"ANNUAL DRINKING WATER QUALITY REPORT FOR 2015"

Annual Drinking Water Quality Report

Prepared by

Gloucester County Public Utilities

INTRODUCTION

This Annual Drinking Water Quality Report for calendar year 2015 is designed to inform you, the customer, about your drinking water quality. Our goal is to provide you with a safe and dependable supply of drinking water, and we want you to understand the efforts we make to protect your water supply. The quality of your drinking water must meet state and federal requirements administered by the Virginia Department of Health (VDH). Gloucester County Public Utilities had no violations of any contaminant levels during the reporting year. Included in this report are details about where your water comes from, what it contains and how it compares to standards set by the EPA and VDH. The Gloucester County Department of Public Utilities is committed to providing you with information about your water supply, because customers who are well informed are our best allies in supporting improvements necessary to maintain the highest drinking water standards. If you have any questions about this report or any aspect of your drinking water or want to know how to participate in decisions that may affect the quality of your drinking water, please contact James C. Dawson, P.E., Director of Public Utilities, by telephone at (804) 693-4044 or by email at jdawson@gloucesterva.info.

GENERAL INFORMATION

Drinking water, including bottled drinking 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 can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

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 and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include: (1) Microbial contaminants, such as viruses and bacteria, which may come from septic systems, agricultural livestock operations, and wildlife. (2) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from stormwater runoff, domestic wastewater discharges, mining, or farming. (3) Pesticides and herbicides, which may come from a variety of sources such as agricultural, stormwater runoff, and residential uses. (4) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, stormwater runoff, and septic systems. (5) Radioactive contaminants, which can be naturally occurring or be the results of mining activities. To ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

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 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 (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Your drinking water comes from two sources. The first, surface water, comes from Beaverdam Reservoir. The water is treated at the County's Surface Water Treatment Plant (SWTP). Your Surface Water Treatment Plant employs conventional technology which includes chemical coagulation, sedimentation and filtration. Raw water pumped from the Beaverdam Reservoir is treated with potassium permanganate, to remove iron, organics and manganese, and powdered activated carbon to remove color organics, and to control taste/odor. This water is then pumped into a rapid mixing basin where alum and polymer are mixed into the water for coagulation. The mixed water is then drawn into vacuum chambers where it "pulsates" into our Superpulsator™ Clarifier units, which facilitates floc formation and settling to remove large particles. This process removes the large particles from the treatment process for disposal at the local landfill. Settled water from the Superpulsator™ Clarifier is next mixed with Sodium Hypochlorite (Chlorine) for further oxidation of organics and metals. The water is then filtered through dual media, sand and anthracite, high rate filters. The filtered water is treated inside the clearwell with chlorine for primary and secondary disinfection; Soda Ash for pH control; and corrosion inhibitor for corrosion control. The clearwell serves as temporary storage and location to blend treated surface water with the water produced by Reverse Osmosis (RO) as described below.

The second source of your drinking water is groundwater. The County's Reverse Osmosis (RO) plant, which treats water from two (2) deep (approximately 1,400 feet) wells, went into operation in April of 2003. The groundwater is pumped to the RO plant where an antiscalant is added to prevent fouling of the membranes used in the process. Well water then passes through a series of 5 micron cartridge filters that removes suspended particles. Removing these particles will prevent fouling of the membranes. After the cartridge filters, high-pressure pumps push the water through the membranes used in

the reverse osmosis process. The reverse osmosis process removes dissolved solids and pathogens from the groundwater. Finally the water flows to the clearwell, located at the Surface Water Treatment Plant, where is mixed and treated with the Surface Water Plant's water as described above..

Beginning in June of 2014, The Department of Public Utilities established an internal policy to blend the product water from the Reverse Osmosis Plant and the Surface Water Treatment Plant at a ratio of 1:1 continuously. This helps ensure that utilities will consistently produce water that is in accordance with Disinfection Byproduct and Lead and Copper Rules.

As a means to protect our sources of drinking water, the Hampton Roads Planning District Commission (HRPDC) and Virginia Department of Health (VDH) evaluated the susceptibility of Gloucester's water supply to contamination. Contamination sources and pathways were reviewed using maps, known and observed activities, water quality data and information about the water source. Using criteria developed by the State in its EPA-approved Source Water Assessment Program, the following was determined:

	Source	***Susceptibility***
i.	Beaverdam Reservoir	High
ii.	R.O. Well #1	Low
iii.	R.O. Well #2	Low

This does not mean that your drinking water is currently unsafe. Your current water quality is described in the rest of this report. A copy of the source water assessment report is available by contacting Mr. James C. Dawson, P.E., Director of Public Utilities, at (804) 693-4044.

DEFINITIONS

Contaminants in your drinking water are routinely monitored according to Federal and State regulations. The tables on the next few pages show the results of our monitoring for calendar year 2015. In the tables and elsewhere in this report you will find many terms and abbreviations that might be unfamiliar to you. The following definitions are provided to help you better understand these terms:

Non-detects (ND) - lab analysis indicates that the contaminant is not present.

Parts per million (ppm) or Milligrams per liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in $10,000.

Parts per billion (ppb) Micrograms per liter - one part per billion corresponds to one minute in 2,000 years or a single penny in $10,000,000.

Parts per trillion (ppt) or Nanograms per liter (nanograms/l) - one part per trillion corresponds to one minute in 2,000,000 years or a single penny in $10,000,000,000.

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Action Level (AL) - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

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

Maximum Contaminant Level, or MCL - 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.

Secondary Maximum Contaminant Level, or SMCL - set recommended levels for contaminants that affect water's taste, color, odor or appearance.

Maximum Contaminant Level Goal, or 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.

NTU (Nephelometric Turbidity Unit) - the amount of turbidity in a water sample as measured by the amount of light scattered by turbidity of the sample.

Maximum Residual Disinfectant Level (MRDL) - the level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an acceptable possibility of adverse health effects.

Maximum Residual Disinfectant Level Goal (MRDLG) - the level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur.

WATER QUALITY RESULTS

I. Microbiological Contaminants

Contaminant	*MCLG*	*MCL*	*No. of Samples Indicating Presence of Bacteria*	*Violation (Y/N)*	*Month of Sampling*	*Typical Source of Contamination*
Total Coliform Bacteria	0	Presence of coliform bacteria in more than one sample per month OR less than 5% of samples when 40 or more samples are collected in a month	0	No	N/A	Naturally present in the environment

II. Contaminants Regulated at the Treatment Plant

Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL*	*Level Detected*	*Typical Source of Contaminant*
Aluminum			<0.05 ppm	Natural geology, mining
Antimony	6 ppb	6 ppb	<2 ppb	Discharge from petroleum refineries, soldering
Arsenic	N/A	10 ppb	<2 ppb	Natural geology, runoff from orchards
Barium	2 ppm	2 ppm	<0.01 ppm	Natural geology, mining
Beryllium	4 ppb	4 ppb	<2 ppb	Discharge from metal refineries, coal burning
Cadmium	5 ppb	5 ppb	<2 ppb	Natural geology, corrosion of galvanized pipes
Chromium	100 ppb	100 ppb	<10 ppb	Natural geology, discharge pulp mills
Cyanide‡	200 ppb	200 ppb	<10 ppb	Discharge metal, plastic, fertilizer factories
Lead	0	AL = 15 ppb	<2 ppb	Corrosion of household plumbing
Mercury	2 ppb	2 ppb	<0.2 ppb	Natural geology, runoff farms
Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL*	*Level Detected*	*Typical Source of Contaminant*
Nickel			<10 ppb	Natural geology
Selenium	50 ppb	50 ppb	<10 ppb	Natural geology, discharge metal refinery
Thalium	2 ppb	2 ppb	<2 ppb	Natural geology
Nitrate/Nitrite-Nitrogen+	10 ppm	10 ppm	0.06 ppm	Natural geology, fertilizer runoff, septic leachate
Gross Alpha[a]	0	15 pCi/L	<0.5 pCi/L	Erosion of natural deposits
Gross Beta*[a]	0	50 pCi/L	1.7 pCi/L	Decay of man-made products and natural deposits
Combined Radium[a]	0	5pCi/L	0.9 pCi/L	Erosion of natural deposits

Metals sample was collected on October 6th, 2015. ‡ +Sample was collected on April 6, 2015. *The MCL for beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles. [a]Samples collected on January 3, 2011.

Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL*	*Highest Detected*	*Lowest Monthly Percentage of Samples Meeting the Turbidity Limit*	*Typical Source of Contaminant*
Turbidity	NA	100% Below 0.3 NTU	0.262 NTU	100%	Soil runoff
Date	-	-	03-28-15		

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

Contaminant	*MCLG*	*Required Removal Ratio*	*Removal Ratio*		*Typical Source of Contaminant*
			Lowest Running Annual Average	*Monthly Range*	
Total Organic Carbon*	TT	1.0	1.00	-0.77 – 1.18	Naturally present in the environment

*Total organic carbon results are given as removal ratios. Running annual average equal to or greater than one meets water quality standards.

III. Other Contaminants Regulated in the Distribution System

Contaminant	*MCLG*	*Required Removal Ratio*	*Amount Detected*		*Typical Source of Contamination*
			Highest Compliance Level	*Quarterly Range*	
Trihalomethanes (THM)	N/A	80 MCL	77 ppb	48-100ppb	Disinfection interaction
Haloacetic Acids (HAA)	N/A	60 MCL	15 ppb	6-20 ppb	Disinfection interaction

IV. Contaminants Regulated at the Customer's Tap

Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL (Action Level)*	*90th Percentile*	*No. of Sites Exceeding A.L.*	*Typical Source of Contamination*
Lead	0 ppb	15 ppb	5.70 ppb	3	Corrosion of household plumbing systems; erosion of natural deposits
Copper	1.3 ppm	1.3 ppm	0.13 ppm	0	Corrosion of household plumbing systems; erosion of natural deposits

The County collected 130 lead and copper samples from residences in 2015. Lead and copper tests are collected by the homeowner and tested by an independent laboratory. The most recent lead and copper sampling process in November resulted in three residential samples contained lead concentrations above 15 ppb. Two homeowners of the three residences requested additional sampling and those tests returned with no detectable lead. Sampling error in the original tests is suspected to be the cause of the three elevated lead concentrations.

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. Gloucester County Public Utilities 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. 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.

V. Disinfectants

Disinfectant	*Units of Measurement*	*MRDLG*	*MRDL*	*Level Detected (Annual Average)*	*Violation (Y/N)*	*Range of Detection at Sampling Points*	*Typical Source*
Chlorine	ppm	4	4	1.2 mg/L	N	0.1 – 2.4 mg/L	Water additive used to control microbes

We constantly monitor for various contaminants in the water supply to meet all regulatory requirements. The table lists only those contaminants that had some level of detection. Many other contaminants have been analyzed but were not present or were below the detection limits of the lab equipment. The water quality results in the preceding tables are from testing done in 2015, unless otherwise noted. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently.

MCLs are set at very stringent levels by the U.S. Environmental Protection Agency. In developing the standards, EPA assumes that the average adult drinks 2 liters of water each day throughout a 70-year life span. EPA generally sets MCLs at levels that will result in no adverse health effects for some contaminants or a one-in-ten-thousand to one-in-a-million chance of having the described health effect for other contaminants.

VIOLATION INFORMATION

There were no MCL or TT violations during the year nor were there any reporting violations during the year for the Gloucester County water system.

ADDITIONAL HEALTH INFORMATION

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

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A copy of this report is also available by visiting the Gloucester County website at www.gloucesterva.info and accessing the Public Utilities Department home page.