



2008 Water Quality Report

NASA Ames Research Center • Moffett Field, California

July 2009

This report contains important information about your drinking water and summarizes last year's water quality data. Contact (650) 604-4443 if you need this information in Spanish. This report is also available on our website: <http://environment.arc.nasa.gov>.

Este informe contiene información muy importante sobre su agua potable. Llame al (650) 604-4443 si necesita la información en español. Este informe también está en nuestra página web: <http://environment.arc.nasa.gov>.

Water delivered in 2008 by NASA Ames Research Center (NASA Ames) met all drinking water standards set by the U.S. Environmental Protection Agency (USEPA) and California Department of Public Health (CDPH). We hope this report will provide the facts and perspective you need to make an informed evaluation.

A message from the United States Environmental Protection Agency (USEPA)

The United States has one of the safest water supplies in the world. However, national statistics don't tell you specifically about the quality and safety of the water coming out of your tap. That's because drinking water quality varies from place to place, depending on the condition of the source water from which it is drawn and the treatment it receives.

There is no such thing as naturally pure water. In nature, all water contains some impurities. As water flows in streams, sits in lakes, and filters through layers of soil and rock in the ground, it dissolves or absorbs the substances that it touches. Some people prefer mineral water precisely because minerals give it an appealing taste. However, at certain levels, minerals can make water unpalatable or even unsafe.

When the water supplier takes untreated water from a river or reservoir, the water often contains dirt and tiny pieces of leaves and other organic matter, as well as trace amounts of certain contaminants. When it gets to the treatment plant, water suppliers often add chemicals called coagulants to the water. These act on the water as it flows very slowly through tanks so that the dirt and other contaminants form clumps that settle to the bottom. Usually, this water then flows through a filter for removal of the smallest contaminants like viruses and Giardia.

For more information, visit: <http://www.epa.gov/safewater> or call the USEPA Safe Drinking Water Hotline at 1-800-426-4791.

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 originate 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 cancelled, since our tap water meets Federal and State health standards.

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 much more than tap water on a per gallon basis.

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

Be "green" by drinking tap water!

Fact Sheet

Ames Environmental Management Division



2008 Water Quality Report

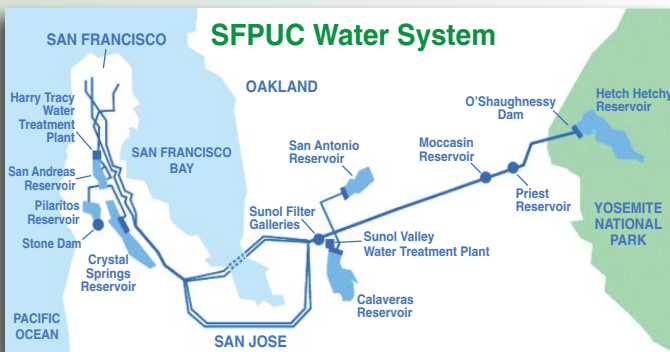
National Aeronautics and Space Administration

WATER SOURCES

The San Francisco Public Utilities Commission (SFPUC) manages a complex water supply system which features a complicated linkage of reservoirs, canals, tunnels, pipelines, and treatment systems. It all begins when spring snowmelt runs down the Tuolumne River and fills Hetch Hetchy Reservoir.

There are six surface water reservoirs in the Alameda and Peninsula watersheds that capture rain and local runoff. Groundwater is pumped from underground aquifers at the Sunol filter galleries. Visit the SFPUC website at

<http://sfwater.org/home.cfm>.



Generally, water is gravity fed, requiring almost no fossil fuel consumption to move water from the mountains to your tap.

NASA Ames does not augment the Center's drinking water supply with groundwater from onsite wells.

NASA AMES RESEARCH CENTER'S EXPANDING WATER PORTFOLIO

Under provisions of Executive Order (EO) 13423, NASA Ames has set a goal to reduce potable water consumption 16% by FY 2015. Historically, all water used at NASA Ames has been potable water purchased from the San Francisco Public Utilities Commission.

There is the obvious water usage that you drink and flush toilets with. The Center's grassy areas and planted landscaping also use potable water. The Unitary wind tunnel and the Arc Jets currently consume an enormous amount of potable water for cooling towers and other operational needs.

The Center has been working on several fronts to wean users off the drinking water system. Two examples of potable water reduction projects are described in the following.

Reclaimed water for golf course use - In February 2009, after 15 years of planning, NASA Ames finally completed its first conversion from potable water to reclaimed water. Approximately 40 acres of golf course property requiring an estimated 35-42 million gallons of water to irrigate from spring to fall has been converted to reclaimed water. This conversion represents projected seasonal water savings of up to 13% of NASA Ames' annual potable water consumption.



Reclaimed groundwater for industrial uses - NASA Ames was recently awarded funding through the Strategic Institutional Investment program for FY11 to retrofit the Industrial Wastewater Utilization and Treatment Facility (IWTF) to treat reclaimed groundwater primarily for use by the Unitary wind tunnel and the Arc Jet facilities.



This will conserve our valuable potable water, and at the same time make the operation of the Arc Jet and Unitary facilities more stable as they will no longer be subject to a potentially constricted potable water supply. This conversion represents saving approximately 9.5% of NASA Ames' overall annual potable water usage.

These two projects combined will help NASA Ames meet its EO 13423 goal. There is still a need for all potable water users to be vigilant in our use of this valuable resource in our everyday lives. Visit the California Department of Water Resources, Office of Water Use Efficiency and Transfers website for tips on water conservation: <http://www.owue.water.ca.gov/conservlinks/conservlinks.cfm>

PROTECTING YOUR HEALTH

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 persons and infants can be particularly at risk from infections.

Seek advice from your healthcare providers, or contact the USEPA Safe Drinking Water Hotline (1-800-426-4791).

YOUR TAP WATER IS SAFE TO DRINK... THAT IS THE REALITY

What assurance do you have that the water coming out of your tap is safe to drink? To hear some peddlers of home treatment devices everyone not adding additional treatment at the home is taking their life in their hands! But what is the reality?

The USEPA is required under the Safe Drinking Water Act to identify things in drinking water that might be harmful, determine the extent of their occurrence, and the level at which they cause a health problem. Identified contaminants are then regulated at a level that is protective of public health taking into consideration the technical feasibility of detecting it at a protective level, treating it to that protective level, and doing so in a cost effective manner. These health based contaminants have Primary Maximum Contaminant Levels assigned that are based on sound science.

The State of California has three regulatory options:

- adopt the Federal limits
- make any particular Primary Maximum Contaminant Level more stringent than the Federal limit
- regulate any contaminants before the USEPA has set a limit

In addition to the health based limits, there are also Secondary Maximum Contaminant Levels on a number of constituents that are purely aesthetic based standards. These are limits based on the appearance, taste, or odor that can make drinking water unpleasant to consume.

Most of the constituents are monitored by our supplier. The NASA Ames Environmental Management Division implements a monitoring plan that covers all the requirements for sampling, analyzing and reporting on the constituents that are regulated for their potential health effects. Only those constituents that might be affected by their residence time in the NASA Ames' distribution system are monitored directly. These include:

- monthly testing for bacteria under the Total Coliform Rule (TCR)
- quarterly testing of trihalomethanes and haloacetic acids under the Disinfectant-Disinfection Byproducts Rule (D-DBP)
- triennial testing of lead and copper under the Lead and Copper Rule (LCR)

As you can see from the data reported elsewhere in this report, the water you receive is safe to drink.

AN EXCERPT FROM THE USEPA BOOKLET TITLED BOTTLED WATER BASICS

Some people drink bottled water as an alternative to other beverages; others drink it because they prefer its taste or think it is safer than their tap water. Whether it travels through a pipe to your home or comes packaged in a bottle, safe drinking water is essential to good health. All our drinking water comes from similar sources, either from sources we can see, such as rivers and lakes, or from sources we can't see, such as underground aquifers.

The taste and quality of both bottled water and tap water depend on the source and quality of the water, including its natural mineral content and how, or if, the water is treated.

Drinking water (both bottled and tap) can reasonably be expected to contain at least small amounts of some contaminants. For example, minerals such as magnesium and calcium give water a distinctive flavor, and are essential to the body.

USEPA sets standards for tap water and US Food and Drug Administration (FDA) sets standards for bottled water based on the USEPA's standards. Bottled water and tap water are both safe to drink if they meet these standards.

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.

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.Florida@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.



Technical staff investigate drinking water complaints.



2008 Water Quality Data ⁽¹⁾

DETECTED CONTAMINANTS	Unit	MCL	PHG or [MCLG]	Range or Level Found	Average or [Max]	Typical Sources in Drinking Water
TURBIDITY ⁽²⁾						
For Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.24 - 0.46 ⁽³⁾	[2.85] ⁽⁴⁾	Soil runoff
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 ⁽⁵⁾	N/A	-	[0.42]	Soil runoff
	-	min 95% of samples ≤0.3 NTU ⁽⁵⁾	N/A	99.97%	-	Soil runoff
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 ⁽⁵⁾	N/A	-	[0.21]	Soil runoff
	-	min 95% of samples ≤0.3 NTU ⁽⁵⁾	N/A	100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR (SFPUC Regional System) - for information only						
Total Trihalomethanes	ppb	80	N/A	8 - 48	[31] ⁽⁶⁾	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	4 - 26	[17] ⁽⁶⁾	Byproduct of drinking water chlorination
Total Organic Carbon ⁽⁷⁾	ppm	TT	N/A	2.2 - 2.8	2.5	Various natural and man-made sources
DISINFECTION BYPRODUCTS AND PRECURSOR (NASA Ames Research Center)						
Total Trihalomethanes	ppb	80	N/A	34.7 - 49.3	41.2	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	20.0 - 31.1	25.4	Byproduct of drinking water chlorination
Total Organic Carbon ⁽⁷⁾	ppm	N/A	N/A	Waived	Waived	Various natural and man-made sources
MICROBIOLOGICAL (SFPUC and NASA Ames Research Center)						
Total Coliform ⁽⁸⁾	-	NoP ≤5.0% of monthly samples	[0]	ND	0	Naturally present in the environment
<i>Giardia lamblia</i>	cyst/L	TT	[0]	ND - 0.03	[0.03]	Naturally present in the environment
INORGANIC CHEMICALS (SFPUC and NASA Ames Research Center)						
Fluoride (source water) ⁽⁹⁾	ppm	2.0	1	<0.1 - 0.8	0.2 ⁽¹⁰⁾	Erosion of natural deposits
Chlorine (including free chlorine and chloramine)	ppm	MRDL = 4.0	MRDLG = 4	0.02 - 2.15	1.75	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	4 - 15	10	Runoff / leaching from natural deposits
Specific Conductance	µS/cm	1600	N/A	31 - 288	164	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.0 - 34.9	16.4	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	39 - 203	111	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.06 - 0.30	0.15	Soil runoff
LEAD AND COPPER (NASA Ames Research Center)						
	Unit	AL	PHG	Range	90th Percentile	
Copper	ppb	1300	300	0 - 330	110	Corrosion of household plumbing systems
Lead	ppb	15	2	0.0-9.8 ⁽¹²⁾	ND	Corrosion of household plumbing systems
OTHER WATER QUALITY PARAMETERS						
	Unit	ORL	Range	Average		KEY:
Alkalinity (as CaCO ₃)	ppm	N/A	10 - 96	50		< / ≤ = less than / less than or equal to
Calcium (as Ca)	ppm	N/A	3 - 26	13		AL = Action Level
Chlorate ⁽¹³⁾	ppb	(800) NL	49 - 224	155		Max = Maximum
Hardness (as CaCO ₃)	ppm	N/A	14 - 100	54		Min = Minimum
Magnesium	ppm	N/A	0.2 - 9.0	4.9		N/A = Not Available
pH	-	N/A	8.5 - 9.2	8.8		ND = Non-Detect
Potassium	ppm	N/A	<0.2 - 1.2	0.6		NL = Notification Level
Silica	ppm	N/A	5.0 - 7.7	5.4		NoP = Number of Coliform-Positive Sample
Sodium	ppm	N/A	3 - 20	13		NTU = Nephelometric Turbidity Unit
						ORL = Other Regulatory Level
						ppb = part per billion
						ppm = part per million
						TT = Treatment Technique
						µS/cm = microSiemens / centimeter

NOTES:

- All results met State and Federal drinking water health standards. **(Confirmed by NASA Ames Research Center.)**
- Turbidity is a water clarity indicator; it also indicates the effectiveness of the filtration plants.
- Turbidity is measured every four hours. These are monthly average turbidity values.
- This is the highest single measurement in 2008. The startup of San Joaquin Pipeline No. 2 caused elevated turbidities on 3/13/08 as a result of sediment resuspension in the pipeline.
- There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations.
- This is the highest quarterly running annual average value.
- Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.
- 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 - 1.5 ppm.
- The naturally occurring fluoride levels in the Hetch Hetchy and SVWTP raw water are ND and 0.15 ppm, respectively. The HTWTP raw water has elevated fluoride levels due to the continued replenishment of the fluoridated Hetch Hetchy & SVWTP treated water into Lower Crystal Springs Reservoir, which supplies water via San Andreas Reservoir to the HTWTP for treatment.
- The most recent Lead and Copper Rule monitoring was in **2006. 0 of 50** water samples collected at consumer taps had copper concentrations above the Action Level.
- The most recent Lead and Copper Rule monitoring was in **2006. 0 of 50** water samples collected at consumer taps had lead concentrations above the Action Level.
- There were no chlorate detected in the raw water sources. The detected chlorate in treated water is a byproduct of the degradation 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 number (650) 604-1800.

IMPORTANT DEFINITIONS

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 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 a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLGs 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 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.