2016 **Water Quality Report**
Reporte de calidad de agua

SOUTH PLATTE RIVER

DENVER WATER

WHAT IS THIS REPORT?

The Environmental Protection Agency requires public water suppliers that serve the same people year-round (community water systems) to provide consumer confidence reports to their customers. These reports are also known as annual water quality reports. This report summarizes information regarding water sources used, any detected contaminants, compliance and educational information.

WHERE DOES YOUR WATER COME FROM?

Denver Water's drinking water comes from rivers, lakes, streams, reservoirs and springs fed by high-quality mountain snow runoff. Denver Water's supply is 100 percent surface water that originates in sources throughout the watershed that encompasses nearly 4,000 square miles on both sides of the Continental Divide.

MOUNTAIN WATER SOURCES

Denver Water's drinking water sources sources are the South Platte River in the mountains and its tributaries, the streams that feed Dillon Reservoir, and the creeks and canals above the Fraser River. Denver Water stores its water in five mountain reservoirs — Antero, Eleven Mile Canyon, Cheesman, Dillon and Gross. From these reservoirs, the water is then sent to one of three treatment plants in the city through a complex system of streams, canals and pipes.

After treatment, drinking water is fed by both gravity and pumps to a system of underground, clear-water reservoirs before continuing to your home or business. More than 3,000 miles of pipe carry water to Denver Water customers.

SOURCE WATER ASSESSMENT

The state health department has completed a source water assessment of the potential for contaminants reaching any of Denver Water's three terminal reservoirs at Strontia Springs, Marston and Ralston. The potential sources of contamination that may exist are: EPA Areas of Concern; Permitted Wastewater Discharge Sites; Aboveground, Underground and Leaking Storage Tank Sites; Solid Waste Sites; Existing/Abandoned Mine Sites; Other Facilities; Commercial/Industrial/Transportation; Residential, Urban Recreational Grasses; Quarries/Strip Mines/Gravel Pits; Agriculture; Forest; Septic Systems; Oil/Gas Wells and Road Miles. For more information on the report contact the Colorado Department of Public Health and Environment by calling 303-692-2000.

INFORMACIÓN IMPORTANTE ACERCA DE LA CALIDAD DEL AGUA

Para recibir la versión en español del Reporte de Calidad de Agua de 2016 de Denver Water, llame a Servicio al cliente al 303-893-2444 o visite www.denverwater.org/Espanol.

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DENVER WATER'S SYSTEM

DEVOTED TO WATER QUALITY

Denver Water proudly serves high-quality water to 1.4 million people in the city of Denver and many surrounding suburbs. Since 1918 we have expertly planned, developed and operated a complex system that provides clean, safe, great-tasting water. We are a public agency funded by water rates, new tap fees and the sale of hydropower, not taxes. We are Colorado's oldest and largest water utility — Denver Water has a total water service area of approximately 300 square miles.

Denver Water serves 25 percent of the state's population with less than 2 percent of all the water used in the state. The natural environment is our lifeline, and we help protect it by promoting wise water use.

We take our water quality very seriously. Last year we collected more than 35,000 samples and conducted more than 68,000 tests to ensure our water is as clean and safe as possible.

Denver Water vigilantly safeguards our mountain water supplies, and the water is carefully treated before it reaches your tap. This brochure provides data collected throughout 2015.

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WATER AT A GLANCE

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 that the 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 at 1-800-426-4791 or by visiting epa.gov/dwstandardsregulations.

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 of 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 Environmental Protection Agency and the Centers for Disease Control and Prevention guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and microbiological contaminants, call the Drinking Water Hotline at 1-800-426-4791.

LEAD IN DRINKING WATER

Since 1992, Denver Water has tested water inside homes within its distribution system considered at risk for lead and copper contamination, per EPA standards. Denver Water's source water, water leaving the treatment plants and water in the distribution system have no detectable lead and trace levels of copper.

Lead can get into water through lead-containing household or building plumbing. Softened water is more aggressive toward household plumbing. Homes built before or during the mid-1950s may have lead service lines, which are the pipes that connect the water main under the street to the home. Homes built between 1982 and 1988 may have copper pipes joined with lead solder — lead solder was banned from use on domestic plumbing in 1988. Homes that do not fall within these two categories are at lower risk for lead contamination in the water.

Lead exposure can cause serious health problems, especially for pregnant women and young children. The most common sources of lead in drinking water are materials and components for service lines and home plumbing. Denver Water is responsible for providing high-quality drinking water, but cannot control the 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 until noticeably colder before using water for drinking or cooking.

If you are concerned about lead, you may wish to have your water tested. Information on lead in drinking water, testing and steps to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791, at epa.gov/lead and at denverwater.org/lead.

WATER QUALITY DATA

TERMS, ABBREVIATIONS AND SYMBOLS

Some of the terms, abbreviations and symbols contained in this report are unique to the water industry and might not be familiar to all customers. Terms used in the table are explained below.

Contaminant: A potentially harmful physical, biological, chemical or radiological substance.

Maximum Contaminant Level (MCL): Highest level of a contaminant allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.

Maximum Level Contaminant 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.

Action Level: Concentration of a contaminant, that if exceeded, triggers treatment or other requirements that a water system must follow.

Parts Per Million (ppm): Equivalent to milligrams per liter. One ppm is comparable to one drop of water in 55 gallons.

Denver Water's Water Quality Lab

IS THERE A PRESENCE OF *CRYPTOSPORIDIUM* AND *GIARDIA*?

Denver Water has tested for *Cryptosporidium (Crypto)* and *Giardia* in both raw and treated water since the 1980s. Since that time, Denver Water has never detected a viable indication of either in the treated drinking water.

Crypto and *Giardia* are microscopic organisms that, when ingested, can cause diarrhea, cramps, fever and other gastrointestinal symptoms. *Crypto* and *Giardia* are usually spread through means other than drinking water.

While most people readily recover from the symptoms, *Crypto* and *Giardia* can cause more serious illness in people with compromised immune systems. The organisms are in many of Colorado's rivers and streams and are a result of animal wastes in the watershed. At the treatment plants, Denver Water removes *Crypto* and *Giardia* through effective filtration, and *Giardia* is also killed by disinfection.

If you are concerned about lead, you may wish to have your water tested. Information on lead in drinking water, testing and steps to minimize exposure is available at epa.gov/lead and denverwater.org/lead.

Parts per Billion (ppb): Equivalent to micrograms per liter. One ppb is comparable to one drop of water in 55,000 gallons.

PicoCuries per liter (pCi/L): Measures radioactivity.

Turbidity: A measure of suspended material in water. In the water field, a turbidity measurement (expressed in Nephalometric Turbidity Units) is used to indicate clarity of water.

Secondary Maximum Contaminant Level (SMCL): Nonenforceable 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): Highest level of a disinfectant allowed in drinking water. There is convincing evidence the addition of disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): Level of a drinking water disinfectant below which there is no known or expected health risk. MRDLGs do not reflect benefit of the use of disinfectants to control microbial contaminants.

SOURCES OF DRINKING WATER

Sources of drinking 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, in some cases, radioactive material. It can also pick up substances resulting from human activity and the presence of animals. Contaminants may include the following:

- Microbial contaminants — viruses, bacteria and other microbes that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- Inorganic contaminants — salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides — chemical substances resulting from a variety of sources, such as agricultural and urban storm water runoff and residential uses.
- Organic chemical contaminants — substances including synthetic and volatile organic chemicals, which are by products of industrial processes and petroleum production, and also may come from gas stations, urban storm water runoff and septic systems.
- Radioactive contaminants — substances that can be naturally occurring or be the result of oil and gas production and mining activities.

THE TREATMENT PROCESS

1. **Coagulation/flocculation** — Untreated water from terminal reservoirs is drawn into mixing basins at our treatment plants where we add alum and polymer. This process causes small particles to stick to one another forming larger particles.
2. **Sedimentation** — Over time, the now larger particles become heavy enough to settle to the bottom of a basin from which sediment is removed.
3. **Filtration** — The water is then filtered through layers of fine, granulated materials — either sand, or sand and coal, depending on the treatment plant. As smaller, suspended particles are removed, turbidity diminishes and clear water emerges.
4. **Disinfection** — As protection against any bacteria, viruses and other microbes that might remain, disinfectant is added before the water flows into underground reservoirs throughout the distribution system and into your home or business. Denver Water carefully monitors the amount of disinfectant added to maintain quality of the water at the farthest reaches of the system. Fluoride occurs naturally in our water but is also added to treated water when necessary to meet the levels recommended by the Public Health Service and Colorado Department of Public Health and Environment.
5. **Corrosion control** — pH is maintained by adding alkaline substances to reduce corrosion in the distribution system and the plumbing in your home or business.

Regulated Water Contaminants: What is in the water?

Regulated leaving the treatment plant (Entry Point to the Distribution System)	Units of Measurement	MCLG	Highest Levels Allowed (MCL)	Average Level Detected (Range of All Results)	MCL Violation?	Sampling Frequency	Sources of contaminant
Aluminum	ppb	N/A[1]	50 - 200 (SMCL)[2]	40 (br[3] - 58)	No	Monthly	Erosion of natural deposits, water treatment chemical
Barium	ppb	2,000	2,000	36 (20 - 37)	No	Monthly	Erosion of natural deposits, discharge of drilling wastes
Manganese	ppb	N/A	50 (SMCL)	13 (br - 41.2)	No	Monthly	Erosion of natural deposits, discharge of drilling wastes
Uranium	ppb	zero	30	0.4 (br - 1.0)	No	Monthly	Erosion of natural deposits, mine drainage
Gross Beta	pCi/L		trigger level = 15 (4mRem/yr)	br (br - 3)	No	Quarterly	Erosion of natural deposits, mine drainage
Fluoride	ppm	4.0	4.0 (2.0 is SMCL)[4]	0.77 (0.05 - 1.06)	No	4 times daily	Erosion of natural deposits, water additive that promotes strong teeth
Nitrate as N	ppm	10	10	0.12 (br - 0.22)	No	Monthly	Erosion of natural deposits
Sodium	ppm	N/A	N/A	14.6 (10.2 - 17)	No	Annually	Naturally present in the environment
Sulfate	ppm	N/A	250 (SMCL)	49 (20 - 67)	No	Monthly	Naturally present in the environment
Turbidity[5]	NTU[6]	N/A	TT[7] ≤0.30 NTU in 95% of samples/month	Highest Turbidity Level for 2015: 0.15 **Percentage of Samples <0.3 NTU: 100%**	No	12 times daily at treatment plants	Soil runoff
Total Organic Carbon	Removal Ratio	N/A	TT	**Compliance Description** Denver Water used enhanced treatment to remove the required amount of natural organic material and/or we demonstrated compliance with alternative criteria.	No	Weekly	Natural organic matter that is present in the environment
1,2-Dichloroethane	ppb		5	br (br-0.5)* *One detection only, at the reporting limit (MRL)	No	Quarterly	Discharge from factories, treatment plants

UCMR 3 (Entry Point to the Distribution System)[8]	Units of Measurement	MCLG	MCL	Average Level Detected (Range of All Results)	Violation	Sampling Frequency	Sources of contaminant
Chromium, Total	ppb	100	100	<0.2 (<0.2 - 0.37)	No	Quarterly	Erosion of natural deposits, discharge of drilling wastes
Chlorodifluoromethane	ppb	N/A	N/A	<0.080 (<0.080 - 0.097)	No	Quarterly	Refrigerant , discharge from waste water
Hexavalent Chromium (Dissolved)	ppb	N/A	N/A	0.06 (<0.03 - 0.25)	No	Quarterly	Byproduct of disinfection reaction of Total Chromium
Molybdenum	ppb	N/A	N/A	6.8 (<1 - 15)	No	Quarterly	Erosion of natural deposits, discharge of drilling wastes
Strontium	ppb	N/A	N/A	159 (44 - 240)	No	Quarterly	Erosion of natural deposits
Vanadium	ppb	N/A	N/A	0.3 (<0.2 - 0.66)	No	Quarterly	Erosion of natural deposits

Regulated in the Distribution System	Units of Measurement	MCLG	MCL		Violation	Sampling Frequency	Sources of contaminant
Total Trihalomethanes (TTHM)[9]	ppb	N/A	80	Highest locational RAA[10]: 25 (7- 50)	No	Monthly	Byproduct of drinking water disinfection
Haloacetic Acids (HAA_5)	ppb	N/A	60	Highest locational RAA: 18 (8 - 33)	No	Monthly	Byproduct of drinking water disinfection
Total Coliform	Absent or Present	zero	No more than 5% positives per month	Highest monthly percentage: 0.23% in September 2015 **Number of positives out of number of samples for the year:** 2 out of 5,059 samples or 0.04%	No	Daily	Naturally present in the environment
Disinfectant as Total Cl_2	ppm		TT	Lowest monthly percentage of samples meeting TT requirement: 99.96% For any two consecutive months, at leats 95% of samples (per month) must be detectable. Two out of 5,059 samples had a non-detectable residual in October and November 2015.	No	Daily	Drinking water disinfectant used to kill microbes

Regulated at the Customer's Tap[11]	Units of Measurement	MCLG	Action Level at the 90th Percentile	90th Percentile Value	No. of Samples exceeding Action Level	Violation?	Sampling Dates	Sources of contaminant
Copper	ppm	1.3	1.3	0.32	0 out of 107 homes	No	March - June 2015	Corrosion of household plumbing
Lead	ppb	0.0	15	8	4 out of 107 homes	No	March - June 2015	Corrosion of household plumbing
Copper	ppm	1.3	1.3	0.26	0 out of 105 homes	No	July - September 2015	Corrosion of household plumbing
Lead	ppb	0.0	15	7	1 out of 105 homes	No	July - September 2015	Corrosion of household plumbing

Footnotes and Definitions:

1. Not applicable.
2. Secondary Maximum Contaminant Level (SMCL) is not enforceable.
3. br means below the reportable level for analysis; the reportable level is the lowest reliable level that can be measured.
4. Exceeding the Fluoride Secondary Maximum Contaminant Level of two milligrams per liter triggers public notification. Other SMCLs are non-enforceable.
5. Turbidity has no known health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth.
6. Nephalometric Turbidity Units.
7. Treatment Technique refers to the water treatment process used in the treatment plants that must be optimized to control the levels of these contaminants.
8. The 1996 ammendments to the Safe Drinking Water Act require that once every five years EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems. UCMR 3 (the Third Unregulated Contaminant Monitoring Rule) provides EPA and other interested parties with scientifically valid data on the occurrence of contaminants in drinking water. EPA can use this information to develop regulatory decisions.These analyses were done in 2013.
9. Byproducts of the disinfection process.
10. RAA = Running Annual Average.
11. The last compliance sampling for lead and copper was in the fall of 2015; the next one will be in the spring of 2016. The results in this table are from spring and fall 2015.

Last year the Water Quality Lab at Denver Water collected more than 35,000 samples and conducted more than 68,000 microbiological and chemical tests.

To receive a copy of the 2015 Treated Water Quality Summary or to ask questions, please call Customer Care at 303-893-2444.

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