2006 Annual Water Quality Report
Stanford University Utilities Division

Top Quality Water

The Stanford Utilities Division is pleased to provide you with the 2006 Annual Water Quality Report. During 2006, 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 the California Department of Health Services (CDHS) and the United States 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.

The Utilities Division manages the storage, distribution, maintenance, and monitoring programs for Stanford’s drinking water supply.

Stanford 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. Additional water quality samples are collected to monitor for more 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-connection, and backflow prevention programs to ensure a consistent high quality drinking water supply.

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May 2007
Stanford University's Drinking Water Sources

Water supplied to Stanford by the SFPUC comes from three major sources: Hetch Hetchy Watershed in the Sierra Nevada Mountains, and local watersheds in Alameda and San Mateo Counties.

Hetch Hetchy Reservoir

Hetch Hetchy Reservoir, which is the largest reservoir in the SFPUC system, is located in Yosemite National Park. It provided approximately 86 percent of the total water supply in 2006. 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, spans more than 35,000 acres in Alameda and Santa Clara Counties. Surface water from rainfall and runoff is collected in the Calavaras and San Antonio Reservoirs. Prior to distribution, water from the watershed is treated at the Sunol Valley Water Treatment Plant. The water delivered from the SFPUC to Stanford is both chloraminated and fluoridated.

San Mateo Watershed

Surface water from rainfall and runoff captured in the 23,000-acre Peninsula Watershed, which is located in San Mateo County, is stored in four reservoirs: Crystal Springs (Lower and Upper), San Andreas, Pilarcitos and Stone Dam. This water source is treated at the Harry Tracy Water Treatment Plant prior to delivery to customers.

The water delivered from the SFPUC to Stanford is both chloraminated and fluoridated.

Watershed Protection

The SFPUC aggressively protects the natural water resources entrusted to its care. An annual report on the Hetch Hetchy, Priest, and Mocassin watersheds is prepared to evaluate the sanitary conditions, water quality, and potential contamination sources in these watersheds. The report also presents performance results of watershed management activities implemented by the SFPUC to reduce the potential contamination sources. The 2006 sanitary survey concludes that very low levels of contaminants associated with wildlife and human activities exist in these watersheds.

The SFPUC also conducts sanitary surveys of the local watersheds every five years. The potential contamination sources identified in the 2005 survey are similar to the upcountry watersheds. The reports are available through the California Department of Health Services.

Water System Improvements Program

Projects that enhance high water quality are a key component of the multi-billion dollar Water System Improvement Program (WSIP), a program developed to upgrade the SFPUC water delivery system.

In 2006 significant progress was made on the Cross Connection Controls Project, a WSIP project that modifies pipeline air valves and blowoff structures to eliminate the possibility of contaminants entering the Hetch Hetchy Water System. To date, SFPUC crews have completed more than half of the approximately 300 sites on pipelines throughout the 167-mile system. For more detailed information visit www.sfwater.org.
Information from the US EPA and the CDHS

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.

Drinking water (including bottled water) may reasonably 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.

Contaminants in Drinking Water

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:

**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.

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

**Pesticides and Herbicides**, that 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.

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

**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 2006.

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 (800) 426-4791 or Website: epa.gov/safewater.
The water quality data table (Page 5) summarizes the 2006 sampling results from laboratory analyses of parameters detected in SFPUC’s source water supply and Stanford’s distribution system. 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.

The Water Quality Data 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, and the typical sources of such contamination. Footnotes explaining the data and a key to units of measurement are also included.

**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 (TT):** 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.

### Diverse Uses of Campus Domestic Water

- **Swimming Pools**
- **Drinking Fountains**
- **Laboratories**
## DETECTED CONTAMINANTS

<table>
<thead>
<tr>
<th>CONSTITUENTS WITH PRIMARY STANDARDS</th>
<th>Unit</th>
<th>MCL</th>
<th>PHG or (MCLG)</th>
<th>Range or Result</th>
<th>Average or (Maximum)</th>
<th>Typical Sources in Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TURBIDITY</strong> (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unfiltered Hetch Hetchy Water, max 5 NTU</td>
<td>-</td>
<td>TT</td>
<td>NS</td>
<td>0.22 - 0.93 (17)</td>
<td>(4.4) (17)</td>
<td>Soil run-off</td>
</tr>
<tr>
<td>Filtered Water - Sunol Valley WTP, max 1 NTU</td>
<td>-</td>
<td>TT</td>
<td>NS</td>
<td>NA</td>
<td>(0.18)</td>
<td>Soil run-off</td>
</tr>
<tr>
<td>95% percentage of time &lt; 0.3 NTU</td>
<td>-</td>
<td>TT</td>
<td>NS</td>
<td>100% (5)</td>
<td>NA</td>
<td>Soil run-off</td>
</tr>
</tbody>
</table>

| DISINFECTION BY-PRODUCTS (SFPUC Samples) | | | | | |
| **Total Trihalomethanes (TTHMs)** | ppb  | 80  | NS         | 22 - 57          | (38) (6)            | By-product of drinking water chlorination |
| **Total Haloacetic Acids (HAAAs)** | ppm  | 60  | NS         | 8 - 45           | (25) (6)            | By-product of drinking water chlorination |

| DISINFECTION BY-PRODUCTS (Stanford Samples) | | | | | |
| **Total Trihalomethanes (TTHMs)** | ppb  | 80  | NS         | 22 - 69          | (42) (6)            | By-product of drinking water chlorination |
| **Total Haloacetic Acids (HAAAs)** | ppm  | 60  | NS         | 17 - 38          | (28) (6)            | By-product of drinking water chlorination |

| MICROBIOLOGICAL (Stanford Samples) | | | | | |
| **Total Coliform percentage of positives detected in any month** | % | ≤5 | (0) | 0 | (0) | Naturally present in the environment |

| NORGANIC CHEMICALS | | | | | |
| **Aluminum** | ppb  | 1000 | 600 | <50 - 71 | <50 | Erosion of natural deposits |
| **Fluoride** | ppm  | 2.0  | 1.0  | 0.1 - 1.5 | 1.0 | Erosion of natural deposits |
| **Total Chlorine (Stanford Samples)** | ppm  | MRDL=4 | MRDLG=4 | 1.1 - 2.5 | (2.2) (6) | Water disinfectant added for treatment |

<table>
<thead>
<tr>
<th>CONSTITUENTS WITH SECONDARY STANDARDS</th>
<th>Unit</th>
<th>SMCL</th>
<th>PHG</th>
<th>Range</th>
<th>Average</th>
<th>Typical Sources in Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chloride</strong></td>
<td>ppm</td>
<td>500</td>
<td>NS</td>
<td>3 - 22</td>
<td>12</td>
<td>Runoff / leaching from natural deposits</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>unit</td>
<td>15</td>
<td>NS</td>
<td>&lt;5 - 10</td>
<td>&lt;5</td>
<td>Naturally occurring organic materials</td>
</tr>
<tr>
<td><strong>Specific Conductance</strong></td>
<td>μS/cm</td>
<td>1600</td>
<td>NS</td>
<td>24 - 376</td>
<td>195</td>
<td>Substances that form ions when in water</td>
</tr>
<tr>
<td><strong>Sulfate</strong></td>
<td>ppm</td>
<td>500</td>
<td>NS</td>
<td>0.8 - 44</td>
<td>20</td>
<td>Runoff/leaching from natural deposits</td>
</tr>
<tr>
<td><strong>Total Dissolved Solids</strong></td>
<td>ppm</td>
<td>1000</td>
<td>NS</td>
<td>20 - 190</td>
<td>112</td>
<td>Runoff / leaching from natural deposits</td>
</tr>
<tr>
<td><strong>Turbidity</strong></td>
<td>NTU</td>
<td>5</td>
<td>NS</td>
<td>0.08 - 0.45</td>
<td>0.21</td>
<td>Soil runoff</td>
</tr>
</tbody>
</table>

| LEAD AND COPPER RULE STUDY (Stanford Samples) | | | | | |
| **Copper (54 samples collected)** | ppb  | 1300 | 170 | <10 - 100 | 60 (9) | Corrosion of household plumbing systems |
| **Lead (54 samples collected)** | ppb  | 15   | 2   | <2.0 - 2.1 | 2.0 (10) | Corrosion of household plumbing systems |

<table>
<thead>
<tr>
<th>OTHER WATER QUALITY PARAMETERS</th>
<th>Unit</th>
<th>NL</th>
<th>Range</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alkalinity (as CaCO3)</strong></td>
<td>ppm</td>
<td>NS</td>
<td>6 - 114</td>
<td>58</td>
</tr>
<tr>
<td><strong>Boron</strong></td>
<td>ppm</td>
<td>1000</td>
<td>&lt;100 - 161</td>
<td>&lt;100</td>
</tr>
<tr>
<td><strong>Calcium</strong></td>
<td>ppm</td>
<td>NS</td>
<td>3 - 28</td>
<td>15</td>
</tr>
<tr>
<td><strong>Hardness (as CaCO3)</strong></td>
<td>ppm</td>
<td>NS</td>
<td>6 - 146</td>
<td>66</td>
</tr>
<tr>
<td><strong>Fluoride (source water)</strong></td>
<td>ppm</td>
<td>NS</td>
<td>&lt;0.1 - 0.2</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Magnesium</strong></td>
<td>ppm</td>
<td>NS</td>
<td>&lt;0.2 - 11.5</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>unit</td>
<td>NS</td>
<td>7.6 - 9.7</td>
<td>8.9</td>
</tr>
<tr>
<td><strong>Potassium</strong></td>
<td>ppm</td>
<td>NS</td>
<td>0.2 - 1.8</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Silica</strong></td>
<td>ppm</td>
<td>NS</td>
<td>3.8 - 7.2</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>ppm</td>
<td>NS</td>
<td>2 - 24</td>
<td>14.3</td>
</tr>
</tbody>
</table>

Key:  
- ≤ = less than / less than equal to  
- TT = Treatment Technique  
- AL = Action Level  
- NA = Not Applicable  
- NL = Notification 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) TURBIDITY is measured every four hours. These are monthly average turbidity values.
(4) This is a single, maximum measurement. This elevated turbidity was caused by the startup of the Hetch Hetchy Aqueduct after shutdown for maintenance work. The turbid water was not served to customers.
(5) This is the minimum percentage of time that the filtered water turbidity is less than 0.3 NTU.
(6) This is the highest running annual average value.
(7) TOC is a precursor for disinfection by-product formation. Data are obtained from effluent monitoring at Sunol Valley Water Treatment Plant.
(8) The 90th percentile levels of lead and copper must not be greater than the action levels.
(9) In 2006, no residences were over the copper Action Level at consumer taps. Customer tap sampling is required again in 2009.
(10) In 2006, no residences were over the lead Action Level at consumer taps. Customer tap sampling is required again in 2009.
Emergency Preparedness

Although Stanford strives to ensure a reliable supply of water for our customers, a natural disaster such as a major earthquake could interrupt water delivery. Residents are encouraged to store drinking water in case of an emergency. Stanford recommends storing at least three days worth of water (one gallon of water per person, per day, including pets) in food-grade plastic containers, such as two-liter soda bottles, and replacing supplies every six months.

To learn more about emergency preparedness for yourself and your family, visit http://facilities.stanford.edu/environment/earthquake.htm or www.72hours.org.

Water Conservation

See how you can make a difference! Visit our web site at facilities.stanford.edu/conservation

Contact 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/dwp/default.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 650/725-7864
E-mail: martyl@bonair.stanford.edu
Or
Tracy Ingebrigtsen 650/723-9747
E-mail: tracyi@bonair.stanford.edu

Este reporte contiene información muy importante sobre el agua que toma. Llame a Stanford University 650-725-8030 si necesita ayuda en español.

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