Edwards Air Force Base
California

2023 Water Quality Report

2023 Monitoring Results for Edwards AFB – AFRL (Public Water System ID: CA1510702)
Prepared By: 412th Test Wing – Bioenvironmental Engineering Flight

Annual Consumer Report

We feel it is important that our consumers know about where our water comes from, what it contains, and how it compares to requirements set by regulatory agencies. This report is a snapshot of last year's water quality.

Through regular monitoring, any contaminates found were verified to be within regulatory standards. The detected amounts and the associated standards, are included in the tables published within this report.

Where Does Our Water Come From?

The AFRL Drinking Water System draws water from two sources:

- Antelope Valley East Kern (AVEK) Water Agency
- On-base groundwater wells

AFRL receives a majority of our water supply from the Antelope Valley East Kern (AVEK) Water Agency. The water received from the AVEK is supplied to AFRL in finished drinking water quality form. The AVEK main water source is the California Aqueduct. AVEK's alternative supply is from the State Water Project, which is water stored in the aquifer at various underground storage facilities (i.e. "water banks"). This water is extracted as local groundwater for water quality purposes or as supply during drought. As a water wholesaler, the AVEK Water Agency published their 2023 Water Quality Report earlier this year, which is located at https://www.avek.org/2023-annual-water-quality-report-kern-county-system

Additionally, groundwater can be extracted from one out of four active installation wells. Although throughout 2023, the wells only served as a back-up function to AVEK supply. These well are fed by the Antelope Valley Aquifer.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Treatment Process

Our water is treated with chlorine, a disinfectant which kills dangerous bacteria and other microorganisms that may be in the water. The 412th Civil Engineering Squadron monitors the disinfectant levels on a daily basis.

Source Water Assessment

The 412th Civil Engineering (CE) Squadron completed our Source Water Assessment on 18 June 2003 and it is on file in the CE Water & Gas office (661-277-5000). This assessment looks at possible contamination sources that may affect the base water supply. Possible contaminating activities for the wells surveyed in this assessment include nearby abandoned wells, storm drainage discharge, above ground water storage tanks, and nearby roads. The health risks from these activities are diminished through weekly monitoring of the potable water system.

EAFB is aware that many buildings at AFRL use bottled water. EAFB is not responsible for sampling or for reporting on bottled water. Water quality reports for your bottled water may be obtained by contacting your building's bottled water vendor.

What Is In 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 Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (1-800-426-4791).

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.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Consumption Note for Susceptible Individuals

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 Safe Drinking Water Hotline (1-800- 426-4791).

Water Quality Data Table

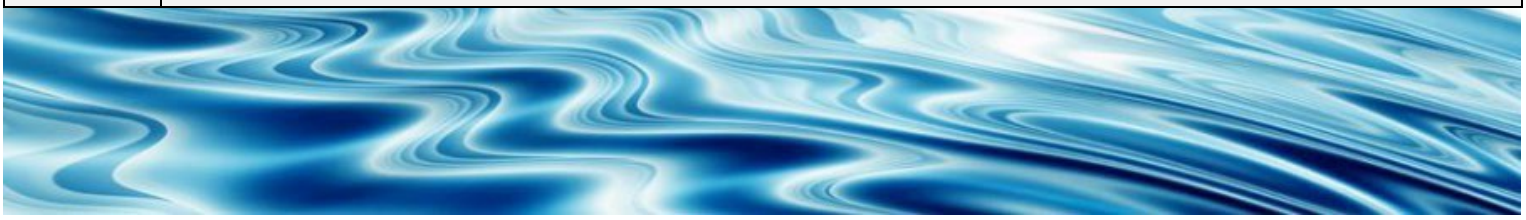
All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. Additionally, some naturally occurring minerals provide benefits by improving the taste of drinking water and providing nutritional value at low levels.

In order to ensure that tap water is safe to drink, the USEPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The tables on the following pages list all of the drinking water contaminants that were detected during the 2023 calendar year of this report. Many more contaminants were tested than listed on the following table; only those substances listed below were detected in our water. The USEPA and state allow us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently, or because the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, is more than one year old.

In these tables you may find terms and abbreviations that might not be familiar to you. To help you better understand these terms, we have provided the definitions below.

Important Terms Used

Term	Definition
AL	Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
LRAA	Local Running Annual Average: Annual running average at a single sampling site.
HAA5	Sum of Five Regulated HAAs, i.e., Monochloroacetic Acid, Monobromoacetic Acid, Dichloroacetic Acid, Dibromoacetic Acid, and Trichloroacetic Acid
MCL	Maximum Contaminant Level: 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.
MCLG	Maximum Contaminant Level Goal: 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.
mg/L	Mg/L: Milligrams per Liter (ppm)
N/A	Not Applicable
ND	Not Detected
pCi/L	pCi/L: picocuries per liter (a measure of radioactivity)
PDWS	Primary Drinking Water Standards: MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.
PHG	Public Health Goal: 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.
ppm	ppm: parts per million, or milligrams per liter (mg/L)
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
ppt	ppt: parts per trillion, or picograms per liter (pg/L)
SDWS	Secondary Drinking Water Standards: 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.
TTHM	Total Trihalomethanes, or Sum of Four Regulated THMs, i.e., Chloroform, Bromodichloromethane, Dibromochloromethane, and Bromoform
µs/cm	µs/cm: micro Siemens per centimeter (a measure of conductivity of a solution)



Water Quality Data Table

Contaminant	MCL	AVEK[1]	AFRL Well	Distribution System[2]	Months in Violation		Major Sources in Drinking Water
Microbiological Contaminants (PDWS)[3]							
Total Coliform	5% positive or 2 consecutive positive samples	0	0	0	0		Naturally present in the environment
E. coli	1 positive sample	0	0	0	0		Human or animal fecal waste

Contaminant	MCL	PHG	AVEK Plant Average[1]	AVEK Wells Average[1]	AFRL Well	Sample Date	Violation		Major Sources in Drinking Water
Inorganic Compound (PDWS)									
Aluminum (µg/L)	1000	600	130	ND	ND	2021	No		Erosion of natural deposits; residue from some surface water treatment processes
Arsenic[4] (µg/L)	10	0.004	3.6	5.2	8.6	2023	No		Erosion of natural deposits; runoff from orchards; glass and electronics production
Barium	1000	2000	58	ND	ND	2021	No		Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
Total Chromium (µg/L)	10	MCLG = 100	5.1	ND	ND	2021	No		Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Hexavalent Chromium[5] (µg/L)	10	0.02	5.8	2.9	5.57	2014	No		Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposits
Fluoride (mg/L)	2	1	0.28	0.15	0.3	2021	No		Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (mg/L)	10	10	0.59	2.8	ND	2023	No		Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits

1. AVEK data, including AVEK Plant Average and AVEK Wells Average, were obtainted from 2023 Kern County Annual Water Quality Report. Some contaminants are not required to be tested every year, thus some of these data were obtained from the 2021 report or previous reports.
2. Distribution System refers to sampling that are taken at final point of delivery to end user through out the base.
3. In 2023, there were no positive bacteriological samples collected at AFRL.
4. Arsenic was only sampled in Januaray and December since the well was not functioning for hte majority of the year.
5. There is currently no MCL or sampling requirement for hexavalent chromium. The previous MCL of 0.010 mg/L (10 ppb) was withdrawn on September 11, 2017. Our last sampling of hexavalent chromium was from 2014.

<<< Table Continues on Next Page >>>

Water Quality Data Table Continued

Contaminant	MCL	PHG	AVEK Plant Average	AVEK Wells Average	AFRL Average	AFRL Range	Sample Date	Violation	Major Sources in Drinking Water
Disinfectants & Disinfection By Products[5] (PDWS)									
Total Trihalomethanes (µg/L)	LRAA: 80		#46	NA	#54.2	0 - 120	2023	No	Byproduct of drinking water disinfection
Haloacetic Acids (µg/L)	LRAA: 60		#11	NA	#11.5	0 - 24	2023	No	Byproduct of drinking water disinfection
Lead and Copper[6] (PDWS)									
Contaminant	**MCL**	**PHG**	**AVEK Plant Average**	**AVEK Wells Average**	**AFRL Average**	**AFRL Results**		**Violation**	**Major Sources in Drinking Water**
Lead (µg/L)	AL=90% of bldgs. <15	0.2	ND	ND	ND	5 sites sampled; 0 sites over AL		No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (mg/L)	AL=90% of bldgs. <1.3	0.3	ND	ND	0.097	5 sites sampled; 0 sites over AL		No	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Contaminant	**MCL**	**PHG**	**AVEK Plant Average**	**AVEK Wells Average**	**AFRL Average**	**AFRL Range**	**Sample Date**	**Violation**	**Major Sources in Drinking Water**
Radioactive Contaminants (PDWS)									
Gross Alpha (pCi/L)	15	0.2	N/A	5.3	4.15	4.15	2021	No	Erosion of natural deposits
Uranium (pCi/L)	20	0.43	3.5	N/A	1.63	1.63	2021	No	Decay of natural and man-made deposits
5th Unregulated Contaminant Monitoring Rule									
PFOS (ppt)	4	1	N/A	N/A	ND	ND	2023	ND	Industrial Sites, Fire Training, landfills, wastewater treatment
PFOA (ppt)	4	0.007	N/A	N/A	ND	ND	2023	ND	Industrial Sites, Fire Training, landfills, wastewater treatment
Contaminant	**Secondary MCL[7]**		**AVEK Plant Average**	**AVEK Wells Average**	**AFRL Well**	**Sample Date**	**Violation**	**Major Sources in Drinking Water**	
Secondary Standard Contaminants (SDWS)									
Alkalinity Bicarbonate (mg/L)	N/A		50	ND	93	2015	No	Erosion of minerals and natural carbonate deposits	
Calcium (mg/L)	N/A		74	70	28.3	2015	No	Leaching from natural deposits	
Chloride (mg/L)	250		47	5	12.3	2015	No	Runoff/leaching from natural deposits; seawater influence	
Hardness Total as CaCO3 (mg/L)	N/A		140	220	98	2015	No	The sun of polyvalent cations present int eh water, generally naturally occuring magnesium and calcium	
Iron (µg/L)	300		ND	135	408	2015	No	Leaching from natural deposits; industrial wastes	
Magenesium (mg/L)	N/A		8.3	8.5	3.85	2015	No	Erosion of minerals and natural deposits	
Manganese (µg/L)	50		ND	ND	1.94	2015	No	Erosion of minerals and natural deposits; steel production and mining.	
Sodium (mg/L)	N/A		15	43	50.4	2015	No	Leaching from natural deposits	
Specific Conductance (µs/cm)	1		500	650	394	2015	No	Substances that form ions when in water; seawater influence	
Sulfate (mg/L)	500		53	56	69.5	2015	No	Runoff/leaching from natural deposits; industrial wastes	
TDS (m/L)	1000		290	390	266	2015	No	Runoff/leaching from natural deposits; industrial wastes	

5. Disinfection Byproduct (DBPs), which includes Trihalomethanes and Haloacetic Acids. They are formed when disinfectant like chlorine is used to control microbial pathogens combine with naturally occurring materials found in source water. #. Indicating the LRAA at sampling locations.
6. Lead and Copper is regulated by ensuring the 90th percentile of sample result in under the AL. In this case, all of our test for Lead came back as ND but we are still require to report them. Sampling is conducted every 3 years. The most recent samples are from August 2021.
7. Secondary MCLs do not have PHGs or MCLGs because secondary MCLs are set to protect the aesthetics of water and PHGs and MCLGs are based on health concerns.

Additional Information Regarding Lead

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. 412th Bioenvironmental Engineering Flight and 412th Civil Engineering Squadron are 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 do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants. 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 (800-426-4791) or at http://www.epa.gov/lead.

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and/or flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the U.S. EPA Safe Drinking Water Hotline (1-800-426-4791).

Additional Information Regarding Fluoride

The AFRL water systems contain naturally occurring fluoride. AFRL does not add additional fluoride to the water system due to State requirements and the scope/size of the EAFB water distribution system. The natural level of fluoride present in the water system is below the maximum contamination limit (MCL) of 2.0 parts per million (ppm).

In 2015, the U.S. Department of Health and Human Services released a Public Health Service recommendation of 0.7 ppm as the optimal fluoride level in drinking water to prevent tooth decay. Your local dentist or pediatrician can prescribe daily fluoride brushing, tablets, or drops for you and your children to ensure you receive enough fluoride.

Tips for Protecting Your Water

- Eliminate excess use of lawn and garden fertilizers and pesticides – they contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- Dispose of chemicals properly; take used motor oil to a recycling center.

Additional Information Regarding Arsenic

While your drinking water meets federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

For more information regarding this report, please contact either:

- 412th Operational Medical Readiness Squadron – Bioenvironmental Engineering Flight (661-277-3272)
- 412th Test Wing – Public Affairs (661-277-1454)