CITY OF GARDEN GROVE
2022 PUBLIC HEALTH GOALS REPORT

JUNE 2022

2022 Public Health Goals (PHGs) Report

City of Garden Grove

1.0 Introduction

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

The 2022 PHGs 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 2019, 2020, and 2021 or, if certain analyses were not performed during those years, the most recent data available. The 2022 PHGs Report has been designed to be as informative as possible, without unnecessary duplication of information contained in the Consumer Confidence Report, which is made available to customers by July 1st of each year.

There are no regulations explaining requirements for the preparation of PHGs reports. A workgroup of the Association of California Water Agencies (ACWA) Water Quality Committee has prepared suggested guidelines for water utilities to use in preparing PHGs reports. The ACWA guidelines were used in the preparation of this 2022 PHGs Report. These guidelines include tables of cost estimates for BAT. The State of California (State) provides ACWA with numerical health risks and category of health risk information for contaminants with PHGs. This health risk information is appended to the ACWA guidelines.

2.0 California Drinking Water Regulatory Process

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

The State office designated to develop PHGs is the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA). The PHG is then forwarded to the State Water Resources Control Board, Division of Drinking Water (DDW) for use in revising or developing a Maximum Contaminant Level (MCL) in drinking water. The MCL is the highest level of a contaminant that is allowed in drinking water. State MCLs cannot be less stringent than federal MCLs and must be as close as is technically and economically feasible to the PHGs. DDW is required to take treatment technologies and cost of compliance into account when setting an MCL. Each MCL is reviewed at least once every five years.

3.0 Identification of Contaminants

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

The City of Garden Grove (City) water system has approximately 34,122 service connections. The following constituents were detected at one or more locations within the drinking water system at levels that exceeded the applicable PHGs or MCLGs:

- **Arsenic** – naturally-occurring in local groundwater.
- **Perchlorate** – industrial contamination in groundwater
- **Uranium** – naturally-occurring in local groundwater and in surface water purchased from MWDSC.

The accompanying table shows the applicable PHG or MCLG and MCL for each contaminant identified above. The table includes the maximum, minimum, and average concentrations of each contaminant in drinking water supplied by the City in calendar years 2019 through 2021.

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 OEHHA, associated with the MCLs, Action Levels, PHGs and MCLGs. Available numerical health risks developed by OEHHA for the contaminants identified above are shown on the accompany table. Only numerical risks associated with cancer-causing chemicals have been quantified by OEHHA. Cancer risk is stated in terms of "excess" cancer cases per million population.

Arsenic – OEHHA has determined the theoretical health risk associated with the PHG is one excess case of cancer in a million people. USEPA has determined the risk associated with the MCL is 2.5 excess cases of cancer in 1,000 people exposed over a 70-year lifetime.

Perchlorate – OEHHA has not established a numerical health risk for perchlorate because PHGs for non-carcinogenic chemicals in drinking water are set at a concentration at which no known or anticipated adverse health risks will occur, with an adequate margin of safety.

Uranium – OEHHA has determined the theoretical health risk associated with the PHG is 1 excess case of cancer in a million people. USEPA has determined the risk associated with the MCL is 5 excess cases of cancer in 100,000 people exposed over a 70-year lifetime.

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 table.

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 BATs are shown on the accompanying table.

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 BATs identified to reduce the concentration of a contaminant to a level at or below the PHG or MCLG. 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 BATs for removal of arsenic in water for large water systems are: activated alumina, coagulation/filtration, electrodialysis, ion exchange, lime softening, oxidation/filtration, and reverse osmosis. Arsenic was detected above the PHG in the

local groundwater (three wells). The City is in compliance with the MCL for arsenic. The estimated cost to reduce arsenic levels in local groundwater to below the PHG of 0.004 microgram per liter (µg/l) using ion exchange was calculated. Because the DDW detection limit for purposes of reporting (DLR) for arsenic is 2 µg/l, treating arsenic to below the PHG level means treating arsenic to below the DLR of 2 µg/l. There are numerous factors that may influence the actual cost of reducing arsenic levels to the PHG. Achieving the water quality goal for arsenic could be approximately $1,107,000 per year, or $32 per service connection per year.

Uranium – The only BAT for the removal of uranium in water for large water systems is reverse osmosis, which can also remove gross alpha and gross beta, if detected. Uranium was detected above the PHG in the local groundwater (11 wells). The cost of providing treatment using Reverse Osmosis to reduce uranium levels in local groundwater below the PHG were calculated. The cost for achieving PHG for uranium could range from $10,500,000 to $38,700,000 per year, or between $310 and $1,134 per service connection per year.

Perchlorate – The BATs for removal of perchlorate in water are: ion exchange and biological fluidized bed reactor. Perchlorate was detected above the PHG in the local groundwater (9 wells). The City is in compliance with the MCL for perchlorate. The estimated cost to reduce perchlorate levels in local groundwater to below the PHG of 1 µg/l using ion exchange was calculated. Because the DLR for perchlorate is 4 µg/l, treating perchlorate to below the PHG level means treating perchlorate to below the DLR of 4 µg/l. There are numerous factors that may influence the actual cost of reducing perchlorate levels to the PHG. Achieving the water quality goal for perchlorate could range from $4,200,000 to $6,700,000 per year, or between $122 and $197 per service connection per year.

All Contaminants – In addition, a cost estimate to treat all water produced or purchased by the City using ion exchange and reverse osmosis to remove all the contaminants detected above the PHGs or MCLGs was calculated. All the contaminants listed in the attached table may be removed to non-detectable levels by ion exchange and reverse osmosis. As shown on the attached table, achieving the water quality goals for all contaminants using ion exchange and reverse osmosis could range from $10,500,000 to $38,700,000 per year, or between $310 and $1,137 per service connection per year.

For additional information, please contact Mr. Cel Pasillas at (714) 741-5276, or write to the City of Garden Grove, 11222 Acacia Parkway, P.O. Box 3070, Garden Grove, California 92842.

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PARAMETER	UNITS OF MEASUREMENT	PHG OR (MCLG)*	MCL	DLR	CONCENTRATION GROUNDWATER VALUE	CONCENTRATION GROUNDWATER RANGE	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
INORGANIC CHEMICALS												
Arsenic	µg/l	0.004	10	2	<2	ND - 2.4	C	1×10^{-6}	2.5×10^{-3}	AA,C/F,E,IE,LS,O/F,RO	$1,107,000 (c)	$32 (c)
Perchlorate	µg/l	1	6	4	<4	ND -4.1	E	NA	NA	IE, BF	$4,200,000 - $6,700,000 (e)	$122 - $197 (e)
RADIOLOGICAL												
Uranium	pCi/l	0.43	20	1	4.7	2.9 - 13.5	C	1×10^{-6}	5×10^{-5}	RO	$10,500,000 - $38,700,000 (f)	$310 - $1,134
ALL CONTAMINANTS	--	--	--	--	--	--	--	--	--	IE and RO	$10,500,000 - $38,700,000 (g)	$310 - $1,137 (g)

* 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.
E (Endocrine Toxicity; Developmental Toxicity) = Affects tyroid; causes neurodevelopmental deficits

TREATMENT/CONTROL TECHNOLOGIES
AA = Activated Aluminum
BF = Biological Fluidized Bed Reactor
C/F = Coagulation/Filtration
D = Disinfection
E = Electrodialysis
GAC = Granular Activated Carbon
IE = Ion Exchange
LS = Lime Softening
O/F = Oxidation/Filtration
RO = Reverse Osmosis

NOTES
PHG = Public Health Goal
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
NA = Not Appplicable or Available
ND = Not Detected
NR = Not Required
ug/l = micrograms per liter or parts per billion
pCi/l = picoCuries per liter
DLR = Detection Limit for Purposes of Reporting
< = Value is less than the DLR

(a) The table shows highest monthly percentage of positive samples as the detected value. Samples were collected in the distribution system.
(b) Cost could not be estimated
(c) Estimated cost to remove arsenic using IE.
(d) Estimated cost to remove bromate using RO.
(e) Estimated cost to remove perchlorate using IE.
(f) Estimated cost to remove gross alpha particle activity using RO, which also removes gross beta particle activity and uranium.
(g) Assuming treating the entire production by IE and RO, which can remove all contaminants listed in the above table to below the detectable levels.