



2017 Consumer Confidence Report of Tap Water for Fort Monroe, VA PWSID #3650150

INTRODUCTION

This annual water quality report or Consumer Confidence Report is prepared and distributed by Veolia and the Fort Monroe Authority as required by the Safe Drinking Water Act. It is reviewed and approved by the Virginia Department of Health/Office of Drinking Water in Richmond. This report explains where your water comes from, what analytical testing shows about it, and other things you should know about your drinking water. Fort Monroe's 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. Drinking water quality must meet state and federal requirements administered by the Virginia Department of Health (VDH). The water is produced by Newport News Waterworks (NNWW) and is treated and tested by state-of-the-art equipment and techniques and meets or exceeds state and federal standards for water-quality.

GENERAL INFORMATION

Generally speaking, 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 radioactive material and can pick up substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial: Such as viruses and bacteria, this may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic: Such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides & Herbicides: May come from a variety of sources such as agriculture, stormwater runoff, and residential uses.

Organic Chemicals: Also including synthetic and volatile organics, are by-products of industrial processes and petroleum production, and may also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive: Can be naturally occurring or be the result of oil and gas production and mining activities.

WATER SOURCES & TREATMENT

During 2017, the drinking water at Fort Monroe was purchased from Newport News Waterworks (NNWW). NNWW's primary source of water is surface water. It begins with the Chickahominy River. When available, water is pumped from the river, above Walkers Dam, and is transferred through pipes to reservoirs for storage. NNWW owns and operates five reservoirs that store and supply water to the treatment plants, Lee Hall and Hardwood's Mill. Brackish (slightly salty) groundwater from deep wells in the Lee Hall area provide a second source of water. The two source waters are treated separately, then blended together before distribution to the service area.

Untreated water is pumped to the NNWW treatment plants, where it passes through screens, before aluminum sulfate (alum) and polymer are added. These chemicals cause tiny particles in the water to cling together (coagulation), making the particles easier to remove. After the water is clarified, ozone (disinfection) is added to kill microorganisms such as bacteria and viruses. The water is then sent through filters to remove any remaining particles (filtration). Lime is added to adjust the pH, fluoride is added to prevent tooth decay, and zinc orthophosphate is added to control corrosion inside the pipe system. Finally, chloramines, the secondary disinfectant, are added to maintain disinfection through the pipe system to your home or business.

The brackish groundwater is pumped to a desalination plant located at the Lee Hall facility. Using a process called reverse osmosis, water is forced by high pressure through membranes that can remove the salt and other contaminants to produce very high quality water. The water is blended with treated surface water from both treatment plants, and then sent out to the NNWW customers, including the Fort Monroe waterworks.

SURFACE WATER SOURCE ASSESSMENT

According to the Hampton Roads Planning District Commission's 2017 Source Water Assessment, NNWW surface water sources were rated as relatively high in susceptibility to contamination (which is one reason why water treatment is so important), while NNWW deep groundwater wells were rated as low in susceptibility using the criteria developed by the state in its approved Source Water Assessment Program. The assessment report includes maps showing the source water assessment area, an inventory of known land-use activities, a susceptibility explanation chart, and definitions of key terms. A copy of the report is available from the Hampton Roads Planning District Commission (757) 420-8300 or Newport News Waterworks (757) 926-1000.

WATER QUALITY TESTING

To ensure tap water is safe to drink, the EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish the limits for contaminants in bottled water, which must provide the same protection for public health. The water quality information listed here is based upon tests conducted in 2017 by NNWW. Samples of treated water were taken at regular intervals from specific locations (residences, businesses, and treatment plants) across the Waterworks service area. Every regulated substance that we detected in the water, even in the smallest traces, is listed in Table 1 below. The tables contain the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health (MCLG), the amount detected, the usual sources of such contamination, and whether or not Waterworks meets set regulation. For help understanding the following tables please see the definition of terms above Table 1 in the next column to the right and the footnotes below table 4.

NNWW participated in the U.S. Environmental Protection Agency's (EPA) third round of the Unregulated Contaminant Monitoring Rule (UCMR3). Approximately 6,000 utilities nationwide monitored unregulated contaminants for a year to help the EPA determine the occurrence of these contaminants in drinking water and whether or not they need to be regulated for protection of public health. TABLE 3 below shows results of our findings.

DEFINITION OF KEY TERMS IN TABLES

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that 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.

MRL (Minimum Reporting Level): An estimate of the lowest concentration of a compound that laboratories would report as a detection.

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 microbial contaminant control.

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 contamination.

ND: Not Detected - Does not equate to zero, but refers to an amount below analytical reporting limits.

NTU (Nephelometric Turbidity Unit): A measure of water clarity. Turbidity greater than five NTU is just noticeable to the average person.

pCi/L (Picocuries per liter): A measure of radioactivity. EPA considers 50 pCi/L to be the level of concern for beta particles.

ppm (Parts per million or milligrams per liter [mg/L]): Equivalent to one penny in \$10 thousand.

ppb (Parts per billion or micrograms per liter [µg/L]): Equivalent to one penny in \$10 million.

ppt (Parts per trillion or nanograms per liter [ng/L]): Equivalent to one penny in \$10 billion.

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

Turbidity: A measure of water clarity serving as an indicator of the treatment facility's performance.

Water Quality Testing Results: Contaminants in Water at Newport News Waterworks

TABLE 1 - REGULATED SUBSTANCES							
Contaminant	Unit	EPA's Ideal Goal (MCLG)	Highest EPA Allowed Level (MCL)	Highest Result (what we found)	Range of Test Results Low-High	Meets State & Federal Standards	Likely Source
INORGANICS (from testing completed in 2017)							
Copper	ppm	0	AL = 1.3	0.071 ¹	0.009-0.088	YES	Corrosion of household plumbing
Lead	ppb	0	AL = 15	<1.0 ¹	<1.0-3.1	YES	Corrosion of household plumbing
Flouride	ppm	4	4	0.89	0.84-0.89	YES	Added to promote strong teeth
Barium	ppm	2	2	0.022	0.019-0.022	YES	Erosion of Natural deposits
Nitrate	ppm	10	10	0.111	0.044-0.111	YES	Erosion of Natural deposits
Nitrite	ppm	1	1	0.001	0.001-0.001	YES	Erosion of Natural deposits
DISINFECTION BY-PRODUCTS AND PRECURSORS (from testing completed in 2017)							
Total Trihalomethanes (TTHM)	ppb	0	80	23 ²	7-33	YES	By-product of chlorination
Haloacetic Acids (HAA5)	ppb	0	60	25 ²	<2-33	YES	By-product of chlorination
Total Organic Carbon Removal		none	TT	1.17 ³	1.08-1.55	YES	Naturally present in the environment
MICROBIOLOGICAL (from testing completed in 2017)							
Turbidity	NTU	none	TT	0.14 ⁴	0.02-0.14	YES	Soil runoff
Chloramines	ppm	MRDLG=4	MRDL=4	3.2 ⁵	<0.02-5.2 ⁵	YES	Water additive used to control microbes
RADIOLOGICAL (from testing completed in 2016)							
Radium-228	pCi/L	0	5	0.6	<0.6-0.6	YES	Erosion of Natural deposits
Beta Emitters	pCi/L	0	4	2.5	1.4-2.5	YES	Decay of natural & man-made deposits
TABLE 2 - NON-REGULATED MICROBIALS MONITORED AT THE SOURCE*							
Contaminant	Unit	MCLG	MCL	Highest Amount Detected	Range of Test Results (Low-High)	Sampling Year	Likely Source
Cryptosporidium	Oocysts/L	n/a	TT	0.082	ND-0.082	2017	Human or animal fecal waste

* Found in source water only, not in treated water.

Water Quality Testing Results: Contaminants in Water at Newport News Waterworks

TABLE 3: UNREGULATED SUBSTANCES

Contaminant	Unit	MRL	Average	Range of Test Results (Low-High)	Likely Source
UNREGULATED ORGANICS - MONITORED AT THE TREATMENT PLANT (samples collected in 2017)					
Chloroform	ppb	n/a	4.3	2.6-6.0	By-product of chlorination
Dichlorobromomethane	ppb	n/a	2.3	1.7-2.9	By-product of chlorination
Dibromochloromethane	ppb	n/a	0.6	0.6-0.7	By-product of chlorination
UNREGULATED CONTAMINANT MONITORING REGULATION (UCMR3)					
This monitoring provides a basis for future regulatory actions to protect public health. (samples collected in 2014)					
Chlorate	µg/L	20	177	ND-550	Agricultural defoliant or desiccant; disinfectant by-product - used in production of chlorine dioxide.
Total Chromium	µg/L	0.2	0.2	ND-0.74	Naturally occurring. Used in industry and can be discharged by industrial facilities. Total Chromium is the sum of chromium in all its valence states.
Hexavalent Chromium CR-6 (dissolved)	µg/L	0.030	0.088	0.044-0.180	Naturally occurring. Used in making steel and other alloys. A new Environmental Protection Agency (EPA) risk assessment, not finalized yet, has raised concerns about the risk to human health.
Strontium (µg/L)	µg/L	0.3	130	90-200	Naturally occurring. Has been used commercially to produce color TV tubes. It also blocks x-ray emissions.
Vanadium (µg/L)	µg/L	0.2	0.71	0.49-1.00	Naturally occurring. Is used as an additive to steel to make engine parts and tools.

The expanded version of the Newport News Waterworks 2017 Consumer Confidence Report, featuring additional test results, is available online at www.nnva.gov/waterqualityreport

Water Quality Testing Results: Fort Monroe Water Distribution System

TABLE 4: REGULATED SUBSTANCES

Contaminant, units	Sampling Occurrence	MCLG	MCL	Test Results	Result Range	Typical Source of Contamination
Total Trihalomethanes (TTHM) ⁶	2016-2017 Quarterly	0	80 ppb	15 ppb	4.1 -18.6 ppb	By-product of drinking water chlorination
Haloacetic Acids (HAA5) ⁶	2016-2017 Quarterly	0	60 ppb	ND	ND	By-product of drinking water chlorination
Total Chlorine (Chloramines) ⁷	2016-2017 Monthly	4	MRDL=4.0	0.10 ppm	<1 - 0.22 ppm	Water additive used to control microbes
Lead, ppb ⁸ (Note 3)	August 2015	0	AL=15	<1 90% percentile	ND - ND	Corrosion of household plumbing; erosion of natural deposits
Copper, ppm ⁸	August 2015	0	AL=1.3	0.77 90% percentile	0.024 - 1.03	Corrosion of household plumbing; erosion of natural deposits
Contaminant	Sampling Occurrence	MCLG	MCL	No. of Samples Indicating Presence of Bacteria	Violation (Y/N)	Typical Source of Contamination
Total Coliform Bacteria	Monthly	N/A	TT	0	N	Naturally present in the environment

Footnotes for Tables 1 through 4:

All results reported in the tables above are for samples taken in 2016-2017. Samples taken in 2016 are part of a required four-quarter running average.

The state allows Fort Monroe and NNWW to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though accurate, is more than one year old.

1. At least 90% of the samples were at or below this level. None of the individual samples exceeded the Action Level. Because our lead and copper levels are so low, we only have to test every three years. Lead and copper testing was completed in 2016.

2. The highest detected level of THM and HAA based on a specific location's four quarter running average. The range numbers are the results from individual samples. The data in "Highest Result" column include samples from 2016. The range is from samples taken in 2017.

3. Compliance of Total Organic Carbon (TOC) is based on a running four-quarter average. The range is the individual monthly ratio from both water treatment plants. TOC has no adverse health effects, but can be a critical component in the formation of disinfection by-products. The data in "Highest Result" column include samples from 2016 and is in fact the lowest level of TOC found. The range is for samples taken in 2017.

4. Turbidity is a measure of water cloudiness. It is a good indicator of the effectiveness of our filtration system. 100% of samples were within the turbidity limit.

5. For Chloramines, a system wide annual running average is used. The range numbers are the results from individual samples. The data in "Highest Result" column include samples from 2016. The range is for samples taken in 2017.

6. At the end of each quarter in 2017, we calculated the running annual average for TTHM and HAA5 for each of the sample sites. The test result for TTHM is the highest running annual average of the four running annual averages for each of the sample sites. The test result for HAA5 was similarly determined. The result ranges are the highest and lowest values found in the individual samples collected in 2017.

7. We measure the chloramine residual whenever we collect a compliance bacteriological sample. A running average of the chloramine residuals, which is the average of the last 12 previous monthly chloramine residuals, were calculated every quarter in 2017. The level detected in the table for the chloramines was the lowest of the four quarterly running annual averages. The result range is the lowest and highest residuals found in the individual chloramine measurements in 2017.

8. At least 90% of samples were at or below this level. The test results are 90th percentile values. None of the individual samples exceeded the Action Level. Our next required monitoring will be to collect 5 lead and copper samples during the June 2018 through September 2018 monitoring period.

WATER QUALITY INFORMATION

Sodium: The EPA has no set standard for sodium levels in drinking water. However, levels are usually low and unlikely to be a significant contributor to adverse health effects. The average level of sodium found in our treated water in 2017 was 14 mg/L, and the range was 10 mg/L - 23 mg/L. Should you have a health concern, please contact your health care provider.

Lead: Not detectable in the treated water tested monthly from either treatment plant. However, if present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water comes primarily from materials associated with service lines and home plumbing. NNWW is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. If your water has been sitting for several hours, you can minimize the potential for lead exposure by running your tap for 30 seconds to 2 minutes, or until it becomes cold or reaches a steady temperature, before using water for drinking or cooking. NNWW recommends preparing baby formula with cold water. 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 www.epa.gov/safewater/lead.

Hardness: No EPA standard is set. Water treated by NNWW grains - 6 grains which is equal to 70 mg/L -120 mg/L as calcium carbonate or CaCO₃). The 2017 average was 81 mg/L with a range of 62 mg/L -114 mg/L.

Fluoride: Added to water to prevent tooth decay - Newport News Waterworks adheres to drinking water regulations set by the EPA and guidance provided by the Virginia Department of Health (VDH). VDH has adopted the recommendation of 0.7 mg/l, set by the U.S. Department of Health and Human Services, as the optimum level of fluoride concentration in drinking water. This is the target Waterworks strives to achieve.

Cryptosporidium: A parasitic microbe found in surface waters throughout the U.S. Its likely source is human or animal fecal waste. Our monitoring indicates the presence of these organisms at very low levels in our source water but not in our treated water. Current test methods approved by the EPA do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to

cause disease, and it may be spread through means other than drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline at (800) 426-4791.

PUBLIC PARTICIPATION OPPORTUNITIES

Because NNWW is a department of the City of Newport News, major decisions about your drinking water are made by Newport News City Council. They meet on the second and fourth Tuesdays of each month at 7:00 pm, and you are welcome to attend and participate. These meetings are broadcast live on Newport News City Channel (in Newport News - Cox channel 48 and Verizon FIOS channel 19) and can be viewed live or on-demand by all customers in our service area on the web at www.nnva.gov/nntv.

The Fort Monroe Authority (FMA) is a political subdivision of the Commonwealth of Virginia and is governed by a twelve member Board of Trustees. The FMA Board meets no less than quarterly to discuss operations and to make managerial and financial decisions including matters related to the water distribution system on Fort Monroe. You are welcome to attend and participate in these meetings as well. The schedule of upcoming meetings can be found on the web at www.fmauthority.com/public-meetings/meeting-schedule/.

INFORMATION FOR SPECIAL POPULATIONS

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 Environmental Protection Agency's (EPA) 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 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 are available from the Safe

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