Water Quality Report for 1999

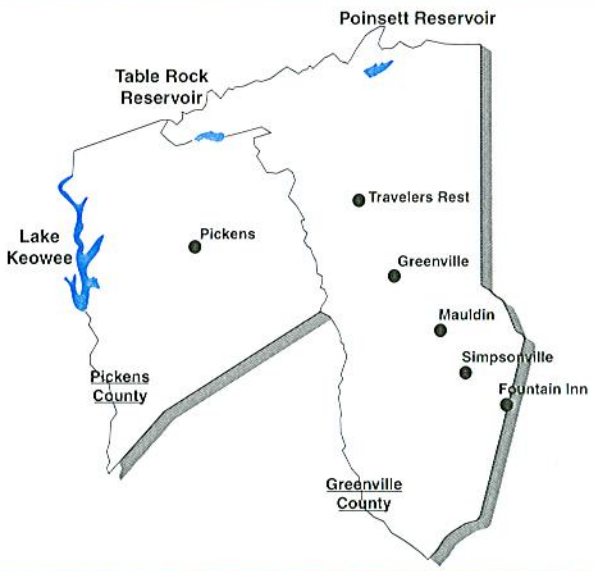
Greenville Water System

Greenville, South Carolina

Greenville's Water Meets All Standards

The Environmental Protection Agency (EPA) and the State Department of Health and Environmental Control (DHEC) have established strict standards for all drinking water. These criteria are designed to protect consumers from bacteria and water-borne illnesses. In order to protect its customers and all South Carolinians, the Greenville Water System and DHEC collect over 29,000 samples each year and perform more than 68,000 meticulous tests for the parameters contained in this report. The results are detailed in the following pages.

We are happy to report that the Water System received the highest of three possible ratings from SC DHEC during its most recent annual inspection.



Where does my water come from?

The Greenville Water System draws water from three sources: Table Rock Reservoir on the South Saluda River, Poinsett Reservoir on the North Saluda River and Lake Keowee.

Table Rock and Poinsett Reservoirs are both located in the foothills of the Blue Ridge Mountains in northern Greenville County. The Greenville Water System owns 100 per cent of both watersheds. Additionally, the Water System regularly patrols and carefully maintains these uninhabited, pristine lands. The properties are further protected by a Conservation Easement with The Nature Conservancy.

Lake Keowee is owned by Duke Energy. The Water System has an agreement with Duke to withdraw up to 150 million gallons per day (MGD) for our customers' water needs. Table Rock and North Saluda have the capacity to deliver up to 30 and 63 MGD, respectively.

SC DHEC is conducting Watershed Assessments on all three sources. Results should be available soon.

Most of the tests are conducted by DHEC. The remaining analyses are performed by Greenville Water System in our DHEC-certified laboratories or another private laboratory. The System ensures your water quality by testing water samples collected during the treatment process and as the water is delivered to customers en route through the 2,000 miles of local pipeline.

The Water Quality Reports indicate that the Greenville Water System's watershed protection practices and treatment procedures are highly effective. Our water meets the chemical specifications required for industrial users. But more importantly, our water is pure and safe to drink.

How is my water treated?

At the Table Rock and North Saluda treatment plants, chlorine is added to the water for disinfection to protect against water-borne diseases. Small amounts of caustic soda are added for pH adjustment and a polyphosphate is added for corrosion control. Fluoridation is provided to help prevent tooth decay. In addition to these treatment methods, water from Lake Keowee passes through the Adkins Filter Plant, a modern filtration facility where alum is used for coagulation.

A new state-of-the-art filter plant is currently under construction to provide filtration for water from the Table Rock and North Saluda watersheds. Scheduled for completion in 2000, this plant will be the largest in the United States to use Dissolved Air Flotation as part of the treatment process.

All treatment plants are rigidly maintained and monitored by State Certified Environmental Systems Operators who are thoroughly trained to make routine chemical and physical tests for treatment control.

What if I have questions?

If you would like more information about water treatment techniques or about our water quality, contact the Greenville Water System's Laboratory at (864) 241-7830. You can visit our web page at *greenvillewater.com* or contact us by e-mail at *laboratory@greenvillewater.com.*

The tables in this report list all the drinking water contaminants that were detected during the 1999 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the tables contain data from testing done January 1 - December 31, 1999. SC DHEC requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, may be more than one year old.

Terms and Abbreviations:

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.

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

AL (Action Level): The concentration of a contaminant which triggers treatment or other requirement which a water system must follow.

ppm (Parts per Million): This is the same as Milligrams per Liter, or one penny out of $10,000.

ppb (Parts per Billion): This is the same as Micrograms per Liter, or one penny out of $10,000,000.

NA (Not Applicable): Does Not Apply.

ND (Not Detected): Not Detected or below detection limits.

NTU (Nephelometric Turbidity Units): Units of measure to indicate water clarity.

pCi/L (Pico Curies per Liter): A measure of radiation.

SU (Standard Units): A measurement of acidity.

Primary Drinking Water Standards - All data from 1999

Parameter	Units	MCL	MCLG	Range	Highest Level Detected	Possible Sources	Violation?
Inorganic Compounds							
Fluoride	ppm	4	4			Drinking water additive	
North Saluda Plant				NA	0.79		NO
Table Rock Plant				NA	0.77	Fluoride is added during treatment to prevent tooth decay.	NO
Adkins Plant				NA	0.75		NO
General Distribution				NA	0.84		NO
Nitrate/Nitrite *(as nitrogen)*	ppm	10	10			Erosion of natural deposits; fertilizer runoff	
North Saluda Plant				NA	0.1		NO
Table Rock Plant				NA	0.34		NO
Adkins Plant				NA	0.06		NO
General Distribution				ND - 0.60	0.11 Avg		NO
Mercury	ppb	2	2			Erosion of natural deposits	
North Saluda Plant				NA	0.4		NO
Table Rock Plant				NA	0.5		NO
Adkins Plant				NA	ND		NO
Organic Compounds							
Total Trihalomethanes	ppb	100	0			Disinfection by-products	
General Distribution				5.0 - 57.0	18.7 Avg		NO
Radionuclides							
Gross Alpha *	pCi/L	15	0	NA	-0.09 +/- 0.58	Erosion of natural deposits	NO
Gross Beta *	pCi/L	50	0	NA	0.70 +/- 1.01	Decay of natural deposits	NO

* Samples from the General Distribution System

Information Collection Rule

Parameter	Units	MCL	MCLG	Range N Saluda	Range T Rock	Range Adkins	Possible Sources	Violation?
Total Organic Carbon	ppm	These parameters are not regulated and therefore have no MCL or MCLG.		0.86 - 1.61	0.83 - 1.24	0.71 - 2.78	Decay of natural deposits	NO
Total Organic Halide	ppb			71 - 100	99 - 140	ND - 110	Disinfection by-products	NO
Chloral Hydrate	ppb			0.99 - 3.21	1.75 - 4.08	ND - 5.28	Disinfection by-products	NO
Cyanogen Chloride	ppb			----------	----------	2.5 - 4.6	Disinfection by-products	NO
Haloacetic Acids (HAA5)	ppb			16.8 - 34.1	20.6 - 42.4	2.7 - 29.4	Disinfection by-products	NO
Total Trihalomethanes	ppb	100	0	9.3 - 26.2	13.7 - 29.8	5.2 - 20.4	Disinfection by-products	NO

All ICR data was collected from July, 1997 to December, 1998

Microbial & Physical Characteristics

Parameter	Units	MCL	Results	Possible Sources	Violation?
Total Coliform Bacteria Over 300 samples analyzed each month.	% positive per month	Less than 5%	1.4% Maximum	Common in the environment; human and animal waste.	NO
Turbidity					
North Saluda Plant	NTU	5	1.3 highest average monthly value	Soil runoff	NO
Table Rock Plant	NTU	5	1.6 highest average monthly value	Soil runoff	NO
General Distribution	NTU	5	0.97 highest average monthly value	Soil runoff	NO
Adkins Filter Plant	NTU	0.5	Maximum = 0.07; Average = 0.04	Soil runoff	NO
			100% of samples are below MCL		

Lead & Copper Rule

Parameter	Units	Action Level (AL)	90th Percentile Value	Sample Sites Exceeding Action Level	Possible Sources	Violation?
Lead	ppb	15	4.8	1 out of 100	Corrosion of household plumbing	NO
Copper	ppm	1.3	0.17	0	Corrosion of household plumbing	NO

Secondary Standards

Parameter	Units	MCL	Range	Average	Possible Sources	Violation?
Chloride	ppm	250	2.0 - 8.0	4.7	Soil runoff	NO
Color	color	15	ND - 15	5	Naturally occurring	NO
Iron	ppb	300	ND - 430	30	Soil runoff	NO
Manganese	ppb	50	ND - 300	ND	Soil runoff	NO
pH	SU	6.5 - 8.5	6.0 - 10.1	7.5	Controlled at treatment plant	NO
Solids (Total Dissolved)	ppm	500	19 - 48	34	Soil runoff	NO
Zinc	ppm	5	ND - 0.29	0.05	Drinking water additive	NO

Tests were performed for the following contaminants, but NONE WERE DETECTED.

Primary Inorganic Elements: Antimony, Arsenic, Asbestos, Barium, Beryllium, Cadmium, Chromium, Nickel, Selenium, Thallium.
Synthetic Organic Compounds: 1,2-Dibromo-3-Chloropropane (DBCP), 1,2-Dibromoethane (EDB), 2,4,5-TP (Silvex), 2,4-D, Alachlor (Lasso), Aldicarb (Temik), Aldicarb sulfone, Aldicarb sulfoxide, Atrazine, Benzo(a)pyrene, Carbofuran, Chlordane (Technical Chlordane), Dalapon, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl)phthalate, Dinoseb, Diquat, Endothall, Endrin, Glyphosate (Round-up), Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane (gamma-BHC), Methoxychlor, Oxamyl (Vydate), Pentachlorophenol (PCP), Picloram, Polychlorinated biphenyls (PCBs), Simazine, Toxaphene.
Volitile Organic Compounds: 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Carbon Tetrachloride, Chlorobenzene, cis-1,2-Dichloroethylene, Ethylbenzene, M,P-Xylenes, Methylene Chloride, O-Xylene, Styrene, Tetrachloroethylene, Toluene, trans-1,2-Dichloroethylene, 1,2,4-Trichlorobenzene, Trichloroethylene, Vinyl Chloride.
Secondary Elements: Aluminum, Silver, Sulfate, Surfactants.
Other Organic Compounds: 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethane, 1,1-Dichloropropene, cis-1,3-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane (TCP), 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichloropropane, 2,2-Dichloropropane, 2-Chlorotoluene, 4-Chlorotoluene, Bromobenzene, Bromochloromethane, Bromomethane, Chloroethane, Chloromethane, Dibromomethane, Dichlorodifluoromethane, Hexachlorobutadiene (HCBD), Isopropylbenzene, Naphthalene, N-Butylbenzene, N-Propylbenzene, P-Isopropyltoluene, Sec-Butylbenzene, Tert-Butylbenzene, trans-1,3-Dichloropropene, Trichlorofluoromethane.
Unregulated Compounds: 3-Hydroxycarbofuran, Aldrin, Butachlor, Carbaryl, Dicamba, Dieldrin, Methomyl, Metolachlor (Dual), Metribuzin (Sencor), Propachlor.
In Compliance with Treatment Techniques for: Giardia, Legionella, Viruses.

The Information Collection Rule and *Cryptosporidium*

The Greenville Water System, along with all other large water systems throughout the United States, participated in a major testing program known as the Information Collection Rule (ICR). The ICR testing program covered a period of 18 months and began in July, 1997. It is intended to provide EPA with information about the occurrence of chemical by-products due to disinfection, plus information about disease-causing pathogens (microorganisms). The EPA will use the data gathered through the ICR to develop or revise drinking water standards. *Cryptosporidium* is one of the microorganisms analyzed under the ICR. No viable oocysts were detected in Greenville's source water under the ICR program. Even before the ICR, the Greenville Water System began monthly testing at all three water sources for *Cryptosporidium* in 1994. Few oocysts were detected during this five-year period. During 1999, none were detected in water from the two protected watersheds or in finished water from the Adkins filter plant at Lake Keowee and none were detected in distribution sampling. *Cryptosporidium* is a one celled protozoan, too small to be seen without a microscope. It can be found in the feces of infected animals or humans. When present in sufficient numbers, it can cause symptoms that include diarrhea, nausea and stomach cramps. Other sources of *Cryptosporidium* include unwashed hands, contaminated surfaces inside and outside the home, contaminated food and recreational waters. No precaution about our drinking water is currently needed for the general public. People with weakened immune systems should speak with their health care providers about how to protect themselves against *Cryptosporidium* from all sources.

The Environmental Protection Agency requires that annual water quality reports contain the following statements:

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 Environmental Protection Agency's Safe Drinking Water Hotline (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 from human activity.

Contaminants that may be present in source 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 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, stormwater runnoff, and residential uses.
* Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runnoff and septic systems.
* Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

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 limits for contaminates in bottled water which must provide the same protection for public health.

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 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 are available from the Safe Drinking Water Hotline (800-426-4791).

Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

WaterTrivia

Water has no calories; no fat; no sugar; and no cholesterol.

Water is the most common substance found on earth.

Of all the earth's water, 97% is salt water located in oceans and seas.

Only 1% of the earth's water is available for drinking water.

The other 2% of the earth's water is frozen.

Each person uses about 100 gallons of water a day at home.

On average, 50% - 70% of household water is used outdoors for watering lawns and gardens.

Morning is the best time to water most lawn areas.

On average, the Greenville Water System delivers about 58 million gallons of water each day to the Greenville area.

It takes nearly 2,100 miles of pipe to deliver water throughout the Greenville area.

One gallon of water weighs 8.34 pounds.

There are 7.48 gallons of water in one cubic foot.

One cubic foot of water weighs 62.4 pounds.

How can I get involved?

The Commissioners of Public Works, the elected officials who control the Water System, hold regular meetings on the second Monday of each month. These meetings are held at Greenville Water System, 407 West Broad Street, and begin at 8:30 a.m. *The public is welcome to attend.*