Stanford University Utilities Division

2004 Annual Water Quality Report

May 6, 2005

What's Inside

Top Quality Water

The Stanford Utilities Division is pleased to provide you with the 2004 Annual Water Quality Report. During 2004, the San Francisco Public Utilities Commission (SFPUC) and Stanford University monitored water quality for both source and treated water supplies, and in all cases the water quality was in compliance with California Department of Health Services (CDHS) and U.S. Environmental Protection Agency (US EPA) drinking water requirements. We continue our commitment to provide our customers with safe, high quality drinking water. It is the policy of the Stanford Utilities Division to fully inform its consumers about the water quality standards and typical concentrations.

Stanford University's Hoover Tower

Stanford University Water System

The Utilities Division manages the storage, distribution, maintenance, and monitoring programs for Stanford's drinking water supply, CDHS Water System # 4310013.

Stanford currently fluoridates the domestic drinking water and collects daily samples to monitor that fluoride concentrations are within the optimum range between 0.8 and 1.4 mg/L. Stanford also routinely collects water quality samples from various locations within the campus distribution system. The most frequently collected samples are analyzed for coliform bacteria, chlorine residual, and general physical parameters.

Supplementary water quality samples are collected to monitor for additional constituents in compliance with CDHS requirements. A certified laboratory analyzes all samples. Stanford submits monthly reports that include all monitoring results to the CDHS.

SFPUC also collects daily water quality samples from various locations within their transmission system. The samples are analyzed for primary standards that apply to the protection of public health and secondary standards that refer to the aesthetic qualities of water such as taste and odor.

The Stanford Utilities Division also maintains flushing, cross-connections, and backflow prevention programs to ensure a consistent high quality drinking water supply.

Stanford University Drinking Water Sources

Water supplied to Stanford by the SFPUC comes from two major sources: Hetch Hetchy Reservoir in the Sierra Nevada Mountains, and local watersheds.

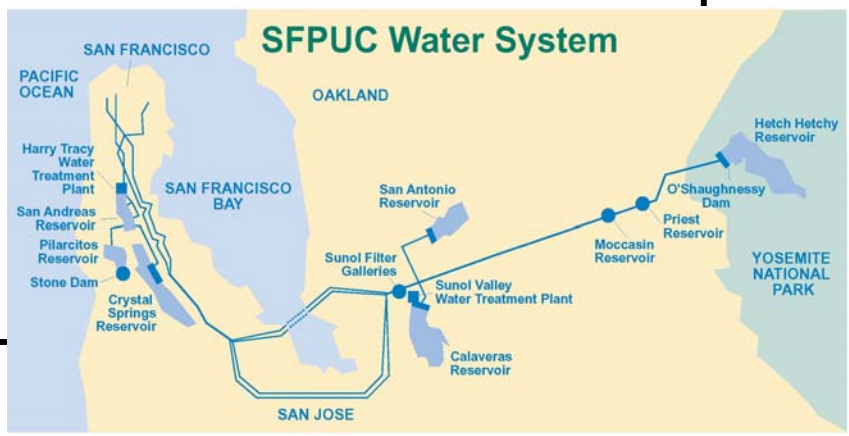
Hetch Hetchy Reservoir

Hetch Hetchy Reservoir, which is the largest reservoir in the SFPUC system, is located in Yose- mite National Park. It provides approximately 94 percent of the total water supply in 2004. Spring snowmelt flows down the Tuolumne River and fills the Hetch Hetchy reservoir. The high quality Hetch Hetchy water supply meets all federal and state criteria for watershed protection, disinfection treatment, bacteriological quality and operational standards. As a result, the US EPA and CDHS granted the Hetch Hetchy water source a filtration exemption. This exemption is contingent upon the Hetch Hetchy water quality continuing to meet all filtration avoidance criteria.

Alameda Watershed

The Alameda watershed, located in Alameda and Santa Clara Counties, contributes to surface water supplies by storing rainfall and runoff in two reservoirs (Calaveras and San Antonio). This surface water source is supplemented by ground water from Sunol Filter Galleries near the Town of Sunol. The SFPUC treats and filters these local water sources prior to delivery to its consumers.

San Francisco Public Utilities Commission's Hetch Hetchy Water Supply Distribution System (2004)



Protecting Our Watersheds

The SFPUC aggressively protects the natural water resources entrusted to its care, and continuously monitors the Hetch Hetchy watersheds' weather conditions, water turbidity levels, microbial contaminants and aqueduct disinfection levels.

The 2004 annual update of the Watershed Control Program and Sanitary Survey were prepared by SFPUC. The survey describes the watersheds and water supply system, identifies potential sources of contamination in the watersheds, discusses the existing and recommended watershed management practices that protect water quality, and summarizes the water quality monitoring SFPUC conducted.

The SFPUC also conducts a sanitary survey for local watersheds every five years. The 2000 assessment found that SFPUC watersheds have very low levels of contaminants, and those contaminants are associated with wildlife and to a limited extent, human recreational activity.

Water Quality Research

The SFPUC Water Quality Bureau (WQB) actively participates with the American Water Works Association, the US EPA and other agencies that research water quality issues. Such research is used to help develop new regulations as well as optimize and improve SFPUC water quality operations. The WQB also maintains a close working relationship with the San Francisco Health Department, suburban county health departments, and other public health organizations in order to coordinate information and research on contaminants, and conduct health surveillance to ensure our drinking water is safe.

How Do Drinking Water Sources Become Polluted?

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, which, in some cases, are radioactive and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural live stock operations, and wildlife.

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharge, oil and gas production, mining, or farming.

Pesticides and Herbicides, which may originate from a variety of sources such as agricultural, urban storm water runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

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

In order to ensure that tap water is safe to drink, the US EPA and CDHS prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDHS regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Special Health Concerns

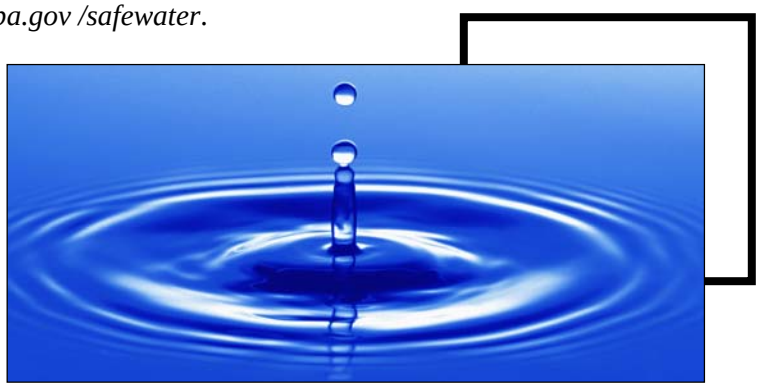
Drinking water (including bottled water) may reasonable be expected to contain at least small amounts of some contaminants, including *Cryptosporidium* and *Giardia*. The presence of small amounts of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the US EPA's Safe Drinking Water Hotline (800) 426-4791.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. US EPA / Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the US EPA's Safe Drinking Water Hotline or Website *epa.gov /safewater*.

Cryptosporidium and Giardia

Cryptosporidium and *Giardia* are parasitic microbes found in most surface water supplies and can pose a potential health threat. If ingested, either may produce symptoms of diarrhea, stomach cramps, upset stomach, and slight fever.

The SFPUC tests regularly for *Cryptosporidium* and *Giardia* in both source and treated water supplies. Both were occasionally found at very low levels in the SFPUC's water in 2004.



SFPUC and Stanford's 2004 Sampling Results

The enclosed data table summarizes the 2004 sampling results from laboratory analyses of parameters detected in SFPUC's supply and Stanford's distribution systems. An extensive water sample collection and testing protocol is used at the various water sources throughout the SFPUC transmission system and in the campus distribution system. Both the SFPUC and Stanford monitor for many additional parameters, which were not detected.

SFPUC source water supply and Stanford water quality sampling results for the campus distribution system are presented in table called '*Stanford University's Water Quality Data for Year 2004'* on page 5 of this report. The table contains the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health (PHG), the average and range, the typical sources of such contamination. Footnotes explaining the data and a key to units of measurement are also included.

Lead and Copper Results

Stanford University completed three consecutive six-month monitoring periods for lead and copper in 1994 and follow-up monitoring in 1995, 1998, 2001, and again in 2004. Stanford has not exceeded the lead and copper action levels established by the US EPA and CDHS. Because Stanford met all compliance standards for lead and copper, the CDHS specifies a reduced sampling program to once every three years. The next sampling will take place June 2007.

"Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water you can flush your coldwater tap for 30 seconds to 2 minutes before use, and always use cold water for cooking. You may also wish to have your water tested. Additional information is available from the Safe Drinking Water Hotline (800) 426-4791." (CDHS)

Table Definitions

The following definitions were used for each parameter that was analyzed.

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 or technically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

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.

Public Health Goal (PHG): The level of 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 Residual Disinfectant Level (MRDL): The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of disinfectant added for water treatment below, which there is no known or expected risk of health. MRDLGs are set by the USEPA.

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 (AL): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.

Treatment Techniques: A required process intended to reduce the level of a contaminant in drinking water.

Waiver: State permission to decrease the monitoring frequency for a particular contaminant.

Stanford University's Water Quality Data for Year 2004 (1)

DETECTED CONTAMINANTS

CONSTITUENTS WITH PRIMARTY STANDARDS	Unit	MCL	PHG (MCLG)	Range	Average (Maximum)	Typical Sources in Drinking Water
TURBIDITY (2)						
Unfiltered Hetch Hetchy Water, max 5 NTU	-	TT	NS	0.28 - 0.46 (3)	(5) (4)	Soil run-off
Filtered Water - Sunol Valley WTP, max 1 NTU	-	TT	NS	-	-0.41	Soil run-off
95 percentage of time < 0.3 NTU	-	TT	NS	99% (14)	-	Soil run-off
ORGANIC CHEMICALS (5)						
DISINFECTION BY-PRODUCTS						
Total Trihalomethanes (TTHMs)	ppb	80	NS	21 - 48	47 (7)	By-product of drinking water chlorination
Total Haloacetic Acids (HAAs)	ppb	60	NS	16 - 30	23 (7)	By-product of drinking water chlorination
Total Organic Carbon (TOC) (6)	ppm	NS	NS	2.6 - 3.1	2.9	Various natural and man-made sources
DISINFECTION BY-PRODUCTS (Stanford)						
Total Trihalomethanes (TTHMs)	ppb	80	NS	21.5-30.8	55.8(7)	By-product of drinking water chlorination
Total Haloacetic Acids (HAAs)	ppb	60	NS	9.0-37.0	23.9(7)	By-product of drinking water chlorination
MICROBIOLOGICAL (13) (Stanford)						
Total Coliform, percentage of positive detected in any month	%	=< 5	(0)	0	0	Naturally present in the environment
INORGANIC CHEMICALS						
Aluminum	ppb	1000	600	32 - 43	38	Erosion of natural deposits
Barium	ppb	1000	2000	3 - 50	26	Erosion of natural deposits
Fluoride (8)	ppm	2	1	<0.1 - 0.14	<0.1	Erosion of natural deposits
Chlorine **(Stanford)**	ppm	MRDL=4	MRDLG=4	0.3-3.8	2.0(7)	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	Range	Average	Typical Sources in Drinking Water
Chloride	ppm	500	NS	<3 - 44	8	Runoff / leaching from natural deposits
Color	unit	15	NS	<5 - 6	<5	Naturally-occurring organic materials
Iron	ppb	300	NS	<10 - 32	18	Leaching from natural deposits
Manganese	ppb	50	NS	<2 - 3	<2	Leaching from natural deposits
Specific Conductance	µS/cm	1600	NS	24 - 440	186	Substances that form ions when in water
Sulfate	ppm	500	NS	<1 - 58	29	Runoff/leaching from natural deposits
Total Dissolved Solids	ppm	1000	NS	29 - 171	100	Runoff / leaching from natural deposits
Turbidity	NTU	5	NS	0.07 - 0.27	0.17	Soil runoff

LEAD AND COPPER RULE STUDY (Stanford)	Unit	AL	PHG	Range	90th Percentile(9)	Typical Sources in Drinking Water
Copper	ppb	1300	170	<10-120	40(10)	Corrosion of household plumbing systems
Lead	ppb	15	2	<2.0-3.0	<2.0(11)	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	AL	Range	Average
Alkalinity (as $CaCO_3$)	ppm	NS	10 - 138	62
Boron	ppb	1000	13 - 74	44
Calcium	ppm	NS	3 - 27	15
Hardness (as $CaCO_3$)	ppm	NS	7 - 145	66
Fluoride (12)	ppm	NS	0.80-1.21	0.93
Magnesium	ppm	NS	<0.5 - 10	5.4
pH	Unit	NS	7.5 - 10.5	8.8
Potassium	ppm	NS	0.3 - 2	1.0
Silica	ppm	NS	5 - 8	6.0
Sodium	ppm	NS	3 - 18	10

Key:

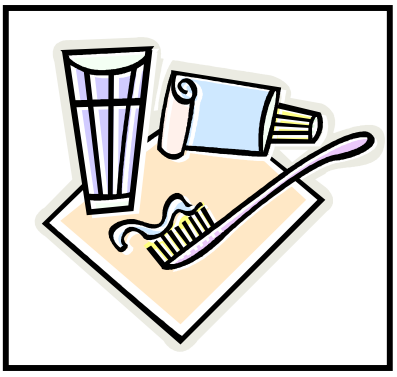
< = less than
TT = Treatment Technique
AL = Action Level
NS = No standard
NTU = Nephelometric Turbidity Unit
ppb = parts per billion
ppm = parts per million
µS/cm = microSiemens/centimeter

(1) All results met State and Federal drinking water regulations. Sampling performed by SFPUC, unless otherwise specified.
(2) Turbidity is the water clarity indicator; it also indicates the quality of the water and the treatment system efficiency.
(3) Results are based on monthly average turbidities measured at Tesla Portal.
(4) Turbidity is measured every four hours. This is a single measurement result. Higher turbidities occurred in the Hetch Hetchy system in January 2004 while returning the Hetch Hetchy water supply to service, but the water was not served to customers.
(5) DHS has approved SFPUC's request for a waiver of 35 additional synthetic organic chemicals.
(6) TOC is a precursor for disinfection by-product formation. Data are obtained from effluent monitoring at Sunol Valley Water Treatment Plant.
(7) This is the highest quarterly running annual average value.
(8) These data indicate the source water fluoride levels obtained from Hetch Hetchy, Calaveras and San Antonio Reservoirs.
(9) The 90th percentile levels of lead and copper must not be greater than the action levels.
(10) In 2004, no residences were over the copper Action Level at consumer taps.
(11) In 2004, no residences were over the lead Action Level at consumer taps.
(12) The Stanford added fluoride in 2004, as reported above to prevent dental cavities in consumers.
(13) For systems collecting <40 samples/month, report the highest number (not the percentage) of positive samples collected in any one month. Also change the MCL per Section 64426.1 of Title 22.
(14) This is the minimum percentage of time that the filtered water turbidity is less than 0.3 NTU.

Fluoride in Your Drinking Water

Fluoride is nature's cavity fighter. Fluoridation adjusts the naturally occurring fluoride concentration in drinking water to an ideal level for protecting teeth. Fluoridated drinking water benefits people of all ages by preventing tooth decay. San Francisco and many of its water customers in the Bay Area Water Supply & Conservation Agency have fluoridated their drinking water for many years to protect dental health. Stanford Utilities currently provides fluoridation to Stanford's domestic water supply.

SFPUC is nearing the completion of its new fluoridation plant in the East Bay, which will replace the aged Polhemlus Fluoride Station and allow the SFPUC to fluoridate the drinking water for its entire suburban wholesale service area by Fall 2005. This change will impact Stanford University's operations by no longer requiring the Utilities water staff to independently fluoridate the campus water supply. Until the conversion is complete, be assured that Stanford Utilities will continue to provide fluoridation in order to protect the community's dental health.



ADDITIONAL INFORMATION

US EPA Drinking Water Homepage:
www.epa.gov/safewater/
or
Safe Drinking Water Hotline
(800) 426-4791

CDHS Drinking Water Program Homepage:
www.dhs.ca.gov/ps/ddwem/technical/dwp/dwpindex.htm

SFPUC's Homepage:
sfwater.org

Stanford's Utilities Water Homepage:
facilities.stanford.edu/environment

If you have questions or need additional information about this report or Stanford's water quality, please contact;
Marty Laporte at 650/725-7864 or
E-mail: martyl@bonair.stanford.edu

Este informe contiene información muy importante sobre agua potable. Por favor tomese el tiempo de entenderlo y traducirlo ó hable con alguien que lo entienda bien.

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