

# Town of Shrewsbury Water Department

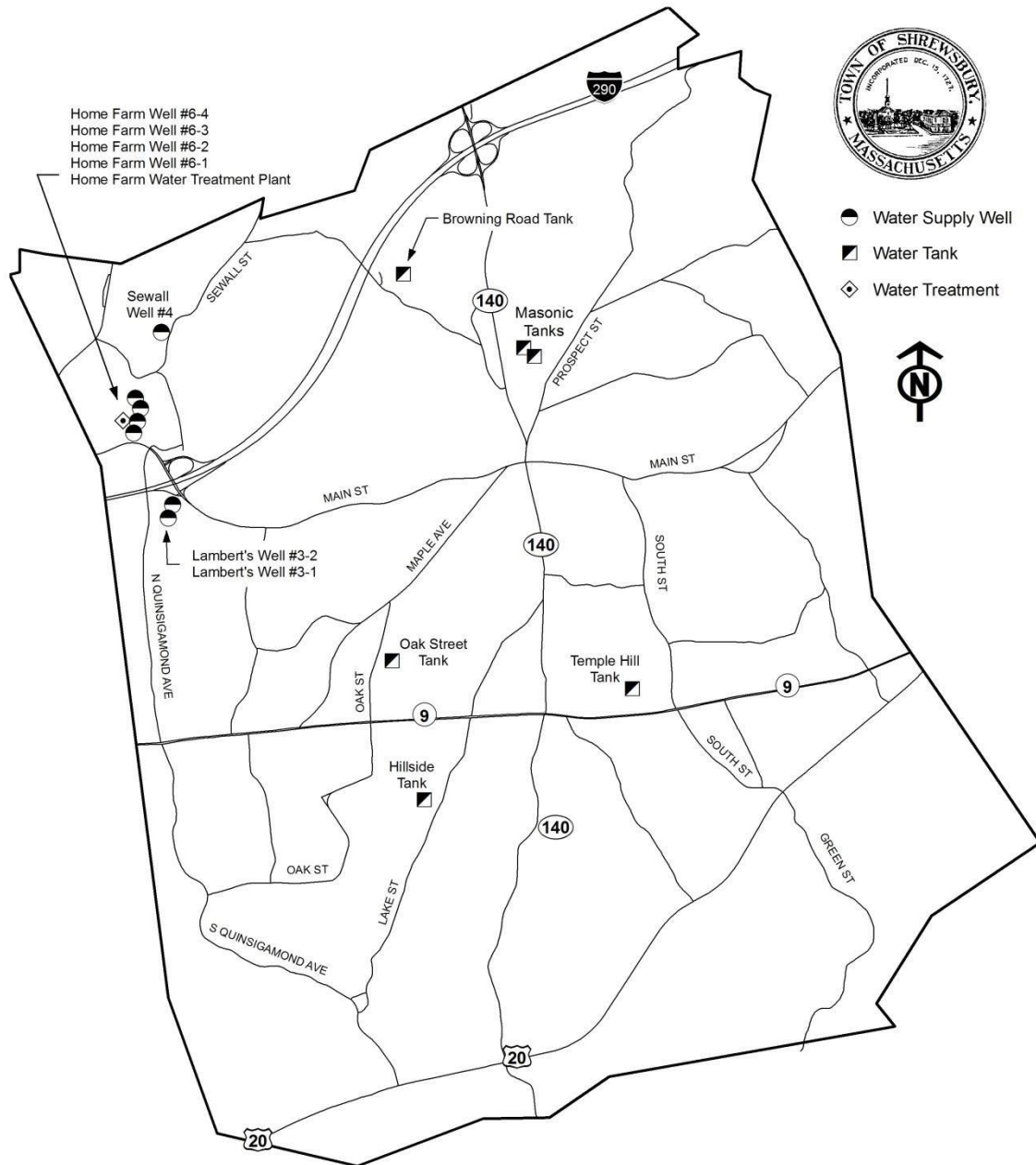
2016

## Annual Drinking Water Quality Report

### Public Water System Information

### Shrewsbury Water Department PWS#2271000

The Shrewsbury Water Department is committed to providing our customers with high quality drinking water 24 hours a day, 365 days a year. To ensure we deliver this quality product, we continue to make significant investments in water treatment facilities, water quality monitoring, water sources, and the distribution system. Today's consumers are keenly aware of environmental and health issues, so they should have information regarding their water supply. Well-informed customers are our best allies in supporting improvements necessary to maintain the highest drinking water standards.



- Water Supply Well
- Water Tank
- ◆ Water Treatment



The Water Department is located on the second floor of the Richard D. Carney Municipal Building, at 100 Maple Ave. We hope this report answers any questions that you may have regarding the water supply. If you have any further concerns, please contact Robert Tozeski @ (508) 841-8506. Our fax number is (508) 841-8497.

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## Source Water Assessment and Protection Report

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The Source Water Assessment and Protection (SWAP) program requires states to assess the susceptibility of the public water supplies to potential sources of contamination. The Department of Environmental Protection (Mass DEP) has completed its assessment on each of the Zone II's for Town of Shrewsbury's Wells. Each of our wells has a protected area known as Zone I which is the 400 foot radius proportional to the well's pumping rate. The Town owns or controls by easement this area for each of our individual wells. The Zone II area for each well is the primary recharge area for the aquifer. This area is defined by hydrogeologic studies and varies for each well source.

A susceptibility rating of high was assigned to each Zone II using the information compiled by Mass DEP. The main reason being that the wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barrier (i.e. clay) that can prevent contaminant migration. There is also a mixture of residential, commercial and light industrial land uses along with the Route 290 corridor in the Zone II areas.

The Shrewsbury Water Department has long recognized the susceptibility of its sources, and has worked closely with the state to maximize the protection of all of its Zone II's. An Aquifer Overlay District for allowed activities and building requirements in our different well zones has been in place since 1988 along with numerous other zoning by laws passed over the years at our annual Town Meeting. The complete SWAP report can be reviewed online at <http://www.mass.gov/eea/docs/dep/water/drinking/swap/cero/2271000.pdf> or at the Shrewsbury Water Department in the Richard D. Carney Municipal Building, 100 Maple Ave.

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## Drinking Water Sources

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The Town's water supply comes entirely from a series of seven (7) active gravel packed groundwater supply wells, located in the northwest quadrant of Town. The six wells are pumped to the Home Farm Water Treatment Plant facility for treatment before entering the distribution system. State and federal drinking water regulations require certain chemical treatments before groundwater enters the distribution system:

- Air stripping is performed on the waters from the Home Farm, 6-1, Home Farm 6-3 & 6-4 satellite wells and 6-2 wells to remove VOC'S (Volatile Organic Compounds). After treatment, levels have remained undetectable.
- Chlorine is added to disinfect the water to prevent waterborne diseases
- Potassium Hydroxide which adjusts the pH of the water and a phosphate based corrosion inhibitor is added to minimize lead and copper. Also, manganese is sequestered in the process to prevent problems in the distribution system
- Fluoride is added for tooth decay prevention

The three remaining wells South St., Sewall St. #5 and Oak St are presently not in use because their rated daily capacities have been transferred to the Home Farm Wells. This site has higher yield capacity and better pumping efficiency for the Town.

The Board of Selectmen often have water related issues on their agenda and we would encourage your attendance and participation in these meetings.

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## Substances Found in Tap Water

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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. It 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 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 agricultural, 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 be the result of oil and gas production and mining activities.

Lead & Copper – 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 Town of Shrewsbury Water Department is 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 <http://www.epa.gov/safewater/lead>.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health. 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 by calling the EPA's Safe Drinking Water Hotline at 800.426.4791.

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. EPA/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 at 800.426.4791.

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## Important Definitions

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**Maximum Contaminant Level (MCL)** – the highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLGs as feasible using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG)** – 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.

**Secondary Maximum Contaminant Level (SMCL)** - These standards are developed to protect the aesthetic qualities of drinking water and are not health based.

**Treatment Technique (TT)** – A required process intended to reduce the level of a contaminant in drinking water.

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

**Parts Per Million (ppm)** – This unit is equivalent to one milligram per liter (mg/L). One part per million is equal to:

- One ounce in 82,500 pounds
- One minute in two years
- One penny in \$10,000

- One drop in ten gallons

**pCi/L**= picocuries per liter (a measure of radioactivity)

**Parts Per Billion (ppb)** – Micrograms per liter (ug/L). Equivalent to one drop in 10,000 gallons

**Massachusetts Office of Research and Standards Guideline (ORSG)** – 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.

**Lead and Copper 90<sup>th</sup> Percentile** – Out of every 10 homes sampled, 9 were at or below this level.

**Maximum Residual Disinfectant Level (MRDL)**: 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.

**Maximum Residual Disinfectant Level Goal (MRDLG)** – The level of a drinking water disinfectant below which there is no known expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**ND**= not detected N/A= not applicable

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## WATER QUALITY TESTING RESULTS

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The tables below list all the drinking water contaminants that were detected during the 2016 calendar year or during the most recent monitoring period for each contaminant group in the water supplied to the distribution system.

<b>Bacteria</b>	<b>Highest # Positive Samples In a Month</b>	<b>MCL</b>	<b>MCLG</b>	<b>Violation Y/N</b>	<b>Possible Source of Contamination</b>
<b>Total Coliform**</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>N</b>	<b>Naturally present in the environment</b>
<b>E. Coli</b>	<b>0</b>	<b>**</b>	<b>0</b>	<b>N</b>	<b>Human and animal fecal waste</b>

\*Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present.

\*\* Compliance with the E. coli MCL is determined upon additional repeat testing.

Regulated Contaminants	Date Collected	Highest Result	RANGE	MCL	MCLG	Violation Y/N	Possible Source
<b>Inorganic Contaminants</b>							
Nitrate (ppm)	04/15/16	0.66	0.66	10	10	N	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (ppm)	04/15/16	0.020	0.020	1.0	1.0	N	
Hexavalent Chromium (ppb)	10/28/16 11/22/16	3.2	0.38-3.2	100	100	N	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories
Barium (ppm)	05/03/16	0.020	--	2	2	N	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride (ppm)	Daily	0.84	0.42-0.84	4*	4	N	Water Additives which promotes strong teeth
Perchlorate (ppb)	04/29/16	0.41	0.41	2	--	N	Rocket propellants, fireworks, munitions flares, blasting agents
<b>Radioactive Contaminants</b>							
Gross Alpha Particle (Latest scheduled results)	5/31/13	0.27	--	15	0	N	Erosion of Natural Deposits
Combined Radium (Latest scheduled results)	5/30/13	0.61	--	5	0	N	Erosion of Natural Deposits

\*Fluoride also has a secondary contaminant level of 2ppm.

Regulated Contaminants	Date(s) Collected	*Highest Quarterly RRA	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation Y/N	Possible Source(s) of Contamination
<b>Disinfection and Disinfection By-Products</b>							
Chlorine (ppm)	Monthly (2016)	0.01	0.00-0.01	4	4	N	Water additive used to control microbes
Haloacetic Acids (ppb)	08/10/16	1.3	0.00-1.3	60	--	N	Byproduct of drinking water disinfection
Total Trihalomethanes (TTHMs) (ppb)	08/10/16	6.4	4.4-6.4	80	--	N	Byproduct of drinking water chlorination

\* Highest RRA = running annual average of four consecutive quarters. Compliance is based on the quarterly RRAs.

Note: Chlorine is reported as the highest monthly average for 2013. Sampling is done daily and averaged for month.

Inorganic Contaminants	Date (s) Collected	90 <sup>th</sup> Percentile	Action Level (AL)	MCLG	#sites Sample	#sites above AL	Possible Source
Lead (ppb) (All school locations)	05/10- 05/12/16	1.1	15	0	29	0	Corrosion of household plumbing systems
Copper (ppm) (All school locations)	05/10- 05/12/16	0.37	1.3	1.3	29	0	Corrosion of household plumbing systems

<b>Unregulated/Secondary Contaminants</b>	<b>Date Collected</b>	<b>Range Detected</b>	<b>Average</b>	<b>SMCL</b>	<b>ORSG</b>	<b>Possible Source</b>
Manganese (ppb)* Distribution System	<b>Monthly 2016</b>	<b>130-510</b>	<b>318</b>	<b>50</b>	<b>300</b>	Erosion of natural deposits
Sulfate (ppm)	<b>05/06/14</b>	<b>2.2</b>	<b>2.2</b>	<b>250</b>	<b>N/A</b>	Natural Sources
Sodium (ppm)***	<b>05/03/16</b>	<b>98</b>	<b>98</b>	<b>N/A</b>	<b>20</b>	Natural sources, runoff from road salt
Nickel (ppb)	<b>05/03/16</b>	<b>1.6</b>	<b>1.6</b>	<b>N/A</b>	<b>100</b>	Discharge from industrial processes
Bromoform (ppb)	<b>Quarterly 2016</b>	<b>ND-0.74</b>	<b>0.34</b>	<b>700</b>	<b>N/A</b>	Trihalomethane; byproduct of drinking water chlorination
Bromodichloromethane (ppb)	<b>Quarterly 2016</b>	<b>ND-0.70</b>	<b>0.34</b>	<b>700</b>	<b>N/A</b>	Trihalomethane; byproduct of drinking water chlorination
Tetrachloroethylene (ppb)	<b>04/16/16</b>	<b>ND-3.5</b>	<b>1.75</b>	<b>5</b>	<b>N/A</b>	Manufactured in chemicals used in coatings and lubricants
<b>Radioactive Contaminants</b>						
Radon (pCi/L) (Latest scheduled results)	<b>6/20/13</b>	<b>250</b>	<b>250</b>	<b>N/A</b>	<b>10,000</b>	<b>Natural Source</b>

\*Manganese: US EPA and MassDEP have established public health advisory levels for manganese to protect against concerns of potential neurological effects. More information on this contaminant can be found on page eight (8) of this report

\*\*\*Sodium sensitive individuals, such as those experiencing hypertension, kidney failure, or congestive heart failure should be aware of the levels of sodium in their drinking water where exposures are being carefully controlled.

## **Cross-Connection Control and Backflow Prevention**

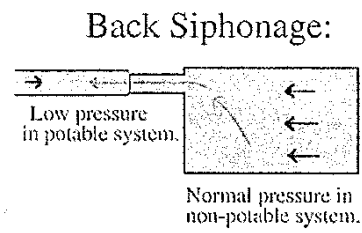
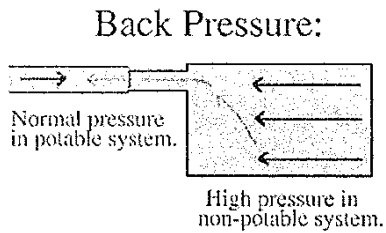
The Town of Shrewsbury makes every effort to ensure that the water delivered to your home and business is clean, safe and free of contamination. Our staff works very hard to protect the quality of the water delivered to our customers from the time the water is extracted via deep wells from underground aquifers or it is withdrawal from a surface water source, throughout the entire treatment and distribution system. But what happens when the water reaches your home or business? Is there still a need to protect the water quality from contamination caused by a cross-connection if so, how?

### **What is a cross-connection?**

A cross-connection is any actual or potential connection between the drinking water lines and potential sources of pollution or contamination such as a piping arrangement or equipment that allows the drinking water to come in contact with non-potable liquids, solids or gases hazardous to humans in event of a backflow.

### **What is a backflow?**

Backflow is the undesired reverse of the water flow in the drinking water distribution lines. This backward flow of the water can occur when the pressure created by an equipment or system such as a boiler or air-conditioning is higher than the water pressure inside the water distribution line (backpressure), or when the pressure in the distribution line drops due to routine occurrences such as water main breaks or heavy water demand causing the water to flow backward inside the water distribution system (backsiphonage). Backflow is a problem that many water consumers are unaware of, a problem that each and every water customer has a responsibility to help prevent.



**What can I do to help prevent a cross-connection?**

Without the proper protection something as simple as a garden hose has the potential to contaminate or pollute the drinking water lines in your house. In fact over half of the country’s cross-connection incidents involve unprotected garden hoses. There are very simple steps that you as a drinking water user can take to prevent such hazards, they are:

- NEVER submerge a hose in soapy water buckets, pet watering containers, pool, tubs sinks, drains or chemicals.
- NEVER attach a hose to a garden sprayer without the proper backflow preventer.
- Buy and install a hose bibb vacuum breaker in any threaded water fixture. The installation can be as easy as attaching a garden hose to a spigot. This inexpensive device is available at most hardware stores and home-improvement centers.
- Identify and be aware of potential cross-connections to your water line.
- Buy appliances and equipment with a backflow preventer.
- Buy and install backflow prevention devices or assemblies for all high and moderate hazard connections.

If you are the owner or manager of a property that is being used as a commercial, industrial or institutional facility you must have your property’s plumbing system surveyed for cross-connection by your water purveyor. If your property has NOT been surveyed for cross-connection contact the Shrewsbury Water Department to schedule a cross-connection survey.

**Radon**

Radon is a radioactive gas that you cannot see, taste, or smell. It is found throughout the United States. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will be (in most cases) a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 picocuries of radon per liter of air (pCi/l) or higher. There are simple way to fix a radon problem that aren’t too costly. For additional information, call your state radon program or call EPA’S Radon Hotline, 800 SOS.RADON.

## Manganese

Manganese is a naturally occurring mineral found in rocks, soil and groundwater, 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 United States Environmental Protection Agency (EPA) and MassDEP have set an aesthetics-based secondary maximum contaminant level (SMCL) for manganese of 50 ug/L (micrograms per liter), or 50 parts per billion. In addition, MassDEP's Office of Research and Standards (ORS) has set a drinking water guideline for manganese (ORSG), which closely follows the EPA public health advisory for manganese. Drinking water may naturally have manganese and, when concentrations are greater than 50 ug/L, the water may be discolored and taste bad. Over a lifetime, the EPA recommends that people drink water with manganese levels less than 300 ug/L and over the short term, EPA recommends that people limit their consumption of water with levels over 1000 ug/L, 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 ug/L, nor should formula for infants be made with that water for longer than 10 days. The ORSG differs from the EPA's health advisory because it expands the age group to which a lower manganese concentration applies from children less than 6 months of age to children up to 1 year of age to address concerns about children's susceptibility to manganese toxicity. See: EPA Drinking Water Health Advisory for Manganese

[http://www.epa.gov/safewater/ccl/pdfs/reg\\_determine1/support\\_cc1\\_magnese\\_dwreport.pdf](http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf) and MassDEP Office of Research and Standards Guideline (ORSG) for Manganese  
<http://www.mass.gov/eea/agencies/massdep/water/drinking/manganese-in-drinking-water.html>

The Town of Shrewsbury did record distribution samples at or above the manganese health advisory level of 0.3 mg/L (300 ppb) during 2016.

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## Water System 2016 Overview

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### Water Department

2016 brought in moderate to extreme drought conditions throughout Massachusetts with a lack of snowfall to start the year and above temperatures and below precipitation for the remainder of the year. These conditions are a continuation of below precipitation and above temperature levels in four of the last five years.

Besides our normal outdoor watering restrictions starting in May, a total outdoor and lawn watering ban was put in place by the Board of Selectmen in July to stay ahead of potential water shortages. Even though we were able to keep up with demand due to the public reducing their daily and peak usages, our ground water well levels of manganese increased substantially as the ground water table lowered. This increase caused multiple problems in the system for discolored water and other associated issues.

Based on the pilot study results in 2015 for manganese treatment options, Town Meeting members at the September 26, 2016 Special Town Meeting approved funding for a new water treatment facility using biological treatment to reduce manganese levels. Also approved was funding to implement a procedure called ice pigging that uses an ice slurry compound to clean water mains. This process was successfully used to clean our main transmission lines in the lower Main Street, Old Mill Road, Audubon Drive, and North Quinsigamond areas in the month of October into early November.

Low levels of a contaminant called Hexavalent Chromium or Chromium-6 were detected in prior years analysis required by EPA by all water systems nationwide serving 10,000 or more residents. Even though the levels of 3-4 ppb were low and well below the Massachusetts standard of 100 ppb for total chromium, the Town made the decision to hold off going out to bid for the new manganese filtration plant to gather more relevant information on the potential source, migration potential and treatment options and costs. Much time and effort was spent working with an adjacent business, Metso, on installing monitoring wells and gathering laboratory data along with contacting various utility companies testing and installing Hexavalent Chromium systems in Southern California. Metso Company personnel have been and continue to be very cooperative to work with regarding this matter. At year's end, we continue to move forward gathering relevant data so that the proposed water treatment plant construction schedule can be started.



Water Main Construction was worked upon throughout the year in various areas of Town where pipe breakage problems were occurring. A larger six-inch water main was installed the entire length of Oakland Avenue replacing the existing smaller diameter line. Work was conducted in the Janet Circle, Elaine Street, Roger Street area along with a section of Lake Street adjacent to this area to also replace existing water main. In conjunction with a drainage replacement project, approximately nine hundred feet of water main was replaced on Lake Street from Grafton Street southerly. Lastly a problematic section of water main was replaced on South Street from near the intersection of Hartford Turnpike approximately five hundred feet southerly.

**The annual water quality report is available upon request at the Shrewsbury Water Department, 100 Maple Ave. Please contact us at (508) 841-8506 for more information regarding this matter.**

### **OUTDOOR WATER USE RESTRICTIONS**

**Effective between May 1 and September 30, 2017, unless modified by the Commissioners, based upon the street address number as follows:**

**Even numbered addresses may use water outdoors: Wednesday & Saturday only**

**Odd numbered addresses may use water outdoors: Thursday and Sunday only**

**No nonessential outdoor water use on Monday, Tuesday and Friday**

#### **Outdoor Watering Hours**

Nonessential outdoor watering hours are restricted to before 9:00 A.M. and after 5:00 P.M.

#### **Nonessential outdoor water uses that are subject to the mandatory restrictions include:**

- Irrigation of lawns via sprinklers or automatic irrigation systems
- Washing of vehicles, except in a commercial car wash or as necessary for operator safety; and
- Washing of exterior building surfaces, parking lots, driveways or sidewalks except as necessary to apply surface treatments such as paint, preservatives, stucco, pavement, or cement.

**The following uses may be allowed when these mandatory restrictions are in place before 9:00 AM and after 5:00 PM.**

- Irrigation to establish a new lawn and new plantings during the months of **May** and **September**
- Irrigation of public parks and recreational fields by means of automatic sprinklers outside the hours: and
- Irrigation of lawns, gardens, flowers and ornamental plants by means of a hand-held hose.

Town of Shrewsbury Water & Sewer Dept.  
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