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Fact Sheet

Ames Environmental Management Division

2015 Water Quality Report

NASA Ames Research Center, Moffett Field, California

July 2016

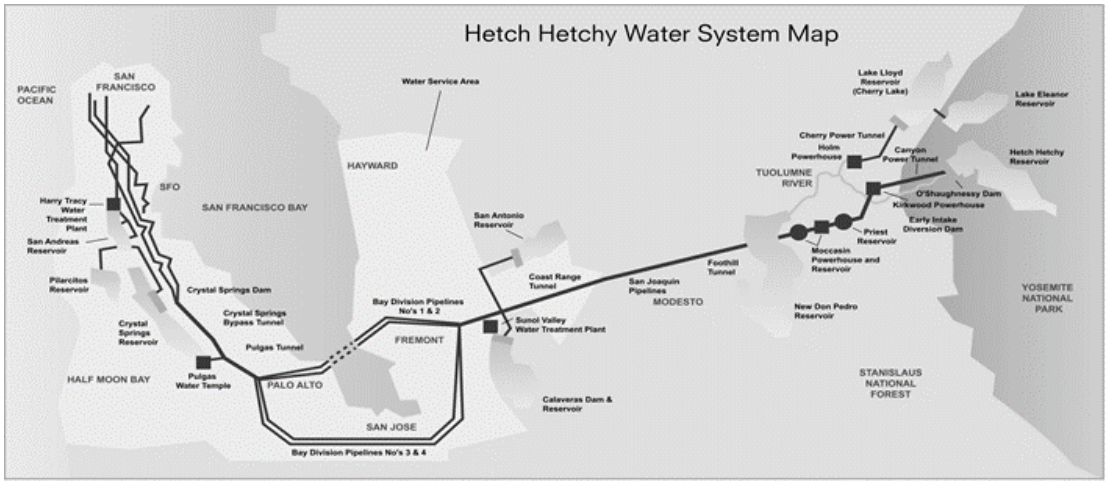
OUR WATER QUALITY AND SOURCE

Federal and State law requires that NASA Ames Research Center make this report every year by July 1st for the previous calendar year concerning the sources and quality of the water provided to our customers by our drinking water distribution system.

This report contains important information about your drinking water. Translate it or speak with someone who understands it. For assistance in Spanish contact Arturo Gonzalez at (650) 604-1523

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien. Para la ayuda en español entre en contacto con a Arturo Gonzalez en (650) 604-1523.

For calendar year 2015, the water provided by the distribution system for NASA Ames Research Center (which includes Moffett Field) was monitored and analyzed by both the supplier and NASA Ames in accordance with Federal and State regulations. This report presents the results of those analyses with the details shown on the table on the last page. Most of the data in this table is provided to us by our supplier and the NASA Ames monitoring results are shown in the shaded regions.



Our water supplier is the San Francisco Public Utilities Commission (SFPUC). The main source of the water is the Hetch Hetchy reservoir in the Sierra Nevada near Yosemite. There are a few smaller reservoirs that also contribute to this system as well as some ground water from the Sunol Filter Galleries near the town of Sunol. The water is treated at the Sunol Valley Water Treatment Plant which includes disinfection and fluoridation. No local Ames/Moffett groundwater contributes to our drinking water. The SFPUC website is http://sfwater.org.

The SFPUC conducts watershed sanitary survey for Hetch Hetchy source annually and local water sources every five years. The latest 5-year local sanitary survey was done in 2010. In 2015, a special watershed sanitary survey for the upcountry water sources including Cherry Creek, Eleanor Creek, and Lower Cherry Aqueduct was completed as part of the SFPUC's drought response plan efforts. These surveys evaluate the sanitary condition, water quality, potential contamination sources, and the results of watershed management activities, and were completed with support from partner agencies including the National Park Service and US Forest Service.

These surveys have identified wildlife, stock, and human activities as potential contamination sources. The reports are available for review at the San Francisco District office of SWRCB (contact phone number: 510-620-3474).

NOTICE OF VIOLATION

Due to an operational error in the San Francisco Regional Water System (SFRWS), the SFPUC failed to filter water from the San Antonio Reservoir on March 3, 2015. The SFPUC promptly notified the SWRCB and advised the wholesale customers about the incident. Through immediate coordination with wholesale customers, they minimized the affected areas and purged the inadequately treated water from the system.

A valve was accidentally opened which led to untreated water from the San Antonio Reservoir entering into the transmission system for approximately 20 minutes. This untreated water mixed with fully treated water from the Hetch Hetchy Aqueduct and traveled through the Regional System for approximately 36 hours before it was discharged into Crystal Springs Reservoir. Inadequately treated surface water may contain disease-causing organisms. These organisms can cause diarrhea, nausea, cramps and associated headaches.

Customers in the South Bay and Peninsula who received the blend of treated and untreated water were notified of the incident. The SFPUC has been working with the SWRCB in developing measures to prevent a recurrence of such an incident in the future.

The Division of Drinking Water determined that NASA Ames Research Center failed to comply with the California Code of Regulations, Title 22, Sections 64652 (a), and 64654 (a). Specifically, NASA failed to provide multibarrier treatment to the raw surface water from San Antonio Reservoir to reliably ensure a total of 99.9 percent reduction of Giardia lamblia cysts through filtration and disinfection and a total of 99 percent removal of Cryptosporidium through filtration.

Based on the information received from SFPUC describing the good quality of the untreated source water and the fact that the slug would effectively get substantial chlorine treatment by virtue of mixing with treated water before the slug reached us, NASA concluded that we would put our system and customers more at risk if we tried to isolate than if we took no action.

Five additional sample points were monitored in addition to the two routinely checked. Water samples were taken at noon, about one hour after the slug of untreated water was said to have passed the Ames intake. The samples were collected by the Environmental Management Division (EMD). No anomalies were detected. The samples were also sent to a certified and independent laboratory for pathogen testing. The results were negative for coliform and e. coli.

LEAD AND COPPER

Ames conducts lead and copper surveys every three years. The last survey was conducted in 2014. The majority of the water distribution system at the former NAS Moffett Field or NASA Research Park (NRP) is cast iron pipe (CIP) with lead joints and was constructed in the 1940's and 1950's. Additional portions of the system were added as the site expanded. Tap sampling locations were selected from Tier 2 sample criteria based on Section 64676, Title 22 of California Code of Regulations.

Determination of the level of exceedance for copper and lead was based on Section 64678, Title 22 of California Code of Regulations. A total of 20 samples were collected and analyzed for lead and copper. The analytical results were evaluated to determine if the lead and copper action levels were not in exceedance in more than 10 percent of the samples (the 90th percentile). Based upon results of the sampling data, Ames did not exceed the action levels for the 90th percentiles for lead and copper during this survey. No sample results exceeded the action levels determined by the State of California. No samples were excluded from the results. We were approved in 2012 for reduced sampling of lead and copper by the State, so our next survey will not be until September 2017.

FREQUENTLY ASKED QUESTIONS

Why is my water yellow or brown?
The most common reason for discolored water is the plumbing. When water is not circulated regularly (unused over weekends), it can pick up color from the pipes. Distribution mains can also accumulate small amounts of sediment that settles out. When the Center opens hydrants this sediment can become re-suspended. Let the water run a few minutes to clear the discoloration.

Why does my water sometimes look cloudy?
Tiny air bubbles that can cause cloudy water often originates when water is pumped during distribution. The cloudy appearance should clear when the water is allowed to stand for a few minutes.

Why tap vs. bottled?
On February 28, 2005 the bottled water service was canceled, since our tap water meets Federal and State health standards. Therefore, the Center cannot expend public funds for bottled water.

What should I consider before buying bottled water?
Consider why you are buying bottled water. Many people choose bottled water because of its taste. One of the key taste differences between tap water and bottled water is based on the disinfection method. Tap water can be disinfected with chlorine, chloramine, ozone, or ultraviolet light. Generally, bottlers prefer ozone because it does not leave a taste.

Bottled water is not necessarily safer than tap water and costs hundreds of times more than tap water on a per gallon basis. Consumers who choose to purchase bottled water should carefully read its label to understand what they are buying, whether it is a better taste, or a certain method of treatment.

Drinking tap water is a sustainable choice. Bottled water manufacturing processes use oil, release carbon dioxide emissions, and use fuel for transportation and delivery.

U.S. EPA SAFE DRINKING WATER HOTLINE

The U.S. EPA's Safe Drinking Water Hotline is referred to in multiple places in this report. It can be reached at (1-800-426-4791) or http://water.epa.gov/drink/hotline/index.cfm

CONTAMINANTS, HEALTH RISKS

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. More information about contaminants and potential health effects can be obtained by consulting the USEPA's Safe Drinking Water Hotline (contact info given above) and http://water.epa.gov/drink/contaminants

SPECIAL NEEDS

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. USEPA/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 USEPA's Safe Drinking Water Hotline (contact info given above) and http://www.epa.gov/safewater/consumer/pdf/crypto.pdf

SOURCES OF WATER AND CONTAMINANTS

The sources of drinking water (both tap water 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 and, in some cases, radioactive material, 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, 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, that 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, that can be naturally-occurring or be the result of oil and gas production and mining activities.

REGULATORY CONTROLS ON WATER QUALITY

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection for public health. The US Food and Drug Administration (FDA) sets standards for bottled water based on the USEPA's standards.

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National Aeronautics and Space Administration

DEFINITIONS

The following terms define the standards for the regulation of contaminants in drinking water that are used by the USEPA and the California SWRCB, many of which are used in the table on the last page of this document.

Public Health Goal (PHG) and Maximum Contaminant Level Goal (MCLG) essentially mean the same thing, the first being a California definition and the second a U.S. EPA definition.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk. 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 U.S. EPA.

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 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.

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

Secondary Drinking Water Standard (SDWS): MCLs for contaminants that may adversely affect the taste, odor or appearance of drinking water. These are aesthetic considerations that are not considered as health concerns.

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.

Regulatory Action Level (AL): 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.

LEAD AND COPPER SURVEY

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The SFPUC is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (contact info given on page 2) and http://water.epa.gov/drink/info/lead/index.cfm

YOUR VIEWS ARE WELCOME

If you have any questions, please let us know. Technical staff investigate drinking water complaints.

REQUIREMENTS

The Center ensures that a clean, constant supply of drinking water is provided by testing the water, maintaining the distribution systems, and reporting on the water quality.

FOR QUESTIONS ABOUT:

Water Quality, contact Garrett Turner at 604-1406, garrett.turner@nasa.gov or Jaclyn Satira at 604-1800, jaclyn.m.satira@nasa.gov

Maintenance, contact the Ames Trouble Desk at 604-5212

Health & Safety, contact your representative.

Ames Environmental Management Division
http://environment.arc.nasa.gov

(Data based on Hetch Hetchy water and effluents from both SVWTP and HTWTP)

NASA Ames Research Center - Water Quality Data for Year 2015 (1)

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 (2)	[3.1]	Soil runoff
Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 (3)	N/A	-	[1]	Soil runoff
	-	Min 95% of samples ≤ 0.3 NTU (3)	N/A	97% - 100%	-	Soil runoff
Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 (3)	N/A	-	[0.14]	Soil runoff
	-	Min 95% of samples ≤ 0.3 NTU (3)	N/A	100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	**37.0-62.0**	**[56.8]** (4)	Byproduct of drinking water disinfection
Haloacetic Acids	ppb	60	N/A	**0.0-32.3**	**[33.3]** (4)	Byproduct of drinking water disinfection
Total Organic Carbon (5)	ppm	TT	N/A	1.4 - 5.2	2.1	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform (6)	-	NoP ≤ 5.0% of monthly samples	(0)	**ND**	**0**	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	0 - 0.08	0.01	Naturally present in the environment
INORGANICS						
Fluoride (source water) (7)	ppm	2.0	1	ND - 0.8	0.3 (8)	Erosion of natural deposits; water additive to promote strong teeth
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	**0.85-2.20**	**[1.61]** (9)	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 - 16	8.4	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 5	<5	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	N/A	34 - 213	144	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.2 - 30	15	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	<20 - 93	54	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.1 - 0.3	0.1	Soil runoff

LEAD AND COPPER	Unit	AL	PHG	Range	90th Percentile	Major Sources in Drinking Water
Copper	ppb	1300	300	**12-98** (10)	**59**	Internal corrosion of household water plumbing systems
Lead	ppb	15	0.2	**0-13** (11)	**8**	Internal corrosion of household water plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
Alkalinity (as $CaCO_3$)	ppm	N/A	7 - 128	30
Boron	ppb	1000 (NL)	103	103
Bromide (12)	ppb	N/A	15 - 24	20
Calcium (as Ca)	ppm	N/A	3 - 18	11
Chlorate (13)	ppb	800 (NL)	39 - 280	157
Hardness (as $CaCO_3$)	ppm	N/A	13 - 65	42
Magnesium	ppm	N/A	0.2 - 5.6	3.7
pH	-	N/A	7.1 - 9.9	9.0
Potassium	ppm	N/A	0.2 - 0.9	0.6
Silica	ppm	N/A	3.7 - 5.4	4.7
Sodium	ppm	N/A	2.9 - 19	13

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:

(1) Confirmed by NASA Ames Research Center shown in shaded regoins.

(2) These are monthly average turbidity values measured every 4 hours daily.

(3) There is no turbidity MCL for filtered water. The limits are based on the TT requirements for filtration systems.

(4) This is the highest locational 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) Since <40 samples are collected per month, the highest number (not the percentage) of positive samples collected in any one month is reported.

(7) In May 2015, the SWRCB recommended a fluoride level in the treated water be maintained at 0.7 ppm. In 2015, the range and average of the fluoride levels were 0.6 ppm - 1.0 ppm and 0.8 ppm, respectively.

(8) The natural fluoride levels in the upcountry sources were ND. Elevated fluoride levels in the SVWTP and HTWTP raw water are attributed to the transfer of fluoridated Hetch Hetchy water into the local reservoirs.

(9) This is the highest running annual average value.

(10) The most recent Lead and Copper Rule monitoring was in 2014. 00 of 20 site samples collected at consumer taps had copper concentrations above the AL.

(11) The most recent Lead and Copper Rule monitoring was in 2014. 00 of 20 site samples collected at consumer taps had lead concentrations above the AL.

(12) Bromide was detected in HTWTP effluent only.

(13) The detected chlorate in the treated water is a degradation product of sodium hypochlorite used by the SFPUC for water disinfection.

Note: Additional water quality data may be obtained by calling the NASA Ames Research Center water system phone numbers (650) 604-1406 or (650) 604-1800