City Of Harrisonburg, VA
Annual Water Quality Report
Public Utilities Department PWS ID 2660345
Reporting Year 2017

Public Utilities Staff Accepts Award for Performance

Mary-Hope Vass, Public Information Officer

The Virginia Department of Health Office of Drinking Water awarded the Public Utilities Department's Water Treatment Plant with the **2016 Excellence in Waterworks Operations and Performance Award**.

"Our staff members at the Water Treatment Plant work behind the scenes in providing one of the most important services to the city," explained Mike Collins, director of the Public Utilities Department. "This award should be credited to their knowledge, commitment, and performance in always striving to meet the highest standards in our water quality."

Customers expect clean drinking water each time the faucet is turned on but most don't realize the process behind receiving clean water. These processes are operating each day (and night) of the year.

The process begins when the water is collected from its raw sources. Two raw water sources that the city currently utilizes are Dry River and North River. The South Fork of the Shenandoah River will eventually be added as an additional source once the infrastructure is constructed.

The raw water is conveyed through underground pipes to the Water Treatment Plant, where it is treated (purified and disinfected) before being tested for a number of safeguards. Once the water is in a drinkable state, it is conveyed by pipe to our customers or otherwise stored in one of the nine water tanks located throughout the city. These tanks serve as a storage facility when water use exceeds plant production.

Pictured above (left to right): Dennis McGuffin, Justin Smith, Charley Dove, and Nick Hottinger.

Not pictured: Cody Arbogast, Joshua Baughman, Ben Evick, Jeff McCauley, Zachary Roy, Thomas Schroeder, and Bryce Whetzel. Also not pictured are the remaining members of the staff, who provide direct support in many other areas of the department.

Although this process seems fairly simple, there is a great deal of "stuff" that must be monitored and maintained. Chemical addition, mixing, flocculation, sedimentation, filtration, drought and weather conditions, water levels, pumps, pipes, water storage tanks, monitors, sensors, water quality, usage, natural contaminants, manpower to work around the clock, and state and federal mandates are all just a few of the components that must all be properly managed.

On an average day, more than 6.7 million gallons of water is consumed by residents and businesses in the city and parts of Rockingham County.

Director Mike Collins explained, "I continue to be impressed with our Water Treatment Plant operators and the field utilities staff and the work they do to protect the quality of water in our distribution system. This truly is a team effort."

Where does your water come from?

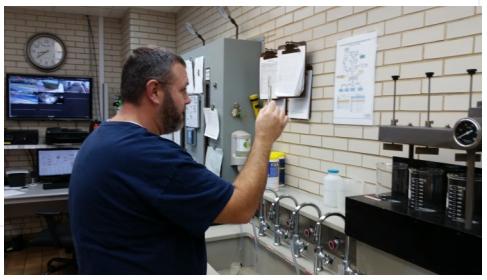
The City of Harrisonburg has two reliable water supply sources. The Dry River in Rawley Springs is a surface water source. The watershed includes the Switzer Reservoir Impoundment and delivers the highest quality water at the most cost-effective price. The North River in Bridgewater is also a surface water source. Approximately 50% of Harrisonburg's water comes from each source. Because of our commitment to long term economic sustainability and environmental stewardship, we are in the process of developing a supply line from the South Fork Shenandoah River. Once this project has been completed, we expect to provide a supply of 15 million gallons per day to our customers.

Is your water Soft or Hard?

Classification	Hardness in mg/L
Soft	0-60
Moderately Hard	61-120
Hard	121-180
Very Hard	≥ 181

Water is soft when it falls from the sky as rain. It readily dissolves minerals as it travels through rock and soil. The treatment process removes some of the mineral content and impurities, but calcium and magnesium will generally not be removed. These minerals are not harmful to your health. See the chart below for the measurement ranges used by the U.S. Geological Survey to classify hard and soft water.

In 2017, our water was between 14-155 mg/l (milligrams per liter).



What is the pH?

pH is measured on a scale of 0 to 14. Water with values lower than 6 are acidic and can have aesthetic problems such as a metallic or sour taste. Water with values greater than 8.5 is less corrosive to metal piping and efficiency with chlorine disinfection decreases.

While the ideal pH level of drinking water should be between 6-8.5, the human body maintains pH equilibrium on a constant basis and will not be affected by water consumption. For example our stomachs have a naturally low pH level of 2, which is a beneficial acidity that helps us with food digestion.

pH Examples	
Substances	pH
Apple Juice	3.0
Orange Juice	3.5
Coffee	5.5
Milk	6.2
Baking Soda	8.5
Soapy Water	10.0

In 2017, our pH levels were between 7.3 and 10.0.

Health Information for Special Populations

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 (800) 426-4791 or at

http://water.epa.gov/drink/ hotline.

Sampling Results

Contaminants detected

January 2017—December 2017

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these 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.

Regulated Substances							
Substance (Unit of Measure)	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	Amount Detected	Range Low-High	Violation	Typical Source
Barium (ppm)	2017	2	2	0.034	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Haloacetic Acids [HAA5] (ppb)	2017	60	NA	24.0	13-36	No	By-product of drinking water disinfection
Nitrate (ppm)	2017	10	10	1.4	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2017	80	NA	38.0	19-60	No	By-product of drinking water disinfection
Total Coliform Bacteria (% positive samples)	2017	5% of monthly samples are positive	0	5 positive samples in 2017 (2%)	NA	No	Naturally present in the environment
Chlorine (mg/l)	2017	4	4	0.97	0.21-1.55	No	By-product of drinking water chlorination
Total Organic Carbon (mg/L)	2017	TT	NA	0.57	0.34-0.80	No	Naturally present in the environment
Turbidity[1] (NTU)	2017	TT	NA	NA	0.02-0.10	No	Soil Runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2017	<0.3 NTU	NA	100%	NA	No	Soil Runoff
Radiological							
Beta Emitters (mrem/yr)	2016	4	0	< 1.0	NA	No	Decay of natural and man-made deposits
Alpha Emitters (pCi/l)	2016	15	0	< 0.27	NA	No	Erosion of natural deposits
Combined Radium(pCi/l)	2016	5	0	< 0.4	NA	No	Erosion of natural deposits
Lead and Copper Sampling							
Substance (Unit of Measure)	Year Sampled	AL	MCLG	Amount Detected (90th %tile)	Sites Above AL/ Total Sites	Violation	Typical Source
Copper[2] (ppm)	2017	1.3	1.3	< 0.02	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead[2] (ppb)	2017	15	0	< 2 ppb	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

[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] Tap water samples were collected for lead and copper analyses from sample sites throughout the community.

[2] The reported amount detected is the average of all samples in the current year.

Definitions

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. 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 Disinfection 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 Disinfection 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 Unit): Measure of water clarity. Turbidity in excess of five NTUs is barely noticeable to the average person.

Ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

Ppm (parts per million) or mg/l (milligrams per liter): One part substance per million parts water or milligrams per liter.

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

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration 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, in some cases, radioactive material, and 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 and wildlife. **Inorganic Contaminants,** such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming. **Pesticides & Herbicides**, which may come from a variety of sources, such as agriculture, urban storm water runoff and residential uses. **Organic Chemical Contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and may also come from gas stations, urban storm water runoff and septic systems. **Radioactive Contaminants,** which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at **(800) 426–4791.**

Source Water Assessment

A Source Water Assessment for the City of Harrisonburg was completed by the Virginia Department of Health on May 24, 2002. This assessment determined that the city's water sources, North River and Dry River, are surface waters exposed to a wide array of changing hydrologic, hydraulic, and atmospheric conditions. More specific information may be obtained by contacting the Harrisonburg Department of Public Utilities at **(540) 434-9959**.

Rate Comparison

MARKET ANALYSIS OF WATER AND SEWER RATES AMONG WATER SYSTEMS OF 10,000-30,000 RESIDENTIAL WATER UNITS 5,000 GALLONS WATER AND SEWER CONSUMPTION				
UTILITY PROVIDER	RESIDENTIAL WATER UNITS	WATER $/5000 GAL	SEWER $/5000 GAL	W & S RATE $/5000 GAL
City of Harrisonburg	12,814	**15.56**	**27.86**	**43.42**
James City Service Authority	21,048	19.00	50.10	59.10
Spotsylvania County	28,633	30.35	29.80	60.15
City of Lynchburg	22,000	21.09	44.75	65.84
Hanover County	19,171	22.95	43.60	66.55
Frederick Co. Sanitation Auth.	14,969	29.95	37.89	67.84
City of Manassas	12,942	21.44	52.96	74.40
Campbell Co. Utilities & Service Auth.	10,084	39.08	38.76	77.84
Albermarle Co Service Auth.	28,549	36.69	43.35	80.04
City of Portsmouth	30,232	29.95	52.42	82.37
Augusta Co. Service Auth.	16,602	34.47	57.07	91.54
City of Charlottesville	12,894	40.52	54.14	94.66
Virginia Control Group Average		**32.48**	**42.72**	**75.20**
This Control Group is comprised of 20 water and wastewater providers who represent a cross section of utilities across the Commonwealth. *Courtesy of Draper Aden Associates 2017 Study*				

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. The Harrisonburg Public Utilities 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 15 to 30 seconds or until it becomes cold or reaches a steady temperature 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.