

2011 Water Quality Report

Charleston Water System's drinking water met or exceeded all quality standards in 2011

This report provides information about where your drinking water comes from, how it's treated, and the results from quality testing in 2011. For more information, visit www.charlestonwater.com.



Our Mission is to protect public health and the environment of our service community by providing clean water services of exceptional quality and value.

About Charleston Water System

Charleston Water System is a publicly owned water and wastewater utility. We provide clean drinking water to more than 400,000 people in the Greater Charleston area, including the City of Charleston, James Island, North Charleston, Hanahan, Hollywood, Ravenel and Meggett.

In addition to our 108,000 water accounts, we provide water to other local utilities, including Mt. Pleasant Waterworks, Town of Sullivan's Island, Isle of Palms Water and Sewer Commission, Town of Folly Beach, City of Lincolnville, St. John's Water Company (serving Kiawah and Seabrook Islands) and Dorchester County Public Works.

Where Your Water Comes From

Charleston Water System's drinking water comes from two surface water sources: The Bushy Park Reservoir in Berkeley County (our primary source) and the Edisto River in Dorchester County. Deep tunnels carry water from these sources to our Hanahan Water Treatment Plant.

The Treatment Process

At the treatment plant, the water goes through several processes to make it clean and safe to drink.

First, food-grade alum is mixed into the water. This causes tiny suspended particles to clump together and form heavier particles called floc. When the water flows into sedimentation basins, the floc sinks to the bottom and is removed.

Next, the water flows through filters, which remove microscopic contaminants such as bacteria and microorganisms. Finally, the water is disinfected to protect against disease-causing organisms, and fluoride is added to protect dental health.

A team of certified operators monitors the treatment process 24/7 and continually tests the water at each stage of the process.

Water Distribution

After treatment, the clean water is pumped into the water distribution system, a network of nearly 2,000 miles of underground pipes ranging in size from four feet in diameter down to one inch.

The distribution system includes dozens of pumps, four storage tanks and some 8,500 fire hydrants. All of this must be monitored and maintained to provide high quality water at the right pressure to the 108,000 homes and businesses served by Charleston Water System.

Possible Contaminants in Source Water

The sources of drinking water—for both tap water and bottled water—include rivers, lakes, streams, ponds, reservoirs, springs, and wells.

As water travels over the surface of land and into waterways, it dissolves naturally occurring minerals and can pick up substances from the presence of animals or human activity. Contaminants that may be present in source water include:

Biological compounds, such as viruses and bacteria, which may come from septic systems, agricultural livestock operations, and wildlife.

Inorganic compounds, such as salts and metals, which can be naturally occurring or the result of 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, runoff, and residential uses.

Organic compounds, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, can also come from gas stations, runoff, and septic systems.

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

To protect public health, water treatment plants remove these contaminants to safe levels established by regulations.

Source Water Protection

To raise awareness about the importance of preventing water pollution, SCDHEC has identified the potential sources of contamination for each drinking water source in the state. You can view the source water assessment report for Charleston Water System on SCDHEC's web site at www.scdhec.gov/environment/water/srcewtr.htm.

How You Can Help

Stormwater runoff is a major source of pollution in our waterways.

- **Pick up the poop!** Pet waste pollutes waterways with bacteria and excess nutrients, which contribute to algae growth that can choke out plants and wildlife.
- **Don't over-fertilize your lawn.** Excess fertilizers and pesticides wash into storm drains and pollute streams.
- **No dumping in storm drains.** Storm drains collect rain water and empty directly into a waterway. Never pour anything into a storm drain.



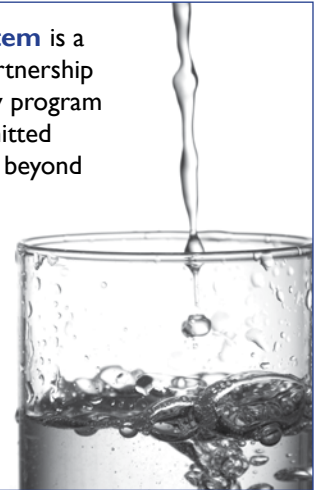
Tap Water Regulations

Charleston Water System meets or surpasses all drinking water standards and regulations established by the US Environmental Protection Agency (USEPA) and the SC Department of Health and Environmental Control (SCDHEC).

These regulations protect public health by setting legal limits on levels of potentially harmful contaminants in drinking 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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

Descriptions of the compounds detected in Charleston's water and the EPA limits for each compound are listed in the table on the next page.

Charleston Water System is a member of the USEPA Partnership for Safe Water, a voluntary program for utilities that are committed to treating drinking water beyond what's required by law.



Water Quality Table Definitions

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 Contaminant Level (MCL)

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.

Action Level (AL)

The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT)

A required process intended to reduce the level of a contaminant in drinking water.

Maximum Residual Disinfectant Level (MRDL)

The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

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 contamination.

Water Quality Results

Charleston Water System met or surpassed all water quality requirements in 2011

Charleston Water System's drinking water was tested more than 20,000 times for 150 substances and parameters in 2011. Of these, only those listed in the table below under

the heading *Detected in Our Water* were found in our water, and all were detected at levels below the regulatory limit.

In addition to the detected substances, we are required to report the results for certain contaminants, such as *Cryptosporidium* and *Giardia*, even when none are detected.

	Constituent	Maximum Contaminant Level (MCL) set by EPA	Maximum Contaminant Level Goal (MCLG)	Actual Level in Charleston's Water for 2011	Possible Sources in Water
Required Reporting					
	Turbidity A measure of the amount of suspended particles in the water (cloudiness); an indicator of overall water quality and filtration effectiveness.	Requires a specific treatment technique (TT); 95% of monthly samples must be less than 0.3 NTU	None	0.18 NTU highest level detected 100% of monthly samples met the limits	Soil runoff
	Cryptosporidium A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	None	Zero <i>Cryptosporidium</i> oocysts per 1 liter of water	Human and animal sources
	Giardia A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	None	Zero <i>Giardia</i> cysts per 1 liter of water	Human and animal sources
Detected in Our Water					
Inorganic Compounds	Copper A metal widely used in household plumbing that may corrode into water. <i>Results are from 2009. EPA requires testing for copper every three years.</i>	90th percentile of all samples collected must be less than the 1.3 ppm action level (AL)	1.3 ppm	0.13 ppm (no samples exceeded the action level) Range 0 to 0.13 ppm	Corrosion of household plumbing materials
	Lead A metal no longer used in water pipes, but may be present in plumbing fixtures or old pipes; may corrode into water. <i>Results are from 2009. EPA requires testing for lead every three years.</i>	90th percentile of all samples collected must be less than the 15 ppb action level (AL)	0 ppb	90th percentile = 5 ppb (two samples exceeded the action level) Range 0 to 17 ppb	Corrosion of household plumbing materials
	Cadmium A metal used in paints, batteries, and metal alloys.	5ppb	5ppb	0.12 ppb	Corrosion of galvanized pipe; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints.
	Nitrate/Nitrogen Nitrates and nitrites are nitrogen-oxygen compounds that can become a source of pollution in the form of unwanted nutrients.	10 ppm	10 ppm	0.1 ppm	Runoff from fertilizers
	Fluoride A substance that is naturally occurring in some water sources, particularly groundwater. It is also added to drinking water to help prevent tooth decay.	4 ppm	4 ppm	0.15 ppm in source water 0.68 ppm in finished water	Naturally occurring in source water and added during treatment to prevent tooth decay.
Disinfectants	Chlorine Dioxide A disinfection agent added in small amounts to protect against microbes.	800 ppb	800 ppb	100 ppb	Added for disinfection
	Chloramine Residual A compound of chlorine and ammonia that is added in small amounts to treated water to protect against microbes.	4 ppm MRDL	4 ppm MRDLG	3.1 ppm running annual average (RAA) Range: 2.7 – 3.3 ppm	Added for disinfection
Disinfection Byproducts	Total Trihalomethanes (THMs) A group of chemicals formed when chlorine used to disinfect drinking water reacts with naturally occurring organic and inorganic matter in the water.	80 ppb	N/A	26.5 ppb running annual average (RAA) Range: 17.3 – 31.8 ppb	Byproduct of disinfection
	Total Haloacetic acids (HAAs) A group of chemicals formed when chlorine used to disinfect drinking water reacts with naturally occurring organic and inorganic matter in the water.	60 ppb	N/A	23.3 ppb running annual average (RAA) Range: 3.3 – 26.2 ppb	Byproduct of disinfection
	Chlorite A byproduct formed when chlorine dioxide is used to disinfect water.	1 ppm	0.8 ppm	0.70 ppm Range: 0.25 - 0.70 ppm	Byproduct of disinfection
Organic Compounds/ Bacteria	Total Coliform Bacteria A group of bacteria whose presence in water indicates possible contamination with soil or waste from warm blooded animals.	Number of positive samples must not exceed 5% of monthly samples taken	Zero positive samples	Highest percentage of positive samples in a month: 1.7% (all repeat samples were satisfactory)	Naturally present in the environment
	Total Organic Carbon (TOC) The measure of organic substances in a body of water, mostly from naturally occurring sources such as plant material. TOC provides a measurement for the potential formation of disinfection byproducts.	No MCL; EPA requires a specific treatment technique (TT). % removal requirement varies from 35% - 55% TOC removal, depending on source water quality	N/A	Range: 31% to 64.5% removal Removal ratio RAA = 1.25 TOC values 1.9 – 2.9 ppm TOC sampled daily	Naturally present in the environment
Abbreviations: ppm: Parts per million (mg/L) ppb: Parts per billion (ug/L)		RAA: Running Annual Average NTU: Nephelometric Turbidity Units			

Water Characteristics

The parameters in the table below affect the aesthetics of drinking water, such as taste, odor, hardness, etc. The USEPA has established secondary standards for some of these parameters, which are non-enforceable, recommended guidelines.

Parameter	CWS Water Average 2011	Highest Level Recommended by USEPA
Chloride	22 ppm	250 ppm
Color	3 PCU	15 PCU
Iron	<0.10 ppm	0.3 ppm
Manganese	<0.05 ppm	0.05 ppm
Total Dissolved Solids (TDS)	85 ppm	500 ppm
Sodium	18 ppm	No Standard
Alkalinity	28 ppm	
Conductivity	210 umhos/cm	
Hardness	56 ppm	
Ortho-phosphate	1.2 ppm	
Silica	5.8 ppm	
Temperature	71.6°F (22°C)	
Abbreviations: ppm: Parts per million PCU: Platinum Cobalt Units umhos/cm: Micromohs/cm		

A Message from the US Environmental Protection Agency

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with HIV/AIDS or other immune system disorders, persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, some elderly and some infants can be particularly at risk from infections.

These people should seek advice 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 the Safe Drinking Water Hotline (1-800-426-4791).

Lead and Drinking Water

Lead is a metal that can cause serious health problems at elevated levels of exposure, especially for pregnant women and young children.

Although the most common exposure is by swallowing or breathing in lead paint chips and dust, lead can also enter tap water by corrosion of plumbing materials. Homes built before 1986 are more likely to have lead pipes, fixtures and solder, but even new plumbing materials may legally contain up to 8 percent lead.

To minimize this corrosion of lead into water, Charleston Water System adjusts the properties of our water to inhibit the chemical reaction that causes lead to leach into water from plumbing.

As an extra precaution, you can minimize the potential for lead exposure by flushing out water that has been sitting in your home's plumbing for several hours or more. Just let your water run for up to two minutes before using it for cooking or drinking.

Charleston Water System offers free lead tests. You can pick up a testing kit at our office locations: 103 St. Philip Street, Downtown, and 6296 Rivers Avenue, North Area. For more information about lead, call the Safe Drinking Water Hotline or visit www.epa.gov/safewater/lead.

Get Involved

Charleston Water System is governed by a board of elected Commissioners, which meets monthly. These meetings are open to the public, and citizen participation is welcomed. Meetings are typically held the fourth Tuesday of every month at 9 a.m. at 103 St. Philip Street.

Want to learn more? Schedule a speaker!

Members of our staff are available to visit your school or community group. We can customize a presentation to suit your group's needs, with topics ranging from the water cycle and water treatment to infrastructure and the history of public water service in Charleston. Call (843) 727-6856 or email info@charlestoncpw.com to schedule a speaker.

Contact Us

This report is produced annually and distributed to all customers during the month of May. For more information, contact our Customer Service Department at 843-727-6800 or customerservice@charlestoncpw.com, or visit www.charlestonwater.com.

Office Locations

Downtown
103 St. Philip Street

North Charleston
6296 Rivers Avenue

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.