

2010 Public Health Goals Report

Mesa Consolidated Water District

1.0 Introduction

Under the Calderon-Sher Safe Drinking Water Act of 1996 public water systems in California serving greater than 10,000 connections must prepare a report containing information on 1) detection of any contaminant in drinking water at a level exceeding a Public Health Goal 2) estimate of costs to remove detected contaminants to below the Public Health Goal using Best Available Technology, and 3) health risks for each contaminant exceeding a Public Health Goal. This report must be made available to the public every three years. The initial report was due on July 1, 1998, and subsequent reports are due every three years thereafter.

This report has been prepared to address the requirements set forth in Section 116470 of the California Health and Safety Code. It is based on water quality analyses during calendar years 2007, 2008, and 2009 or, if certain analyses were not performed during those years, the most recent data available. The report has been designed to be as informative as possible, without unnecessary duplication of information contained in the Consumer Confidence Reports, which are mailed to customers by July 1st of each year.

There are no regulations explaining requirements for the preparation of Public Health Goal reports. A workgroup of the Association of California Water Agencies Water Quality Committee has prepared suggested guidelines for water utilities to use in preparing Public Health Goal reports. These guidelines were used in the preparation of our report, and include tables of cost estimates for Best Available Technology. The State of California provides the Association of California Water Agencies with numerical health risks and category of health risk information for contaminants with Public Health Goals. This health risk information is appended to the Association of California Water Agencies guidelines.

2.0 California Drinking Water Regulatory Process

California Health and Safety Code Section 116365 requires the State to develop a Public Health Goal for every contaminant with a primary drinking water standard or for any contaminant California is proposing to regulate with a primary drinking water standard. A Public Health Goal is the level which poses no significant health risk if consumed for a lifetime. The process of establishing a Public Health Goal is a risk assessment based strictly on human health considerations. Public Health Goals are recommended targets and are not required to be met by any public water system.

The State office designated to develop Public Health Goals is the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment. The Public Health Goal is then forwarded to the California Department of Public Health (the Department) Division

of Drinking Water and Environmental Management for use in revising or developing a Maximum Contaminant Level in drinking water. The Maximum Contaminant Level is the highest level of a contaminant that is allowed in drinking water. California Maximum Contaminant Levels cannot be less stringent than federal Maximum Contaminant Levels and must be as close as is technically and economically feasible to the Public Health Goals. The Department is required to take treatment technologies and cost of compliance into account when setting a Maximum Contaminant Level. Each Maximum Contaminant Level is reviewed at least once every five years.

Four chemical contaminants (selenium, styrene, total chromium and 2,3,7,8-TCDD) and two radiological contaminants (gross alpha particle and gross beta particle) have Maximum Contaminant Levels but do not yet have designated Public Health Goals. If any of these contaminants have been detected in drinking water, the Maximum Contaminant Level Goal, the federal U.S. Environmental Protection Agency equivalent of Public Health Goals, is used in this Public Health Goal Report.

N-Nitrosodimethylamine has a Public Health Goal of 3 nanograms per liter but is not regulated in drinking water with a primary drinking water standard. Bromodichloromethane, Bromoform, and Dichloroacetic Acid are three disinfection byproducts that have federal Maximum Contaminant Level Goals of zero but are not individually regulated with primary drinking water standards. According to the Association of California Water Agencies guidance and instructions from the Department, these four chemicals do not have to be included in this report because they do not have an existing Maximum Contaminant Level.

3.0 Identification of Contaminants

Section 116470(b)(1) of the Health and Safety Code requires public water systems serving more than 10,000 connections to identify each contaminant detected in drinking water that exceeded the applicable Public Health Goal. Section 116470(f) requires the Maximum Contaminant Level Goal to be used for comparison if there is no applicable Public Health Goal.

The Mesa Consolidated Water District (Mesa Consolidated) system has approximately 24,000 service connections. The following constituents were detected at one or more locations within the drinking water system at levels that exceeded the applicable Public Health Goals or Maximum Contaminant Level Goals.

- **Arsenic** – naturally occurring in groundwater and in surface water purchased from the Metropolitan Water District of Southern California (Metropolitan)
- **Bromate** – byproduct of ozonating groundwater to remove color
- **Gross Alpha Particle Activity (gross alpha)** – naturally occurring in groundwater in and surface water purchased from Metropolitan
- **Gross Beta Particle Activity (gross beta)** – naturally occurring in surface water purchased from Metropolitan
- **Uranium** - naturally occurring in groundwater and in surface water purchased from Metropolitan

The accompanying chart shows the applicable Public Health Goal or Maximum Contaminant Level Goal and Maximum Contaminant Level or Action Level for each contaminant identified above. The chart includes the maximum, minimum, and average concentrations of each contaminant in drinking water supplied by Mesa Consolidated in calendar years 2007 to 2009.

4.0 Numerical Public Health Risks

Section 116470(b)(2) of the Health and Safety Code requires disclosure of the numerical public health risk, determined by the Office of Environmental Health Hazard Assessment, associated with the Maximum Contaminant Levels, Action Levels, Public Health Goals and Maximum Contaminant Level Goals. Available numerical health risks developed by the Office of Environmental Health Hazard Assessment for the contaminants identified above are shown on the accompanying chart. Only numerical risks associated with cancer-causing chemicals have been quantified by the Office of Environmental Health Hazard Assessment.

Arsenic - The Office of Environmental Health Hazard Assessment has determined that the health risk associated with the Public Health Goal is one excess case of cancer in a million people and the risk associated with the Maximum Contaminant Level is 2 excess cases of cancer in 1,000 people exposed for a 70-year lifetime.

Bromate – The Office of Environmental Health Hazard Assessment has determined that the health risk associated with the Public Health Goal is one excess case of cancer in a million people and the risk associated with the Maximum Contaminant Level is 1 excess case of cancer in 10,000 people exposed for a 70-year lifetime.

Gross Alpha – The United States Environmental Protection Agency has determined that the health risk associated with the Maximum Contaminant Level Goal is 0 and the risk associated with the Maximum Contaminant Level is 1 excess case of cancer in 1,000 people over a lifetime exposure.

Gross Beta – The United States Environmental Protection Agency has determined that the health risk associated with the Maximum Contaminant Level Goal is 0 and the risk associated with the Maximum Contaminant Level is 2 excess case of cancer in 1,000 people over a lifetime exposure.

Uranium - the Office of Environmental Health Hazard Assessment has determined that the health risk associated with the Public Health Goal is one excess case of cancer in a million people and the risk associated with the Maximum Contaminant Level is 5 excess cases of cancer in 100,000 people over a lifetime exposure.

5.0 Identification of Risk Categories

Section 116470(b)(3) of the Health and Safety Code requires identification of the category of risk to public health associated with exposure to the contaminant in drinking water, including a brief, plainly worded description of those terms. The risk categories and definitions for the contaminants identified above are shown on the accompanying chart.

6.0 Description of Best Available Technology

Section 116470(b)(4) of the Health and Safety Code requires a description of the best available technology, if any is available on a commercial basis, to remove or reduce the concentrations of the contaminants identified above. The best available technologies are shown on the accompanying chart.

7.0 Costs of Using Best Available Technologies and Intended Actions

Section 116470(b)(5) of the Health and Safety Code requires an estimate of the aggregate cost and cost per customer of utilizing the best available technologies identified to reduce the concentration of a contaminant to a level at or below the Public Health Goal or Maximum Contaminant Level Goal. In addition, Section 116470(b)(6) requires a brief description of any actions the water purveyor intends to take to reduce the concentration of the contaminant and the basis for that decision.

Arsenic - The best available technologies for removal of arsenic in water for large water systems are: activated alumina, coagulation/filtration, lime softening, ion exchange, and reverse osmosis. Arsenic was detected above the Public Health Goal in two Mesa Consolidated wells and in treated surface water purchased from Metropolitan. Mesa Consolidated is in compliance with the Maximum Contaminant Level for arsenic. The estimated cost to reduce arsenic levels in groundwater to below the Public Health Goal of 0.004 µg/l using ion exchange was calculated. Because the Detection Limit for the purpose Reporting for arsenic is 2 µg/l, treating arsenic to below the Public Health Goal level means treating arsenic to below the Detection Limit for the purpose Reporting of 2 µg/l. There are numerous factors that may influence the actual cost of reducing arsenic levels to the Public Health Goal. Achieving the water quality goal for arsenic could range from \$3,280,000 to \$3,344,000 per year, or between \$137 and \$140 per household per year.

Bromate – Mesa Consolidated operates a treatment system that uses ozone to remove color from groundwater. The ozone in the treatment process produces bromate when the ozone oxidizes naturally-occurring bromide. The best available technology for bromate is to control the ozone treatment process to reduce production of bromate. The best available technology is not feasible for Mesa Consolidated's treatment facility. Mesa Consolidated installed a catalytic carbon system to reduce bromate levels in the ozonated water below the Maximum Contaminant Level. The Maximum Contaminant Level for bromate is 10µg/l based on a running annual average. The highest running annual average in the fully-treated groundwater (including carbon treatment) reported from 2007 – 2009 was 8.8 µg/l, below Maximum Contaminant Level but exceeding the

Public Health Goal of 0.1 µg/l. Mesa Consolidated will be replacing the ozone treatment facility with a nanofiltration process to remove color in the groundwater. Bromate will no longer be formed as a result of the switch to nanofiltration. The ozone plant is slated to be taken out of service at the end of 2010 to begin construction of the new treatment process. No estimated cost for removing bromate is given in the accompanying chart.

Gross Alpha, Gross Beta, and Uranium - The only best available technology for the removal of gross alpha in water for large water systems is reverse osmosis, which can also remove gross beta, and uranium. Gross alpha was detected above the Maximum Contaminant Level Goal in three wells and in surface water purchased from Metropolitan. Gross beta was detected above the Maximum Contaminant Level Goal in water purchased from Metropolitan and uranium was detected above the Public Health Goal in seven wells and in water purchased from Metropolitan. The cost of providing treatment using reverse osmosis to reduce radionuclide levels in groundwater and in Metropolitan water to the applicable Maximum Contaminant Level Goal or Public Health Goal was calculated. Achieving the water quality goals for all the radionuclides could range from \$11,914,000 to \$39,686,000 per year, or between \$498 and \$1,616 per household per year.

All Contaminants - In addition, a cost estimate to treat all water produced or purchased by the Mesa Consolidated Water District using reverse osmosis to remove all the contaminants detected above the Public Health Goals or Maximum Contaminant Level Goals was calculated. As shown on the accompanying chart, achieving the water quality goals for all contaminants using reverse osmosis could range from \$15,314,000 to \$49,725,000 per year, or between \$640 and \$2,077 per household per year.

For additional information, please contact Ms. Tracy Manning, Water Quality Coordinator at (949) 574-1031, or write to Mesa Consolidated Water District, 1965 Placentia Ave Costa Mesa, CA 92627.

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Mesa Consolidated Water District**

PARAMETER	UNITS OF MEASUREMENT	PHG OR (MCLG)*	MCL	CONCENTRATION		CATEGORY OF RISK	Cancer Risk at PHG or MCLG	Cancer Risk at MCL	BEST AVAILABLE TECHNOLOGIES	AGGREGATE COST PER YEAR	COST PER HOUSEHOLD PER YEAR
				AVERAGE	RANGE						
DISINFECTION BYPRODUCTS											
Bromate	µg/l	0.1	10	7.7	ND - 20	C	1 x 10 ⁻⁶	1 x 10 ⁻⁴	Ozone Control	-- (a)	--
INORGANIC CHEMICALS											
Arsenic	µg/l	0.004	10	ND	ND - 2.9	C	1 x 10 ⁻⁶	2.5 x 10 ⁻³	AA,C/F,IE,LS,RO	\$3,280,000 - \$3,344,000 (b)	\$137 - \$140
RADIOLOGICAL											
Gross Alpha Particle Activity	pCi/l	(0)	15	4.1	ND - 9.3	C	0	1 x 10 ⁻³	RO	\$7,860,000 - \$25,521,000 (c)	\$328 - \$1,066
Gross Beta Particle Activity	pCi/l	(0)	50	2.9	ND - 6.4	C	0	2 x 10 ⁻³	IE, RO	\$6,608,000 - \$21,455,000 (c)	\$276 - \$896
Uranium	pCi/l	0.43	20	1.2	ND - 3.7	C	1 x 10 ⁻⁶	5 x 10 ⁻⁵	AA, C/F, IE, RO	\$11,914,000 - \$38,686,000 (c)	\$498 - \$1,616
All Radionuclides	--	--	--	--	--	--	--	--	RO	\$11,914,000 - \$38,686,000 (c)	\$498 - \$1,616
All Listed Contaminants	--	--	--	--	--	--	--	--	RO	\$15,314,000 - \$49,725,000 (d)	\$640 - \$2,077

* MCLGs are shown in parentheses. MCLGs are provided only when no applicable PHG exists.

RISK CATEGORIES

C (Carcinogen) = A substance that is capable of producing cancer.

ABBREVIATIONS

PHG = Public Health Goal

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

µg/l = micrograms per liter or parts per billion

pCi/l = picoCuries per liter

TREATMENT/CONTROL TECHNOLOGIES

AA = Activated Aluminum

LS = Lime Softening

CC = Corrosion Control

O = Ozonation

C/F = Coagulation/Filtration

P/F = Precipitation/Filtration

D = Disinfection

PTA = Packed Tower Aeration

E = Electrodialysis

RO = Reverse Osmosis

GAC = Granular Activated Carbon

UV = Ultraviolet Radiation

IE = Ion Exchange

(a) Cost could not be estimated because the current color removal system using ozone will be removed from service later this year and replaced with nanofiltration.

(b) Estimated cost to remove Arsenic using ion exchange.

(c) Estimated cost to remove radionuclides by reverse osmosis.

(d) Estimated cost to remove all contaminants by reverse osmosis.