Drinking Water Quality
Annual Report for Calendar Year 2023

Yokota Air Base & Tama Hills
(Published: Jun 2024)

この年次報告書には横田基地における飲料水の水質について重要な情報が記載されいています。 この英語版が正式な原本として公示されますが、日本語での説明は医療部衛生環境課 内線 225-8040 までご連絡下さい。
なお、基地関係者以外の方からのご質問につきましては、横田基地代表番号 042-552-2511 におかけいただき、オペレーターを通して広報部へお問合せ下さい。

This annual report summarizes the quality of water delivered by Yokota Air Base, Japan. Under the "Consumer Confidence Reporting Rule" of the federal Safe Drinking Water Act (SDWA), community water systems are required to report this water quality information to the consuming public. Presented in this report is information on the source(s) of our water, its constituents, and the associated health risks. This report is designed to strengthen public understanding about the safety of their public water systems; technical language included is required by the Environmental Protection Agency (EPA). **The drinking water systems at Yokota Air Base and Tama Hills met all** Japan Environmental Governing Standards **(JEGS) drinking water quality standards in 2023.**

1. Drinking Water Sources for Yokota Air Base and Tama Hills

Yokota: The Yokota Air Base water supply system is supplied from groundwater sources with 11 active wells on the base. Water is pumped from wells to the on-base treatment plants for chlorination and fluoridation then pumped to elevated storage tanks prior to entering the distribution system. The Yokota AB water system serves approximately 11,500 people and the water consumption average is 2.1 million gallons per day.

*Yokota AB also maintains **local city water connections** to Musashi-Murayama and Fussa cities and only used during emergency situations treated at Ozaku and Fussa-Musashinodai treatment plants (city water quality is monitored by the Tokyo Waterworks Bureau).*

Tama Hills: The Tama Hills Recreational Annex is a Geographically Separated Unit (GSU) and water supply system is supplied from groundwater sources with two active wells on the annex. Water is pumped from wells to the treatment plants for chlorination then pumped to the distribution system. The Tama Hills water system serves approximately 200 transient personnel and the water consumption average during the highest usage season is 34,000 gallons per day.

2. Common Sources of Drinking Water Contamination

Common drinking water sources (for both tap 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 other substances from animal or human activity. 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 calling the EPA's Safe Drinking Water Hotline (1-800-426- 4791). Contaminants that may be present in source water include:

- ***Microbial contaminants***: Viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ***Inorganic contaminants:*** Salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ***Pesticides and herbicides***: May come from agriculture, urban storm water runoff, and residential uses.

- ***Organic chemical contaminants***: Including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can come from gas stations, urban storm water runoff, and septic systems.
- ***Disinfectant Byproducts***: By-product of drinking water disinfection, intended to kill or inactivate pathogenic microorganisms in water.
- ***Radioactive Contaminants:*** Can be naturally occurring or the result of oil/gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

3. Water Safety and Quality Assurance Responsibilities

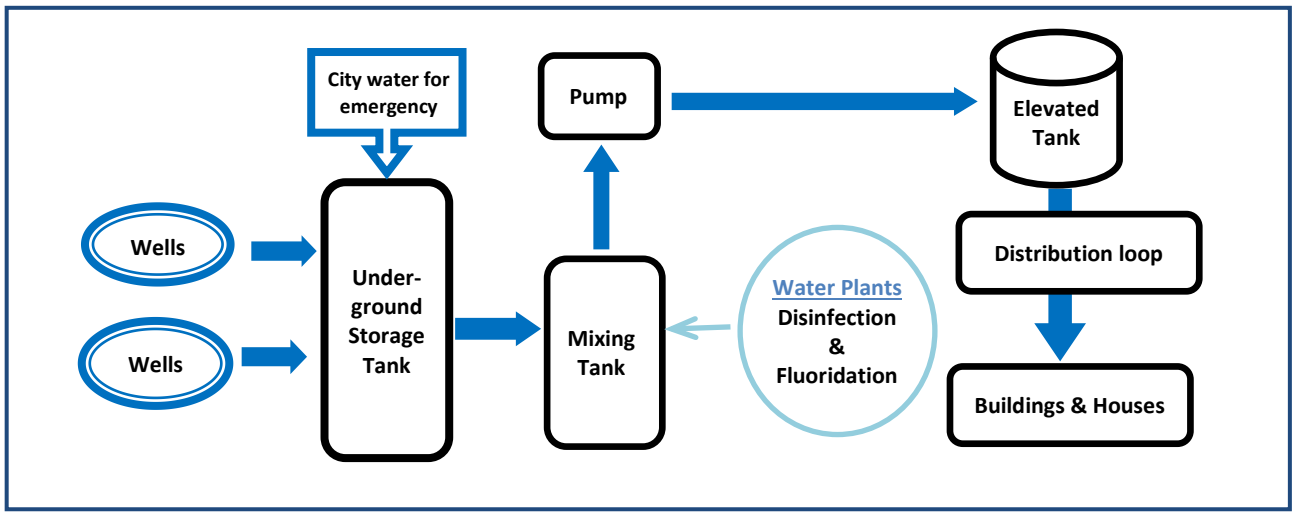
The 374th Civil Engineering Squadron (CES) manages the maintenance and operations of the drinking water supply and distribution system. CES Water & Fuel Systems Maintenance (WFSM) shop personnel operate 24 hours a day to maintain sufficient pressurization, disinfection, and fluoridation. At all water plants, the operator also monitors pH, chlorine residual and fluoride concentration.

The 374th Operational Medical Readiness Squadron (OMRS) Bioenvironmental Engineering (BE) Flight monitors the quality of drinking water provided to consumers and addresses any health-related concerns. Analysis is conducted by EPA certified laboratories for contaminants. Additionally, microbial contaminants analysis is conducted in the BE Laboratory (Bldg. 1585, Rm LB02) on a weekly basis.

4. Drinking Water Treatment Information

Water is treated at the plant before it is sent to the distribution system. The treatment method is chlorination or electrochemical generation for disinfection. BE monitors the levels of chlorine, fluoride, and presence of bacteria at the distribution sites weekly at Yokota AB and monthly at Tama Hills. BE contacts the WFM shop when adjustments are needed. Also contact times (i.e., CT values) are monitored to ensure proper disinfection of the water in accordance with applicable regulations.

Yokota Water System (simplified diagram)



5. Drinking Water Monitoring

Yokota BE routinely monitors for over 170 contaminants by using EPA certified laboratories and approved methods in accordance with 2022 JEGS and EPA regulations.

- ***Microbial contaminants:*** Sampling is conducted every week at distribution points (such as childcare facilities, elementary schools, youth center, and the hospital), the analysis includes chlorine and pH levels and coliform testing. Coliforms are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present. Both total and fecal coliforms have been undetectable in tests of Yokota AB's water throughout the year.
- ***Other contaminants* (*inorganic, pesticides & herbicides, organic, disinfectant byproducts and radioactive*)**: Monitored on a different frequency respectively as shown below Table 1.

Table 1. Contaminant Groups and Monitoring Frequencies <as of 2023>

Contaminant Group	Chemical Name	Monitoring Frequency	Sampling Location
Microbial	Total coliform, Fecal Coliform, pH, Free Available Chlorine	Weekly/Monthly/ Quarterly	Schools, FSS child occupied facilities, Aircraft watering point, GSU locations
Inorganic	Metals, (e.g. arsenic, selenium, mercury, nickel, sodium, etc.) Note 1 **(13 Total)**	Once every 3 years	Yokota AB: 5 water plants Tama Hills: 2 water plants
	Nitrate, Nitrite, Total Nitrate/Nitrite	Annually	
	Asbestos	Once every 9 years	
	Corrosivity	Once	Wells
Synthetic Organic Chemicals	**<Volatile Organic Chemicals>** Benzene, Trichloroethylene, Carbon Tetrachloride, etc. Note 2 **(21 Total)**	Quarterly	Yokota AB: 5 water plants Tama Hills: 2 water plants
	<Pesticides/PCBs> Herbicides, Dioxin, etc. Note 3 **(30 Total)**	2 consecutive quarters every 3 years	Yokota AB: 5 water plants Tama Hills: 2 water plants
Disinfectant By-Products	Total Trihalomethanes (TTHM) Total Haloacetic Acids (HAA5)	Note 4 Yokota: Annually Tama: Once every 3 years	Yokota AB: 8 distribution sites Tama Hills: 4 distribution sites
Lead & Copper from plumbing materials	Lead, Copper	Once every 3 years	Yokota AB: 30 homes Tama Hills: 5 facilities
Radionuclide Compounds	Gross Alpha and Beta, Radium226/228,Uranium	(Radionuclide types) Alpha - every 4 years Beta - every 9 years	Yokota AB: 5 water plants Tama Hills: 2 water plants
Per- and polyfluoroalkyl substances (PFAS)	Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), (29 Total)	Note 5 Every 2 years	Yokota AB: 5 water plants and 2 city water connections Tama Hills: 2 water plants

Note 1 **Inorganic compound list can be found in JEGS Chapter 8, Table 8.2**

Note 2 **Volatile organic compound list can be found in JEGS Chapter 8, Table 8.5**

Note 3 **Synthetic volatile organic compounds list can be found in JEGS Chapter 8, Table 8.5**

Note 4 **Reduced monitoring frequency based on JEGS in Chapter 8, Paragraph 8.9**

Note 5 **Monitoring frequency was changed to semi-annual IAW DoD memo *Memorandum for Sampling of Per- and polyfluoroalkyl substances in DoD-Owned Drinking Water System, 11 Jul 23***

6. Special Precautions

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. EPA/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).

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. Yokota AB 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 or at www.epa.gov/safewater/lead. **The measured concentrations at Yokota AB are all below the action level.**

Copper: The primary sources of copper in drinking water are corrosion of household plumbing systems and erosion of natural deposits. Copper enters the water (leaches) through contact with the plumbing. Copper leaches into water through corrosion –the dissolving or wearing away of metal caused by a chemical reaction between water and plumbing. Copper can leach into water primarily from pipes, but fixtures, faucets (brass), and fittings can also be a source of copper contaminants. The amount of copper in your water also depends on the types and amounts of minerals in the water, how long the water stays in the pipes, the amount of wear in the pipes, the water's acidity and its temperature. When water sits in copper pipes or plumbing containing copper for several hours or more, the copper may dissolve into the water. This means the first water drawn from the tap for the day may contain elevated levels of copper. As a precaution, consumers are encouraged to flush water from their faucets for 60 seconds before consumption after the faucet has remained unused for four or more hours. **The measured concentrations at Yokota AB are all below the action level.**

7. Monitoring Results in Calendar Year 2023

Our drinking water meets all JEGS and EPA requirements. Monitoring results are summarized in Table 2 (Yokota AB Water System), Table 3 (Tama Hills Water System), Table 4 (Yokota Per- and polyfluoroalkyl substances (PFAS)) and Table 5 (Tama Hills Per- and polyfluoroalkyl substances (PFAS)).

Table 2. 2023 Yokota AB Water System Detected Contaminants
<Detected Chemicals Only>

Inorganics Monitoring Frequency: Annually for Nitrate, every 3 years for other Inorganics
Total 21 chemicals are tested and only chemicals detected are listed below.

Substances	Violation? Yes / No	Units	Detected Level		MCLG	MCL	Last Sampled	Common Potential Sources in Drinking Water
			Highest	Lowest		EPA (JEGS)		
Nitrate	**No**	ppm	**3.5**	0.7	10	**10** (10)	Jan 23	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Arsenic	**No**	ppb	**3.0**	ND	0	**10** (10)	Apr 21	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium	**No**	ppm	**0.003**	ND	2	**2** (2)	Apr 21	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits

Fluoride	**No**	ppm	**1.0**	0.6	4	**4** (4)	Apr 21	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Sodium	**No**	ppm	**18**	12	N/A	N/A (N/A)	Apr 21	Erosion of natural deposits

Volatile Organic Compounds Monitoring Frequency: Quarterly
Total 21 chemicals are tested and only chemicals detected are listed below.

Substances	Violation? Yes / No	Units	Detected Level		MCLG	MCL	Last Sampled	Typical Source
			Highest	Lowest		EPA (JEGS)		
1,1-Dichloroethylene	**No**	ppb	**1.0**	ND	7	**7** (7)	Jan 23	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	**No**	ppb	**0.2**	ND	70	**70** (70)	Jan 23	Discharge from industrial chemical factories
Tetrachloroethylene	**No**	ppb	**1.8**	ND	0	**5** (5)	Jan 23	Discharge from factories and dry cleaners
Trichloroethylene	**No**	ppb	**0.4**	ND	0	**5** (5)	Jan 23	Discharge from metal degreasing sites and other factories

Disinfectant By-Products Monitoring Frequency: Annual

Substances	Violation? Yes / No	Unit	Your Water	Range	MCLG	MCL EPA (JEGS)	Last Sampled	Typical Source
Total Trihalomethanes (TTHM)	**No**	ppb	**0.9**	0.59 -1.2	N/A	**80** (80)	Aug 23	By-product of drinking water disinfection

Radionuclides Compounds Monitoring Frequency: every 4 years

Substances	Violation? Yes / No	Units	Detected Level		MCLG	MCL EPA (JEGS)	Last Sampled	Typical Source
			Highest	Lowest				
Combined Radium 226 and 228	**No**	pCi/L	**1.64**	ND	0	**5** (5)	Nov 20	Erosion of natural deposits
Gross Beta	**No**	pCi/L	**6.03**	0.07	0	**50**	Mar 22	

Table 3. 2022 Tama Hills Water System Detected Contaminants <Detected Chemicals Only>

Inorganics Monitoring Frequency: Annually for Nitrate, every 3 years for Other Inorganics
Only chemicals detected are listed below, 14 others were tested.

Substances	Violation ? Yes / No	Units	Detected Level		MCLG	MCL EPA (JEGS)	Last Sampled	Typical Source
			Highest	Lowest				
Nitrate	**No**	ppm	**0.83**	0.03	10	**10** (10)	Jan 23	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Sodium	**No**	ppm	**7.9**	7.9	N/A	**N/A** (N/A)	Apr 21	Erosion of natural deposits

Disinfectant By-Products Monitoring Frequency: every 3 years
Only chemicals detected are listed below

Substances	Violation ? Yes / No	Unit	Your Water	Range	MCLG	MCL EPA (JEGS)	Last Sampled	Typical Source
Total Trihalomethanes (TTHM)	**No**	ppb	**5.3**	0.6-9.9	N/A	**80** (80)	Mar 22	By-product of drinking water disinfection

Radionuclides Compounds Monitoring Frequency: every 4 years

Substances	Violation ?	Units	Detected Level		MCLG	MCL EPA	Last Sampled	Typical Source
			Highest	Lowest				

	Yes / No					(JEGS)		
Combined Radium 226 and 228	**No**	pCi/L	**1.19**	1.08	0	**5** (5)	Nov 20	Erosion of natural deposits
Gross Alpha	**No**	pCi/L	**0.3**	0.3	0	**15** (15)	Nov 20	
Uranium	**No**	pCi/L	**0.08**	ND	0	**20**	Nov 20	
Gross Beta	**No**	pCi/L	**4.82**	1.80	0	**50**	Mar 22	

8. Per- and polyfluoroalkyl substances (PFAS)

- Per-and Polyfluoroalkyl Substances (PFAS): Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonate (PFOS) and other substances. (EPA Method 537.1 and EPA Method 533 for PFAS analysis)

PFAS Frequently Asked Questions (FAQ)

- **What are per- and polyfluoroalkyl substances and where do they come from?**

Per- and polyfluoroalkyl substances (PFAS) are a group of thousands of man-made chemicals. PFAS have been used in a variety of industries and consumer products around the globe, including in the U.S., since the 1940s. PFAS have been used to make coatings and products that are used as oil and water repellents for carpets, clothing, paper packaging for food, and cookware. They are also contained in some foams such as aqueous film-forming foam, or AFFF, used for fighting petroleum fires at airfields and in industrial fire suppression processes. PFAS compounds are persistent in the environment and some are persistent in the human body – meaning they do not break down and they can accumulate over time.

- **Is there a regulation for PFAS in drinking water?**

In May 2016, the Environmental Protection Agency (EPA) established a lifetime health advisory (LHA) level at 70 parts per trillion (ppt) for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Both compounds are types of PFAS. On 10 April 2024, the EPA published new drinking water standards for certain PFAS under the Safe Drinking Water Act (SDWA). AF is reviewing the EPA's new rule now, and will incorporate these standards into future sampling and analysis efforts.
Out of an abundance of caution, DoD pursued PFAS testing and response actions beyond EPA SDWA requirements. In 2020, the DoD established a policy to monitor drinking water for 17 PFAS compounds at all service owned and operated water systems. If results confirmed the drinking water contained PFOA and PFOS at individual or combined concentrations greater than 70ppt, water systems quickly took action to reduce exposures. While not a SDWA requirement, n 2023, DoD improved upon its 2020 PFAS drinking water monitoring policy by expanding the list of PFAS compounds monitored to 29, implementing continued monitoring of systems with detectable PFAS over the laboratory Method Reporting Limits (MRL), and requiring initial mitigation planning actions.

- **Has Yokota AB tested its water for PFAS?**

Yes. In October 2023, samples were collected from Yokota and Tama.

We are informing you that 8 of the 29 PFAS compounds covered by the sampling method were detected above the Method Detection Limit (MDL). The results are provided in Table 4 below, and public notification of these sample results was initially provided on 2 Feb 24 via Yokota AB Official Website (www.yokota.af.mil). PFOA and PFOS were detected but below 70ppt. As PFOA and PFOS were below the 70ppt, there is no immediate cause for concern and we will continue to monitor the drinking water closely. In accordance with DoD policy, Yokota AB will collect semi-annual samples for PFAS, and periodic updates are available at Yokota AB Official Website.

Table 4. 2023 Yokota AB Detected PFAS

Analyte	Abbrevia-tion	CAS Number	Result (ppt)	2016 EPA Health Advisory Level	Last Sampled
Perfluorooctanoic acid	PFOA	335-67-1	5.3	70 ppt	Oct 23
Perfluorooctanesulfonic acid	PFOS	1763-23-1	8.7		
Perfluoroheptanoic acid	PFHpA	375-85-9	1.9	N/A	

Perfluorohexanoic acid	PFHxA	307-24-4	2.4		
Perfluorohexanesulfonic acid	PFHxS	355-46-4	4.6		
Perfluorononanoic acid	PFNA	375-95-1	2.1		
Perfluorobutanoic acid	PFBA	375-22-4	2.6		
Perfluoropentanoic acid	PFPeA	2706-90-3	2.3		

Table 5. 2023 Tama Hills Detected PFAS

Analyte	Abbrevia-tion	CAS Number	Result (ppt)	2016 EPA Health Advisory Level	Last Sampled
None Detected					Oct 23

Terms Defined

DoD - Department of Defense.
EPA - United States Environmental Protection Agency.
JEGS - Japan Environmental Governing Standards (JEGS).
Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no expected health risk. MCLGs allow for a margin of safety.
N/A - Not applicable, No MCL established.
ND - Means not detected and indicates that the substance was not found by laboratory analysis.
Part per million (ppm) – 1/1,000,000; One ppm corresponds to 1 minute in 2 years, or a single penny in $10,000.
Part per billion (ppb) – 1/1,000,000,000; One ppb corresponds to 1 minute in 2,000 years, or a single penny in $10,000,000.
Part per trillion (ppt) – 1/1,000,000,000,000; One ppt corresponds to 1 minute in 2,000,000 years, or single penny in $10,000,000,000
Picocuries per liter (pCi/L) - Picocuries per liter is a measure of radioactivity in water.
Millirem (mrem) – , One thousandth of a rem. Dose unit of absorbed energy with ionizing radiation.

For more information

For more information on opportunities to participate in decisions that affect the quality of local drinking water, reach out to the following organizations:

Organization	DSN	Service Area
374 OMRS Bioenvironmental Engineering (BE)	225-8040	Drinking water quality concerns
374 CES Water & Fuel Systems Maintenance (WFSM)	225-7089	Water treatment and distribution

- **E-mail: usaf.yokota.374-mdg.mbx.omrs-bioenvironmental-engineering@health.mil**