

2001
Water Quality
REPORT

Chesapeake
VIRGINIA
Department of Public Utilities
PO Box 15225
Chesapeake, VA 23328

POSTAL CUSTOMER

PRSR STD
US POSTAGE PAID
NORFOLK VA
PERMIT #427



*It's Safe, it's reliable,
You can depend on it.
Water...for today and tomorrow.*



Water plant operator collecting a sample at the Northwest River

What's New...

Source Water Assessment

A detailed source water assessment was conducted in 2001 to find ways to better protect our water sources. Once it has been reviewed and approved by VDH, the report will provide you with information about potential sources of contamination and measures to reduce or eliminate them.

EPA Regulatory Initiatives

Arsenic – Arsenic is a naturally occurring mineral in soil, water, air, plants, and animals. Studies have linked long-term, chronic exposure to arsenic in drinking water to cancer. After considerable public interest and debate, EPA reduced the MCL for arsenic from 50 ppb to 10 ppb on October 31, 2001. Compliance with the 10 ppb MCL is required in January 2006. Water providers will begin providing health information and arsenic concentrations in annual reports for water that exceeds 5 ppb (one-half of the MCL). Arsenic was not found in any of Chesapeake's sources.

Stage 1 Disinfectants and Disinfection Byproducts (DBP) Rule – This rule is the first of a staged set of rules that will reduce the allowable levels of DBPs in drinking water. The deadline for compliance is January 1, 2002. The purpose of the rule is to improve public health protection. Under this rule Chesapeake is monitoring haloacetic acids (HAA5) and trihalomethanes (THM). HAA5s have an MCL of 60 parts per billion. THMs MCL is reduced from 100 to 80 parts per billion.

Unregulated Contaminants Monitoring Regulation (UCMR) Rule – The rule was finalized in January 2001 to determine the MCLs for selected compounds. The rule applies to all large systems serving more than 10,000 persons. Surface water systems such as the Northwest River Water Treatment Plant must monitor during four consecutive quarters. The City of Chesapeake started the program in August 2001 and the Virginia Department of Health (VDH) has approved the sampling schedule. All results are being submitted to the VDH and the EPA. You can find more information about EPA's regulations on the Internet www.epa.gov/safewater/ or call the Safe Drinking Water Hotline at 1-800-426-4791.

High Water Quality = Top Priority

The City of Chesapeake provides this report. We want you to have confidence in the high quality drinking water we supply you. You will find important information about Chesapeake's water sources that tells about how we work to purify the water you receive at your tap. The results of the testing we perform to ensure the high quality of Chesapeake's drinking water supply is also included. The federal Safe Drinking Water Act (SDWA) sets the standards and this report is one of the provisions of the SDWA 1996 Amendments.



Chemist using flame atomic absorption analyzer

In order to produce the approximately 16 million gallons a day for about 55,300 customers, more than 110,000 analyses throughout the treatment process are performed. Water quality sampling in the homes and businesses at approximately 500 locations around the city tells the story of how well we are doing.

We are committed to continuous improvement. Membership and participation in national and international professional organizations keeps the City up-to-date on the industry innovations. We are members of the **American Water Works Association (AWWA)** and its **Partnership for Safe Water (PSW)**, an association of water utilities and government entities committed to drinking water quality that is superior to that required by federal regulations. We provide financial support to the **American Water Works Association Research Foundation (AWWARF)**, which funds and publishes the results of many projects every year aimed at improving management and treatment of water and wastewater facilities. We belong to the **Association of Metropolitan Water Agencies (AMWA)**, whose membership is limited to utilities with at least 50,000 customer accounts. We are members of the **American Membrane Technology Association (AMTA)**, and the **Water Environment Federation (WEF)**.

On the local scene, the City provides financial and technical support to the regional **Hampton Roads Planning District Commission (HRPDC)**, which coordinates many research, public education and information programs. Some of these programs are Hampton Roads Water Efficiency Team (HR WET), Hampton Roads Stormwater (HR Storm), Hampton Roads Clean (HR Clean), the Groundwater Committee, the Water



Chemist collecting samples from RO membrane train

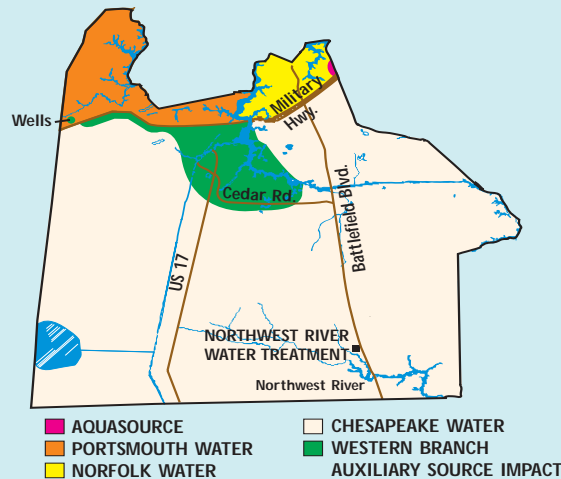
Supply Committee, Help 2 Others (H2O), Southern Watershed Area Management Program (SWAMP) and Source Water Assessment Program (SWAP). We are members of the **Hampton Roads Utility and Heavy Contractors Association (HRUHCA)** and the **Virginia Cross-Connection Control Association (VCCCA)**.

The AWWA **QualServe** program, believing that good ideas can come from any level of the organization, continues to involve employee volunteers in the on-going improvement of the Public Utilities Department. Projects completed during the past year include installation of the maintenance management system at the treatment plant, a rate study, and several employee-related initiatives.

Reliability = 3 Sources Plus

To provide water to the City's increasing population, there are three major water sources, Northwest River Water Treatment Plant and the cities of Norfolk and Portsmouth, plus one auxiliary source, which is used during peak demand periods. These sources are described below.

The City's Northwest River Water Treatment Plant, located at 3550 South Battlefield Boulevard, treats up to 10 million gallons a day (mgd) from the Northwest River. The plant also treats brackish ground water from four wells located along South Battlefield Boulevard. The plant capabilities include both the conventional processes of coagulation, sedimentation, and filtration as well as reverse osmosis (RO) membrane treatment. This supply serves customers south of Military Highway.



The City purchases bulk treated water from two neighboring cities, Norfolk and Portsmouth. Customers in the Indian River and South Norfolk areas north of Military Highway receive water from the city of Norfolk. Water customers in Western Branch and Deep Creek north of Military Highway receive water from the city of Portsmouth. These sources are of excellent quality and meet or exceed the SDWA standards.

The Western Branch Auxiliary Source is located near the Hampton Roads Airport. This source contains groundwater from the Western Branch Well #1 blended with Aquifer Storage and Recovery (ASR) water. This source is used to meet peak demand and serves roughly the Deep Creek area below Military Highway with a maximum reach to the Civic Center on Cedar Road.

A private water company, **AquaSource**, has a franchise area in the Norfolk Highlands neighborhood, which serves approximately 450 customers. Inquiries may be addressed to Mr. Dale Kyser, Project Manager, at 804-448-3770.

Treatment and Testing = Quality Control

The Northwest River Water Treatment Plant sources are both river water and brackish well water. The river water is treated first through the conventional process of coagulation, sedimentation, and filtration. Then the water is filtered through the reverse osmosis (RO) membrane plant as necessary to maintain high quality and to mitigate salt-water intrusion events. One hundred percent of the brackish well water is treated with the RO membranes and blended with treated surface water.

The Utilities Department operates 24 hours a day, seven days a week, to produce a reliable supply of superior quality drinking water, as well as to ensure a sufficient quantity of water, customer satisfaction, and the environmental integrity of our source water.

Spotlighting Cross Connection Control

Cross connection control is a federally mandated program to prevent contamination resulting from backflow of liquids into the public water supply. The program provides education, inspection, and regulation of back flow devices. For more information contact the Engineering Division at 757-382-6671.



Cross connection inspector examines industrial back flow device

The Future = Lake Gaston Project

Looking toward the future needs of the City, the Lake Gaston Project will provide 10 mgd for thirsty customers. The Project is currently in Phase II, building a pipeline to transport untreated Lake Gaston water from Suffolk into Chesapeake. A new water treatment plant, adjacent to the Hampton Roads Airport and two in-town lakes for storage are under design. Expected completion for this project is 2006.



Water plant maintenance mechanic checking chemical feed system

Want More Information?

If you have any questions about this report or need more information, please contact the Water Quality Laboratory at 757-382-3550. The following telephone numbers are provided for specific issues or questions:

Customer Service (billing) 757-382-6352
 Laboratory (water quality) 757-382-3550
 Water Quality Hot Line 757-382-6360

Visit our web site for online information at www.chesapeake.va.us, then click on Public Utilities. Contact us by E-mail at water@city.chesapeake.va.us.

The Business Office is located at City Hall, second floor, 306 Cedar Road, Chesapeake, VA 23322. It is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. Address correspondence to Chesapeake Department of Public Utilities, P.O. Box 15225, Chesapeake, VA, 23328.

Director Amar Dwarkanath, P.E.
 Financial/Customer Service Administrator Markiella A. Moore
 Maintenance & Operations Administrator Gurmukh S. Dulai, P.E.
 Utility Engineer William J. Meyer, Jr., P.E.
 Water Production Superintendent A. Craig Maples

Water Works Permit Identification Numbers

Northwest River System – PWSID 3550051
 South Norfolk/Indian River System – PWSID 3550052
 Western Branch System – PWSID 3550050

Public Participation

The Utilities Department is funded by customer fees, not taxes. However, it is part of the City of Chesapeake government. Our legislative body is the Chesapeake City Council, which holds hearings on budget and other financial matters, approves contracts and considers ordinances that create or amend local laws. Some of these matters affect the operation of the Public Utilities Department. The City Council meets on the 2nd, 3rd, and 4th Tuesdays of each month at 6:30 p.m. in the City Council Chambers, First Floor of the City Hall Building, 306 Cedar Road. The meetings are televised live on WCTV Channel 48, the local government access cable channel. Agendas for upcoming meetings may be requested from the City Clerk's office at 757-382-6151.



Customer Service: "May we help you?"

Special Concerns?

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. Environmental Protection Agency/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Act Hotline at 1-800-426-4791.

Additional Information

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 sewage treatment plants, septic systems, agricultural livestock operations, and wildlife; (2) 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; (3) pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses; (4) organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial process and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; (5) radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure the tap water is safe to drink, the EPA prescribes regulations that limit the amount of 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.

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 Safe Drinking Water Hotline at 1-800-426-4791 or accessing the EPA web site at www.epa.gov/safewater/.

2001 Water Quality Table

Highest level and range, if available, detected by analyses performed in the calendar year 2001, or for the most recent testing in accordance with the regulations. An additional 180 compounds were tested for and not detected.

Regulated Substances

Substance (Unit)	MCL	MCLG	NWR Highest Level & Range	N Highest Level & Range	P Highest Level	Likely Source	Meets EPA Stds.	
Asbestos (MFL) (tested every 9 years)	7	7	0.26 [1995]	0.55 ND-0.55	Testing Waived	Erosion of natural deposits	✓	
Barium (ppm)	2	2	ND	0.03 0.02 – 0.03	ND	Erosion of natural deposits	✓	
Di(2-Ethylhexyl)phthalate (ppb)	6	0	ND	0.9 ND – 0.9	ND	Contamination from plastics	✓	
Gross Alpha Activity (pCi/L) (tested every 4 years) *ASR/WB#1 Source only	15	0	0.20 0.06 – 0.20 [1999] 2.3* [2000]	0.4	0.70	Erosion from natural deposits	✓	
Gross Beta Activity (pCi/L) (tested every 4 years) **EPA considers 50 pCi/L to be the level of concern for beta particles	50**	0	2.3 1.7 – 2.3 [1999] 7.5* [2000]	2.6 2.3 – 2.6	3.9	Erosion from natural deposits	✓	
Nitrate (ppm)	10	10	0.78 ND – 0.78	0.11 0.02 – 0.11	ND	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits	✓	
Radium 226/228 (pCi/l)	5	0	ND	0.5 0.2 – 0.5	ND	Erosion of natural deposits	✓	
			NWR					
	MCL	MCLG	Treatment Plant	WB#1 [†]	N [‡]	P [‡]		
Fluoride (ppm)	4	4	0.99 0.87 – 0.99	4.57 1.49 – 4.57	1.11 0.78 – 1.11	1.38 0.76 – 1.38	Natural, water additive which promotes strong teeth	✓ See notes below

Public Notice to Consumers of the City of Chesapeake Northwest River System Waterworks:

This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/L) of fluoride for prolonged periods may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system had an average fluoride concentration of 2.34 milligrams per liter (mg/L) in 2001, at the entry point of our ASR and Western Branch wells. The elevated fluoride was a result of using the WB#1 for 22 days during a mechanical failure of the ASR well, as reported to the public. This entry point provided 7% of the total water supplied to the Northwest River System and serves roughly the Deep Creek area below Military Highway.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in development teeth before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

For more information, please call the Water Quality Laboratory of Chesapeake Public Utilities at 757-382-3550.

*Norfolk and Portsmouth supplies met the EPA standards for fluoride.

Substance (Unit)	MCL	MCLG	NWR	N	P	Likely Source	Meets EPA Stds.
Turbidity	Max. TT, 5	NA	Max. 0.24	Max. 0.48	Max. 0.17	Soil runoff	✓
	Min. TT, less than or equal to 0.5, greater than 95%	NA	Min. 99.9%	Min. greater than 95%	Min. 100%		✓

Substance (Unit)	MCL	MCLG	NWR		N		P		Likely Source	Meets EPA Stds.
			Range at Sampling Sites	Highest Running Quarterly Average	Range at Sampling Sites	Highest Running Quarterly Average	Range at Sampling Sites	Highest Running Quarterly Average		
TTHM – Total Trihalomethanes (ppb)	100	0	17 – 61	51	35 - 74	71	40 - 74	72	By-product of drinking water chlorination	✓

Microbial Substances

Substance (Unit)	MCL	MCLG	NWR	N	P	Likely Source	Meets EPA Stds.
Total Coliform Bacteria	5% of monthly samples are positive	0	1 sample in August	ND	ND	Naturally present in the environment	✓

Lead and Copper (90th percentile)

Substance (Unit)	MCL	MCLG	NWR	N	P* [2000]	Likely Source	Meets EPA Stds.
Copper (ppm) (plant effluent)	AL=1.3	1.3	ND	ND	ND	Erosion of natural deposits	✓
Copper (ppm) (house tap)	AL=1.3	1.3	0.070 0.002 – 0.142	0.140 0.001 – 0.385	0.140 0.018 – 0.300	Corrosion of household plumbing	✓
Lead (ppb) (plant effluent)	AL=15	0	ND	ND	ND	Erosion of natural deposits	✓
Lead (ppb) (house tap)	AL=15	0	0.003 ND-0.068	0.0046 ND-0.0153	0.002 ND-0.004	Corrosion of household plumbing	✓
# of Samples above AL of 1.3 ppm for copper			0	0	0		✓
# of Samples above AL of 15 ppb for lead			2 out of 60	1 out of 31	0 out of 30		✓

*This system is on Reduced Monitoring. This means after meeting 3 consecutive years of lead and copper monitoring with results below the AL, EPA requires sampling once every three years.

Cryptosporidium & Giardia

Substance (Unit)	MCL	MCLG	NWR/Wells	N	P	Likely Source
Cryptosporidium (organisms/liter)	None	None	ND	ND	NA	Warm blooded animals living in the watershed
Giardia (organisms/liter)	TT	0	ND	ND	8†	Warm blooded animals living in the watershed

Since 1994 the Utility Department has tested quarterly for Cryptosporidium and Giardia in the Northwest River system and the organisms have never been detected in the raw or finished water.

† Two occurrences collected in 1998 in the source water prior to treatment.

Additional Water Quality Parameters

These substances are not considered harmful, but some can affect the taste and odor of drinking water.

Substance (Unit)	Suggested Limit	NWR Highest Level & Range	N Highest Level & Range	P Highest Level & Range	Likely Source
Aluminum (ppm)	0.05 – 0.2	ND	0.25 0.10 – 0.25	ND	Erosion of natural deposits
Ammonia (ppm)	None	0.55 0.17 – 0.55	NA	0.68	Runoff from fertilizer use; by-product of drinking water chloramination
Calcium (ppm)	None	33.2 16.4 – 33.2	NA	19.4	Erosion of natural deposits
Chloride (ppm)	250	76 67 – 76	19 12 – 19	18.5	Erosion of natural deposits; saltwater intrusion
Color (CU)	15	ND	ND	NA	Erosion of natural deposits
Hardness – total (ppm)	None	48 22 – 48	64 28 – 64	24.9	Erosion of natural deposits
Iron (ppm)	0.3	ND	0.07 ND – 0.07	ND	Erosion of natural deposits; leaching from pipes
Manganese (ppm)	0.05	ND	0.028 ND – 0.028	ND	Erosion of natural deposits; by-product of drinking water treatment process
MTBE (ppb) methyl tertiarybutyl ether	None	2* 0 – 2	ND	ND	A gasoline additive
Orthophosphate (ppm)	None	0.54 0.46 – 0.54	NA	NA	Runoff from fertilizer use and natural deposits; treatment corrosion inhibitor
pH (pH units)	6.5 – 8.5	7.9 6.1 – 7.9	9.0 6.4 – 9.4	7.7 7.3 – 7.7	Drinking water treatment process
Sodium (ppm)	250	159 76 – 159	24 9 – 24	66.6	Erosion of natural deposits; saltwater intrusion, residual of drinking water treatment
Sulfate (ppm)	250	58 36 – 58	34 21 – 34	NA	Erosion of natural deposits; saltwater intrusion, residual of drinking water treatment
Zinc (ppm)	5	0.39 ND – 0.39	0.28 ND – 0.28	ND	Erosion of natural deposits

*Although MTBE was detected during 2001, it was detected as part of the Unregulated Monitoring Rule. A confirmation sample was collected and revealed a negative result.

Table Definitions

Substances in your drinking water are routinely monitored by the VDH according to Federal and State Regulations. The 2001 Water Quality Table shows the results of our monitoring for the period of January 1 to December 31, 2001 unless otherwise stated. In the table and elsewhere in this report you will find many terms and abbreviations you might not be familiar with. The following definitions are provided to help you better understand these terms:

Additional Water Quality Parameters – the compounds that may affect drinking water aesthetics such as taste, odor and color.

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

CU (Color Units) – a measure of the color of water.



Chemist identifying and counting plankton

Detected Substances – compounds detected in Chesapeake's drinking water during calendar year 2001. All amounts detected are below SDWA maximum allowable levels. The SDWA requires that the highest value detected and the range, if available, during the calendar year be provided in this report. An additional 180 compounds were tested for and not detected. A full list of these test results is available from the Laboratory at 757-382-3550.

Likely Source – the major sources of the compounds detected in the finished water.

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.

MFL – Million Fibers per Liter.

Microbial Substance – disease-causing organisms that, at certain levels, may be harmful. More information about *Cryptosporidium* and *Giardia* is supplied in this report.

N (Norfolk System Results) – the highest level and range, if available, of the compounds detected in the finished water supplied by the city of Norfolk for Chesapeake customers.

NA – not available.

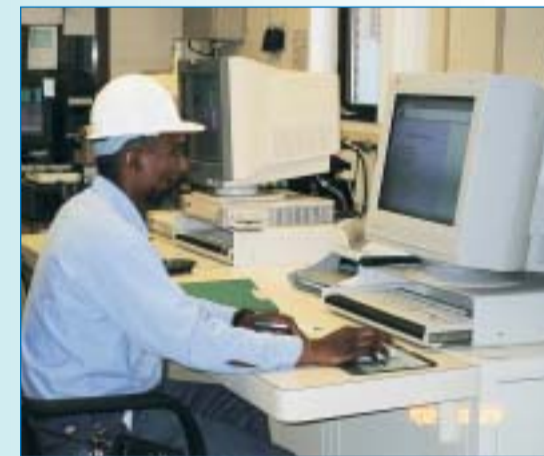
ND – not detected, lab analysis indicates that the contaminant is not present or was below the level of detection.

NTU (Nephelometric Turbidity Unit) – a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

NWR (Northwest River System Results) – The highest level and range, if available, of the compounds detected in the finished water processed at the Northwest River Water Treatment Plant, a conjunctive (combined) surface and brackish well water source, and the Western Branch Well #1 and Aquifer Storage and Recovery (ASR) water source. The Western Branch auxiliary source is used during heavy demand on the Northwest River system.

P (Portsmouth System Results) – the highest level and range, if available, of the compounds detected in the finished water supplied by the city of Portsmouth for Chesapeake customers.

pCi/L (PicoCuries per Liter) – a measure of radioactivity in water.



Water plant operator at computer controls

ppb (parts per billion) – One part per billion is the equivalent of one minute in 2,000 years or one penny in \$10,000,000.

ppm (parts per million) – One part per million is the equivalent of one minute in 2 years or one penny in \$10,000.

Plant Effluent (see Lead & Copper) – water leaving the plant after going through the treatment process.

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

TTHMs (Total Trihalomethanes) – compounds formed during the chloramination (disinfection) of drinking water.



Water distribution crew making a water line repair