2013
Treated Water Quality Summary

DENVER WATER

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2013 Treated Water Quality Report

DENVER WATER
2013 TREATED WATER SUMMARY

Introduction

Denver Water provides its customers with high-quality drinking water. We want you to be aware of how that quality is maintained and learn more about the water treatment process. We take great care and effort into providing the Denver-metro area with water that meets the most stringent standards. This report was prepared to provide you with important information about Denver's water quality.

Table 1: Measurement Units Interpretation Table

Unit	Full Name	Equivalent to:
General Terms		
SU	Standard Units (a measurement of pH)	
µS	Micro Siemens (a measurement of Specific Conductance)	Micro mhos
°C	Degrees Celsius (a measurement of temperature)	25°C ≈ (= approx.) 77°F (Fahrenheit)
Chemical Terms		
mg/L	Milligrams per Liter	Parts per million (ppm)
µg/L	Micrograms per Liter	Parts per billion (ppb)
ng/L	Nanograms per Liter	Parts per trillion (ppt)
NTU	Nephalometric Turbidity Units (a measurement of clarity, fine particulate matter)	
pCi/L	PicoCuries per Liter (a measurement of radioactivity)	
AU	Absorbance units (a measurement of the absorbance at a specific wavelength)	
g/g	Grains per gallon (a measure of water hardness, approximately = to 17.1 mg/L)	
Microbiological Terms		
CFU/100 ml	Colony forming units per 100 milliliters (a bacterial unit)	
Count/ml	Count of organisms per milliliter of sample (a bacterial unit)	

Explanation of Terms

To better understand this report, please refer to Table 1, which gives brief explanations of terms and measurement units that are used in the document. Parameters such as temperature and turbidity (which is a measure of the discoloration or particulates in the water that interferes with the clarity of the water) are measurements of physical characteristics and are expressed in units specific to their analyses. Chemical results are generally expressed in terms of concentration, weight or amount per unit volume, for example, mg/L or µg/L. Microbiological results are generally expressed in terms of a count of organisms per volume of sample, for example, CFU/100 ml.

Report Data

This report includes graphs and tables summarizing data for samples collected throughout 2013 from the potable (drinking) water leaving Denver Water's treatment plants. This report also includes data from the source water to the treatment plants, and data from the distributed water. The data in this report are directly related to drinking water compliance criteria. Denver Water uses these analyses to ensure the safety and aesthetic quality of the water.

Some of the data is presented in graphs to highlight changes over time or dynamic ranges in the parameters. Results are expressed primarily as averages unless otherwise specified. On page 12 of this report, treated water results are displayed in tables that include the regulatory limit for the analysis where applicable. Water quality is monitored both at the treatment plants and at more than 130 locations in the distribution system for various parameters each week. Total coliform bacteria are used as an indicator of water's potability.

The percent of positive coliform samples each month is calculated and reported to the Colorado Department of Public Health and Environment, the primacy agency that enforces the Environmental Protection Agency regulations in Colorado. No more than five percent of the samples may be positive per month for total coliform. As evident from the table on page 3, Denver Water is well below the five percent level.

Where Does Denver Get Its Water?

Denver Water collects its water from two sources. The South Platte Collection System combines water from high mountain regions on the east slope of the Rocky Mountains, with water diverted from Summit County and water from Dillon Reservoir on the west slope of the Continental Divide. The Moffat Collection System spans both sides of the Continental Divide, with the majority of it located in Grand County on the West Slope. Raw water from the Moffat Collection System is sent through the Moffat Tunnel to facilities northwest of Denver for storage and treatment.

These sources provide high quality water, but their characteristics are quite different, and the source water mineral concentration varies seasonally with the amount of flow. In general, the water in the South Platte System has a higher mineral content than the water in the Moffat System.

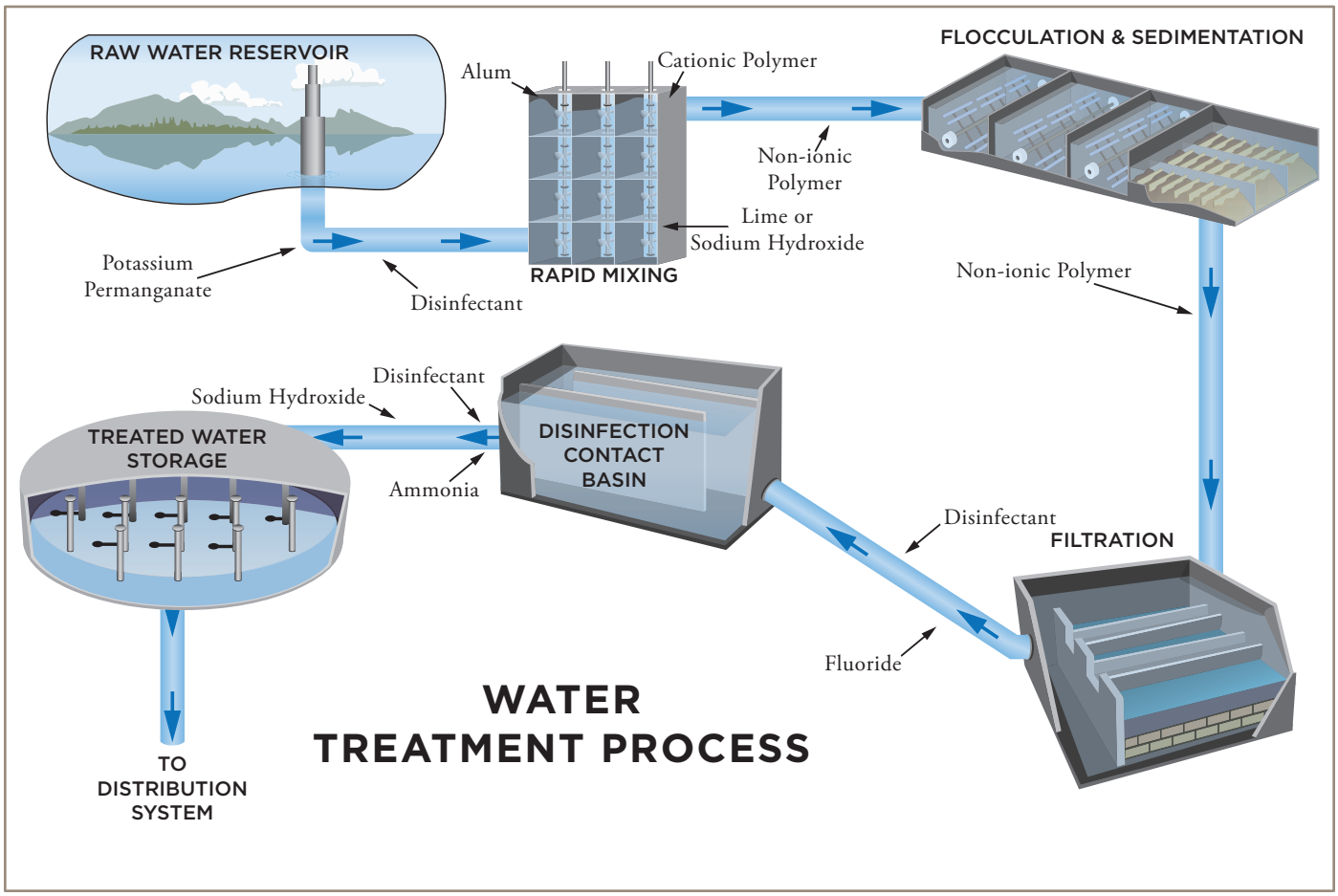
Watershed Collection System

How Is Water Treated To Make It Drinkable?

Denver Water has three treatment plants that process water for drinking, with a combined maximum treatment capacity of 715 million gallons per day. Two treatment plants, Foothills and Marston, process water from the South Platte Collection System. The third plant, Moffat, treats water from the Moffat Collection System. The treatment process begins with the addition of coagulants to raw water. These coagulants are commonly referred to as alum and polymer. Alum is aluminum sulfate, a chemical that attaches to dirt and other particles in the water. Through a process of slow mixing, the particles collide and stick together; as this process continues, the particles grow, becoming large enough to see. The larger particles are called floc. Polymer enhances the process. These now larger and heavier particles settle to the bottom of the sedimentation basin. The clarified water at the top of the basin is then sent through silica sand filters at Moffat Treatment Plant and sand and anthracite coal dual media filters at Marston and Foothills treatment plants. Filtration removes virtually all of the particles carried over from the

Table 2: Treatment Plant Treated Water and Distribution System Total Coliform Samples for 2013

Month	Number of Samples	Number of Positives	% Positive
January	419	0	0.00%
February	378	0	0.00%
March	407	1	0.25%
April	431	0	0.00%
May	321	0	0.00%
June	411	0	0.00%
July	460	0	0.00%
August	434	0	0.00%
September	431	2	0.46%
October	458	0	0.00%
November	422	0	0.00%
December	422	0	0.00%
Totals	**4,994**	**3**	**0.06%**



sedimentation process. Each treatment plant produces extremely clear water, evidenced by low turbidities (a measure of clarity). Less than 0.20 turbidity units represents clear, clean water. Potassium permanganate or powdered activated carbon may also be added to control excess manganese or odors, respectively.

Most of Denver Water's supply has naturally occurring fluoride. The Colorado Department of Public Health and Environment and the Centers for Disease Control and Prevention set the recommended level of fluoride. After filtration, the water may be supplemented to bring the total concentration of fluoride up to 0.70 mg/L. The health department and the Centers for Disease Control and Prevention have determined that 0.70 mg/L is the optimal level to prevent tooth decay. Caustic soda may be used to control the pH (acidity/alkalinity) of the water. It is added to adjust the pH of the water to greater than 7.5 standard units. Finally, the water is thoroughly disinfected to maintain its high quality as it travels to homes and businesses.

Why Is The Water Treated This Way?

The treatment process is designed to remove dirt, particulate matter, naturally occurring organic matter, and microscopic organisms, such as bacteria, that are found in surface waters. Disinfection kills potentially harmful microorganisms. See Table 2 on page 3. Disinfection of drinking water has saved millions of lives over the past century by preventing waterborne diseases such as typhoid and cholera. Denver Water uses a very effective long-lasting disinfectant, chloramine. This produces lower concentrations of disinfection by products, such as total trihalomethanes and haloacetic acids, than would free chlorine. Disinfection by products above their regulatory limits are potentially harmful; therefore minimization of them is very important.

These regulations are very strict and require that drinking water is made safe for consumption over a person's lifetime. At present, there are more than 90 contaminants and groups of contaminants that are regulated in drinking water. Some of these contaminants, such as lead, have been shown to be a health risk, while others are merely suspected of being health risks but are still considered serious enough to regulate.

The Environmental Protection Agency has set regulatory limits for these compounds. Regulatory limits are levels of safety that must not be exceeded in order to

Table 3: Denver Water Average Values for 2013

PARAMETER	TREATMENT PLANT	SOURCE WATER RESULT	TREATED WATER RESULT	EPA REGULATORY LIMIT
Lead (ppb)	Marston	None detected	None detected	15 ppb (action level)
	Foothills			
	Moffat			
Arsenic (ppb)	Marston			10 ppb
	Foothills			
	Moffat			
Mercury (ppb)	Marston			2 ppb
	Foothills			
	Moffat			
Giardia (Cysts/L)	Marston	None detected		Treatment Technique
	Foothills	2.5		
	Moffat	None detected		
Cryptosporidium (Oocysts/L)	Marston	None detected		Treatment Technique
	Foothills	None detected		
	Moffat	None detected		
E. Coli (MPN/100 ml)	Marston	6		Ø
	Foothills	6		
	Moffat	None detected		

Table 4: Denver Water Average Values for 2013

PARAMETER	TREATMENT PLANT	SOURCE WATER RESULT	TREATED WATER RESULT	EPA REGULATORY LIMIT
Aluminum (ppb)	Marston	71	31	50 - 200 (SMCL)
	Foothills	187	36	50 - 200 (SMCL)
	Moffat	601 (impact of September flood)	None detected	50 - 200 (SMCL)
Barium (ppb)	Marston	42	41	2,000
	Foothills	36	35	2,000
	Moffat	27	22	2,000
Calcium (ppm)	Marston	34	33	None
	Foothills	25	25	
	Moffat	12	17	
Magnesium (ppm)	Marston	8.4	8.3	
	Foothills	6.3	6.4	
	Moffat	3.1	3.0	
Potassium (ppm)	Marston	2.1	2.0	
	Foothills	1.8	1.7	
	Moffat	1.2	1	
Sodium (ppm)	Marston	18	18.3	
	Foothills	13	17.4	
	Moffat	4	5	

maintain safe drinking water. Some contaminants are regulated based on the possibility of their occurrence in water. Regulatory limits or levels were determined based on the best available data from health effects studies. The majority of the EPA's drinking water regulations apply to the treated water entering the distribution system before it reaches the first customer. Denver Water is happy to report that we have never violated a regulatory limit for any contaminant to date.

How Well Is Denver Water Doing?

Tables 3-5 illustrate the effectiveness of treatment for a few parameters of note.

Turbidity is a measurement of the clarity of the water; thus, a low turbidity indicates very clear water. Most microorganisms, including bacteria, are attached to particulate matter (fine dirt and debris). Particulate matter accounts for much of the turbidity in water. Therefore, turbidity is an extremely important parameter and has been regulated by the EPA for many years. The turbidity regulation requires that turbidities in the treated water be less than or equal to 0.30 NTU (turbidity units) in 95 percent of the samples each month. In 2013, 100 percent of the samples were below 0.30 NTU. The water was clean and clear entering the distribution system. See Graph 2 below.

The total coliform test is a measure of all types of coliform bacteria in the water. Coliform bacteria are ubiquitous. They are even found in soils and on plants. We test for coliform bacteria, which includes *E. coli* (found in the intestines of all mammals, including humans) to determine the cleanliness of the water. We test for total coliform in our plants source and treated waters, as well as throughout our entire distribution system.

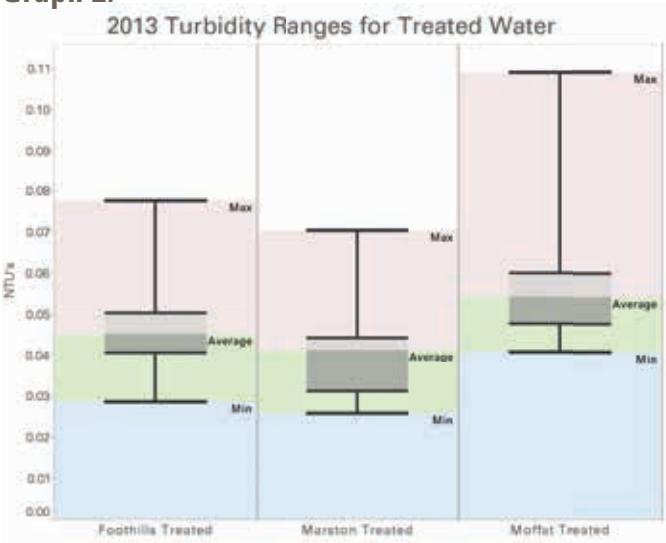
On the rare occasion when a sample has tested positive for total coliform, additional samples had to be taken at locations upstream and downstream of the original test site and again at the site itself.

Table 5: Denver Water Average Values for 2013

PARAMETER	TREATMENT PLANT	SOURCE WATER RESULT	TREATED WATER RESULT	EPA REGULATORY LIMIT
Turbidity (NTU)	Marston	0.98	0.04	95% of samples less than 0.30 in any month
	Foothills	1.8	0.05	
	Moffat	11	0.06	
Total Coliform (MPN/100 ml)	Marston	240	None detected	No more than 5% positives / month
	Foothills	218		
	Moffat	25		

This re-sampling is mandated by the state health department to assure the safety of the water. Regardless, Denver Water's internal operating procedures would require this re-sampling.Samples are collected until results indicate the water is safe.

Graph 2:



Are There More Serious Contaminants in the Water?

Denver Water has tested for all of the EPA-regulated compounds for years, and in anticipation of upcoming regulations, has tested for newly identified contaminants as well. Contaminants that have been seen in news headlines include lead, arsenic, mercury, *Cryptosporidium*, *Giardia*, and *E. coli,* among others. Denver Water has tested for these for more than 20 years and has not detected them in the treated water. *Giardia, E. coli* and *Cryptosporidium* have occasionally been detected in the source water, but the effective treatment system in our treatment plants, as outlined on page 3, removes or inactivates these microorganisms.

Minerals In Nature That Are Found In Water

All natural waters contain minerals found in the earth's crust. These mineral salts result from the natural erosion of soils, rocks and/or the decay of plants and aquatic life. The amounts of these minerals in water also determine the characteristics of the water, such as its hardness. Minerals in water give water its flavor. Mineral-rich water often tastes chalky. Of the minerals shown in table 4 on page 5, only barium and aluminum are regulated in the treated water. Barium has a maximum contaminant level of 2,000 ppb, while aluminum has a secondary maximum contaminant level, which is a non-enforceable drinking water regulation (does not pose a health risk)of 50-200 ppb. Most minerals are not removed by conventional treatment. Calcium, magnesium, iron and manganese amounts may be reduced by water treatment, but not completely removed. Please note that these comparisons, though from the same treatment plants, are not always from samples collected on the same dates for the source and the treated waters, and therefore are general comparisons. Drinking water naturally contains several minerals that are beneficial to humans and mammals. The minerals in Table 4 are beneficial at prescribed levels. However, at levels *above* the regulatory limits (where applicable), some

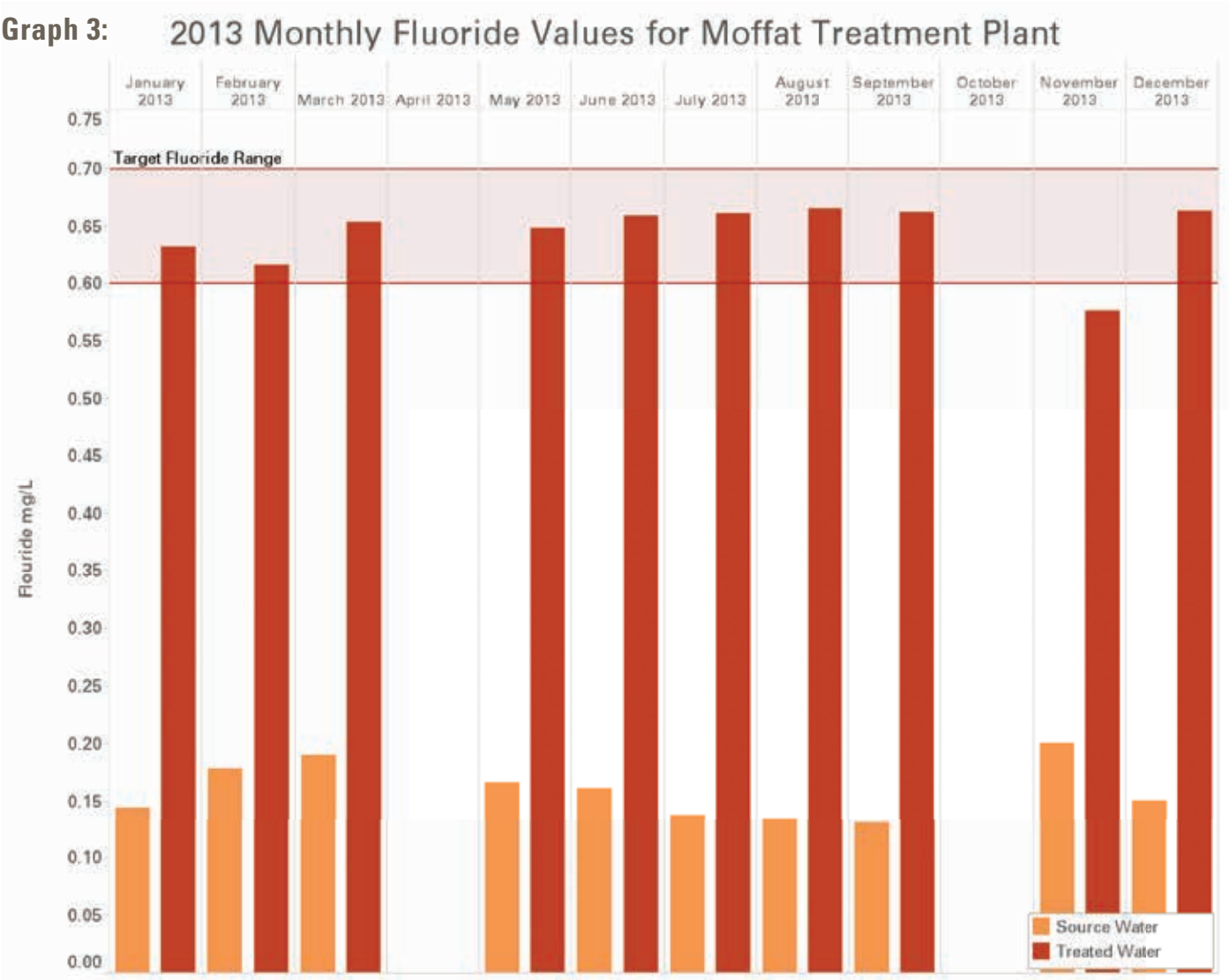
of these minerals may cause detrimental effects over a lifetime. If there is no regulatory limit, or maximum contaminant level, listed in the table, then the amount of the mineral that might cause a potential health concern is much higher than would ever be found in water.

Comparison of Fluoride Between the Source and Treated Water

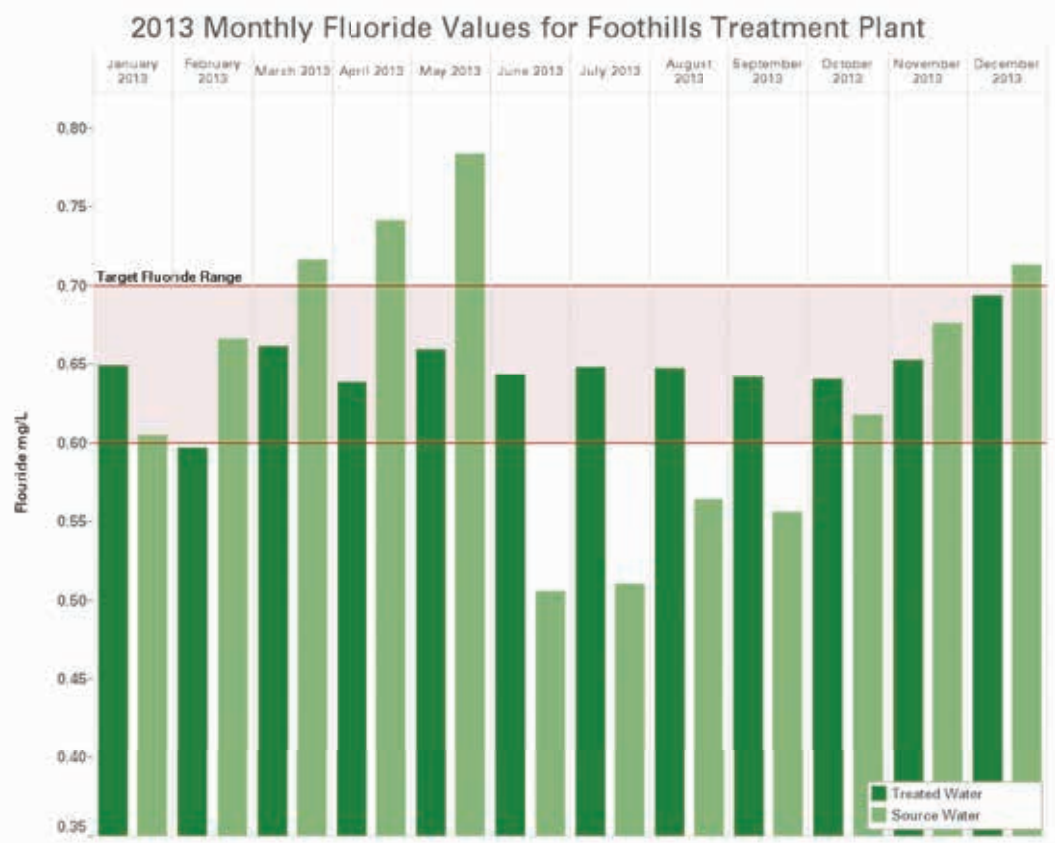
Denver Water's source water has natural fluoride. When needed, Denver Water supplements the water with fluoride to bring the total fluoride content up to 0.70 mg/L, to comply with the recommendation ofthe state health department and the Center for Disease Control and Prevention for the prevention of tooth decay. Water from the Moffat Collection System has lower amounts of natural fluoride and must be fortified to meet the recommended standard (Graph 3).

Natural fluoride levels from the South Platte Collection System generally meet or exceed the recommended level in the source water, but both the Foothills and Marston treatment plants can supplement when needed (Graphs 3 - 5, pages 7- 8). Note: Fluoride is tested monthly for the source water and six times daily for treated water. Moffat treatment plant was out of service during April, October and part of November due to the September flood. Foothills treatment plant went offline the begining of December.

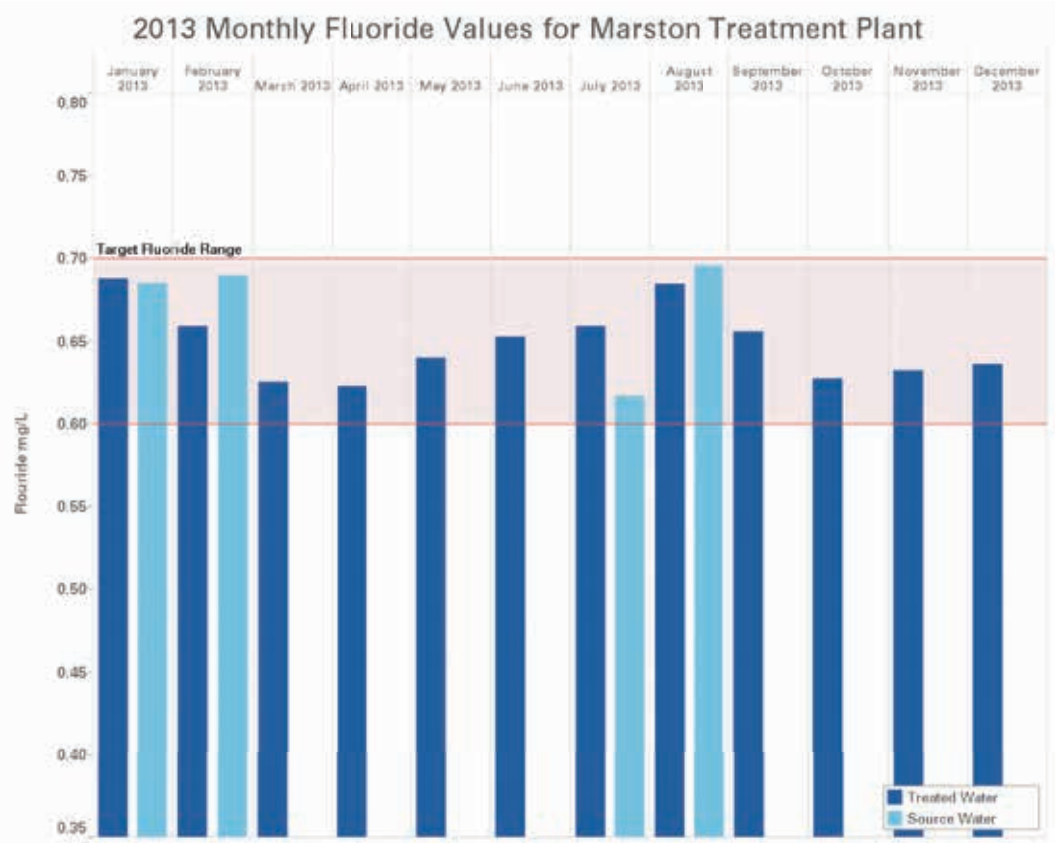
Graph 3:



Graph 4:



Graph 5



pH

We measure the pH range of water to prevent it from corroding residential and distribution system plumbing. The pH of water does not impact the safety of the water; it relates to the aggressiveness of it toward plumbing materials. Denver Water is required to maintain a pH greater than 7.5 SU to ensure that the water does not leach potentially harmful metals from plumbing, see Graph 6 on page 10.

Water Hardness

The hardness of water is a result of calcium and magnesium salts dissolved in water. Other minerals such as potassium and iron can contribute to water hardness. In Denver's water, the iron levels are non detectable, but iron can come from old cast-iron water mains and the plumbing in buildings or homes. The units of measure for water hardness are in mg/L, but most customers' appliances state water hardness in grains per gallon, g/g. In the laboratory, we measure hardness in mg/L (ppm). Graph 7 on page 11, lists hardness in both mg/L and g/g. Denver's water sources are considered soft to moderately hard. The South Platte source water from Antero Reservoir to Strontia Springs Reservoir in Waterton Canyon is moderately hard and varies between 70—130 mg/L or 4—7 g/g. The water that feeds our Moffat Treatment Plant is all snowmelt around the Winter Park area and is considered soft water, and varies seasonally between 30—60 mg/L or 2—4 g/g. After the September flood Moffat's water hardness increased as did it's mineral content. Most customers calling about water hardness are inquiring for detergent usage amounts for dishwashers and clothes washers or water amounts for their iron or other appliances. Our water tends to form a mineral scale on the inside of plumbing; this is purely aesthetic and does not impact the safety or health of the water.

Many cities across the nation have much harder water than Denver's. Graph 7 on page 11, shows the seasonal fluctuations in hardness over the year.

Which Treatment Plant Serves My Area?

Denver Water's distribution system is completely integrated. This means that we can distribute water from any of our three potable treatment plants to anywhere in our system. Water is usually routed based on demand. Foothills Treatment Plant is our largest gravity fed potable water plant. It is often in service and serves much of the system.

However, we can blend water from Foothills with Moffat or Marston or blend the water from any two potable treatment plants and send it anywhere in our system. This complete redundancy is rather unique compared to other distribution systems in the United States. When wondering which treatment plant

serves you, it is best to assume that the water can come from any of the three treatment plants to your home or business at any given time.

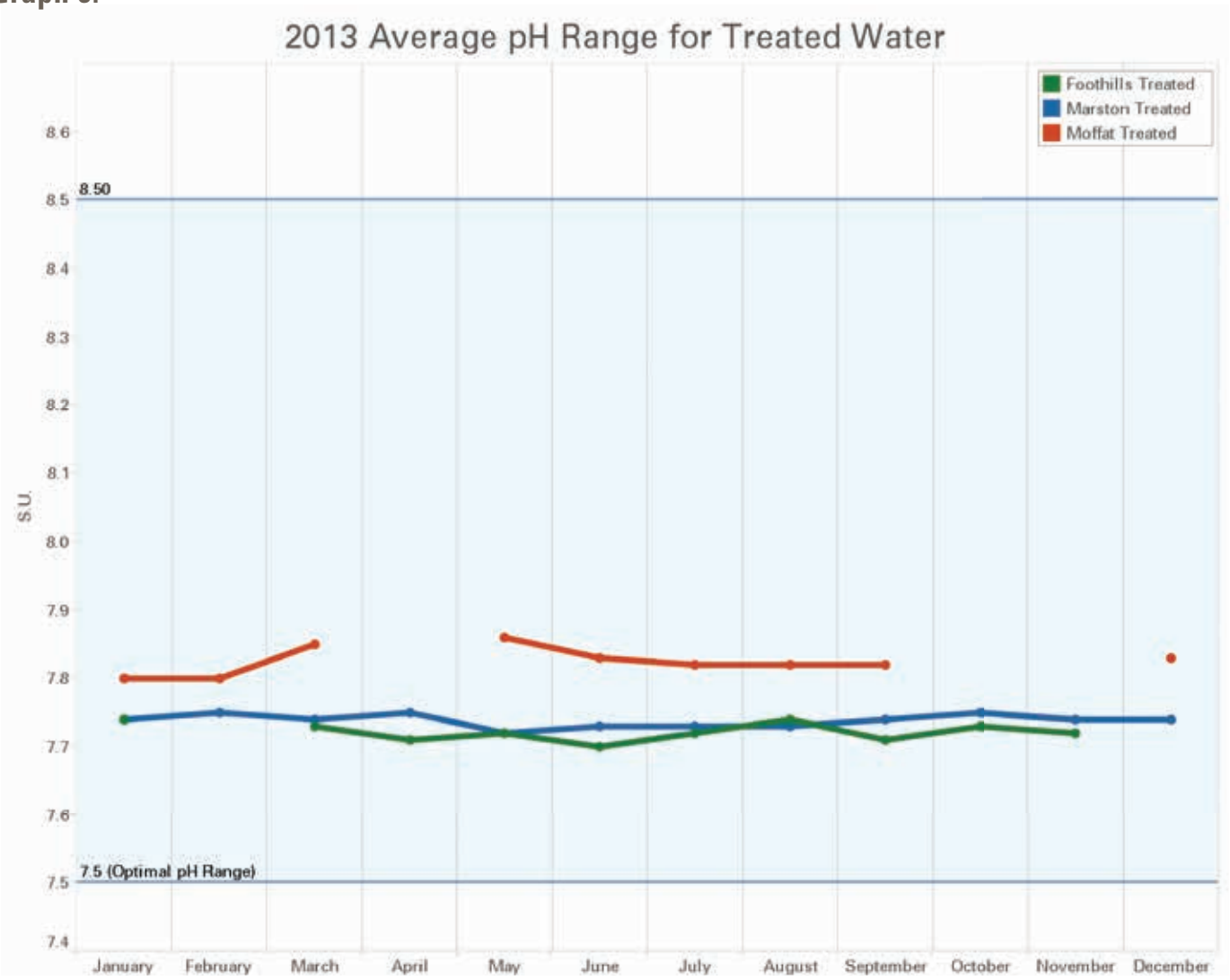
Looking Down the Road

Water quality is Denver Water's most important mission, and we make every effort to ensure our water is safe to drink.

As part of the Environmental Protection Agency's 1996 Safe Drinking Water Act amendments, all water utilities in the United States are required to test for 30 unregulated contaminants in drinking water every five years. Some of these contaminants are under consideration to be regulated in the future. The most recent round of testing was called Unregulated Contaminant Monitoring Rule 3 (UCMR3). Contaminants on the list can be found on EPA's website (www.epa.gov/OGWDW). In 2013, Denver Water conducted UCMR3 testing. Whether these contaminants pose a health risk is still unknown, and toxicology studies are ongoing. Still, it's important to continue to look for new contaminants in our water to ensure water is always safe to drink.

Sometimes customers ask about hexavalent chromium in treated water. Hexavalent chromium was one of the 30 contaminants we tested as part of the UCMR3 testing. Though we found it in extremely low amounts – ranging from not detected to 0.25 parts per billion – our goal is to eliminate it from drinking water.

Graph 6:

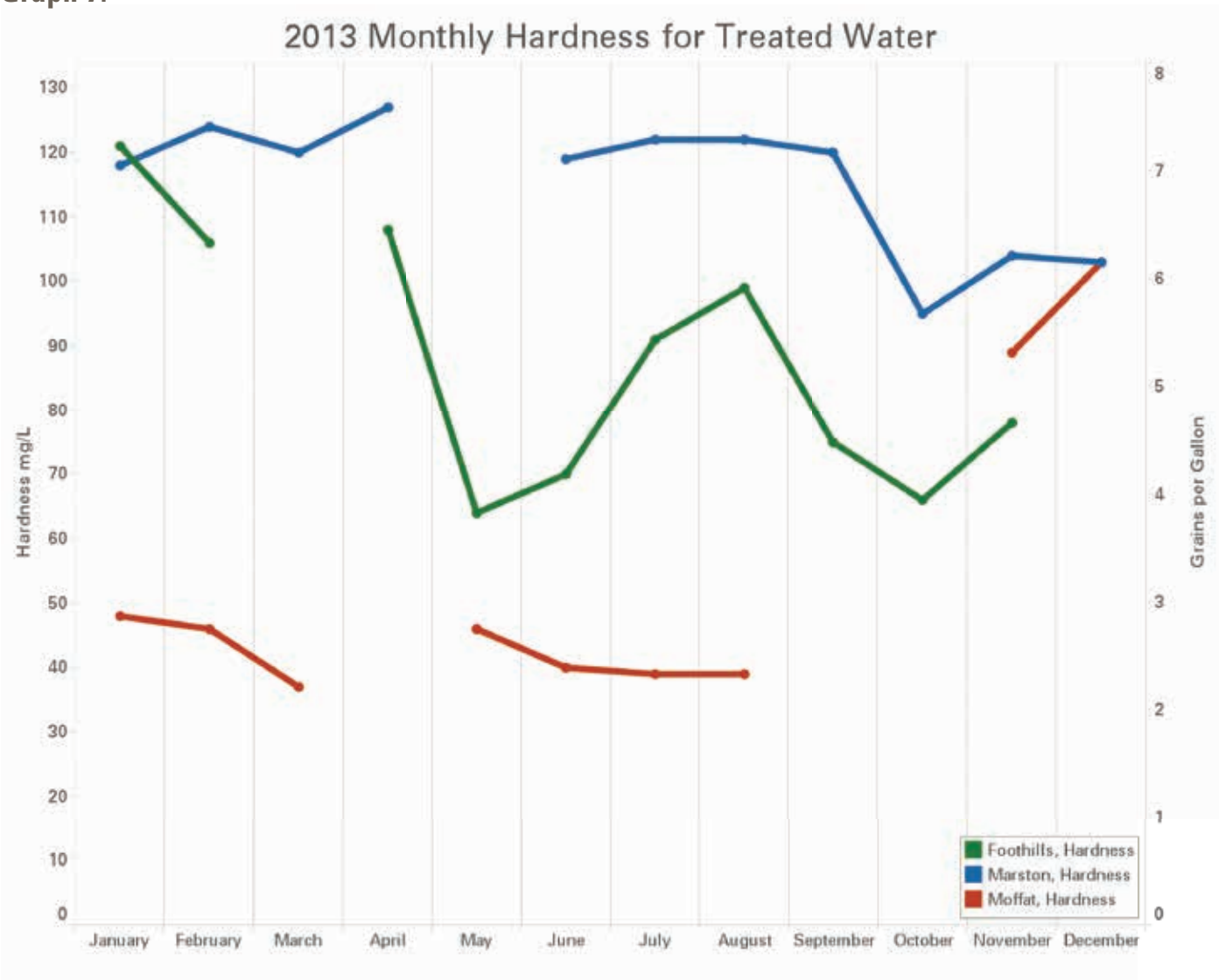


Scientists do not yet know what levels of hexavalent chromium may present a health concern, and studies are ongoing. We will continue to monitor and remain engaged in the EPA's effort to investigate it further.

Another challenge to our water quality in 2013 was caused by the September floods. The debris that washed into the reservoirs that feed Moffat caused higher turbidities and mineral content than usual. We saw increases in total dissolved solids, total organic carbon, barium, calcium, sodium, hardness, specific conductance, disinfection byproducts and aluminum. Because of our integrated distribution system, we were able to shut down Moffat Treatment Plant to avoid the high cost of treating the flood waters and still provide our entire service area with safe, clean water.

We have a stake in making sure the water is safe for all of us; after all, we drink the water too. We are environmental scientists, and we care about preserving our watershed and the natural beauty that surrounds it. Though we have caretakers who live at and monitor our mountain reservoirs, customers help too – an effort we sincerely appreciate. If you have any concerns, questions or comments regarding water quality, call Denver Water at 303-893-2444.

Graph 7:



Regulatory Terminology

Pages 12 through 15 are tables of data for compounds found in the treated water. The tables contain the name of the compound, the maximum contaminant level (see below) where applicable, the average result, the range of detections for the year, and the number of times for which it was tested in 2013. Most of the compounds found are not regulated and do not pose a health or safety risk. Regulatory abbreviations are explained below.

AL: Action levels are enforceable triggers for compliance that force public notification and treatment optimization.

MCL: Maximum contaminant level, which are the U.S. Environmental Protection Agency's drinking water regulatory limits. Based on health and toxicology studies, results at or below these levels in drinking water are considered safe. These are usually numeric values; sometimes they are designated as DS or TT. (see below)

SMCL: Secondary maximum contaminant level, the U.S. Environmental Protection Agency's nonenforceable, but recommended guideline level of a contaminant or compound. When the fluoride secondary maximum contaminant level exceeds 2 mg/L, we must notify the public.

DS: Distribution system is how the total coliform regulation is decreed. This means that the total coliform regulation (less than 5 percent total coliform positive samples per month) applies to the water in the distribution system (service area) not just the treatment plant effluents.

TT: Treatment Technique refers to the water treatment process used in the plants, which must be optimized to control the levels of contaminants, such as the corrosion control process (maintaining a pH greater than 7.5 and alkalinity greater then 15) used to control lead and copper. To date, we have not detected lead in the raw, treated or distribution system water, and only small amounts of copper (less than a tenth of the regulatory limit 1.3 mg/L) have been found.

Compounds that were below reporting levels in Denver's water are listed on pages 16-18. We test for all of these compounds and contaminants at least annually. Contaminants that have been in the news recently, such as arsenic, lead, and TCE, are on the not found list.

Data Tables For Treated Water

Marston Treated Water

Analysis	MCL	Average	Range	No.
General (mg/L)				
Total Alkalinity as $CaCO_3$	>15	72	65 - 77	11
Total Chlorine		1.60	1.47 - 1.77	4,178
Hardness as $CaCO_3$		116	95 - 127	11
pH (SU)	>7.5 daily average	7.74	7.68 - 7.74	4,175
Specific Conductance (µS)		352	300 - 410	51
Temperature (°C)		13	6 - 21	42
Total Dissolved Solids		199	178 - 211	11
Turbidity (NTU)	Treatment Technique	0.040	0.03 - 0.07	4,177
Metals (µg/L)				
Aluminum		31	22 - 46	11
Barium	2,000	41	37 - 46	11
Boron		18	14 - 22	11
Calcium (mg/L)		33	27 - 36	11
Copper		5	<5 - 10	11
Magnesium (mg/L)		8.3	6.8 - 9.2	11
Manganese		<2	<2 - 3	11
Molybdenum		7	6 - 8	11
Potassium (mg/L)		2.0	1.8 - 2.1	11
Sodium (mg/L)		18.3	n/a	1
Strontium (mg/L)		0.22	0.19 - 0.24	3

Data Tables For Treated Water

Marston Treated Water

Analysis	MCL	Average	Range	No.
Ions (mg/L)				
Chloride		28.5	25.3 - 30.2	10
Fluoride	4.0	0.65	0.59 - 0.77	1,395
Nitrate as N	10	0.10	<0.02 - 0.17	4
Silicon		1.2	<0.5 - 2.2	11
Sulfate		57	52 - 61	10
Disinfection By Products (µg/L)				
Bromochloroacetic acid		3.1	1.9 - 4.0	8
Bromodichloromethane		6.9	4.3 - 10.3	23
Chloroform		8.1	4.5 - 13.3	23
Cyanogen Chloride		5	<0.5 - 10	2
Dibromochloromethane		3.2	1.6 - 6.0	23
Dichloroacetic acid		5.0	2.6 - 7.4	8
Haloacetic Acids (5)	60(DS)	9	<5 - 12	8
Total Trihalomethanes	80(DS)	18	11 - 29	23
Trichloroacetic acid		3.9	1.8 - 5.4	8
Non Specific Organics				
Total Organic Carbon (mg/L)		1.8	1.4 - 2.1	51
Total Organic Halogen (µg/L)		118	90 - 145	4

Downtown Denver

Data Tables For Treated Water

Foothills Treated Water

Analysis	MCL	Average	Range	No.
General (mg/L)				
Total Alkalinity as $CaCO_3$	>15	51	31 - 76	10
Total Chlorine		1.68	1.52 - 1.87	3,673
Hardness as $CaCO_3$		88	64 - 121	10
pH (SU)	>7.5 daily average	7.73	7.66 - 7.83	3,670
Specific Conductance (µS)		279	190 - 400	44
Temperature (°C)		12	5 - 19	40
Total Dissolved Solids		158	132 - 206	10
Turbidity (NTU)	Treatment Technique	0.05	0.02 - 0.08	3,675
Metals (µg/L)				
Aluminum		36	24 - 68	10
Barium	2,000	35	27 - 44	10
Boron		12	8 - 14	10
Calcium (mg/L)		25	18 - 33	10
Copper		<5	<5 - 8	10
Magnesium (mg/L)		6.4	4.3 - 9.3	10
Manganese		11	<2 - 25	10
Molybdenum		8	2 - 17	10
Potassium (mg/L)		1.7	1.3 - 2.0	10
Sodium (mg/L)		17.4	n/a	1
Strontium (mg/L)		0.19	0.06 - 0.22	4
Ions (mg/L)				
Chloride		20.4	12.2 - 30.1	9
Fluoride	4.0	0.65	0.52 - 0.76	1,833
Nitrate as N	10	0.16	0.06 - 0.25	4
Silicon		3.0	2.2 - 3.9	10
Sulfate		49	37 - 57	9
Disinfection By Products (µg/L)				
Bromochloroacetic acid		2.2	1.3 - 3.0	8
Bromodichloromethane		3.8	2.2 - 6.5	22
Chloroform		7.4	2.0 - 23.9	22
Cyanogen Chloride		6	<0.5 - 12	2
Dibromochloromethane		1.2	0.6 - 2.3	22
Dichloroacetic acid		7.0	2.1 - 15.7	8
Haloacetic Acids (5)	60(DS)	12	<5 - 25	8
Total Trihalomethanes	80(DS)	12	5 - 30	22
Trichloroacetic acid		5.3	1.3 - 9.1	8
Non Specific Organics				
Total Organic Carbon (mg/L)		1.6	1.1 - 2.6	44
Total Organic Halogen (µg/L)		102	43 - 131	4

Data Tables For Treated Water

Moffat Treated Water

Analysis	MCL	Average	Range	No.
General (mg/L)				
Total Alkalinity as $CaCO_3$	>15	30	24 - 45	9
Total Chlorine		1.59	0.93 - 1.80	2,621
Hardness as $CaCO_3$		54	37 - 103	9
pH (SU)	>7.5 daily average	7.82	7.57 - 8.25	1,317
Specific Conductance (µS)		148	100 - 290	32
Temperature (°C)		14	7 - 20	30
Total Dissolved Solids		96	65 - 174	9
Turbidity (NTU)	Treatment Technique	0.060	0.04 - 0.11	2,619
Metals (µg/L)				
Aluminum		<20	<20 - 37	9
Barium	2,000	22	15 - 36	9
Boron		8	4 - 17	9
Calcium (mg/L)		17	11 - 32	9
Magnesium (mg/L)		3.0	1.7 - 5.6	9
Manganese		<2	<2 - 6	9
Molybdenum		1	<1 - 4	9
Potassium (mg/L)		1.0	0.6 - 2.2	9
Sodium (mg/L)		5	n/a	1
Strontium (mg/L)		0.08	0.04 - 0.12	4
Strontium (mg/L)		0.08	0.04 - 0.12	4
Ions (mg/L)				
Chloride		6.2	3.4 - 14.6	8
Fluoride	4.0	0.65	0.15 - 0.80	1,308
Nitrate-Nitrogen	10	0.15	0.05 - 0.29	5
Silicon		3.3	2.6 - 4.7	9
Sulfate		28	17 - 64	8
Disinfection By Products (µg/L)				
Bromochloroacetic acid		1.1	<1.0 - 2.7	5
Bromodichloromethane		3.1	1.2 - 7.6	14
Chloroform		14.6	4.9 - 29.0	14
Chloropicrin		0.5	<0.5 -0.8	2
Cyanogen Chloride		4.9	1.7 - 8.1	2
Dibromochloromethane		<0.5	<0.5 - 1	14
Dichloroacetic acid		9.3	3.5 - 15.0	5
Haloacetic Acids (5)	60(DS)	17	7 - 29	5
Total Trihalomethanes	80(DS)	18	6 - 38	14
Trichloroacetic acid		8.2	3.4 - 14.2	5
Non Specific Organics				
Total Organic Carbon (mg/L)		2.2	0.9 - 4.9	33
Total Organic Halogen (µg/L)		137	82 - 200	4

Contaminants Not Found In Denver's Drinking Water

The following analyses were performed, and each of these constituents was either below the reporting limit or the average result was less than the reporting limit. VOCs are volatile organic chemicals (easily airborne), and SOCs are synthetic organic chemicals, (typically man made). The maximum contaminant level (MCL) is listed after the contaminant in parentheses, if regulated in drinking water. The unit of measure is also listed if different than that listed for the subsection.

General Parameters	*Giardia* (TT1) (cysts/L)	Benzo(g,h,i)perylene	Ethyl methacrylate
Alkalinity, Phenolphthalein as CaCO3	*Legionella* (TT1)	Benzo(k)fluoranthene	Ethylparaben
Chlorine, Free	Plankton	Chloroprene	Galaxolide
Asbestos (7 MFL)	Microcystin-LA (Algal Toxin)	Chloropropylate	Isobutylparaben
Metals - plumbing, mining, natural errosion (µg/L)	Microcystin-LR	Chrysene	Isopropyl ether
	Microcystin-RR	Cyclohexanone	Methyl paraben
Antimony (6)	Microcystin-YR	Dibenzo(a,h)anthracene	Methacrylonitrile
Arsenic (10)	Nodularin	Diethanolmine (DEA)	Polychlorinated Biphenyls (PCB)
Beryllium (4)	Total Coliform (DS)	Ethyl acrylate	PCB 1016 Aroclor
Cadmium (5)	Nodularin	Ethyl tert-butyl ether	PCB 1221 Aroclor
Chromium (100)	**Disinfection By Products -reaction between the disinfectant and natural organic matter (µg/L)**	Fluoranthene	PCB 1232 Aroclor
Cobalt		Fluorene	PCB 1242 Aroclor
Copper (TT1)		Hexachlorobenzene	PCB 1248 Aroclor
Iron	Carbon Tetrachloride	Hexachlorocyclopentadiene	PCB 1254 Aroclor
Lead (TT1)	Chlorate	Indeno(1,2,3-cd)pyrene	PCB 1260 Aroclor
Lithium	Chloroacetonitrile	Isophorone	Perfluoro octanesulfonic acid (PFOS)
Mercury (2)	Monochloroacetic Acid	Methacrylonitrile	Perfluoro-1-butanesulfonic acid (PFBS)
Selenium (50)	N-nitrosodiethylamine (Nitrosamine)	Methyl acrylate	Perfluoro-1-hexanesulfonic acid (PFHxS)
Silver	N-nitrosodimethylamine (NDMA)	Naphthalene	Perfluoroheptanoic acid (PFHpA)
Thallium (2)	N-nitrosodi-n-butylamine	n-Butyl Acrylate	Perfluoro-nonanoic acid (PFNA)
Titanium	N-nitrosodi-n-propylamine	N-nirtosopyrollidine	Perfluorooctanoic acid (PFOA)
Vanadium	N-nitrosomethylethylamine	Nitrobenzene	Phenol
Zinc	N-nitrososdiphenylamine	Nonylphenol isomer mix	Propylparaben
Ions - from farming, and industry, (mg/L, µg/L)	Tribromoacetic Acid	Pyrene	Pyrene
	Synthetic Organic Compounds (SOC) - from Feedstock/ combustion by-products, Flame retardants (µg/L)	Quinoline	TCEP
Bromide		TCPP	TCPP
Carbonate		TDCPP	TDCPP
Cyanide, Total	1,2,4,5 -Tetrachlorobenzene	**SOC - Plastizers, Surfactants, Personal Care Products µg/L, ng/L**	Tetrabromobisphenol A
Hydroxide	2-Chlorobiphenyl		Toxaphene
Nitrite-Nitrogen (1)	2-Chlorophenol	2,4,5-Trichlorobiphenyl	Triclosan
Ortho Phosphorus, Dissolved	2-Nitrophenol	4-Chloro-3-methylphenol	**Pesticides µg/L**
Radiological errosion of natural deposits/mining (pCi/L)	2,4-Dichlorophenol	4-nonylphenol - semi quantitative	1,2-Dibromo-3-chloropropane (0.2)
	2,4-Dimethylphenol	Benzyl chloride	2,4,5-T
Alpha	2,4-Dinitrophenol	Bis(2-ethylhexyl)adipate	2,4,5-Trichlorobiphenyl
Amercium-241	2,4-Dinitrotoluene	Bis(2-ethylhexyl)phthalate	2,4,6-Trichlorophenol
Beta	2,6-Dinitrotoluene	Bisphenol A	2,4-D (70)
Cesium-134,137	3,5-Dichlorobenzoic acid	Butyl benzyl phthalate	2,4-DB
Iodine-129, 131	4-tert-Octylphenol	Butylparaben	3-Hydroxycarbofuran
Radium 226/228 (5)	4-Nitrophenol	Chloroprene	4,4'-DDD
Strontium-90	4,6-Dinitro-2-methylphenol	Desethylatrazine	4,4'-DDE
Thorium-227,234	Acenaphthene	Desisopropylatrazine	4,4'-DDT
Thallium=208	Acenaphthylene	Diethyl phthalate	alpha-BHC
Uranium-235	Acetochlor	Dimetyl phthalate	alpha-Chlordane
Zinc-65	Ametryn	Di-n-butyl phthalate	Acifluourfen
Microbiological - animal and human activity, Algal toxins	Anthracene	Di-n-octyl phthalate	Alachlor (2)
	Benzo(a)anthracene	Epichlorohydrin	Aldicarb
Cryptosporidium (oocysts/L)	Benzo(a)pyrene (0.2)	Erucylamide	Aldicarb sulfone
E. coli (count/100 ml)	Benzo(b)fluoranthene	Ethyl acrylate	Aldicarb sulfoxide

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Pesticides (µg/L)	Dioxathion	Linuron	Propiconazole isomer b
Aldrin	Dioxin	Malathion	Propoxur
Atraton	Diphenamid	Metalaxyl	Prothiofos
Atrazine (3)	Diquat	Metazachlor	Siduron, Total
Azoxystrobin	Disulfoton	Methiocarb	Silvex (50)
Baygon	Disulfoton sulfone	Methomyl	Simazine (4)
Bendiocarb	Disulfoton sulfoxide	Methoxychlor	Simetryn
Benfluralin	Diuron	Methyl paraoxon	Stirofos
Bensulide	Dursban	Methyl parathion	Sulfotep
Bentazon	Endosulfan sulfate	Metolachlor	Tebuthiuron
β-BHC (beta-BHC)	Endosulfan –A	Metribuzin	Terbacil
Bolstar	Endosulfan –B	Metsulfuron-methyl	Terbuthylazine
Bromacil	Endothall	Mevinphos	Terbutryn
Butachlor	Endrin (2)	MGK 264 isomer a	Thidiazuron
Butylate	Endrin Aldehyde	MGK 264 isomer b	Thiobencarb
Carbaryl	EPN	MGK 326	Thionazin
Carbofuran	EPTC	Mirex	trans-Nonachlor
Carbophenothion	Esfenvalerate	Molinate	Triademefon
Chlordane	Ethalfluralin	Monocrotophos	Triadimenol
Chlorfenvinphos	Ethion	Monuron	Tribufos
Chloridazon	Ethofumesate	Naled	Trichloronate
Chlorneb	Ethoprop	Napropamide	Tricyclazole
Chlorobenzilate	Ethylene dibromide	Neburon	Trifluralin
Chlorothalonil	Etridiazole	N-nitrosomorpholine	Vernolate
Chlorotoluron	Famphur	N-nitrosopiperidine	Vinclozolin
chlorpyrifos methyl	Fenamiphos	Norflurazon	Z-Phosphamidon
cis-Nonachlor	Fenarimol	Oryzalin	**Volatile Organic Compounds (VOC) - from solvents, feedstock/ fuels, Flame retardants (µg/L, ng/L)**
cis-Permethrin	Fenitrothion	Oxadiazon	
Clomazone	Fenoxaprop-ethyl	Oxamyl (200)	
Clopyralid	Fensulfothion	Oxychlordane	1,1,1,2-Tetrachloroethane
Coumaphos	Fenthion	Oxyfluorfen	1,1,1-Trichloroethane (200)
Crotoxyphos	Fenuron	Paclobutrazol	1,1,2,2-Tetrachloroethane
Cyanazine	Fluazifop-butyl	Paraquat	1,1,2-Trichloroethane (5)
Dacthal	Fluchloralin	Parathion	1,1-Dichloroethane
Dalapon (200)	Fluometuron	PCNB	1,1-Dichloroethene (7)
DCPA acid metabolites	Fluridone	Pebulate	1,1-Dichloropropene
Demeton O	Fonofos	Pendimethalin	1,2,3-Trichlorobenzene
Demeton S	gamma-Chlordane	Pentachlorophenol (1)	1,2,3-Trichloropropane
Desisopropylatrazine (DIA)	Glyphosate	Permathrin Isomers	1,2,3-Trimethylbenzene
delta- BHC	Halofenozide	Permathrin, cis & trans	1,2,4-Trichlorobenzene (70)
Diazinon	Halosulfuron methyl	Phorate	1,2,4-Trimethylbenzene
Dicamba	Heptachlor (0.4)	Phosmet	1,2,4,5-Tetrochlorobenzene
Dichlobenil	Heptachlor Epoxide (0.2)	Picloram	1,2-Dichloroethane (5)
Dichlofenthion	Hexachlorobenzene	Profluralin	1,2-Dichloropropane (5)
Dichloran	Hexazinone	Prometon	1,3,5-Trimethylbenzene
Dichloprop	Imidacloprid	Prometryn	1,3-Dichloropropane
Dichlorvos	Iodomethane	Pronamide	1,3-Dichloropropene
Dicrotophos	Iprodione	Propachlor	1,4-Dioxane
Dieldrin	Isofenphos	Propanil	1-Chlorobutane
Diflubenzuron	Isoproturon	Propargite	2,2-Dichloropropane
Dimethoate	Leptophos	Propazine	2-Hexanone
Dinoseb	Lindane	Propiconazole isomer a	2-Nitropropane

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Volatile Organic Compounds (VOC) - from solvents, feedstock/ fuels, Flame retardants (µg/L, ng/L)	trans-1,3-Dichloropropene	Equilin	Phenazone
	trans-1,4-Dichloro-2-butene	Erythromycin	Prednisone
	Trichloroethylene (5) (TCE)	Estradiol	Primidone
4-Methyl-2-Pentanone (MIBK)	Trichlorofluoromethane	Estriol	Progesterone
Acrylonitrile	Vinyl acetate	Estrone	Roxithromycin
Allyl chloride	Vinyl Chloride (2)	Fluoxetine (Prozac)	Salicylic acid
Benzene (5)	Xylenes (10000)	Gemfibrozil	Salinomycin
Bromobenzene	**Pharmaceuticals/Hormones (µg/L, ng/L)**	Ibuprofen	Simvastatin
Bromoethane		Iohexol	Sulfachloropyridazine
Bromomethane	17 alpha-Ethynyl estradiol	Iopromide	Sulfadiazine
Carbon disulfide	17-beta-Estradiol	Ketoprofen	Sulfadimethoxine
Chlorobenzene (100)	4-androstene-3,17-dione	Ketorolac	Sulfamerazine
Chlorodifluoromethane (CFC 22)	Acetaminophen (Tylenol)	Lasalocid	Sulfamethazine
Chloroethane	Albuterol	Levothyroxine (Synthroid)	Sulfamethizole
Chloromethane	Amoxicillin (semi-quantitative)	Lidocaine	Sulfamethoxazole
cis-1,2-Dichloroethene (70)	Andorostenedione	Lincomycin	Sulfasalazine
cis-1,3-Dichloropropene	Atenolol	Lopressor	Sulfathiazole
Dibromomethane	Azithromycin	Meprobamate	Testosterone
Dichlorodifluoromethane (CFC-12)	Bendroflumethiazide	Methyl methacrylate	Tetracycline
Dichloromethane (5)	Bezafibrate	Monensin	Theobromine
Diethyl ether	Butalbital	Naproxen (Aleve)	Theophylline
Diisopropyl ether	Caffeine	Narasin	Thiabendazole
Epichlorohydrin	Carbadox	Nifedipine	trans-Testosterone
Ether	Carbamazepine	Norethisterone	Trimethoprim
Ethyl Benzene (700)	Carboxin	Norfloxacin	Tylosin
Ethyl tert-butyl ether	Carisoprodol (Soma)	Oleandomycin	Virginiamycin M1
Ethylbenzene	Chloramphenicol	Oxolinic acid	Warfarin
Freon 113	Chlorotetracycline	Oxytetracycline	
Hexachloroethane	Ciprofloxacin	Paraxanthine	
Hexachlorobutadiene	Clofibric acid	Penicillin G	
Isopropylbenzene (Cumene)	Cimetidine	Penicillin V	
m-Dichlorobenzene	cis-Testosterone	Pentoxifylline (Aventis)	
Methyl tert-butyl ether (MTBE)	Cotinine	Phenanthrene	
n-Butylbenzene	Dehydronifedipine		
n-Propylbenzene	Dexamethasone		
o-Chlorotoluene	Diazepam (Valium)		
o-Dichlorobenzene (600)	Diclofenac		
p-Chlorotoluene	Diethylstilbestrol (DES)		
p-Dichlorobenzene (78.5)	Dilantin		
Pentachlorobenzene	Diltiazem		
Pentachloroethane	Doxycycline		
p-Isopropyltoluene (Cymene)			
Propionitrile			
sec-Butylbenzene			
Styrene (100)			
tert-Amyl Methyl ether (TAME)			
tert-Butyl alcohol			
tert-Butylbenzene			
Tetrachloroethene (5)			
Tetrahydrofuran			
Toluene (1000)			
trans-1,2-Dichloroethene (100)			

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