# Drinking Water Quality
# Annual Report for Calendar Year 2022

## Yokota Air Base & Tama Hills
## (Published: Jun 2023)

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 are safe and reliable.**

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

**Yokota**: Yokota AB is located on the island of Honshu Japan, 25 miles west of Tokyo in the densely populated area of the Kanto Plain. The system is currently supplied from groundwater sources with 11 total active wells. These sources provide water to five different treatment and distribution plants within three distinct areas on the base (East, Main, and West). The water supply, pumped from wells with an average of 2.1 million gallons per day, is then sent to the on-base treatment plants for disinfection and fluoridation then pumped to elevated storage tanks prior to entering the distribution system. The population served on Yokota AB is 10,863 people.

*Yokota AB also maintains connections to **Musashi-Murayama** and **Fussa** cities used during **emergency situations only** treated at **Ozaku** and **Fussa-Musashinodai** treatment plants (monitoring is adjusted to accommodate the change if used).*

**Tama:** The water supply system at Tama Hills Recreational Annex consists of two wells within the annex. Chlorination of the water occurs at two water treatment plants. The Tama Hills water system serves approximately 200 transient personnel, the water consumption average during the highest usage season is 69,000 gallons per day.

## 2. Common Sources of Drinking Water Contamination

Drinking water sources (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. 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.

## 3. Water Safety and Quality Assurance Responsibilities

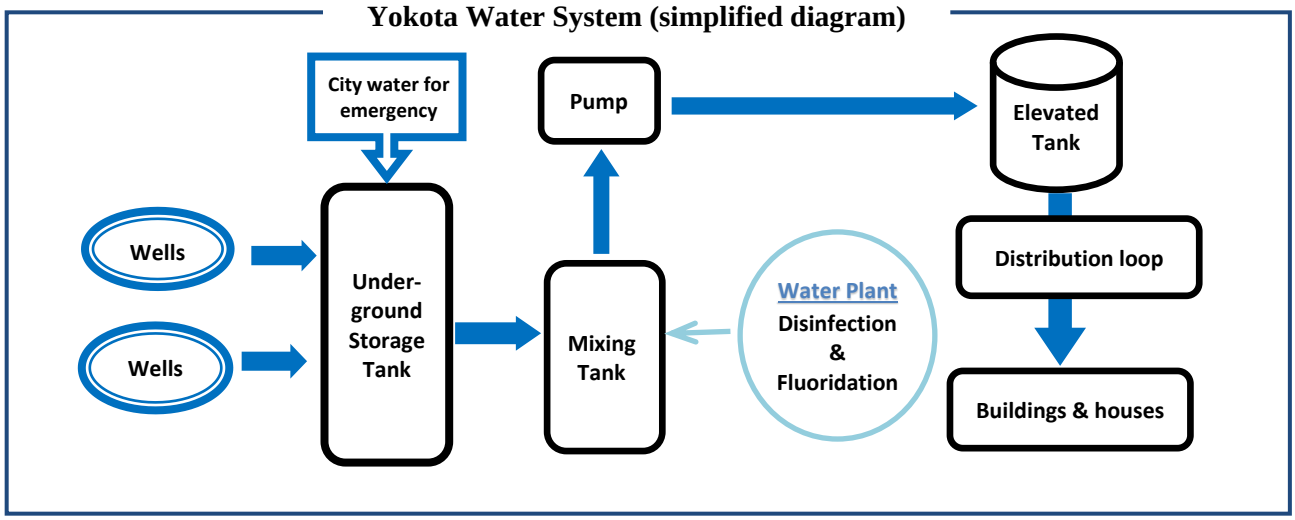
The 374th Civil Engineer Squadron (CES) manages the maintenance and operations of the drinking water supply and distribution system. CES Utilities personnel operate 24 hours a day to maintain sufficient pressurization, disinfection, and fluoridation. At all water plants, the operator also monitors pH, 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 all contaminants. Additionally, microbial contaminants analysis is conducted in the BE Lab (Bldg. 1585, Rm LB02) on a weekly basis.

**The Drinking Water Working Group (DWWG)**, required by AFI 48-144, is held quarterly in the BE Conference Rm (Bldg. 1585, Rm LB03) by members of CE Utility Shop, CE Environmental Element, and BE. The DWWG meets to address all local drinking water issues involving compliance, risk reduction, and continuous improvement. DWWG has the authority to call a special meeting with Public Affairs (PA), Base Legal (JA), or other related members as needed. Consumers are welcome to attend this meeting; please call 225-8040 for more information.

## 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 and monthly at Tama. BE contacts the CES Utilities 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.




## 5. Drinking Water Monitoring

Yokota BE routinely monitors for over 170 contaminants using EPA-certified laboratories and approved methods in accordance with 2022 Japan Environmental Governing Standards (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'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 2022>

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

## 6. Special Precautions

Although our water is safe to drink and meets all water quality standards, some individuals are more susceptible to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer and 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. These people should seek advice about drinking water from their health care providers.

**Lead** is a toxic material known to be harmful to human health if ingested or inhaled. Lead in the body can cause damage to the brain, kidneys, nervous system, and red blood cells. Children, infants, pregnant women, and their unborn children are especially vulnerable to lead. In children, lead has been associated with impaired mental and physical development as well as hearing problems. The harmful effects of lead in the body can be subtle and may occur without any obvious signs of lead poisoning. Blood levels as low as 10 micrograms per deciliter (ug/dL) are associated with harmful effects on children's learning and behavior. Minimizing sources of exposure to lead can help reduce the number of children with elevated blood lead levels. Although drinking water is not typically the primary source of lead exposure in children, it can contribute to total lead exposure.

Lead can also be introduced into the body through soil and air, which contributes to the total amount of lead exposure. In response, the EPA has set a cumulative blood lead level of less than 10 ug/dL. Therefore, reducing the amount of lead in the drinking water is an important part of reducing a child's overall exposure to lead in the environment. **The measured concentrations at Yokota 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 are all below the action level.**

## 7. Monitoring Results in Calendar Year 2022

**"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) and Table 4 (Non-Regulated Compounds).

**Table 2. 2022 Yokota AB Water System Detected Contaminants**
**<Detected Chemicals Only>**

| Substances | Violation? Yes / No | Units | Detected Level | | MCLG | MCL | Last Sampled | Common Potential Sources in Drinking Water |
|---|---|---|---|---|---|---|---|---|
| | | | Highest | Lowest | | EPA (JEGS) | | |
| **Inorganics** Monitoring Frequency: Annually for Nitrate, every 3 years for other Inorganics<br>*Total 21 chemicals are tested and only chemicals detected are listed below.* | | | | | | | | |
| **Nitrate** | **No** | ppm | **3.6** | 0.7 | 10 | **10** (10) | Jan 2022 | Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits |
| **Arsenic** | **No** | ppb | **3.0** | ND | 0 | **10** (10) | Apr 2021 | Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes |
| **Barium** | **No** | ppm | **0.0034** | ND | 2 | **2** (2) | Apr 2021 | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits |
| **Fluoride** | **No** | ppm | **1.0** | 0.6 | 4 | **4** (4) | Apr 2021 | 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 2021 | Erosion of natural deposits |
| **Volatile Organic Compounds** Monitoring Frequency: Quarterly<br>*Total 21 chemicals are tested and only chemicals detected are listed below.* | | | | | | | | |
| **cis-1,2-Dichloroethylene** | **No** | ppb | **0.3** | ND | 70 | **70** (70) | Dec 2022 | Discharge from industrial chemical factories |
| **Tetrachloroethylene** | **No** | ppb | **1.6** | ND | 0 | **5** (5) | Dec 2022 | Discharge from factories and dry cleaners |
| **1,1,1-Trichloroethane** | **No** | ppb | **0.3** | ND | 20 | **200** (200) | Dec 2022 | Discharge from metal degreasing sites and other factories |
| **Trichloroethylene** | **No** | ppb | **0.8** | ND | 0 | **5** (5) | Dec 2022 | Discharge from metal degreasing sites and other factories |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Disinfectant By-Products** Monitoring Frequency: Quarterly | | | | | | | | |
| **Total Trihalomethanes (TTHM)** | **No** | ppb | **3.6** | ND | N/A | **80** (80) | Aug 2022 | By-product of drinking water disinfection |
| **Haloacetic acids (HAA5)** | **No** | ppb | **0.5** | ND | N/A | **60** | Aug 2022 | |
| **Radionuclides Compounds** Monitoring Frequency: every 4 years | | | | | | | | |
| **Combined Radium 226 and 228** | **No** | pCi/L | **1.64** | ND | 0 | **5** (5) | Nov 2020 | Erosion of natural deposits |
| **Gross Beta** | **No** | pCi/L | **6.03** | 0.07 | 0 | **50** | Mar 2022 | |

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

| Substances | Violation? Yes / No | Units | Detected Level | | MCLG | MCL | Last Sampled | Common Potential Sources in Drinking Water |
|---|---|---|---|---|---|---|---|---|
| | | | Highest | Lowest | | EPA (JEGS) | | |
| **Inorganics** Monitoring Frequency: Annually for Nitrate, every 3 years for Other Inorganics<br>*Only chemicals detected are listed below, 14 others were tested.* | | | | | | | | |
| **Nitrate** | **No** | ppm | **0.15** | 0.10 | 10 | **10** (10) | Jan 2022 | 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 2021 | Erosion of natural deposits |
| **Disinfectant By-Products** Monitoring Frequency: Annually<br>*Only chemicals detected are listed below* | | | | | | | | |
| **Total Trihalomethanes (TTHM)** | **No** | ppb | **9.9** | 2.9 | N/A | **80** (80) | Mar 2022 | By-product of drinking water disinfection |
| **Radionuclides Compounds** Monitoring Frequency: every 4 years | | | | | | | | |
| **Combined Radium 226 and 228** | **No** | pCi/L | **1.19** | 1.08 | 0 | **5** (5) | Nov 2020 | Erosion of natural deposits |
| **Gross Alpha** | **No** | pCi/L | **0.3** | 0.3 | 0 | **15** (15) | Nov 2020 | |
| **Uranium** | **No** | pCi/L | **0.08** | ND | 0 | **20** | Nov 2020 | |
| **Gross Beta** | **No** | pCi/L | **4.82** | 1.80 | 0 | **50** | Mar 2022 | |

## Non-Regulated Compounds: Yokota AB and Tama Hills

- Per-and Polyfluoroalkyl Substances (**PFAS**): Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonate (PFOS) and 16 other substances. (EPA Method 537.1 for PFAS analysis)

**Background:** PFAS are a group of thousands of man-made chemicals. PFAS have been used in a variety of industrial and consumer products around the globe, including in the U.S., for decades. Due to their widespread use and environmental persistence, most people in the United States have been exposed to certain PFAS. 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 (aqueous film-forming foam or AFFF) used for fighting petroleum fires.

## Table 4. 2022 Yokota AB and Tama Hills Water System

**<PFAS>**

| Water Source | Violation? Yes / No | Units | Detected Level | | EPA Health Advisory | MCL | Last Sampled | Common Potential Sources in Drinking Water |
|---|---|---|---|---|---|---|---|---|
| | | | Highest | Lowest | | JEGS | | |
| **DoD-Owned (Yokota AB)** | **No** | ppt | **14.2** | ND | **70** | N/A | Aug 2022 | PFAS are chemicals that are found in many different consumer, commercial, and industrial products. They can enter the environment through air emissions, water discharges, landfills. |
| **DoD-Owned (Tama Hills)** | **No** | ppt | **ND** | ND | **70** | N/A | Aug 2022 | |
| ***Non-DoD (City Water)** | **No** | ppt | **5.9** | ND | **70** | N/A | Aug 2022 | |

While PFAS was detected at Yokota AB those results were below the 2016 EPA HA level.

**PFAS Regulation:** There is currently no federal drinking water standard for any PFAS compounds. In 2016, the U.S. Environmental Protection Agency (EPA) established a lifetime drinking water health advisory (HA) level at 70 parts per trillion (ppt) for individual or combined concentrations of PFOA and PFOS.

In 2020, Department of Defense (DoD) issued a policy to monitor drinking water for PFAS at all DoD owned and operated water systems at a minimum of every three years. The DoD policy states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than the 2016 EPA HA level, water systems would 1) take immediate action to reduce exposure to PFOS or PFOA, to include providing alternative drinking water; and 2) undertake additional sampling to assess the level, scope, and localized source of contamination.

On 14 March 2023, EPA announced a proposed regulation on PFAS drinking water standards for public comment. The Department supports EPA taking regulatory actions to address PFAS, including a drinking water standard for PFAS that will apply to all drinking water suppliers once final. DoD respects and values the public comment process on this proposed nationwide drinking water rule and looks forward to the clarity that a final regulatory drinking water standard for PFAS will provide.

In accordance with DoD policy, Yokota AB collected quarterly samples for one year and are now collecting samples every two years thereafter as long as the results are below the 2016 EPA HA level.

## 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

| Organization | DSN | Service Area |
|---|---|---|
| 374 OMRS Bioenvironmental Engineering | 225-8040 | Drinking water quality concerns |
| 374 CES Water & Fuel System Maintenance | 225-7089 | Water treatment and distribution |

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