2008
Water Quality Analyses

ANNUAL TEST RESULTS – PUBLISHED MARCH 2009

Providing safe, high quality drinking water is the Medford Water Commission's top priority. To ensure this objective, a comprehensive water quality program has been developed. This involves water treatment and testing, as well as measures aimed at assuring that our water resources are protected to the greatest extent possible.

The Medford Water Commission obtains its water from two high quality sources. During the winter months, the system is supplied entirely by the Big Butte Springs, which are located approximately thirty miles northeast of Medford. When summer demands exceed the capacity of the springs (typically from May to October) water from the Rogue River is used as a supplemental supply.

Water from both of these sources is regularly tested for basic physical characteristics and a vast array of potential contaminants. The term "contaminant" refers to any substance that may be found in the water. All water may reasonably be expected to contain at least small amounts of contaminants, and their presence does not necessarily indicate a health concern. The levels of certain contaminants are regulated by the U.S. Environmental Protection Agency (EPA); in Oregon these regulations are administered by the Department of Human Services (DHS).

Drinking water standards are set in two categories. Primary standards establish limits for various substances that have been found to adversely affect human health. Maximum Contaminant Levels (MCLs) reflect these mandatory standards. Secondary standards relate to aesthetic qualities of the water, which can affect customer satisfaction, but are not necessarily harmful. Secondary standards are recommended guidelines.

The Medford Water Commission conducts water quality testing on more than 120 parameters. Results consistently exceed state and federal health standards relative to all items tested. This brochure provides a comprehensive listing of current test results. Except where noted otherwise, the tables herein summarize results from water quality tests for the year 2008. On substances for which annual testing has been determined to be unnecessary, the most recent test results are given. Average values are shown if multiple readings were obtained during the testing period.

Where applicable, the tables also indicate the MCL, or maximum amount of a regulated contaminant allowed in water. For those substances subject only to a secondary standard, that standard is identified with an asterisk (*). Definitions and explanations have also been included to provide assistance in understanding the tables.

It is noted that the Commission also publishes an annual Water Quality Report. While similar to this document, it does not include data on all parameters tested. Rather, it focuses on and provides additional details about contaminants that either have been detected in the water or have been determined to pose the most serious health concerns. You are encouraged to read that report for additional health related information.

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GENERAL PARAMETERS

Component	Big Butte Springs	Rogue River	MCL or Standard	
			Level	Unit
Temperature	47.4	55.8	None	Deg F
pH *	7.01	7.34	6.5-8.5*	pH units
Chlorine, Free Residual	0.55	0.63	4.0	ppm
Specific Conductance	96.4	67.8	None	µmhos/cm
Alkalinity as $CaCO_3$	42.0	29.0	None	ppm
Color*	ND @ 5.0	ND @ 5.0	15*	CU
Corrosivity (Langelier Index)*	-1.976	-1.912	Noncorrosive*	LI
Hardness as $CaCO_3$*	33.1	22.2	250*	ppm
Odor*	ND @ 1.0	ND @ 1.0	3*	TON
Total Dissolved Solids	74.0	53.0	500*	ppm

*Secondary standards

SYNTHETIC ORGANIC CHEMICALS (SOCs)

Component	Big Butte Springs	Rogue River	MCL or Standard	
			Level	Unit
2,4-D	ND @ 5.0	ND @ 5.0	70	ppb
2,4,5-TP (Silvex)	ND @ 5.0	ND @ 5.0	50	ppb
Alachlor (Lasso)	ND @ 0.2	ND @ 0.2	2	ppb
Atrazine	ND @ 0.3	ND @ 0.3	3	ppb
Benzo(a) pyrene	ND @ 40.0	ND @ 40.0	200	ppt
BHC-gamma (Lindane)	ND @ 20.0	ND @ 20.0	200	ppt
Carbofuran	ND @ 4.0	ND @ 4.0	40	ppb
Chlordane	ND @ 0.1	ND @ 0.1	2	ppb
Dalapon	ND @ 5.0	ND @ 5.0	200	ppb
Di(2-ethylhexyl)adipate	ND @ 4.0	ND @ 4.0	400	ppb
Di(2-ethylhexyl)phthalate	ND @ 0.5	ND @ 0.5	6	ppb
Dibromochloropropane	ND @ 20.0	ND @ 20.0	200	ppt
Dinoseb	ND @ 0.5	ND @ 0.5	7	ppb
Dioxin (1993 Analysis)	Waived	ND @ 30.0	30	ppq
Diquat	ND @ 2.0	ND @ 2.0	20	ppb
Endothall	ND @ 10.0	ND @ 10.0	100	ppb
Endrin	ND @ 0.2	ND @ 0.2	2	ppb
Ethylene dibromide (EDB)	ND @ 10.0	ND @ 10.0	50	ppt
Glyphosate	ND @ 20.0	ND @ 20.0	700	ppb
Heptachlor epoxide	ND @ 20.0	ND @ 20.0	200	ppt
Heptachlor	ND @ 40.0	ND @ 40.0	400	ppt
Hexachlorobenzene (HCB)	ND @ 0.1	ND @ 0.1	1	ppb
Hexachlorocyclopentadiene	ND @ 5.0	ND @ 5.0	50	ppb
Methoxychlor	ND @ 0.02	ND @ 0.02	40	ppb
Pentachlorophenol	ND @ 0.08	ND @ 0.08	1	ppb
Picloram	ND @ 5.0	ND @ 5.0	500	ppb
Polychlorinated biphenyls	ND @100.0	ND @100.0	500	ppt
Simazine	ND @ 0.4	ND @ 0.4	4	ppb
Toxaphene	ND @ 0.3	ND @ 0.3	3	ppb
Vydate (Oxamyl)	ND @ 2.0	ND @ 2.0	200	ppb

In addition to the regulated SOCs listed above, analysis was also performed for 13 unregulated SOCs, none of which were detected.

Maximum Contaminant Level (MCL): The maximum amount of a regulated substance allowed in drinking water.

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

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

ND: Indicates that the contaminant was not detected in the water. Today's precise laboratory equipment detects substances at very low levels, but it is recognized that a substance could be present at an even lower level. Therefore the results are given as "ND @" a specific testing level, typically well below the MCL.

ppm, ppb, ppt, ppq: These refer to the amount of a contaminant found per increment of water. With increasing technology, contaminants can be detected in extremely small quantities. One ppm (part per million) means that one part of a particular substance is present for every million (1,000,000) parts of water. Similarly, parts per billion (ppb) indicate the amount of a contaminant per billion (1,000,000,000) parts of water, parts per trillion (ppt) relate to a part per trillion (1,000,000,000,000) parts of water, and parts per quadrillion (ppq) relates to one part per quadrillion (1,000,000,000,000,000) parts of water.

Synthetic Organic Chemicals (SOCs): Pesticide/herbicide compounds, most often present in areas of intensive agriculture.

Inorganic Chemicals: A diverse group of substances generally derived from mineral sources.

Volatile Organic Chemicals (VOCs): Includes fuels and various solvents that tend to vaporize or be unstable in the environment.

pH: The degree of acidity or alkalinity of a solution. Values between 0 and 7 indicate acidity, those between 7 and 14 indicate alkalinity, and a value of 7 is neutral.

Chlorine Residual: In order to assure that protection from microorganisms occurs until drinking water reaches the customer's taps, chlorine should be present throughout the distribution system.

MEDFORD WATER COMMISSION BOARD OF WATER COMMISSIONERS:
Cathie Davis (Chair), Leigh Johnson (Vice Chair), Tom Hall, Don Skundrick, Jason Anderson
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ALSO SERVING:
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The table indicates the amount of chlorine present as the water leaves the source. Chlorine residual is also routinely tested for compliance at sampling locations dispersed throughout the water system.

µmhos/cm: Micromhos per centimeter, a measurement of conductivity (the ability to carry an electrical current). Dissolved minerals and salts will increase conductivity. Pure distilled water has a conductivity of 0 to 3 µmhos/cm, and the conductivity of finished drinking water in the U.S. generally ranges from 50 to 1500 µmhos/cm.

CU: Color units, used to measure the amount of color in water.

LI: Langelier Index. A means of expressing the corrosive potential of the water, based on the tendency for the water to either dissolve or deposit calcium carbonate. A score of 0 is neutral, negative values indicate the degree to which water is dissolving, and positive test results reflect the tendency to leave deposits.

Hardness: A description of the mineral content of the water, typically measured by dissolved calcium carbonate ($CaCO_3$). The more hard the water, the less easily soap will lather. Typically ranging between 25 and 40 ppm, our water tends to be moderately soft, with hard water typically having a score of more than 100 ppm. Hardness is sometimes given in grains per gallon, with our water generally having between 1.5 and 2.5 grains per gallon.

TON: Threshold Odor Number, an evaluation of any odor detected.

Trihalomethanes (THMs), Haloacetic Acids (HAAs) & Bromate: Compounds that can result from chemical reactions between organic material and chlorine or bromide. These are collectively called disinfection byproducts (DBPs). The disinfection processes are carefully monitored to keep DBPs to a minimum while still insuring that sufficient disinfection is achieved.

Radioactive Contaminants: An evaluation of radiant energy emitted from certain minerals as they disintegrate. It can be released from the ground and from water that has been exposed to such substances.

pCi/L: Picocuries per liter, a measure of radioactivity.

INORGANIC CHEMICALS

Component	Big Butte Springs	Rogue River	MCL or Standard	
			Level	Unit
Aluminum, Al*	106	9.3	50-200*	ppb
Antimony (Total)	ND @ 0.2	ND @ 0.2	6	ppb
Arsenic, As	ND @ 1.0	ND @ 0.5	10	ppb
Barium, Ba	ND @ 0.05	ND @ 0.05	2	ppm
Beryllium (Total)	ND @ 0.1	ND @ 0.1	4	ppb
Cadmium, Cd	ND @ 0.1	ND @ 0.1	5	ppb
Calcium	6.36	5.43	None	ppm
Chloride, Cl*	1.94	2.6	250*	ppm
Chromium, Cr	ND @ 5.0	ND @ 5.0	100	ppb
Copper, Cu*	0.0203	ND @ 0.01	1.0*	ppm
Cyanide, Cn	ND @ 3.0	ND @ 3.0	200	ppb
Fluoride, F	ND @ 0.2	ND @ 0.2	4	ppm
Iron, Fe*	36.6	ND @ 15.0	300*	ppb
Manganese, Mn*	ND @ 20	ND @ 20.0	50*	ppb
MBAS*	ND @ 100	ND @ 100.0	500*	ppb
Mercury, Hg	ND @ 0.2	ND @ 0.2	2	ppb
Nickel, Ni	ND @ 0.5	ND @ 0.5	100	ppb
Nitrate, NO_3	ND @ 0.2	ND @ 0.2	10	ppm
Nitrite, NO_2	ND @ 0.05	ND @ 0.05	1	ppm
Selenium, Se	ND @ 0.5	ND @ 0.5	50	ppb
Silica, SiO_2	41.4	25.3	None	ppm
Silver, Ag*	ND @ 1.0	ND @ 1.0	100*	ppb
Sodium, Na	6.09	4.73	20(Advisory)	ppm
Sulfate, SO_4*	0.975	0.582	250*	ppm
Thallium, Tl	ND @ 0.5	ND @ 0.5	2	ppb
Zinc, Zn*	ND @ 0.05	ND @ 0.05	5*	ppm

*Secondary standards

VOLATILE ORGANIC CHEMICALS (VOCs)

Component	Big Butte Springs	Rogue River	MCL or Standard	
			Level	Unit
Benzene	ND @ 0.5	ND @ 0.5	5	ppb
Carbon Tetrachloride	ND @ 0.5	ND @ 0.5	5	ppb
cis-1,2-Dichloroethylene	ND @ 0.5	ND @ 0.5	70	ppb
Dichloromethane	ND @ 0.5	ND @ 0.5	5	ppb
Ethylbenzene	ND @ 0.5	ND @ 0.5	700	ppb
Monochlorobenzene	ND @ 0.5	ND @ 0.5	100	ppb
o-Dichlorobenzene	ND @ 0.5	ND @ 0.5	600	ppb
p-Dichlorobenzene	ND @ 0.5	ND @ 0.5	75	ppb
Styrene	ND @ 0.5	ND @ 0.5	100	ppb
Tetrachloroethylene	ND @ 0.5	ND @ 0.5	5	ppb
Toluene	ND @ 0.0005	ND @ 0.0005	1	ppm
trans-1,2-Dichloroethylene	ND @ 0.5	ND @ 0.5	100	ppb
Trichloroethylene	ND @ 0.5	ND @ 0.5	5	ppb
Vinyl Chloride	ND @ 0.5	ND @ 0.5	2	ppb
Xylenes (Total)	ND @ 0.0005	ND @ 0.0005	10	ppm
1,1-Dichloroethylene	ND @ 0.5	ND @ 0.5	7	ppb
1,1,1-Trichloroethane	ND @ 0.5	ND @ 0.5	200	ppb
1,1,2-Trichloroethane	ND @ 0.5	ND @ 0.5	5	ppb
1,2-Dichloroethane	ND @ 0.5	ND @ 0.5	5	ppb
1,2-Dichloropropane	ND @ 0.5	ND @ 0.5	5	ppb
1,2,4-Trichlorobenzene	ND @ 0.5	ND @ 0.5	70	ppb
Total Trihalomethanes (Avgs)	7.43	7.43	80	ppb
Haloacetic Acids (HAAs) (Avgs)	7.27	7.27	60	ppb
Bromate (Avgs)	N/A	1.7	10	ppb
MTBE	ND @ 0.5	ND @ 0.5	N/A	ppb

RADIOACTIVE CONTAMINANTS ANALYSIS

Component	Amount Detected	MCL
Gross Alpha	Rogue River: 1.2 pCi/L ± 0.7 Big Butte Springs: 1.5 pCi/L ± 0.8	15 pCi/L
Combined Radium-226/228	Rogue River: ND @ 0.7 pCi/L ± 0.7 Big Butte Springs: 0.8 pCi/L ± 0.7	5 pCi/L
Uranium	Rogue River: ND @ 1 µg/L Big Butte Springs: ND @ 1 µg/L	30 µg/L
Radon-222 (2006 results)	Big Butte Springs: 161 pCi/L	None

MICROBIOLOGICAL ANALYSIS

Component	Amount Detected	MCL
Total Coliform Bacteria	Zero positive samples	Coliform bacteria may be present in no more than 5% of monthly samples.
Fecal Coliform Bacteria	Zero positive samples	The standard is exceeded if a routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive.
Giardia lamblia	No samples	Treatment technique required to remove or destroy active cysts. (Rogue River Source)
Cryptosporidium	No samples	Treatment technique required to remove or destroy active cysts. (Rogue River Source)
Turbidity	Rogue River: 0.027 NTU Big Butte Springs: 0.501 NTU	Rogue River: 0.3 NTU Big Butte Springs: 5.0 NTU

Coliform bacteria are the primary measure of the microbial quality of drinking water. They are used as indicators of the possible presence of disease causing microorganisms. Any samples showing the presence of coliforms would be further examined for fecal contamination. The Water Commission has 47 microbiological sampling points established at representative locations throughout the water distribution system, and collects a minimum of 96 samples each month. A total of 1194 coliform bacteria samples were collected and analyzed at these stations during 2008. One sample tested positive for total coliform and fecal coliform.

Turbidity is an expression of optical clarity in water. Turbidity itself has no health effects, but it can interfere with disinfection and provide a medium for microbial growth. It can also be an indicator of microorganisms. While turbidity measurement is not required of groundwater, the Big Butte Springs are continuously monitored for turbidity.

LEAD AND COPPER SAMPLING AT RESIDENTIAL WATER TAPS

Component	Amount Detected	MCL
Copper (2007 Results)	90th percentile value = 0.800 ppm No samples exceeded action level.	Action Level: 90% of the homes tested must have copper levels less than 1.3 parts per million.
Lead (2007 Results)	90th percentile value = 1.59 ppb No samples exceeded action level.	Action Level: 90% of the homes tested must have lead levels less than 15 parts per billion.

There is virtually no lead or copper in either of the Commission's water supply sources. However, since these metals can enter the drinking water supply through corrosion within the water distribution system or household plumbing, supplemental testing is conducted at the individual taps of customers whose plumbing meets criteria for being at risk for elevated lead and copper levels. Based on several rounds of testing in representative home plumbing systems, it has been found that our water does not tend to promote the leaching of these minerals in amounts that would normally be considered a health concern.

Additional water quality information may be obtained from the following:

Medford Water Commission
Water Quality Division
774-2434
wtrcom@ci.medford.or.us
www.medfordwater.org

Jackson County Environmental Health
774-8206
www.co.jackson.or.us

Oregon Department of Human Services
Drinking Water Program
(971) 673-0405
http://oregon.gov/DHS/ph/dwp

U.S. Environmental Protection Agency
Safe Drinking Water Hotline
(800) 426-4791
www.epa.gov/safewater/hotline/index.html

Medford Water Commission
Is Committed to:

Excellence in Water Quality
Professionalism
Customer Service
System Reliability