

PUBLIC HEARING WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

**CITY OF LONG BEACH WATER DEPARTMENT
1800 E. WARDLOW ROAD
LONG BEACH, CA 90807**

**9:00 AM
SEPTEMBER 1, 2022**

AGENDA

- 1. Open Public Hearing**
- 2. Staff Presentation Regarding Long Beach Water
Department's Water Quality Relative to Public Health
Goals**
- 3. Public Comments**
- 4. Board Comments**
- 5. Close Hearing**

An opportunity will be given to the public to address the Board of Water Commissioners concerning the subject matter. Each person will be allowed three minutes unless extended by the Board Chair.

The Long Beach Water Department provides reasonable accommodation in accordance with the Americans with Disabilities act of 1990. If a special accommodation is required, please contact the Executive Assistant to the Board of Water Commissioners 48 hours in advance of this meeting at (562) 570-2435 or watercommission@lbwater.org.



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Board of Water Commissioners

September 1, 2022

CHRISTOPHER J. GARNER, General Manager

Subject

Conduct Public Hearing on the results of Public Health Goals Report and receive and file the 2022 Public Health Goals Report (California Health and Safety Code Section 116470 (b)).

Executive Summary

LBWD's drinking water quality meets or betters all USEPA and California drinking water standards set for the protection of public health. As mandated by California Health and Safety Code Section 116470 (b), this letter provides a summary to the Board of Water Commissioners of the results obtained from a comparison of the Long Beach Water Department's (LBWD) drinking water quality with the state's Public Health Goals (PHGs) and the federal Maximum Contaminant Level Goals (MCLGs). PHGs are non-enforceable; however, the results must be disclosed in a public hearing to be held promptly after July 1, 2022.

Of the constituents considered, arsenic, bromate, gross alpha and beta particle activity, and uranium were determined to exceed the PHG or the MCLG, but not the regulatory enforceable Maximum Contaminant Level (MCL). LBWD is using the best available technology for these water quality parameters and the levels detected are below the enforceable regulatory levels; therefore, no further actions are recommended at this time.

Recommendation

Receive and file the 2022 Public Health Goals Report (California Health and Safety Code Section 116470 (b)).

Fiscal Impact: There is no fiscal impact associated with the recommendation.

Tai Tseng
Assistant General Manager - Operations

Christopher J. Garner
General Manager

Attachment



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2022 PUBLIC HEALTH GOALS REPORT

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Long Beach Water Department
2022 Report on Water Quality Relative to Public Health Goals

Background

LBWD's drinking water quality meets or better all USEPA and California drinking water standards set for the protection of public health. The California Health and Safety Code (Section 116470 (b)) requires water utilities with greater than 10,000 service connections to prepare a special report by July 1, 1998 and every three years thereafter. The purpose of this report is to provide additional information on any water quality constituent which has a Maximum Contaminant Level (MCL) and either a Public Health Goal (PHG) or Maximum Contaminant Level Goal (MCLG). The following specifies what information is to be provided in the report:

- 1) The PHG or MCLG, and MCL for the constituent detected;
- 2) Numerical public health risk associated with these numbers (if that data is available);
- 3) Category of risk to public health associated with each constituent;
- 4) Best available technology (BAT) that could be used to reduce the constituent level; and
- 5) Estimate of the cost to install BAT (if it is appropriate and feasible).

What are MCLs, MCLGs, and PHGs?

In 1974, Congress passed the Safe Drinking Water Act (SDWA), which requires the US Environmental Protection Agency (USEPA) to establish enforceable maximum contaminant levels, or MCLs, for contaminants that are found in drinking water. In addition, USEPA must also determine the level of contaminants in drinking water at which no adverse health effects are likely to occur. These non-enforceable levels are based solely on possible health risks and exposure over a lifetime with an adequate margin of safety and are called maximum contaminant level goals (MCLGs).

The Office of Environmental Health Hazard Assessment (OEHHA) is charged with establishing Public Health Goals (PHGs). PHGs represent goals based solely on public health considerations, and are developed based on the best available data in the scientific literature. PHGs are not enforceable and are not required to be met by any public water system. PHGs are the State Equivalent to federal MCLGs, but they are not identical.

It is important to note that MCLs are set as close to the health goals as possible, but it may not be possible to set the drinking water MCLs at the same level as the MCLGs or PHGs due to other risk management factors. These factors include analytical detection capability, available treatment technology and adverse effects, benefits, and costs. In addition, there are a few constituents that are routinely detected in water systems at levels well below the drinking water standards for which no PHG nor MCLG has yet been adopted by OEHHA or USEPA. These include total trihalomethanes (TTHMs), haloacetic acids (HAA5) and some radionuclides. These constituents will be addressed in future reports once OEHHA or USEPA selects and adopts a PHG or MCLG.

Water Quality Data Considered

All the system water quality data collected by LBWD in 2019, 2020 and 2021, for purposes of determining compliance with drinking water standards were considered. These data were summarized in the 2019, 2020 and 2021 Consumer Confidence Reports (also referred to as the Annual Water Quality Report), which was made available to all LBWD customers by July 1, of each year.

Most of the constituents tested in the water were reported as Not Detected (ND) and are not generally listed in the Annual Water Quality Reports. When a constituent is reported as ND, it generally means that the laboratory did not detect the compound, but it could also mean 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) provided guidelines for water utilities to use in the preparation of these newly required reports. These guidelines were used in the preparation of LBWD's report, including the treatment cost estimates. No guidance was available from State regulatory agencies.

Best Available Treatment Technologies (BATs) and Cost Estimates

Both the USEPA and SWRCB-DDW adopted techniques known as Best Available Technologies (BATs). BATs are the best-known methods of reducing a constituent's level to below the MCL. Although costs may be estimated for BATs, the cost associated with a BAT may not be applicable for meeting PHGs or MCLGs, because many PHGs and MCLGs are set lower than the MCL. 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 situations, installing treatment to attempt to reduce very low levels of a constituent may have adverse effects on other aspects of water quality.

Constituents Detected in LBWD's Water That Exceed a PHG or MCLG

The following section discuss the constituents which were detected in LBWD's distribution system at levels above the PHG, or if no PHG, above the MCLG. Included in the table below are the constituents' MCL, Action Level (AL), Detection Limits for Reporting (DLR) and BATs to reduce these constituents to below the MCL.

Table: Constituents Detected in LBWD's Distribution System; 2019-2021

Constituent	Max Amt. Detected	MCL/(AL)	PHG/(MCLG)	DLR	BATs
Arsenic (µg/L [#])	2.5	10	0.004 (0)	2	IX, Blending, RO, CF, GFO
Bromate (µg/L [#])	3.1 ⁺	10	0.1(0)	1	RCF
Gross Alpha (pCi/L [^])	3.8	15	(0)	3	RO
Gross Beta (pCi/L [^])	6.5	4mrem/yr [*]	(0)	4	RO
Uranium (pCi/L [^])	2.9	20	0.43 (0)	1	RO

^{*} Equivalent to 50 pCi/L, California's MCL; ^{*}rem = roentgen exposed man; the greater range of human tissue affected by beta particles;

[^] pCi/L = picocuries/Liter

[#] ug/L = parts per billion (ppb)

[`] TT = Treatment Technique (optimized corrosion control)

+ Calculated on an Running Annual Average (RAA)

Arsenic

Arsenic is a naturally occurring element in the earth's crust and is widely distributed in the environment. A low level of arsenic is found in the purchased treated surface water and in the local groundwater supply. Studies in human's exposure have shown individual variability in arsenic toxicity. There are many pathways to arsenic exposure in our lifetime. The levels of arsenic exposure in water are to a lesser degree to what most people would ingest daily from some foods (25 to 50 µg/day).

The State's MCL and federal standards for arsenic is 10 ppb; the PHG is set at 0.004 ppb and the federal MCLG for arsenic is at zero. During 2019 to 2021, Arsenic was detected at levels ranging from not detected to 2.5 ppb in the water supplied to the City of Long Beach. The running annual average (RAA) for arsenic was lower than the 2 ppb DLR. The arsenic levels detected in the City of Long Beach's source and purchased waters were below the MCL of 10 ppb at all times. The MCL is the highest level of a contaminant allowable in drinking water. Long Beach Water Department is in full compliance with the federal and state's standards for arsenic, although the detected level is above the PHG.

Category of Risk to Public Health

The health risk associated with arsenic, and the reason that a drinking water standard was adopted for it, is that people who drink water containing arsenic above the MCL throughout their lifetime could experience an increased risk of getting cancer and may experience skin damage or circulatory problems.

Numerical Health Risks

The Office of Environmental Health Hazard Assessment (part of the California Environmental Protection Agency) has set the PHG at 0.004 ppb (4 parts per trillion) to reduce the risk of cancer and other adverse health effects. The health risk associated with arsenic is 2.5×10^{-3} or 2.5 surpluses of cancer cases per thousands of people drinking two liters of water a day for seventy years.

BAT to Remove or Reduce the Concentration of Arsenic

Long Beach Water Department has taken the following steps to lower the risk of arsenic in our water. LBWD is using the best available technology for arsenic removal; we use conventional treatment for our groundwater supply, we attentively monitor the arsenic levels of our wells and the purchased waters on a monthly basis and we blend our wells to ensure that the natural levels of arsenic are below the standards set for drinking water. Because Long Beach Water Department purchases treated surface water from MWD there may be times when arsenic is detected above the DLR of 2 ppb.

The BAT cited in literature to remove arsenic is reverse osmosis (RO). This option for treatment is discussed in a separate section below.

Bromate

The PHG for bromate is 0.1 ppb, the MCLG is zero and the MCL is 10 ppb. Bromate is a disinfection byproduct (DBP) formed when water containing naturally occurring bromide ion is ozonated. The MCL for bromate does not apply to single readings but is instead

compared to a Running Annual Average (RAA).

The MCL was adopted to address concerns with potential health effects as studies suggest that long-term exposure to bromate in drinking water may cause cancer. The standard applies only to water treatment plants that apply ozone for disinfection or other purposes, and so it does not apply to the LBWD'S treated groundwater.

However, the supplemental water that Long Beach receives from MWD is ozonated and although at times bromate is detected in our water, we have met the RAA MCL for bromate of 10 ppb at all times, but, exceeded the PHG and MCLG for the period covered by this report.

Bromate was detected in our distribution water during 2019 - 2022 from ND to 5.5 ppb. The highest RAA was 3.1 ppb for 2019 - 2021 and demonstrated compliance with the MCL.

The category for health risk associated with bromate is that people who drink water containing bromate above the MCL for many years could experience an increased risk of getting cancer. OEHHA has determined that the numerical cancer risk for bromate above the PHG level is 1×10^{-6} , or one additional theoretical cancer cases in one million people drinking two liters of water a day for 70 years.

The BAT to reduce bromate is to control the ozone treatment process to reduce production of this DBP. As such, this process is under the control and jurisdiction of MWD.

Radionuclides (Gross Alpha and Beta Particle Activity)

There are minerals found in the earth's crust that are naturally radioactive and may emit a form of radiation known as alpha radiation. Radioactive elements are naturally present in a wide range of concentrations in all rocks, soil, and water. The SWRCB and USEPA have determined that gross alpha (GA) particle activity above specific levels of exposure are a health concern. Gross Alpha is a measure of several different radioactive substances that naturally occur in well water due to radioactive elements decaying or breaking down. These include radium 226 and radium 228. The cancer risk associated with gross alpha particles is significant of cancer cases per one thousand people who drink two liters of water a day for 70 years. There is no PHG for gross alpha particle activity, however, the MCLG is set at zero. The MCL associated with gross alpha excludes alpha particles emitted from uranium and radon. GA particle activity has been detected during 2019 to 2021, in the purchased treated surface water from MWD at 3.8 picocuries/L (pCi/L), which is below the federal MCL of 15 pCi/L.

Gross beta (GB) particle activity is a measure of the total amount of radioactivity in a water sample attributable to the radioactive decay of beta-emitting elements. Beta particles present an external as well as an internal hazard from inhalation or absorption. Chronic effect can result from low-level exposure over a long period (approximately 5-30 years).

The main chronic health effect from radiation is cancer. The USEPA MCL for gross beta particle activity states that the average annual concentration of beta particle activity from radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirems* per year (judged equivalent to 50 pCi/L, California's MCL). There is no PHG for gross beta particle activity, however, the

MCLG is set at zero. GB particle activity has been detected in the purchased treated surface water from MWD in 2019 and 2021 at levels ranging from ND to 6.5 pCi/L, which is over the MCLG of zero. Treatment is beyond LBWD's ability to control, since the water is provided by MWD. One BAT for removing GA particle activity levels below the MCLG is RO treatment and is discussed in a separate section below.

**rem = roentgen exposed man; the greater range of human tissue affected by beta particles*

ND = Not Detected

Uranium

Uranium is a mineral found in the earth's crust as a result of the erosion of natural NO deposits. SWRCB and USEPA have determined that uranium is a health concern at certain levels of exposure. Consumers who drink water containing uranium above the MCL over many years may be at a greater risk of having kidney problems and an increased risk of getting cancer. SWRCB has set the drinking water MCL for uranium at 20 pCi/L in order to reduce the risk of cancer and other adverse health effects. Uranium was detected at a maximum level of 2.9pCi/L in the LBWD's distribution system during 2019 to 2021. LBWD is in compliance with the State's MCL for drinking water, although the detected level is higher than the PHG of 0.43 pCi/L and the MCLG of zero. One BAT for effective removal of uranium to levels below the PHG is RO treatment and is discussed in the following section.

Reverse osmosis (RO) treatment

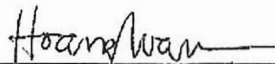
One available BAT for arsenic, gross alpha particle, gross beta particle and uranium removal is through reverse osmosis (RO) treatment. Because reverse osmosis removes contaminants so effectively, it can significantly lower the alkalinity of the product water. This can cause decreased pH and increased corrosivity of the product water. The product water may need to have corrosion inhibitors added or to have the pH and alkalinity adjusted upwards by the addition of more alkalinity. These actions are necessary to avoid simultaneous compliance issues in the distribution system such as elevated levels of lead and copper. This RO treatment technology may generate significant waste (brine and concentrated radionuclides) streams and leads to substantial water losses up to 70%, and therefore is not deemed as a practical option for LBWD. The cost estimate to install and operate a RO system to effectively remove arsenic, gross alpha, gross beta and uranium below the MCL (conducted by CH2M Hill for Scottsdale, AZ), annualized capital and O&M costs ranged from \$2.20 to \$8.04 per 1,000 gallons treated. Based on the water delivered, an additional \$23.4 to \$85.7 million annually is required, which includes capital, operational, and maintenance costs. This translates into additional annual cost of approximately \$265 to \$968 per service connection for the life of the treatment system.

Recommendation for Further Action

LBWD consistently delivers safe water at the lowest possible cost to our customers using multiple treatment methods approved by SWRCB. To further reduce the levels of the constituents identified in this report that are already significantly below the health-based MCLs established to provide "safe drinking water", would require additional costly treatment processes. The effectiveness of the treatment processes to provide any significant reductions in constituent levels at the already low values is uncertain. The health protection benefits of these further hypothetical reductions are not clear and may not be quantifiable. Therefore, no further action is proposed at this time.

Submitted by:

Date:



Kevin Hoang, Laboratory Services Officer

8/11/2022



Yan Zhang, Director of Water Quality & Process

8/15/2022

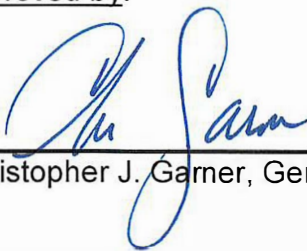


Tai J. Tseng, Assistant General Manager, Operations

8/15/2022

Approved by:

Date:



Christopher J. Garner, General Manager

8/15/22