

Lead in Water Information

Frequently Asked Questions (FAQ) About Drinking Water and Lead

Updated 4.06.04

Note: Some of the information contained in this document reflects best available, but evolving scientific, health, and policy on lead. As additional information becomes available, it will be updated.

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A. Regional Sources of Drinking Water

1. Where does my drinking water come from?

The Washington metropolitan region gets nearly 90% of its drinking water from the Potomac River. This supply is further augmented by water from the Patuxent and Occoquan Rivers, Goose Creek (a Potomac tributary), Lake Manassas (tributary to the Occoquan), and groundwater. A relatively small percentage of the region obtains water from individual groundwater wells.

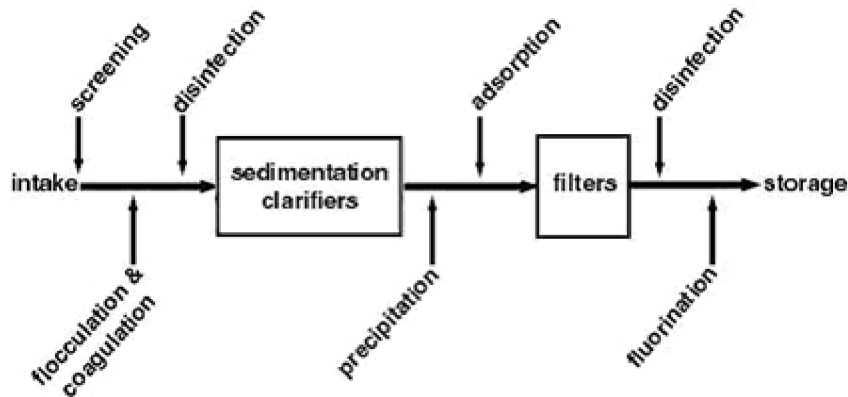
Three major water supply agencies treat about 95% of the metropolitan region's drinking water: the Washington Aqueduct Division of the U.S. Army Corps of Engineers, the Fairfax County Water Authority, and the Washington Suburban Sanitary Commission. Several other agencies treat the remaining 5% of the water, including the City of Fairfax, Frederick County and the City of Frederick, the Town of Leesburg, the City of Bowie, City of Rockville, and several small utilities that provide water to towns in Loudoun County.

Parts of the region receive their water directly from the water utilities that treat the water. Others receive their water from a water distributor, i.e., the District of Columbia Water and Sewer Authority, the City of Falls Church, Arlington County, the Loudoun County Sanitation Authority, the Prince William County Service Authority, the Virginia American Water Company, the Town of Herndon, and the Town of Vienna. The water distributors may receive their water from more than one water utility that is responsible for water treatment.

To contact the agency that provides your water, or if you do not know or are unsure of which agency provides your water, please see the [water utility distribution map](#) or go to the [table of utility and health agency contacts by jurisdiction](#).

2. How is my drinking water treated?

Your public drinking water is generally treated in the following way: Dirt and suspended particles are removed through a chemical process called coagulation. Then heavy particles are settled out of the water. The remaining water is passed through filters (sand, gravel, charcoal) to remove smaller particles. The final treatment step is disinfection with chlorine, chloramines or other disinfection method. Once purified, the water is either stored or pumped to the customer through a pipe distribution system.



This flowchart above shows the path that water takes from the intake of the water treatment plant (from the raw source water) to the storage tank, from which it is pumped to homes, businesses, and industries. The specific steps and their sequence may vary somewhat from one treatment plant to another.

Many systems add additional chemicals (e.g., lime, orthophosphate) to minimize corrosion of pipes and thus reduce the amount of lead leaching into the water. For specific information on your water provider, please see the [water utility distribution map](#) or go to the [table of utility and health agency contacts by jurisdiction](#).

3. **How was the development of the RECPSM funded?**

The Washington Regional Association of Grant Makers (WRAG) awarded COG a \$75,000 grant to begin the planning process. Later, COG received a \$5 million appropriation from the federal government to address regional emergency preparedness, including communications, vulnerability threat assessment, regional training and community outreach.

B. General Facts about Lead

1. **What is lead?**

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. It has no characteristic taste or smell. Metallic lead does not dissolve in water and does not burn. It can combine with other chemicals to form lead compounds or lead salts. Some lead salts can dissolve in water. It is known to be harmful to humans if inhaled or ingested. Because of the use of lead in manmade products, including past use as a gasoline additive, it has become widespread in the environment. Lead can be found in the air, in the water, and on land.

2. **What are the uses of lead?**

Lead has many uses. Lead is found in some types of batteries and is used in the production of ammunition, sheet lead, solder, some brass and bronze products, pipes, paints, medical equipment, and some ceramic glazes. Lead was also found in the chemicals added to gasoline to increase octane ratings, but its use was banned in 1996.

3. **What happens to lead when it enters the environment?**

When released to land, lead binds with the soils and does not migrate to ground water. In surface waters it binds to sediments. It does not accumulate in fish, but does accumulate in some shellfish, such as mussels.

C. Lead and Health Issues

1. **What are the primary sources of lead exposure in humans?**

Nationally, the primary source of lead exposure is lead paint. The two primary lead exposure routes for humans are inhalation and ingestion. Lead from airborne sources has been reduced since the phase out and elimination of lead additives in gasoline. Lead is also found in urban areas with older homes containing leaded paint which is also a source of soil contamination. Once lead enters the soil it adheres to the soil particles. Soil containing lead may also be blown by the wind, exposing

people to lead containing dust. Movement of lead into groundwater is unlikely unless the water is acidic; a common situation in acid mine drainage areas. Sources of lead in surface water or sediment include deposits of lead-containing dust from the atmosphere, waste water from industries that handle lead (iron and steel and lead producers), urban runoff, and mining piles.

Foods such as fruits, vegetables, meats, grains, seafood, soft drinks, and wine may contain lead. Cigarette smoke also contains small amounts of lead. Lead gets into food from water during cooking and into foods and beverages from dust that contains lead falling onto food during processing. The amount of lead found in canned food (lead solder joints) decreased 87% between 1980 and 1988.

Levels of lead may build up in plants and animals in areas where air, water, or soil are contaminated. If animals eat contaminated plants or animals, most of the lead they eat will pass through their bodies.

In general, very little lead is found in the groundwater or surface waters sources of drinking water (lakes, rivers, streams). Groundwater that is acidic may cause lead found in pipes, leaded solder, and brass faucets to enter water. Public water systems are required to treat water to make it less corrosive; this may include decreasing the acidity of the water.

2. What are the health impacts from lead?

Lead can cause a variety of adverse health effects when people are exposed to it at levels above the U.S. EPA drinking water Action Level of 15 parts per billion for relatively short periods of time. Short term health effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in attention span, hearing, and learning abilities of children. Long-term exposure to lead levels above the U.S. EPA drinking water Action Level may cause stroke, kidney failure, and cancer. See questions C3 and C5 for additional information.

3. What is the relationship between the EPA Action Level for water and lead levels in blood?

This is not easily answered and not fully understood. First of all, the EPA Action Level for lead of 15 parts per billion (ppb) in water was established based on reasonable risk assessments. It is the level that, when reached, EPA requires additional corrective and educational actions. It does not necessarily directly correlate to blood lead levels, because lead levels in water may be only one of a number of contributors to lead to humans. As for blood lead levels, they are reflective of a variety of factors, i.e., age, pregnancy, nursing, diet, other lead exposure (dusts, paint chips, soil), and the amount of water consumed daily. In addition, there are health studies that demonstrate that various health effects may be correlated to blood lead levels.

4. How much lead is harmful?

Blood lead levels of 10 micrograms of lead per deciliter of blood (mcg/dL) or greater are considered harmful. This level has been associated with decreased intelligence, behavior problems, reduced physical stature and growth, and impaired hearing. A child is estimated to lose 2 IQ points for each 10-mcg/dL increase lead in blood lead concentrations. A variety of intervention actions are taken at various thresholds above 10 mcg/dL.

Pregnant women and women who are nursing are also at risk from lead exposure. Fetuses have been shown to receive lead from their mothers and nursing mothers can pass lead through their breast milk. In both cases, the unborn and young children are taking in levels of lead that have more of an impact due to their smaller size.

It should be noted that local and state health departments recommend that children be routinely screened for lead at 9 months and again at 24 months.

5. Does a high level of lead in tap water cause health effects?

High levels of lead in tap water can cause adverse health effects because the lead may enter the bloodstream and cause an elevated blood lead level.

Most studies show that exposure to lead-contaminated water alone would not be likely to elevate blood lead levels in most adults, even with exposure to water with lead content close to the EPA "Action Level" of 15 ppb. Risk will vary depending upon the individual, the circumstances, and the

amount of water consumed. For example, infants who drink formula prepared with lead contaminated water are considered to be at higher risk because of the large volume of water they consume relative to their body size.

6. Are some people more at risk than others from lead in drinking water?

Yes. Children under the age of 6, pregnant women, and nursing mothers are considered to be most at risk. Children because of their smaller body size and pregnant and breast feeding mothers because of lead's ability to pass through the placenta and through breast milk to the child. If you fall into one of these categories and are concerned, contact your local health department or physician.

7. What can I do to minimize my exposure to lead contaminated water?

If you have lead service lines:

- The best option is to work with your water supplier, and/or licensed plumber to replace any service lines and plumbing containing lead.
- Other effective options include:
 - Run your cold water flushing the system for 10 minutes (see also Section E: Water Conservation). After flushing for ten minutes, flush the kitchen tap for 60 seconds before using the water for drinking or cooking. (boiling water will not remove lead)
 - As part of recommended pipe flushing and to minimize wasted water, use the bathroom, run your dishwasher or washing machine.
 - Use only cold water or bottled water for cooking and drinking. Heated water tends to concentrate more lead.
 - Once your lines are flushed, fill some clean containers with water and refrigerate for drinking water later on.
 - Periodically, remove and clean the strainer/aerator device on your faucet to remove debris.
 - Install and use NSF certified water filters (see C8 below).

If your house does not have lead service lines and was built prior to 1986:

- Let your cold water run from the faucet for 60 to 90 seconds prior to drinking or cooking, if the water in your faucet has not been used for more than 6 hours. Leaded solder may have been used prior to 1986.
- Periodically, remove and clean the strainer/aerator device on your faucet to remove debris

General guidance for minimizing exposure to lead:

- Avoid paints and pigments used in make-up, or hair coloring that contains lead.
- Wash children's hands and faces often to remove potential lead dusts and soil, and regularly clean the house of dust and tracked-in soil.
- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth painted surfaces that may have been painted with lead-based paint (homes built before 1978).
- For specific guidance related to drinking water, contact your water utility. View a [map](#) of water utilities.

- For additional ways to reduce exposure to lead visit the [EPA lead Web site](#).

8. Do lead water filters work to remove lead, and where can I get one?

Yes. There are a variety of water filters on the market certified to remove lead. They come in a variety of shapes, sizes, and technologies. They range from units that filter all the water entering the house to units that attach to the faucet, to units that water drips through into a pitcher. These filters in general remove about 98% of the lead. When purchasing a filter, look for filters certified to remove lead by the National Sanitation Federation International. Finally, be sure to maintain the filter as instructed by the manufacturer. You might also check with your water provider to find out if they have a list of recommended brands. Go to [NSF International](#) for additional information.

EPA Region III has recently suggested that residents, who have been advised to filter water, filter water after the appropriate flushing procedures have been performed. Flushing is to ensure that lead levels entering the filtration devices are within the range that can be removed by most commercially-available filters.

9. Can I bathe, wash clothes, or wash dishes with water that has lead?

Yes. Bathing and showering, and washing dishes or clothes should be safe for you and your children, even if the water contains lead over the EPA Action Level. Human skin DOES NOT absorb lead from the water. The primary route of lead exposure is through ingestion.

10. Is lead contaminated water safe for my pet?

Changes in pet behavior as a result of drinking lead contaminated water are not likely be noticeable. In general, pets are more likely to obtain lead as a result of eating an object containing much higher lead levels (lead paint chips). To be safe check with your veterinarian and/or give your pet filtered or bottled water if elevated levels of lead are found in your drinking water.

D. Lead in Water

1. How does lead get into my drinking water?

Although sometimes found in natural deposits near drinking water sources, lead contamination generally occurs from the corrosion of lead pipes either between the water main and a customer's home (lead service lines) or in a home or building's plumbing system. Even in homes not served by a lead service line, corrosive water may cause lead to leach from lead pipes, lead solder, and brass fixtures.

2. What is my water provider doing to reduce the likelihood of lead in my drinking water?

All water utilities are regulated under U.S. EPA drinking water regulations, including requirements that help limit lead in drinking water. Actions taken by utilities to reduce lead exposure may include replacement of lead water service lines, water treatment to control corrosion, as well as regular testing and monitoring to ensure compliance with EPA drinking water regulations.

3. If I have a groundwater well for drinking water, do I have to worry about lead contamination?

Drinking water from wells using submersible pumps made of brass or copper may contain lead at levels that could pose risks to human health. If the submersible pump is made of plastic or stainless steel components, lead from the pump should not be a concern. If you have an individual household well, you will need to test the water yourself; if you are concerned see question D8 for information on water testing labs.

4. How can I tell if there are lead pipes, lead solder, or other lead components in my household plumbing?

The existence of lead service lines is often difficult to determine unless the lines are dug up and examined or unless there are records available. The first thing to do is to check with your water provider. They should be able to tell you if you have lead service lines to your house. Homes that are more likely to have lead lines are generally those built either in the early 1900's, during the 1930's, or during World War II when there was a copper shortage, and lead service lines were used. Inside the home, the use of lead service lines and lead solder is not generally known by the

water provider and would be up to the homeowner to investigate. Brass fixtures, fittings and valves can contain up to 8% lead. Even new brass fittings can leach a considerable amount of lead in contact with corrosive water. The use of lead solder for plumbing was banned in 1985.

5. **What does the EPA Action Level for lead in drinking water mean?**

EPA has established an Action Level for lead in drinking water of 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 additional types of treatment, public education, and possibly lead service line replacement.

6. **How much is a part per billion?**

A part per billion (ppb) is a measure of concentration, the amount of one material contained in a larger amount of another material. To look at it differently, a pinch of salt in ten tons of potato chips or one drop of an impurity in 500 barrels (about 26,500 gallons) of water would represent a part per billion.

7. **How do I know if I should be concerned about lead in my drinking water?**

The only way to know whether your tap water contains lead is to have it tested. Lead can normally not be seen, tasted, or smelled in drinking water. First, check with your water provider to find out what testing has been done in your area. For homes served by public water systems, information on lead in tap water may be available on the internet from your local water provider. If not call your water provider to find out. For more information on how to test your water system see question D8.

8. **How can I get my water tested?**

If you are concerned about the possibility of lead in your drinking water, first contact your water provider. Unless there is a recognized lead problem, most water providers will not offer testing for individual homes or businesses. Nevertheless, they may be able to provide you with a contact list of private laboratories certified to perform a lead water test. For a list of certified labs in Virginia and Maryland visit the [following site](#). For the District of Columbia certified laboratories near DC metropolitan area will be certified in Maryland and Virginia. For a partial list of these laboratories, visit [DC WASA's Web site](#).

9. **Are there limits on how much lead can be in drinking water?**

Yes. The U.S. EPA has set an Action Level for lead at 15 ppb. Given present technology and resources, this is the level to which water systems can reasonably be required to control this contaminant should it occur in drinking water in homes. Fewer than 1 in 10 homes sampled are allowed to exceed this Action Level. If the Action Level is exceeded in 10 % or more of the homes tested, then additional corrective actions are required under federal regulation.

E. Water Conservation

1. **What do you recommend I do if I want to conserve water and follow the guidance to flush my water lines?**

There are a number of simple steps you can take to conserve water and also follow the recommendation to flush your water line prior to use. In the morning take a shower or run your washing machine or dishwasher and flush your tap for 60 seconds prior to drinking any tap water. When you run water from the faucet, fill up jugs or other containers with water and use it later to water your garden or household plants. Once your lines are flushed, you should fill up several clean jugs of water and place them in the refrigerator for drinking. For more information on using water wisely visit the campaign [Web site](#).

[Wise Water Use Tips: A guide for those with lead service lines](#)

[Wise Water Use Tips: A guide for those without lead service lines](#)

(concerned about lead in water and/or live in a house built prior to 1986)

[Click here for a PDF version of these wise water use tips](#)

F. For Further Information

[Water Utilities Map](#) or [System Description](#)

[Jurisdictional table of water utility and health agency contact information](#)

[Health Departments \(local, state, federal\)](#)

EPA Drinking Water Hotline 800-426-4791

[Community Right to Know](#) 800-535-0202 or I or [EPA Region III](#)

[CDC](#)

[MWCOG](#)

[American Nurses Association](#)

[District of Columbia](#)

[Arlington County](#)

[City of Falls Church](#)

[USGS](#)

[The Maryland Department of the Environment](#); (410) 537-3000, or toll free in Maryland (800) 633-3101

[The Virginia Department of Environmental Quality](#); (804) 698-4000, or toll-free in Virginia 1-800-592-5482