

# ANNUAL WATER QUALITY REPORT

Reporting Year 2022



*Presented By*  
**City of Portsmouth**



## Our Mission Continues

We are once again pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2022. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users. Please remember that we are always available should you ever have any questions or concerns about your 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, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

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

“Thousands have lived without love, not one without water.”

—W.H. Auden

## Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by



*Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.

## QUESTIONS?

At the City of Portsmouth Department of Public Utilities, we value our customers and work hard to ensure your satisfaction. If you have questions or comments about this report or other issues concerning water quality, please call us or the other sources of water quality information:

City of Portsmouth  
Lake Kilby Water Treatment Plant  
Water Quality Laboratory  
(757) 539-2201, ext. 235 or 225

Public Utilities Customer Service  
(757) 393-8524

Additional sources of information regarding water quality:

Virginia Department of Health  
Office of Water Programs  
(757) 683-2000

U.S. Environmental Protection Agency Safe Drinking Water Hotline  
(800) 426-4791

This water quality report and other city issues can also be viewed at [www.portsmouthva.gov](http://www.portsmouthva.gov).



## Information on the Internet

The U.S. EPA (<https://goo.gl/TFAMKc>) and the Centers for Disease Control and Prevention ([www.cdc.gov](http://www.cdc.gov)) Web sites provide a substantial amount of information on many issues relating to water resources, water conservation and public health. Also, the Virginia Department of Health, Office of Drinking Water, has a Web site (<https://goo.gl/3Tn805>) that provides complete and current information on water issues in Virginia, including valuable information about our watershed.

### Source Water Assessment

The Source Water Assessment Plan (SWAP) is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area and a determination of the water supply's susceptibility to contamination by the identified potential sources.

According to the SWAP, our water system had a susceptibility rating of medium, in which the drinking water is potentially most susceptible to agriculture, urban, and forestry runoff. However, we have not detected any contaminants from these sources in our drinking water. If you would like to review the SWAP, please feel free to contact our watershed office during office hours at (757) 539-2201, ext. 222.

## 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. Lake Kilby Water Treatment Plant is responsible for providing high-quality drinking water, but we 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 two 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 at (800) 426-4791 or [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



### Source Water Description

Your tap water comes from four surface lakes - Meade, Cohoon, Speight's Run, and Kilby - and five deep wells. Portsmouth's water treatment facility has the capacity to treat 32 million gallons of water each day and serves over 150,000 customers in Portsmouth, Chesapeake, and Suffolk.

## Water Treatment Process

The treatment process for drinking water consists of several steps. First, water is drawn from our lake's intake. Next, it goes through a rapid mix where a coagulant is added. Coagulation is the chemical process used to remove solids from water by manipulating the electrostatic charges of particulates suspended in water. The water is then sent to a contact basin where a chemical is added for pH control. From there, the water is sent to the clarifiers.

At the beginning of the clarifier, chemicals are added, initiating the flocculation process and the removal of any possible taste or odor found in lake water. The flocculation process converts small suspended particles into larger, more settleable clumps. The clarifiers act as large settling basins in which water is retained to allow the floc to settle out by gravity. Next, the water is sent to multimedia filters, where liquid chlorine is added for disinfection at the beginning of the filtration process. The chlorine causes inactivity in pathogenic microbes and aids in the removal of dissolved iron and manganese in the water. Once the water passes through the filters, well water with naturally occurring levels of fluoride is added. It then goes through ultraviolet light tubing for additional disinfection to provide safe water for drinking and other uses.

Finally, the water is pumped to one of two clearwell holding tanks where ammonia is added before proceeding to the distribution system. The ammonia added to the chlorinated water forms chloramines, which maintain a longer disinfectant residual in the distribution system to keep pathogenic microbials at bay and reduce the amount of disinfection by-products formed. This treatment process has proven to be very effective at producing drinking water that meets and exceeds all federal testing standards.



## Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule, and the water we deliver must meet specific health standards. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

The state recommends monitoring 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
Alpha Emitters (pCi/L)	2021	15	0	0.36+/- 0.65	NA	No	Erosion of natural deposits
Barium (ppm)	2022	2	2	0.025	NA	No	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beta/Photon Emitters (pCi/L)	2021	50	0	1.4+/-1.3	NA	No	Decay of natural and human-made deposits
Chloramines (ppm)	2022	[4]	[4]	3.6	1.5–4.0	No	Water additive used to control microbes
Combined Radium (pCi/L)	2021	5	0	1.67+/- 0.73	NA	No	Erosion of natural deposits
Fluoride (ppm)	2022	4	4	0.82	0.72–0.88	No	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Haloacetic Acids [HAAs]–Stage 2 (ppb)	2022	60	NA	29	13–42	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2021	TT <sup>1</sup>	NA	1.93	1.34–2.63	No	Naturally present in the environment
TTHMs [total trihalomethanes]–Stage 2 (ppb)	2022	80	NA	43	20–66	No	By-product of drinking water disinfection
Turbidity <sup>2</sup> (NTU)	2022	TT	NA	0.05	0.02–0.06	No	Soil runoff
Turbidity (lowest monthly percent of samples meeting limit)	2022	TT = 95% of samples meet the limit	NA	100	NA	No	Soil runoff

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

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2021	1.3	1.3	0.125	0/52	No	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb)	2021	15	0	<0.001	0/52	No	Corrosion of household plumbing systems; erosion of natural deposits

### OTHER REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alkalinity (ppm)	2022	NA	NA	84	71–93	No	Naturally occurring
Calcium Hardness (ppm)	2022	NA	NA	21	16–27	No	Naturally present in sedimentary rocks
Calcium (ppm)	2022	NA	NA	8	6–10	No	Naturally present through the leaching of calcium rocks
Conductivity (µS/cm)	2022	NA	NA	369	320–407	No	Naturally occurring
Corrosion Index [Langlier] (units)	2022	NA	NA	-1.13	-1.67–0.14	No	Naturally or industrially influenced balance of hydrogen, carbon, and oxygen in the water affected by temperature and other factors
Hardness (ppm)	2022	NA	NA	25	20–30	No	NA
Magnesium (ppm)	2022	NA	NA	4	ND–10	No	NA
Orthophosphate (ppm)	2022	NA	NA	0.11	0.09–0.17	No	Naturally occurring in rocks and other minerals

## SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Aluminum (ppb)	2022	200	NA	4.7	0-23	No	Erosion of natural deposits; residual from some surface water treatment processes
Chloride (ppm)	2022	250	NA	20	NA	No	Runoff/leaching from natural deposits
pH (units)	2022	6.5-8.5	NA	7.6	7.5-7.7	No	Naturally occurring
Sulfate (ppm)	2022	250	NA	69	52-90	No	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids [TDS] (ppm)	2022	500	NA	220	214-273	No	Runoff/leaching from natural deposits

## UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Sodium (ppm)	2022	70	67-83	Naturally occurring

## UNREGULATED CONTAMINANTS MONITORING RULE PART 4 (UCMR4) (SAMPLING PERFORMED 2018-2019)

SUBSTANCE (UNIT OF MEASURE)	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
HAA5 (ppb)	27.12	17.44-36.85	By-product of drinking water disinfection
HAA6Br (ppb)	8.87	5.98-12.21	By-product of drinking water disinfection
HAA9 (ppb)	35.71	24.12-47.76	By-product of drinking water disinfection
Manganese (ppb)	0.84	0.562-1.01	Naturally occurring
Quinoline (ppb)	0.0419	NA	Typically found in cocoa, black tea, and certain types of alcohols

<sup>1</sup>The value reported under Amount Detected for TOC is the lowest ratio of percentage of TOC actually removed to percentage of TOC required to be removed. A value of greater than 1 indicates that the water system is in compliance with TOC removal requirements. A value of less than 1 indicates a violation of the TOC removal requirements.

<sup>2</sup>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.



## Definitions

**90th %ile:** The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

**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 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

**NTU (Nephelometric Turbidity Units):** Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

**pCi/L (picocuries per liter):** A measure of radioactivity.

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

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

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

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

**µS/cm (microsiemens per centimeter):** A unit expressing the amount of electrical conductivity of a solution.

