2022 Consumer Confidence Report

Water System Information

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

Report Date: July 1, 2023

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 – March 28: Zone 7
- March 28 – end of 2022: SFPUC

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. 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:
Bill Howing, Mechanical Utility Division Deputy at 1-925-423-9253
John Jursca, Regulatory Permit Contact at 1-925-341-9093
Temple (Joe) Steadman, Chief Water Operator at 1-925-422-0019

About This Report

We test the drinking water quality for many constituents as required by state and federal regulations. This report shows the results of our monitoring for the period of January 1 to December 31, 2022 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 Lawrence Livermore National Lab – Livermore Site a Bill Howing, MUD Deputy at (925) 423-9253 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 Bill Howing, MUD Deputy at (925) 423-9253 以获得中文的帮助: Lawrence Livermore National Lab – Livermore Site.

Language in Tagalog: Ang pag-uulat na ito ay naglalaman ng mahalagang impormasyon tungkol sa inyong inuming tubig. Mangyaring makipag-ugnayan sa Lawrence Livermore National Lab – Livermore Site o tumawag sa Bill Howing, MUD Deputy at (925) 423-9253 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 Lawrence Livermore National Lab – Livermore Site tại Bill Howing, MUD Deputy at (925) 423-9253 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 Lawrence Livermore National Lab – Livermore Site ntawm Bill Howing, MUD Deputy at (925) 423-9253 rau kev pab hauv lus Askiv.

Terms Used in This Report

Term	Definition
cyst/L	Cysts per liter
Level 1 Assessment	A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
Level 2 Assessment	A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.
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.

Term	Definition
NTU	Nephelometric Turbidity Units
ng/L	Nanograms per liter
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.
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.
pCi/L	Picocuries per liter (a measure of radiation)
ppm	Parts per million or milligrams per liter (mg/L)
ppb	Parts per billion or micrograms per liter (µg/L)
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 – 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 us 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 one 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[(a)] (ppb)	7/13/22-7/15/22	20	ND	1*	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper[(a)] (ppm)	7/13/22-7/15/22	20	0.16	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

(a)LLNL Data, 2022.
(*)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)	2022	40	3.5-106	None	None	Salt present in the water and is generally naturally occurring
Hardness[(a)(b)] (ppm)	2022	122	9.1-460	None	None	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring

(a)Zone 7 Data, 2022.
(b)SFPUC Data, 2022.

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)	2022	46	13.93-59.15	80	N/A	Byproduct of drinking water disinfection
Haloacetic Acids[a] (Five) (HAA5) (ppb)	2022	45	8.8-53.6	60	N/A	Byproduct of drinking water disinfection
Total Organic Carbon[b*][c] (TOC) (ppm)	2022	1.3	1-1.9	TT	N/A	Various natural and manmade sources
Microbiological						
Giardia lamblia[c] (cyst/L)	2022	0.01	0-0.04	TT	(0)	Naturally present in the environment
Turbidity						
Unfiltered Hetch Hetchy Water[c] (NTU)	2022	[3.4]	0.2-0.4**	5	N/A	Soil runoff
Inorganics						
Chlorine Residual[a] (Cl) (ppm)	2022	2.34	0.58-2.72	[4]	[4]	Drinking water disinfectant added for treatment
Fluoride[b][c] (ppm)	2022	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)	2022	133	ND-299	1000	2000	Erosion of natural deposits
Bromate[b] (ppb)	2022	ND	ND-6	10	0.1	Byproduct of drinking water disinfection
Selenium[b] (ppb)	2022	ND	ND-6	50	30	Erosion of natural deposits; discharge from mines and industrial wastes

Nitrate as Nitrogen[(b)] (ppm)	2022	3	ND-4	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)	2022	4	3-5	15	(0)	Erosion of natural deposits
Uranium[(b)] (pCi/L)	2022	1	ND-4	20	0.43	Erosion of natural deposits

(a)LLNL Data, 2022.
(b)Zone 7 Data, 2022.
(c)SFPUC Data, 2022.
(*)TOC results represent lowest quarterly running annual average (RAA) ratio.
(**)These are monthly average turbidity values measured every 4 hours daily at the Tesla Treatment Facility, which is located upstream of the 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 Portal.
(****)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
Specific Conductance [(a)(b)] (µS/cm)	2022	403	37-1090	1,600	N/A	Substances that form ions when in water; seawater influence
Color[(b)] (ppb)	2022	5	5	15	N/A	Naturally-occurring organic materials
Chloride[(a)] (ppm)	2022	96	57-132	500	N/A	Runoff/leaching from natural deposits; seawater influence
Iron[(b)] (ppb)	2022	24	24	300	N/A	Leaching from natural deposits; industrial wastes
Manganese[(b)] (ppb)	2022	2.4	2.4	50	N/A	Leaching from natural deposits
Sulfate[(a)(b)] (ppm)	2022	29	1.1-92	500	N/A	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids[(a)] (ppm)	2022	449	263-680	1000	N/A	Runoff/leaching from natural deposits
Turbidity[(a)(b)] (NTU)	2022	0.2	ND-0.2	5	N/A	Soil runoff

(a)Zone 7 Data, 2022.
(b)SFPUC Data, 2022.

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)	2022	232	28 – 1,100*	1,000	Boron exposures resulted in decreased fetal weight (developmental effects) in newborn rats.
Chlorate[(b)] (ppb)	2022	45	45	800	Animal studies demonstrated that chlorate exposure in rats caused adverse effects to the pituitary and thyroid glands.

(a)Zone 7 Data, 2022.
(b)SFPUC Data, 2022.
(*)This range of detection includes Zone 7 groundwater at well sources. This groundwater goes through a demineralization plant and blending with surface water prior to distribution. No finished water that is delivered to customers exceeds the boron notification level.

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)

PFAS is a group of approximately 5,000 man-made, persistent chemicals used in a variety of industries and consumer products. SFPUC conducted two rounds of PFAS monitoring between 2019 and 2021. No PFAS were detected above the State Water Resources Control Board's (SWRCB's) Consumer Confidence Report Detection Levels (CCRDLs) in surface water and groundwater sources.

Zone 7 Water Agency monitored for PFAS in 2022. 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 2022 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	4	ND, N/A	5, ND-7	Various man-made sources
Perfluoroctane Sulfonic Acid (PFOS), ng/L	40	6.5	4	ND, N/A	20, ND-32	Various man-made sources
Perfluoroctanoic Acid (PFOA), ng/L	10	5.1	4	ND, N/A	ND, ND-4	Various man-made sources
Perfluorohexane Sulfonic Acid (PFHxS), ng/L	20**	3**	4	ND, N/A	19, ND-28	Various man-made sources
Perfluorohexanoic Acid (PFHxA), ng/L	N/A	N/A	4	ND, N/A	4, ND-5	Various man-made sources

(*)Results are from 2022.
(**)These levels apply for monitoring starting in 2023.

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

The EPA's Lead and Copper Rule sets the action level for lead in drinking water at 0.015 micrograms per liter (mg/L). The Maximum Contaminant Level Goal (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

What are we doing to manage and minimize the lead content in tap water?
Infrastructure and Operations is actively flushing the lines in these facilities to ensure the lead levels are below the established action level.

What are the health effects of lead?
Drinking this water over many years can cause long-term harm in adults, including increased risk of high blood pressure and kidney damage.

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 or until it becomes cold, before using it for drinking.
2. Use cold water for cooking.
3. Look for alternative sources or treatment of water. If you have a choice, consider using bottled or filtered water.

Summary Information for Violation of a MCL, MRDL, AL, TT, or Monitoring and Reporting Requirement

In 2022 there were no violations of MCL, MRDL, AL, TT, or monitoring reporting requirements in the Lawrence Livermore Lab Site 200 drinking water distribution system.

Summary Information for Revised Total Coliform Rule Level 1 and Level 2 Assessment Requirements

In 2022 there were no exceedances of coliform thresholds in the Lawrence Livermore Lab Site 200 drinking water distribution system.