San Francisco Water System

2022 Public Health Goals Report

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Acronyms and Abbreviations

ACWA	Association of California Water Agencies
BAT	Best available technology
CHSC	California Health and Safety Code
DBP	Disinfection byproduct
DLR	Detection Limit for the Purposes of Reporting
HTWTP	Harry Tracy Water Treatment Plant
LUSL	Lead user service line
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MGD	Million gallons per day
MRL	Method reporting limit
O&M	Operations and maintenance
OEHHA	Office of Environmental Health Hazard Assessment
PHG	Public Health Goal
ppb	parts per billion
SFDPH	San Francisco Department of Public Health
SFGW	San Francisco Groundwater Project
SFPUC	San Francisco Public Utilities Commission
SFWS	San Francisco Water System
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
USEPA	United States Environmental Protection Agency

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Table of Contents

Tables

Figures

Attachments

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San Francisco Water System
2022 Public Health Goals Report

This report is divided into the following sections:

I. Introduction

A. Regulatory Requirements

California Health and Safety Code (**CHSC**) §116470(b) (Attachment A) requires public water systems with more than 10,000 service connections prepare a brief written report by July 1 every three years for contaminants that exceed the applicable public health goals (**PHGs**) in drinking water. The report, which is referred to as the PHG report herein, is to provide consumers with the following information:

- Each contaminant that exceeds the applicable PHG in drinking water
- Numerical public health risk, including the risk category for the contaminant
- Any commercially available best treatment information and associated cost estimates to reduce the contaminant to the PHG level
- Actions already taken, or intended to be taken, by the water system to reduce the contaminant in drinking water

Water systems are required to use applicable maximum contaminant level goal (**MCLG**) adopted by the United States Environmental Protection Agency **(USEPA**) if no PHG is available. While the primary drinking water standards, which are expressed in maximum contaminant levels (**MCLs**) or treatment technique (**TT**), are enforceable, both the PHGs and the MCLGs are not.

Systems preparing the PHG report are required to hold a hearing for the purpose of accepting and responding to public comment on the report.

B. PHG and MCL

PHGs are published by the California Office of Environmental Health Hazard Assessment (**OEHHA**) to support the MCL development effort of the State Water Resources Control Board (**SWRCB**). A PHG is the concentration of a contaminant in drinking water that poses no significant health risk if consumed for a lifetime, whereas the MCL is set as close to the PHGs (or MCLGs) as is economically and technologically feasible.

A PHG is based solely on public health risk using current risk assessment principles and methods, without consideration of practical risk-management factors, which are used by the SWRCB to set enforceable drinking water standards. MCLG is determined by the USEPA using a similar process. However, the USEPA sets the MCLGs of all carcinogens at zero, even though the goal of zero is difficult or impossible to meet.

Therefore, adopted MCLs are the criteria for regulatory compliance determination, not those proposed or possible in the future and certainly not MCLGs or PHGs.

C. Guidelines

San Francisco Public Utilities Commission (**SFPUC**) staff prepared its first PHG report for the San Francisco Water System (**SFWS**) in 2004 without any regulatory guidance. The Association of California Water Agencies (**ACWA**) developed guidelines to help water systems prepare the PHG report in 2007. The guidelines, updated every three years, provide structured approach to enhance consistency in PHG report preparation. The latest ACWA guidelines were used in the preparation of this 2022 PHG.

D. Water Supply to SFWS

The SFWS's drinking water supply is from the wholesaler, San Francisco Regional Water System (**SFRWS**), supplemented with a small contribution from its own local groundwater sources. Although both SFWS and SFRWS are operated by the SFPUC, these two water systems are separately permitted by the SWRCB and each has its own regulatory responsibilities to fulfill. All treatment and watershed management of the surface water sources are the responsibility of the SFRWS, whereas the SFWS is responsible for the operations and maintenance of the distribution system and local groundwater wells within the City and County of San Francisco. As a wholesaler, the SFRWS delivers drinking water, which is typically[1] a blend of unfiltered water from Hetch Hetchy Reservoir and filtered water from two treatment plants using local water sources. The contribution of each water source in the blend varies throughout the year.

II. Elements of the PHG Report

This section discusses the key elements of the report that will help explain the significance of a PHG exceedance. These include target drinking water levels, health risks, identified best available technology (**BAT**) and cost estimates, and SFPUC programs. **Only contaminants that have an existing primary drinking water standard and were "detected" at a level that "exceeds" the existing PHG or MCLG need to be included in the report**. There are a few constituents, including total trihalomethanes and five haloacetic acids, that are routinely detected in water systems at levels usually well below the MCLs for which no PHG nor MCLG exists. These will be addressed in future reports after a PHG or a MCLG has been adopted.

A. Target Drinking Water Contaminant Levels

To ensure that customers receive high-quality drinking water, the SFPUC sets its own operational water quality targets at levels more stringent than the MCLs. These operational target levels help SFWS and

[1] Although the SFRWS has new groundwater sources approved by the SWRCB during the reporting period, these groundwater wells are designed to be used during drought conditions. In 2021, four of these wells together contributed to less than 0.07% of the overall SFRWS's supply.

SFRWS prevent MCL violations. Figure 1 illustrates the relationship between the SFPUC's water quality targets, PHGs/MCLGs, and MCLs.

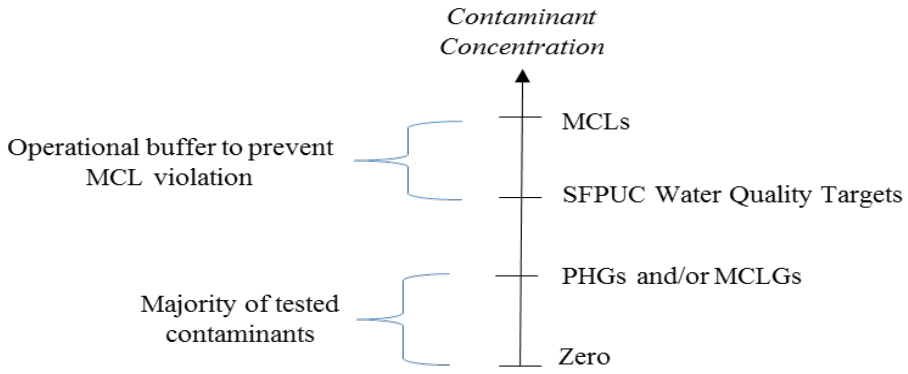

Figure 1. SFPUC Water Quality Targets vs. PHGs/MCLGs and MCLs

Contaminants that have existing MCLs or TTs and have confirmed detections in exceedance of the applicable PHGs or MCLGs (if no PHGs available) in drinking water are included. However, there are two terms worthy of further explanation:

1. **Detection Limit for Reporting Purposes**

   Along with each MCL, the SWRCB also adopted a corresponding Detection Limit for Purposes of Reporting (DLR) to help determine a water system's compliance with the drinking water standards. When a contaminant has a confirmed level above the DLR, it is conceived as "detected" according to the drinking water requirements in Title 22 of the California Code of Regulations (**Title 22**). Per SWRCB guidance and procedure on compliance reporting, results that are reported below the DLR would be treated as zero for calculation purpose. A similar approach was used for PHG comparison in this report.

2. **Exceedance**

   There are no regulations that relate to data handling for complying with PHGs. According to ACWA guidelines and consistent with the procedure acceptable to the SWRCB for MCL compliance determination, this report follows the same approach in evaluating water quality data for PHG comparison. For example, if Title 22 of the California Code of Regulations or the SWRCB guidance specifies that the average of a group of samples be compared to the MCL for compliance purposes, the same averaging approach is used to determine detections for comparison to the PHG or MCLG. If wells are blended or treated before delivery to the system, the judgment as to whether there was a "detection exceeding the MCLG or PHG" is be based on the "point of entry" data just as for compliance with MCLs. As in all cases of reporting results to the SWRCB, the analytical results are rounded to reflect appropriate number of significant figures matching the corresponding PHG or MCLG.

B. Health Risks

The OEHHA evaluates toxicological data from scientific literature to assess health risks for each contaminant in categories (Attachment B) including, among others, the following:

- Carcinogenic: capable of producing cancer.
- Cardiovascular toxicity: adverse effects on the structure or function of the heart or the vascular system following exposure to a chemical substance.
- Developmental toxicity: adverse effects on a developing organism that may result from exposure prior to conception (either parent), during prenatal development, or postnatally to the time of sexual maturation. Adverse developmental effects may be detected at any point in the life span of the organism. The major manifestations include (1) death of the developing organism, (2) structural abnormality (birth defects), (3) altered growth, and (4) functional deficiency.
- Neurotoxicity: capable of adversely affecting or destroying parts of the nervous system or interfering with nerve signal transmission. Effects may be reversible (for example, effects on chemicals that carry nerve signals across gaps between nerve cells) or irreversible (for example, destruction of nerve cells).
- Reproductive toxicity: adverse effects on the reproductive system of females or males. The toxicity may cause changes to the female or male reproductive organs, the regulating endocrine system, or pregnancy outcomes.

The OEHHA calculates numerical risks associated with a contaminant's non-carcinogenic and carcinogenic effects, if any, on human health. The PHG is then developed as a public health-protective concentration based on the most sensitive health effects. For contaminants with non-carcinogenic effects, PHGs are set at concentrations at which no known or anticipated adverse health effects occur. For carcinogens, PHGs are set at concentrations that do not pose a significant risk to health (usually less than 1 in 1,000,000 additional cases resulting in adverse health effects). By regulation, OEHHA cannot set a PHG at zero. However, the USEPA considers no safe level of exposure to carcinogens and sets MCLGs for carcinogens at zero.

C. Best Available Technologies (BATs) and Cost Estimate

For drinking water, both the USEPA and the SWRCB have specified BATs that have been determined to be the best available methods for reducing contaminant levels to MCLs. Costs can be readily estimated for such technologies. However, since most PHGs and MCLGs are set much lower than the corresponding MCLs (and some MCLGs are set at zero), it is not always possible to determine what treatment could further reduce a contaminant down to the PHG or MCLG level. Estimating the cost to reduce a contaminant to absolute zero is impossible, as it is not technically feasible to verify by existing analytical methods that the level has truly been lowered to zero. Only very preliminary cost estimates, if applicable, are required in PHG reports.

ACWA has compiled unit cost estimates (dollars per thousand gallons treated) for BATs from various sources. For presenting cost estimates, ACWA guidelines suggest including both total project cost and the cost per customer. As the amount of water used by each SFWS customer varies, this report presents costs in a percent increase of a customer's water bill. Since other wholesale customers uses approximately two-thirds of SFRWS's surface water supply, only one third of estimated costs for surface water treatment, if any, will be assigned to SFWS retail customers. Any estimated costs of additional treatment, if needed, for San Francisco's own groundwater sources will be solely borne by SFWS retail customers.

It should be noted that installing a treatment technology to reduce already low levels of a single contaminant could have unexpected and adverse consequences on other aspects of water quality.

D. SFPUC Programs

Other than the applicable BATs, the SFPUC also engages in various voluntary and mandatory programs to protect public health and maintain drinking water quality. These programs typically focus on source water protection, public outreach, treatment chemical quality assurance, and optimization of treatment and operations.

III. Water Quality Data and Analysis

Drinking water regulations require compliance with MCLs or TT but not PHGs. Thus, the logical approach for determination of PHG or MCLG exceedance would be to use the same procedures and requirements specified in Title 22 for determining compliance with MCLs. All water quality data collected for compliance monitoring between January 1, 2019 and December 31, 2021 (herein the **Reporting Period**) for purposes of determining compliance with drinking water standards were considered. These data include those collected at the entry points to the SFRWS as well as within the SFWS's own distribution system. Concentrations of analytes detected above DLRs in treated water delivered to SFWS customers in 2019, 2020, and 2021 were summarized in the corresponding Annual Water Quality Reports (a.k.a. Consumer Confidence Reports) in Attachment C

A. Contaminants Detected above PHGs/MCLGs

Table 1 shows the monitoring results of the three contaminants that exceed the applicable PHGs or MCLGs during the Reporting Period.

Table 1. Contaminants Detected above PHGs/MCLGs in SFWS

Contaminant	Unit	MCL	DLR	PHG	MCLG	Maximum Detection
Bromate	ppb	10	1	0.1	0	2.1[(a)]
Lead	ppb	15[(b)]	5	0.2	0	7[(c)]
Total coliform	P/A	5%	N/A	N/A	0	1%[(d)]

Notes: (a) This is the maximum running annual average value

(b) Lead does not have MCL; 15 ppb is the Action Level (AL), of which the exceedance is based on the 90th percentile lead result measured at customer taps.

(c) This is the 90th percentile lead result.

(d) This is the maximum monthly percentage of total coliform positive results.

Key: N/A = not available P/A = Presence/Absence ppb = parts per billion

- Bromate exceeding its PHG in treated water samples HTWTP effluent in the reporting period.
- Lead exceeding its PHG in customer tap samples collected by the SFWS in 2021 Lead and Copper Rule monitoring; it was non-detect in the distribution system and in the SFRWS's source water.

- Total coliform (a bacteriological indicator) exceeding its MCLG in the SFWS distribution system in 2020.

B. Contaminants that Meet Requirements for Treatment Techniques

For pathogenic microorganisms (i.e., *Cryptosporidium*, *Giardia lamblia*, *Legionella*, heterotrophic bacteria, and viruses) that are regulated under the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule, the drinking water standard is met if the water supplier uses specified treatment techniques. The OEHHA does not establish PHG for pathogenic microorganisms. Although the MCLG for the microorganism contaminants is zero, the USEPA does not mandate monitoring because there are limitations in existing analytical methods that can specifically point to an individual infective pathogen. The SFPUC performed voluntary monitoring of *Giardia lamblia and Cryptosporidium* for the SFRWS and SFWS during the Reporting Period. These monitoring results are for research and operational purposes and not for compliance purposes. These contaminants are considered to not have exceeded their MCLGs because the SFPUC uses the required TT.

Similarly, there are no primary drinking water standards in MCL values for lead and copper, but the corresponding regulations establish optimized corrosion control treatment as TT along with tap monitoring results not to exceed the applicable ALs (i.e., 15 ppb for lead and 300 ppb for copper).

IV. Evaluation of Contaminants Exceeding PHGs or MCLGs

During the Reporting Period, San Francisco's drinking water has met all MCLs and TTs adopted by the USEPA and the SWRCB. However, bromate and lead exceeded the corresponding PHG and total coliform exceeded the MCLG. The following sections discuss water quality monitoring results and the applicable health goals, associated health risks, identified BATs and preliminary cost estimates, if any, and programs in place or to be implemented by the SFPUC to address these contaminants.

A. Bromate

The OEHHA established a PHG of 0.1 ppb for bromate, which is 1% of the MCL (10 ppb). Bromate salts are used as a food ingredient and a neutralizing agent in hair products. Bromate is usually not found in water sources. In drinking water, bromate is typically formed as a disinfection byproduct from ozonation when naturally occurring bromide reacts with ozone. The HTWTP uses ozone for primary disinfection and pre-oxidation.

1. SFPUC Water Sample Results

Bromate is subject to monthly monitoring, and compliance with the MCL is determined quarterly based on the annual average results. It has been detected in the treated water at the HTWTP effluent during the reporting period. Bromate was non-detect in 2019. Starting in 2020, the method of analysis was changed with a lower detection limit. The highest running annual average values were at 2.1 ppb for both 2020 and 2021. Though exceeding the PHG of 0.1 ppb, these detections are well below the MCL of 10 ppb.

2. Health Risk Category and Level

Bromate is classified as a probable human carcinogen. Acute symptoms of bromate ingestion include nausea, vomiting, diarrhea, central nervous system depression, tinnitus, deafness, and renal failure. The OEHHA primarily identifies hyperplasia[2] as a non-cancer risk associated with bromate in drinking water. Cancer risk associated with lifetime consumption of water at the PHG translates into one per one million excess cancer cases. Cancer risk at the MCL is approximately one per ten thousand excess cancer cases. However, bromate is still permitted in use as a food additive in raw ingredients (such as flour), though it is largely converted to bromide in the baking process.

3. BATs and Treatment Cost

Bromate is a disinfection byproduct formed when the source water containing bromide is subject to ozonation treatment at the HTWTP. Although it is technically possible to remove bromate after formation using several treatment approaches, such as activated ferrous iron addition, UV irradiation, or membrane and anion exchange resins[3], these methods have been evaluated primarily at bench-scale and pilot level. Information on full-scale application and associated treatment and O&M costs are rare. In fact, the USEPA and the SWRCB have both identified optimized control of the ozone treatment process as the BAT for reducing bromate formation. Therefore, no additional BAT and associated cost estimate for bromate is evaluated in this report.

4. SFPUC Programs

The SFPUC began a one-year special monthly monitoring program to track the bromide level in the raw water supply to the HTWTP, as recommended in the 2019 PHG report. The one-year monitoring has been extended and become a routine operational monthly monitoring effort. The 2020-2021 data showed that bromide levels in the raw water were generally low at an average of 22 ppb with a range of 18 ppb -30 ppb.

In 2015, a Long-Term Improvements Project was completed at the HTWTP that allows the SFPUC to optimize ozone dosage and residual management to meet the disinfection byproducts requirements. This major improvement project included new ozone generators as well as flow control upgrades to improve ozone generation, ozone feed system, ozone dose adjustments, and ozone residual measurements.

Together with the existing watershed management/protection program, these monitoring and ozone optimization efforts will continue to be the most efficient and effective treatment approach for the SFPUC to minimize the formation of bromate.

B. Lead

The PHG for lead is 0.2 ppb, which is below the DLR of 5 ppb. The SWRCB adopted AL of 15 ppb for lead in 1995 and requires that lead concentrations in 90% of water samples collected at customer taps not to exceed the AL.

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[2] Hyperplasia is an enlargement of an organ or tissue caused by an increase in the amount of cell number. OEHHA concluded this based on male rat data in the DeAngelo *et al*. (1998) study.

[3] Health Canada, *Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Bromate*, October 2016

Lead enters drinking water primarily through leaching of lead-containing materials in household plumbing (Figure 2). These materials include lead-based solder used to join copper pipes, brass and/or chrome-plated brass faucets, lead pipe connections from homes to water mains (herein referred to as lead user service line, or **LUSL**), brass/bronze water meters, brass/bronze curb valves, and brass/bronze corporation valves. Corrosion of these materials in a plumbing system can contribute to lead in household drinking water. Note that CHSC §116875 and the Safe Drinking Water Act of 2014 require that pipes, fittings, fixtures, solder, and flux used in plumbing systems must meet the amended definition of "lead-free".[4] However, older lead-containing materials remain in many households.

Figure 2. Potential Contributors to Lead in Tap Water from Household Plumbing

There are other lead sources than drinking water present in the environment. For example, lead-based paint was widely used in home painting before 1977, and is still the major source of lead exposure to children in San Francisco. The San Francisco Department of Public Health (**SFDPH**) visits homes of children with elevated blood lead levels to investigate potential environmental causes and inspect for the presence of lead in the home environment. The SFDPH investigations of lead-exposed children in San Francisco have found that the most

[4] Plumbing components are considered "lead-free" if the weighted average lead content of the component's wetted surface area is not more than 0.25%.

common sources of environmental lead are lead-based paint, lead-contaminated soil, and take-home exposure of adults employed in the construction industry.[5]

1. SFPUC Water Sample Results

Lead was not detected in raw water sources to the SFRWS and water supply to the SFWS. The SFPUC conducted the triennial lead and copper monitoring at SFWS customer taps in 2021 according to the schedule approved by the SWRCB. The results showed that the AL for lead was not exceeded. However, lead levels in 10 of 72 tap monitoring results were above the DLR of 5 ppb, and thus perceived as exceeding the PHG of 0.2 ppb. The probable lead source in these tap samples is household plumbing. It is likely that some residences have higher lead levels in their tap water than others because of differences in plumbing materials.

2. Health Risk Category and Values

Lead has multiple toxic effects on human body. The carcinogenic risks are considered smaller than the risks for chronic toxicity, which includes negative neurobehavioral effects in children, hypertension in adults, potential to cause kidney disease. The most sensitive risk is the reduction of Intelligence Quotient (**IQ**) points in children. The public health goal of 0.2 ppb was determined from a maximum daily lead intake of 2.86 micrograms per day, which corresponds to a decrease of one IQ point in children.

3. BATs and Cost

The SWRCB considers optimizing corrosion control as the BAT for reducing lead in drinking water and approved the SFPUC's use of pH adjustment as the optimal corrosion control treatment. The SWRCB requires that a minimum pH value of 8.2 be maintained throughout the transmission and distribution systems. Because the SFWS continues to meet the AL for lead and operates the water system with pH greater than 8.2, the SWRCB requires no additional BATs.

In addition to corrosion control optimization, the SWRCB also requires water systems implement a LUSL replacement program that comprise (i) an inventory of service lines identifying lead, unknown, and galvanized steel materials, and (ii) a replacement schedule that includes both system-side and customer-side service lines. Although this is not considered a BAT, the goal is to help further reduce the customer exposure to lead in drinking water.

4. SFPUC Programs

In conjunction with existing tap monitoring and optimized corrosion control treatment, the SFWS has also implemented the following actions with the goal of reducing lead exposure to San Francisco residents.

Replacement of Lead Components

[5] See SFDPH report "Two Decades Protecting San Francisco Children from Lead Exposure" at *Department of Public Health -Childhood Lead Prevention Program (sfdph.org)*.

1980s Removed approximately 7,000 lead service lines in the distribution system.

1983 Discontinued "leaded" water main joints in the distribution system.

2003 Began replacing curb stop valves with lead-free units when found.

2008 Began replacing water meters with lead-free units and now over 99.6% complete.

Lead User Service Line (LUSL) Inventory and Replacement

Since 2010, the plumbing components used for human consumption in California have been "lead-free". However, there are minor fittings known as lead whips in older parts of the SFWS. If a lead whip is found, it will be quickly replaced in coordination with the customer. As of May 1, 2022, a total of 31 lead whips was found and replaced.

In 2018, the SFWS completed an inventory of LUSL in accordance with Senate Bill 427 (2017), which does not apply to water lines on customer's side of the meter or the meter itself, but include lead goosenecks (also known as lead whips) associated with the user service line on the water system side. The LUSL inventory reported to the SWRCB had the following findings:

- No lead pipelines were identified.
- 10,912 service lines were made of unknown material.
- 4,988 galvanized[6] steel service lines that may contain short (2 to 3 feet) section of lead whip connectors on the water main.

This initial service line inventory was subsequently refined and updated in 2019 and 2020 based on additional information gathered after 2018.

In June 2020, the SFPUC submitted a 10-year lead component replacement schedule to the SWRCB for the estimated total of 1,578 galvanized steel services lines that may have lead whips. The schedule includes field inspection to confirm the unknown material service lines. If a galvanized service line is found or the unknown material cannot be verified, the service line is scheduled for replacement. The SFWS created a Lead Service Line Replacement Program with a customer lookup map, which is posted on SFPUC's website (*sfpuc.org/lead*). A customer can use the map to identify if the address has an unknown or galvanized service line. The LUSL will not be replaced until the customer has been given lead health information fact sheets, building flushing instructions, and water pitcher filter with 6-month supply of filters.

In July 2021, the 10-year lead component replacement schedule was updated with the number of unknowns and galvanized services that remained to be inspected. New changes also reflected that customers in disadvantaged neighborhood areas would be distributed equitably in the monthly field inspection and replacement schedule. As of May 2022, about 2,904 field inspections remain with 1,031 galvanized services

[6] Total 5,218 service lines were possibly made of galvanized steel, brass, or wrought iron material. Older galvanized pipelines material can corrode, which could potentially allow any lead contained therein to accumulate over time and be released after the lead source (i.e., lead whip) is removed.

confirmed and planned for replacement. It is anticipated that the field inspection and inventory of unknown lines will be completed by Fall 2022.

Between July 2019 and May 2022, SFPUC staff conducted a pilot study evaluating the lead levels at residences in SFWS where 158 LUSLs (including the 31 lead whips) were subsequently replaced. A total of 36 participants volunteered for the study, of which the results indicated that lead levels in tap samples after LUSL replacement increased slightly and then dropped to levels lower than the AL. Some of these participants still have detectable lead results in their first 1-liter samples, suggesting that the household plumbing is still a contributor to the lead detected in the tap water. These are consistent with industry findings. See Attachment C for the SFWS report on "Impact of Lead Components on Household Lead Levels at the Tap", dated March 2022.

In addition to the above lead reduction activities, the SFPUC is working on the development of the following to comply with the USEPA's 2021 Lead and Copper Rule Revision:

- Identification of new Tier 3 sites to recruit volunteers for future lead and copper monitoring. These are homes that had a lead utility service line removed and have a galvanized customer service line.
- Inventory of customer service line materials (completed inventory of 5,027 pipelines as of May 2022 and 406 are galvanized service lines)

Public Outreach and Education

The SFPUC has long taken a proactive approach to educating customers about lead in drinking water, its health effects, and ways to reduce lead exposure in drinking water. Below are highlights of public outreach activities:

1980	Conducted free lead tests of drinking water taps at the San Francisco Unified School District.
1994	Began providing "Lead Test for a Fee" for consumers, testing tap water for a nominal fee.
1996	Began sending customer-focused communications regarding lead issues in bill inserts and annual Water Quality Reports. Participated in San Francisco Department of Public Health's (**SFDPH**) Childhood Lead Prevention Program to provide laboratory services and water sampling assistance to help investigate the lead sources for cases of high blood levels in children residing in the City.
1998	Began offering free lead tests for Women, Infants & Children program enrollees.
2000-2010	Provided lead-free faucets to childcare centers and public schools in San Francisco at no cost and offered significantly discounted lead-free faucets to city residents via annual sales at street fairs.
2017-2019	Assisted 198 public and private K-12 schools including pre-school facilities on public school properties in sampling and analysis of lead in drinking water.
2022-	Assist San Francisco Unified School District in completing lead sampling at childcare centers

Present by January 2023 and develop a long-term, recurring lead monitoring program for the K-12 schools.

C. Total Coliform Bacteria

The bacteriological quality of drinking water is generally expressed in terms of total coliform and fecal coliform like *E. coli*. Total coliform is naturally present and ubiquitous in the environment, whereas *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Total coliform is used as a proxy measure of bacterial contamination because it can be easily monitored and analyzed. The MCL for bacteriological quality in drinking water has been changed in 2021 as follows:

- No more than 5.0% monthly total coliform samples are positive; and
- The total number of samples showing *E. coli* positive should be zero during the reporting year.

The OEHHA has not set a PHG for either total coliform or *E. coli*, but the USEPA has established a MCLG of zero for both.

1. SFPUC Water Sample Results

Due to the ubiquitous nature of total coliform, a public water system, no matter how well it is being operated and maintained, will have an occasional coliform-positive result. In fact, it is not possible to assure that a water system will never have a total coliform positive sample. For the SFWS, the maximum monthly total coliform positive samples are 0%, 1%, and 1% in the years of 2019, 2020, and 2021, respectively. No *E. coli* was detected in any of the coliform-positive samples. These monitoring results indicate that the SFWS complied with the applicable MCLs for the 3-year reporting period, but exceeded the MCLG of zero percent for total coliform in years 2020 and 2021.

2. Health Risk Category and Values

The detection of total coliform in drinking water samples indicates the possible presence of pathogen contamination pathways in the distribution system; however, total coliform by itself is not generally considered harmful. The numerical health risk cannot be determined since the actual pathogens are not being measured. On the other hand, human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

3. BATs and Cost

Exceeding 0% coliform bacteria in any month, in and of itself, would not normally constitute the need for any new or additional treatment or action. There is no action that could be taken to ensure zero-percent coliform every single month. The SWRCB has specified BATs for MCL compliance. These BATs have been adopted by the SFPUC for the operations and maintenance of the SFWS. The costs associated with the implementation of these BAT measures are already budgeted as annual expenses in the operations of the SFWS. One method for reducing bacteriological contamination is to maintain effective disinfectant residuals in the water distribution system. However, increasing chlorine residual levels in the SFWS drinking water at the SFRWS's

treatment plants could likely increase the levels of disinfection byproducts, which might have adverse health consequences.

4. SFPUC Programs

Positive total coliform samples may indicate a potential problem in the distribution system. A routine sample showing coliform positive usually triggers the collection of three repeat samples according to the applicable regulations. If the repeat samples showed total coliform positives, usually follow-up investigation and mitigation may be required. In response to the reported total coliform positive results, the SFWS implemented the protocol consisting of follow-up monitoring, investigation, and mitigation, as needed. No trend or pattern had been identified that suggested the presence of a contamination source or there was a systemwide problem.

The SFWS maintains an effective distribution system maintenance program, which comprises the following elements:

- Water main flushing and disinfection
- Reservoir and storage tank inspection and cleaning
- Cross-connection control and backflow prevention
- Routine chlorine-residual monitoring and boosting
- Maintaining positive water pressures throughout the distribution system.
- Continuous sanitary practices such as capping open ends of pipes in storage yard, etc.

In conjunction with the SFRWS's watershed controls at the Hetch Hetchy Reservoir and local water sources, the above measures help reduce the potential for bacteriological contamination at the SFWS's water sources and the distribution system.

V. Recommendations for Further Actions

In accordance with the OEHHA literature,[7] a PHG is not a boundary line between a "safe" and "dangerous" level of a contaminant. Drinking water is considered acceptable for public consumption, even if it contains contaminants at levels exceeding the PHG, provided the MCLs are met.

The benefits of reducing the naturally occurring contaminants are minimal if their levels are well below their corresponding MCLs. The SFPUC will continue monitoring for the bromide level in the influent and optimizing the ozone dose to minimize bromate formation at the HTWTP.

The major source of lead in tap water is the plumbing fixtures at customer premises, albeit that the presence of lead service lines may also contribute to the lead level in drinking water. The most effective actions that the SFPUC can take to reduce customer's exposure to lead in drinking water are to maintain optimized corrosion

[7] OEHAA, *Guide to Public Health Goal for Chemicals in Drinking Water*, 2022.

control treatment, and continue existing lead abatement and public outreach efforts. Identifying and replacing service lines and components of unknown and galvanized materials will also help ensure that lead is not introduced into drinking water.

Since the SFPUC is already practicing the BATs for total coliform and *E. coli*, no additional treatments are required to meet the MCLG of zero.

In summary, the SFPUC will continue existing surveillance and monitoring programs in a proactive manner to control and reduce contaminants entering the water supply to the SFWS.

Attachment A

Excerpt from California Health and Safety Code, Section 116470(b)-(f)

Excerpt from California Health and Safety Code: Section 116470(b) – (f)

(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.

Attachment B

Health Risk Information for Public Health Goal Exceedance Reports

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

Public Health Goals

Health Risk Information for Public Health Goal Exceedance Reports

February 2022

Pesticide and Environmental Toxicology Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

Health Risk Information for Public Health Goal Exceedance Reports

Prepared by

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

February 2022

NEW for the 2022 Report: New in this document are an updated Public Health Goal (PHG) for 1,2-dibromo-3-chloropropane (DBCP) and newly established PHGs for the trihalomethanes bromodichloromethane, bromoform, chloroform, and dibromochloromethane.

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 regulated 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 regulated contaminant in drinking water 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)

[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 or 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
Barium	cardiovascular toxicity (causes high blood pressure)	2	NA	1	NA
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

[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
Carbon tetrachloride	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.0005	5×10^{-6} (five per million)
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}	none	NA
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

[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
Di(2-ethylhexyl) phthalate (DEHP)	carcinogenicity (causes cancer)	0.012	1×10^{-6}	0.004	3×10^{-7} (three per ten million)
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

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
Dichloromethane (methylene chloride)	carcinogenicity (causes cancer)	0.004	1×10^{-6}	0.005	1×10^{-6} (one per million)
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

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
Ethylene dibromide (1,2-Dibromoethane)	carcinogenicity (causes cancer)	0.00001	1×10^{-6}	0.00005	5×10^{-6} (five per million)
Fluoride	musculoskeletal toxicity (causes tooth mottling)	1	NA	2	NA
Glyphosate	nephrotoxicity (harms the kidney)	0.9	NA	0.7	NA
Heptachlor	carcinogenicity (causes cancer)	0.000008 (8×10^{-6})	1×10^{-6}	0.00001	1×10^{-6} (one per million)
Heptachlor epoxide	carcinogenicity (causes cancer)	0.000006 (6×10^{-6})	1×10^{-6}	0.00001	2×10^{-6} (two per million)
Hexachloroben-zene	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)

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
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)
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

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
Nitrate and Nitrite	hematotoxicity (causes methemoglobinemia)	10 as nitrogen[10]	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
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
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)

[10] 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
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
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)

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
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
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

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
1,1,2-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)
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)[11]
Trihalomethanes: Bromoform	carcinogenicity (causes cancer)	0.0005	$1x10^{-6}$	0.080*	2×10^{-4} (two per ten thousand)[12]

* For total trihalomethanes (the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane). There are no MCLs for individual trihalomethanes.

[11] Based on 0.080 mg/L bromodichloromethane; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.

[12] Based on 0.080 mg/L bromoform; 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: Chloroform	carcinogenicity (causes cancer)	0.0004	$1x10^{-6}$	0.080*	2×10^{-4} (two per ten thousand)[13]
Trihalomethanes: Dibromochloro-methane	carcinogenicity (causes cancer)	0.0001	$1x10^{-6}$	0.080*	8×10^{-4} (eight per ten thousand)[14]
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.
[13] Based on 0.080 mg/L chloroform; the risk will vary with different combinations and ratios of the other trihalomethanes in a particular sample.
[14] 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
Disinfection byproducts: haloacetic acids (HAA5)					
Monochloroacetic acid (MCA)	general toxicity (causes body and organ weight changes[8])	0.07	NA	none	NA

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

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
Dichloroacetic acid (DCA)	Carcinogenicity (causes cancer)	0	0	none	NA
Trichloroacetic acid (TCA)	hepatotoxicity (harms the liver)	0.02	NA	none	NA
Monobromoacetic acid (MBA)	NA	none	NA	none	NA
Dibromoacetic acid (DBA)	NA	none	NA	none	NA
Total haloacetic acids (sum of MCA, DCA, TCA, MBA, and DBA)	general toxicity, hepatotoxicity and carcinogenicity (causes body and organ weight changes, harms the liver and causes cancer)	none	NA	0.06	NA
Radionuclides					
Gross alpha particles[9]	carcinogenicity (causes cancer)	0 (^{210}Po included)	0	15 pCi/L[10] (includes radium but not radon and uranium)	up to $1x10^{-3}$ (for ^{210}Po, the most potent alpha emitter)

[9] 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.

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

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
Beta particles and photon emitters[9]	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)

Attachment C

SFWS Water Quality Reports - 2019, 2020, 2021

San Francisco
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Power
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San Francisco, CA 94120-7369

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The San Francisco Public Utilities Commission meets on the 2nd and 4th Tuesday of every month. To find out more about our Commissioners and past meetings, visit

sfwater.org/commission

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است. اگر نمیتوانید این اطلاعات را بزبان انگلیسی
بخوانید لطفاً از کسی که میتواند یاری بگیرید تا مطالب را برای شما به فارسی ترجمه کند.

Cé rapport contient des information importantes concernant votre eau potable. Veuillez traduire, ou parlez avec quelqu' un qui peut le comprendre.

"هذا التقرير يحتوي على معلومات مهمة تتعلق بمياه الشفة (أو الشرب).
ترجم التقرير , أو تكلم مع شخص يستطيع أن يفهم التقرير."

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

הדו"ח הזה מכיל מידע חשוב לגבי מי השתייה שלך
תרגם את הדו"ח או דבר עם מישהו שמבין אותו

此份水質報告, 內有重要資訊。請找他人為你翻譯和解說清楚。

Chi tiết này thật quan trọng. Xin nhờ người dịch cho quý vị.

Dieser Bericht enthält wichtige Information über Ihr Trinkwasser. Bitte übersetzen Sie ihn oder sprechen Sie mit jemandem, der ihn versteht.

Questo rapporto contiene informazioni importanti che riguardano la vostra aqua potabile. Traducetelo, o parlate con una persona qualificata in grado di spiegarvelo.

この報告書には上水道に関する重要な情報が記されております。翻訳を御依頼なされるか、内容をご理解なさっておられる方にお尋ね下さい。

यह सूचना महत्वपूर्ण है । कृपा करके किसी से इसका अनुवाद करायें ।

이 안내는 매우 중요합니다. 본인을 위해 번역인을 사용하십시요.

Η κατούθεν αναφορα παρουσιαζη σπουδαιες πληροφορειες για το ποσιμο νερο σας. Πρακτικλω να το μεταφρασετε η να το σξολειασετε με καποιον που το καταλαβαινη απολητως.

This report contains important information about our drinking water. Please contact SFPUC Communications at **415-554-3289** or email **info@sfwater.org** for assistance.

Este informe contiene información muy importante sobre su agua para beber. Favor de comunicarse SFPUC a **415-554-3289** para asistirlo en español.

San Francisco Public Utilities Commission

Every day we deliver high-quality drinking water to 2.7 million people in San Francisco, Alameda, Santa Clara and San Mateo counties. We generate clean, reliable hydroelectricity that powers 100% of San Francisco's vital services, including police and fire stations, street lights, Muni, SF General Hospital and more.

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

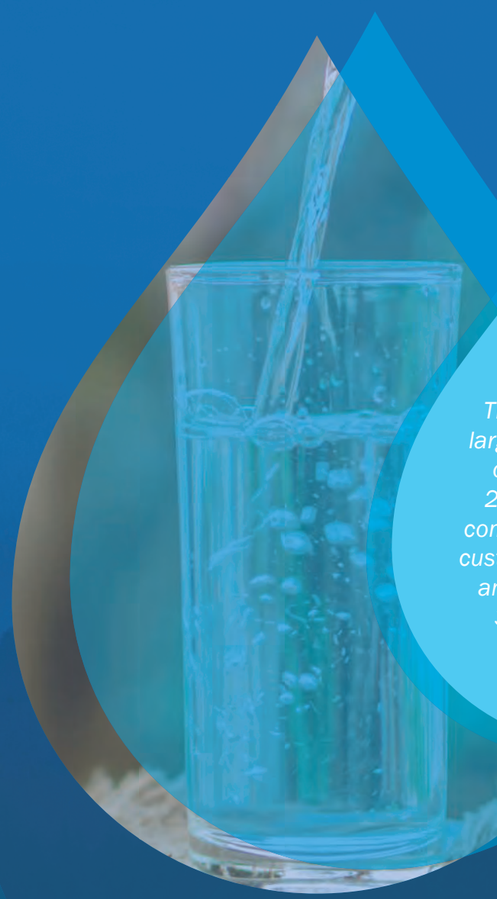
CITY OF SAN FRANCISCO
2019 ANNUAL
WATER QUALITY REPORT

UNDERSTANDING THIS REPORT

The San Francisco Public Utilities Commission (SFPUC) produces this annual report detailing where your water comes from, how we treat it, and its overall chemical composition. We do this as a regulatory requirement, and we think it is important for you to understand the information within it.

We are committed to providing high quality drinking water for all our customers. Our system is large and we work across several counties to maintain the system that delivers our water. In addition to the wider system outside of San Francisco, we also maintain a system of reservoirs within San Francisco. It is our hope that this report will not only provide you with greater knowledge of your water, but also an increased understanding of the considerable skill, talent, and effort that goes into ensuring businesses and residents have reliable access to this precious resource.

We're proud of our water, and we hope you are too. Throughout this report, you'll find facts and figures to help expand upon the basic information we're required to provide. We hope you enjoy getting to know a little more about who we are as an Agency and how you can get involved.



WATER FACT:

The SFPUC is the third largest utility in the State of California, serving 2.7 million residential, commercial and industrial customers in the Bay Area, and we operate 24/7 – 365 days every year

FOOTNOTES ON SAN FRANCISCO WATER SYSTEM - WATER QUALITY DATA:

(1) These are monthly average turbidity values measured every 4 hours daily. **(2)** There is no turbidity MCL for filtered water. The limits are based on the TT requirements for filtration systems. **(3)** This is the highest locational running annual average value. **(4)** Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only. **(5)** In May 2015, the SWRCB-DDW recommended an optimal fluoride level of 0.7 ppm be maintained in the treated water. In 2019, the range and average of the fluoride levels were 0.2 ppm - 0.9 ppm and 0.7 ppm, respectively. **(6)** The natural fluoride level in the Hetch Hetchy source was ND. Elevated fluoride levels in the raw water at SVWTP and HTWTP were attributed to the transfer of fluoridated Hetch Hetchy water into the local reservoirs. **(7)** This is the highest running annual average value. **(8)** Aluminum also has a primary MCL of 1,000 ppb. **(9)** The most recent Lead and Copper Rule monitoring was in August 2018. Two of the 90 site samples collected at consumer taps had lead concentrations above the AL. **(10)** The detected chlorate in the treated water is a degradation product of sodium hypochlorite, which we use for water disinfection. **(11)** Chromium (VI) has a PHG of 0.02 ppb but no MCL. The previous MCL of 10 ppb was withdrawn by the SWRCB-DDW on September 11, 2017. Currently, the SWRCB-DDW regulates all chromium through a MCL of 50 ppb for Total Chromium, which was not detected in our water in 2019.

Note: The different water sources blended at different ratios throughout the year have resulted in varying water quality. Additional water quality data may be obtained by calling our Water Quality Division toll-free number at (877) 737-8297.

San Francisco Local Groundwater - Water Quality Data for Year 2019

	DETECTED CONTAMINANTS	UNIT	MCL	PHG	RANGE FOUND	AVERAGE	MAJOR SOURCES IN DRINKING WATER
Treated Water (Sunset Reservoir)	**INORGANICS**						
	Chromium (VI)	ppb	N/A [1]	0.02	0.08 - 0.91	0.24	Leaching from natural deposits; commercial and industrial waste discharges, e.g., electroplating.
	CONSTITUENTS WITH SECONDARY STANDARDS						
	Chloride	ppb	500	N/A	4.8	4.8	Runoff / leaching from natural deposits
	Color	Unit	15	N/A	8	8	Naturally-occurring organic materials
	Specific Conductance	µS/cm	1600	N/A	61 - 397	125	Substances that form ions when in water
	Sulfate	Unit	500	N/A	5.5	5.5	Runoff / leaching from natural deposits
	Total Dissolved Solids	ppm	1000	N/A	33	33	Runoff / leaching from natural deposits
	Turbidity	NTU	5	N/A	0.3	0.3	Soil runoff
	OTHER WATER QUALITY PARAMETERS	**UNIT**	**ORL**		**RANGE FOUND**	**AVERAGE**	
	Chlorate [2]	ppb	800 (NL)		61	61	
	Strontium	ppb	N/A		49	49	

	DETECTED CONTAMINANTS	UNIT	MCL	PHG	RANGE FOUND	AVERAGE	MAJOR SOURCES IN DRINKING WATER
Raw Water [3] (San Francisco Local Groundwater Wells)	**INORGANICS**						
	Chromium (VI)	ppb	N/A[1]	0.02	0.02 - 23.7	15.9	Leaching from natural deposits; commercial and industrial waste discharges, e.g., electroplating.
	Nitrate (as nitrogen)	ppm	10	10	3 - 13.6	8.0	Landscape fertilizers and leaked wastewater.
	VOLATILE ORGANICS						
	Carbon tetrachloride [4]	ppb	0.5	0.1	ND - 0.99	0.61 [4]	Commercial and industrial solvent used in dry cleaning prior to 1960.
	Tetrachloroethylene [5]	ppb	5	0.06	ND - 2.5	1.9 [5]	Commercial and industrial solvent used in dry cleaning prior to 2010, and as a metal degreaser in auto shops and metalworking industries.
	OTHER WATER QUALITY PARAMETERS	**UNIT**	**ORL**		**RANGE FOUND**	**AVERAGE**	
	pH	-	N/A		7.3 - 8.5	7.9	
	Strontium	ppb	N/A		134 - 202	176	

FOOTNOTES ON SAN FRANCISCO LOCAL GROUNDWATER - WATER QUALITY DATA:

(1) The previous Chromium (VI) MCL of 10 ppb was withdrawn by the SWRCB-DDW on September 11, 2017. Currently, the SWRCB-DDW regulates total chromium through a MCL of 50 ppb. The results of total chromium in treated water was ND in 2019. **(2)** The detected chlorate in the treated water is a degradation product of sodium hypochlorite, which is used for water disinfection and maintenance of chlorine residual in the system. **(3)** The concentration ranges and averages of these contaminants are indicative of the raw groundwater quality prior to treatment. They are not representative of water in the reservoirs and distribution system. **(4)** This contaminant was detected above the MCL at South Sunset Well only. The average is based on the monitoring results from South Sunset Well. **(5)** This contaminant was detected only at Golden Gate Central Well, which is currently serving Golden Gate Park of irrigation purpose only. The average is based on the monitoring results from Golden Gate Central Well.

SAN FRANCISCO WATER SYSTEM-WATER QUALITY DATA FOR 2019

The table below lists all 2019 detected drinking water contaminants and the information about their typical sources. Contaminants below detection limits for reporting are not shown, in accord with regulatory guidance. We hold a SWRCB-DDW monitoring waiver for some contaminants in our surface water supply and therefore their monitoring frequencies are less than annual. Visit **sfwater.org** for a list of all water quality parameters we monitored in raw water and treated water in 2019.

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE OR LEVEL FOUND	AVERAGE OR [MAX]	MAJOR SOURCES IN DRINKING WATER
TURBIDITY						
Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.3 - 0.7 [1]	[2.1]	Soil runoff
Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 [2]	N/A	-	[1]	Soil runoff
	-	Min 95% of samples ≤0.3 NTU [2]	N/A	99.9% - 100%	-	Soil runoff
Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 [2]	N/A	-	[0.1]	Soil runoff
	-	Min 95% of samples ≤0.3 NTU [2]	N/A	100%	-	Soil runoff
DISINFECTION BY-PRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	13 - 65	[45] [3]	By-product of drinking water disinfection
Haloacetic Acids	ppb	60	N/A	7.2 - 46	[38] [3]	By-product of drinking water disinfection
Total Organic Carbon [4]	ppm	TT	N/A	1.6 - 2.6	2.1	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform	-	NoP ≤5.0% of monthly samples	(0)	-	[0.3%]	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	0 - 0.09	0.02	Naturally present in the environment
INORGANICS						
Fluoride (source water) [5]	ppm	2.0	1	ND - 0.9	0.3 [6]	Erosion of natural deposits; water additive to promote strong teeth
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.5 - 3.3	[2.6] [7]	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	UNIT	SMCL	PHG	RANGE	AVERAGE	MAJOR SOURCES OF CONTAMINANT
Aluminum [8]	ppb	200	600	ND - 68	ND	Erosion of natural deposits; some surface water treatment residue
Chloride	ppm	500	N/A	<3 - 17	8.7	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 10	<5	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	N/A	32 - 234	158	Substances that form ions when in water
Sulfate	ppm	500	N/A	1 - 29	15	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	<20 - 119	76	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	ND - 0.5	0.2	Soil runoff

LEAD AND COPPER [9]	UNIT	AL	PHG	RANGE	90TH PERCENTILE	MAJOR SOURCES IN DRINKING WATER
Copper	ppb	1300	300	7.7 - 103	64	Internal corrosion of household water plumbing systems
Lead	ppb	15	0.2	<1 - 90	6	Internal corrosion of household water plumbing systems

OTHER WATER QUALITY PARAMETERS	UNIT	ORL	RANGE	AVERAGE
Alkalinity (as $CaCO_3$)	ppm	N/A	3.5 - 97	46
Boron	ppb	1000 (NL)	ND - 107	ND
Calcium (as Ca)	ppm	N/A	3.3 - 20	12
Chlorate [10]	ppb	800 (NL)	40 - 220	84
Chromium (VI) [11]	ppb	NA	0.04 - 0.19	0.12
Hardness (as $CaCO_3$)	ppm	N/A	8.9 - 77	47
Magnesium	ppm	N/A	0.2 - 6.6	4.2
pH	-	N/A	8.6 - 9.9	9.4
Potassium	ppm	N/A	0.3 - 1.2	0.8
Silica	ppm	N/A	4.9 - 8	6.1
Sodium	ppm	N/A	2.8 - 21	14
Strontium	ppb	N/A	13 - 230	107

KEY

< / ≤ = less than / less than or equal to
AL = Action Level
Max = Maximum
Min = Minimum
N/A = Not Available
ND = Non-Detect
NL = Notification Level
NoP = Number of Coliform-Positive Sample
NTU = Nephelometric Turbidity Unit
ORL = Other Regulatory Level
ppb = part per billion
ppm = part per million
µS/cm = microSiemens/centimeter

OUR DRINKING WATER SOURCES AND TREATMENT

Our drinking water comes from a variety of protected sources carefully managed by the SFPUC. These sources include surface water stored in reservoirs located in the Sierra Nevada, Alameda County and San Mateo County, and groundwater supplies stored in a deep aquifer located in San Francisco and San Mateo counties. These sources are diverse in both the origin of the supply – snowmelt, rainfall and recharge of groundwater – and their location within our system. Maintaining this variety of sources is an important component of our near and long-term water supply management strategy. A diverse mix of sources protects us from potential disruptions due to emergencies or natural disasters, provides resiliency during periods of drought, and helps us ensure a long-term, sustainable water supply as we address issues such as climate uncertainty, regulatory changes and population growth.

To meet drinking water standards for consumption, water from all of our surface water sources undergoes treatment before it is delivered to our customers. Water from the Hetch Hetchy Reservoir is exempt from state and federal filtration requirements but receives the following treatment: ultraviolet light and chlorine disinfection, pH adjustment for optimum corrosion control, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing the formation of regulated disinfection byproducts. Water from local Bay Area reservoirs in Alameda County and San Mateo County is delivered to Sunol Valley Water Treatment Plant (SVWTP) and Harry Tracy Water Treatment Plant (HTWTP), respectively, and is treated by filtration, disinfection, fluoridation, optimum corrosion control and taste and odor removal processes.

WATER FACT:
Groundwater is widely used across California and throughout the world. While it is true not all groundwater sources (aquifers) are the same, we're proud of ours. To learn more about the Westside Basin and our groundwater, please visit **sfwater.org/groundwater**

PROTECTING OUR WATERSHEDS

We conduct watershed sanitary surveys for the Hetch Hetchy source annually, for the local water, and Upcountry Non-Hetch Hetchy Sources (UNHHS) every five years. The latest local sanitary survey was completed in 2016 for the period of 2011 - 2015. The last watershed sanitary survey for UNHHS was conducted in 2015 as part of our drought response plan efforts. All these surveys together with our stringent watershed protection activities were completed with support from partner agencies including the National Park Service and the US Forest Service. The purpose of these surveys is to evaluate the sanitary conditions and water quality of the watersheds and to review results of watershed management activities conducted in the preceding years. Wildlife, stock, and human activities continue to be potential contamination sources. You may contact the San Francisco District office of the State Water Resources Control Board's Division of Drinking Water (SWRCB-DDW) at **510-620-3474** to review these reports.

WE ♥ SF WATER. DRINK TAP!

Your tap water is the most sustainable choice when it comes to drinking water sources. Bottled water is many times more expensive than the water from your tap, and the carbon footprint associated with it is avoidable. Show your love for our water and our planet and drink tap!

WATER QUALITY

We regularly collect and test water samples from reservoirs and designated sampling points throughout the system to ensure the water delivered to you meets or exceeds federal and state drinking water standards. In 2019, we conducted more than **100,000** drinking water tests in the source, transmission, and distribution system. This is in addition to the extensive treatment process control monitoring performed by our certified operators and online instruments.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and the SWRCB-DDW prescribe regulations that limit the amounts of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

FLUORIDATION AND DENTAL FLUOROSIS

Mandated by State law, water fluoridation is a widely accepted practice proven to be safe and effective for preventing and controlling tooth decay. Our fluoride target level in the water is 0.7 milligram per liter (mg/L, or part per million, ppm), consistent with the May 2015 State regulatory guidance on optimal fluoride level. Infants fed formula mixed with water containing fluoride at this level may still have a chance of developing tiny white lines or streaks in their teeth. These marks are referred to as mild to very mild fluorosis, and are often only visible under a microscope. Even in cases where the marks are visible, they do not pose any health risk. The Centers for Disease Control (CDC) considers it safe to use optimally fluoridated water for preparing infant formula. To lessen this chance of dental fluorosis, you may choose to use low-fluoride bottled water to prepare infant formula. Nevertheless, children may still develop dental fluorosis due to fluoride intake from other sources such as food, toothpaste and dental products.

Contact your healthcare provider or SWRCB-DDW if you have concerns about dental fluorosis. For additional information about fluoridation or oral health, visit the SWRCB-DDW website **waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.shtml**, the CDC website **cdc.gov/fluoridation**, or our website **sfwater.org/fluoride**.

WATER FACT:

We're immensely proud of our water quality, and the team of experts that make it possible. It is estimated that 785 million people in the world are living without access to safe water.

Source: WHO 'Progress on Drinking Water, Sanitation and Hygiene,' 2017.

KEY WATER QUALITY TERMS

The following are definitions of key terms referring to standards and goals of water quality noted on the data table.

Public Health Goal (PHG): 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.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): 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 (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): 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.

Maximum Residual Disinfectant Level Goal (MRDLG): 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.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

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

Turbidity: A water clarity indicator that measures cloudiness of the water, and is also used to indicate the effectiveness of the filtration system. High turbidity can hinder the effectiveness of disinfectants.

Cryptosporidium is a parasitic microbe found in most surface water. We regularly test for this waterborne pathogen and found it at very low levels in source water and treated water in 2019. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

OUR WATER IN THE COMMUNITY

Throughout the spring of 2019, SFPUC staff members worked alongside local business owners to encourage appreciation for our water through a series of open house-style events.

We were lucky enough to collaborate with popular bakeries, breweries, and coffee shops across the city. These events allowed many San Francisco residents to meet staff from many different parts of our organization and learn more about our water, how it is treated, as well as some of our wonderful conservation programs and initiatives.

Later in the autumn we were fortunate enough to have some of these business partners from the spring volunteer to be featured in a visual campaign now on display in our headquarters on Golden Gate Avenue.

We were so pleased to see the enthusiasm we have for our high quality water reflected in the conversations we had with many of you. Our water makes many popular products and businesses possible, and we're grateful for your ongoing interest in our work.

In addition to our water source protection efforts, we continue the following programs to minimize customer exposure to lead in water:

- Replacing the remaining 2% of brass meters with lead-free automated water meters.
- Annual monitoring in our water transmission system entry points in 2019 continues to return results of non-detect.
- Offering in partnership with the San Francisco Department of Public Health free lead test vouchers for clients enrolled in the Women, Infants and Children (WIC) program.
- Offering low-cost water tests for lead for $25 per tap. To request a test, call 311 or visit our website **sfwater.org/leadtest** for an application form.

In 2019, we continued inspecting and characterizing the 10,912 service lines of unknown material and 4,524 service lines suspected of having lead components, also known as lead user service lines (LUSLs). These figures were first reported to SWRCB-DDW in July 2018. Results of field investigations, as well as a schedule to replace known LUSLs, will be reported to the SWRCB-DDW by July 2020. Our policy is to remove and replace any LUSL promptly if it is discovered during pipeline repair and/or maintenance. We are also conducting a pilot study to determine the effects of the lead components on lead levels at customer taps.

LEAD TESTING OF DRINKING WATER IN SCHOOLS

Between 2017 and 2019, we assisted a total of 190 public and private K-12 schools in lead monitoring for their tap water. School monitoring data can be found at **sfwater.org/lead**. Starting in late 2019, we have been working with San Francisco Unified School District to develop a voluntary, 5-year recurring monitoring program to provide continued support to local schools in addressing lead in their tap water.

WATER FACT:
Do you know how much water you should have stored as part of your emergency kit? To find out visit **sf72.org/supplies**

GET FAMILIAR WITH OUR WATERSHEDS

The system that delivers our water is made up of many different sources of water. We work hard to protect our water and water quality. Find out about each of our reservoirs, how much they contribute to the system and how you can visit them.

A watershed is a land area that collects and channels rainfall and snowmelt by gravity to creeks, streams, and rivers, and eventually to common outflow points such as reservoirs, bays, and the ocean.

CALAVERAS RESERVOIR

FUN FACT:
This is the largest of our East Bay reservoirs. During the recent construction of the new dam at Calaveras, prehistoric whale teeth were found in the ground some 60 miles from the Pacific Ocean.

CHERRY LAKE

FUN FACT:
This is the only lake in our system where recreational boating is permitted on the water itself, as this is only an emergency supply. Maintained in partnership with the US Forest Service, Cherry Lake is a popular recreation spot for locals and visitors alike.

CRYSTAL SPRINGS RESERVOIR

FUN FACT:
One of the most accessible reservoirs of ours to visit from San Francisco, Crystal Springs offers the opportunity to walk, hike, and even attend docent lead bike tours along the trails that surround the water itself.

HETCH HETCHY RESERVOIR

FUN FACT:
O'Shaughnessey Dam which holds back the Hetch Hetchy Reservoir, was initially completed in 1923. It was raised a further 85 feet in 1938 to the height it currently stands, which is 430 feet.

LAKE ELEANOR

FUN FACT:
Because of differences in elevation and water levels, water can be moved from Lake Eleanor to Cherry Lake through the Eleanor-Cherry Diversion Tunnel, resulting in a unique opportunity for highly efficient hydroelectric power generation.

PILARCITOS RESERVOIR

FUN FACT:
Completed in 1866, this reservoir was the first in our system and initially built by the Spring Valley Water company primarily serves water to Half Moon Bay, though at one point it did store water for San Francisco too.

SAN ANDREAS RESERVOIR

FUN FACT:
As the name would suggest, the San Andreas fault runs through the Reservoir, and the dam holding back the reservoir survived the 1906 earthquake. The 6-mile long Sawyer Camp Trail links San Andreas and Crystal Springs reservoirs.

SAN ANTONIO RESERVOIR

FUN FACT:
This reservoir, impounded by Turner Dam, was first sited as a water supply source in 1875 by the Spring Valley Water Company. It was impounded in 1964 by Turner Dam, named after former General Manager of Hetch Hetchy, James H. Turner.

SPECIAL HEALTH NEEDS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people and infants, can be particularly at risk from infections.

Such individuals should seek advice about drinking water from their healthcare providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline **1-800-426-4791** or at **epa.gov/safewater**.

QUINOLINE MONITORING

Quinoline is a chemical compound that was commonly used in the coal-tar lining of drinking water pipes to prevent corrosion.

In order to confirm the safe distribution of water, and in conjunction with the San Francisco Regional Water System, we conducted a special round of voluntary monitoring for quinoline. The monitoring was part of our assessment to determine the source(s) of quinoline from anywhere in our supply, transmission and distribution systems.

Our monitoring results confirmed the absence of quinoline in our system's raw water; in other words the results were "non-detect." We did find low levels of quinoline in four locations in our distribution system; the same locations where low levels were found in 2018, during monitoring done in compliance with the USEPA's 4th Unregulated Contaminant Monitoring Rule (UCMR4). You may access our UCMR4 water quality data here, and visit the USEPA website **epa.gov/dwucmr** for information about UCMR4.

WATER FACT:

Planning for the future: our Water Innovations Program is implementing and exploring several efforts, including PureWaterSF, Expanded Leak Detection and Brewery Process Water Reuse

MONITORING OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

PFAS is a group of approximately 5,000 man-made chemicals used in a variety of industries and consumer products. These chemicals are widely present in the environment and human body. In order to determine the impact of PFAS on the water we provide to our customers, we conducted a round of PFAS monitoring in 2019. This monitoring effort, done on a voluntary basis, helped to determine whether PFAS was present in any form in any of our water supply, transmission or distribution systems. Using the State's stringent sampling procedures and based on the currently approved/certified method of analysis for 18 PFAS contaminants, we confirmed no PFAS were detected in our water sources. We did find a trace amount of one PFAS contaminant in 20 samples collected in our distribution system. We suspect the plumbing seal component in the sample tap may be a source of the only detected contaminant, ADONA, found at a level of 2.7 parts per trillion. We plan to conduct another round of PFAS monitoring in late 2020 or early 2021 when a new USEPA method of analysis is available at our contract laboratory. For additional information about PFAS, visit our website at **sfwater.org/quality**. View the factsheet **here**, the SWRCB-DDW website **waterboards.ca.gov/pfas**, and/or USEPA website **epa.gov/pfas**.

CONTAMINANTS AND REGULATIONS

Generally, the sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants, and may be present in source water as:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife,

Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming,

Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses,

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application and septic systems,

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline **1-800-426-4791**, or at **epa.gov/safewater**.

DRINKING WATER AND LEAD

Exposure to lead, if present, can cause serious health effects in all age groups, especially for pregnant women and young children. Infants and children who drink water containing lead could have decreases in IQ and attention span and increases in learning and behavior problems. Lead exposure among women who are pregnant increases prenatal risks. Lead exposure among women who later become pregnant has similar risks if lead stored in the mother's bones is released during pregnancy. Recent science suggests that adults who drink water containing lead have increased risks of heart disease, high blood pressure, kidney or nervous system problems.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. There are no known lead service lines in our water distribution system. We are responsible for providing high quality drinking water, but we cannot control the variety of materials used in plumbing components. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Before drinking, flush your pipes for several minutes by running your tap, taking a shower, doing laundry or a load of dishes. You can also use a filter certified to remove lead from drinking water. If you are concerned about lead in your water you may wish to have your water tested, call 311 or access our website at **sfwater.org/leadtest** to apply for lead testing analysis at a minimal fee. Information about lead in drinking water, testing methods, and steps you can take to minimize exposure is available at **epa.gov/safewater/lead**.

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

2020 ANNUAL WATER QUALITY REPORT

CITY OF SAN FRANCISCO

UNDERSTANDING THIS REPORT

The San Francisco Public Utilities Commission (SFPUC) produces this annual report detailing where your water comes from, how we treat it, and its overall chemical composition. We do this not only to meet a regulatory requirement but also provide an educational opportunity for you to understand our drinking water operations and public health protection efforts.

We are committed to providing high quality drinking water for all our customers. Our system is large and we work across several counties to maintain the system that delivers potable water for your consumption. In addition to the wider system outside of San Francisco, we also maintain a system of reservoirs within San Francisco. It is our hope that this report will not only provide you with greater knowledge of your water, but also an increased understanding of the considerable skill, talent, and effort of the SFPUC staff that goes into ensuring businesses and residents have reliable access to this precious resource.

We're proud of our water, and we hope you are too. Throughout this report, you'll find facts and figures to help expand upon the basic information we're required to provide. We hope you enjoy getting to know a little more about who we are as an Agency and how you can get involved.

WATER FACT:
Bottled water not only contributes to plastic waste and additional carbon emissions in transportation, it is also on average

11 TIMES

more expensive than tap water, and not as heavily regulated as tap water.

OUR DRINKING WATER SOURCES AND TREATMENT

Our drinking water supply consists of surface water and groundwater that are well protected and carefully managed by the SFPUC. These sources are diverse in both the origin and the location with the surface water stored in reservoirs located in the Sierra Nevada, Alameda County and San Mateo County, and groundwater stored in a deep aquifer located in San Francisco and San Mateo counties. Maintaining this variety of sources is an important component of the SFPUC's near- and long-term water supply management strategy. A diverse mix of sources protects us from potential disruptions due to emergencies or natural disasters, provides resiliency during periods of drought, and helps us ensure a long-term, sustainable water supply as we address issues such as climate uncertainty, regulatory changes and population growth.

To meet drinking water standards for consumption, water from all of our surface water sources including the upcountry non-Hetch Hetchy sources (UNHHS) undergoes treatment before it is delivered to our customers. Water from the Hetch Hetchy Reservoir is exempt from state and federal filtration requirements but receives the following treatment: ultraviolet light and chlorine disinfection, pH adjustment for optimum corrosion control, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing the formation of regulated disinfection byproducts. Water from local Bay Area reservoirs in Alameda County and San Mateo County is delivered to Sunol Valley Water Treatment Plant (SVWTP) and Harry Tracy Water Treatment Plant (HTWTP), respectively, and is treated by filtration, disinfection, fluoridation, optimum corrosion control and taste and odor removal processes.

In 2020, the SFPUC did not use the UNHHS; a small amount of groundwater from two local wells was added to our surface water supplies.

WATER FACT:

96% *of the Earth's water is saline,*

2% *is trapped in the polar caps as ice.*

Humans rely on the remaining ***2%*** *for drinking water.*

Source: ***on.doi.gov/3uNqkjV***

WATERSHED PROTECTION

The SFPUC conducts watershed sanitary surveys for the Hetch Hetchy source annually and for the local water sources and UNHHS every five years. The latest sanitary surveys for the local watersheds and the UNHHS watershed were completed in 2021 for the period of 2016-2020. All these surveys together with our stringent watershed protection management activities were completed with support from partner agencies including National Park Service and US Forest Service. The purposes of the surveys are to evaluate the sanitary conditions and water quality of the watersheds and to review results of watershed management activities conducted in the preceding years. Wildfire, wildlife, livestock, and human activities continue to be the potential contamination sources. You may contact the San Francisco District office of the State Water Resources Control Board's Division of Drinking Water (SWRCB-DDW) at **510-620-3474** to review these reports.

WATER QUALITY

The SFPUC regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure the water delivered to you meets or exceeds federal and state drinking water standards. In 2020, we conducted more than **95,400** drinking water tests in the source, transmission, and distribution system. This is in addition to the extensive treatment process control monitoring performed by our certified operators and online instruments.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and the SWRCB-DDW prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

WATER FACT:

Ever wondered how much water it takes to make breakfast?

*On average, it takes about **35 gallons** to produce a cup of coffee beans, **193 gallons** to produce the wheat for a 1lb loaf of bread, and **50 gallons** of water to produce 2 eggs.*

*Source: **waterfootprint.org***

FLUORIDATION AND DENTAL FLUOROSIS

Mandated by State law, water fluoridation is a widely accepted practice proven to be safe and effective for preventing and controlling tooth decay. Our fluoride target level in the water is 0.7 milligram per liter (mg/L, or part per million, ppm), which is consistent with the May 2015 State regulatory guidance on optimal fluoride level. Infants fed formula mixed with water containing fluoride at this level may still have a chance of developing tiny white lines or streaks in their teeth. These marks are referred to as mild to very mild fluorosis, and are often only visible under a microscope. Even in cases where the marks are visible, they do not pose any health risk. The Centers of Disease Control (CDC) considers it safe to use optimally fluoridated water for preparing infant formula. To lessen this chance of dental fluorosis, you may choose to use low-fluoride bottled water to prepare infant formula. Nevertheless, children may still develop dental fluorosis due to fluoride intake from other sources such as food, toothpaste and dental products.

Contact your healthcare provider or SWRCB-DDW if you have concerns about dental fluorosis. For additional information about fluoridation or oral health, visit the SWRCB-DDW website **waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.html**, the CDC website **cdc.gov/fluoridation**, or our website **sfpuc.org/waterquality**.

GET FAMILIAR WITH OUR WATERSHEDS

The system that delivers our water is made up of many different sources of water. We work hard to protect our water and water quality. Find out about each of our reservoirs, how much they contribute to the system and how you can visit them.

A watershed is a land area that collects and channels rainfall and snowmelt by gravity to creeks, streams, and rivers, and eventually to common outflow points such as reservoirs, bays, and the ocean.

CALAVERAS RESERVOIR

FUN FACT:
The largest of our East Bay reservoirs, Calaveras is located near a seismically active fault. The original dam was built in 1925, and was recently replaced along with several upgrades to improve our ability to better manage the watershed's biodiversity.

CHERRY LAKE

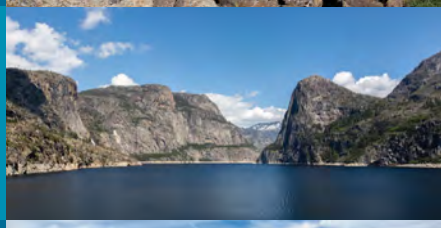
FUN FACT:
This is the only lake in our system where recreational boating is permitted on the water itself, as this is only an emergency supply. Maintained in partnership with the US Forest Service, Cherry Lake is a popular recreation spot for locals and visitors alike.

CRYSTAL SPRINGS RESERVOIR

FUN FACT:
Actually consisting of two reservoirs, Upper and Lower Crystal Springs together provide one of the most accessible watersheds to visit offering the opportunity to walk, hike, and even attend docent lead bike tours along nearby trails.

HETCH HETCHY RESERVOIR

FUN FACT:
The name of our largest reservoir is Miwok for "Valley of the Two Trees", which refers to a pair of pines that once stood at the head of Hetch Hetchy Valley. Miwok names are still used throughout the area, including the two waterfalls Tueeulala Fall, Wapama Fall, and Kolana Rock.

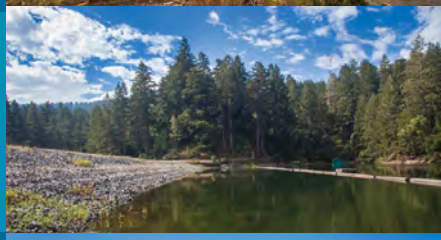


LAKE ELEANOR

FUN FACT:
Although the current lake was created by the damming of the Eleanor Creek in 1918, there was a smaller natural lake located at the same site, and bearing the same name. Today, visitors can take advantage of trails primarily used for moderate hikes as well as the campground.

PILARCITOS RESERVOIR

FUN FACT:
Construction of Pilarcitos Dam began in 1862, and was completed in 1866. It was raised in 1867 and 1874. The dam is an earth fill dam with a clay puddle core, and a height of 95 feet from foundation to crest. The reservoir has a capacity of just over 1 billion gallons. It serves as a key water supply for Half Moon Bay.



SAN ANDREAS RESERVOIR

FUN FACT:
As the name would suggest, the San Andreas fault runs through the Reservoir, and the dam holding back the reservoir survived the 1906 earthquake. The 6-mile long Sawyer Camp Trail links San Andreas and Crystal Springs reservoirs.

SAN ANTONIO RESERVOIR

FUN FACT:
Located near the town of Sunol in Alameda County, This reservoir was impounded in 1964 by Turner Dam, named after former General Manager of Hetch Hetchy, James H. Turner. Like Calaveras, it is closed to the public.

WATER FACT:
The cost of SF tap water averages at

$0.002
PER GALLON

SPECIAL HEALTH NEEDS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people and infants, can be particularly at risk from infections.

These people should seek advice about drinking water from their healthcare providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline **800-426-4791** or at **epa.gov/safewater**.

BORON DETECTION ABOVE NOTIFICATION LEVEL IN SOURCE WATER

In 2020, boron was detected at a level of 1.06 ppm in the raw water stored in Pond F3 East, an approved source in Alameda Watershed. This detection is lower than those in the past, and is slightly above the California Notification level (NL). Boron is an element in nature, and is typically released into air and water when soils and rocks naturally weather. Currently there is no drinking water standard for this naturally-occurring contaminant.

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

PFAS is a group of approximately 5,000 man-made, persistent chemicals used in a variety of industries and consumer products. We previously reported that a voluntary round of PFAS monitoring at our surface water sources and some groundwater wells was conducted in 2019. The objective is to identify if our supply sources and water in the distribution system are impacted by PFAS. No PFAS was detected in our water sources; only one PFAS contaminant, ADONA, was slightly detected at a level of 2.7 parts per trillion in our distribution system. In 2020, another round of voluntary monitoring for PFAS was completed for the two new groundwater wells in the Golden Gate Park; no PFAS contaminants were detected. Considering a new PFAS analytical method recently adopted by the USEPA for some more PFAS contaminants, we plan to conduct another round of PFAS monitoring in 2021. For additional information about PFAS, visit our website at **sfpuc.org/waterquality**, SWRCB-DDW website **waterboards.ca.gov/pfas**, and/or USEPA website **epa.gov/pfas**.

CONTAMINANTS AND REGULATIONS

Generally, the sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants, and may be present in source water as:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife,

Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming,

Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses,

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application and septic systems,

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline **800-426-4791**, or at **epa.gov/safewater**.

WATER FACT:

Since 2010, the SFPUC has funded the installation of over ***170 Drink-Tap Stations****, including* ***12*** *installed in January 2021 in collaboration with neighborhood groups and the City's COVID Command Center to support COVID recovery efforts.*

DRINKING WATER AND LEAD

Exposure to lead, if present, can cause serious health effects in all age groups, especially for pregnant women and young children. Infants and children who drink water containing lead could have decreases in IQ and attention span and increases in learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney or nervous system problems.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high quality drinking water and removing lead pipes, but we cannot control the variety of materials used in plumbing components in your home. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your pipes for several minutes, such as running your tap, taking a shower, doing laundry or a load of dishes, before using water for drinking and cooking. You can also use a filter certified by an American National Standards Institute accredited certifier to remove lead from drinking water. If you are concerned about lead in your water you may wish to have your water tested, call 311 or access our website at **sfpuc.org/lead** to apply for lead testing analysis at a minimal fee. Information about lead in drinking water, testing methods, and steps you can take to minimize exposure is available at **epa.gov/safewater/lead**.

In addition to our water source protection efforts, we continue the following programs to minimize customer exposure to lead in water:

- Replacing the remaining 2% of brass meters with lead-free automated water meters
- Annual monitoring for lead at transmission system's entry points (monitoring results in 2020 were non-detect)
- Offering in partnership with the San Francisco Department of Public Health free lead test vouchers for clients enrolled in the Women, Infants and Children (WIC) program
- Offering low-cost water tests for lead at $25 per tap. To request a test, call **311** or visit our website **sfpuc.org/lead** for an application form

LEAD USER SERVICE LINE (LUSL)

In 2020, we continued inspecting and characterizing the 10,912 service lines of unknown material and 4,524 service lines suspected of having lead components, as known as LUSLs. These figures were first reported to SWRCB-DDW in July 2018. Results of field investigations, as well as a schedule to replace known LUSLs, were reported to the SWRCB-DDW in July 2020. As of April 2021, there remains 4,481 service lines of unknown material and 4,434 LUSLs to be field verified by the end of 2022. The LUSL inventory and map are accessible to public and can be found at **sfpuc.org/waterquality**. Investigations at schools and licensed child care centers are prioritized in the schedule. Our policy is to remove and replace any LUSL promptly if it is discovered during pipeline repair and/or maintenance. We are also conducting a pilot study to determine the effects of the lead components on lead levels at customer taps.

WATER FACT:

*Only **14 countries** report high levels of community and user participation for collaborative management and decision-making.*

*Source: **: UN Water: SDG6 Water and Sanitation for All, 2021.***

bit.ly/3mOgag7

LEAD AND COPPER TAP SAMPLING RESULTS

We conducted our triennial Lead and Copper Rule (LCR) monitoring in 2018, and these tap sampling results are accessible at **sfpuc.org/waterquality**. LCR monitoring occurs at household taps within residences. The results do not represent lead and copper concentrations throughout the distribution system. The next round of LCR monitoring will be in 2021.

LEAD IN SCHOOLS

We assisted a total of 190 public and private K-12 schools in lead monitoring for their tap water between 2017 and 2019. School monitoring data can be found at **sfpuc.org/lead**. Presently we are working with San Francisco Unified School District to develop a voluntary, 5-year recurring monitoring program to provide continued support to local schools in addressing lead in their tap water. However, due to COVID-19 situation, discussions with the school district has been postponed.

KEY WATER QUALITY TERMS

The following are definitions of key terms referring to standards and goals of water quality noted on the data table.

Public Health Goal (PHG): 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.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): 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 (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): 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.

Maximum Residual Disinfectant Level Goal (MRDLG): 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.

Primary Drinking Water Standard (PDWS): MCLs, MRDLs, and TT (see below) for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

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

Turbidity: A water clarity indicator that measures cloudiness of the water, and is also used to indicate the effectiveness of the filtration system. High turbidity can hinder the effectiveness of disinfectants.

Cryptosporidium is a parasitic microbe found in most surface water. We regularly test for this waterborne pathogen and found it at very low levels in source water and treated water in 2020. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

OUR WATER IN THE COMMUNITY: THE WESTSIDE ENHANCED WATER RECYCLING PROJECT

On the west side of San Francisco, we are aiming to save up to 2 million gallons per day (mgd) on average of drinking water that is currently used for non-drinking purposes such as irrigation and lake fill. Recycled water will be delivered for these uses through a system of pipelines, pump stations, storage tanks and reservoirs. The system will bring recycled water from the recycled water treatment facility to Golden Gate Park, Lincoln Park Golf Course, the Presidio Golf Course and other landscaped areas for irrigation.

Almost 8 miles of new recycled water pipelines have been constructed mostly under City streets. These pipelines will bring recycled water from the newly constructed treatment facility to sites where the water will be used. Construction has also begun on an underground recycled water reservoir, and above-ground recycled water pump station in Golden Gate Park that will pump recycled water to Lincoln Park and the Presidio.

SAN FRANCISCO WATER SYSTEM-WATER QUALITY DATA FOR 2020

The table below lists detected contaminants in our drinking water in 2020 and the information about their typical sources. Contaminants below detection limits for reporting are not shown, in accord with regulatory guidance. We hold a SWRCB-DDW monitoring waiver for some contaminants in our surface water supply and therefore their monitoring frequencies are less than annual. Visit **sfpuc.org/waterquality** for a list of all water quality parameters we monitored in raw water and treated water in 2020.

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE OR LEVEL FOUND	AVERAGE OR [MAX]	MAJOR SOURCES IN DRINKING WATER
TURBIDITY						
Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.5 (1)	[1.3]	Soil runoff
Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 (2)	N/A	-	[0.4]	Soil runoff
	-	Min 95% of samples ≤0.3 NTU (2)	N/A	99.8% - 100%	-	Soil runoff
Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 (2)	N/A	-	[0.1]	Soil runoff
	-	Min 95% of samples ≤0.3 NTU (2)	N/A	100%	-	Soil runoff
DISINFECTION BY-PRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	13 - 43	[43] (3)	By-product of drinking water disinfection
Haloacetic Acids	ppb	60	N/A	10 - 33	[35] (3)	By-product of drinking water disinfection
Total Organic Carbon (4)	ppm	TT	N/A	1.7 - 3.4	2.9	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform	-	NoP ≤5.0% of monthly samples	(0)	-	[0.6%]	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	0 - 0.05	0.01	Naturally present in the environment
INORGANICS						
Fluoride (source water) (5)	ppm	2.0	1	ND - 0.7	0.3 (6)	Erosion of natural deposits; water additive to promote strong teeth
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.1 - 3.5	[2.5] (7)	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	UNIT	SMCL	PHG	RANGE	AVERAGE	MAJOR SOURCES OF CONTAMINANT
Chloride	ppm	500	N/A	<3 - 15	9	Runoff / leaching from natural deposits
Specific Conductance	µS/cm	1600	N/A	30 - 260	160	Substances that form ions when in water
Sulfate	ppm	500	N/A	1 - 34	17	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	<20 - 137	72	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	ND - 0.2	ND	Soil runoff

LEAD AND COPPER (8)	UNIT	AL	PHG	RANGE	90TH PERCENTILE	MAJOR SOURCES IN DRINKING WATER
Copper	ppb	1300	300	ND - 103	64	Internal corrosion of household water plumbing systems
Lead	ppb	15	0.2	<1 - 90	6	Internal corrosion of household water plumbing systems

OTHER WATER QUALITY PARAMETERS	UNIT	ORL	RANGE	AVERAGE
Alkalinity (as $CaCO_3$)	ppm	N/A	6.7 - 138	55
Calcium (as Ca)	ppm	N/A	2.9 - 22	12
Chlorate (9)	ppb	800 (NL)	67 - 1200	262
Hardness (as $CaCO_3$)	ppm	N/A	8.0 - 79	45
Magnesium	ppm	N/A	0.2 - 6.8	4.0
pH	-	N/A	8.1 - 9.8	9.3
Potassium	ppm	N/A	0.3 - 1.3	0.8
Silica	ppm	N/A	2.8 - 7	4.8
Sodium	ppm	N/A	2.4 - 22	14
Strontium	ppb	N/A	14 - 242	110

KEY

< / ≤	=	less than / less than or equal to
AL	=	Action Level
Max	=	Maximum
Min	=	Minimum
N/A	=	Not Available
ND	=	Non-Detect
NL	=	Notification Level
NoP	=	Number of Coliform-Positive Sample
NTU	=	Nephelometric Turbidity Unit
ORL	=	Other Regulatory Level
ppb	=	part per billion
ppm	=	part per million
µS/cm	=	microSiemens/centimeter

FOOTNOTES ON SAN FRANCISCO WATER SYSTEM - WATER QUALITY DATA:

(1) These are monthly average turbidity values measured every 4 hours daily. **(2)** There is no turbidity MCL for filtered water. The limits are based on the TT requirements for filtration systems. **(3)** This is the highest locational running annual average value. **(4)** Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only. **(5)** The SWRCB -DDW recommended an optimal fluoride level of 0.7 ppm be maintained in the treated water. In 2020, the range and average of the fluoride levels were 0.6 ppm - 0.9 ppm and 0.7 ppm, respectively. **(6)** Natural fluoride in the Hetch Hetchy source was ND. Elevated fluoride levels in the raw water at

the SVWTP and HTWTP were attributed to the transfer of fluoridated Hetch Hetchy water into the local reservoirs. **(7)** This is the highest running annual average value. **(8)** The most recent Lead and Copper Rule monitoring was in August 2018. Two of the 90 site samples collected at consumer taps had lead concentrations above the AL. **(9)** The detected chlorate in the treated water is a degradation product of sodium hypochlorite, which we use for water disinfection.

Note: The different water sources blended at different ratios throughout the year have resulted in varying water quality. Additional water quality data may be obtained by calling our Water Quality Division toll-free number at 877-737-8297.

San Francisco Local Groundwater - Water Quality Data for Year 2020

Treated Water (Sunset Reservoir)

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE OR LEVEL FOUND	AVERAGE	MAJOR SOURCES IN DRINKING WATER
INORGANICS						
Chromium (VI)	ppb	N/A [1]	0.02	ND - 1.3	ND	Leaching from natural deposits; waste discharges from electroplating
Nitrate (as nitrogen)	ppm	10	10	ND - 0.5	ND	Landscape fertilizers and leaked wastewater
Fluoride	ppm	2.0 (Natural-Source)	1	0.7	0.7	Erosion of natural deposits; water additive to promote strong teeth
DETECTED CONTAMINANTS	**UNIT**	**SMCL**	**PHG**	**RANGE OR LEVEL FOUND**	**AVERAGE**	**MAJOR SOURCES OF CONTAMIANT**
CONSTITUENTS WITH SECONDARY STANDARDS						
Chloride	ppm	500	N/A	5.5 - 6.2	5.9	Runoff / leaching from natural deposits
Color	Unit	15	N/A	5	5	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	N/A	57 - 325	138	Substances that form ions when in water
Sulfate	ppm	500	N/A	2.3 - 3.5	2.9	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	25 - 73	50	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.1	0.1	Soil runoff
OTHER WATER QUALITY PARAMETERS	**UNIT**	**ORL**		**RANGE**	**AVERAGE**	
Strontium	ppb	N/A		22 - 28	25	

Raw Water (San Francisco Local Groundwater Wells)

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE	AVERAGE	MAJOR SOURCES IN DRINKING WATER
INORGANICS [2]						
Chromium (VI)	ppb	N/A [1]	0.02	2.5 - 23	14.7	Leaching from natural deposits; waste discharges from electroplating
Chromium (Total)	ppb	50	(100)	ND - 21	10.7	Erosion of natural deposits; discharge from electroplating
Nitrate (as nitrogen)	ppm	10	10	3.1 - 9.4	5.8	Landscape fertilizers and leaked wastewater
VOLATILE ORGANICS						
Carbon tetrachloride [3]	ppb	0.5	0.1	0.6 - 0.9	0.7	Commercial and industrial solvent used in dry cleaning prior to 1960
Tetrachloroethylene [4]	ppb	5	0.06	1.5 - 2.2	1.9	Commercial and industrial solvent used in dry cleaning prior to 2010, and as a metal degreaser in auto shops and metalworking industries
OTHER WATER QUALITY PARAMETERS	**UNIT**	**ORL**		**RANGE**	**AVERAGE**	
pH	-	N/A		7.3 - 8.3	7.8	
Strontium	ppb	N/A		131 - 187	159	
Vanadium	ppb	50 (NL)		5.9 - 7	6.5	

FOOTNOTES ON SAN FRANCISCO LOCAL GROUNDWATER - WATER QUALITY DATA:

(1) Chromium (VI) is currently regulated by the SWRCB-DDW under a MCL of 50 ppb for total chromium. The results of total chromium monitoring in treated water were ND in 2020. **(2)** The concentration ranges and averages of these contaminants are indicative of the raw groundwater quality prior to blending, which is approved by SWRCB-DDW as a treatment for groundwater. They are not representative of water in the distribution system. In 2020, only two wells (Lake Merced Well and West Sunset Well) delivered groundwater to the distribution system intermittently. **(3)** Carbon tetrachloride was detected above the MCL in the raw water at South Sunset Well; however, the well was not in operation throughout 2020. **(4)** Tetrachloroethylene was slightly detected in the raw water at Golden Gate Central Well, which supplied Golden Gate Park throughout 2020 for irrigation only.

San Francisco
Water
Power
Sewer
Services of the San Francisco
Public Utilities Commission

P.O. Box 7369
San Francisco, CA 94120-7369

@MySFPUC

Interested in learning more? Our Commission meets monthly, and more details are on our website

sfpuc.org/commission

This report contains important information about our drinking water. Please contact SFPUC Communications at **415-554-3289** or email **info@sfwater.org** for assistance.

Este informe contiene información muy importante sobre su agua para beber. Favor de comunicarse SFPUC a **415-554-3289** para asistirlo en español con alguien que lo entienda bien.

此份水質報告，內有重要資訊。請找他人為你翻譯和解說清楚。

San Francisco Public Utilities Commission

Every day we deliver high-quality drinking water to 2.7 million people in San Francisco, Alameda, Santa Clara and San Mateo counties. We generate clean, reliable hydroelectricity that powers 100% of San Francisco's vital services, including police and fire stations, street lights, Muni, SF General Hospital and more.

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است. اگر نمیتوانید این اطلاعات را بزبان انگلیسی بخوانید لطفاً از کسی که میتواند یاری بگیرید تا مطالب را برای شما به فارسی ترجمه کند.

Cé rapport contient des information importantes concernant votre eau potable. Veuillez traduire, ou parlez avec quelqu' un qui peut le comprendre.

"هذا ألتقرير يحتوي على معلومآ ت مهمّة تتعلق بمياه ألشفة (أو ألشرب). ترجم ألتقرير , أو تكلم مع شخص يستطيع أن يفهم ألتقرير."

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

הדו"ח הזה מכיל מידע חשוב לגבי מי השתייה שלך
תרגם את הדו"ח או דבר עם מישהו שמבין אותו

此份水質報告, 內有重要資訊。請找他人為你翻譯和解說清楚。

Chi tiết này thật quan trọng. Xin nhờ người dịch cho quý vị.

Dieser Bericht enthält wichtige Information über Ihr Trinkwasser. Bitte übersetzen Sie ihn oder sprechen Sie mit jemandem, der ihn versteht.

Questo rapporto contiene informazioni importanti che riguardano la vostra aqua potabile. Traducetelo, o parlate con una persona qualificata in grado di spiegarvelo.

この報告書には上水道に関する重要な情報が記されております。翻訳を御依頼なされるか、内容をご理解なさっておられる方にお尋ね下さい。

यह सूचना महत्वपूर्ण है । कृपा करके किसी से :सका अनुवाद करायें ।

이 안내는 매우 중요합니다. 본인을 위해 번역인을 사용하십시요.

Η κατοθεν αναφορα παρουσιαζη σπουδαιες πληροφορειες για το ποσιμο νερο σας. Πρακακλω να το μεταφρασετε η να το σξολειασετε με καποιον που το καταλαβαινη απολητως.

2021 ANNUAL WATER QUALITY REPORT

CITY OF SAN FRANCISCO

Our Tap Water

The San Francisco Public Utilities Commission (SFPUC) provides 2.7 million customers in cities and towns across the region with water so pure that it meets all federal and state standards. Through careful stewardship of both our natural resources and our infrastructure, every drop that arrives at your home or business is clean and of the highest quality. However, long-term climate change and recent years of reduced rainfall require all of us to rethink the way we use this precious resource.

In response to the three years of nearly statewide drought, in November 2021 the SFPUC declared a Water Shortage Emergency to help extend our water supplies. The SFPUC is asking all of our customers in San Francisco, San Mateo, Santa Clara, and Alameda counties to reduce their water use by cutting waste. Visit **sfpuc.org/drought** for ways you can help.

Understanding This Report

The SFPUC produces a Water Quality Report every year in order to provide specific information about where your water comes from, how we treat it, and its overall chemical composition. We do this not only to meet regulatory requirements but also to provide you with clear and important information about our drinking water operations and our public health protection efforts.

We are committed to providing high quality drinking water for all our customers. The SFPUC operates and maintains a water system that extends over a hundred miles across several counties to deliver potable water for consumption by millions of individuals. In addition to the system of reservoirs within San Francisco, the SFPUC also maintains a wider system of reservoirs and pipelines on the Peninsula, in the South Bay, and upcountry in the Yosemite Valley. It is our hope that this report will not only provide you with greater knowledge of your water, but also an increased confidence in the skills, talents, and efforts of our staff that ensure the highest quality water for every one of our customers.

We're proud of our water, and we need your help in conserving it. Throughout this report, you'll find facts and figures to help expand upon the basic information we're required to provide. We hope you enjoy getting to know a little more about who we are as an Agency and how you can help make a difference.

WAYS TO SAVE

FIX LEAKS RIGHT AWAY

A leaking faucet wastes hundreds of gallons of water a month. Fix leaks to save water and avoid bill increases.

Our Drinking Water Sources and Treatment

Most of our drinking water supply comes from the San Francisco Regional Water System (SFRWS), which is the wholesale system owned and operated by the SFPUC. The supply consists of surface water and groundwater that are well protected and carefully managed. These sources are diverse in both origin and location with the surface water stored in reservoirs located in the Sierra Nevada, Alameda County and San Mateo County, as well as groundwater stored in a deep aquifer located in the northern part of San Mateo County and the western side of San Francisco. Maintaining this variety of sources is an important component of the SFPUC's near- and long-term water supply management strategy. A diverse mix of sources protects us from potential disruptions due to emergencies or natural disasters, provides resiliency during periods of drought, and helps us ensure a long-term, sustainable water supply as we address issues such as climate uncertainty, regulatory changes, and population growth.

To meet drinking water standards for consumption, all surface water supplies including the upcountry non-Hetch Hetchy sources (UNHHS) undergo treatment by the SFRWS before it is delivered. Although the water from Hetch Hetchy Reservoir is exempt from state and federal filtration requirements, it receives the following treatment: disinfection using ultraviolet light and chlorine, pH adjustment for optimum corrosion control, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing the formation of regulated disinfection byproducts. Water from local Bay Area reservoirs in Alameda County and UNHHS is delivered to Sunol Valley Water Treatment Plant (SVWTP); whereas water from local reservoirs in San Mateo County is delivered to Harry Tracy Water Treatment Plant (HTWTP). Water treatment at these plants consist of filtration, disinfection, fluoridation, optimum corrosion control, and taste and odor removal.

In 2021, no UNHHS water was used. However, a small amount of groundwater was added to our surface water supplies through blending in the transmission pipelines and Sunset Reservoir.

Protection of Watersheds

The SFPUC conducts watershed sanitary surveys for the Hetch Hetchy source annually and for non-Hetch Hetchy surface water sources every five years. The latest sanitary surveys for the non-Hetch Hetchy watersheds were completed in 2021 for the period of 2016-2020. All these surveys, together with SFRWS's stringent watershed protection management activities, were completed with support from partner agencies including National Park Service and US Forest Service. The purposes of the surveys are to evaluate the sanitary conditions and water quality of the watersheds and to review results of watershed management activities conducted in the preceding years. Wildfire, wildlife, livestock, and human activities continue to be the potential contamination sources. You may contact the San Francisco District office of the State Water Resources Control Board's Division of Drinking Water (SWRCB) at **510-620-3474** for more information.

Water Quality

We regularly collect and test water samples from reservoirs and designated sampling points throughout the systems to ensure the water delivered to you meets all federal and state drinking water standards. In 2021, we conducted more than **95,190** drinking water tests in the source, transmission, and distribution system. This is in addition to the extensive treatment process control monitoring performed by our certified operators and online instruments.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. To ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and the SWRCB prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

WAYS TO SAVE

SHOWERS

Showers can use up to a gallon a minute, so shorter showers really save. Get a water-efficient showerhead before you lather, rinse, and repeat.

Fluoridation and Dental Fluorosis

Mandated by State law, water fluoridation is a widely accepted practice proven safe and effective for preventing and controlling tooth decay. Our fluoride target level in the water is 0.7 milligram per liter (mg/L, or part per million, ppm), which is consistent with the May 2015 State regulatory guidance on optimal fluoride level. Infants fed formula mixed with water containing fluoride at this level may still have a chance of developing tiny white lines or streaks in their teeth. These marks are referred to as mild to very mild fluorosis, and are often only visible under a microscope. Even in cases where the marks are visible, they do not pose any health risk. The Centers of Disease Control (CDC) considers it safe to use optimally fluoridated water for preparing infant formula. To lessen this chance of dental fluorosis, you may choose to use low-fluoride bottled water to prepare infant formula. Nevertheless, children may still develop dental fluorosis due to fluoride intake from other sources such as food, toothpaste, and dental products.

Contact your healthcare provider or the SWRCB if you have concerns about dental fluorosis. For additional information about fluoridation or oral health, visit the SWRCB website **waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.html**, the CDC website **cdc.gov/fluoridation**, or our website **sfpuc.org/tapwater**.

Get Familiar With Our Watersheds

The system that delivers our water is made up of many different sources of water. We work hard to protect our water and water quality. Find out about each of our reservoirs, how much they contribute to the system and how you can visit them.

A watershed is a land area that collects and channels rainfall and snowmelt by gravity to creeks, streams, and rivers, and eventually to common outflow points such as reservoirs, bays, and the ocean.

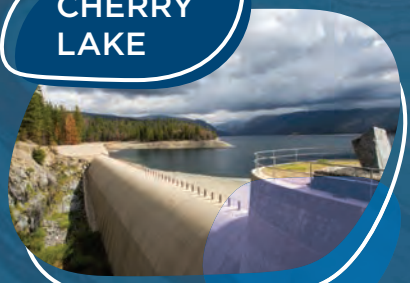
CALAVERAS RESERVOIR

FUN FACT:
The largest of our East Bay reservoirs, Calaveras is located near a seismically active fault. The original dam was built in 1925, and was recently replaced along with several upgrades to improve our ability to better manage the watershed's biodiversity.

LAKE ELEANOR

FUN FACT:
Although the current lake was created by the damming of the Eleanor Creek in 1918, there was a smaller natural lake located at the same site, and bearing the same name. Today, visitors can take advantage of trails primarily used for moderate hikes as well as the campground.

CHERRY LAKE



FUN FACT:
Cherry Lake is a popular recreation spot for local and visitors alike. It provides emergency backup water supply to our system, and recreational boating is permitted on the water itself. This reservoir is maintained in partnership with US Forest Service.

PILARCITOS RESERVOIR

FUN FACT:
Construction of Pilarcitos Dam began in 1862, and was completed in 1866. It was raised in 1867 and 1874. The dam is an earth fill dam with a clay puddle core, and a height of 95 feet from foundation to crest. The reservoir has a capacity of just over 1 billion gallons. It serves as a key water supply for Half Moon Bay.

CRYSTAL SPRINGS RESERVOIR

FUN FACT:
Actually consisting of two reservoirs, Upper and Lower Crystal Springs together provide one of the most accessible watersheds to visit offering the opportunity to walk, hike, and even attend docent lead bike tours along nearby trails.

SAN ANDREAS RESERVOIR

FUN FACT:
As the name would suggest, the San Andreas fault runs through the reservoir, and the dam holding back the reservoir survived the 1906 earthquake. The 6-mile long Sawyer Camp Trail links San Andreas and Crystal Springs reservoirs.

HETCH HETCHY RESERVOIR

FUN FACT:
The name of our largest reservoir ikely comes from the Miwok word, hatchhatchie, meaning "edible grasses." Miwok names are still used throughout the area, including the two waterfalls Tueeulala Fall, Wapama Fall, and Kolana Rock.

SAN ANTONIO RESERVOIR

FUN FACT:
Located near the town of Sunol in Alameda County, this reservoir was impounded in 1964 by Turner Dam, named after former General Manager of Hetch Hetchy, James H. Turner. Like Calaveras, it is closed to the public.

Special Health Needs

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, and some elderly people and infants, can be particularly at risk from infections.

These people should seek advice about drinking water from their healthcare providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline **800-426-4791** or at **epa.gov/safewater**.

Per-and Polyfluoroalkyl Substances (PFAS)

PFAS is a group of approximately 5,000 man-made, persistent chemicals used in a variety of industries and consumer products. In 2021, we conducted a second round of voluntary monitoring using a new analytical method adopted by the USEPA for some other PFAS contaminants. No PFAS were detected above the SWRCB's Consumer Confidence Report Detection Levels in our surface water and groundwater sources. For additional information about PFAS, you may visit SWRCB website **waterboards.ca.gov/pfas**, SFPUC website **sfpuc.org/tapwater**, and/or USEPA website **epa.gov/pfas**.

Contaminants and Regulations

Generally, the sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants, and may be present in source water as:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife

Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming

Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities

More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline **800-426-4791**, or at **epa.gov/safewater**.

WAYS TO SAVE

LAWNS AND GARDENS

Use water-wise principles when caring for lawns and gardens -- select climate appropriate plants, efficient irrigation and conservation-friendly design.

Drinking Water and Lead

Exposure to lead, if present, can cause serious health effects in all age groups, especially for pregnant women and young children. Infants and children who drink water containing lead could have decreases in IQ and attention span and increases in learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney or nervous system problems.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. There are no known lead service lines in our water distribution system. We are responsible for providing high quality drinking water and removing lead pipes, but we cannot control the variety of materials used in plumbing components in your home. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. You can take responsibility by identifying and removing lead materials within your home plumbing and by taking steps to reduce your family's risk. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your pipes for several minutes, such as running your tap, taking a shower, doing laundry or a load of dishes, before using water for drinking and cooking. You can also use a filter certified by an American National Standards Institute accredited certifier to remove lead from drinking water. If you are concerned about lead in your water you may wish to have your water tested, call 311 or access our website at **sfpuc.org/leadtest** to apply for lead testing analysis at a minimal fee. Information about lead in drinking water, testing methods, and steps you can take to minimize exposure is available at **epa.gov/safewater/lead**.

In addition to our water source protection efforts, we continue the following programs to minimize customer exposure to lead in water:

- Replace the remaining 0.33% of brass meters with lead-free automated water meters to the practicable extent
- Conduct annual monitoring for lead at the entry points to the SFRWS
- Offer in partnership with the San Francisco Department of Public Health free lead test vouchers for clients enrolled in the Women, Infants and Children program
- Offer low-cost water tests for lead for $25 per tap

Lead User Service Line (LUSL)

In July 2020, the SFPUC submitted a 10-year lead component replacement schedule to the SWRCB and began replacing the estimated 1,578 galvanized steel services lines that may have lead whips. The schedule includes field inspection to confirm the unknown material service lines. If a galvanized service line is found or the unknown material cannot be verified, the service line is scheduled for replacement. The SFWS created a Lead Service Line Replacement Program with a customer lookup map, which is posted on SFPUC's website, **sfpuc.org/lead**. A customer can use the map to identify if the address has an unknown or galvanized service line.

In July 2021, the 10-year lead component replacement schedule was updated with the number of unknowns and galvanized services that remained to be inspected. New changes also reflected that customers in disadvantaged neighborhood areas would be distributed equitably in the monthly field inspection and replacement schedule. As of May 2022, there are 1,031 galvanized service lines confirmed and 2,904 field inspections to be done. We also began the preparation of material inventory for customer-side service line: 5207 field inspection were done and 406 service lines were determined as galvanized.

Between 2019 and 2021, staff conducted a pilot study evaluating the lead levels at residences in SFWS where LUSLs were subsequently replaced. A total of 36 participants volunteered for the study, of which the results indicated that lead levels in tap samples after LUSL replacement increased slightly and then dropped to levels lower than the Action Level. Some of these participants still have noticeable lead results in their first 1-liter samples, suggesting that the household plumbing is still a contributor to the lead detected in the tap water. These are consistent with industry findings. See **sfpuc.org/lead** for the SFWS report on "Impact of Lead Components on Household Lead Levels at the Tap", dated March 2022.

Lead and Copper Tap Sampling Results

We conducted our triennial Lead and Copper Rule (LCR) monitoring in 2021, when we sample from customer taps rather than our distribution system, and these sampling results are accessible at **sfpuc.org/lead**. The next round of LCR monitoring will be in 2024.

Lead Tests in Childcare Facilities and Public Schools

Presently we are working with San Francisco Unified School District to help develop a long-term, recurring lead monitoring program for the K-12 schools. We are also assisting the school district in completing lead sampling in childcare centers on public school campuses by late 2022.

State Revised Total Coliform Rule

This report reflects changes in drinking water regulatory requirements during 2021, in which the SWRCB adopted the California version of the federal Revised Total Coliform Rule. The revised rule, effective on July 1, 2021, maintains the purpose to protect public health by ensuring the integrity of the drinking water distribution system and monitoring for the presence of microbes (i.e., total coliform and *E. coli* bacteria). Greater public health protection is anticipated, as the revised rule requires water systems that are vulnerable to microbial contamination to identify and fix problems. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment to determine if any sanitary defects exist. If found, these must be corrected by the water system.

Carbon Tetrachloride Detection in Groundwater Source

In 2021, we detected carbon tetrachloride at levels above the California MCL in groundwater source at West Sunset Well (WSW). However, water from WSW was blended with treated surface water in Sunset Reservoir and the contaminant was not detected in the blend water that was served to the system. Upon confirmed detection, we have suspended the operation of WSW indefinitely.

WAYS TO SAVE

OUTDOORS

Landscaping with native plants attracts beneficial bugs and minimizes the need for chemicals.

sfpuc.org/savewater

Key Water Quality Terms

The following are definitions of key terms referring to standards and goals of water quality noted on the data table.

Public Health Goal (PHG): 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.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): 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 (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): 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.

Maximum Residual Disinfectant Level Goal (MRDLG): 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.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

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

Turbidity: A water clarity indicator that measures cloudiness of the water, and is also used to indicate the effectiveness of the filtration system. High turbidity can hinder the effectiveness of disinfectants.

Cryptosporidium is a parasitic microbe found in most surface water. We regularly test for this waterborne pathogen and found it at very low levels in source water and treated water in 2021. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

Recycling a Precious Resource

Drinking water is precious – in both drought and downpour. Once it has been treated, wastewater from homes and businesses can have a second life when used for non-drinking purposes such as irrigation and filling lakes. Starting in late 2022, highly treated wastewater from our Oceanside Wastewater Treatment Plant will irrigate Golden Gate Park. This frees up more groundwater to add to our drinking water system, enough to serve 47,000 San Franciscans.

Already, almost 8 miles of dedicated pipelines have been constructed to bring recycled water from the newly constructed treatment facility to these sites. Construction has also begun on an underground recycled water reservoir, and above-ground recycled water pump station in Golden Gate Park that will pump recycled water to Lincoln Park and the Presidio.

Learn more about how we make the most out of every drop at **sfpuc.org**.

San Francisco Water System - Water Quality Data for 2021

This report is a snapshot of last year's water quality. The tables below list detected contaminants in our drinking water in 2021 and the information about their typical sources. Contaminants below detection limits for reporting are not shown, in accord with regulatory guidance. The SFRWS holds a SWRCB monitoring waiver for some contaminants in the surface water supply and therefore their monitoring frequencies are less than annual. Visit **sfpuc.org/waterquality** for a list of all water quality parameters we monitored in raw water and treated water in 2021.

DETECTED CONTAMINANTS	UNIT	MCL/TT	PHG OR (MCLG)	RANGE OR LEVEL FOUND	AVERAGE OR [MAX]	TYPICAL SOURCES IN DRINKING WATER
TURBIDITY						
Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.4 [1]	[3.3]	Soil runoff
Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 [2]	N/A	-	[0.4]	Soil runoff
	-	Min 95% of samples ≤0.3 NTU [2]	N/A	99.8% - 100%	-	Soil runoff
Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 [2]	N/A	-	[0.2]	Soil runoff
	-	Min 95% of samples ≤0.3 NTU [2]	N/A	100%	-	Soil runoff
DISINFECTION BY-PRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	9.4 - 4.7	[36] [3]	By-product of drinking water disinfection
Five Haloacetic Acids	ppb	60	N/A	5.1 - 42	[28] [3]	By-product of drinking water disinfection
Bromate	ppb	10	0.1	ND - 1.9	[2.1] [4]	By-product of drinking water disinfection
Total Organic Carbon [5]	ppm	TT	N/A	1.2 - 2.2	1.8	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform [6]	-	NoP ≤5.0% of monthly samples	(0)	-	[0.0%]	Naturally present in the environment
Fecal coliform and *E. coli* [6]	-	0 Positive Sample	(0)	-	[0]	Human or animal fecal waste
Giardia lamblia	cyst/L	TT	(0)	0 - 0.04	0.01	Naturally present in the environment
INORGANICS						
Fluoride (source water) [7]	ppm	2.0	1	ND - 0.8	0.4 [8]	Erosion of natural deposits; water additive to promote strong teeth
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	<0.1 - 3.8	[2.6] [4]	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	UNIT	SMCL	PHG	RANGE	AVERAGE	TYPICAL SOURCES IN DRINKING WATER
Chloride	ppm	500	N/A	<3 - 11	6.7	Runoff / leaching from natural deposits
Specific Conductance	µS/cm	1600	N/A	34 - 217	135	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.1 - 29	13	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	<20 - 96	52	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	ND - 0.2	ND	Soil runoff

LEAD AND COPPER [9]	UNIT	AL	PHG	RANGE	90TH PERCENTILE	TYPICAL SOURCES IN DRINKING WATER
Copper	ppb	1300	300	ND - 383	60	Internal corrosion of household water plumbing systems
Lead	ppb	15	0.2	ND - 190	7.1	Internal corrosion of household water plumbing systems

NON-REGULATED WATER QUALITY PARAMETERS	UNIT	ORL	RANGE	AVERAGE
Alkalinity (as CaCO3)	ppm	N/A	4.5 - 79	37
Boron	ppb	1000 (NL)	ND - 123	ND
Calcium (as Ca)	ppm	N/A	3 - 17	9.5
Chlorate [10]	ppb	800 (NL)	28 - 420	162
Hardness (as CaCO3)	ppm	N/A	7.7 - 60	34
Magnesium	ppm	N/A	<0.2 - 5.5	2.9
pH	-	N/A	7.9 - 9.7	9.2
Phosphate (ortho)	ppm	N/A	<0.3 - 0.3	<0.3
Potassium	ppm	N/A	0.4 - 1.1	0.7
Silica	ppm	N/A	3 - 5.9	4.8
Sodium	ppm	N/A	3.1 - 17	12
Strontium	ppb	N/A	14 - 181	83

KEY

- < / ≤ = less than / less than or equal to
- AL = Action Level
- Max = Maximum
- Min = Minimum
- N/A = Not Available
- ND = Non-Detect
- NL = Notification Level
- NoP = Number of Coliform-Positive Sample
- NTU = Nephelometric Turbidity Unit
- ORL = Other Regulatory Level
- ppb = part per billion
- ppm = part per million
- µS/cm = microSiemens/centimeter

FOOTNOTES ON SAN FRANCISCO WATER SYSTEM - WATER QUALITY DATA:
(1) These are monthly average turbidity values measured every 4 hours daily. **(2)** This is a TT requirement for filtration systems. **(3)** This is the highest locational running annual average value. **(4)** This is the highest running annual average value. **(5)** Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only. **(6)** The MCL was changed to *E. coli* based starting on July 1, 2021 after the SWRCB adopted the Revised Total Coliform Rule. **(7)** The SWRCB recommended an optimal fluoride level of 0.7 ppm be maintained in the treated water. In 2021, the range and average of the fluoride levels were 0.6 ppm - 0.9 ppm and 0.7 ppm, respectively. **(8)** Natural fluoride in the Hetch Hetchy source was ND. Elevated fluoride levels in the raw water at the SVWTP and HTWTP were attributed to the transfer of fluoridated Hetch Hetchy water into the local reservoirs. **(9)** The most recent Lead and Copper Rule monitoring from consumer taps was in August 2021. Three of the 72 site samples collected at consumer taps had lead concentrations above the AL. **(10)** The detected chlorate in the treated water is a degradation product of sodium hypochlorite, which the SFRWS uses for water disinfection.

Note: The different water sources blended at different ratios throughout the year have resulted in varying water quality. Additional water quality data may be obtained by calling our Water Quality Division toll-free number at 877-737-8297.

San Francisco Local Groundwater - Water Quality Data for Year 2021

Treated Water (Sunset Reservoir)

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE	AVERAGE	TYPICAL SOURCES IN DRINKING WATER
INORGANICS						
Chromium (VI)	ppb	N/A [1]	0.02	ND - 1	ND	Leaching from natural deposits; waste discharges from electroplating
Nitrate (as nitrogen)	ppm	10	10	ND - 0.4	ND	Landscape fertilizers and leaked wastewater
Fluoride	ppm	2.0 (Natural-Source)	1	0.6 - 0.8	0.7	Erosion of natural deposits; water additive to promote strong teeth
CONSTITUENTS WITH SECONDARY STANDARDS	**UNIT**	**SMCL**	**PHG**	**RANGE OR LEVEL FOUND**	**AVERAGE**	**TYPICAL SOURCES IN DRINKING WATER**
Chloride	ppm	500	N/A	4.5 -14	7.2	Runoff / leaching from natural deposits
Specific Conductance	µS/cm	1600	N/A	59 - 221	95	Substances that form ions when in water
Sulfate	ppm	500	N/A	4.3	4.3	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	41	41	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	ND - 0.4	0.2	Soil runoff

Raw Water (San Francisco Local Groundwater Wells)

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE	AVERAGE	TYPICAL SOURCES IN DRINKING WATER
INORGANICS [2]						
Chromium (VI)	ppb	N/A [1]	0.02	6.7 - 23	15	Leaching from natural deposits; waste discharges from electroplating
Chromium	ppb	50	(100)	ND - 23	11	Erosion of natural deposits; discharge from electroplating
Nitrate (as nitrogen)	ppm	10	10	3.1 - 8.2	5.7	Landscape fertilizers and leaked wastewater
VOLATILE ORGANICS						
Carbon tetrachloride [3]	ppb	0.5	0.1	0.6 - 0.9	0.7	Discharge from chemical plants and other industrial activities
Tetrachloroethylene [4]	ppb	5	0.06	1.8 - 2.2	2	Discharge from factories, dry cleaners, and auto shops (metal degreaser)
NON-REGULATED WATER QUALITY PARAMETERS	**UNIT**	**ORL**		**RANGE**	**AVERAGE**	
pH	-	N/A		7.6 - 8.4	7.9	
Strontium	ppb	N/A		127 - 185	156	

FOOTNOTES ON SAN FRANCISCO LOCAL GROUNDWATER - WATER QUALITY DATA:
(1) Chromium (VI) is currently regulated by the SWRCB under a MCL of 50 ppb for total chromium. **(2)** These contaminants are detectable in the raw groundwater. Blending of groundwater with surface water has been approved by SWRCB as treatment for these contaminants. In 2021, only two wells (Lake Merced Well and West Sunset Well) delivered groundwater to the distribution system intermittently. **(3)** This contaminant was detected at South Sunset Well and West Sunset Well but not in the blend water at Sunset Reservoir. South Sunset Well was not in operation in 2021. **(4)** Tetrachloroethylene was detected at Golden Gate Central Well, which supplied to Golden Gate Park throughout 2021 for irrigation only.

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

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Water quality policies are decided at SFPUC Commission hearings, held the 2nd and 4th Tuesdays of each month at 1:30 pm in San Francisco City Hall, Room 400.

Anson Moran, PRESIDENT
Newsha K. Ajami, VICE PRESIDENT
Sophie Maxwell, COMMISSIONER
Tim Paulson, COMMISSIONER

This report contains important information about our drinking water. Please contact SFPUC Communications at **628-215-0940** or email **jstreeter@sfwater.org** for assistance.

Este informe contiene información muy importante sobre su agua potable. Favor de comunicarse con JP Streeter en tel **628-215-0940** o **jstreeter@sfwater.org** para asistencia.

此報告有重要飲水資訊。需要協助，請聯絡三藩市水利局公關部，電話:**628-215-0940**或電郵 **jstreeter@sfwater.org** 。

San Francisco Public Utilities Commission

Every day we deliver high-quality drinking water to 2.7 million people in San Francisco, Alameda, Santa Clara and San Mateo counties. We generate clean, reliable hydroelectricity that powers 100% of San Francisco's vital services, including police and fire stations, street lights, Muni, SF General Hospital and more.

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

این اطلاعیه شامل اطلاعات مهمی راجع به آب آ شامیدنی است.اگر نمیتوانید این اطلاعات را بزبان انگلیسی بخوانید لطفاًازکسی که میتواند یاری بگیرید تامطالب را برای شما به فارسی ترجمه کند.

Cé rapport contient des information importantes concernant votre eau potable. Veuillez traduire, ou parlez avec quelqu' un qui peut le comprendre.

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

此份水質報告, 內有重要資訊。請找他人為你翻譯和解說清楚。

Chi tiết này thật quan trọng. Xin nhờ người dịch cho quý vị.

この報告書には上水道に関する重要な情報が記されております。翻訳を御依頼なされるか、内容をご理解なさっておられる方にお尋ね下さい。

यह सूचना महत्वपूर्ण है । कृपा करके किसी से :सका अनुवाद करायें ।

이 안내는 매우 중요합니다. 본인을 위해 번역인을 사용하십시요.