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National Aeronautics and Space Administration

2010 Water Quality Report

NASA Ames Research Center, Moffett Field, California

July 2011

Fact Sheet

Ames Environmental Management Division

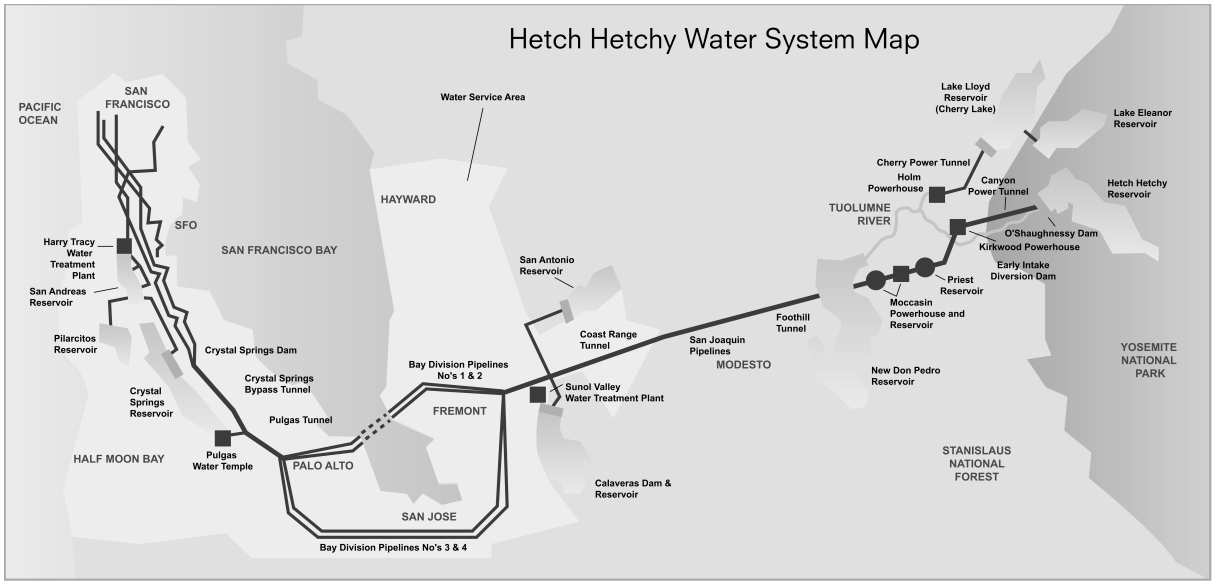
OUR WATER QUALITY AND SOURCE

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 Armando Jimenez at (650) 604-1523 or Mark Hightower at (650) 604-4443.

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 Armando Jimenez en (650) 604-1523 o Mark Hightower en (650) 604-4443.

For calendar year 2010 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/home.cfm.

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://www.epa.gov/safewater/hotline/

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://www.epa.gov/safewater/hfacts.html.

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 Department of Public Health (CDPH) 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.

DEFINITIONS

The following terms define the standards for the regulation of contaminants in drinking water that are used by the USEPA and the CDPH, 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

During 2010, the 90th percentile values for lead and copper were both below their respective action levels as indicated on the table on the last page of this document.

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://www.epa.gov/safewater/lead.

YOUR VIEWS ARE WELCOME

If you have any questions, please let us know. The Environmental Management Division can be reached by telephone at (650) 604-5602. 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 Mark Hightower at 604-4443, T.M.Hightower@nasa.gov or Steve Florida at 604-1800, Steven.A.Flarida@nasa.gov

Maintenance, contact the Ames Trouble Desk at 604-5212

Legionella updates, contact John Steen at 604-5726, John.W.Steen@nasa.gov

Health & Safety, contact your representative.

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

NASA Ames Research Center - Water Quality Data for Year 2010 (1)

DETECTED CONTAMINANTS	Unit	MCL	PHG or (MCLG)	Range or Level Found	Average or [Max]	Major Sources in Drinking Water
TURBIDITY						
For Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.6 (2)	[4.9] (3)	Soil runoff
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 (4)	N/A	-	[0.54]	Soil runoff
	-	min 95% of samples ≤ 0.3 NTU (4)	N/A	97.6% - 100%	-	Soil runoff
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 (4)	N/A	-	[0.19]	Soil runoff
	-	min 95% of samples ≤ 0.3 NTU (4)	N/A	100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR (SFPUC Regional System) - for information only						
Total Trihalomethanes	ppb	80	N/A	14 - 92	[40] (5)	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	7 - 55	[25] (5)	Byproduct of drinking water chlorination
Total Organic Carbon (6)	ppm	TT	N/A	2.4 - 3.2	2.7	Various natural and man-made sources
DISINFECTION BYPRODUCTS AND PRECURSOR (NASA Ames Research Center)						
Total Trihalomethanes	ppb	80	N/A	38 - 64	49.7 (5)	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	33.7 - 42	38.6 (5)	Byproduct of drinking water chlorination
Total Organic Carbon (6)	ppm	N/A	N/A	Waived	Waived	Various natural and man-made sources
MICROBIOLOGICAL (SFPUC and NASA Ames Research Center)						
Total Coliform (7)	-	≤ 1 of monthly samples	(0)	ND	0	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	ND - 0.06	[0.06]	Naturally present in the environment
INORGANIC CHEMICALS (SFPUC and NASA Ames Research Center)						
Fluoride (source water) (8)	ppm	2.0	1	ND - 0.7	0.3 (9)	Erosion of natural deposits
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.01 - 2.20	1.98 (5)	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	Range	Average	Typical Sources of Contaminant
Chloride	ppm	500	N/A	3 - 16	9.5	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 6	<5	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	N/A	33 - 316	179	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.6 - 38.7	18.2	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	27 - 174	95	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.07 - 0.33	0.16	Soil runoff

LEAD AND COPPER (NASA Ames Research Center)	Unit	AL	PHG	Range	90th Percentile	Typical Sources in Drinking Water
Copper	ppb	1300	300	0 - 1500 (10)	150	Corrosion of household plumbing systems
Lead	ppb	15	0.2	0 - 130 (11)	5	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
Alkalinity (as $CaCO_3$)	ppm	N/A	8 - 98	49
Bromide	ppb	N/A	<10 - 17	<10
Calcium (as Ca)	ppm	N/A	2 - 26	12
Chlorate (12)	ppb	(800) NL	92 - 357	150
Hardness (as $CaCO_3$)	ppm	N/A	8 - 104	53
Magnesium	ppm	N/A	0.3 - 9	4.6
pH	-	N/A	8.2 - 8.7	8.5
Potassium	ppm	N/A	0.34 - 1.2	0.6
Silica	ppm	N/A	4.1 - 7.6	5.7
Sodium	ppm	N/A	3 - 22	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
NTU	= Nephelometric Turbidity Unit
ORL	= Other Regulatory Level
ppb	= part per billion
ppm	= part per million
µS/cm	= microSiemens / centimeter

Notes:

(1) All results met State and Federal drinking water health standards. (Confirmed by NASA Ames Research Center shown in shaded regions.)

(2) Turbidity is measured every four hours. These are monthly average turbidity values.

(3) This is the highest turbidity of the unfiltered water served to customers in 2010. The switch of San Joaquin Pipelines and rate change caused elevated turbidities as a result of sediment resuspension in the pipelines. The turbidity spike was not observed further downstream at Alameda East.

(4) There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations.

(5) This is the highest quarterly running annual average value.

(6) Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.

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

(8) The SFPUC adds fluoride to the naturally occurring level to help prevent dental caries in consumers. The CDPH requires our fluoride levels in the treated water to be maintained within a range of 0.8 ppm - 1.5 ppm. In 2010, the range and average of our fluoride levels were 0.6 ppm - 1.5 ppm and 1.0 ppm, respectively.

(9) The naturally occurring fluoride levels in the Hetch Hetchy and SVWTP raw water were ND and 0.15 ppm, respectively. The HTWTP raw water had elevated fluoride levels of 0.7 ppm - 0.9 ppm due to the continued supply of the fluoridated Hetch Hetchy & SVWTP treated water into the Lower Crystal Springs Reservoir, which supplies water via the San Andreas Reservoir to the HTWTP for treatment.

(10) The most recent Lead and Copper Rule monitoring was in 2010. 1 of 20 water samples collected at consumer taps had copper concentrations above the Action Level.

(11) The most recent Lead and Copper Rule monitoring was in 2010. 1 of 20 water samples collected at consumer taps had lead concentrations above the Action Level.

(12) There were no chlorate detected in the raw water sources except the Crystal Springs and San Andreas reservoirs, where the detected chlorate were 81 ppb and 57 ppb, respectively. The chlorate levels in both reservoirs are due to the transfer of the disinfected Hetch Hetchy water and SVWTP effluent into the Crystal Springs Reservoir. The detected chlorate in treated water is a degradation byproduct of sodium hypochlorite, the primary disinfectant used by SFPUC for water disinfection.

Note: Additional water quality data may be obtained by calling the NASA Ames Research Center water system phone numbers (650) 604-4443 or (650) 604-1800.