EBMUD

AGENDA NO. 12.
MEETING DATE July 9, 2019

TITLE **WATER QUALITY PUBLIC HEALTH GOALS REPORT**

☒ MOTION ☐ RESOLUTION ☐ ORDINANCE

RECOMMENDED ACTION

Accept the 2019 Public Health Goals (PHG) Report and conduct a public hearing to provide an opportunity for public comment.

SUMMARY

The District is required to prepare a report every three years detailing the concentration of any drinking water constituents measured in the water system at levels above the PHGs established by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment or, in the absence of a PHG, the United States Environmental Protection Agency's Maximum Contaminant Level Goal (MCLG). PHGs and MCLGs are non-enforceable goals that represent the highest concentration of a constituent that poses no significant health risk. The attached report covers calendar years 2016, 2017, and 2018.

DISCUSSION

The District's drinking water quality continues to meet all state and federal standards and requirements. State regulations require utilities to prepare and publicly disclose a PHG Report based on any water quality results that exceed PHGs or MCLGs in the previous three calendar years. PHGs and MCLGs are very conservative and are typically set at levels much lower than the enforceable drinking water standards. For the current reporting period of 2016-2018, total coliform bacteria and bromate results exceeded their respective PHGs or MCLGs, necessitating discussion and disclosure of the attached report. The PHG Report supports the District's Water Quality and Environmental Protection Strategic Plan goal.

SUSTAINABILITY

Economic

The goal of the District's daily operations and investments in water treatment is to exceed existing and anticipated water quality regulations. The PHG and MCLG goals are developed without regard to cost or

Funds Available: NA		Budget Code: NA
DEPARTMENT SUBMITTING Water Operations	DEPARTMENT MANAGER or DIRECTOR David A. Briggs	APPROVED General Manager

other practical limitations. While the District strives to meet PHG and MCLGs, these efforts are balanced with technological limitations, competing public health objectives, and cost to ratepayers.

Social

All customers benefit from the District's exceptionally high water quality. Although water quality varies throughout the District's service area, there are no significant differences in public health.

Environmental

Publishing the 2019 PHG report helps underscore the quality of the District's water and ensures transparency.

ALTERNATIVE

Do not complete and disclose the PHG Report. This alternative is not recommended as preparation of the PHG Report and holding a public hearing is required by state law for all public water systems serving more than 10,000 customers.

Attachment

ATTACHMENT

EAST BAY MUNICIPAL UTILITY DISTRICT

2016, 2017 AND 2018
REPORT ON WATER QUALTIY
RELATIVE TO CALIFORNIA'S PUBLIC HEALTH GOALS

July 9, 2019

BACKGROUND

Provisions of the California Health and Safety Code Section require water utilities with more than 10,000 service connections to prepare a triennial report comparing water quality results to the Public Health Goals (PHGs) or Maximum Contaminant Level Goals (MCLGs). The report must be completed on or before July 1, 2019, and covers the calendar years 2016, 2017, and 2018. PHGs are non-enforceable goals established by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment and are not required to be met by any public water system. The United States Environmental Protection Agency (U.S. EPA) establishes MCLGs, which are also non-enforceable goals. Following completion of the report, each agency must conduct a public hearing to receive any public comment on the results.

The PHG represents a level or concentration of a constituent that poses no significant health risk if consumed over a lifetime. Only constituents that have a California primary drinking water standard or Notification Level, and have either a PHG or MCLG, are addressed in this report. The MCLG is only used for constituents without a PHG. This report also includes information on the numerical public health risk associated with the constituent, the category of health risk, and an estimate of the cost to meet the PHG if a best available technology has been identified by the State Water Resources Control Board's Division of Drinking Water (DDW). This report was prepared following the guidelines developed by the Association of California Water Agencies. No other guidelines are available.

WATER QUALITY DATA USED IN THIS REPORT

The water quality compliance data collected from the District's water system in calendar years 2016, 2017, and 2018 were used for this report. This data is summarized separately in the District's 2016, 2017, and 2018 Annual Water Quality Reports which are provided annually to customers by July 1 of each year.

CONSTITUENTS DETECTED THAT EXCEED A PHG OR MCLG

The following is a discussion of constituents that were detected in one or more of our drinking water sources at levels above the PHG or the MCLG in the reporting period.

Total Coliform

Total coliform bacteria were detected above the MCLG of zero in one month (October 2016) between 2016 and 2018. Repeat samples were collected and found to be negative for coliform. For the remaining 35 months, the MCLG was not exceeded.

The District uses chloramine to inhibit the growth of coliform in water. Chloramine, however, decays over time. In some instances, low water demand resulted in long retention times in remote parts of the distribution system. The District endeavors to maintain a high chloramine residual in the distribution system by removing excess water storage from service where possible, manually boosting chloramine, and increasing mixing or cycling time in reservoirs. In addition, the District has installed new online analyzers at remote locations, an automated small-scale chloramine booster system, and hydraulic mixers at selected reservoirs to improve water quality. Pilot testing continues to demonstrate the effectiveness of ultraviolet light to minimize nitrification in a distribution reservoir.

The Maximum Contaminant Level (MCL) for coliform is 5 percent positive samples per month and the MCLG is zero. The coliform MCL is established as close to the MCLG as feasible to minimize the possibility that waterborne pathogens are present. Coliform bacteria are an indicator organism, ubiquitous in the environment, and are not generally considered harmful. If a positive sample is found, the system is investigated for potential contamination, including follow-up sampling and response, as needed, to prevent adverse public health effects.

Because total coliform is a surrogate indicator of the potential presence of pathogens, establishing a numerical public health risk based on the presence of coliform is not possible.

Best Available Treatment (BAT) Technology and Cost Estimates

Chloramine is used as a disinfectant in the distribution system to minimize microbiological contamination. Chloramine levels are carefully controlled to provide the highest health protection possible without creating undesirable taste or odor issues, or elevated disinfection byproduct levels.

The District has taken all of the steps described in the DDW drinking water regulation as BAT for coliform bacteria, including implementation of an effective cross-connection control program, maintenance of a disinfectant residual throughout the system, an effective monitoring and surveillance program, and maintenance of positive pressure in the distribution system.

There is no available treatment technology that will guarantee that every sample collected throughout the distribution system is negative for total coliform, and therefore, the cost of attaining the MCLG of zero cannot be estimated.

Bromate

Bromate is a byproduct of the ozonation process; naturally-occurring bromide in source water reacts with ozone to form bromate. Ozone is used at the District's Sobrante and Upper San Leandro Water Treatment Plants primarily to control taste- and odor-causing compounds. Occasional algal blooms in source water reservoirs can impart significant taste and odor to the raw water, and ozone is used to remove these compounds. If bromide is present in the water, bromate can form during ozonation. Ozone is also a powerful disinfectant, and it can oxidize other unwanted compounds such as cyanotoxins that can form during algal blooms.

Bromate compliance is determined on a quarterly basis and is only relevant for the water treatment plants utilizing ozone (Upper San Leandro and Sobrante Water Treatment Plants). Three of the twelve measurements between 2016 and 2018 at these two treatment plants exceeded the bromate PHG of 0.1 µg/L. The MCL for bromate is 10 µg/L. The state's analytical detection limit is 1.0 µg/L, an order of magnitude higher than the PHG. The following table summarizes the quarters in which bromate was measured above the PHG; all occurrences were from the Upper San Leandro Water Treatment Plant.

Quarter	Running Annual Average, µg/L
2016, First quarter	2.0
2016, Second quarter	1.5
2016, Third quarter	1.4

Health Effects

U.S. EPA classifies bromate as a probable human carcinogen. For the MCL of 10 µg/L, the theoretical excess cancer risk is 100 extra cancer cases per million individuals consuming the water on a daily basis over a lifetime (70 years). For the PHG of 0.1 µg/L, the calculated theoretical excess cancer risk is one per million individuals.

Best Available Technology (BAT) and Cost Estimates

Both U.S. EPA and DDW adopt BATs, which are the best known methods for reducing contaminant levels to meet the MCLs. However, when PHGs or MCLGs are established at concentrations much lower than current analytical methods are capable of measuring (such as for bromate), it is not always possible or feasible to determine if the BAT can reduce a constituent down to or near the PHG or MCLG.

DDW and U.S. EPA cite "control of ozone treatment process to reduce production of bromate" as the BAT to control bromate formation. The lack of specificity in the DDW and U.S. EPA BAT designation for bromate control clearly indicates the need for more research in this area, as control requires balancing the water quality benefits of taste and odor control, disinfection, and toxin removal, with disinfection byproduct formation.

To date, no BAT to remove bromate has been identified. Studies and full-scale projects at other utilities have demonstrated the efficacy of various treatment techniques in controlling bromate formation to below the MCL. These techniques inhibit the reaction between ozone and bromide and include pH suppression and chloramination before ozonation. Such methods have been shown to control bromate formation to less than 10 µg/L; it is not known if the methods can control formation to the very low concentration of the PHG. The only known treatment technology that can remove bromate is reverse osmosis, but it has not been identified by the DDW or U.S. EPA as a BAT.

At present, the evaluation of all bromate treatment technologies is limited by detection limits of the analytical methods. It is uncertain whether these treatment methods can effectively reduce bromate formation to the PHG level, which is one hundred times lower than the MCL and ten times lower than the method detection limit of 1 µg/L. In addition, the technologies previously mentioned have yet to be designated as BAT by the regulatory agencies. For these reasons, it is premature to develop treatment costs for bromate control.

RECOMMENDATIONS FOR FURTHER ACTIONS

The District's drinking water quality meets all DDW and U.S. EPA drinking water standards. From 2016 to 2018, the only constituent detected above its MCLG was total coliform bacteria, and the only constituent detected above its PHG was bromate.

The District has taken all of the steps described in the DDW drinking water regulations as BAT to control coliform bacteria. The chloramine residual levels in the distribution system will continue to be carefully controlled to provide the best public health protection without causing undesirable taste and odor or increased disinfection byproduct levels. No further action is recommended.

Current operational controls are sufficient and effective for meeting the bromate MCL. Until analytical technology is available to measure bromate below the PHG and a BAT is identified, it is premature to identify any treatment technology for meeting the bromate PHG.