CITY OF SANTA MONICA

REPORT ON WATER QUALITY
RELATIVE TO
PUBLIC HEALTH GOALS (PHGs)

June 2025

BACKGROUND

A Public Health Goal (PHG) is a health risk assessment, not a proposed drinking water standard. It is the level of a constituent in drinking water, which is considered not to pose a significant risk to health if consumed for a lifetime. This determination is reassessed every three years and made without regard to cost or treatability.

The California legislature created the concept of PHGs, and the California Environmental Protection Agency's (Cal-EPA) Office of Environmental Health Hazard Assessment (OEHHA) researches and establishes PHGs. The State Water Resource Control Board (SWRCB) - Division of Drinking Water (DDW), formerly the California Department of Public Health, then uses PHGs to evaluate health-related drinking water standard and establish Maximum Contaminant Levels (MCLs). PHGs, as well as cost and technical feasibility estimates, provide the basis for revising and setting new contaminant MCLs to protect public health.

Provisions of the California Health and Safety Code Section 116470(b) (Exhibit A) require that large water utilities (>10,000 service connections) prepare a special report by July 1, 2025 if their water quality measurements exceeded any PHGs in the three previous calendar years. The law also requires that where OEHHA has not adopted a PHG for a contaminant, the water suppliers are to use the Maximum Contaminant Level Goals (MCLGs) adopted by the United States Environmental Protection Agency (USEPA). MCLGs are the federal equivalent to PHGs, but they are not identical. This report includes constituents that have Primary Drinking Water Standards (PDWS) and a set PHG or MCLG. PDWS may be an MCL or Treatment Technique (TT). A TT is appointed when it is not feasible or appropriate to set a numerical standard (e.g. the Lead and Copper Rule). Exhibit B is a list of all regulated constituents with MCLs and PHGs or MCLGs.

There are a few constituents that are routinely detected in water systems at levels usually well below the drinking water standards for which no PHG nor MCLG have yet been adopted by OEHHA or USEPA. These include total trihalomethanes (TTHMs) among others.

This report provides the following information as specified in the Health and Safety Code (Exhibit A) for each constituent detected in the City of Santa Monica's (City) water supply in 2022, 2023, and 2024 at a level exceeding an applicable PHG or MCLG:

- Numerical public health risk associated with the MCL and the PHG or MCLG (Exhibit C).
- Category or type of risk to health that could be associated with each constituent.
- Best Available Treatment Technology that could be used to reduce the constituent level.
- Estimate of the cost to install that treatment if it is appropriate and feasible.

OVERVIEW OF SANTA MONICA'S TREATMENT FACILITIES

The City's current domestic water supply consists of local groundwater and purchased imported water (either from the State Water Project or the Colorado River) from the Metropolitan Water District of Southern California. The City extracts local groundwater from ten active groundwater wells located in the Santa Monica Groundwater Basin. Five of these wells are located in the Charnock subbasin, two are located in the Olympic subbasin, and three are located in the Arcadia subbasin.

Three of the five wells located in the Charnock subbasin are pretreated at the Charnock Water Treatment Plant (Charnock WTP) through greensand filtration and two-stage biological granular activated carbon filters to remove volatile organic carbon compounds from historical industrial pollution and then blended with the two other Charnock wells prior to being pumped to the Arcadia Water Treatment Plant (Arcadia WTP) for further treatment.

Groundwater from the Olympic Well Field is treated through the new Olympic Advanced Water Treatment Facility (Olympic AWTF) to remove industrial contaminants through greensand filtration, ultraviolet light advanced oxidation, and two-stage granular activated carbon filters before it is blended with other groundwater sources for further treatment at the Arcadia WTP. Groundwater pumped from Arcadia subbasins are also treated at the Arcadia WTP.

The Arcadia WTP provides multi-barrier treatment to the majority of the City's groundwater wells to reduce hardness in the groundwater and meet all federal and state drinking water regulations. The Arcadia WTP consists of greensand filtration, reverse osmosis filtration, air stripping towers, and chemical disinfection. Final treated water from the Arcadia WTP is sent to the 5-million-gallon (MG) Arcadia Reservoir and distributed for potable water use throughout the City. In addition to the Arcadia Reservoir, the City also owns and operates three additional water storage reservoirs representing a total storage capacity of 40 MG: Riviera Reservoir, Mt. Olivette Reservoir, and San Vincente Reservoir. Only one groundwater well, SM-1, located in the Arcadia subbasin is distributed, after disinfection at the well head, directly into the water distribution system as it does not require any additional treatment to meet federal and state drinking water regulations.

APPLICATION OF PHGs

- PHGs are set by the California Office of Environmental Health Hazard Assessment (OEHHA) which is part of Cal-EPA.
- PHGs are based solely on public health risk considerations. None of the risk-management factors that are considered by DDW in setting drinking water standards are considered in setting the PHGs. These factors include analytical detection capabilities, treatment technology available, benefits and costs.

- PHGs are not enforceable and are not required to be met by any public water system. MCLGs are federal equivalent to PHGs and are set by the USEPA.

WATER QUALITY DATA CONSIDERED

All the water quality data collected for Santa Monica's water system between 2022 and 2024 for purposes of determining compliance with drinking water standards was considered. This information was summarized in our Annual Water Quality Reports made available to all Santa Monica customers, residents, and businesses in June 2023, June 2024, and June 2025 (Exhibit D).

A majority of DDW mandated constituents with a Maximum Contaminant Level (MCL) were tested for in Santa Monica's water system and were reported as Not Detected (ND). Constituents with the greatest relevance to the public are listed in the Annual Water Quality Reports. A constituent reported as ND generally means that the laboratory did not detect the compound, or that it was detected at a level less than California's Detection Level for purposes of Reporting (DLR).

GUIDELINES FOLLOWED

The Association of California Water Agencies (ACWA) formed a workgroup, which prepared guidelines for water utilities to use in preparing PHG reports. These guidelines were used in the preparation of this report. No general guidelines are available from the state regulatory agencies. ACWA's workgroup also prepared guidelines for water utilities to use in estimating the costs to reduce a constituent to the MCL. Exhibit E provides cost estimates in 2024 dollars for the best treatment technologies that are available today.

BEST AVAILABLE TREATMENT TECHNOLOGY AND COST ESTIMATES

Both the USEPA and DDW have adopted what are known as Best Available Technologies (BATs), which are the best-known methods of reducing contaminant levels to achieve compliance with MCLs. Capital construction and operation and maintenance (O&M) costs can be estimated for such technologies. However, since many PHGs and MCLGs are set much lower than the MCL, it is not always possible or feasible to determine the treatment needed to meet the PHG or MCLG. For example, USEPA sets the MCLG for potential cancer-causing chemicals at zero. Estimating the costs to reduce a constituent to zero is difficult, if not impossible, because it is not possible to verify by analytical means that the level has been lowered to zero. In some cases, installing treatment to try and further reduce very low levels of one constituent may have adverse effects on other aspects of water quality.

CONSTITUENTS DETECTED THAT EXCEED A PHG OR A MCLG

The following is a discussion of constituents that were detected in one or more of the City's drinking water sources at levels exceeding the PHG or, if no PHG exists, above

the MCLG. Drinking water sources that directly enter the distribution system are comprised of the treated water from the Arcadia Water Treatment Plant, Santa Monica Well #1, and treated imported MWD water from Weymouth Plant and Jensen Plant.. The health risk information for regulated constituents with MCLs, PHGs, or MCLGs is provided in Exhibit C.

- Total Coliform Bacteria

Total coliform bacteria are measured at approximately 100 sites around the City. The MCL requires that no more than 5% of all samples collected in a month can be positive for total coliforms, and the MCLG requires zero positive samples per month. There is no PHG for total coliform bacteria, thus the MCLG is followed. The reason for the total coliform drinking water standard is to minimize the possibility of the water containing pathogens, which are organisms that cause waterborne disease. Total coliform analysis serves as a surrogate indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk. While USEPA normally sets MCLGs "at a level where no known or anticipated adverse effects on persons would occur", USEPA indicates that it cannot do so with total coliforms. Nevertheless, without the ability to determine a specific numerical risk, the MCLG has been set at zero for total coliform bacteria.

Coliform bacteria are a group of indicator organisms that are ubiquitous in nature and are not generally considered harmful. They are used because of the ease in monitoring and analysis. If a positive sample is found, it indicates a potential problem that needs to be investigated with follow-up sampling. It is not at all unusual for a system to have an occasional positive sample. In Santa Monica, approximately 80 of the total coliform bacteria sample sites are taken from resident or business taps, such as hose bibbs. Many of these taps are exposed to the environment and while they provide a satisfactory sample point most of the time, occasionally the tap itself may become exposed to bacteria from the environment, e.g. overgrown plants, pets and humans. When samples are drawn from these exposed taps, they may test positive on rare occasion.

During the 2022 – 2024 period, the City collected between 119 and 142 samples each month for total coliform analysis. No repeat samples were confirmed positive for Total Coliform Bacteria from 2022 - 2024. The Annual Water Quality Reports, also known as CCRs, state that the highest percent of monthly samples positive was 1.60% in 2022, 1.60% in 2023, and 0 in 2024. This percent includes sample locations that initially tested positive, however, they were resampled and confirmed having no presence of Coliform Bacteria. City of Santa Monica's water system was well below the 5% monthly positive rate that would require further corrective action/investigation to take place.

In order to reduce the potential for positive results due to taps exposed to the open environment, the Water Resources Division (WRD) has a program to prioritize the sites and install more dedicated sampling stations in conjunction with the WRD's main line

replacement program. The dedicated sampling stations are enclosed in a lockable box and are protected from the environment.

The WRD already maintains an effective cross connection control program, a disinfectant residual throughout the system, an effective monitoring and surveillance program, and positive pressure in all parts of the distribution system. The WRD has already taken all steps described by the DDW as Best Available Technology (BAT) for Coliform Bacteria in Section 64447, Title 22, CCR. Since it is unlikely that any change to the treatment process at the Arcadia Water Treatment Plant would prevent the occasional positive test result at distribution sampling sites, staff recommends no change to the existing treatment.

- Lead and Copper

There are no MCLs for lead or copper. Lead and copper are not present in our water sources, but they can leach into drinking water through the residents' plumbing systems and faucets. Instead of MCLs, every three years a set of special samples is collected, and the results evaluated to determine whether the City's water system has achieved "optimized corrosion control". The samples collected are first-draw at the tap of thirty or more homes identified as high-risk (new plumbing installed with lead solder before it was banned). To meet drinking water standards, the 90th percentile reading (meaning 90% of the samples were lower) of all samples collected by the City from these household taps cannot exceed an Action Level (AL) of 0.015 mg/L for lead and 1.3 mg/L for copper. The PHG for lead is 0.0002 mg/L (0.2 ppb) and the PHG for copper is 0.3 mg/L.

There are three categories of health risk associated with lead - chronic toxicity (neurobehavioral effects in children, hypertension in adults) and cancer. The numerical health risk of ingesting drinking water with lead above the Action Level is $2X10^{-6}$, or two additional theoretical cancer cases in one million people drinking two liters of water a day for 70 years.

The last round of testing for lead and copper was conducted by the Water Resources WRD in 2022 (next round is summer 2025). The 90^{th} percentile reading for lead in the last round was 0.0021 mg/L and was 0.2 mg/L for copper. Lead levels were above the PHGs, but below the Action Levels, which means the City continued to meet water quality standards for lead and copper and was again considered to have "optimized corrosion control".

In general, optimizing corrosion control is considered the Best Available Technology to address corrosion issues and any lead and copper findings. The WRD will continue to monitor water quality parameters that relate to corrosivity, such as pH, hardness, alkalinity, and total dissolved solids, and will act, if necessary, to maintain our system in an "optimized corrosion control" condition.

Since the City's water supply continues to meet the "optimized corrosion control" requirements, it is not prudent to initiate additional corrosion control treatment until such time as changing conditions might warrant further action. Therefore, no estimate of cost has been included in this report and no recommendations for further action are advised.

- Bromate

Bromate is a disinfection byproduct (DBP) formed when water containing naturally occurring bromide ion is ozonated. Long-term exposure to bromate in drinking water may cause cancer; thus, the Bromate MCL was adopted in 2002 to address the potential health effect. The standard applies only to water treatment plants that apply ozone for disinfection and does not apply to the City's groundwater or treatment system.

The standard does apply to supplemental water the City imports directly from MWD's Jensen and Weymouth Treatment Plants. After more than two decades of planning and construction, MWD has retrofitted all five of its water treatment plants to use ozone, rather than chlorine, as the primary disinfectant. The upgrade has driven DBP levels in MWD's system to historically low levels and complies with stringent regulations that limit the level of DBPs in drinking water. Ozonation also improves drinking water aesthetics, offers protection from pathogens, and reduces other potential contaminants such as cyanotoxins. MWD controls Bromate by adjusting pH, or by adding chloramine (a combination of ammonia and chlorine) prior to the water reaching the ozone contactors.

The PHG for bromate is 0.0001 mg/L. The MCL for bromate is 0.010 mg/L. The MCL for bromate does not apply to single readings but is instead compared to a Running Annual Average (RAA). For 2022 – 2024, the highest RAAs from MWD's imported water from Weymouth Plant exceeded the PHG measuring at 0.0024 mg/L in 2023 and 0.0020 mg/L in 2024. The highest RAAs from the Jensen Plant measured 0.0072 mg/L in 2022, 0.0076 mg/L in 2023, and 0.0031 mg/L in 2024 and exceeded the PHG. However, there were no recordings of bromate levels above the MCL.

An increased risk of developing cancer is the category for health risk associated with drinking water containing bromate above the MCL for many years. OEHHA has determined that the numerical cancer risk for bromate above the PHG level is $1x10^{-6}$, or one additional theoretical cancer case in one million people drinking two liters of water a day for 70 years.

The BAT to reduce bromate is control of the ozone treatment process. The City does not have any control over imported water quality and as such, this is a process that is under the control and jurisdiction of MWD that is already being conducted. Therefore, no recommendations for further action will not be addressed in this report.

- Uranium

The PHG for Uranium is 0.43 picoCuries per liter (pCi/L) and the MCL is 20 pCi/L.

Uranium is a naturally occurring metallic element which is weakly radioactive and is ubiquitous in the earth's crust. Uranium is found in ground and surface waters due to its natural occurrence in geological formations. The average Uranium concentrations in surface and ground water are 1 and 2 pCi/L respectively. The Uranium intake from water is about equal to the total from other dietary components.

Uranium levels always tested below the MCL for all water sources from 2022 – 2024; however, all sources exceeded the PHG at least once during this period.

Uranium readings in water out of the Arcadia Water Treatment Plant ranged from 1.1 pCi/L to 2.2 pCi/L; the annual averages from the plant ranged from 1.2 to 2.0 pCi/L for 2022 – 2024. Annual averages of water from MWD's Weymouth and Jensen plants ranged from ND (Reporting Limit was 0.7 pCi/L) to 2 pCi/L for years 2022 – 2024.

An increased risk of developing cancer is the health risk category associated with drinking water containing Uranium above the MCL for many years. OEHHA has determined that the numerical cancer risk for Uranium above the PHG level is $1x10^{-6}$, or one additional theoretical cancer case in one million people drinking two liters of water a day for 70 years.

There are several BATs designated to lower Uranium to below the MCL including RO. The City's Arcadia Water Treatment Plant uses RO as part of its multi-barrier treatment process and to soften the local groundwater. The RO system also achieves some reduction of Uranium that may be present in the City's groundwater supplies. However, BATs are designed for treatment to achieve compliance with the corresponding MCL only, and not PHGs; thus, RO treatment did not achieve reduction of Uranium to below the PHG. Further treatment to reduce Uranium at the Arcadia Water Treatment Plant is neither practical, nor feasible.

It is not practical or feasible to estimate costs for the reduction of Uranium from the supplemental water the City purchases from MWD. Therefore, no estimate of cost has been included in this report and no recommendations for further action are advised.

- Arsenic

The PHG for Arsenic is 0.000004 mg/L (4.0 ppt). The MCL for Arsenic is 0.01 mg/L. Arsenic is a naturally occurring metallic element found in water generally at low levels throughout California and elsewhere due to the erosion of mineral deposits. It can also enter water supplies from runoff from agricultural and industrial sites. The MCL was lowered in 2006 due to increasing evidence of potential detrimental health effects even at low levels. The concern is that long-term exposure to Arsenic in drinking water may cause skin damage, problems with circulatory systems, and may cause cancer.

Arsenic was below the MCL and PHG in all the City's water sources during 2022 – 2024. Arsenic readings for all sources during this report period were measured as ND (Reporting Limit was 0.0005 mg/L).

The Jensen Water Treatment Plant reported one exceedance above the PHG of arsenic at 0.0024 mg/L in 2022, but ND in 2023 and 2024. Still, this occurrence remained below the MCL. The Weymouth Water Treatment Plant reported ND for arsenic during 2022 – 2024. These two facilities are owned and operated by MWD.

An increased risk of cancer the health risk category for long-term exposure to drinking water containing Arsenic above the MCL. The numerical health risk of ingesting drinking water with Arsenic above the PHG is $1X10^{-6}$, or one additional theoretical cancer cases in one million people drinking two liters of water a day for 70 years.

It is not practical or feasible to estimate costs for the reduction of Arsenic from the supplemental water the City purchases from MWD, the Arcadia Water Treatment Plant or Santa Monica Well #1. Therefore, no estimate of cost has been included in this report and no recommendations for further action are advised.

- Other Radionuclides

There are several radionuclides for which OEHHA has not set PHGs, but for which an MCLG has been designated by USEPA. The standards include the following radionuclides: alpha emitters, beta/photon emitters, combined radium as well as the standard for Uranium described above. In addition to these standards, USEPA has designated an MCLG of zero for each. The groundwater and supplemental water supplies for Santa Monica always tested below the MCLs for these constituents during 2022 – 2024; however, the MCLGs of zero for some of these radionuclides were exceeded at some sources at various times during this period.

Radionuclides are radioactive elements that are found in nature or are man-made. They are unstable and emit particles or waves of high energy from the nucleus or other parts of the atom. There are three basic kinds of high-energy radiation: alpha, beta, and gamma (included in a broader group called photons). Many radionuclides emit more than one kind of radiation, but they are classified by their most important kind. The MCL for alpha emitters limits the level of “gross alpha” radiation other than what is contributed by Uranium and radon. The MCL for beta/photon emitters limits the level of radiation from a group of 179 man-made radioactive materials. The MCL for combined radium limits the radiation on two kinds (or “isotopes”) of radium: radium-226 and radium-228. These MCLs were adopted to address concern with the health effects from radiation inside the body after consuming the radionuclides because evidence suggests that long-term exposure to radionuclides in drinking water may cause cancer.

The level of alpha emitters in the City’s groundwater and supplemental supplies always tested below the MCL of 15 pCi/L as well as below the MCLG of zero during 2022 – 2024. The Arcadia Water Treatment Plant recorded ND for alpha emitters during 2022 – 2024.

The standard for beta/photon emitters does not apply to the City's groundwater and as such, is not covered by this report. The standard for beta/photon emitters does apply to supplemental water that the City received from MWD. The MWD water always tested below the beta/photon emitters MCL of 50 pCi/L, but an annual average was verified to exceed the MCLG of zero data during 2022 at Weymouth. Beta/photon emitter readings for both MWD supplies for this period ranged from ND (Detection Limit for Purposes of Reporting or DLR was 4 pCi/L) to a high of 7 pCi/L in the water coming from MWD's Weymouth Treatment Plant during 2022. The annual averages ranged from ND to 6 pCi/L for the Jensen and Weymouth supplies respectively, for the period covered by this report.

The level of combined radium in the City's groundwater and supplemental supplies always tested below the MCL of 5 pCi/L during 2022 – 2024, however, in 2023, one detection of radium-228 was found at the Arcadia Water Treatment Plant. Combined radium levels measured to 1.23 pCi/L, exceeding the MCLG. No detections of combined radium were reported for MWD imported water from Weymouth and Jensen plant.

The BATs for these radionuclides are similar to those for Uranium, which includes RO. The City's Arcadia Water Treatment Plant is achieving some reduction of these radionuclides from the City's groundwater supply. BATs are designed for treatment to achieve compliance with the corresponding MCL only, and not PHGs, so the addition of RO softening, considered a BAT for these other radionuclides, did not achieve reduction to below the MCLGs in all cases. Further treatment to reduce other radionuclides at the Arcadia Water Treatment Plant is neither practical, nor feasible. Thus, the analysis for treatment of the MWD supplies is the same as for Uranium and no recommendations for further action are advised.

- Hexavalent Chromium (Chromium VI)

The PHG for Chromium VI was established in 2011 as 0.02 ppb, however, an MCL was more recently adopted in October 2024 as 10 ppb. Therefore, an average of the City's water sources is compared to the DLR (0.1 ppb) and used for reporting purposes. Chromium is an odorless and tasteless metallic element. It is found naturally in rocks, plants and can also be produced by industrial processes. The most common types of chromium found in natural waters in the environment are Chromium III and Chromium VI. Total chromium is the sum of Chromium III and Chromium VI. Chromium III and Chromium VI are covered together under the total Chromium MCL because these forms of chromium can convert back and forth in water depending on environmental conditions.

Chromium III is an essential human dietary element and naturally occurs in many vegetables, fruits, grains and yeast. Chromium VI also occurs naturally in the environment from the erosion of natural chromium deposits from rocks and can also be released in the environment from industrial processes via storage leaks, discharges and improper disposal practices.

Total Chromium and Chromium VI were below the MCL in all of the City's water sources at all times, but exceeded the PHG for chromium VI at least once during the period covered in this report. Supplemental water from the Jensen and Weymouth Treatment Plants had no detection of Chromium or Chromium VI during this reporting period.

The City's single well not treated by the Arcadia Water Treatment Plant, Santa Monica Well #1, had one instance of Chromium VI levels above the PHG in 2022 at 1.7 ppb.

Chromium VI is known to be a potent carcinogen when inhaled. It was found to also cause cancer in laboratory mice and rats when exposed through drinking water. OEHHA has determined that the numerical cancer risk for Chromium VI above the PHG level is $1x10^{-6}$, or one additional theoretical cancer cases in one million people drinking two liters of water a day for 70 years.

The recommended technologies for Chromium VI removal are weak base anion exchange resin or reverse osmosis technology. The City's Arcadia Water Treatment Plant is achieving some reduction of Chromium VI from the City's groundwater supply. BATs are designed for treatment to achieve compliance with the corresponding MCL only, and not PHGs, so the addition of RO softening, considered a BAT for Chromium VI, did not achieve reduction to below the PHG in all cases. Further treatment to reduce Chromium VI at the Arcadia Water Treatment Plant is neither practical, nor feasible. Thus, no recommendations for further action are advised for Arcadia Water Treatment Plant. The cost estimate provided for treatment of Uranium at Santa Monica Well #1 applies for Chromium VI along with the same recommendation that such treatment is neither practical or feasible.

- Fluoride

The PHG for Fluoride is 1 mg/L as of 1997. The MCL is 2 mg/L. Fluoride is a natural occurring element found in natural deposits, which enters groundwater through erosion. It is commonly found as an additive in drinking water supplies as a public health measure to prevent tooth decay. The main concern is mild dental fluorosis (discoloration of teeth) in children and adults at the 2 mg/L MCL and higher levels.

Fluoride, in addition to being naturally found at levels close to 0.3 mg/L in Santa Monica groundwater sources, is raised to a target level of 0.7 mg/L with a control range of 0.6 mg/L to 1.2 mg/L throughout the distribution system. The only exceedance of the fluoride PHG in the City's system occurred at Santa Monica Well #1 in 2023 with the highest analyzer reading at 1.10 mg/L. The fluoride MCL was never exceeded during this reporting period.

City water is actively fluoridated to increase the natural occurring levels that are below the PHG due in part to existing RO softening that removes fluoride. As such, no BAT's are recommended beyond operator-controlled adjustments to the active dosing at Arcadia Water Treatment Plant and Santa Monica Well #1 where dosing takes place before entry into the distribution system. Imported supplemental MWD water is also

difficult to control and for that reason, City fluoride dosing may exceed the PHG, but not the control range or MCL. As such, no recommendations for further action are advised.

ADDITIONAL INFORMATION

1,4-Dioxane

No MCL, MCLG, or PHG exists for 1,4-Dioxane, and as such, is not a requirement for this report. However, DDW has a Notification Level (NL) for 1,4-Dioxane, which was lowered to 0.001 mg/l in 2010. As reported to City Council in 2002, the City's Olympic Wells (Santa Monica Wells 3&4) were found to have 1,4-Dioxane above the NL. The City was advised by DDW in 2002 that it was acceptable to continue the use of these wells as long as the level remained less than 100 times the NL. However, the City recently completed the new Olympic Advanced Water Treatment Facility that utilizes Ultraviolet Advanced Oxidation to target 1,4-Dioxane and other contaminants. The target reduction is well below the NL of 0.001 mg/l.

RECOMMENDATIONS FOR FURTHER ACTION

The drinking water quality of the City of Santa Monica meets all SWRCB/Division of Drinking Water and USEPA drinking water standards set to protect public health. The City's Arcadia Water Treatment Plant is achieving further reduction of many of the constituents identified in this report from the City's groundwater supply. To further reduce the levels of these constituents that are already significantly below the established health-based MCL would typically require that additional costly treatment processes be constructed. The effectiveness of the additional costly treatment processes to provide any significant reductions in constituent levels at these already low values below the MCL and in some cases, laboratory detection levels, is uncertain. The health protection benefits of these further hypothetical reductions are not clear and may not be quantifiable. Therefore, no action is proposed at this time.

ADDITIONAL INFORMATION

No MCL, MCLG, or PHG exists for 1,4-Dioxane, and as such, is not a requirement for this report. However, DDW has a NL for 1,4-Dioxane, which was lowered to 0.001 mg/l in 2010. As reported to City Council in 2002, the City's Olympic Wells (Santa Monica Wells 3&4) were found to have 1,4-Dioxane above the NL. The City was advised by DDW in 2002 that it was acceptable to continue the use of these wells as long as the level remained less than 100 times the NL. However, the City recently began the operation of the new Olympic Advanced Water Treatment Facility that utilizes Ultraviolet Advanced Oxidation to target 1,4-Dioxane and other contaminants. The target reduction is well below the NL of 0.001 mg/l.

EXHIBITS:

A. California Health and Safety Code Section 116470(b)
B. List of Regulated Constituents with MCLs, PHGs or MCLGs
C. Numerical Health Risk Information for Public Health Goal Exceedance Reports. Prepared by the Office of Environmental Health Hazard Assessment. Feb 2025
D. Tables excerpted from Annual Water Quality Reports for 2022 - 2024
E. Cost Estimates for Treatment Technologies
F. Acronyms

Exhibit A

Health and Safety Code
Section 116470 (b)

(b) On or before July 1, 1998, and every three years thereafter, public water systems serving more than 10,000 service connections that detect one or more contaminants in drinking water that exceed the applicable public health goal, shall prepare a brief written report in plain language that does all of the following:

(1) Identifies each contaminant detected in drinking water that exceeds the applicable public health goal.

(2) Discloses the numerical public health risk, determined by the office, associated with the maximum contaminant level for each contaminant identified in paragraph (1) and the numerical public health risk determined by the office associated with the public health goal for that contaminant.

(3) Identifies the category of risk to public health, including, but not limited to, carcinogenic, mutagenic, teratogenic, and acute toxicity, associated with exposure to the contaminant in drinking water, and includes a brief plainly worded description of these terms.

(4) Describes the best available technology, if any is then available on a commercial basis, to remove the contaminant or reduce the concentration of the contaminant. The public water system may, solely at its own discretion, briefly describe actions that have been taken on its own, or by other entities, to prevent the introduction of the contaminant into drinking water supplies.

(5) Estimates the aggregate cost and the cost per customer of utilizing the technology described in paragraph (4), if any, to reduce the concentration of that contaminant in drinking water to a level at or below the public health goal.

(6) Briefly describes what action, if any, the local water purveyor intends to take to reduce the concentration of the contaminant in public drinking water supplies and the basis for that decision.

(c) Public water systems required to prepare a report pursuant to subdivision (b) shall hold a public hearing for the purpose of accepting and responding to public comment on the report. Public water systems may hold the public hearing as part of any regularly scheduled meeting.

(d) The department shall not require a public water system to take any action to reduce or eliminate any exceedance of a public health goal.

(e) Enforcement of this section does not require the department to amend a public water system’s operating permit.

(f) Pending adoption of a public health goal by the Office of Environmental Health Hazard Assessment pursuant to subdivision (c) of Section 116365, and in lieu thereof, public water systems shall use the national maximum contaminant level goal adopted by the United States Environmental Protection Agency for the corresponding contaminant for purposes of complying with the notice and hearing requirements of this section.

(g) This section is intended to provide an alternative form for the federally required consumer confidence report as authorized by 42 U.S.C. Section 300g-3(c).

MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants

(Units are in milligrams per liter (mg/L), unless otherwise noted.)

Last Update: November 2024

This table includes:

California's maximum contaminant levels (MCLs) Detection limits for purposes of reporting (DLRs)

Public health goals (PHGs) from the Office of Environmental Health Hazard Assessment (OEHHA)

The PHGs for NDMA, PFOA and PFOS (which are not yet regulated in California) are included at the bottom of this table.

The Federal MCLs for PFOA and PFOS are also listed at the end of this table.

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
Chemicals with MCLs in 22 CCR §64431—Inorganic Chemicals				
Aluminum	1	0.05	0.6	2001
Antimony	0.006	0.006	0.001	2016
Arsenic	0.010	0.002	0.000004	2004
Asbestos (MFL = million fibers per liter; for fibers >10 microns long)	7 MFL	0.2 MFL	7 MFL	2003
Barium	1	0.1	2	2003
Beryllium	0.004	0.001	0.001	2003
Cadmium	0.005	0.001	0.00004	2006
Chromium, Total - OEHHA withdrew the 0.0025-mg/L PHG	0.05	0.01	withdrawn Nov. 2001	1999
Chromium, Hexavalent - 0.01-mg/L MCL & 0.001-mg/L DLR repealed September 2017	--	--	0.00002	2011
Cyanide	0.15	0.1	0.15	1997
Fluoride	2	0.1	1	1997
Mercury (inorganic)	0.002	0.001	0.0012	1999 (rev2005)*
Nickel	0.1	0.01	0.012	2001
Nitrate (as nitrogen, N)	10 as N	0.4	45 as NO3 (=10 as N)	2018
Nitrite (as N)	1 as N	0.4	1 as N	2018
Nitrate + Nitrite (as N)	10 as N	--	10 as N	2018
Perchlorate	0.006	0.004	0.001	2015
Selenium	0.05	0.005	0.03	2010

Thallium	0.002	0.001	0.0001	1999 (rev2004)
Copper and Lead, 22 CCR §64672.3				
Values referred to as MCLs for lead and copper are not actually MCLs; instead, they are called "Action Levels" under the lead and copper rule				
Copper	1.3	0.05	0.3	2008
Lead	0.015	0.005	0.0002	2009
Radionuclides with MCLs in 22 CCR §64441 and §64443—Radioactivity				
[units are picocuries per liter (pCi/L), unless otherwise stated; n/a = not applicable]				
Gross alpha particle activity - OEHHA concluded in 2003 that a PHG was not practical	15	3	none	n/a
Gross beta particle activity - OEHHA concluded in 2003 that a PHG was not practical	4 mrem/yr	4	none	n/a
Radium-226	--	1	0.05	2006
Radium-228	--	1	0.019	2006
Radium-226 + Radium-228	5	--	--	--
Strontium-90	8	2	0.35	2006
Tritium	20,000	1,000	400	2006
Uranium	20	1	0.43	2001
Chemicals with MCLs in 22 CCR §64444—Organic Chemicals				
(a) Volatile Organic Chemicals (VOCs)				
Benzene	0.001	0.0005	0.00015	2001
Carbon tetrachloride	0.0005	0.0005	0.0001	2000
1,2-Dichlorobenzene	0.6	0.0005	0.6	1997 (rev2009)
1,4-Dichlorobenzene (p-DCB)	0.005	0.0005	0.006	1997
1,1-Dichloroethane (1,1-DCA)	0.005	0.0005	0.003	2003
1,2-Dichloroethane (1,2-DCA)	0.0005	0.0005	0.0004	1999 (rev2005)
1,1-Dichloroethylene (1,1-DCE)	0.006	0.0005	0.01	1999
cis-1,2-Dichloroethylene	0.006	0.0005	0.013	2018
trans-1,2-Dichloroethylene	0.01	0.0005	0.05	2018
Dichloromethane (Methylene chloride)	0.005	0.0005	0.004	2000
1,2-Dichloropropane	0.005	0.0005	0.0005	1999
1,3-Dichloropropene	0.0005	0.0005	0.0002	1999 (rev2006)
Ethylbenzene	0.3	0.0005	0.3	1997
Methyl tertiary butyl ether (MTBE)	0.013	0.003	0.013	1999
Monochlorobenzene	0.07	0.0005	0.07	2014
Styrene	0.1	0.0005	0.0005	2010
1,1,2,2-Tetrachloroethane	0.001	0.0005	0.0001	2003

Tetrachloroethylene (PCE)	0.005	0.0005	0.00006	2001
Toluene	0.15	0.0005	0.15	1999
1,2,4-Trichlorobenzene	0.005	0.0005	0.005	1999
1,1,1-Trichloroethane (1,1,1-TCA)	0.2	0.0005	1	2006
1,1,2-Trichloroethane (1,1,2-TCA)	0.005	0.0005	0.0003	2006
Trichloroethylene (TCE)	0.005	0.0005	0.0017	2009
Trichlorofluoromethane (Freon 11)	0.15	0.005	1.3	2014
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	1.2	0.01	4	1997 (rev2011)
Vinyl chloride	0.0005	0.0005	0.00005	2000
Xylenes	1.75	0.0005	1.8	1997
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)				
Alachlor	0.002	0.001	0.004	1997
Atrazine	0.001	0.0005	0.00015	1999
Bentazon	0.018	0.002	0.2	1999 (rev2009)
Benzo(a)pyrene	0.0002	0.0001	0.000007	2010
Carbofuran	0.018	0.005	0.0007	2016
Chlordane	0.0001	0.0001	0.00003	1997 (rev2006)
Dalapon	0.2	0.01	0.79	1997 (rev2009)
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00001	0.000003	2020
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.01	0.02	2009
Di(2-ethylhexyl)adipate	0.4	0.005	0.2	2003
Di(2-ethylhexyl)phthalate (DEHP)	0.004	0.003	0.012	1997
Dinoseb	0.007	0.002	0.014	1997 (rev2010)
Diquat	0.02	0.004	0.006	2016
Endothal	0.1	0.045	0.094	2014
Endrin	0.002	0.0001	0.0003	2016
Ethylene dibromide (EDB)	0.00005	0.00002	0.00001	2003
Glyphosate	0.7	0.025	0.9	2007
Heptachlor	0.00001	0.00001	0.000008	1999
Heptachlor epoxide	0.00001	0.00001	0.000006	1999
Hexachlorobenzene	0.001	0.0005	0.00003	2003
Hexachlorocyclopentadiene	0.05	0.001	0.002	2014
Lindane	0.0002	0.0002	0.000032	1999 (rev2005)
Methoxychlor	0.03	0.01	0.00009	2010
Molinate	0.02	0.002	0.001	2008
Oxamyl	0.05	0.02	0.026	2009
Pentachlorophenol	0.001	0.0002	0.0003	2009
Picloram	0.5	0.001	0.166	2016
Polychlorinated biphenyls (PCBs)	0.0005	0.0005	0.00009	2007

Simazine	0.004	0.001	0.004	2001
Thiobencarb	0.07	0.001	0.042	2016
Toxaphene	0.003	0.001	0.00003	2003
1,2,3-Trichloropropane	0.000005	0.000005	0.0000007	2009
2,3,7,8-TCDD (dioxin)	$3x10^{-8}$	$5x10^{-9}$	$5x10^{-11}$	2010
2,4,5-TP (Silvex)	0.05	0.001	0.003	2014
Chemicals with MCLs in 22 CCR §64533—Disinfection Byproducts				
Total Trihalomethanes	0.080	--	--	--
Bromodichloromethane	--	0.0010	0.00006	2020
Bromoform	--	0.0010	0.0005	2020
Chloroform	--	0.0010	0.0004	2020
Dibromochloromethane	--	0.0010	0.0001	2020
Haloacetic Acids (five) (HAA5)	0.060	--	--	--
Monochloroacetic Acid	--	0.0020	--	--
Dichloroacetic Adic	--	0.0010	--	--
Trichloroacetic Acid	--	0.0010	--	--
Monobromoacetic Acid	--	0.0010	--	--
Dibromoacetic Acid	--	0.0010	--	--
Bromate	0.010	0.0050**	0.0001	2009
Chlorite	1.0	0.020	0.05	2009
Chemicals with PHGs established in response to DDW requests. These are not currently regulated drinking water contaminants.				
N-Nitrosodimethylamine (NDMA)	--	--	0.000003	2006
*OEHHA's review of this chemical during the year indicated (rev20XX) resulted in no change in the PHG.				
**The DLR for Bromate is 0.0010 mg/L for analysis performed using EPA Method 317.0 Revision 2.0, 321.8, or 326.0.				

Chemicals with PHGs established in response to DDW requests. These are not currently regulated drinking water contaminants.***

Regulated Contaminant	MCL	DLR	PHG	Date of PHG
N-Nitrosodimethylamine (NDMA)	--	--	0.000003	2006
Perfluorooctanoic acid (PFOA)***	--	--	0.00000007	2024
Perfluorooctane sulfonic acid (PFOS)***	--	--	0.000001	2024

***PFOA and PFOS have US EPA MCLGs and MCLs.
PFOA – MCLG is zero. MCL is 4 ng/L.
PFOS – MCLG is zero. MCL is 4 ng/L.

EXHIBIT C
ATTACHMENT NO. 2
2025 Health Risk Information for Public Health Goal
Exceedance Reports

Health Risk Information for Public Health Goal Exceedance Reports

Prepared by

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

February 2025

NEW for the 2025 Report: New in this document are newly established Public Health Goals (PHGs) for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and five haloacetic acids: monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

Background: Under the Calderon-Sher Safe Drinking Water Act of 1996 (the Act), public water systems with more than 10,000 service connections are required to prepare a report every three years for contaminants that exceed their respective PHGs.[1] This document contains health risk information on drinking water contaminants to assist public water systems in preparing these reports. A PHG is the concentration of a contaminant in drinking water that poses no significant health risk if consumed for a lifetime. PHGs are developed and published by the Office of Environmental Health Hazard Assessment (OEHHA) using current risk assessment principles, practices and methods.[2]

The water system's report is required to identify the health risk category (e.g., carcinogenicity or neurotoxicity) associated with exposure to each contaminant in drinking water that has a PHG and to include a brief, plainly worded description of these risks. The report is also required to disclose the numerical public health risk, if available, associated with the California Maximum Contaminant Level (MCL) and with the PHG for each contaminant. This health risk information document is prepared by OEHHA every three years to assist the water systems in providing the required information in their reports.

[1] Health and Safety Code Section 116470(b)
[2] Health and Safety Code Section 116365

Numerical health risks: Table 1 presents health risk categories and cancer risk values for chemical contaminants in drinking water that have PHGs.

The Act requires that OEHHA publish PHGs based on health risk assessments using the most current scientific methods. As defined in statute, PHGs for non-carcinogenic chemicals in drinking water are set at a concentration "at which no known or anticipated adverse health effects will occur, with an adequate margin of safety." For carcinogens, PHGs are set at a concentration that "does not pose any significant risk to health." PHGs provide one basis for revising MCLs, along with cost and technological feasibility. OEHHA has been publishing PHGs since 1997 and the entire list published to date is shown in Table 1.

Table 2 presents health risk information for contaminants that do not have PHGs but have state or federal regulatory standards. The Act requires that, for chemical contaminants with California MCLs that do not yet have PHGs, water utilities use the federal Maximum Contaminant Level Goal (MCLG) for the purpose of complying with the requirement of public notification. MCLGs, like PHGs, are strictly health based and include a margin of safety. One difference, however, is that the MCLGs for carcinogens are set at zero because the US Environmental Protection Agency (US EPA) assumes there is no absolutely safe level of exposure to such chemicals. PHGs, on the other hand, are set at a level considered to pose no *significant* risk of cancer; this is usually no more than a one-in-one-million excess cancer risk (1×10^{-6}) level for a lifetime of exposure. In Table 2, the cancer risks shown are based on the US EPA's evaluations.

For more information on health risks: The adverse health effects for each chemical with a PHG are summarized in a PHG technical support document. These documents are available on the OEHHA website (https://oehha.ca.gov/water/public-health-goals-phgs).

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Alachlor	carcinogenicity (causes cancer)	0.004	NA[5,6]	0.002	NA
Aluminum	neurotoxicity and immunotoxicity (harms the nervous and immune systems)	0.6	NA	1	NA
Antimony	hepatotoxicity (harms the liver)	0.001	NA	0.006	NA
Arsenic	carcinogenicity (causes cancer)	0.000004 (4×10^{-6})	1×10^{-6} (one per million)	0.01	2.5×10^{-3} (2.5 per thousand)
Asbestos	carcinogenicity (causes cancer)	7 MFL[7] (fibers >10 microns in length)	1×10^{-6}	7 MFL (fibers >10 microns in length)	1×10^{-6} (one per million)
Atrazine	carcinogenicity (causes cancer)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)
Barium	cardiovascular toxicity (causes high blood pressure)	2	NA	1	NA

[1] Based on the OEHHA PHG technical support document unless otherwise specified. The categories are the hazard traits defined by OEHHA for California's Toxics Information Clearinghouse (online at: https://oehha.ca.gov/media/downloads/risk-assessment//gcregtext011912.pdf).
[2] mg/L = milligrams per liter of water, equivalent to parts per million (ppm)
[3] Cancer Risk = Upper bound estimate of excess cancer risk from lifetime exposure. Actual cancer risk may be lower or zero. 1×10^{-6} means one excess cancer case per million people exposed.
[4] MCL = maximum contaminant level.
[5] NA = not applicable. Cancer risk cannot be calculated.
[6] The PHG for alachlor is based on a threshold model of carcinogenesis and is set at a level that is believed to be without any significant cancer risk to individuals exposed to the chemical over a lifetime.
[7] MFL = million fibers per liter of water.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Bentazon	hepatotoxicity and digestive system toxicity (harms the liver, intestine, and causes body weight effects[8])	0.2	NA	0.018	NA
Benzene	carcinogenicity (causes leukemia)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)
Benzo[a]pyrene	carcinogenicity (causes cancer)	0.000007 (7×10^{-6})	1×10^{-6}	0.0002	3×10^{-5} (three per hundred thousand)
Beryllium	digestive system toxicity (harms the stomach or intestine)	0.001	NA	0.004	NA
Bromate	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.01	1×10^{-4} (one per ten thousand)
Cadmium	nephrotoxicity (harms the kidney)	0.00004	NA	0.005	NA
Carbofuran	reproductive toxicity (harms the testis)	0.0007	NA	0.018	NA
Carbon tetrachloride	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.0005	5×10^{-6} (five per million)

[8] Body weight effects are an indicator of general toxicity in animal studies.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Chlordane	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.0001	3×10^{-6} (three per million)
Chlorite	hematotoxicity (causes anemia) neurotoxicity (causes neurobehavioral effects)	0.05	NA	1	NA
Chromium, hexavalent	carcinogenicity (causes cancer)	0.00002	1×10^{-6}	0.010	5×10^{-4} (five per ten thousand)
Copper	digestive system toxicity (causes nausea, vomiting, diarrhea)	0.3	NA	1.3 (AL[9])	NA
Cyanide	neurotoxicity (damages nerves) endocrine toxicity (affects the thyroid)	0.15	NA	0.15	NA
Dalapon	nephrotoxicity (harms the kidney)	0.79	NA	0.2	NA
Di(2-ethylhexyl) adipate (DEHA)	developmental toxicity (disrupts development)	0.2	NA	0.4	NA
Di(2-ethylhexyl) phthalate (DEHP)	carcinogenicity (causes cancer)	0.012	1×10^{-6}	0.004	3×10^{-7} (three per ten million)

[9] AL = action level. The action levels for copper and lead refer to a concentration measured at the tap. Much of the copper and lead in drinking water is derived from household plumbing (The Lead and Copper Rule, Title 22, California Code of Regulations [CCR] section 64672.3).

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
1,2-Dibromo-3-chloropropane (DBCP)	carcinogenicity (causes cancer)	0.000003 ($3x10^{-6}$)	1×10^{-6}	0.0002	7×10^{-5} (seven per hundred thousand)
1,2-Dichloro-benzene (*o*-DCB)	hepatotoxicity (harms the liver)	0.6	NA	0.6	NA
1,4-Dichloro-benzene (*p*-DCB)	carcinogenicity (causes cancer)	0.006	1×10^{-6}	0.005	8×10^{-7} (eight per ten million)
1,1-Dichloro-ethane (1,1-DCA)	carcinogenicity (causes cancer)	0.003	1×10^{-6}	0.005	2×10^{-6} (two per million)
1,2-Dichloro-ethane (1,2-DCA)	carcinogenicity (causes cancer)	0.0004	1×10^{-6}	0.0005	1×10^{-6} (one per million)
1,1-Dichloro-ethylene (1,1-DCE)	hepatotoxicity (harms the liver)	0.01	NA	0.006	NA
1,2-Dichloro-ethylene, cis	nephrotoxicity (harms the kidney)	0.013	NA	0.006	NA
1,2-Dichloro-ethylene, trans	immunotoxicity (harms the immune system)	0.05	NA	0.01	NA
Dichloromethane (methylene chloride)	carcinogenicity (causes cancer)	0.004	1×10^{-6}	0.005	1×10^{-6} (one per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
2,4-Dichloro-phenoxyacetic acid (2,4-D)	hepatotoxicity and nephrotoxicity (harms the liver and kidney)	0.02	NA	0.07	NA
1,2-Dichloro-propane (propylene dichloride)	carcinogenicity (causes cancer)	0.0005	1×10^{-6}	0.005	1×10^{-5} (one per hundred thousand)
1,3-Dichloro-propene (Telone II®)	carcinogenicity (causes cancer)	0.0002	1×10^{-6}	0.0005	2×10^{-6} (two per million)
Dinoseb	reproductive toxicity (harms the uterus and testis)	0.014	NA	0.007	NA
Diquat	ocular toxicity (harms the eye) developmental toxicity (causes malformation)	0.006	NA	0.02	NA
Endothall	digestive system toxicity (harms the stomach or intestine)	0.094	NA	0.1	NA
Endrin	neurotoxicity (causes convulsions) hepatotoxicity (harms the liver)	0.0003	NA	0.002	NA
Ethylbenzene (phenylethane)	hepatotoxicity (harms the liver)	0.3	NA	0.3	NA
Ethylene dibromide (1,2-Dibromoethane)	carcinogenicity (causes cancer)	0.00001	1×10^{-6}	0.00005	5×10^{-6} (five per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Fluoride	musculoskeletal toxicity (causes tooth mottling)	1	NA	2	NA
Glyphosate	nephrotoxicity (harms the kidney)	0.9	NA	0.7	NA
Haloacetic acids: dibromoacetic acid	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.06*	2×10^{-3} (two per thousand)[10]
Haloacetic acids: dichloroacetic acid	carcinogenicity (causes cancer)	0.0002	1×10^{-6}	0.06*	3×10^{-4} (three per ten thousand)[11]
Haloacetic acids: monobromo-acetic acid	musculoskeletal toxicity (causes muscular degeneration)	0.025	NA	0.06*	NA
Haloacetic acids: monochloro-acetic acid	general toxicity (causes body and organ weight changes[8])	0.053	NA	0.06*	NA
Haloacetic acids: trichloroacetic acid	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.06*	6×10^{-4} (six per ten thousand)[12]
Heptachlor	carcinogenicity (causes cancer)	0.000008 (8×10^{-6})	1×10^{-6}	0.00001	1×10^{-6} (one per million)

* For total haloacetic acids (the sum of dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, and trichloroacetic acid). There are no MCLs for individual haloacetic acids.
[10] Based on 0.060 mg/L dibromoacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.
[11] Based on 0.060 mg/L dichloroacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.
[12] Based on 0.060 mg/L trichloroacetic acid; the risk will vary with different combinations and ratios of the other haloacetic acids in a particular sample.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Heptachlor epoxide	carcinogenicity (causes cancer)	0.000006 (6×10^{-6})	1×10^{-6}	0.00001	2×10^{-6} (two per million)
Hexachloro-benzene	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.001	3×10^{-5} (three per hundred thousand)
Hexachloro-cyclopentadiene (HCCPD)	digestive system toxicity (causes stomach lesions)	0.002	NA	0.05	NA
Lead	developmental neurotoxicity (causes neurobehavioral effects in children) cardiovascular toxicity (causes high blood pressure) carcinogenicity (causes cancer)	0.0002	$<1\times10^{-6}$ (PHG is not based on this effect)	0.015 (AL[9])	2×10^{-6} (two per million)
Lindane (γ-BHC)	carcinogenicity (causes cancer)	0.000032	1×10^{-6}	0.0002	6×10^{-6} (six per million)
Mercury (inorganic)	nephrotoxicity (harms the kidney)	0.0012	NA	0.002	NA
Methoxychlor	endocrine toxicity (causes hormone effects)	0.00009	NA	0.03	NA
Methyl tertiary-butyl ether (MTBE)	carcinogenicity (causes cancer)	0.013	1×10^{-6}	0.013	1×10^{-6} (one per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Molinate	carcinogenicity (causes cancer)	0.001	1×10^{-6}	0.02	2×10^{-5} (two per hundred thousand)
Monochloro-benzene (chlorobenzene)	nephrotoxicity (harms the kidney)	0.07	NA	0.07	NA
Nickel	developmental toxicity (causes increased neonatal deaths)	0.012	NA	0.1	NA
Nitrate	hematotoxicity (causes methemoglobinemia)	45 as nitrate	NA	10 as nitrogen (=45 as nitrate)	NA
Nitrite	hematotoxicity (causes methemoglobinemia)	3 as nitrite	NA	1 as nitrogen (=3 as nitrite)	NA
Nitrate and Nitrite	hematotoxicity (causes methemoglobinemia)	10 as nitrogen[13]	NA	10 as nitrogen	NA
N-nitroso-dimethyl-amine (NDMA)	carcinogenicity (causes cancer)	0.000003 (3×10^{-6})	1×10^{-6}	none	NA
Oxamyl	general toxicity (causes body weight effects)	0.026	NA	0.05	NA

[13] The joint nitrate/nitrite PHG of 10 mg/L (10 ppm, expressed as nitrogen) does not replace the individual values, and the maximum contribution from nitrite should not exceed 1 mg/L nitrite-nitrogen.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Pentachloro-phenol (PCP)	carcinogenicity (causes cancer)	0.0003	1×10^{-6}	0.001	3×10^{-6} (three per million)
Perchlorate	endocrine toxicity (affects the thyroid) developmental toxicity (causes neurodevelop-mental deficits)	0.001	NA	0.006	NA
Perfluorooctane sulfonic acid (PFOS)	carcinogenicity (causes cancer)	1×10^{-6}	1×10^{-6}	NA	NA
Perfluoro-octanoic acid (PFOA)	carcinogenicity (causes cancer)	7×10^{-9}	1×10^{-6}	NA	NA
Picloram	hepatotoxicity (harms the liver)	0.166	NA	0.5	NA
Polychlorinated biphenyls (PCBs)	carcinogenicity (causes cancer)	0.00009	1×10^{-6}	0.0005	6×10^{-6} (six per million)
Radium-226	carcinogenicity (causes cancer)	0.05 pCi/L	1×10^{-6}	5 pCi/L (combined $Ra^{226+228}$)	1×10^{-4} (one per ten thousand)
Radium-228	carcinogenicity (causes cancer)	0.019 pCi/L	1×10^{-6}	5 pCi/L (combined $Ra^{226+228}$)	3×10^{-4} (three per ten thousand)
Selenium	integumentary toxicity (causes hair loss and nail damage)	0.03	NA	0.05	NA

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Silvex (2,4,5-TP)	hepatotoxicity (harms the liver)	0.003	NA	0.05	NA
Simazine	general toxicity (causes body weight effects)	0.004	NA	0.004	NA
Strontium-90	carcinogenicity (causes cancer)	0.35 pCi/L	1×10^{-6}	8 pCi/L	2×10^{-5} (two per hundred thousand)
Styrene (vinylbenzene)	carcinogenicity (causes cancer)	0.0005	1×10^{-6}	0.1	2×10^{-4} (two per ten thousand)
1,1,2,2-Tetrachloro-ethane	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.001	1×10^{-5} (one per hundred thousand)
2,3,7,8-Tetra-chlorodibenzo-*p*-dioxin (TCDD, or dioxin)	carcinogenicity (causes cancer)	5×10^{-11}	1×10^{-6}	3×10^{-8}	6×10^{-4} (six per ten thousand)
Tetrachloro-ethylene (perchloro-ethylene, or PCE)	carcinogenicity (causes cancer)	0.00006	1×10^{-6}	0.005	8×10^{-5} (eight per hundred thousand)
Thallium	integumentary toxicity (causes hair loss)	0.0001	NA	0.002	NA

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Thiobencarb	general toxicity (causes body weight effects) hematotoxicity (affects red blood cells)	0.042	NA	0.07	NA
Toluene (methylbenzene)	hepatotoxicity (harms the liver) endocrine toxicity (harms the thymus)	0.15	NA	0.15	NA
Toxaphene	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.003	1×10^{-4} (one per ten thousand)
1,2,4-Trichloro-benzene	endocrine toxicity (harms adrenal glands)	0.005	NA	0.005	NA
1,1,1-Trichloro-ethane	neurotoxicity (harms the nervous system), reproductive toxicity (causes fewer offspring) hepatotoxicity (harms the liver) hematotoxicity (causes blood effects)	1	NA	0.2	NA
1,1,2-Trichloro-ethane	carcinogenicity (causes cancer)	0.0003	$1x10^{-6}$	0.005	2×10^{-5} (two per hundred thousand)
Trichloro-ethylene (TCE)	carcinogenicity (causes cancer)	0.0017	1×10^{-6}	0.005	3×10^{-6} (three per million)

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Trichlorofluoro-methane (Freon 11)	accelerated mortality (increase in early death)	1.3	NA	0.15	NA
1,2,3-Trichloro-propane (1,2,3-TCP)	carcinogenicity (causes cancer)	0.0000007 (7×10^{-7})	$1x10^{-6}$	0.000005 (5×10^{-6})	7×10^{-6} (seven per million)
1,1,2-Trichloro-1,2,2-trifluoro-ethane (Freon 113)	hepatotoxicity (harms the liver)	4	NA	1.2	NA
Trihalomethanes: Bromodichloro-methane	carcinogenicity (causes cancer)	0.00006	$1x10^{-6}$	0.080#	1.3×10^{-3} (1.3 per thousand)[14]
Trihalomethanes: Bromoform	carcinogenicity (causes cancer)	0.0005	$1x10^{-6}$	0.080#	2×10^{-4} (two per ten thousand)[15]
Trihalomethanes: Chloroform	carcinogenicity (causes cancer)	0.0004	$1x10^{-6}$	0.080#	2×10^{-4} (two per ten thousand)[16]

For total trihalomethanes (the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane). There are no MCLs for individual trihalomethanes.
[14] Based on 0.080 mg/L bromodichloromethane; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.
[15] Based on 0.080 mg/L bromoform; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.
[16] Based on 0.080 mg/L chloroform; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Trihalomethanes: Dibromochloro-methane	carcinogenicity (causes cancer)	0.0001	$1x10^{-6}$	0.080[#]	8×10^{-4} (eight per ten thousand)[17]
Tritium	carcinogenicity (causes cancer)	400 pCi/L	$1x10^{-6}$	20,000 pCi/L	5×10^{-5} (five per hundred thousand)
Uranium	carcinogenicity (causes cancer)	0.43 pCi/L	1×10^{-6}	20 pCi/L	5×10^{-5} (five per hundred thousand)
Vinyl chloride	carcinogenicity (causes cancer)	0.00005	1×10^{-6}	0.0005	1×10^{-5} (one per hundred thousand)
Xylene	neurotoxicity (affects the senses, mood, and motor control)	1.8 (single isomer or sum of isomers)	NA	1.75 (single isomer or sum of isomers)	NA

[#] For total trihalomethanes (the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane). There are no MCLs for individual trihalomethanes.
[17] Based on 0.080 mg/L dibromochloromethane; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.

Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Chemical	Health Risk Category[1]	US EPA MCLG[2] (mg/L)	Cancer Risk[3] at the MCLG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Disinfection byproducts (DBPs)					
Chloramines	acute toxicity (causes irritation) digestive system toxicity (harms the stomach) hematotoxicity (causes anemia)	4[5,6]	NA[7]	none	NA
Chlorine	acute toxicity (causes irritation) digestive system toxicity (harms the stomach)	4[5,6]	NA	none	NA
Chlorine dioxide	hematotoxicity (causes anemia) neurotoxicity (harms the nervous system)	0.8[5,6]	NA	none	NA
Radionuclides					

[1] Health risk category based on the US EPA MCLG document or California MCL document unless otherwise specified.
[2] MCLG = maximum contaminant level goal established by US EPA.
[3] Cancer Risk = Upper estimate of excess cancer risk from lifetime exposure. Actual cancer risk may be lower or zero. 1×10^{-6} means one excess cancer case per million people exposed.
[4] California MCL = maximum contaminant level established by California.
[5] Maximum Residual Disinfectant Level Goal, or MRDLG.
[6] The federal Maximum Residual Disinfectant Level (MRDL), or highest level of disinfectant allowed in drinking water, is the same value for this chemical.
[7] NA = not available.

Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Chemical	Health Risk Category[1]	US EPA MCLG[2] (mg/L)	Cancer Risk[3] at the MCLG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Gross alpha particles[8]	carcinogenicity (causes cancer)	0 (^{210}Po included)	0	15 pCi/L[9] (includes radium but not radon and uranium)	up to $1x10^{-3}$ (for ^{210}Po, the most potent alpha emitter)
Beta particles and photon emitters[8]	carcinogenicity (causes cancer)	0 (^{210}Pb included)	0	50 pCi/L (judged equiv. to 4 mrem/yr)	up to $2x10^{-3}$ (for ^{210}Pb, the most potent beta-emitter)

[8] MCLs for gross alpha and beta particles are screening standards for a group of radionuclides. Corresponding PHGs were not developed for gross alpha and beta particles. See the OEHHA memoranda discussing the cancer risks at these MCLs at http://www.oehha.ca.gov/water/reports/grossab.html.

[9] pCi/L = picocuries per liter of water.

EXHIBIT D

CITY OF SANTA MONICA WATER RESOURCES DIVISION

Summary of Results for Primary Drinking Water Standards for 2022

PARAMETER	PHG/ [MCLG]/ {MRDLG}	State MCL/ {MRDL}	LOCAL WELL WATER Arcadia Plant Average	Range	SM WELL #1(a) Average	Range	IMPORTED SURFACE WATER Jensen Plant Average	Range	IMPORTED SURFACE WATER Weymouth Plant Average	Range	Dates Sampled if other than 2022(b)	Meets Std	MAJOR SOURCES IN DRINKING WATER
PRIMARY DRINKING WATER STANDARDS (MANDATORY HEALTH-RELATED STANDARDS)													
Clarity													
Maximum Turbidity (NTU)	NS	95% < 0.3	NA	NA	NA	NA	0.05	100% ≤ 0.3	0.04	100% ≤ 0.3		Y	Soil runoff
Microbiological													
Total Coliform Bacteria (% positive samples/month)	[0]	5%	Citywide Highest Monthly 1.60% Range: ND - 1.60% No violations									Y	Naturally present in the environment
Fecal Coliform/E. Coli	[0]	(c)	Citywide Maximum: 0 Positive Samples									Y	Human and animal fecal waste
Organic Chemical													
Methyl tert-Butyl Ether (MTBE) (ppb)	13	13(5*)	ND	ND	ND	ND	ND	ND	ND	ND		Y	Leaking underground storage tanks
Trichloroethylene (ppb)	1.7	5	0.6	ND - 1.0	ND	ND	ND	ND	ND	ND		Y	Discharge from metal degreasing sites
Disinfection Byproducts & Residuals													
Total Trihalomethanes (ppb)	NS	80	Citywide LRAA: 23.4 Range: 6.3 - 54.1									Y	By-product of drinking water chlorination
Haloacetic Acids (ppb)	NS	60	Citywide LRAA: 2.8 Range: ND - 4.3									Y	By-product of drinking water chlorination
Total Chlorine/Chloramines (ppm)	{4}	{4}	Citywide Average: 1.84 Range: ND - 3.10									Y	Drinking water disinfectant added for treatment
Bromate (ppb)	0.1	10	NA	NA	NA	NA	7.2**	ND - 15	ND**	ND - 7.6		Y	By-product of drinking water ozonation
Total Organic Carbon (ppm)	N/A	TT	NA	NA	NA	NA	1.5**	1.0 - 1.4	2.4**	1.7 - 2.6			
Inorganic Chemicals													
Aluminum (ppm)	0.6	1 (0.2*)	ND	ND	ND	ND	0.06**	ND - 0.08	0.16**	0.06 - 0.24		Y	Erosion of natural deposits; used in water treatment process
Arsenic (ppb)	0.004	10	ND	ND	ND	ND	2.4	2.4	ND	ND		Y	Erosion of natural deposits
Barium (ppm)	2	1	0.01	0.01	0.04	0.04	ND	ND	0.11	0.11		Y	Discharge from oil and metal industries; Erosion of natural deposits
Chromium (ppb)	[100]	50	ND	ND	ND	ND	ND	ND	ND	ND		Y	Discharge from steel and pulp mills; natural deposits erosion
Chromium 6 (ppb)	0.02	NS	0.2	0.2	1.7	1.7	ND	ND	ND	ND		Y	Naturally occuring; industrial waste discharge
Copper (d) (ppm)	0.3	AL=1.3 (1.0*)	Citywide, 90th percentile: 0.20 0 sites out of 35 exceeded the AL									Y	Corrosion of household plumbing systems
Fluoride After Treatment (ppm)	1	2	Control Range: 0.6 - 1.2 Citywide Range: 0.6 - 0.9									Y	Water additive for dental health
Lead (d) (ppb)	0.2	AL=15	Citywide, 90th percentile: 2.10 0 sites out of 35 exceeded the AL (d)									Y	Corrosion of household plumbing systems
Nitrate (as N) (ppm)	10	10	0.5	ND - 0.7	3.1	3.0 - 3.4	0.9	0.9	ND	ND		Y	Runoff from fertilizer use; leaching from sewage; erosion of natural deposits
Perchlorate (ppb)	1	6	ND	ND	0.7	0.7	ND	ND	ND	ND		Y	Industrial waste discharge
Radionuclides													
Alpha emitters (pCi/L)	[0]	15	8.1	8.1	ND	ND	ND	ND	ND	ND		Y	Erosion of natural deposits
Beta/photon emitters (pCi/L)	[0]	50	NA	NA	NA	NA	ND	ND - 5	6	4 - 7		Y	Decay of natural and man-made deposits
Combined Radium (pCi/L)	[0]	5	ND	ND	ND	ND	ND	ND	ND	ND		Y	Erosion of natural deposits
Uranium (pCi/L)	0.43	20	1.9	1.6 - 2.2	0.8	0.8	ND	ND - 3	2	1 - 3		Y	Erosion of natural deposits

KEY TO ABBREVIATIONS

PDWS = Primary Drinking Water Standards are MCLs, MRDLs, and Treatment Techniques TTs for contaminants that affect health ,along with their monitoring and reporting requirements.
PHG = Public Health Goal is the level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
MCLG = Maximum Contaminant Level Goal is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.
MCL = Maximum Contaminant Level is the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
MRDLG = Maximum Residual Disinfectant Level Goal is the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL = Maximum Residual Disinfectant Level is the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
LRAA = Locational Running Annual Average. The running annual average is based on monitoring location.
AL = Regulatory Action Level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
NA = Not Applicable
ND = Monitored for but Not Detected
NS = No Standard
NTU = Nephelometric Turbidity Units - used to measure cloudiness of drinking water.
TT = Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
ppb = parts per billion, or micrograms per liter (µg/l)
ppm = parts per million, or milligrams per liter (mg/l)
pCi/L = picocuries per liter

FOR ADDITIONAL WATER QUALITY QUESTIONS CONTACT THE LEAD CHEMIST, CLEMENT DO, AT (310) 434-2672.

* = secondary standard
** = Highest Running Average (RAA)

(a) = SM Well#1 is pumped into a transmission line, is blended with Imported Surface Water and enters the system at 19th St. & Idaho Ave.
(b) = The City is not required to test for every parameter each year. If indicated, data is from a previous year.
(c) = The E. coli MCL is based on routine and repeat samples testing positive for coliforms and/or E. coli or failure to collect required repeat samples. Fecal Coliform/E. Coli constitutes an acute MCL violation. No Level 1 Assessments or MCL violations occurred for 2022.
(d) = The MCL has been replaced with a treatment technique requiring agencies to optimize corrosion control. Results given are from first draw, at-the-tap monitoring performed every three years.

Contact information is available on the last page of this report.

CITY OF SANTA MONICA WATER RESOURCES DIVISION

SUMMARY OF RESULTS FOR PRIMARY DRINKING WATER STANDARDS FOR 2023

PARAMETER	PHG/ [MCLG]/ {MRDLG}	State MCL/ {MRDL}	LOCAL WELL WATER Arcadia Plant Average	Range	SM WELL #1(a) Average	Range	IMPORTED SURFACE WATER Jensen Plant Average	Range	IMPORTED SURFACE WATER Weymouth Plant Average	Range	Dates Sampled if other than 2023(b)	Meets Std	MAJOR SOURCES IN DRINKING WATER
PRIMARY DRINKING WATER STANDARDS (MANDATORY HEALTH-RELATED STANDARDS)													
Clarity													
Maximum Turbidity (NTU)	NS	95% < 0.3	NA	NA	NA	NA	0.07	100% ≤ 0.3	0.06	100% ≤ 0.3		Y	Soil runoff
Microbiological													
Total Coliform Bacteria (% positive samples/month)	[0]	5%	Citywide Highest Monthly 1.60% Range: ND - 1.60% No violations									Y	Naturally present in the environment
Fecal Coliform/E. Coli	[0]	(c)	Citywide Maximum: 0 Positive Samples									Y	Human and animal fecal waste
Organic Chemical													
Methyl tert-Butyl Ether (MTBE) (ppb)	13	13(5*)	ND	ND	ND	ND	ND	ND	ND	ND		Y	Leaking underground storage tanks
Trichloroethylene (ppb)	1.7	5	0.5	03 - 0.7	ND	ND	ND	ND	ND	ND		Y	Discharge from metal degreasing sites
1,2,3-Trichloropropane (TCP) (ng/L)	0.7	5	ND	ND	ND***	ND***	ND	ND	ND	ND	2021***	Y	Discharge and leaching from industrial/agricultural, and hazardous waste sites used as cleaning solvent for paint, varnish, and degreasing; pesticide by produc
Disinfection Byproducts & Residuals													
Total Trihalomethanes (ppb)	NS	80	Citywide LRAA: 26.8 Range: 6.5 - 49.4									Y	By-product of drinking water chlorination
Haloacetic Acids (ppb)	NS	60	Citywide LRAA: 6.5 Range: ND - 12.8									Y	By-product of drinking water chlorination
Total Chlorine/Chloramines (ppm)	{4}	{4}	Citywide Average: 2.08 Range: ND - 3.3									Y	Drinking water disinfectant added for treatment
Bromate (ppb)	0.1	10	NA	NA	NA	NA	7.6**	ND - 14	2.4**	ND - 12		Y	By-product of drinking water ozonation
Total Organic Carbon (ppm)	N/A	TT	NA	NA	NA	NA	2.1**	1.4 - 2.6	2.4**	1.8 - 3.0			
Inorganic Chemicals													
Aluminum (ppb)	600	1000 (200*)	ND	ND	ND***	ND***	ND**	ND - 83	115**	ND - 71	2022***	Y	Erosion of natural deposits; used in water treatment process
Arsenic (ppb)	0.004	10	ND	ND	ND***	ND***	ND	ND	ND	ND	2022***	Y	Erosion of natural deposits
Barium (ppm)	2	1	0.01	0.01	0.04***	0.04***	ND	ND	ND	ND	2022***	Y	Discharge from oil and metal industries; Erosion of natural deposits
Chromium (ppb)	[100]	50	ND	ND	ND***	ND***	ND	ND	ND	ND	2022***	Y	Discharge from steel and pulp mills; natural deposits erosion
Chromium 6 (ppb)	0.02	NS	0.1	0.1	1.7***	1.7***	ND	ND	ND	ND	2022***	Y	Naturally occuring; industrial waste discharge
Copper (d) (ppm)	0.3	AL=1.3 (1.0*)	Citywide, 90th percentile: 0.20 0 sites out of 35 exceeded the AL								2022	Y	Corrosion of household plumbing systems
Fluoride After Treatment (ppm)	1	2	Control Range: 0.6 - 1.2 Citywide Range: 0.6 - 1.0									Y	Water additive for dental health
Lead (d) (ppb)	0.2	AL=15	Citywide, 90th percentile: 2.10 0 sites out of 35 exceeded the AL (d)								2022	Y	Corrosion of household plumbing systems
Nitrate (as N) (ppm)	10	10	0.3	0.2 - 0.3	2.8	2.8	1.0	1.0	0.8	0.8		Y	Runoff from fertilizer use; leaching from sewage; erosion of natural deposits
Perchlorate (ppb)	1	6	ND	ND	0.7***	0.7***	ND	ND	ND	ND	2022***	Y	Industrial waste discharge
Radionuclides													
Alpha emitters (pCi/L)	[0]	15	ND	ND	ND	ND	ND	ND	ND	ND		Y	Erosion of natural deposits
Beta/photon emitters (pCi/L)	[0]	50	NA	NA	NA	NA	ND	ND	ND	ND - 6		Y	Decay of natural and man-made deposits
Combined Radium (pCi/L)	[0]	5	ND	ND	ND	ND	ND	ND	ND	ND		Y	Erosion of natural deposits
Uranium (pCi/L)	0.43	20	1.2	1.2	0.8***	0.8***	2	2 - 3	ND	ND - 3	2022***	Y	Erosion of natural deposits

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NS = No Standard

NTU = Nephelometric Turbidity Units - used to measure cloudiness of drinking water.

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

ppb = parts per billion, or micrograms per liter (µg/l)

ppm = parts per million, or milligrams per liter (mg/l)

pCi/L = picocuries per liter

***** = secondary standard

****** = Highest Running Average (RAA)

***= Santa Monica Well #1 offline in 2023 for maintenance purposes. For reporting purposes this information is from 2021 or 2022.

(a) = SM Well#1 is pumped into a transmission line, is blended with Imported Surface Water and enters the system at 19th St. & Idaho Ave.

(b) = The City is not required to test for every parameter each year. If indicated, data is from a previous year.

(c) = The E. coli MCL is based on routine and repeat samples testing positive for coliforms and/or E. coli or failure to collect required repeat samples. Fecal Coliform/E. Coli constitutes an acute MCL violation. No Level 1 Assessments or MCL violations occurred for 2023.

(d) = The MCL has been replaced with a treatment technique requiring agencies to optimize corrosion control. Results given are from first draw, at-the-tap monitoring performed every three years.

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**Contact information is available on the last page of this report.*

CITY OF SANTA MONICA WATER RESOURCES DIVISION

SUMMARY OF RESULTS FOR PRIMARY DRINKING WATER STANDARDS FOR 2024

PARAMETER	PHG/ [MCLG]/ {MRDLG}	State MCL/ {MRDL}	LOCAL WELL WATER Arcadia Plant Average	Range	SM WELL #1(a) Average	Range	IMPORTED SURFACE WATER Jensen Plant Average	Range	IMPORTED SURFACE WATER Weymouth Plant Average	Range	Dates Sampled if other than 2024(b)	Meets Std	MAJOR SOURCES IN DRINKING WATER
PRIMARY DRINKING WATER STANDARDS (MANDATORY HEALTH-RELATED STANDARDS)													
Clarity													
Maximum Turbidity (NTU)	NS	95% < 0.3	NA	NA	NA	NA	ND	100% ≤ 0.3	ND	100% ≤ 0.3		Y	Soil runoff
Microbiological													
Total Coliform Bacteria	[0]	5%	Citywide Highest Monthly: 0% Positive Samples			Range: ND		No violations				Y	Naturally present in the environment
(% positive samples/month)													
Fecal Coliform/E. Coli	[0]	(c)	Citywide Maximum: 0 Positive Samples									Y	Human and animal fecal waste
Organic Chemical													
Methyl tert-Butyl Ether (MTBE) (ppb)	13	13(5*)	ND	ND	ND	ND	ND	ND	ND	ND		Y	Leaking underground storage tanks
Trichloroethylene (ppb)	1.7	5	0.7	0.5 - 0.9	ND***	ND***	ND	ND	ND	ND	2023***	Y	Discharge from metal degreasing sites
1,2,3-Trichloropropane (TCP) (ng/L)	0.7	5	ND	ND	ND***	ND***	ND	ND	ND	ND	2021***	Y	Discharge and leaching from industrial/agricultural, and hazardous waste sites used as cleaning solvent for paint, varnish, and degreasing; pesticide by product
Disinfection Byproducts & Residuals													
Total Trihalomethanes (ppb)	NS	80	Citywide LRAA: 20.9			Range: 6.9 - 50.2						Y	By-product of drinking water chlorination
Haloacetic Acids (ppb)	NS	60	Citywide LRAA: 3.8			Range: ND - 17.5						Y	By-product of drinking water chlorination
Total Chlorine/Chloramines (ppm)	{4}	{4}	Citywide Average: 2.00			Range: ND - 3.5						Y	Drinking water disinfectant added for treatment
Bromate (ppb)	0.1	10	NA	NA	NA	NA	3.1**	ND - 5.4	2.0**	ND - 9.2		Y	By-product of drinking water ozonation
Total Organic Carbon (ppm)	N/A	TT	NA	NA	NA	NA	2.4**	2.0 - 2.5	2.4**	2.1 - 2.6			
Inorganic Chemicals													
Aluminum (ppb)	600	1000 (200*)	ND	ND	ND***	ND***	62**	52 - 91	93**	ND - 150	2022***	Y	Erosion of natural deposits; used in water treatment process
Arsenic (ppb)	0.004	10	ND	ND	ND***	ND***	ND	ND	ND	ND	2022***	Y	Erosion of natural deposits
Barium (ppm)	2	1	ND	ND	0.04***	0.04***	ND	ND	124	124	2022***	Y	Discharge from oil and metal industries; Erosion of natural deposits
Chromium (ppb)	[100]	50	ND	ND	ND***	ND***	ND	ND	ND	ND	2022***	Y	Discharge from steel and pulp mills; natural deposits erosion
Chromium 6 (ppb)	0.02	NS	0.1	0.1	1.7***	1.7***	ND	ND	ND	ND	2022***	Y	Naturally occuring; industrial waste discharge
Copper (d) (ppm)	0.3	AL=1.3 (1.0*)	Citywide, 90th percentile: 0.20			0 sites out of 35 exceeded the AL					2022	Y	Corrosion of household plumbing systems
Fluoride After Treatment (ppm)	1	2	Control Range: 0.6 - 1.2			Citywide Range: 0.7 - 1.9						Y	Water additive for dental health
Lead (d) (ppb)	0.2	AL=15	Citywide, 90th percentile: 2.10			0 sites out of 35 exceeded the AL (d)					2022	Y	Corrosion of household plumbing systems
Nitrate (as N) (ppm)	10	10	0.2	ND - 0.2	2.8	2.8	0.5	0.5	ND	ND			Runoff from fertilizer use; leaching from sewage; erosion of natural deposits
Perchlorate (ppb)	1	6	ND	ND	0.7***	0.7***	ND	ND	ND	ND	2022***	Y	Industrial waste discharge
Radionuclides													
Alpha emitters (pCi/L)	[0]	15	ND	ND	ND***	ND***	ND	ND	ND	ND	2022***	Y	Erosion of natural deposits
Beta/photon emitters (pCi/L)	[0]	50	NA	NA	NA	NA	ND	ND	ND	ND - 5		Y	Decay of natural and man-made deposits
Combined Radium (pCi/L)	[0]	5	ND	ND	ND***	ND***	ND	ND	ND	ND	2023***	Y	Erosion of natural deposits
Uranium (pCi/L)	0.43	20	1.6	1.1 -2.1	ND***	ND***	2	2 - 3	ND	ND - 3	2022***	Y	Erosion of natural deposits

KEY TO ABBREVIATIONS

PDWS = Primary Drinking Water Standards are MCLs, MRDLs, and Treatment Techniques TTs for contaminants that affect health, along with their monitoring and reporting requirements.

PHG = Public Health Goal is the level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

MCLG = Maximum Contaminant Level Goal is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

MCL = Maximum Contaminant Level is the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

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

MRDL = Maximum Residual Disinfectant Level is the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

LRAA = Locational Running Annual Average. The running annual average is based on monitoring location.

AL = Regulatory Action Level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

NA = Not Applicable

ND = Monitored for but Not Detected

NS = No Standard

NTU = Nephelometric Turbidity Units - used to measure cloudiness of drinking water.

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

ppb = parts per billion, or micrograms per liter (µg/l)

ppm = parts per million, or milligrams per liter (mg/l)

pCi/L = picocuries per liter

***** = Secondary Standard

****** = Highest Running Average (RAA)

******* = Santa Monica Well #1 offline in 2023 for maintenance purposes. For reporting purposes, this information is from 2021, 2022, or 2023 (prior to offline status).

(a) = SM Well#1 is pumped into a transmission line, is blended with Imported Surface Water and enters the system at 19th St. & Idaho Ave.

(b) = The City is not required to test for every parameter each year. If indicated, data is from a previous year.

(c) = The E. coli MCL is based on routine and repeat samples testing positive for coliforms and/or E. coli or failure to collect required repeat samples. Fecal Coliform/E. Coli constitutes an acute MCL violation. No Level 1 Assessments or MCL violations occurred for 2024.

(d) = The MCL has been replaced with a treatment technique requiring agencies to optimize corrosion control. Results given are from first draw, at-the-tap monitoring performed every three years.

FOR ADDITIONAL WATER QUALITY QUESTIONS CONTACT THE LEAD CHEMIST, CLEMENT DO, AT (310) 434-2672.

For additional water quality questions, contact lead chemist, Clement Do at (310) 434-2672.

EXHIBIT E

ATTACHMENT NO. 3
Table 1
Reference: 2012 ACWA PHG Survey

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated Unit Cost 2012 ACWA Survey Indexed to 2024* ($/1,000 gallons treated)
1	Ion Exchange	Coachella Valley WD, for GW, to reduce Arsenic concentrations. 2011 costs.	2.68
2	Ion Exchange	City of Riverside Public Utilities, for GW, for Perchlorate treatment.	1.30
3	Ion Exchange	Carollo Engineers, anonymous utility, 2012 costs for treating GW source for Nitrates. Design souce water concentration: 88 mg/L NO_3. Design finished water concentration: 45 mg/L NO_3. Does not include concentrate disposal or land cost.	0.98
4	Granular Activated Carbon	City of Riverside Public Utilities, GW sources, for TCE, DBCP (VOC, SOC) treatment.	0.65
5	Granular Activated Carbon	Carollo Engineers, anonymous utility, 2012 costs for treating SW source for TTHMs. Design souce water concentration: 0.135 mg/L. Design finished water concentration: 0.07 mg/L. Does not include concentrate disposal or land cost.	0.47
6	Granular Activated Carbon, Liquid Phase	LADWP, Liquid Phase GAC treatment at Tujunga Well field. Costs for treating 2 wells. Treament for 1,1 DCE (VOC). 2011-2012 costs.	1.99
7	Reverse Osmosis	Carollo Engineers, anonymous utility, 2012 costs for treating GW source for Nitrates. Design souce water concentration: 88 mg/L NO_3. Design finished water concentration: 45 mg/L NO_3. Does not include concentrate disposal or land cost.	1.05
8	Packed Tower Aeration	City of Monrovia, treatment to reduce TCE, PCE concentrations. 2011-12 costs.	0.58
9	Ozonation+ Chemical addition	SCVWD, STWTP treatment plant includes chemical addition + ozone generation costs to reduce THM/HAAs concentrations. 2009-2012 costs.	0.12

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	**Estimated Unit Cost 2012 ACWA Survey Indexed to 2024*** ($/1,000 gallons treated)
10	Ozonation+ Chemical addition	SCVWD, PWTP treatment plant includes chemical addition + ozone generation costs to reduce THM/HAAs concentrations, 2009-2012 costs.	0.26
11	Coagulation/Filtration	Soquel WD, treatment to reduce manganese concentrations in GW. 2011 costs.	0.98
12	Coagulation/Filtration Optimization	San Diego WA, costs to reduce THM/Bromate, Turbidity concentrations, raw SW a blend of State Water Project water and Colorado River water, treated at Twin Oaks Valley WTP.	1.12
13	Blending (Well)	Rancho California WD, GW blending well, 1150 gpm, to reduce fluoride concentrations.	0.93
14	Blending (Wells)	Rancho California WD, GW blending wells, to reduce arsenic concentrations, 2012 costs.	0.76
15	Blending	Rancho California WD, using MWD water to blend with GW to reduce arsenic concentrations. 2012 costs.	0.91
16	Corrosion Inhibition	Atascadero Mutual WC, corrosion inhibitor addition to control aggressive water. 2011 costs.	0.11

*Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

ATTACHMENT NO. 3
Table 2
Reference: Other Agencies

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	**Estimated 2012 Unit Cost Indexed to 2024*** ($/1,000 gallons treated)
1	Reduction - Coagulation-Filtration	Reference: February 28, 2013, Final Report Chromium Removal Research, City of Glendale, CA. 100-2000 gpm. Reduce Hexavalent Chromium to 1 ppb.	1.14 – 13.38
2	IX - Weak Base Anion Resin	Reference: February 28, 2013, Final Report Chromium Removal Research, City of Glendale, CA. 100-2000 gpm. Reduce Hexavalent Chromium to 1 ppb.	2.19 – 9.16
3	IX	Golden State Water Co., IX w/disposable resin, 1 MGD, Perchlorate removal, built in 2010.	0.67
4	IX	Golden State Water Co., IX w/disposable resin, 1000 gpm, perchlorate removal (Proposed; O&M estimated).	1.47
5	IX	Golden State Water Co., IX with brine regeneration, 500 gpm for Selenium removal, built in 2007.	9.59
6	GFO/Adsorption	Golden State Water Co., Granular Ferric Oxide Resin, Arsenic removal, 600 gpm, 2 facilities, built in 2006.	2.51 - 2.67
7	RO	Reference: Inland Empire Utilities Agency : Chino Basin Desalter. RO cost to reduce 800 ppm TDS, 150 ppm Nitrate (as NO3); approx. 7 mgd.	3.28
8	IX	Reference: Inland Empire Utilities Agency : Chino Basin Desalter. IX cost to reduce 150 ppm Nitrate (as NO3); approx. 2.6 mgd.	1.82

9	Packed Tower Aeration	Reference: Inland Empire Utilities Agency : Chino Basin Desalter. PTA-VOC air stripping, typical treated flow of approx. 1.6 mgd.	0.55
10	IX	Reference: West Valley WD Report, for Water Recycling Funding Program, for 2.88 mgd treatment facility. IX to remove Perchlorate, Perchlorate levels 6-10 ppb. 2008 costs.	0.76 – 1.08
11	Coagulation Filtration	Reference: West Valley WD, includes capital, O&M costs for 2.88 mgd treatment facility- Layne Christensen packaged coagulation Arsenic removal system. 2009-2012 costs.	0.50
12	FBR	Reference: West Valley WD/Envirogen design data for the O&M + actual capitol costs, 2.88 mgd fluidized bed reactor (FBR) treatment system, Perchlorate and Nitrate removal, followed by multimedia filtration & chlorination, 2012. NOTE: The capitol cost for the treatment facility for the first 2,000 gpm is $23 million annualized over 20 years with ability to expand to 4,000 gpm with minimal costs in the future. $17 million funded through state and federal grants with the remainder funded by WVWD and the City of Rialto.	2.26 – 2.38

*Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

ATTACHMENT NO. 3
Table 3
Reference: Updated 2012 ACWA Cost of Treatment Table

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated 2012 Unit Cost Indexed to 2024* ($/1,000 gallons treated)
1	Granular Activated Carbon	Reference: Malcolm Pirnie estimate for California Urban Water Agencies, large surface water treatment plants treating water from the State Water Project to meet Stage 2 D/DBP and bromate regulation, 1998	0.77 – 1.47
2	Granular Activated Carbon	Reference: Carollo Engineers, estimate for VOC treatment (PCE), 95% removal of PCE, Oct. 1994,1900 gpm design capacity	0.36
3	Granular Activated Carbon	Reference: Carollo Engineers, est. for a large No. Calif. surf. water treatment plant (90 mgd capacity) treating water from the State Water Project, to reduce THM precursors, ENR construction cost index = 6262 (San Francisco area) - 1992	1.69
4	Granular Activated Carbon	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility for VOC and SOC removal by GAC, 1990	0.66 – 0.96
5	Granular Activated Carbon	Reference: Southern California Water Co. - actual data for "rented" GAC to remove VOCs (1,1-DCE), 1.5 mgd capacity facility, 1998	3.03
6	Granular Activated Carbon	Reference: Southern California Water Co. - actual data for permanent GAC to remove VOCs (TCE), 2.16 mgd plant capacity, 1998	1.96
7	Reverse Osmosis	Reference: Malcolm Pirnie estimate for California Urban Water Agencies, large surface water treatment plants treating water from the State Water Project to meet Stage 2 D/DBP and bromate regulation, 1998	2.28 – 4.35
8	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 1.0 mgd plant operated at 40% of design flow, high brine line cost, May 1991	5.37
9	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 1.0 mgd plant operated at 100% of design flow, high brine line cost, May 1991	3.31
10	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 10.0 mgd plant operated at 40% of design flow, high brine line cost, May 1991	3.58

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated 2012 Unit Cost Indexed to 2024* ($/1,000 gallons treated)
11	Reverse Osmosis	Reference: Boyle Engineering, RO cost to reduce 1000 ppm TDS in brackish groundwater in So. Calif., 10.0 mgd plant operated at 100% of design flow, high brine line cost, May 1991	2.77
12	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 1.0 mgd plant operated at 40% of design capacity, Oct. 1991	8.99
13	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 1.0 mgd plant operated at 100% of design capacity, Oct. 1991	5.31
14	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 10.0 mgd plant operated at 40% of design capacity, Oct. 1991	3.97
15	Reverse Osmosis	Reference: Arsenic Removal Study, City of Scottsdale, AZ - CH2M Hill, for a 10.0 mgd plant operated at 100% of design capacity, Oct. 1991	2.46
16	Reverse Osmosis	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility with RO to remove nitrate, 1990	2.48 – 4.35
17	Packed Tower Aeration	Reference: Analysis of Costs for Radon Removal... (AWWARF publication), Kennedy/Jenks, for a 1.4 mgd facility operating at 40% of design capacity, Oct. 1991	1.42
18	Packed Tower Aeration	Reference: Analysis of Costs for Radon Removal... (AWWARF publication), Kennedy/Jenks, for a 14.0 mgd facility operating at 40% of design capacity, Oct. 1991	0.76
19	Packed Tower Aeration	Reference: Carollo Engineers, estimate for VOC treatment (PCE) by packed tower aeration, without off-gas treatment, O&M costs based on operation during 329 days/year at 10% downtime, 16 hr/day air stripping operation, 1900 gpm design capacity, Oct. 1994	0.38
20	Packed Tower Aeration	Reference: Carollo Engineers, for PCE treatment by Ecolo-Flo Enviro-Tower air stripping, without off-gas treatment, O&M costs based on operation during 329 days/year at 10% downtime, 16 hr/day air stripping operation, 1900 gpm design capacity, Oct. 1994	0.39
21	Packed Tower Aeration	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility - packed tower aeration for VOC and radon removal, 1990	0.63 – 1.01

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated 2012 Unit Cost Indexed to 2024* ($/1,000 gallons treated)
22	Advanced Oxidation Processes	Reference: Carollo Engineers, estimate for VOC treatment (PCE) by UV Light, Ozone, Hydrogen Peroxide, O&M costs based on operation during 329 days/year at 10% downtime, 24 hr/day AOP operation, 1900 gpm capacity, Oct. 1994	0.75
23	Ozonation	Reference: Malcolm Pirnie estimate for CUWA, large surface water treatment plants using ozone to treat water from the State Water Project to meet Stage 2 D/DBP and bromate regulation, *Cryptosporidium* inactivation requirements,1998	0.17 – 0.36
24	Ion Exchange	Reference: CH2M Hill study on San Gabriel Basin, for 135 mgd central treatment facility - ion exchange to remove nitrate, 1990	0.82 – 1.08

*Costs were adjusted from date of original estimates to present using the Engineering News Record (ENR) 20-City average Construction Cost Index of 13,571 for 2024.

EXHIBIT F

ACRONYMS

ACWA - Association of California Water Agencies

AL - Action Level

BAT - Best Available Technology

Cal/EPA - California Environmental Protection Agency

CCR - California Code of Regulations

DBP - Disinfection Byproduct

DDW – Division of Drinking Water

DLR - Detection Level for purposes of Reporting

GAC - Granular Activated Carbon

MCL - Maximum Contaminant Level

MCLG - Maximum Contaminant Level Goal

mg/l - milligrams per liter

MWD - Metropolitan Water District

ND - Not Detected

NL - Notification Level

OEHHA - Office of Environmental Health Hazard Assessment

pCi/l - picoCuries per liter

PHG – Public Health Goal

PPM – Parts Per Million (1 / 1,000,000)

PPB – Parts Per Billion (1 / 1,000,000,000)

PPT – Parts Per Trillion (1 / 1,000,000,000,000)

PTA - Packed Tower Aeration

RAA - Running Annual Average

RO - Reverse Osmosis

SWRCB – State Water Resource Control Board

TCE –Trichloroethylene

TTHMs - Total Trihalomethanes

USEPA - United States Environmental Protection Agency

VOC - Volatile Organic Compound