



Annual
WaterQuality
Report
Water testing performed in 2010



Presented By
Henrico County
Public Utilities

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Quality First Quality

Once again we are proud to present Henrico County's annual water quality report covering all testing performed between January 1 and December 31, 2010. As in years past, we are committed to delivering the best-quality drinking water possible. To that end, we remain vigilant in meeting the challenges of new regulations, source water protection, water conservation, and community outreach and education while continuing to serve the needs of all of our water users. Thank you for allowing us to continue providing you and your family with quality drinking water.

We encourage you to share your thoughts with us on the information contained in this report. Should you ever have any questions, we are always available to assist you.

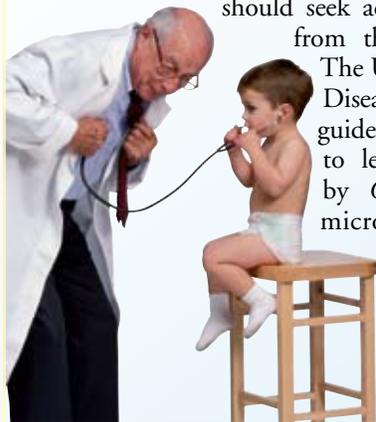
Where Does My Water Come From?

Henrico County customers receive water from the county's and the City of Richmond's water treatment facilities. The source water for both facilities is surface water drawn from the James River. The county's water treatment facility began operations in April 2004 and currently produces up to 42 million gallons of drinking water daily. Henrico's facility was designed to meet the county's future drinking water needs and can produce up to 55 million gallons per day. The facility has multiple sources of electric power to enhance our ability to provide drinking water during local power outages.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.



Tap vs. Bottled

Thanks in part to aggressive marketing, the bottled water industry has successfully convinced some people that water purchased in bottles is a healthier alternative to tap water. However, according to a four-year study conducted by the Natural Resources Defense Council, bottled water is not necessarily cleaner or safer than most tap water. In fact, about 25 percent of bottled water is actually just bottled tap water (40 percent according to government estimates).

The Food and Drug Administration is responsible for regulating bottled water, but these rules allow for less rigorous testing and purity standards than those required by the U.S. EPA for community tap water. For instance, the high mineral content of some bottled waters makes them unsuitable for babies and young children. Further, the FDA completely exempts bottled water that's packaged and sold within the same state, which accounts for about 70 percent of all bottled water sold in the United States.

People spend 10,000 times more per gallon for bottled water than they typically do for tap water. If you get your recommended eight glasses a day from bottled water, you could spend up to \$1,400 annually. The same amount of tap water would cost about 49 cents. Even if you installed a filter device on your tap, your annual expenditure would be far less than what you'd pay for bottled water.

For a detailed discussion on the NRDC study results, check out their Web site at www.nrdc.org/water/drinking/bw/exesum.asp.

Water Conservation

You can play a role in conserving water and save yourself money in the process by becoming conscious of the amount of water your household is using and by looking for ways to use less whenever you can. It is not hard to conserve water. Here are a few tips:

- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So get a run for your money and load it to capacity.
- Turn off the tap when brushing your teeth.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank. Watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
- Use your water meter to detect hidden leaks. Simply turn off all taps and water-using appliances. Then check the meter after 15 minutes. If it moved, you have a leak.

Fact vs Fiction

There is the same amount of water on Earth now as there was when the Earth was formed. *(Fact: The water that comes from your faucet could contain molecules that dinosaurs drank!)*

About half the water treated by public water systems is used for drinking and cooking. *(Fiction: Actually, the amount used for cooking and drinking is less than 1 percent of the total water produced!)*

A person can live about a month without food, but only about a week without water. *(Fact: Dehydration symptoms generally become noticeable after only 2 percent of one's normal water volume has been lost.)*

The first water pipes in the United States were made of cast iron. *(Fiction: The first water pipes were actually made of fire-charred bored logs.)*

The world's first municipal water filtration plant was opened in the United States. *(Fiction: The first plant was actually opened in Paisley, Scotland, in 1832.)*

A person must consume a half-gallon of water daily to live healthily. *(Fact: A person should drink at least 64 ounces, or 8 cups, of water each day.)*

Questions?

If you have any questions about this report or your drinking water quality, please call Nyibe Cousins-Flythe, Water Quality Engineer, Henrico County, Department of Public Utilities, at (804) 727-8700. Also, you can view this report on our Web site at www.co.henrico.va.us/utility/PDF/CCReport10.pdf.

Potential Substances in Drinking Water

To ensure that tap water is safe to drink, the U.S. EPA (United States Environmental Protection Agency) prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. 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. Their presence does not necessarily indicate that the water poses a health risk.

Sources of drinking water (both tap and bottled) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it can acquire naturally occurring minerals, radioactive material, and substances resulting from the presence of animals or human activity. Substances that may be present in source water include:

Microbial Contaminants, like viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater 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 stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and which may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and their potential health effects, call the EPA's Safe Drinking Water Hotline at (800) 426-4791.

Lead and 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. Henrico County is responsible for providing high-quality drinking water but we 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 or at www.epa.gov/safewater/lead.

Water Treatment Process

The treatment process consists of a series of steps.

First, raw (untreated) water is pumped from the river to the treatment plant. After it enters the plant, a coagulant is added and the water then goes to a rapid mixing basin, followed by a flocculation basin. These two steps cause particles to adhere to one other (called floc), making them heavy enough to settle to the bottom of the sedimentation basins, where the sediments are removed.

The water then undergoes intermediate ozonation, which is used for primary disinfection of settled water prior to filtration. Next, the water goes through deep-bed granular activated carbon (GAC) filters. The GAC filters are used for removing turbidity, taste and odors, and any bio-degradable organics and/or ozonation by-products remaining in the water following ozonation. Chloramines and fluoride are added to the filtered water: chloramines as a secondary disinfectant and fluoride to promote strong teeth. Finally, the finished water is pumped into the distribution system, which delivers the water to your home or business.

Source Water Assessment

The Safe Drinking Water Act mandated that the Virginia Department of Health (VDH) perform source water assessments for all public water sources. The assessment reports consist of maps showing the source water assessment area, an inventory of known land-use activities of concern, and documentation of any known contamination within the last five years from the date of the assessment. The VDH assessed our system in 2002 and determined that the source water for our system, the James River, was highly susceptible to contamination. As a result, both Richmond's and Henrico's water treatment facilities have systems that remove harmful contaminants from source water to ensure that high-quality drinking water is supplied to you. Information about the source water assessment is available from Nyibe Cousins-Flythe, Water Quality Engineer, Henrico County, Department of Public Utilities, at (804) 727-8700.

Testing for Cryptosporidium

Cryptosporidium is a microbial parasite found in surface water throughout the United States. We collected 24 samples between 2006 and 2008 and found an average level of 2.1 Oocysts per 100 liters (Oocysts/100L). We also purchased water from Richmond. They collected 48 samples between 2004 and 2005 and found an average of 2.9 Oocysts/100L. Both values are less than the EPA's future action level of 7.5 Oocysts/100L.



Why do I get this report each year?

Community water system operators are required by federal law to provide their customers with an annual water quality report. The report helps people make informed choices about the water they drink. It lets people know what contaminants, if any, are in their drinking water and how these contaminants may affect their health. It also gives the system operators a chance to tell customers what it takes to deliver safe drinking water.

Why does my water sometimes look “milky”?

The “milky” look is caused by tiny air bubbles in the water. The water in the pipes coming into your home or business is under pressure so gasses (the air) are dissolved and trapped in the pressurized water as it flows into your glass. As the air bubbles rise in the glass, they break free at the surface, thus clearing up the water. Although the milky appearance might be disconcerting, the air bubbles won't affect the quality or taste of the water.

How can I keep my pet's water bowl germ free?

Veterinarians generally recommend that water bowls be washed daily with warm, soapy water—normally when you change the water. Scour the corners, nooks, and crannies of the water dish using a small scrub brush. In addition, once a week, put water bowls into the dishwasher to sanitize them with hot water. In most situations, disinfectants like bleach are not needed; warm, soapy water is all you need to keep your pet's water clean and safe.

How much water is used during a typical shower?

The Federal Energy Policy Act set a nationwide regulation that limits showerheads to a maximum flow of 2.5 gallons per minute (GPM). Showerheads made before 1980 are rated at 5 GPM. Since the average shower is estimated to last 8.2 minutes, the old showerheads use 41 gallons of water while the newer, low-flow showerheads use only about 21 gallons.

Is it okay to use hot water from the tap for cooking and drinking?

No, always use cold water. Hot water is more likely to contain rust, copper, and lead from household plumbing and water heaters. These substances can dissolve into hot water faster than they do into cold water, especially when the faucet has not been used for an extended period of time.

How many contaminants are regulated in drinking water?

The U.S. EPA regulates over 80 contaminants in drinking water. Some states may choose to regulate additional contaminants or to set stricter standards, but all states must have standards at least as stringent as the U.S. EPA's.

Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2005	15	0	0.4	0.1–0.8	No	Erosion of natural deposits
Barium (ppm)	2010	2	2	0.04	0.03–0.04	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chloramines ¹ (ppm)	2010	[4]	[4]	3.0	0.2–4.5	No	Water additive used to control microbes
Combined Radium (pCi/L)	2005	5	0	0.4	ND–0.6	No	Erosion of natural deposits
Fluoride (ppm)	7/2010	4	4	1.0	NA	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] ¹ (ppb)	2010	60	NA	29	1–40	No	By-product of drinking water disinfection
Nitrate (ppm)	1/2010	10	10	0.54	0.12–0.54	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] ¹ (ppb)	2010	80	NA	24	1–34	No	By-product of drinking water chlorination
Total Coliform Bacteria ² (% positive samples)	8/2010	5% of monthly samples are positive	0	1.89 (3 samples)	NA	No	Naturally present in the environment
Total Organic Carbon ³ (removal ratio)	2010	TT	NA	1.4	1.0–2.8	No	Naturally present in the environment
Turbidity ⁴ (NTU)	2010	TT	NA	0.24	NA	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2010	TT of samples < 0.3 NTU	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper ⁵ (ppm)	2009	1.3	1.3	0.1	0/68	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead ⁵ (ppb)	2009	15	0	1	0/68	No	Corrosion of household plumbing systems; Erosion of natural deposits

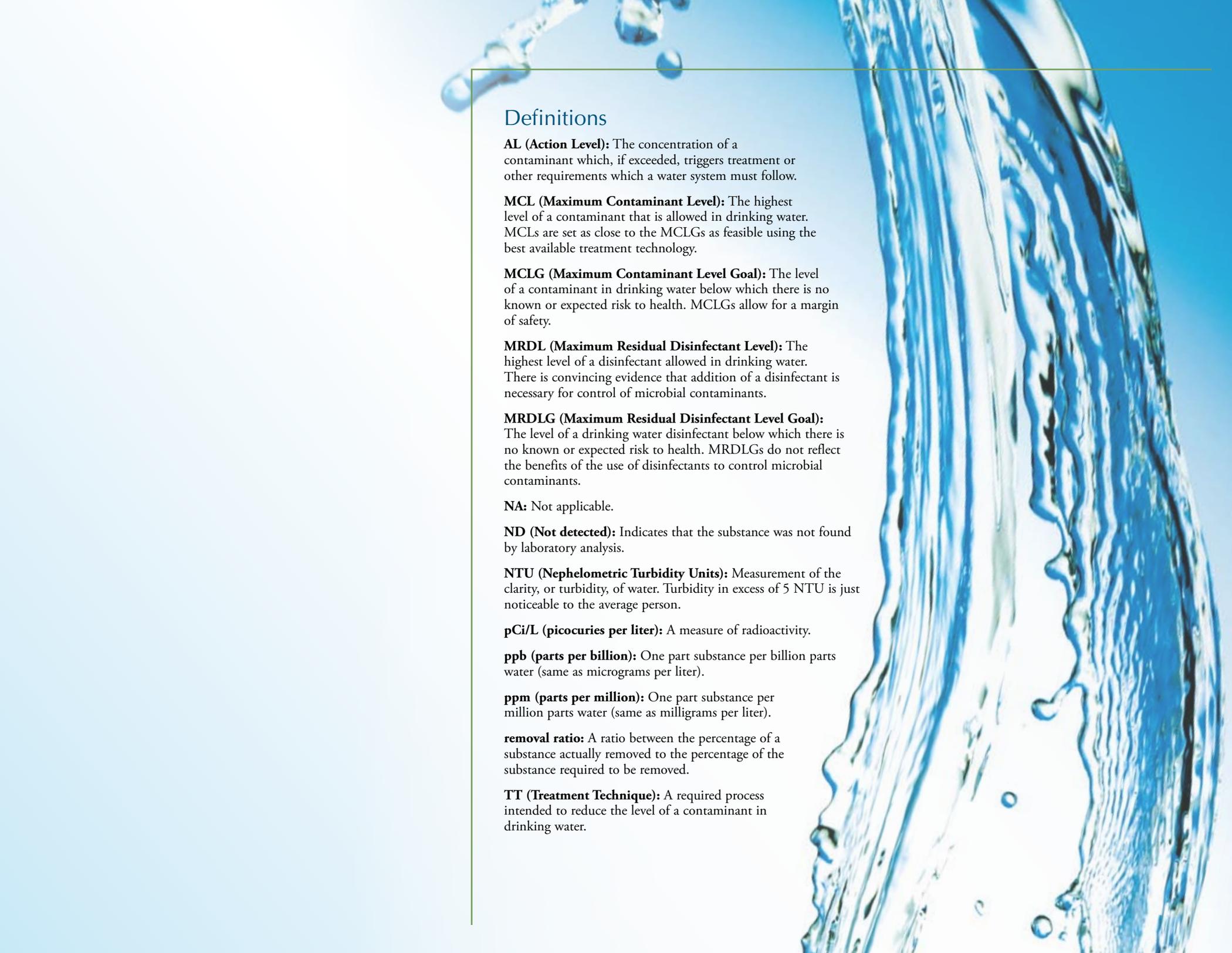
¹ Amount detected is the maximum of the rolling annual average. Range is the minimum and maximum of all 2010 samples used to calculate those averages.

² We sample for coliforms each month, and our highest monthly total occurred in August. The results listed are the highest number of positive samples during any given month (3) and what percentage of the total monthly samples this number represents (1.89 percent).

³ Amount detected is the lowest rolling annual average removal ratio. Range is the minimum and maximum of all samples used to calculate those averages. (A value of one or greater indicates that the water system complies with TOC removal requirements.)

⁴ Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of our filtration system's effectiveness.

⁵ Ninetieth percentile of the latest round of sampling equals the value of lead or copper at the 90 percent level of ascending results.



Definitions

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

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 control of microbial contaminants.

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 contaminants.

NA: Not applicable.

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (same as micrograms per liter).

ppm (parts per million): One part substance per million parts water (same as milligrams per liter).

removal ratio: A ratio between the percentage of a substance actually removed to the percentage of the substance required to be removed.

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