CITY & COUNTY OF BROOMFIELD

2012 ANNUAL DRINKING WATER QUALITY REPORT

2012 REPORT

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, 2012. 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 website 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 and mining 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.

Public Water Supply ID# CO0107155

Drinking Water Treatment Process

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.

Water Conservation

In addition to protecting our source water, we can all increase our efforts to use water more wisely. Staff are closely monitoring the water supply outlook. Due to low water storage in its source reservoirs, **Broomfield is asking its customers to closely follow the watering guidelines developed in cooperation with other Front Range communities. The guidelines are available on the Environmental Services website at www.broomfield.org.** Please reduce water use by 10%. The City & County will take the lead in this effort by reducing city water use, including watering of parks and streetscapes, by 10%. The exception will be the athletic fields, which will be watered as needed to assure the fields are in peak condition when organized sports are ready to use them, and spot watering of new sod as needed. Voluntary efforts to reduce water use now may postpone the need for watering restrictions as the water storage reservoir levels decline. Broomfield is offering free irrigation audits and rebates for toilets, clothes washers, irrigation controllers and irrigation heads to help residents achieve the desired savings. Please visit **www.BroomfieldRebates.com** for information and applications.

BROOMFIELD'S WATER SOURCES

Broomfield is fortunate to have two sources of high-quality drinking water – water treated at our 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 Water, 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 (CBT) 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.

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 **www.colorado.gov** and searching on 'source water assessment,' 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.

WATER QUALITY DATA

During 2012, Broomfield's Water Treatment Staff and Certified Drinking Water Laboratory performed more than 25,000 tests for about 100 different contaminants. Laboratory staff routinely sample more than 190 locations throughout Broomfield. The table below lists all the drinking water contaminants detected that Broomfield water consumers could have received during the 2012 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

pCi/L – picocuries per liter, a measure of the radioactivity in water.

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.

Violation – A failure to meet a Colorado Primary Drinking Water Regulation.

Range of Individual Samples – The lowest sample result to the highest sample result.

Average of Individual Samples – The sum of all sample results divided by the number of sample results.

Secondary Maximum Contaminant Level (SMCL) –
A non-enforceable, recommended limit for a substance that affects 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 contamination.

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

Turbidity – Turbidity is a measure of the cloudiness of the water. It is measured in "Nephelometric Turbidity Units," or NTU.

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

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

N/A – Not Applicable **ND –** Not Detected

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.

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. More information about contaminants and potential health effects can be obtained by calling the **EPA Safe Drinking Water Hotline (800-426-4791).**

Lead in Drinking Water and Its Effects on Children

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. The City and County of Broomfield is responsible for providing high quality drinking water, but 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 (800-426-4791)** or at **http://www.epa.gov/safewater/lead.**

Special Health Concerns

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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 and other microbial contaminants are available from the **Safe Drinking Water Hotline (800-426-4791).**

Other Water Quality Concerns

Our 2012 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)
Secondary Constituents (Recommended Limit is the SMCL)			
Aluminum	ppm	0.05 – 0.2	0.011 – 0.048
Chloride	ppm	250	3.6 - 33
Copper	ppm	1	0.013 - 0.17
Fluoride	ppm	2	0.56 - 1.0
Iron	ppb	300	ND - 38
Manganese	ppb	50	0.52 - 2.3
pH	Std. Units	6.5 - 8.5	7.3 - 8.5
Silver	ppm	0.1	ND
Sulfate	ppm	250	13 - 63
Total Dissolved Solids	ppm	500	50 - 200
Zinc	ppm	5	ND - 0.008
Unregulated Constituents			
Alkalinity (as $CaCO_3$)	ppm	N/A	28 - 76
Hardness (as $CaCO_3$)	ppm	< 50 ="soft" > 150 ="hard"	26 - 120
	grains per gallon	< 3 = "soft" > 8.8 ="hard"	1.5 - 7.2
Calcium	ppm	N/A	9.0 - 36
Magnesium	ppm	N/A	1.1 - 7.6
Potassium	ppm	N/A	0.66 - 1.8
Sodium	ppm	N/A	9.7 - 23

DETECTED CONTAMINANTS TABLE: What's in Broomfield's water?

Sampled at the Entry Point to the Distribution System

Contaminant	CCR Units	EPA Goal (MCLG)	Highest Level Allowed (MCL)	Level Detected for Compliance	Range of Individual Samples	MCL Violation?	Sample Date/ Frequency	Typical Sources
Barium[1]	ppm	2	2	0.038	0.015 – 0.042	No	Monthly	Erosion of natural deposits, discharge of drilling waste
Fluoride	ppm	4	4 (SMCL=2)	0.92	0.71 - 1.0	No	Monthly	Water additive to promote strong teeth, erosion of natural deposits
Nitrate, as Nitrogen[1]	ppm	10	10	0.13	ND – 0.16	No	Monthly	Fertilizer runoff, sewage, septic tank leachate
Combined Radium (Ra-226 and Ra-228)[2]	pCi/L	0	5	0.1	N/A	No	August 9, 2011	Erosion of natural mineral deposits
Sodium (monitoring required, but no MCL)[1]	ppm	N/A	N/A	13	5.1 - 17	N/A	Monthly	Naturally present in the environment

Contaminant	TT Requirement	Results	TT Violation?	Sample Date/ Frequency	Typical Sources
Turbidity	Maximum of 1 NTU for any single measurement	Highest single measurement: 0.27 NTU	No	August 2012 Every 4 hours	Soil runoff
	Each month, at least 95% of samples must be less than 0.3 NTU	Lowest % of samples less than 0.3 NTU: 100%	No	Every 4 hours	

Sampled at the Treatment Facility

Disinfection Byproduct Precursor	Year	Average of All 2012 Individual Ratio Samples	Range of Individual Ratio Samples	Number of Ratio Samples	TT Minimum Ratio	Unit of Measure	TT Violation?	Typical Sources
Total Organic Carbon	2012	1.48	1.28 - 1.73	12	1	Ratio	No	Naturally present in the environment

Sampled in the Distribution System[3]

Disinfection Byproduct	CCR Units	EPA Goal (MCLG)	Highest Level Allowed (MCL)	Average of All 2012 Individual Samples	Range of Individual Samples	MCL Violation?	Sample Date/ Frequency	Typical Sources
Total Trihalomethanes (TTHM)	ppb	0	80	19.7	11.8 - 25.9	No	8 per Quarter	Byproducts of chlorine disinfection of drinking water
Haloacetic acids (HAA5)	ppb	0	60	15.6	9.41 - 20.3	No	8 per Quarter	

Disinfectant	CCR Units	EPA Goal (MRDLG)	Highest Level Allowed (MRDL)	Average of All 2012 Individual Samples	Range of Individual Samples	MRDL Violation?	Sample Date/ Frequency	Typical Sources
Total Chlorine (chloramine)[3]	ppm	4	4.0	1.72	ND - 3.2	No	100 per month	Water additive used to control microbes

Disinfectant	TT Requirement	Results	Number of Samples	TT Violation?	Sample Date/ Frequency	Typical Sources
Total Chlorine (chloramine)	For any two consecutive months, disinfectant residuals for at least 95% of each month's samples must be detectable	Lowest monthly percentage of samples meeting TT Requirement: 98%	2 out of 98 samples in January 2012 were less than 0.05 ppm	No	100 per month	Water additive used to control microbes

Microorganism Contaminant	EPA Goal (MCLG)	Highest Level Allowed (MCL)	Results	Number of Samples	MCL Violation?	Sample Date/ Frequency	Typical Sources
Total Coliform Bacteria	zero	Less than 5% of each month's samples are positive	Highest % of positive samples: 1.83%	2 out of 109 samples in June 2012 were positive	No	100 per month	Naturally present in the environment

Sampled at the Consumer's Tap

Lead and copper monitoring is required only every 3 years because Broomfield has had consistently low results. We monitor again in 2014.	CCR Units	Action Level (AL)[4]	90th Percentile	Sample Sites Above AL	Sample Size	MCL Violation?	Sample Date/ Frequency	Typical Sources
Lead	ppb	15	2.8	Zero	34	No	August – September, 2011	Corrosion of household plumbing
Copper	ppm	1.3	0.122	Zero	34	No		

[1] Denver Water data. We report the maximum detected concentration that Broomfield water customers could have received, from either Broomfield or Denver Water sources.

[2] Monitoring for combined radium (Ra-226 and Ra-228) is required only every 6 years because Broomfield has had consistently low results. We monitor again in 2017.

[3] TTHM, HAA5 and Total Chlorine are regulated as a running annual average (RAA), not a single value.

[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.