

The City of Norfolk Department of Utilities is committed to providing residents and businesses throughout the City with top quality water service. Utilities' employees are on-call 24 hours a day, 365 days a year to ensure that you always have access to safe Norfolk drinking water. The Water Quality Report is distributed annually to inform our customers that we are meeting all water quality guidelines set forth by the Environmental Protection Agency.

Once again in 2011, Norfolk tap water met all federal requirements.

**City of Norfolk  
Department of Utilities  
Contact Information:**

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Norfolk, VA 23510

Mailing Address: P.O. Box 1080  
Norfolk, VA 23501

Customer Service: 757-664-6700  
Water & Sewer Emergencies: 757-823-1000  
Water Quality Lab: 757-441-5678

[www.norfolk.gov/utilities](http://www.norfolk.gov/utilities)

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NORFOLK DEPARTMENT OF UTILITIES  
**2012  
Water Quality Report**  
Based on 2011 Testing Data



**Top Quality Drinking Water  
Top Quality Service  
757-664-6700  
[www.norfolk.gov/utilities](http://www.norfolk.gov/utilities)**

*Please share this information with people who drink this water, especially those who may not have received this notice directly. You can do this by posting this notice in a public place or by distributing copies by hand or by mail.*

**Norfolk Drinking Water  
Tap Into Quality**



**Quality of Life**

Any measure of a successful society (economic diversity, productivity, public safety) is in some way related to the access to safe drinking water. In Norfolk, safe water is always accessible to drink, wash our clothes, water our lawns and for myriad other purposes. In all our activities, we are reminded of the extraordinary value of water.



**Support for the Economy**

Businesses or residential communities succeed with a safe and sustainable water supply. Tap water is critical to businesses' day-to-day operations and is often a primary ingredient in the services and products they create. Norfolk's Department of Utilities continues to invest in the water infrastructure to accommodate the City's growing business and residential population. Water capital improvement projects are continuing across the City.



**Public Health Protection**

Norfolk began treating drinking water long before it was commonplace and decades before it was required by law. The central water system was created in 1871 and the sewer system in 1889. By the 1930's Norfolk experienced a significant drop in death rates caused by waterborne illnesses. Water distribution and wastewater collection are two of the City's oldest public services and contribute significantly to the protection of public health.

**Public Safety**

A well maintained water system is critical in protecting our communities from the ever present threat of fire. The ability to suppress fires also influences new home construction, business location decisions and insurance rates.

**WATER**

**Celebrate the essential.**

Lately, there's been a lot of talk about getting back to what's most important - to celebrating the essential parts of our lives.

And, really, what's more essential than water? It's a vital element of our daily lives, and the original source for refreshment and hydration.

So, this Drinking Water Week, let's celebrate the essential. **Let's celebrate water.**

May 6-12, 2012  
**Drinking Water Week 2012**

American Water Works Association

The City of Norfolk receives its raw (untreated) water from eight reservoirs, two rivers and four deep wells. The map at right shows the location of each of your water sources. From these sources, raw water is pumped to one of the Department of Utilities' two water treatment plants, where it is filtered and disinfected. Once tested to meet water quality standards, Norfolk drinking water is pumped on demand to your tap.



## Definitions

- **MCL (maximum contaminant level)**, the highest level allowed by regulation
- **MCLG (maximum contaminant level goal)**, the ideal goal
- **MRDL (maximum residual disinfectant level)**, the highest level of a disinfectant allowed in drinking water
- **MRDLG (maximum residual disinfectant level goal)**, the level of a drinking water disinfectant below which there is no known or expected risk to health
- **TT (treatment technique)**, a required process intended to reduce the level of a substance in drinking water
- **AL (action level)**, the amount required to trigger treatment or other action
- **LIKELY SOURCE**, where it could come from
- **REGULATED SUBSTANCES** are regulated by the EPA and they cannot be above the MCL
- **TURBIDITY** is a measure of the cloudiness of water, which is not necessarily harmful, but can interfere with the disinfection of drinking water
- **MICROBIOLOGICAL CONTAMINANTS** are used as an indicator that other, potentially harmful bacteria may be present
- **UNREGULATED MONITORED SUBSTANCES** are not regulated by the EPA, but they must be monitored so information about their presence in drinking water can be used to develop limits
- **SMCL (secondary maximum contaminant levels)**, which are recommendations
- **Norfolk's Average Level**, the average level of a detected compound or water quality parameter
- **Norfolk's Maximum Level**, Norfolk's single highest level of a detected compound or water quality parameter

## Table Key

- ppm – One part per million (equivalent to 1 minute in 2 years).
- ppb – One part per billion (equivalent to 1 minute in 2,000 years).
- pCi/L – Picocuries per liter (measure of radioactivity).
- NTU – Nephelometric Turbidity Unit (measure of very small particulate matter in drinking water).
- > – Greater than.
- ND – Not detected in the water.

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. It can also pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source (raw) 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 and herbicides**, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- **Radioactive contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In 2001 the Hampton Roads Planning District Commission conducted a study on all the raw water sources in the area, including Norfolk's, to determine the susceptibility of reservoirs, rivers, and wells to contamination. Norfolk's susceptibility has been rated high. Norfolk's water treatment process ensures you receive high quality treated tap water that meets all Federal Safe Drinking Water Act requirements. For a copy of this study contact Norfolk's Water Quality Lab at 757-441-5678.

In order 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. FDA regulations establish limitations 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 (trace) amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. **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, persons 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 and other microbial contaminants are available from:**

**Environmental Protection Agency's  
Safe Drinking Water Hotline  
800-426-4791**

For questions regarding this report contact Norfolk's Water Quality Lab at 757-441-5678. For more information about decisions affecting your drinking water quality, you may attend Norfolk City Council meetings. For times and agendas, call the City Clerk's office at 757-664-4253.

## Regulated Substances

Substance	Likely Source	Norfolk's Measured Range	Norfolk's Average Level	Norfolk's Highest Level	MCL	MCLG	Unit	Meets EPA Standards
Barium	Erosion of natural deposits	0.020 - 0.033	0.028	0.033	2	2	ppm	
Chloramine	Drinking water disinfectant	2.8 - 3.5	3.3	3.5	4 <sup>1A</sup>	4 <sup>1B</sup>	ppm	
Fluoride	Added to prevent tooth decay	0.1 - 1.0	0.7	0.8 <sup>2</sup>	4	4	ppm	
Haloacetic Acid (HAA5)	Disinfection by-product	18 - 48	32	38 <sup>3</sup>	60	n/a	ppb	
Nitrate as Nitrogen	Erosion of natural deposits, runoff	0.12 - 0.27	0.17	0.27	10	10	ppm	
Selenium	Erosion of natural deposits, runoff	ND - 2	ND	2	50	50	ppb	
Total Organic Carbon	Occurs naturally in environment	1.8 - 3.6	2.5	3.2 <sup>2</sup>	TT	n/a	ppm	
Trihalomethanes (TTHM)	Disinfection by-product	19 - 90	47	46 <sup>3</sup>	80	n/a	ppb	

<sup>1A</sup> MRDL <sup>1B</sup> MRDLG <sup>2</sup> Highest monthly average for calendar year <sup>3</sup> Highest running average of quarterly compliance samples for the calendar year

## Turbidity

Substance	Likely Source	Norfolk's Lowest Monthly % of Samples Meeting Limit	Norfolk's Highest Level (NTUs)	MCL	MCLG	Unit	Meets EPA Standards
Turbidity <sup>1</sup>	Soil runoff	100%	0.23	<1.0 maximum, and ≤0.3 95% of the time	n/a	NTU	

<sup>1</sup>Water Utilities are required by *Waterworks Regulations* to continuously monitor the turbidity levels of the water leaving each of the filters in the treatment plant, and to record this information every 15 minutes. On November 3, 2011, a power surge caused the meter on 1 of the 43 filters at Norfolk's treatment facilities to give false readings for a period of ten hours. In such cases, facilities are required to manually analyze a turbidity sample from that filter every four hours until the meter is repaired. Since the erroneous readings were not immediately detected, the required monitoring was not conducted. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. There is no indication that water quality was affected. However, this is considered a violation of facility operations monitoring standards. To avoid a recurrence, additional alarm set points were added.

## Microbiological Contaminants

Substance	Likely Source	Norfolk Samples Indicating Bacteria Present	Norfolk's Highest Monthly % of Positive Samples	Norfolk's Months of Presence	National MCL	National MCLG	Meets EPA Standards
Total Coliform Bacteria	Natural in environment	7	1.3%	Apr, May, June, Aug, Sept	5% of samples per month positive for total coliform	0%	

## Lead and Copper in Customers' Homes (data from 2011 triennial sampling)

Norfolk has extremely low lead levels in its drinking water system. Because of this, the EPA has placed Norfolk on a reduced monitoring schedule. In 2011, no lead was detected at the monitoring level.<sup>1</sup>

Substance	Likely Source	Norfolk's Results <sup>1</sup>	Norfolk Homes Exceeding Action Level	Action Level	Unit	MCLG	Meets EPA Standards
Lead	Household plumbing corrosion	< 2.5	0	15	ppb	0	
Copper	Household plumbing corrosion	0.1	0	1.3	ppm	1.3	

<sup>1</sup>Lead and copper compliance is measured at the 90<sup>th</sup> percentile of all samples taken.

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 Norfolk Department of 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 30 seconds to 2 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 (800-426-4791) or at <http://www.epa.gov/safewater/lead>.

## Secondary and Unregulated Monitored Substances

Substance	Likely Source	Norfolk's Range	Norfolk's Average Level	Norfolk's Highest Level	SMCL <sup>1</sup>	Unit
Aluminum	Erosion of natural deposits; also from the use of chemicals at the water treatment plant	0.02 - 0.06	0.04	0.06	0.2	ppm
Boron	Erosion of natural deposits	ND - 0.1	ND	0.1	n/a	ppm
Chloride	Natural in environment	13 - 24	18	24	250	ppm
Iron	Natural in environment	0.01 - 0.1	0.02	0.1	0.3	ppm
Manganese	Natural in environment	ND - 0.01	ND	0.01	50	ppm
pH	Adjusted during the water treatment process	7.4 - 7.8	7.6	7.8 <sup>1</sup>	6.5 - 8.5	pH units
Nickel	Corrosion of plumbing materials	ND - 0.003	ND	0.003	n/a	ppm
Sodium	Natural in environment; also from the use of chemicals at the water treatment plant	11 - 23	17	23	n/a <sup>2</sup>	ppm
Sulfate	Natural in environment; also from the use of chemicals at the water treatment plant	23 - 38	30	38	250	ppm
Total Dissolved Solids	Natural in environment	94 - 115	105	115	500	ppm
Zinc	Natural in environment; also from the use of chemicals at the water treatment plant	0.03 - 0.22	0.12	0.22	5	ppm

<sup>1</sup> Highest monthly average for calendar year

<sup>2</sup> For physician-prescribed "no salt diets," a limit of 20 ppm is suggested

## Additional Information

The substances listed below are not regulated by the EPA; however, the Water Quality Lab provides this information as a service to our customers.

Substance	Norfolk's Range	Norfolk's Average Level	Unit
Alkalinity	17 - 40	27	ppm
Ammonia	ND - 0.5	0.1	ppm
Hardness	19 - 67	45	ppm
Silica	1 - 6	4	ppm