2023 Consumer Confidence Report

Water System Information

Water System Name: Lawrence Livermore National Laboratory, Livermore Site, 0110701

Report Date: June 2024

Type of Water Source(s) in Use: Surface water and groundwater

Name and General Location of Source(s): Lawrence Livermore National Laboratory (LLNL) receives water from two drinking water providers. The primary source is the San Francisco Public Utilities Commission (SFPUC). The backup source is the Zone 7 Water Agency (Zone 7).

- January 1 – May 3: Zone 7
- May 3 – December 4: SFPUC
- December 4 – December 31: Zone 7

SFPUC Source: San Francisco Regional Water System's major drinking water supply to LLNL systems consists of water stored in the Hetch Hetchy Reservoir, which is well protected and carefully managed by SFPUC. The Hetch Hetchy water is exempt from state and federal filtration requirements due to its high quality. To meet drinking water standards for consumption, this surface water source receives the following treatment from SFPUC: pH adjustment for optimum corrosion control, ultraviolet light and chlorine disinfection, and fluoridation for dental health protection.

Zone 7 Sources: ~75% San Francisco-San Joaquin River Delta via the State Water Project, and ~25% from Lake Del Valle and local groundwater wells.

Drinking Water Source Assessment Information: SFPUC and Zone 7 perform their own source assessments.

Time and Place of Regularly Scheduled Board Meetings for Public Participation: N/A

For More Information, Contact:
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About This Report

LLNL tests the drinking water quality for many constituents as required by state and federal regulations. This report shows the results of LLNL's monitoring for the period of January 1 to December 31, 2023 and may include earlier monitoring data.

Importance of This Report Statement in Five Non-English Languages (Spanish, Mandarin, Tagalog, Vietnamese, and Hmong)

Language in Spanish: Este informe contiene información muy importante sobre su agua para beber. Favor de comunicarse [Enter Water System's Name] a [Enter Water System's Address or Phone Number] para asistirlo en español.

Language in Mandarin: 这份报告含有关于您的饮用水的重要讯息。请用以下地址和电话联系 [Enter Water System Name]以获得中文的帮助: [Enter Water System's Address][Enter Water System's Phone Number].

Language in Tagalog: Ang pag-uulat na ito ay naglalaman ng mahalagang impormasyon tungkol sa inyong inuming tubig. Mangyaring makipag-ugnayan sa [Enter Water System's Name and Address] o tumawag sa [Enter Water System's Phone Number] para matulungan sa wikang Tagalog.

Language in Vietnamese: Báo cáo này chứa thông tin quan trọng về nước uống của bạn. Xin vui lòng liên hệ [Enter Water System's Name] tại [Enter Water System's Address or Phone Number] để được hỗ trợ giúp bằng tiếng Việt.

Language in Hmong: Tsab ntawv no muaj cov ntsiab lus tseem ceeb txog koj cov dej haus. Thov hu rau [Enter Water System's Name] ntawm [Enter Water System's Address or Phone Number] rau kev pab hauv lus Askiv.

Terms Used in This Report

Term	Definition
cyst/L	Cysts per liter
CCRDL	Consumer Confidence Report Detection Level (State Water Board established)
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. Environmental Protection Agency (U.S. EPA).
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.
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.
Primary Drinking Water Standards (PDWS)	MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.
Public Health Goal (PHG)	The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Term	Definition
Regulatory Action Level (AL)	The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
Secondary Drinking Water Standards (SDWS)	MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.
Treatment Technique (TT)	A required process intended to reduce the level of a contaminant in drinking water.
N/A	Not applicable
ND	Not detectable at testing limit
NTU	Nephelometric Turbidity Units
ng/L	Nanograms per liter
ppm	parts per million or milligrams per liter (mg/L)
ppb	parts per billion or micrograms per liter (µg/L)
ppq	parts per quadrillion or picogram per liter (pg/L)
pCi/L	picocuries per liter (a measure of radiation)
µS/cm	MicroSiemens per centimeter

Sources of Drinking Water and Contaminants that May Be Present in Source Water

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 byproducts 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.

Regulation of Drinking Water and Bottled Water Quality

In order to ensure that tap water is safe to drink, the U.S. EPA and the State Board prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

About Your Drinking Water Quality

Drinking Water Contaminants Detected

Tables 1 through 6 list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The State Board allows LLNL to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than a year old. Any violation of an AL, MCL, MRDL, or TT is asterisked. Additional information regarding the violation is provided later in this report.

Table 1. Sampling Results Showing the Detection of Lead and Copper

Lead and Copper	Sample Date	No. of Samples Collected	90th Percentile Level Detected	No. Sites Exceeding AL	AL	PHG	Typical Source of Contaminant
Lead (ppb)	7/18/23-7/20/23	20	6.4	1*	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm)	7/18/23-7/20/23	20	0.13	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

*This exceedance was for Building 162. This is an older, low occupancy building. A notice was posted in this building following sampling.

Table 2. Sampling Results for Sodium and Hardness

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sodium[a,b] (ppm)	2023	30	2.7-102	None	None	Salt present in the water and is generally naturally occurring
Hardness[a,b] (ppm)	2023	97	7.5-473	None	None	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring

(a)Zone 7 Data, 2023
(b)SFPUC Data, 2023

Table 3. Detection of Contaminants with a Primary Drinking Water Standard

Chemical or Constituent (and reporting units)	Sample Date	Level Detected [Maximum]	Range of Detections	MCL [MRDL]	PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Disinfection Byproducts and Precursor						
Total Trihalomethanes[a] (TTHMs) (ppb)	2023	[62]	47.9-80.7*	80	N/A	Byproduct of drinking water disinfection
Haloacetic Acids[a] (Five) (HAA5) (ppb)	2023	[51]	19.5-59.1	60	N/A	Byproduct of drinking water disinfection
Total Organic Carbon[b**][c] (TOC) (ppm)	2023	1.4	1.2-2	TT	N/A	Various natural and manmade sources
Microbiological						
Giardia lamblia[c] (cyst/L)	2023	0.03	0-0.13	TT	(0)	Naturally present in the environment
Turbidity						
Unfiltered Hetch Hetchy Water[c] (NTU)	2023	[2]	0.3-0.9***	5	N/A	Soil runoff

Inorganics						
Chlorine Residual[(a)] (Cl) (ppm)	2023	[2.35]	0.23-3.16	[4]	[4]	Drinking water disinfectant added for treatment
Fluoride[(b)(c)] (ppm)	2023	0.7	ND-0.7****	2.0	1.0	Erosion of natural deposits; water additive to promote strong teeth; discharge from fertilizer and aluminum factories
Barium[(b)] (ppb)	2023	ND	ND-261	1000	2000	Erosion of natural deposits
Bromate[(b)] (ppb)	2023	ND	ND-7	10	0.1	Byproduct of drinking water disinfection
Selenium[(b)] (ppb)	2023	ND	ND-7	50	30	Erosion of natural deposits; discharge from mines and industrial wastes
Nitrate as Nitrogen[(b)] (ppm)	2023	1.5	ND-3.9	10	10	Erosion of natural deposits; runoff from fertilizer use; and leaching from septic tanks and sewage
Radiological						
Gross Alpha particle activity[(b*****)] (pCi/L)	2017, 2022	1.5	ND-5	15	(0)	Erosion of natural deposits
Uranium[(b)] (pCi/L)	2023	ND	ND-4	20	0.43	Erosion of natural deposits

(a) LLNL Data, 2023
(b) Zone 7 Data, 2023
(c) SFPUC Data, 2023
(*) All locational running annual averages (LRAAs), which are how compliance is calculated, were below the MCL during 2023.
(**) TOC results represent lowest quarterly RAA Ratio for Zone 7 data.
(***) These are monthly average turbidity values measured every 4 hours daily at the Tesla Treatment Facility, which is located upstream of LLNL turnout.
(****) For SFPUC data, natural fluoride in the Hetch Hetchy source was ND. The level shown in the table for SFPUC data was the result of water fluoridation at Tesla Treatment Facilities.
(*****) Gross alpha data is from 2017 except Hopyard well 9 that was sampled in 2022.

Table 4. Detection of Contaminants with a Secondary Drinking Water Standard

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	SMCL	PHG (MCLG)	Typical Source of Contaminant
Aluminum[(b)] (ppb)	2023	82	82	200	600	Erosion of national deposits
Specific Conductance [(a)(b)] (µS/cm)	2023	297	32-1054	1,600	N/A	Substances that form ions when in water; seawater influence
Color[(a)(b)] (units)	2023	1.7	ND-5	15	N/A	Naturally-occurring organic materials
Chloride[(a)] (ppm)	2023	60	8-126	500	N/A	Runoff/leaching from natural deposits; seawater influence
Foaming Agents [MBAS][(a)] (ppb)	2023	ND	ND-100	500	N/A	Municipal and industrial waste discharges
Iron[(b)] (ppb)	2023	42	42	300	N/A	Leaching from natural deposits; industrial wastes
Manganese[(a)(b)] (ppb)	2023	1	ND-22	50	N/A	Leaching from natural deposits
Sulfate[(a)(b)] (ppm)	2023	24	1.2-97	500	N/A	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids[(a)] (ppm)	2023	340	75-718	1000	N/A	Runoff/leaching from natural deposits
Turbidity[(a)(b)] (NTU)	2023	0.2	ND-0.6	5	N/A	Soil runoff

(a)Zone 7 Data, 2023
(b)SFPUC Data, 2023

Table 5. Detection of Unregulated Contaminants

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	Notification Level	Health Effects
Boron[(a)(b)] (ppb)	2023	188	ND-850	1,000	Boron exposures resulted in decreased fetal weight (developmental effects) in newborn rats.
Chlorate[(b)] (ppb)	2023	30	30	800	Animal studies demonstrated that chlorate exposure in rats caused adverse effects to the pituitary and thyroid glands.

(a)Zone 7 Data, 2023
(b)SFPUC Data, 2023

Additional General Information on Drinking Water

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline (1-800-426-4791).

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. U.S. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Per- and Polyfluoroalkyl Substances (PFAS)

The fifth Unregulated Contaminant Monitoring Rule (UCMR5) includes 29 per- and poly-fluoroalkyl substances (PFAS) and lithium. PFAS comprise a group of thousands of man-made, persistent chemicals used in a variety of industries and consumer products. SFPUC conducted four consecutive quarters of monitoring at designated locations approved by the U.S. EPA in 2023, and all results have been non-detect. Together with the two previous rounds of voluntary PFAS monitoring in 2019 and 2021, SFPUC reported that our water supplies are not compromised by these contaminants. For additional information about PFAS, you may visit State Water Resources Control Board's website **waterboards.ca.gov/pfas**, SFPUC's website **sfpuc.org/TapWater**, and/or U.S. EPA's website **epa.gov/pfas**.

Zone 7 Water Agency monitored for PFAS in 2023. No PFAS were detected above the CCRDLs in treated surface water. Although Zone 7 detected some PFAS in certain groundwater wells, this water was blended and/or treated to reduce the contaminant level below the applicable Response Level.

Zone 7 PFAS monitoring in 2023 is summarized in Table 6. For more details about PFAS in Zone 7's water supply, visit www.Zone7Water.com/pfas.

Table 6. Zone 7 PFAS Sampling

Per- and Polyfluoroalkyl Substances (PFAS)	Response Level	Notification Level	CCRDL	Surface Water (Average, Range)	Groundwater (Average, Range)	Typical Source of Contaminant
Perflourobutanesulfonic Acid (PFBS), ng/L	5000*	500	3	ND, N/A	ND, ND-5	Various man-made sources
Perfluoroctane Sulfonic Acid (PFOS), ng/L	40**	6.5	4	ND, N/A	6, ND-27	Various man-made sources
Perfluoroctanoic Acid (PFOA), ng/L	10**	5.1	4	ND, N/A	ND, NA	Various man-made sources
Perfluorohexane Sulfonic Acid (PFHxS), ng/L	20*	3	3	ND, N/A	5, ND-21	Various man-made sources
Perfluorohexanoic Acid (PFHxA), ng/L	N/A	N/A	3	ND, N/A	ND, ND-4	Various man-made sources

(*) Response level for PFBS and PFHxS are based on a single sample result
(**) Response level for PFOA and PFOS are based on running annual average values
(***) A sample at the Mocho Groundwater Demineralization Plant (MGDP) exceeded the PFHxS response level due to a brief flow surge during well startup on Feb 2, 2023. Operational procedures were modified to prevent future incidents. Subsequent samples were all below the response level.

For additional information about PFAS, visit the SWRCB website ***waterboards.ca.gov/pfas***, SFPUC website ***PFAS_factsheet.pdf (sfpuc.org)***, and/or the U.S. EPA website ***epa.gov/pfas***.

Lawrence Livermore National Security, LLC (LLNS) Lead Educational Statement

Key points:

- LLNL does not have any lead-pipe service lines.
- LLNL routinely monitors lead content in drinking water in accordance with state and federal drinking water laws to ensure it is safe to drink.
- Practices are in-place to periodically flush systems if action level concentration is identified.

With lack of regular use, lead can leach into drinking water from fixtures.

What are the health effects of lead?
Lead can cause serious health problems, especially for pregnant women and young children. Adults who drink water containing lead in excess of the action level over many years may develop kidney problems or high blood pressure.

What can I do to reduce my exposure to lead in drinking water?
1. Run your water for 30 seconds to 2 minutes to flush lead from interior plumbing before using it for drinking.
2. Use cold water for cooking.

Summary: In 2023 there were no exceedances of coliform thresholds and no violations of MCL, MRDL, AL, TT, or monitoring reporting requirements at the LLNL drinking water system.