



The City and County of Broomfield is again pleased to provide you with our Annual Water Quality Report, summarizing water quality data collected from January 1 to December 31, 2008. The Colorado Department of Public Health and Environment requires all public water systems to inform consumers about their water sources, water treatment processes, and levels of regulated contaminants in drinking water distributed to consumers during the past calendar year. Much more information about Broomfield's drinking water may be obtained by visiting the Environmental Services page of Broomfield's web site (www.broomfield.org) or by calling Laura Hubbard at **303-464-5606**. Broomfield's water supply, treatment, and delivery professionals are committed to providing you with drinking water that is safe, pleasing and dependable.

What's the bottom line?

Last year, as in years past, your tap water met or surpassed all EPA and Colorado health standards for drinking water. We're pleased to report that **our system has never violated a Maximum Contaminant Level or any other regulatory requirement**. Although some regulated contaminants were detected, the levels were far below the health-protection limits established by EPA.

You're Invited...

We welcome your input on any water quality or service issue. Broomfield City Council provides opportunities for public input and meets on the 2nd and 4th Tuesdays of each month at 6:00 pm at the City and County Building, One Descombes Drive. Notice of upcoming agendas is published in the Broomfield Enterprise, and is posted at the City and County Building and on our web site at www.broomfield.org.

En Español

Este informe contiene información muy importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

Drinking Water Contaminant Sources

Drinking water contaminants may occur naturally, or result from human activity. Contaminants may be present in the source water, introduced during the treatment process, or develop after the water leaves the treatment facility.

Source Water. 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 land surface or through the ground, it dissolves naturally-occurring minerals and other contaminants resulting from the presence of animals or from human activity. For example:

- ◆ **Microbial contaminants**, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agriculture, livestock operations, household pets, and wildlife.
- ◆ **Inorganic contaminants**, such as salts and metals, can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ◆ **Pesticides and herbicides** may come from sources such as agriculture, urban stormwater runoff, and residential uses.

- ◆ **Organic chemical contaminants**, including synthetic and volatile organic chemicals, can be byproducts of industrial processes such as petroleum production, or come from gas stations, urban stormwater runoff, and septic systems.
- ◆ **Radioactive contaminants** can be naturally-occurring or result from oil and gas production, mining activities or other industrial activities.

Treatment Process. Some regulated substances are introduced during the water treatment process, or form as a result of treatment. Examples include fluoride, disinfectants, and disinfection by-products.

After Treatment. After treatment, the interaction of treated water with water mains and household plumbing may contribute other substances, such as lead and copper, to consumers' tap water.

Because contaminant sources cannot be completely eliminated, all drinking water, including bottled water, may be reasonably expected to contain at least small amounts of some contaminants. It's important to remember that the presence of contaminants does not necessarily indicate that water poses a health risk.

Broomfield's Water Sources

Broomfield is fortunate to have two sources of high-quality drinking water – water treated at the city's Water Treatment Facility, and treated water purchased from Denver Water. The two sources are generally blended in the distribution system. All of Broomfield's drinking water, whether supplied by Broomfield or Denver, comes from surface water sources such as rivers, lakes, and reservoirs.

Denver Water may deliver treated water to its municipal customers from any of its three treatment facilities. Water supplying these facilities comes from Denver Water's extensive Moffat and South Platte River collection systems.

The water supply for Broomfield's treatment facility originates in the Colorado and Fraser Rivers west of the Continental Divide, and is delivered through the Northern Colorado Water Conservancy District's Colorado-Big Thompson (C-BT) Project. On the eastern slope, Broomfield's water is stored in Carter Lake near Berthoud. From there, it is transported to Broomfield's treatment facility via a 33-mile pipeline, and stored in Matthew D. Glasser Reservoir, a small storage reservoir adjacent to the treatment facility.

Drinking Water Treatment Process

Broomfield's modern treatment facility, completed in 1997, is designed to treat 20 million gallons of water per day. Chemicals specially formulated for drinking water treatment are added to the raw water to remove particles, microorganisms and other contaminants. The water is then filtered to remove any remaining particles. Fluoride is added to help prevent tooth decay, and the treated water is disinfected with chloramines to inactivate bacteria and viruses and prevent harmful organisms from growing in the distribution system. Certified Water Treatment Operators monitor the treatment process continuously to ensure consistent quality and safety.

Source Water Protection

The best place to prevent or minimize contaminants is at the source! The State of Colorado has developed a Source Water Assessment & Protection (SWAP) program to provide information and encourage community-based source water protection and preventive management strategies to keep our water resources safe from future contamination. You may obtain a copy of the report by visiting <http://www.cdph.state.co.us/wq/sw/swaphom.html> or by contacting Laura Hubbard at **303-464-5606**.

The Source Water Assessment Report provides a screening-level evaluation of potential contamination that **could** occur. It does not mean that the contamination **has or will** occur. We can use this information to evaluate the need to improve our current water treatment capabilities and prepare for future contamination threats. This can help us ensure that quality finished water is delivered to your home. In addition, the source water assessment results provide a starting point for developing a source water protection plan.

Contamination in our source water areas could possibly occur from discrete sources such as:

- Aboveground, underground and/or leaking storage tank sites (including gas and propane tanks)
- Existing/abandoned mine sites
- Other industrial/commercial facilities such as convenience stores, campgrounds, and motels

Land uses in our source water areas represent potential dispersed sources of contamination. These include commercial/industrial/transportation use, residential areas, fields, and forests. Septic systems, oil/gas wells and roads could also possibly contribute dispersed contaminants to our source water areas.

Cryptosporidium and Giardia

Broomfield continues to monitor its raw and finished water for the presence of Cryptosporidium and Giardia, two common microbial pathogens that can cause serious illness. Animals in our watershed harbor both of these organisms, but our treatment system of effective filtration and disinfection removes or inactivates them. During 2008, one of six raw water samples tested positive for Cryptosporidium. Broomfield has never detected either Cryptosporidium or Giardia in its treated drinking water.

Cryptosporidiosis is an abdominal infection that can cause nausea, diarrhea and abdominal cramps. Cryptosporidium must be ingested to cause this disease, which can occur from swallowing recreational water (from pools, hot tubs, lakes or streams) or drinking water that is contaminated. Most people recover from this infection within a few weeks. However, immunocompromised people, infants and small children may develop more serious illness.

Water Conservation

In addition to protecting our source water, we can all increase our efforts to use water more wisely. Recent water shortages across the United States have reminded us of the value of reliable water supplies. From 1950 to the present, potable water demand on US public water supply systems has tripled, increasing the volume of wastewater that must be collected and treated. Costs for supplying drinking water and treating wastewater can increase more than necessary when water demand is inflated by wasteful water use and water loss. For information on what you can do to conserve water, visit the Environmental Services website at www.broomfield.org.

Water Quality Data

During 2008, Broomfield's Water Treatment staff and Certified Drinking Water Laboratory performed more than 35,000 tests for about 125 different contaminants. Laboratory staff routinely sample more than 220 locations throughout Broomfield. The table below lists all the drinking water contaminants detected that Broomfield water consumers could have received during the 2008 calendar year. Contaminants not reported in the table were not detected.

Terms, Abbreviations, and Symbols Used in This Report:

ppm – parts per million, or milligrams per liter (mg/L). In dollars, 1 ppm = 1 cent in \$10,000

ppb – parts per billion, or micrograms per liter (µg/L). In dollars, 1 ppb = 1 cent in \$10,000,000

picoCuries per liter (pCi/L) – a picoCurie is a measure of radioactivity and equals one trillionth of a Curie.

Action Level (AL) – the concentration of a contaminant, which if exceeded, triggers treatment or other requirements a water system must follow.

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

Maximum Contaminant Level Goal – The “Goal” (MCLG) is 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 – The MCL is 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.

Secondary Maximum Contaminant Level (SMCL) – SMCLs are non-enforceable, recommended limits for substances that affect the taste, odor, color or other aesthetic qualities of drinking water, rather than posing a health risk.

Maximum Residual Disinfectant Level (MRDL) – 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.

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.

Running Annual Average (RAA) – An average of monitoring results for the previous 12 calendar months.

Turbidity – Turbidity is a measure of the cloudiness of the water. It is measured in “Nephelometric Turbidity Units,” or NTU. Although turbidity has no known health effects, it is regulated because it serves as an indicator of treatment plant performance.

N/A – Not Applicable

REGULATED CONTAMINANTS TABLE

Contaminant	CCR Units	EPA Goal (MCLG)	Highest Level Allowed (MCL)	Level Detected for Compliance	Range Detected (ND = not detected)	MCL Violation ?	Test Frequency	Likely Source of Substances
Regulated Leaving the Treatment Facility								
Arsenic	ppb	0	10	0.27	ND – 0.30	No	Monthly	Erosion of natural deposits, glass and electronics production waste
Barium ¹	ppm	2	2	0.037	0.014 – 0.039	No	Monthly	Erosion of natural deposits, discharge of drilling wastes
Chromium	ppb	100	100	0.16	ND – 0.16	No	Monthly	Erosion of natural deposits
Fluoride	ppm	4	4 (SMCL=2)	0.94	0.82 – 1.3	No	Monthly	Water additive to promote strong teeth, erosion of natural deposits
Nitrate, as Nitrogen ¹	ppm	10	10	0.12	0.05 – 0.19	No	Monthly	Fertilizer runoff, sewage, septic tank leachate
Alpha particles ¹	pCi/L ²	0	15	ND	ND – 2.0	No	Quarterly	Erosion of natural mineral deposits that emit alpha radiation
Beta/photon emitters ¹	pCi/L ²	0	50 (4 mrem/year)	ND	ND – 4.0	No	Quarterly	Decay of natural deposits
Uranium ¹	ppb	0	30	ND	ND – 0.5	No	Quarterly	Erosion of natural deposits
Sodium (monitoring required, but no MCL) ¹	ppm	N/A	N/A	19	6.0 - 22	N/A	Monthly	Naturally present in soils and dissolved minerals
Regulated in the Distribution System ³								
Total Trihalomethanes (TTHM)	ppb	0	80	24	13 - 34	No	Quarterly	Byproducts of chlorine disinfection of drinking water
Haloacetic acids (HAA5)	ppb	0	60	18	9.9 - 28	No	Quarterly	
Total Chlorine (chloramine)	ppm	4 (MRDLG)	4.0 (MRDL)	1.7	ND – 3.7	No	20 per week	Drinking water disinfectant
Total Coliform Bacteria	Absent or Present	zero	Less than 5% positive per month	Highest monthly % positive samples: 1.01%	# positive samples of total 2008 samples: 1 of 1131	No	20 per week	Naturally present in the environment
Regulated at the Consumer's Tap								
<i>Lead and copper monitoring is required only every 3 years because Broomfield has had consistently low results. We monitor again in 2011.</i>			Action Level (AL) ⁴	90th percentile value	Number of Homes exceeding the AL	MCL Violation ?	Sample Date/ Frequency	Likely Source of Substances
Lead	ppb	0	AL = 15	7.3	Zero	No	Jul - Aug, 2008	Corrosion of household plumbing
Copper	ppm	1.3	AL = 1.3	0.206	Zero	No		

Regulated at the Treatment Facility						
Parameter	Requirement	Compliance Level / Description	Violation?	Sample Date	Test Frequency	Likely Source of Substances
Turbidity	At no time to exceed 1 NTU	0.14 NTU – maximum	No	3/5/2008, 4/11/2008	Every 4 hours	Soil Runoff
	Each month, at least 95% of samples must be less than 0.3 NTU	100% - monthly minimum	No	N/A	Every 4 hours	
Control of Disinfection By-Product Precursors	Treatment technique	Enhanced treatment was used to remove the required amount of natural organic material	No	N/A	Monthly	Organic material naturally present in soil and water
Microscopic Particulate Analysis (MPA) ⁵	Treatment technique	2-log removal	No	12/4/08	Annual	Pollen, phytoplankton, algae, insects and zooplankton

Regulated Contaminants Table Footnotes

- ¹ Denver Water data. The compliance level is the maximum detected concentration that Broomfield customers could have received, from either Broomfield or Denver Water sources.
- ² Although the MCL for beta/photon emitters is 4 mrem per year, EPA considers 50 pCi/L to be the level of concern for beta particles.
- ³ TTHM, HAA5 and chlorine are regulated as a running annual average (RAA), not a single value. "Level detected for compliance" is the highest RAA; the "range" is based on the individual sample results.
- ⁴ The Action Levels for lead and copper apply to the 90th percentile of all samples collected; 90% of the samples must be below the Action Level.
- ⁵ MPA is a test of our filters' particulate removal efficiency. Additional control of microbial contaminants is achieved by enhanced coagulation, and inactivation through disinfection.

Drinking Water and Health

In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Special Health Concerns

All 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 the water poses a health risk. Immuno-compromised people, such as people with cancer undergoing chemotherapy, people 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. For more information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and microbiological contaminants, call the **EPA Safe Drinking Water Hotline at 1-800-426-4791**.

Other water quality questions?

Our 2008 monitoring results for other water quality characteristics that may be of interest are reported in the table below. These may affect water's taste, smell or appearance. Water hardness may affect how much detergent we use. For more information about water quality concerns or this report, please call Laura Hubbard at 303-464-5606, or the Water Treatment Facility at 303-464-5600.

Secondary and Unregulated Water Quality Characteristics

Constituent	Units	Recommended Limit (if any)	Range in Distribution System (Minimum – Maximum)
<i>Secondary Constituents (Recommended Limit is the SMCL)</i>			
Aluminum	ppm	0.05 – 0.2	0.010 – 0.041
Chloride	ppm	250	4.5 – 21
Copper	ppm	1.0	0.002 – 0.11
Fluoride	ppm	2.0	0.31 – 1.1
Iron	ppb	300	4 – 20
Manganese	ppb	50	0.5 – 2.9
pH	Std. Units	6.5 - 8.5	7.1 – 8.2

Silver	ppm	0.10	ND
Sulfate	ppm	250	12 – 57
Total Dissolved Solids	ppm	500	69 – 170
Zinc	ppm	5	0.001 – 0.011
<i>Unregulated Constituents</i>			
Alkalinity (as CaCO ₃)	ppm	N/A	27 – 67
Hardness (as CaCO ₃)	ppm	<50 = “soft”, >150 = “hard”	26 – 110
	grains per gallon	<3 = “soft”, > 8.8 = “hard”	1.6 – 6.7
Calcium	ppm	N/A	8.6 – 46
Magnesium	ppm	N/A	1.1 – 6.6
Potassium	ppm	N/A	0.6 – 1.9
Sodium	ppm	N/A	6.6 - 18