SOQUEL CREEK WATER DISTRICT
REPORT ON DISTRICT'S WATER QUALITY
RELATIVE TO PUBLIC HEALTH GOALS
2019-2021

MAIL TO: P. O. Box 1550 • Capitola, CA 95010
5180 Soquel Drive • TEL: 831-475-8500 • FAX: 831-475-4291 • WEBSITE: www.soquelcreekwater.org

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ACRONYM DEFINITIONS

ACWA	Association of California Water Agencies
ATSDR	Agency for Toxic Substances and Disease Registry
BAT	Best Available Technologies
DDW	Division of Drinking Water (California)
District	Soquel Creek Water District
DLR	California Detection Limit for Purposes of Reporting
EPA	Environmental Protection Agency
GAC	Granular Activated Carbon
LCR	Lead and Copper Rule
MCL	California Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
mg/L	milligrams per liter, or parts per million
O&M	Operations & Maintenance
OEHHA	California EPA Office of Environmental Health Hazard Assessment
PHG	California Public Health Goal
pCi/L	pico curies per liter
ppb	parts per billion, or micrograms per liter
ppm	parts per million, or milligrams per liter
RCF	Reduction, Coagulation and Filtration
SWRCB	State Water Resources Control Board (California)
µg/L	micrograms per liter, or parts per billion

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1.0 BACKGROUND

The California Health and Safety Code [Section §116470(b)] requires larger water utilities (>10,000 service connections) every 3 years to prepare a special report if water quality measurements exceed any Public Health Goal (PHG). PHGs are non-enforceable goals established by California Environmental Protection Agency's (EPA's) Office of Environmental Health Hazard Assessment (OEHHA). The law also requires that if OEHHA has not adopted a PHG for a constituent, the water suppliers are to use the Maximum Contaminant Level Goals (MCLGs) adopted by US EPA.

PHG reports are unique to California. They are required in addition to the extensive public reporting of water quality information that California water utilities have been doing for many years and in addition to the federally and state-mandated annual Consumer Confidence Reports/Water Quality Reports. The Soquel Creek Water District (District) will continue to report annually in greater depth on water quality in the system.

The purpose of the legislative requirement for PHG reports is to give water system customers access to information on levels of constituents even below the enforceable, mandatory Maximum Contaminant Levels (MCLs). Included in this information is the numerical public health risk associated with the MCL and the PHG or MCLG, the category or type of risk to health that could be associated with each constituent, the best treatment technology available (BAT) that could be used to reduce the constituent level, and an estimate of the cost to install that treatment if it is appropriate and feasible.

2.0 WHAT ARE PHGs?

PHGs are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the US EPA or California State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, benefits and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

3.0 WATER QUALITY DATA CONSIDERED

All water quality data collected by our water system from calendar years 2019, 2020 and 2021 for purposes of determining compliance with drinking water standards were considered for this PHG Report. This includes water quality data from the point of entry to the distribution system and water quality data from the distribution system for Stage 2 Disinfection Byproduct Rule compliance. This data was summarized in our 2019, 2020 and 2021 Consumer Confidence Reports that were electronically distributed to customers. If a constituent was detected in the District's water supply in this time period at a level exceeding an applicable PHG or MCLG, this report provides the information required by the law.

4.0 GUIDELINES FOLLOWED

The Association of California Water Agencies (ACWA) formed a workgroup which produces guidelines for water utilities to use in preparing PHG reports. The District used these ACWA guidelines, updated in 2022, in the preparation of this report. No formal guidance is available from

state regulatory agencies. However, as discussed below, the local Division of Drinking Water (DDW) office provided some guidance on one issue. ACWA interprets the law to mean that only constituents exceeding a PHG that also have an established California primary MCL or Action Level (AL) be included in the PHG report. The local DDW office stated that all constituents with a PHG should be included in the report, regardless of whether MCLs are set for the constituent. Therefore, this report includes the individual chemicals of Total Trihalomethanes: chloroform, bromoform, bromodichloromethane and dibromochloromethane. These individual chemicals of the Trihalomethanes group do not have an MCL, but are regulated by the summation of the concentration of these individual chemicals known as Total Trihalomethanes (TTHMs).

5.0 BEST AVAILABLE TREATMENT TECHNOLOGIES AND COST ESTIMATES

Both the US EPA and DDW adopt what are known as BATs or Best Available Technologies which are the best-known methods of reducing constituent levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible nor feasible to determine what treatment is needed to further reduce a constituent downward to or near the PHG or MCLG, many of which are set at zero. Estimating 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. Cost information included in the next section is from the ACWA guidance document.

6.0 CONSTITUENTS DETECTED THAT EXCEED A PHG OR A MCLG

A constituent is considered detected if it equals or exceeds the state regulatory Detection Limit for Purposes of Reporting (DLR). If compliance with an MCL is determined by an average, then that average is compared to the DLR to determine if it is detected.

Five constituents were detected at or above the applicable DLR at entry points to or within the distribution system, at levels above the PHG, or if no PHG exists, above the MCLG. The table on the next page summarizes the detections, which are also referenced in the discussion that follows.

Constituent and Year(s)	Health Risk Category	PHG (MCLG)	Cancer Risk at PHG/MCLG	MCL	Cancer Risk at MCL	SqCWD Maximum Level	SqCWD Average Level	Best Available Technology (BAT) Options	Annual Potential Treatment Costs (Annualized Capital and O&M)
Copper 2019	Digestive system toxicity (may cause nausea, vomiting, diarrhea)	0.3 mg/L (ppm)	N/A	1.3 mg/L (action level)	N/A	0.35 mg/L (ppm) ***90th percentile, see discussion)***	0.24 mg/L (ppm)	Optimized Corrosion Control	N/A - Already meeting requirement
Trihalomethanes: Chloroform 2019-2021	Carcinogenicity (may cause cancer)	0.4 ug/L	One per million	80 ug/L (TTHM LRAA, see discussion)	Two per ten thousand	53 ug/L	5.1 ug/L	Enhanced coagulation or enhanced softening, plus GAC	$440,000-$1,390,000; $31-$100 per service connection
Trihalomethanes: Bromoform 2019-2021	Carcinogenicity (may cause cancer)	0.5 ug/L	One per million	80 ug/L (TTHM LRAA, see discussion)	Two per ten thousand	21 ug/L	8.5 ug/L	Enhanced coagulation or enhanced softening, plus GAC	$440,000-$1,390,000; $31-$100 per service connection
Trihalomethanes: Bromodichloromethane 2019-2021	Carcinogenicity (may cause cancer)	0.06 ug/L	One per million	80 ug/L (TTHM LRAA, see discussion)	1.3 per thousand	20 ug/L	6.7 ug/L	Enhanced coagulation or enhanced softening, plus GAC	$440,000-$1,390,000; $31-$100 per service connection
Trihalomethanes: Dibromochloromethane 2019-2021	Carcinogenicity (may cause cancer)	0.1 ug/L	One per million	80 ug/L (TTHM LRAA, see discussion)	Eight per ten thousand	25 ug/L	11 ug/L	Enhanced coagulation or enhanced softening, plus GAC	$440,000-$1,390,000; $31-$100 per service connection

Notes:
mg/L = milligrams per liter of water
ppm = parts per million
ug/L = micrograms per liter of water
ppb = parts per billion
TTHM= Total Trihalomethanes
GAC= Granular Activated Carbon
LRAA- Locational Running Annual Average

6.1 Copper

Copper is a naturally occurring element and is an essential nutrient in humans. The category of health risk for copper is digestive system toxicity (OEHHA, 2022). Copper is not classified by the US EPA as a human carcinogen (ATSDR, 2004). However, children may be especially susceptible to the effects of excess copper.

Copper does not have a primary drinking water standard in the form of an MCL. Instead, according to the DDW, the 90th percentile value of all Lead and Copper Rule (LCR) samples from household taps in the distribution system cannot exceed the copper AL of 1.3 mg/L or parts per million (ppm) for copper. The PHG for copper is 0.3 mg/L.

Copper was not detected in any District source water sample collected from 2019 through 2021 at or above the DLR (0.05 mg/L). Based on sampling of the District's distribution system in 2019, the 90th percentile value for copper was 0.35 mg/L, above the PHG of 0.30 mg/L. The average copper concentration was 0.24 mg/L, below the PHG. The water system is in full compliance with the federal and state Lead and Copper Rule. Therefore, the District is deemed by the DDW to have "optimized corrosion control" for the water system.

In general, optimizing corrosion control is the BAT to deal with corrosion issues and with any copper findings. The District continues 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 the system in an "optimized corrosion control" condition.

The District's last LCR monitoring in 2019 meets the "optimized corrosion control" requirements. Additional corrosion control treatment involves the addition of other chemicals that could raise additional water quality issues. Therefore, no estimate of treatment cost has been included.

6.2 Trihalomethanes

Trihalomethanes (THMs) are a group of four chemicals: chloroform, bromoform, bromodichloromethane and dibromochloromethane. THMs are formed when chlorine or other disinfectants used to control microbial contamination in drinking water react with natural organic matter present in source water. THMs are regulated under the Stage 2 Disinfection Byproducts Rule, which established the Total THMs MCL of 80 ug/L, on a Locational Running Annual Average.

In February of 2020, OEHHA established PHGs for the individual THM chemicals. Each individual PHG value is based on the carcinogenic effects in laboratory animals (OEHHA, 2020).

THMs are routinely detected in distribution system water at levels usually well below the Stage 2 Disinfection Byproducts Rule drinking water standard. Soquel Creek Water District monitors for THM's at five pre-determined sample locations on a quarterly basis to comply with the Stage 2 Disinfection Byproducts Rule. The table below summarizes distribution system THM monitoring in relation to the Stage 2 Disinfection Byproducts Rule MCL and applicable PHGs. It should be noted that the high values in the range of detection were sampled during the periods of the Water Transfer Pilot Project with the City of Santa Cruz from 1/2019-4/2019 and 12/2019-2/2020.

Summary of THM Monitoring in the Soquel Creek Water District Distribution System				
Sample Dates 2019-2021				
Trihalomethane	**PHG (ug/L)**	**MCL (ug/L)**	**Range of Detection (ug/L)**	**Average (ug/L)**
Total Trihalomethanes	None	80 ug/L	5-77	31
Trihalomethane: Chloroform	0.4	None	ND-53	5
Trihalomethane: Bromofrom	0.5	None	1-21	8.5
Trihalomethane: Bromodichloromethane	0.06	None	1-20	6.7
Trihalomethane: Dibromochloromethane	0.1	None	2-25	11

Notes:
ug/L = micrograms per liter of water
ND= Non-Detect

The BAT for treatment of THMs is enhanced coagulation or enhanced softening, plus GAC. The ACWA guidance document did not provide estimates on annual potential treatment costs for enhanced coagulation or enhanced softening, therefore estimated annual potential treatment costs for enhanced coagulation or enhanced softening were omitted. Annual GAC treatment costs for reduction of THMs at well sites is estimated to range from $440,00-$1,390,000; or $31-$100 per service connection. Per ACWA guidance, this cost estimate range was determined by the cost to treat 1,000 gallons and multiplied by the average annual kilogallons produced by the Soquel Creek Water District from 2019-2021. Soquel Creek Water District currently has 15 active water production wells. The cost estimate range is likely to be artificially low, given the number of GAC contact vessels that would need to be constructed at each well site to implement GAC treatment.

6.3 Radium-228

Radium-228 was detected in only one District source: Granite Way Well during the 2019-2021 monitoring period. The average detection of Radium-228 at this source was less than the DLR of 1 pCi/L, therefore it is not required to include Radium-228 in this PHG report, according to ACWA guidance. However, it is included here for informational purposes. The range of detection of Radium-228 during the 2019-2021 monitoring period was Non-Detect to 1.04 pC/L. The PHG for Radium-228 is 0.019 pCi/L. Radium-228 is not regulated with an individual MCL. Instead, Radium-226 and Radium-228 are regulated with a combined MCL value of 5 pCi/L.

6.4 Arsenic

The District treats two of its wells for arsenic. The average arsenic level in water entering the distribution system was not detected during the reporting period at or above the DLR of 2 ug/L, therefore it is not required to include arsenic in this PHG report, according to ACWA guidance. However, it is included here for informational purposes. The range of detection during the 2019-2021 monitoring period was Non-Detect to 3.4 ug/L. The PHG for arsenic is 0.004 ug/L and the MCL is 10 ug/L.

RECOMMENDATIONS FOR FURTHER ACTION

The District's supplied drinking water meets all state DDW and US EPA drinking water standards set to protect public health. To further reduce the levels of the constituents identified in this report, additional or different costly treatment processes would be required, and nonrevenue water from treated wells would increase. The health protection benefits of these further hypothetical reductions are not clear and may not be quantifiable. Initiation of treatment is not recommended at this time.

REFERENCES

Agency for Toxic Substances and Disease Registry (ASTDR), September 2004, Public Health Statement for Copper

ACWA, April 2022, Suggested Guidelines for Preparation of Required Reports on Public Health Goals (PHGs) to Satisfy Requirements of California Health and Safety Code Section 116470(b)

OEHHA, December 2003, Health-Protective Considerations Regarding Measurement of Gross Alpha Particle Activity in Drinking Water

OEHHA, March 2006, Public Health Goals for Chemicals in Drinking Water RADIUM-226 and -228

OEHHA, February 2022, Health Risk Information for Public Health Goal Exceedance Reports

OEHHA, February 2020, Public Health Goals for Trihalomethanes in Drinking Water: Chloroform, Bromoform, Bromodichloromethane, Dibromochloromethane