PUBLIC HEALTH GOALS
REPORT ON WATER QUALITY

CITY OF SAN JOSE
MUNICIPAL WATER SYSTEM
(EVERGREEN, EDENVALE, AND COYOTE)
System No. 4310020

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City of San Jose
Environmental Services Department

SAN JOSE MUNICIPAL WATER SYSTEM
PUBLIC HEALTH GOALS REPORT ON WATER QUALITY

TABLE OF CONTENTS

SECTION 1: BACKGROUND INFORMATION

SECTION 2: CONTAMINANTS DETECTED THAT EXCEED PHGS OR MCLGS

SECTION 1: BACKGROUND INFORMATION

WHAT ARE PUBLIC HEALTH GOALS (PHGS)?

PHGs are water quality goals established by the California Office of Environmental Health Hazard Assessment (OEHHA) and are based solely on public health risk considerations. In setting the PHGs, OEHHA does not take into account any of the practical risk-management factors which are considered by the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board (SWRCB) when setting drinking water standards such as Maximum Contaminant Levels (MCLs), including factors such as analytical detection capability, treatment technology available, benefits and costs. PHGs are typically set at values lower than the corresponding MCLs. PHGs are non-enforceable and are not required to be met by public water systems under the California Health and Safety Code. Maximum Contaminant Level Goals (MCLGs), established by USEPA, are the federal equivalent to PHGs.

REPORTING REQUIREMENTS:

Provisions of the California Health and Safety Code §116470(b) (see Attachment 1) specify that public water systems serving more than 10,000 service connections must prepare a special report if their water quality measurements have exceeded any PHGs. Reporting must be done every three years. The law also requires that where OEHHA has not adopted a PHG for a contaminant, the water suppliers are to use the MCLGs adopted by USEPA.

The purpose of this report is to inform consumers of contaminants in San José Municipal Water System's (SJMWS) drinking water that exceeded the PHGs or MCLGs during 2019, 2020, and 2021. Included in this PHG report is the numerical public health risk associated with the Maximum Contaminant Level (MCL) and the PHG or MCLG, the category or type of risk to health that could be associated with each contaminant, the best treatment technology available that could be used to reduce the contaminant level, and an estimate of the cost to install that treatment if it is appropriate and feasible. For general information about the quality of the water delivered by SJMWS, please refer to the latest Annual Water Quality Report that was prepared in June 2022. The report can be found online at www.sjenvironment.org/waterquality.

WATER QUALITY DATA CONSIDERED:

The water quality data collected by SJMWS and by SJMWS's water suppliers between 2019 and 2021 were considered for the purpose of determining compliance with drinking water standards and PHG reporting requirements (see Attachment 2). This data was all summarized in SJMWS's Annual Water Quality Report that were made available on SJMWS's website. Postcards were mailed to all customers with a QR code to SJMWS's website and information on how to request a hard copy of the Annual Water Quality Report, if preferred.

For each regulated contaminant, SWRCB establishes Detection Limits for Purposes of Reporting (DLR). DLRs are the minimum levels at which any analytical result must be reported to SWRCB. Analytical results below the DLRs cannot be quantified with any certainty. A constituent is "detected" when measured concentrations are above the DLR. In some cases, PHGs are set below the DLR.

GUIDELINES FOLLOWED:

The Association of California Water Agencies (ACWA) formed a workgroup which prepared guidelines for water utilities to use in preparing these PHG reports. ACWA guidelines were used in the preparation of this report. No formal guidance was available from state regulatory agencies.

BEST AVAILABLE TREATMENT TECHNOLOGY AND COST ESTIMATES:

Both USEPA and SWRCB adopted Best Available Technologies (BATs), which are the best known methods of reducing contaminant levels to the MCL. However, since many PHGs and MCLGs are set much lower than the MCL, it is not always possible or feasible to determine what treatment is needed to further reduce a contaminant to or below the PHG or MCLG. Where the MCLG or PHG is set at zero, there may not be commercially available technology available to reach that level. Estimating the costs to reduce a contaminant 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 contaminant may have adverse effects on other aspects of water quality.

SECTION 2: CONTAMINANTS DETECTED THAT EXCEED PHGS OR MCLGS

The following is a discussion of the constituents that were detected in one or more of our drinking water sources at levels above the PHG, or if no PHG, above the MCLG. The two contaminants that were detected at levels above the applicable PHGs or MCLGs between 2019 and 2021 are:

Table 1: Constituents Detected Above PHG or MCLG (2019-2021)

Contaminant	Unit	CA MCL	DLR	PHG	MCLG	SJMWS Levels
Arsenic	ug/L	10	2	0.004	0	ND – 2.7
Bromate	ug/L	10	1	0.1	0	ND – 7.9*

* Valley Water treated surface water data
ug/L = micrograms per liter
ND = Not Detected

A. ARSENIC

Arsenic is a naturally occurring metallic element found in water due to the erosion of mineral deposits. It can also enter water supplies from runoff from agricultural and industrial activities. Arsenic, categorized as an inorganic chemical, is a toxic chemical element that is unevenly distributed in the Earth's crust in soil, rocks, and minerals. According to the SWRCB, arsenic is ubiquitous in nature and is commonly found in drinking water sources in California.

The PHG for arsenic is 0.004 ug/L. The federal and state MCL for arsenic is 10 ug/L (the federal MCLG is 0 ug/L). The DLR for arsenic is 2 ug/L, and at the present time there are no laboratory methods available that can reliably measure arsenic to levels as low as the PHG.

SJMWS Results

Arsenic was below the MCL in all of SJMWS's water sources at all times during the period covered in this report. Several inorganic chemical analyses were performed between 2019-2021 as part of routine monitoring, and the groundwater well sources tested in the Evergreen, Edenvale and Coyote service area exceeded the arsenic PHG. The highest detected level was 2.7 ug/L, which is less than half the MCL of 10 ug/L.

Health Risk Category and Level

According to OEHHA, ingestion of arsenic can pose a risk of cancer. The health risk category associated with arsenic is carcinogenicity. The PHG is based on a level that will result in not more than 1 excess cancer in 1 million people who drink 2 liters daily for 70 years.

Arsenic can also result in a number of non-cancer effects at higher levels of exposure (e.g., vascular effects or skin effects), but the cancer risk is the most sensitive endpoint, and the basis of the PHG. Although short-term exposures to high doses cause adverse effects in people, such exposures do not occur from public water supplies in the U.S. that comply with the arsenic MCL.

Best Available Technology

The SWRCB has identified the following treatment technologies as Best Available Technology, treatment techniques, or other means available for achieving compliance with the MCL:

- Activated Alumina
- Coagulation/Filtration
- Ion Exchange
- Lime Softening
- Reverse Osmosis
- Electrodialysis
- Oxidation/Filtration

Note that BATs are designed for treatment to achieve compliance with the corresponding MCL only, and not PHGs. It is unlikely that arsenic will be removed to a level lower than the PHG. The PHG level is lower than laboratory tests can detect, so it would be impossible to confirm if any source water has actually reached levels below the PHG after treatment. SJMWS does not own or operate a water treatment facility and therefore cannot provide an exact cost estimate to treat arsenic.

Recommendation

SJMWS will continue to monitor and protect water sources, as required by state and federal regulations. In the event that arsenic levels exceed the MCL, SJMWS will coordinate with the SWRCB to identify solutions for removing or reducing arsenic levels in the water. No further action is proposed at this time.

B. BROMATE

Bromate is not commonly found in water, but it can be formed as a byproduct of ozonation disinfection of drinking water, or as a byproduct from treatment of water with concentrated hypochlorite. It is formed when naturally occurring bromide reacts with ozone during the disinfection process. SJMWS purchases treated surface water from Valley Water and delivers it to its Evergreen customers. Since 2006, Valley Water has used ozone as the primary disinfectant. Ozone disinfection is highly effective at inactivating microbial contamination and creates fewer disinfection by-products than chlorine.

The MCL for bromate is 10 ug/L, with a PHG of 0.1 ug/L. The DLR for bromate is 1 ug/L, and at the present time there are no laboratory methods available that can reliably measure bromate to levels as low as the PHG.

SJMWS Results

The reported bromate data found in Table 1 is from the 2020 and 2021 water quality data from Valley Water's two water treatment plants that serve the Evergreen service area. Valley Water had detected levels of bromate ranging from non-detected to 7.9 ug/L.

Health Risk Category and Level

The category of health risk for bromate is carcinogenicity as it is capable of producing cancer. OEHHA has determined that the numerical health risk associated with concentrations at the PHG is equivalent to one excess case of cancer in 1,000,000 people.

Best Available Technology

The BAT for bromate reduction includes:

- Maintain watershed protection
- Optimize ozone dosage control at the water treatment plant
- Continue bromide monitoring of raw water supply to water treatment plants
- Reverse osmosis (RO)

RO treatment reduces the naturally-occurring bromide in source water by reducing the natural organic matter in water. When this is reduced, the demand for ozone decreases, therefore reducing bromate formation. Because the DLR for bromate (1 ug/L) is greater than the PHG (0.1 ug/L), it would be difficult to assess the effectiveness of RO treatment on reaching the PHG level. SJMWS does not own or operate a water treatment facility and therefore cannot provide an exact cost estimate to treat bromate.

Recommendation

Valley Water staff monitors its raw and treated water supply and continues to optimize treatment for disinfection byproduct control. Detected bromate levels are well below the state and federal MCL. However, if an MCL violation occurs, SJMWS will coordinate with Valley Water and the SWRCB to identify solutions for removing or reducing bromate in the water. No further action is proposed at this time.

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 web site (http://www.oehha.ca.gov). Also, technical fact sheets on most of the chemicals having federal MCLs can be found at http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants.

ATTACHMENT 1

EXERPT FROM CALIFORNIA HEALTH & SAFETY CODE SECTION 116470

(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.

…

(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.

ATTACHMENT 2

CALIFORNIA MCLS & PHGS AND FEDERAL MCLGS

PARAMETERS/CONTAMINANTS	Units	State MCL	DLR	PHG or (MCLG)	PHG EXCEEDED?
INORGANICS					
ALUMINUM	mg/L	1	0.05	0.6	NO
ANTIMONY	mg/L	0.006	0.006	0.02	NO
ARSENIC	ug/L	10	2	0.004	YES
ASBESTOS	million fibers/L	7	0.2	7	NO
BARIUM	mg/L	1	0.1	2	NO
BERYLLIUM	mg/L	0.004	0.001	0.001	NO
CADMIUM	mg/L	0.005	0.001	0.00004	NO
CHROMIUM	mg/L	0.05	0.01	withdrawn	NO
COPPER (at-the-tap; 90th percentile)	mg/L	1.3	0.05	0.3	NO
CYANIDE	mg/L	0.15	0.1	0.15	NO
FLUORIDE	mg/L	2	0.1	1	NO
LEAD (at-the-tap; 90th percentile)	mg/L	0.015	0.005	0.0002	NO
MERCURY	mg/L	0.002	0.001	0.0012	NO
NICKEL	mg/L	0.1	0.01	0.012	NO
NITRATE [as N03]	mg/L	45	2	45	NO
NITRATE + NITRITE [as N]	mg/L	10	--	10	NO
NITRITE [as N]	mg/L	1	0.4	1	NO
PERCHLORATE	mg/L	0.006	0.004	0.006	NO
SELENIUM	mg/L	0.05	0.005	(0.05)	NO
THALLIUM	mg/L	0.002	0.001	0.0001	NO
ORGANIC CHEMICALS					
ALACHLOR	mg/L	0.002	0.001	0.004	NO
ATRAZINE	mg/L	0.001	0.0005	0.00015	NO
BENTAZON	mg/L	0.018	0.002	0.2	NO
BENZO (a) PYRENE	mg/L	0.0002	0.0001	0.000004	NO
BROMATE	ug/L	10	1	0.1	YES
CARBOFURAN	mg/L	0.018	0.005	0.0017	NO
CHLORDANE	mg/L	0.0001	0.0001	0.00003	NO
CHLORITE	ug/L	1	0.02	0.05	NO
2,4-DICHLOROPHENOXYACETIC ACID	mg/L	0.07	0.01	0.02	NO
DALAPON	mg/L	0.2	0.01	0.79	NO
DIBROMOCHLOROPROPANE [DBCP]	mg/L	0.0002	0.00001	0.0000017	NO
DI (2-ETHYLHEXYL) ADIPATE	mg/L	0.4	0.005	0.2	NO
DI (2-ETHYLHEXYL) PHTHALATE	mg/L	0.004	0.003	0.012	NO
DINOSEB	mg/L	0.007	0.002	0.014	NO
DIOXIN [2,3,7,8 - TCDD]	mg/L	3x10-8	5x10-9	(0)	NO
DIQUAT	mg/L	0.02	0.004	0.015	NO
ENDOTHALL	mg/L	0.1	0.045	0.58	NO
ENDRIN	mg/L	0.002	0.0001	0.0018	NO
ETHYLENE DIBROMIDE [EDB]	mg/L	0.00005	0.00002	0.00001	NO
GLYPHOSATE	mg/L	0.7	0.025	0.9	NO
HEPTACHLOR	mg/L	0.00001	0.00001	0.000008	NO
HEPTACHLOR EPOXIDE	mg/L	0.00001	0.00001	0.000006	NO
HEXACHLOROBENZENE	mg/L	0.001	0.0005	0.00003	NO
HEXACHLOROCYCLOPENTADIENE	mg/L	0.05	0.001	0.05	NO
LINDANE	mg/L	0.0002	0.0002	0.000032	NO
METHOXYCHLOR	mg/L	0.03	0.01	0.03	NO

PARAMETERS/CONTAMINANTS	Units	State MCL	DLR	PHG or (MCLG)	PHG EXCEEDED?
MOLINATE	mg/L	0.02	0.002	0.001	NO
OXAMYL	mg/L	0.05	0.02	0.026	NO
PENTACHLOROPHENOL	mg/L	0.001	0.0002	0.0003	NO
PICLORAM	mg/L	0.5	0.001	0.5	NO
POLYCHLORINATED BIPHENYLS [PCBs]	mg/L	0.0005	0.0005	0.00009	NO
SILVEX [2,4,5-TP]	mg/L	0.05	0.001	0.025	NO
SIMAZINE	mg/L	0.004	0.004	0.004	NO
THIOBENCARB	mg/L	0.07	0.001	0.07	NO
TOXAPHENE	mg/L	0.003	0.001	0.00003	NO
BENZENE	mg/L	0.001	0.0005	0.00015	NO
CARBON TETRACHLORIDE	mg/L	0.0005	0.0005	0.0001	NO
1,2-DICHLOROBENZENE [ORTHO]	mg/L	0.6	0.0005	0.6	NO
1,4-DICHLOROBENZENE [PARA]	mg/L	0.005	0.0005	0.006	NO
1,1-DICHLOROETHANE [1,1-DCA]	mg/L	0.005	0.0005	0.003	NO
1,2-DICHLOROETHANE [1,2-DCA]	mg/L	0.0005	0.0005	0.0004	NO
1,1-DICHLOROETHENE [1,1-DCE]	mg/L	0.006	0.0005	0.01	NO
CIS-1,2-DICHLOROETHYLENE	mg/L	0.006	0.0005	0.1	NO
TRANS-1,2-DICHLOROETHYLENE	mg/L	0.01	0.0005	0.06	NO
DICHLOROMETHANE (METHYLENE CHLORIDE)	mg/L	0.005	0.0005	0.004	NO
1,2-DICHLOROPROPANE	mg/L	0.005	0.0005	0.0005	NO
1,3-DICHLOROPROPENE	mg/L	0.0005	0.0005	0.0002	NO
ETHYLBENZENE	mg/L	0.3	0.0005	0.3	NO
METHYL TERT BUTYL ETHER (MTBE)	mg/l	0.013	0.003	0.013	NO
MONOCHLOROBENZENE	mg/L	0.07	0.0005	0.2	NO
STYRENE	mg/L	0.1	0.0005	(0.1)	NO
1,1,2,2-TETRACHLOROETHANE	mg/L	0.001	0.0005	0.0001	NO
TETRACHLOROETHYLENE [PCE]	mg/L	0.005	0.0005	0.00006	NO
TOLUENE	mg/L	0.15	0.0005	0.15	NO
1,2,4-TRICHLOROBENZENE	mg/L	0.005	0.0005	0.005	NO
1,1,1-TRICHLOROETHANE [1,1,1-TCA]	mg/L	0.2	0.0005	1	NO
1,1,2-TRICHLOROETHANE [1,1,2-TCA]	mg/L	0.005	0.0005	0.0003	NO
TRICHLOROETHYLENE [TCE]	mg/L	0.005	0.0005	0.0017	NO
TRICHLOROFLUOROMETHANE (FREON 11)	mg/L	0.15	0.005	0.7	NO
TRICHLOROTRIFUOROETHANE (FREON 113)	mg/L	1.2	0.01	4	NO
VINYL CHLORIDE	mg/L	0.0005	0.0005	0.00005	NO
XYLENES [SUM OF ISOMERS]	mg/L	1.75	0.0005	1.8	NO
MICROBIOLOGICAL					
CRYPTOSPORIDIUM		TT		(zero)	NO
GIARDIA LAMBLIA		TT		(zero)	NO
LEGIONELLA		TT		(zero)	NO
VIRUSES		TT		(zero)	NO
RADIOLOGICAL					
ALPHA ACTIVITY, GROSS	pCi/L	15	3	(zero)	NO
BETA ACTIVITY, GROSS	pCi/L	4 mrem/yr	4	(zero)	NO
RADIUM 226	pCi/L	--	1	0.05	NO
RADIUM 228	pCi/L	--	1	0.019	NO
RADIUM 226 + RADIUM 228	pCi/L	5	--	--	NO
STRONTIUM 90	pCi/L	8	2	0.35	NO
TRITIUM	pCi/L	20000	1000	400	NO
URANIUM	pCi/L	20	1	0.43	NO

Abbreviations: MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; PHG = Public Health Goal; DLR = Detection Limit for purposes of Reporting, set by SWRCB; TT = Treatment Technique