

2013 Drinking Water Quality Report

Central System

LOUDOUN  WATER

For the year ending 2012

Introduction

Loudoun Water is pleased to present your annual water quality report. The information in this report represents data collected and reported in 2012, unless otherwise noted. The Safe Drinking Water Act of 1974 (SDWA) sets the limits for contaminants in drinking water. These limits are represented in this report as MCLs, or Maximum Contaminant Levels. The SDWA was amended most significantly in 1986 and 1996.

The tables you see in this report provide the actual data collected on your water throughout the year. Table One, on page 12, shows the quality of the water as it flows within the Loudoun Water distribution system. Table Two, on page 13, shows the quality of the water as it leaves the two treatment plants which supply us water.

Please contact us at any time to obtain our latest data. If your question or concern is not answered here, please let us know so we can get the answer for you. You may find your answers at www.loudounwater.org or you may call Customer Service during business hours Monday through Friday at 571.291.7880. For after hours emergencies, call 571.291.7878.

We invite you to attend our monthly Loudoun Water Board Meetings, usually held the second Thursday of each month at 3 p.m. in the Boardroom of our Administration office at 44865 Loudoun Water Way, Ashburn, VA 20147.

You can learn more about Loudoun Water board Meeting including upcoming meetings by visiting www.boarddocs.com/va/lwva/Board.nsf/Public.



Dear Loudoun Water Customer:



As Chairman of the Loudoun Water Board of Directors, I'm pleased to present our 2013 Annual Drinking Water Quality Report. I hope you will take the time to review this report. It provides detailed information about where your drinking water comes from, how it is treated and what tests we perform to ensure that your drinking water meets or exceeds all regulatory standards for quality and safety.

We believe that our customers share in our achievements. Great water quality goes hand-in-hand with healthy families, strong communities and a vibrant region. As a leading water authority in the United States, our strategic vision, innovative spirit and commitment to continual improvement helps secure the future of Loudoun County and our way of life. We are committed to delivering to you, our customers, exceptional water quality and we are dedicated to sustainable business practices in order to provide the best possible value to our customers and the communities we serve.

Thank you for taking time to read this report. Our staff is available to answer any questions that you may have. Please contact us if you would like our staff to speak in your community about our water quality, conservation or utility operations. For additional information about Loudoun Water, I encourage you to visit our website at www.loudounwater.org.

Sincerely,

A handwritten signature in black ink, appearing to read "Fred E. Jennings". The signature is fluid and cursive.

Fred E. Jennings
Chairman
Loudoun Water Board of Directors



Dear Loudoun Water Customer:



At Loudoun Water, our practices are transparent, innovation is flowing and our mission is clear: we provide sustainable water services that protect the environment and promote the health and quality of life of our customers. Our 2013 Annual Drinking Water Quality Report, based on data from 2012, demonstrates that we are fulfilling this mission. I'm pleased to report that, once again, the drinking water that we provide our customers is of exceptional quality.

You may rarely think about your drinking water, where it comes from, how it is treated and tested, or the efforts needed to provide sustainable service. That's okay, because at Loudoun Water we think about all of this and more. By demonstrating that our water is meeting the rigorous standards set forth by USEPA and the Virginia Department of Health, I hope this report gives you further peace of mind. We take great pride in knowing that our customers can rely on our focused management, proactive workforce and attention to detail. Your confidence is our commitment to quality.

As always, we want to know what you think about the job we're doing and learn from you how we can improve. I encourage you to relay your comments to us by phone, email or via our website: www.loudounwater.org. Thank you for taking time to learn more about us and the quality of your water.

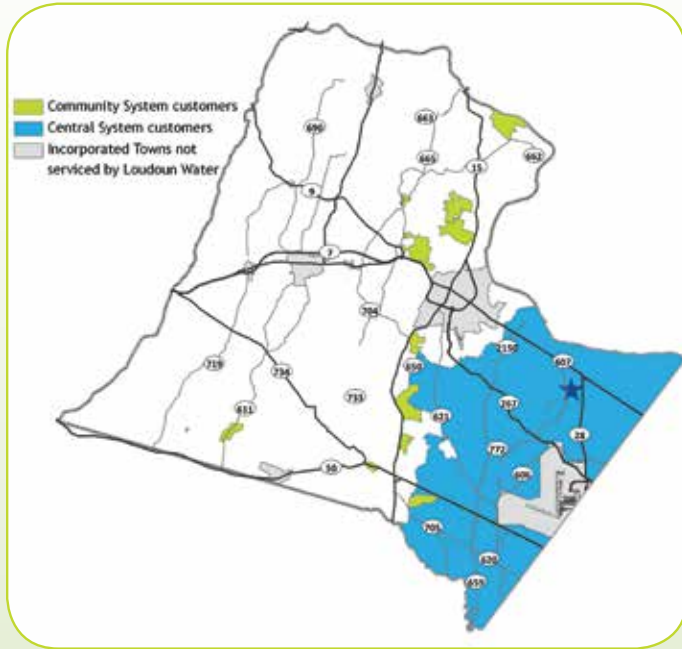
Sincerely,

A handwritten signature in black ink that reads "Dale C. Hammes".

Dale C. Hammes
General Manager



Loudoun Water Service Area



A Brief History of Loudoun Water

The Loudoun County Sanitation Authority, doing business as Loudoun Water, is a state-chartered authority, formed in 1959 by resolution by the Loudoun County Board of Supervisors under the Virginia Water and Waste Authorities Act.

Headquartered in Ashburn, Virginia, Loudoun Water provides water and wastewater service to residents and businesses in the unincorporated areas of Loudoun County, which includes nearly all residents and businesses east of Route 15. At last count, Loudoun Water serves more than 200,000 people in our Central Service Area.

As an authority, Loudoun Water makes no profit and its operations and finances are independent of the County's tax-supported services. We operate on the income collected from you in the form of water and wastewater user fees. New water and wastewater infrastructure needed to serve new developments in Loudoun County are paid for by the developers themselves, so that current customers do not fund new water and sewer infrastructure needed to serve new growth.

Your Water Sources

Your drinking water comes from two surface water sources: the Potomac River and Goose Creek. The Potomac River is augmented by reservoirs in Maryland, Virginia and West Virginia through a shared supply agreement we have with neighboring water providers. Beaverdam Creek Reservoir fills Goose Creek Reservoir when it gets low and vice versa. Loudoun Water does not treat this water. We purchase your drinking water from Fairfax Water and the City of Fairfax through contractual agreements, and they provide it to us fully treated.





Source Water Assessment

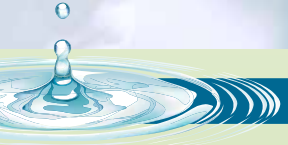
Since the Loudoun Water system has two sources of water (Potomac River and Goose Creek), two source water assessment reports have been conducted by the Virginia Department of Health. These reports consist of maps showing the source water assessment areas, an inventory of known land-use activities of concern and documentation of any known contamination. Based on state criteria, both sources are considered to be highly susceptible to contamination. Additional information about these reports can be obtained by contacting Beate Wright, Manager of Water Quality at 571-291-7931, or bwright@loudounwater.org.

What is in Your Water?

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency (EPA) Safe Drinking Water Hotline at (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 radioactive material and can pick up substances resulting from the presence of animals or human activity. Contaminants that may be present in the water include:

- Microbes (viruses or bacteria) from septic systems, agricultural livestock operations, wildlife and wastewater treatment plants
- Inorganics, such as salts and metals, which can occur naturally or result from



storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming

- Pesticides and herbicides from agriculture, urban runoff and residential uses
- Organics, like synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production; and can also come from gas stations, urban storm water runoff and septic systems
- Radioactive contaminants, either naturally occurring or the result of oil and gas production or mining activities

What Do We Test For?

- Bacteriological analysis is performed daily. It is reported based on the presence or absence of total and Escherichia coliform. Their presence indicates potential health risks for individuals exposed to this water. Loudoun Water tests for coliform bacteria at approximately 121 locations. Total coliform bacteria must not be present in more than five percent of monthly samples.
- Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5) analysis is a quarterly monitoring requirement. Both of these can form in the water supply as chlorine reacts with organic matter. When ingested in large quantities, these chemicals are suspected human carcinogens, so we monitor for them closely. The legal limit for TTHMs is a system running annual average of 80 parts per billion (ppb). For HAA5, the limit is a system running annual average of 60 ppb. Loudoun Water tests for TTHMs and HAA5 at ten locations.
- Corrosion control parameters (orthophosphate and pH) are a semiannual monitoring requirement. By dosing a minimum of 0.50 ppm orthophosphate

and maintaining a minimum pH of 6.5, we reduce the potential for corrosion of lead, copper and other metals. Loudoun Water tests for these at 10 locations.

Lead in Drinking Water

What is the EPA standard for lead in drinking water?

EPA has established an Action Level for lead in water of 15 parts per billion (ppb). When lead testing is performed as required by EPA, 90 percent of the samples must contain less than 15 ppb. This is usually referred to as the 90th percentile results being less than 15 ppb. The Action Level was not designed to measure health risks from water represented by individual samples. Rather, it is a statistical trigger value that, if exceeded, may require more treatment, public education, and possibly lead service-line replacement where such lines exist. (Loudoun Water does not have any lead service lines in its system.)

Loudoun Water has been testing for lead in accordance with EPA's Lead and Copper Rule (LCR) since 1992. In 2011, the 90th percentile value for lead was 2 ppb compared to the EPA action level of 15 ppb. The Virginia Department of Health requires Loudoun Water to monitor for lead at 50 locations every three years, with the next monitoring event to occur in 2014.



Where does lead in drinking water come from?

Although some utilities use raw source waters that contain lead, Loudoun Water's sources do not contain lead. In 1986, lead was banned from being used in pipe and solder in home construction. In older homes, where lead is present in pipe and solder connections, it may dissolve into the water after the water sits for long periods of time.

Some household plumbing components may contain a small amount of lead and can contribute to lead concentrations at the tap. Our water suppliers add a corrosion inhibitor to slow this dissolution process.

What can I do in my home to reduce exposure to lead in the drinking water?

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. Loudoun Water is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components in home construction. 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 the water for drinking or cooking. Use only cold water for cooking and making baby formula.

If you are concerned about lead in your water, you may wish to have your water tested. Information about 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 or by calling the Safe Drinking Water Hotline at (800) 426-4791, TTY 711.



Some people choose to install filters in their homes. If you choose to use a water filter, follow these three rules:

1. Choose one designed for the specific filtration desired (chlorine, lead, *Cryptosporidium*, etc.).
2. Make sure the filter is approved by the National Sanitation Foundation (www.nsf.org).
3. Maintain the filter as directed.

How can Loudoun Water assist in having the water in my house tested?

For information on having a lead-level test conducted, call our Customer Service Department at (571) 291-7880.



Information About *Cryptosporidium* in the Potomac River

The following information was provided by our primary water provider, Fairfax Water.

Cryptosporidium is a microbial pathogen sometimes found in surface water throughout the United States. Although filtration removes *Cryptosporidium*, the most commonly used filtration methods cannot guarantee 100 percent removal. Fairfax Water consistently maintains its filtration process in accordance with regulatory guidelines to maximize removal efficiency. Our monitoring indicates the occasional presence of these organisms in the source water. Current test methods do not allow us to determine whether 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. 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 in order to cause disease. It may be spread through means other than drinking water, such as other people, animals, water, swimming pools, fresh food, soils and any surface that has not been sanitized after exposure to feces.

Fairfax Water has completed monitoring of the Potomac River for compliance with the EPA Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The EPA created this rule to provide for increased protection against microbial pathogens, such as *Cryptosporidium*, in public water systems that use surface water sources. Fairfax Water's monitoring program began in 2004 and involved the collection of two samples from water treatment plant sources each month for a period of two years. Once monitoring for compliance with the LT2ESWTR was complete, Fairfax Water continued to monitor for *Cryptosporidium* at water treatment plant sources.

Under the LT2ESWTR, the average *Cryptosporidium* concentration determined whether additional treatment measures were needed. A *Cryptosporidium* concentration of 0.075 oocysts/Liter would have triggered additional water treatment measures. Fairfax Water's raw water *Cryptosporidium* concentrations consistently remain below this threshold. The results for Potomac River 2012 are as follows:

The results for Potomac River 2012 are as follows:

Source (Before Treatment)	Average <i>Cryptosporidium</i> Concentration (oocysts/Liter)
Potomac River	0



Are You Vulnerable to Contaminants?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer who are 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 and Centers for Disease Control and Prevention guidelines on appropriate means to lessen the risk of infections by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

How is Your Water Treated?

The treatment process includes chemical coagulation, flocculation, sedimentation, filtration and disinfection. Coagulation and flocculation help condition the raw water so that contaminants combine with particulate matter to form floc (large particles), which will settle out in the sedimentation process. Filtration removes the smaller, lighter particles. Disinfection with chlorine is the last step, which kills bacteria, viruses and other microbial contaminants. Sufficient chlorine is added to deter growth of bacteria while water flows through the pipes to your home. Chlorine can be dangerous to human health at high amounts. EPA sets the safe limit for chlorine in your water at a running annual average of 4 ppm. We maintain the chlorine amount to be extremely effective at inactivating bacteria.

Fairfax Water also uses ozone as a disinfectant, which reduces the amount of chlorine needed to treat the water, offers additional barriers against water-borne pathogens and produces a better tasting water. They also use chloramines as a disinfectant. Chloramines are created by adding ammonia to chlorine. They break down much slower than free chlorine, minimizing the creation of TTHMs and maximizing the length of time the disinfectant remains in the water. Fairfax Water adds orthophosphate to the water to help coat the pipes and reduce the ability of the lead to leach out. One downside of the chloramines is they may cause certain types of gaskets or toilet flappers to deteriorate faster, potentially causing leaks.



Turbidity

Turbidity is the clarity of the water. It is measured in Nephelometric Turbidity Unit (NTU). Turbidity higher than 5 NTU is just noticeable to the average person. Turbidity has no health effects; however, it can interfere with the disinfection process and provide a medium for microbial growth. Turbidity is measured during the treatment process after the water has been filtered, but before disinfection. The turbidity level of filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month and no single measurement can exceed 1 NTU. The tables on this page show the results of monitoring for the period of January 1, 2012, to December 31, 2012.



Turbidity	Average Annual Turbidity (NTU) ¹	Highest Single Measurement (NTU)	Lowest % Of Samples Meeting TT Turbidity Limit	MCL	MCLG	Major Source in Drinking Water
Fairfax Water	0.04	0.21	100%	TT ²	N/A	Soil runoff
City of Fairfax	0.06	0.27	100%			

Turbidity levels are measured during the treatment process after the water has been filtered, but before disinfection. The turbidity level of filtered water shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month and shall at no time exceed 1 NTU.

- N/A = not applicable
- ¹ NTU = Nephelometric Turbidity Unit
- ² TT = Treatment Technique



Our suppliers test the water for a large array of contaminants. You'll find data on what they detected in table two. Loudoun Water tests the water, too, once it's in our possession. We test for the presence of bacteria, total trihalomethanes, haloacetic acids, lead and copper and submit the results to the Virginia Department of Health on a regular basis. This data is found in table one. The tables on these pages show the results of monitoring for the period of January 1, 2012, to December 31, 2012.

Table One: Water Quality in the Distribution System

Microbial Component	Highest Monthly % of Positive Samples	MCL (Max Allowed)	MCLG (Goal)	Typical Source	Violation
Total Coliform Bacteria	0.8%	Cannot exceed 5% of monthly samples	0	Naturally present in the environment	No
Fecal Coliform Bacteria	0%	A routine sample and repeat sample are Total Coliform positive, and one is also Fecal Coliform or E. coli positive	0	Human and animal fecal waste	No
Component	Highest Quarterly System Running Annual Average	MRDL (Max Allowed, Compliance Based on System Running Annual Average)	MRDLG (Goal)	Typical Source	Violation
Total Chlorine (ppm)	2.74	4	4	Water additive used to control microbes	No
	RANGE (INDIVIDUAL TEST RESULTS)				
	0.4 – 3.9				
Disinfection Byproducts	Highest Quarterly System Running Annual Average	MCL (Max Allowed, Compliance Based on System Running Annual Average)	MCLG (Goal)	Typical Source	Violation
Total Trihalomethanes (ppb)	30	80	N/A	Byproduct of drinking water disinfection	No
	RANGE (INDIVIDUAL TEST RESULTS)				
	4.7 – 82.9				
Haloacetic Acids (ppb)	Highest Quarterly System Running Annual Average	60	N/A	Byproduct of drinking water disinfection	No
	18				
	RANGE (INDIVIDUAL TEST RESULTS)				
	1.7 – 69.7				

Metal Components ¹	90th Percentile Level	Action Level	Goal	Number Of Sites Above Action Level	Typical Source	Violation
Copper (ppm)	0.2	1.3	0	0	Corrosion of household plumbing; erosion of natural deposits	No
Lead (ppb)	2	15	0	1	Corrosion of household plumbing; erosion of natural deposits	No

¹ These samples were taken in 2011. The next required testing is 2014.



Table Two: Water Quality from Loudoun Water Suppliers					
Components	Average Amount Detected		MCL (Max Allowed)	MCLG (Goal)	Typical Source
	RANGE				
	City of Fairfax	Fairfax Water			
Beta/photon emitters ^{1,2} (pCi/L)	6.4	ND	50	0	Decay of natural and man-made deposits
Combined Radium 226/228 ¹ (pCi/L)	0.1	ND	5	0	Erosion of natural deposits
Fluoride (ppm)	0.4	0.7	4	4	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
	RANGE				
	ND – 0.7	0.5 – 0.7			
Nitrate [as Nitrogen] (ppm)	0.039	1.2	10	10	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
		RANGE			
		0.9 – 1.6			
Barium (ppm)	0.018	0.037	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
		RANGE			
		0.029 – 0.046			
Total Organic Carbon ³ (ppm)	1.4	1.1	TT	N/A	Naturally present in the environment
	RANGE				
	1 – 1.9	0.9 – 1.4			

¹ The MCL for Beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for Beta particles.

² City of Fairfax testing performed in 2012, Fairfax Water Testing performed in 2011.

³ Total Organic Carbon (TOC) has no health effects. However, it provides a medium for the formation of disinfection byproducts, including trihalomethanes and haloacetic acids. The maximum contaminant level for TOC is a Treatment Technique (TT), which means there is a required process needed to reduce the level of TOC in the water. The average level reported is a quarterly running average of the monthly ratio of actual TOC removal versus required TOC removal between source and treated waters. This value must be greater than or equal to 1 to be in compliance.



Helpful Definitions

Action Level: The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement that a water system must follow.

Maximum Contaminant Level (MCL): The highest level of a contaminant that EPA allows in drinking water. MCLs are set as close to the MCLGs as possible using the best available treatment technology.

Maximum Contaminant Level Goal (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.

Maximum Residual Disinfectant Level (MRDL): The maximum permissible level of disinfectant residual in drinking water, based on a running annual average.

Maximum Residual Disinfectant Level Goal (MRDLG): 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.

mrems/year: Millirems per year. A measurement of radiation absorbed by the body.

ND: Non-detect. Levels were so low, they were not detectable.

Ninetieth (90th) Percentile: Represents the highest value found out of 90 percent of the samples taken in a representative group. If the 90th percentile is greater than the action level, it will trigger a treatment or other requirement that a water system must follow.

NRL: No regulatory limit.

NTU: Nephelometric Turbidity Unit.

PCi/L: Picocuries per liter.

ppb: Parts per billion. One ppb is equal to one microgram per liter. (ug/L)

ppm: Parts per million. One ppm is equal to one milligram per liter. (mg/L)

Total Coliform: Bacteria that indicate whether other potentially harmful bacteria may be present.

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

Using Tap Water for Fish Tanks

You will need to treat tap water before using it in a fish aquarium because drinking water contains free chlorine and chloramines to inhibit bacterial growth. These disinfectants can kill fish. Check with a pet store to learn what types of chemicals you need to add to the tank to neutralize the effects of the disinfectants.



Have You Visited the Aquary® Yet?

Grab the kids and learn about water.

The Loudoun Water Aquary is an interactive indoor educational center and outdoor interpretive trail. Walk through 3,500 sq. feet of exhibits as you learn the story of drinking water treatment and delivery; source water protection; water conservation and water reclamation. Then enjoy the outdoor trails as you walk along a wetland area and learn more about its features.

The Aquary is a unique destination in Loudoun. We hope to see you soon. Normal Aquary hours: Self-guided tours: M–F, 8:00am–5:00pm; trails are open anytime.

Schools and groups can schedule a tour online at www.loudounwater.org, click on Talks and Tours.

Visit www.loudounwater.org
for directions.
44865 Loudoun Water Way
Ashburn, Virginia



Did you get our email?

Our bill stuffer, called the NewsLeak, is now available as a quarterly newsletter by email. Responding to hundreds of requests from you to do so, we have replaced the bill stuffer that used to come with your bill with this electronic format. Sign up to receive news and information related to your water and sewer service. Just visit our website and type in your email address on our home page under "Sign up for our quarterly E-newsletter." You'll receive the newsletter in April, July, October and January.



PO Box 4000 | 44865 Loudoun Water Way | Ashburn, VA 20146
WWW.LOUDOUNWATER.ORG

You can also sign up to receive RSS feeds from us and our Water We Thinking? blog by clicking on "Register for Web Alerts" on our homepage.

Disinfectant Switch

A strong chlorine taste or odor in April, May and June is due to a switch in disinfectants during our annual flushing program, when free chlorine is used instead of chloramines. Keeping an open container of water in the refrigerator allows the chlorine to dissipate, which usually improves the taste of the water. Remember—drinking water has a shelf life. Change out the water in your refrigerated container weekly.

