drinking water supplies and the World Health Organization (WHO) has stated that the risk to water supplies is low based on current evidence. It is recommended to continue drinking and using tap water as usual.

The Environmental Protection Agency requires that we test Manchester's drinking water for over 100 contaminants. We only found a few which are listed in this report. All of the levels are lower than the EPA's maximum allowable levels. The water we supply to you meets all State and Federal water quality standards.

Water Quality Monitoring Program

Manchester's water is routinely monitored for microorganisms, organic chemicals, inorganic chemicals and pesticides. The following tables contain important information about your water quality. The tables represent data from 2019 and only include substances that were found in the water. Not all substances are tested for every year. The results of these tests are reported to the State of Connecticut Department of Health. **In 2019 the Water Department performed over 27,000 analyses on approximately 4,500 water samples and was in compliance with all state and federal drinking water standards.** The tables correspond to the areas shown on the maps. To read the tables, find your location on the map to determine your water source, then refer to the appropriate column in the table to find the water quality results for your area.

Potential Sources of Contaminants	
Contaminant	How it gets in the water
Asbestos	Decay of asbestos cement water mains
Barium	Erosion of natural deposits
Chloride	Natural deposits, runoff from road salting
Ethyl Benzene	Discharge from petroleum refineries
Fluoride	Water additive which reduces tooth decay and promotes strong teeth
Nitrate as N	Erosion of natural deposits; runoff from fertilizer use or septic systems
Sodium	Runoff from road salting, natural deposits
Tetrachloroethylene	Discharge from factories and dry cleaners
1,1,1-Trichloroethane	Discharge from metal degreasing sites
Trichloroethylene	Discharge from metal degreasing sites
1,1-Dichloroethylene	Discharge from industrial chemical factories
Total Organic Carbon	Naturally present in the environment
Turbidity	Soil runoff
Xylene	Discharge from chemical and petroleum factories

Definitions of terms and abbreviations used in this report:

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. MCL's are set as close to the MCLG 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.

MFL = Million Fibers per Liter (longer than ten micrometers)

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 for the sample site indicated

ND = Not detected

NL = Notification Level - The level of a contaminant that if exceeded requires public notification by a public water system to its customers.

NTU = Nephelometric turbidity units, used to measure the clarity of water and evaluate the treatment process.

pCi/L = Picocuries per liter, a measure of radioactivity

ppb = Parts per billion (for comparison, 1 cent in \$10,000,000)

ppm = Parts per million (for comparison, 1 cent in \$10,000)

TT = Treatment Technique - A required process intended to reduce the level of a contaminant in drinking water.

Regulated Contaminants - Average Level and Range Detected in 2019

The following were present at levels below State and Federal allowable limits.

Contaminant	MCLG	MCL	Units	Globe Hollow Water Treatment Plant	Blend of Globe Hollow, Parker St. and Charter Oak Wells	Blend of Globe Hollow, Progress Drive and Charter Oak Wells	New State Road and Love Lane Wells	Meets EPA Drinking Water Standard?
Barium *	2	2	ppm	0.04 NA	0.22 Range 0.04 - 0.43	0.17 Range 0.04 - 0.23	0.30 Range 0.26 - 0.33	YES
Chloride	250	250	ppm	39 Range 33-45	63 Range 33-123	60 Range 33 - 100	163 Range 102 - 230	YES
Fluoride	4	4	ppm	0.73 Range 0.49 - 0.84	0.73 Range 0.10 - 1.1	0.72 Range 0.30 - 1.0	0.72 Range 0.08 - 1.16	YES
Nitrate as N	10	10	ppm	0.29 Range <0.1 - 0.54	1.2 Range <0.1 - 3.16	1.0 Range <0.1 - 3.16	2.68 Range 2.1 - 3.8	YES
Sodium *	None	NL=28	ppm	21 NA	32** Range 21-56	33** Range 21- 56	68** Range 66 - 97	YES
1,1 Dichloroethylene	7	7	ppb	ND	ND	ND Range ND-0.7	ND	YES
Trichloroethylene	0	5	ppb	ND	ND	ND Range ND-0.6	ND	YES
Turbidity Average level for area	None	TT=5	NTU	0.26 Range 0.03 - 0.53	0.20 Range 0.03- 1.67	0.21 Range 0.03-1 .67	0.16 Range 0.07 - 0.74	YES
Filter Plant highest single value and % <0.3 NTU	None	TT= 95% of samples must be <0.3 NTU	NTU	0.22 100% <0.3	NA	NA	NA	YES
Total Organic Carbon	None	TT=Ratio ≥ 1.0	-	1.58 Range 1.39—1.74	NA	NA	NA	YES

* Data from Globe Hollow tested in 2019, Well data is from testing conducted in 2018.

**Sodium Notice:

Customers in this area of Manchester receive water with a sodium concentration above the State's sodium notification level of 28 parts per million (ppm). If you have been placed on a sodium restricted diet, please inform your physician of the sodium level in your area of Manchester. The average dietary intake of sodium in the United States is 4000 to 6000 parts per million each day. Considering the large amounts of sodium from other sources, the relatively small intake from the water supply will not affect most healthy individuals.

Information on *Cryptosporidium*: *Cryptosporidium* is a microscopic organism commonly found in the environment. *Cryptosporidium* can contaminate surface waters, including drinking water sources, via runoff from the watershed. Ingesting only a small amount of *Cryptosporidium* in contaminated water can cause Cryptosporidiosis, a gastrointestinal illness that typically lasts 10 to 14 days. The ozone system, installed as part of the water treatment plant upgrade in 2011, provides an additional barrier of protection against *Cryptosporidium*. The Manchester Water Department has completed a two year monitoring program for *Cryptosporidium*. Samples of untreated source water were collected monthly from October 2015 to September 2017 to comply with EPA's Long Term 2 Enhanced Surface Water Treatment Rule (LT2). *Cryptosporidium* concentration was less than 0.075 oocysts/Liter indicating compliance with the treatment requirements of the LT2 rule.

Regulated Contaminants: System-wide testing					
Contaminant	MCLG	MCL	Level Detected	Major Sources in Drinking Water	Meets EPA Drinking Water Standard?
Asbestos (last tested 2011)	None	7 MFL	ND	Decay of asbestos cement water mains.	YES
Chlorine	4 ppm (MRDLG)	4 ppm (MRDL)	0.75 Range 0.02 - 1.55	Water additive used to control microbes.	YES
Total Coliform Bacteria	0	Coliform bacteria not present in more than 5 % of monthly samples	2% (Highest monthly %) 0.1% (% of 2019 samples)	Naturally present in the environment.	YES
Total Trihalomethanes	0 ppb	80 ppb	24 ppb Range 3 - 72	Byproduct of drinking water disinfection	YES
Haloacetic Acids	0 ppb	60 ppb	12 ppb Range 4 - 21	Byproduct of drinking water disinfection	YES
Lead (last tested 2017)	0 ppb	AL = 15 ppb	10 ppb (0 samples above AL)	Corrosion of household plumbing systems; erosion of natural deposits.	YES
Copper (last tested 2017)	1.3 ppm	AL = 1.3 ppm	0.20 ppm (0 samples above AL)	Corrosion of household plumbing systems; erosion of natural deposits.	YES

Information on Lead in Drinking Water: 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. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. When you haven't used your water for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using the 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 (1-800-426-4791) or at <http://www.epa.gov/safewater/lead>.

Information on Copper in Drinking Water: 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.

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 at 1-800-426-4791 and on the EPA website at <http://water.epa.gov/drink/hotline/index.cfm>.

If you have questions about this report or your water supply, contact us directly at 860 647-3115. If you wish to participate in decisions that may affect the quality of the water, the Board of Directors meets at Lincoln Center on the first Tuesday of each month. For dates and times, please contact 860-647-3130. For additional information, visit our website at <http://www.townofmanchester.org/water>

Unregulated Contaminants: Average level and range detected in 2019

Unregulated contaminants are those that don't yet have a drinking water standard set by EPA. The purpose of monitoring is to help the EPA make a determination whether they should have a standard. The results of detected contaminants are shown in the tables below.

Federal testing of unregulated contaminants is coordinated by the EPA to evaluate the levels specific contaminants over the country as a whole. This is done through their UCMR (unregulated contaminant monitoring rule) program. Currently, we are midstream through the 2018-2020 round of UCMR testing (UCMR4) which tests for 30 chemical contaminants. Detected results follow in the tables below.

Contaminant	MCL	Units	Globe Hollow Water Treatment Plant	Blend of Globe Hollow, Parker St. and Charter Oak Wells	Blend of Globe Hollow, Progress Drive and Charter Oak Wells	New State Road and Love Lane Wells	Major Sources in Drinking Water
Sulfate	Not Regulated	ppm	23 Range 19 - 30	20 Range 12 - 30	20 Range 12 - 30	26 Range 21 - 28	Natural deposits
Bromodichloro methane	Not Regulated	ppb	2.3 0.9 — 4.5	1.4 Range ND - 2.3	1.4 Range ND - 2.3	ND Range ND - ND	Byproduct of drinking water disinfection
Chlorodibromo-methane	Not Regulated	ppb	0.6 NA	0.5 Range ND - 0.7	0.4 Range ND - 0.6	0.6 Range ND - 0.6	Byproduct of drinking water disinfection
Chloroform	Not Regulated	ppb	1.0 0.4 — 1.6	0.6 Range ND — 1.6	0.6 Range ND - 1.6	ND Range ND - ND	Byproduct of drinking water disinfection
Dieldrin	Not Regulated	ppb	NA	ND Range ND - 0.035 Parker Street Only	NA	ND ND - 0.048 Love Lane Only	Run-off from pesticide use
Manganese	Not Regulated	ppb	24.5	15 ND — 24.5	15 ND — 24.5	17 ND — 18	Natural deposits

Contaminant	MCL	Units	Average Levels Detected Range	Major Sources in Drinking Water
Bromochloroacetic Acid	Not Regulated	ppb	1.5 0.7 — 2.2	Byproduct of drinking water disinfection
Bromodichloroacetic Acid	Not Regulated	ppb	2.0 1.4 — 2.8	Byproduct of drinking water disinfection
Chlorodibromoacetic Acid	Not Regulated	ppb	0.3 ND — 0.6	Byproduct of drinking water disinfection
<i>The following contaminants are also included as an aggregate on page 5 as they comprise the haloacetic acids we currently test for under the Stage 2 Disinfection Byproduct Rule. While there are not individual MCLs for each component, collectively the MCL is 60 ppb for their sum.</i>				
Dibromoacetic Acid	Not Regulated	ppb	0.25 ND — 0.7	Byproduct of drinking water disinfection
Dichloroacetic Acid	Not Regulated	ppb	4.2 ND — 7.8	Byproduct of drinking water disinfection
Monochloroacetic Acid	Not Regulated	ppb	0.25 ND — 2.0	Byproduct of drinking water disinfection
Trichloroacetic Acid	Not Regulated	ppb	7.3 3.9 — 10.9	Byproduct of drinking water disinfection

Information about Radon: Radon is a colorless, tasteless, naturally occurring radioactive gas which may be present in rock, soil, groundwater and air. Radon normally escapes from the ground in small concentrations into the atmosphere, where it dissipates harmlessly. Elevated concentrations of radon, however, can exist if this gas is trapped, for example in our homes or businesses. Radon can enter the home through cracks and openings in foundations. Some radon can also enter homes through drinking water supplies during showering, cooking and other water activities.

Long-term exposure to high levels of radon in air may lead to the development of lung cancer. The EPA has set an Action Level of 4 picocuries per liter (pCi/L, a measure of radioactivity) for radon in air. Studies have shown that approximately 10,000 pCi/L of radon in water will normally produce a concentration of about 1 pCi/L in air. In most cases radon entering the home through tap water is a small source of all the radon in indoor air and therefore constitutes a low risk of exposure. Although the EPA has not yet set a standard for radon in water, the Water Department has performed voluntary monitoring for radon in its groundwater supplies. The radon levels in 1999 ranged from 37 to 1481 pCi/L. If you are concerned about radon in your home, *test the air*. For more information contact the Connecticut Department of Health at 860-509-7367 or the National Radon Hotline at 1-800-767-7236.

Information about hardness: Hardness is due to dissolved minerals, primarily calcium and magnesium, naturally occurring in groundwater. The presence or absence of hardness is not associated with health risks. However, it can produce soap scum on tubs and showers, as well as white mineral deposits on dishes and glassware, and can also negatively affect water heaters and boilers. Manchester's water ranges from moderately hard (Globe Hollow Treatment plant and Charter Oak and Progress Drive wells) to hard (Parker Street and Love Lane wells) to very hard (New State Road Wells). Classified according to USGS guidelines by a scale widely used in industry, where water exceeding 180 mg/L (10.5 grains per gallon) is defined as very hard.

Information about PFAS: Per- and polyfluoroalkyl substances are a group of over 4000 manufactured chemicals collectively referred to as PFAS. They have been used in a variety of ways, including the manufacturing of non-stick surfaces, waterproof material, stain-resistant materials, food packaging, and firefighting foam for petroleum fires. The EPA has issued a health advisory of 70 parts per trillion (ppt) in drinking water for the sum of two of the chemicals: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). The State of CT has developed an action level for the sum of five chemicals in the class: PFOA, PFOS, perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and perfluoroheptanoic acid (PFHpA). The Manchester Water Department has tested all of our entry points into the water distribution system and levels of detection were significantly lower than the current advisory and action levels. We are continuing to monitor for PFAS and are evaluating mitigation where appropriate.